Amador County
Local Hazard Mitigation Plan Update

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FOSTER MORRISON
CONSULTING

Executive Summary

Amador County, five incorporated communities, and two special districts prepared this Local Hazard Mitigation Plan (LHMP) Update to the Federal Emergency Management Agency (FEMA) approved 2020 Amador County LHMP. This Amador County LHMP is a multi-jurisdictional plan that geographically covers the entire area within Amador County's jurisdictional boundaries (hereinafter referred to as the Planning Area). The following jurisdictions participated in the planning process and are seeking FEMA approval of the LHMP Update:

- Amador County*
- City of Amador City*
- City of Ione*
- City of Jackson*
- City of Plymouth*
- City of Sutter Creek*
- Amador Water Agency*
- Jackson Valley Irrigation District*

* Participated in 2020 Amador County LHMP

4 jurisdictions that were approved for the 2020 LHMP, but are not seeking approval for this Plan Update include:

- Amador Fire Safe Council
- Lockwood Fire Protection District
- Pine Grove Community Services District
- River Pines Public Utility District

The purpose of this 2025 Amador County LHMP Update and hazard mitigation planning process is to reduce or eliminate long-term risk to people and property, critical facilities and infrastructure, natural and historic and cultural resources, and other community assets from future hazard events and natural disasters. This LHMP Update demonstrates the participating jurisdictions' commitment to reducing risks from hazards and serves as a tool to help decision makers direct mitigation activities and resources. This LHMP Update was also developed in order for the participating jurisdictions to be eligible for certain federal disaster assistance, specifically, the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program (HMGP), Building Resilient Infrastructure and Communities (BRIC) program, and the Flood Mitigation Assistance (FMA) program.

Each year in the United States, natural disasters take the lives of hundreds of people and injure thousands more. Nationwide, taxpayers pay billions of dollars annually to help communities, organizations, businesses, and individuals recover from disasters. These monies only partially reflect the true cost of disasters, because additional expenses to insurance companies and nongovernmental organizations are not reimbursed by tax dollars. Many natural disasters are predictable, and much of the damage caused by these events can be alleviated or even eliminated through natural hazard mitigation.

2025 LHMP Update Plan Development Process

Hazard mitigation planning is the process through which hazards that threaten communities are identified, likely impacts determined, mitigation goals set, and appropriate mitigation strategies determined, prioritized, and implemented. This LHMP Update documents the 2025 hazard mitigation planning process and identifies relevant hazards, community risk and vulnerabilities, and mitigation strategies the participating jurisdictions will use to decrease vulnerability and increase resiliency and sustainability in the Amador County Planning Area.

This LHMP Update was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 (Public Law 106-390), the implementing regulations set forth by the Interim Final Rule published in the Federal Register on February 26, 2002, (44 CFR §201.6) and finalized on October 31, 2007, and current FEMA guidance. Amador County jurisdictions followed a planning process prescribed by FEMA as detailed in Table ES-1.

Table ES-1 Local Hazard Mitigation Planning Process

DMA Process	Modified CRS Process
1) Organize Resources	
201.6(c)(1)	1) Organize the Planning Effort
201.6(b)(1)	2) Involve the Public
201.6(b)(2) and (3)	3) Coordinate with Other Departments and Agencies
2) Assess Risks	
201.6(c)(2)(i)	4) Identify the Hazards
201.6(c)(2)(ii)	5) Assess the Risks
3) Develop the Mitigation Plan	
201.6(c)(3)(i)	6) Set Goals
201.6(c)(3)(ii)	7) Review Possible Activities
201.6(c)(3)(iii)	8) Draft an Action Plan
4) Implement the Plan and Monitor Progress	
201.6(c)(5)	9) Adopt the Plan
201.6(c)(4)	10) Implement, Evaluate, and Revise the Plan

The planning process began with the organizational phase to establish the Hazard Mitigation Planning Committee (HMPC), comprised of key Amador County jurisdictional representatives, and other local and regional stakeholders; to involve the public; and to coordinate with other departments and agencies. A detailed risk assessment was then conducted followed by the development of a focused mitigation strategy for the Amador County Planning Area and specific to each participating jurisdiction. Once approved by Cal OES and FEMA, this 2025 LHMP Update will be adopted and implemented by the participating jurisdictions over the next five years.

Risk Assessment

A natural hazard risk assessment was conducted that identified and profiled hazards that pose a risk to the Amador County Planning Area and to each participating jurisdiction, assessed the vulnerability of the Amador County Planning Area and jurisdictions to these hazards, and examined the existing jurisdictional capabilities to mitigate identified hazards.

The Amador County Planning Area is vulnerable to numerous hazards that are identified, profiled, and analyzed in this 2025 LHMP Update. Wildfires, floods, earthquakes, drought, dam failure, and other severe weather events are among the hazards that can have a significant impact on the Planning Area. Table ES-2 details the hazards identified for this 2025 LHMP Update.

Table ES-2 Amador County Planning Area Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Agricultural Hazards (severe weather/pests/invasive species)	Extensive	Highly Likely	Limited	Medium	Medium
Avalanche	Limited	Likely	Critical	Medium	Medium
Climate Change	Extensive	Likely	Limited	Medium	--
Dam Failure	Limited	Unlikely	Critical	Medium	Medium
Drought & Water shortage (w/ tree mortality)	Extensive	Likely	Critical	Medium	High
Earthquake (w/subhazards)	Extensive	Unlikely	Catastrophic	Medium	Low
Floods: 1%/0.2% annual chance (w/ levee failure)	Significant	Occasional/Unlikely	Critical	Medium	Medium
Floods: Localized Stormwater	Extensive	Highly Likely	Limited	Medium	Medium
Landslide, Mudslide, Debris Flow	Limited	Likely	Critical	Medium	Medium
Severe Weather: Extreme Cold, Freeze, and Snow	Extensive	Highly Likely	Limited	Medium	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Limited	Medium	High
Severe Weather: Heavy Rains and Storms (Hail, Lightning)	Extensive	Highly Likely	Limited	Medium	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Highly Likely	Limited	Medium	Medium
Wildfire (w/smoke and air quality)	Extensive	Highly Likely	Catastrophic	High	Medium

Geographic Extent

Limited: Less than 10% of planning area

Significant: 10-50% of planning area

Extensive: 50-100% of planning area

Likelihood of Future Occurrences

Highly Likely: Near 100% chance of occurrence in next year, or happens every year.

Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.

Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.

Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Magnitude/Severity

Catastrophic: More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths

Critical: 25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability

Limited: 10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability

Negligible: Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance

Low: Minimal potential impact

Medium: Moderate potential impact

High: Widespread potential impact

Climate Change Influence

Low: Minimal potential impact

Medium: Moderate potential impact

High: Widespread potential impact

Mitigation Strategy

Based on the results of the risk assessment, a mitigation action strategy was developed to reduce the Amador County Planning Area's risk and vulnerability to identified natural hazards. The resulting mitigation strategy is comprised of goals and objectives, and a mitigation action plan which includes a series of mitigation actions, projects, and implementation measures. The 2025 LHMP Update Goals and Objectives are detailed below followed by a summary table of the 2025 mitigation actions and projects.

Goal #1: Provide protection for people's lives, property, public health, and the environment and reduce risk and losses from natural hazards

- Minimize impact to existing development
- Minimize impact to future development
- Minimize economic and resource impact
- Promote resiliency strategies
- Consider and prioritize the use of prevention measures such as land use controls and code enhancements

Goal #2: Provide protection for critical facilities, infrastructure, utilities and services from hazard impacts

- Protect and improve resiliency of critical facilities, services, and community lifelines from hazard impacts to protect life and reduce loss of property
- Implement critical facility upgrades, retrofits, and mitigation measures to ensure reliability of services
- Update and maintain GIS list of critical facilities: Essential Services, At-Risk Populations, Hazardous Materials Facilities

Goal #3: Improve community (public and stakeholder) awareness, education, and preparedness to natural hazard events

- Enhance public/stakeholder outreach, education and preparedness planning for all hazards of concern and for all populations, including underserved and vulnerable populations
- Reinforce emergency response systems
- Foster household preparedness and self responsibility for hazard mitigation
- Increase public and stakeholder knowledge and awareness about the risk and vulnerability to identified hazards and how to take responsibility for and mitigate these risks with a focus on high priority hazards such as wildfire and flood
- Leverage existing public outreach and education mechanisms such as community coalitions and other existing forums; expand social media presence and local community boards
- Increase use of technology to communicate hazard information (e.g., GIS)
- Provide education and outreach on evacuation routes, signage, roles and responsibilities, as well as on various emergency communication modes

Goal #4: Build community resilience and increase communities' ability to be prepared for, respond to, and recover from a disaster event

- Improve community capabilities to mitigate hazards, reduce losses, and to better recover from disasters

- Integrate mitigation into planning and decision making by embedding mitigation strategies into everyday county policies, capital projects, and other similar mechanisms
- Improve interagency (local, state, federal) emergency coordination, communication, and operational capacity to ensure effective community preparedness, response and recovery
- Maintain current service levels and continue internal and operational training
- Enhance alert and warning systems and ensure effective system redundancies
- Improve emergency communication systems with reliable backup (e.g., cell phones, radios, sirens, reverse 911, multi-media, etc.)
- Improve identification, education, and emergency notifications of vulnerable and underserved populations
- Enhance the use of shared resources/Develop a strong mutual aid support system
- Improve and make better use of technology (e.g., GIS)
- Establish and expand GIS technologies to map hazards and community assets for mitigation planning and to support hazard response and community recovery
- Maintain coordination of disaster plans, data, and information with changing DHS/FEMA and State requirements
- Support and build upon evacuation planning and sheltering efforts in the County
- Mitigate future hazard losses through adequate land use/facilities planning

Goal #5: Reduce fire severity and intensity in Amador County and surrounding lands

- Reduce life safety issues, property loss, natural resource impacts, and damages associated with wildfires
- Prevent and reduce wildfire ignitions
- Increase agency and jurisdictional coordination to reduce wildfire risk, severity and intensity
- Increase vegetation management countywide to reduce wildfire losses
- Be proactive in identifying and prioritizing mitigation funding to minimize risk and vulnerability to wildfire
- Prioritize wildfire mitigation around critical facilities and infrastructure
- Support efforts to gain access to affordable insurance for all communities including underserved and vulnerable populations

Goal #6: Maintain FEMA Eligibility/Position the communities for Grant funding

- Improve community ability to be competitive/successful with grant funding opportunities from application development to project delivery
- Establish and share best practices among agencies for development of grant applications, project permits, etc.
- Educate (and advocate) local officials to support local access to funding.

Based on the risk assessment review and goal setting process, the HMPC identified mitigation actions (Table ES-3), which provide direction for reducing future hazard-related losses within the Amador County Planning Area and specific to each participating jurisdiction.

Table ES-3 Amador County Planning Area Mitigation Actions

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Amador County					
Multi-Hazard Actions					
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Previous Action	X	X		Prevention
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	Previous Action	X	X	X	Prevention Public Education
Action 3. Backup Power Projects for Critical Facilities & Infrastructure	Previous Action	X	X		Prevention Property Protection Natural Resource Protection
Action 4. Establish and Fund a Full-Time Geographic Information Systems (GIS) position for Hazard Mitigation and Emergency Planning	Previous Action	X	X		Prevention Emergency Services
Action 5. Enhance and Harden Cellular and Repeater Communications Infrastructure Countywide	Previous Action	X	X		Property Protection Structural
Action 6. Upgrade and Replace Countywide Emergency Radio Communications Infrastructure	Previous Action	X	X		Prevention Emergency Services
Action 7. Emergency Water Storage & Hauling Infrastructure Project	Previous Action	X	X		Prevention Emergency Services
Action 8. Launch of PHapp Mobile Preparedness Public Health Application	New Action	X	X		Prevention Property Protection Natural Resource Protection
Agricultural Hazard Actions					
Action 9. Invasive Pests (Insect)	Previous Action	X	X		Property Protection Natural Resource Protection
Action 10. Invasive Pests (Weeds)	Previous Action	X	X		Property Protection Natural Resource Protection
Climate Change Actions					
Action 11. Climate Resilience through Multi-Hazard Mitigation	New Action	X	X		Prevention Property Protection Natural Resource Protection

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Dam Failure, Flood, Localized Flood, and Heavy Rains and Storm Actions					
Action 12. Flood & Dam Failure Resilience Plan	New Action	X	X	X	Prevention Property Protection Natural Resource Protection
Earthquake Actions					
Action 13. Amador County Earthquake Preparedness & Seismic Resilience Plan	New Action	X	X		Prevention Property Protection Natural Resource Protection
Landslide Actions					
Action 14. Landslide Hazard Mitigation & Slope Stability Plan	New Action	X	X		Prevention Property Protection Natural Resource Protection
Severe Weather: Extreme Cold, Freeze, and Snow Actions					
Action 15. Severe Winter Weather Resilience Plan	New Action	X	X		Prevention Property Protection Natural Resource Protection
Severe Weather: Extreme Heat Actions					
Action 16. Extreme Heat Resilience Plan	New Action	X	X		Prevention Property Protection Natural Resource Protection
Wildfire, Drought, and Extreme Heat Actions					
Action 17. Tree Mortality Program Coordinator	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 18. Countywide wildfire resiliency coordination GIS mapping project to support fuels reduction efforts	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 19. Forest Health Projects	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 20. Ingress/Egress Phases I and II: Public Education and Fuels Reduction	Previous Action	X	X		Prevention Property Protection Natural Resource Protection
Action 21. Community Fuel Break Network	Previous Action	X	X		Prevention Property Protection Natural Resource Protection

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 22. Defensible Space Assistance	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 23. Defensible Space Public Education	New Action	X	X		Public Education
Action 24. Develop Amador County CWPP and Implementation of Identified Projects	Previous Action	X	X		Prevention Property Protection Public Education Natural Resource Protection
Action 25. Vegetation Management projects – Monitoring and Maintenance	Previous Action	X	X		Property Protection Natural Resource Protection
City of Amador City					
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Previous Action	X	X		Prevention
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	Previous Action	X	X	X	Prevention Public Education
Action 3. Old Hwy 49/Main Street Slope and Road Stabilization	Previous Action	X	X	X	Property Protection Natural Resource Protection
Action 4. Cooling Center/Severe Weather Center	New Action	X	X		Structural
Action 5. Amador Creek Annual Cleaning projects	New Action	X	X	X	Property Protection Natural Resource Protection
Action 6. Stormwater Masterplan Development and Implementation	Previous Action	X	X	X	Property Protection Natural Resource Protection
Action 7. Vegetation Management and Perimeter Wildfire Protection Fuel Break	Previous Action	X	X		Property Protection Natural Resource Protection
City of Ione					
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Previous Action	X	X		Prevention
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	Previous Action	X	X	X	Prevention Public Education
Action 3. Develop a Climate Adaptation Plan	New Action	X	X	X	Prevention Public Education

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 4. Implement Water Conservation and Drought Preparedness Program	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 5. Update Floodplain Ordinance and Join Community Rating System (CRS)	Previous Action	X	X	X	Prevention Property Protection Natural Resource Protection
Action 6. Develop a Storm Water Master Plan	Previous Action	X	X	X	Prevention Public Education
Action 7. Establish a Cooling Center Network and Shelter Upgrades	Previous Action	X	X		Emergency Services Prevention Property Protection Natural Resource Protection
Action 8. Implement Urban Forestry and Debris Management Program	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 9. Enhance Wildfire Preparedness and Defensible Space	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 10. Develop a Sustainable Sutter Creek Maintenance Program	New Action	X	X		Prevention Property Protection Natural Resource Protection
City of Jackson					
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Previous Action	X	X		Prevention
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	Previous Action	X	X	X	Prevention Public Education
Action 3. Creation of Drone Program	New Action	X	X		Property Protection Natural Resource Protection
Action 4. Backup Power Projects for Critical Facilities and Infrastructure (e.g. Generators, Batteries, Solar, Etc.)	New Action	X	X		Property Protection Structural
Action 5. Creek Excavation and Annual Clearing Projects	Previous Action	X	X	X	Property Protection Natural Resource Protection
Action 6. Pitt Street Bridge Replacement	New Action	X	X	X	Structural

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 7. Mattley Street Erosion Project	New Action	X	X	X	Prevention Property Protection Natural Resource Protection
Action 8. Home Hardening Education Program/Go Bags, ARC	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 9. Defensible Space Public Education	Previous Action	X	X		Public Education
Action 10. Fuel Break Projects	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 11. Jackson Fire Station 131 Replacement Project	New Action	X	X		Structural
City of Plymouth					
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Previous Action	X	X		Prevention
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	Previous Action	X	X	X	Prevention Public Education
Action 3. Develop a Community Wildfire Prevention Plan	New Action	X	X		Prevention Public Education
Action 4. Repairs of Old Sacramento Road to Reduce Flooding and Road Blockage	New Action	X	X	X	Prevention Property Protection Natural Resource Protection
Action 5. Additional Water Tank Storage	Previous Action	X	X		Structural
City of Sutter Creek					
Action 6. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Previous Action	X	X		Prevention
Action 7. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	Previous Action	X	X	X	Prevention Public Education
Action 8. Auditorium, Community Center, and WWTP Backup Power Generators	New Action	X	X	X	Structural
Action 9. Development of Walking Paths, Native Tree Protection, and Native Tree Species Planting	Previous Action	X	X		Prevention Property Protection Natural Resource Protection

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 10. Henderson Underdrain	New Action	X	X	X	Structural
Action 11. Recycled Water System for New Development	New Action	X	X		Structural
Action 12. Early EQ Warning Program	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 13. Sutter Creek Excavation/Annual Cleaning Projects	Previous Action	X	X	X	Prevention Property Protection Natural Resource Protection
Action 14. Stormwater Masterplan Development and Implementation	Previous Action	X	X	X	Prevention Property Protection Natural Resource Protection
Action 15. Culvert Cleaning Projects	Previous Action	X	X	X	Prevention Property Protection Natural Resource Protection
Action 16. Karsan Drive Tributary Slope and Road Stabilization	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 17. Cooling Center/Severe Weather Center	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 18. Vegetation Management Enforcement and Perimeter Wildfire Protection Fuel break	Previous Action	X	X		Prevention Property Protection Natural Resource Protection
Amador Water Agency					
Action 19. AWA Tank Flexibility Connectors	New Action	X	X		Structural
Action 20. Camanche WWTP Treatment, Disposal, and Effluent Storage Upgrades	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 21. CAWP Transmission Main Improvements and Tank D Replacement	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 22. CAWP Tiger Creek Afterbay Alternate Supply	New Action	X	X		Structural Property Protection Natural Resource Protection

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 23. Ione WTP Backwash Handling Improvements	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 24. Tanner Clearwell Replacement	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 25. Tanner WTP Backwash Drying Beds	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 26. Tank Replacement/ Tank Repair	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 27. Amador and Ione Water Systems Taste and Odor Mitigation	Previous Action	X	X		Structural Property Protection Natural Resource Protection
Action 28. Replacement of Two Hypalon Lined and Covered Tanks with New Tanks	Previous Action	X	X		Structural Property Protection Natural Resource Protection
Action 29. Mt. Crossman Main Area Tank for Upper CAWP System	Previous Action	X	X		Structural Property Protection Natural Resource Protection
Action 30. Martell Regional Lift Station and Collection System Improvements	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 31. Mace Meadows Pump Station Flooding	New Action	X	X	X	Structural Property Protection Natural Resource Protection
Action 32. Water Treatment Plant Raw Water Bypasses	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 33. Upgrade Fire Pumps	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 34. Tanner WTP Flow Control and Reliability Improvements	New Action	X	X		Structural Property Protection Natural Resource Protection

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 35. Ione Reliability Capacity Expansion and Site Security	New Action	X	X		Structural Property Protection Natural Resource Protection
Jackson Valley Irrigation District					
Action 36. Aquatic Invasive Species Monitoring Plan and Decontamination Station	Previous Action	X	X		Natural Resource Protection
Action 37. Long Term Water Solutions Analysis Due to Climate Change	Previous Action	X	X		Property Protection Natural Resource Protection
Action 38. Jackson Creek Dam Spillway Apron Extension Project	Previous Action	X	X	X	Structural Property Protection Natural Resource Protection
Action 39. Lake Amador Spillway Rubber Dam Project	Previous Action	X	X	X	Structural Property Protection Natural Resource Protection
Action 40. JVID Water Procurement and Additional Water Storage Study	Previous Action	X	X		Property Protection Natural Resource Protection
Action 41. Jackson Creek Streambank and Levee Maintenance Project	Previous Action	X	X	X	Structural Property Protection Natural Resource Protection
Action 42. Lake Amador Drive Box Culvert Expansion Project	Previous Action	X	X	X	Structural Property Protection Natural Resource Protection

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Annex D: City of Plymouth

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Annex F: Amador Water Agency

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Appendices

Appendix A: Planning Process

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Appendix C: Mitigation Strategy

Appendix D: Adoption Resolution

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Appendix F: Critical Facilities

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Abbreviations and Acronyms

Acronym	Definition
AB	Assembly Bill
AF	Acre-feet
ALERT	Automated Local Evaluation in Real Time
APG	California Adaptation Planning Guide
AQI	Air Quality Index
ASTDR	Agency for Toxic Substances and Disease Registry's
BAM	Best Available Map
BCA	Benefit Cost Analysis
BCEGS	Building Code Effectiveness Grading Schedule
BFE	Base Flood Elevation
BLM	Bureau of Land Management
BRIC	Building Resilient Infrastructure and Communities
CA-DWR	California Department of Water Resources
CAISO	California Independent System Operator
Cal EPA	Environmental Protection Agency
Cal OES	California Office of Emergency Services
CAP	Climate Adaptation Plan
CAS	Climate Adaptation Strategy
CAV	Community Assistance Visit
CBC	California Building Code
CCHPR	Climate Change and Health Profile Report
CCSM	Community Climate System Model
CDAA	California Disaster Assistance Act
CDBG	Community Development Block Grant
CDC	Center for Disease Control
CDFW	California Department of Fish and Wildlife
CEMP	Comprehensive Emergency Management Program
CEQA	California Environmental Quality Act
CERT	Community Emergency Response Team
CFR	Code of Federal Regulations
CGS	California Geological Survey
CIP	Capital Improvements Plan
CLOMR	Conditional Letter of Map Revision
CNPS	California Native Plant Society
CNRA	California Natural Resource Agency
COG	Continuity of Government
COO	Continuity of Operations

Acronym	Definition
CPUC	California Public Utilities Commission
CRS	(National Flood Insurance Program's) Community Rating System
CRV	Contents Replacement Value
CVP	Central Valley Project
CWPP	Community Wildfire Protection Plan
DAC	Disadvantaged Community
DFIRM	Digital Flood Insurance Rate Map
DMA	Disaster Mitigation Act of 2000
DOF	Department of Finance
DSOD	Division of Safety of Dams
EF	Enhanced Fujita
EOC	Emergency Operations Center
EPSS	Enhanced Powerline Safety Settings
ESPM	University of California, Berkeley's Department of Environmental Science, Policy, and Management
ETSU	Enhanced Treatment and Site Upgrade
F	Fujita
FEMA	Federal Emergency Management Agency
FHSZ	Fire Hazard Severity Zone
FIRM	Flood Insurance Rate Map
FIS	Flood Insurance Study
FMA	Flood Mitigation Assistance Program
FPA	Floodplain Administrator
FRA	Federal Responsibility Area
FRAP	Fire and Resource Assessment Program
FWS	US Fish and Wildlife Service
GFDL	Geophysical Fluid Dynamics Laboratory
GHG	Greenhouse Gases
GIS	Geographic Information Systems
GPH	Gallons per Hour
GRASP	Geospatial Research, Analysis & Services Program
HHPD	High Hazard Potential Dam
HI	Heat Index
HMGP	Hazard Mitigation Grant Program
HMPC	Hazard Mitigation Planning Committee
ICS	Incident Command System
IPCC	Intergovernmental Panel on Climate Change
IRWM	Integrated Regional Water Management
LHMP	Local Hazard Mitigation Plan
LOMA	Letter of Map Amendment

Acronym	Definition
LOMC	Letters of Map Change
LOMR	Letter of Map Revision
LRA	Local Responsibility Area
MHI	Median Household Income
MMI	Modified Mercalli Intensity Scale
MSL	Mean Sea Level
MW	Megawatt
NASA	National Aerospace and Science Agency
NAVD	North American Vertical Datum
NCDC	National Climactic Data Center
NDMC	National Drought Mitigation Center
NEHRP	National Earthquake Hazards Reduction Program
NEPA	National Environmental Policy Act
NFIP	National Flood Insurance Program
NGVD	National Geodetic Vertical Datum
NIDIS	National Integrated Drought Information System
NOAA	National Oceanic and Atmospheric Administration
NPS	National Park Service
NWS	National Weather Service
OHP	Office of Historic Preservation
PDM	Pre-Disaster Mitigation Program
PIT	Point-in-time Homeless Count
PM	Particulate Matter
PNAS	Proceedings of the National Academy of Sciences
PSPS	Public Safety Power Shutoff
RCP	Representative Concentration Pathway
RHNA	Regional Housing Need Allocation
SAC-SJ	Sacramento-San Joaquin Valley
SB	Senate Bill
SBA	Small Business Administration
SEMS	Standard Emergency Management System
SFHA	Special Flood Hazard Area
SGMA	Sustainable Groundwater Management Act
SHBC	State Historical Building Code
SRA	State Responsibility Area
SVI	Social Vulnerability Index
SWP	State Water Project
UAV	Unmanned Aerial Vehicle
UBC	Uniform Building Code

Acronym	Definition
UCERF	Uniform California Earthquake Rupture Forecast
UFMP	Urban Forest Management Plan
UHF	Ultra High Frequency
UNFCCC	United Nations Framework Convention on Climate Change
UPRR	Union Pacific Railroad
URM	Unreinforced Masonry
USACE	US Army Corp of Engineers
USDA	United States Department of Agriculture
USGS	United States Geologic Survey
UWMP	Urban Water Management Plan
VHFHSZ	Very High Fire Hazard Severity Zone
WCD	Water Control District
WRCC	Western Regional Climate Center
WSOC	Wildfire Safety Operations Center
WUI	Wildland Urban Interface
WWTP	Wastewater Treatment Plant

Chapter 1 Introduction

1.1 Purpose

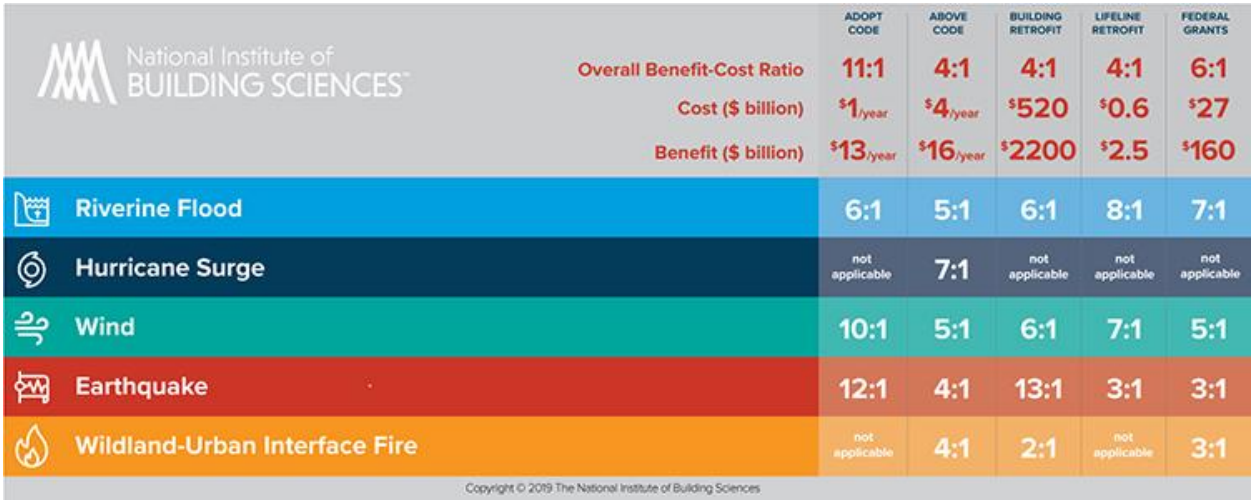
Amador County, five incorporated communities, and two special districts prepared this 2025 Local Hazard Mitigation Plan (LHMP) Update to the Federal Emergency Management Agency (FEMA) approved 2020 Amador County LHMP. The purpose of this LHMP Update is to guide hazard mitigation planning to better protect the people and property of the County from the effects of hazard events and natural disasters. This LHMP Update demonstrates the communities' commitment to reducing risks from hazards and serves as a tool to help decision makers direct mitigation activities and resources. This LHMP Update was also developed, among other things, to ensure Amador County and participating jurisdictions' continued eligibility for certain federal disaster assistance: specifically, the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program (HMGP), Pre-Disaster Mitigation (PDM) program, Building Resilient Infrastructure and Communities (BRIC) program, and the Flood Mitigation Assistance (FMA) program.

1.2 Background and Scope

Each year in the United States, natural disasters take the lives of hundreds of people and injure thousands more. Nationwide, taxpayers pay billions of dollars annually to help communities, organizations, businesses, and individuals recover from disasters. These monies only partially reflect the true cost of disasters, because most expenses to insurance companies and nongovernmental organizations are not reimbursed by tax dollars. Although the timing of natural disasters is unpredictable, their occurrence is largely predictable over time, and much of the damage caused by these events can be significantly reduced.

Hazard mitigation is defined by FEMA as "any sustained action taken to reduce or eliminate long-term risk to human life and property from a hazard event." The results of a three-year, congressionally mandated independent study to assess future savings from mitigation activities provide evidence that, overall, mitigation activities are highly cost-effective investments. On average, each dollar spent on mitigation saves society an average of $6 in avoided future losses in addition to saving lives and preventing injuries (National Institute of Building Science Multi-Hazard Mitigation Council 2019 Interim Report) (see Figure 1-1).

Figure 1-1 Natural Hazard Mitigation Savings by Hazard Type and Mitigation Type



Source: National Institute of Building Science Multi-Hazard Mitigation Council 2019 Interim Report

Hazard mitigation planning is the process through which hazards are identified, likely impacts determined, mitigation goals set, and appropriate mitigation strategies determined, prioritized, and implemented. This plan documents Amador County's hazard mitigation planning process and identifies relevant hazards and vulnerabilities and strategies the County and participating jurisdictions will use to decrease vulnerability and increase resiliency and sustainability in the community.

This Amador County 2025 LHMP is a multi-jurisdictional plan that geographically covers the entire area within Amador County's jurisdictional boundaries (hereinafter referred to as the Planning Area). The following jurisdictions participated in the planning process and are seeking FEMA approval of the LHMP Update:

- Amador County*
- City of Amador City*
- City of Ione*
- City of Jackson*
- City of Plymouth*
- City of Sutter Creek*
- Amador Water Agency*
- Jackson Valley Irrigation District*

* Participated in 2020 Amador County LHMP

4 jurisdictions that were approved for the 2020 LHMP, but are not seeking approval for this Plan Update include:

- Amador Fire Safe Council
- Lockwood Fire Protection District
- Pine Grove Community Services District
- River Pines Public Utility District

This LHMP Update was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 (Public Law 106-390) and the implementing regulations set forth by the Interim Final Rule published in the

Federal Register on February 26, 2002, (44 CFR §201.6) and finalized on October 31, 2007. (Hereafter, these requirements and regulations will be referred to collectively as the Disaster Mitigation Act (DMA) or DMA 2000.) This planning effort also follows FEMA's most current effective LHMP Preparation and Review Guidance, LHMP Policy Guide FP 206-21-0002 effective April 11, 2025. While DMA 2000 emphasized the need for mitigation plans and more coordinated mitigation planning and implementation efforts, the regulations establish the requirements that local hazard mitigation plans must meet in order for a local jurisdiction to be eligible for certain federal disaster assistance and hazard mitigation funding under the Robert T. Stafford Disaster Relief and Emergency Act (Public Law 93-288). Because the Amador County Planning Area is subject to many kinds of hazards, access to these programs is vital.

Information in this LHMP Update will be used to help guide and coordinate mitigation activities and decisions for local land use policy in the future. Proactive mitigation planning will help reduce the cost of disaster response and recovery to communities and their residents by protecting public health and safety and critical community facilities; reducing liability exposure; and minimizing overall community impacts and disruptions. In the past, the Amador County Planning Area has been affected by numerous hazards on multiple occasions. The participating jurisdictions are thus committed to reducing future impacts from hazard events and maintaining eligibility for mitigation-related federal funding.

1.3 Amador County Profile

Amador County is located in the foothills of the Sierra Nevada Range, approximately 25 miles east of Sacramento. State Route (SR) 49 traverses the county from north to south along the Mother Lode, connecting the cities of Plymouth, Sutter Creek, Amador City, and Jackson. SR 104 and SR 124 connect Ione with neighboring areas of Amador and Sacramento Counties, and SR 16 connects the county with Sacramento to the west. SR 88 extends from Stockton on the west, through the county to the Kirkwood ski resort, passing through Jackson, and the unincorporated communities of Martell, Pine Grove, Pioneer, Red Corral, and Buckhorn. SR 88 is an important route over the Sierra Nevada, connecting the Central Valley to U.S. 395 in the eastern Sierra Nevada.

Amador County is bordered by El Dorado County on the north, Alpine County on the east, Calaveras County on the south, and Sacramento and San Joaquin Counties on the west. The only public airport in Amador County is Westover Field, located in Martell. Private airports in the County include the Eagle's Nest Airport in the northwestern portion of the county, south of SR 16. The former Amador Central rail line extends from Ione to Martell, and connects to active Union Pacific lines in the Central Valley.

A map of the County is shown in Figure 1-2. Multiple entities own land in Amador County. A land ownership map can be seen on Figure 1-3 and is detailed in Table 1-1.

Figure 1-2 Amador County Planning Area

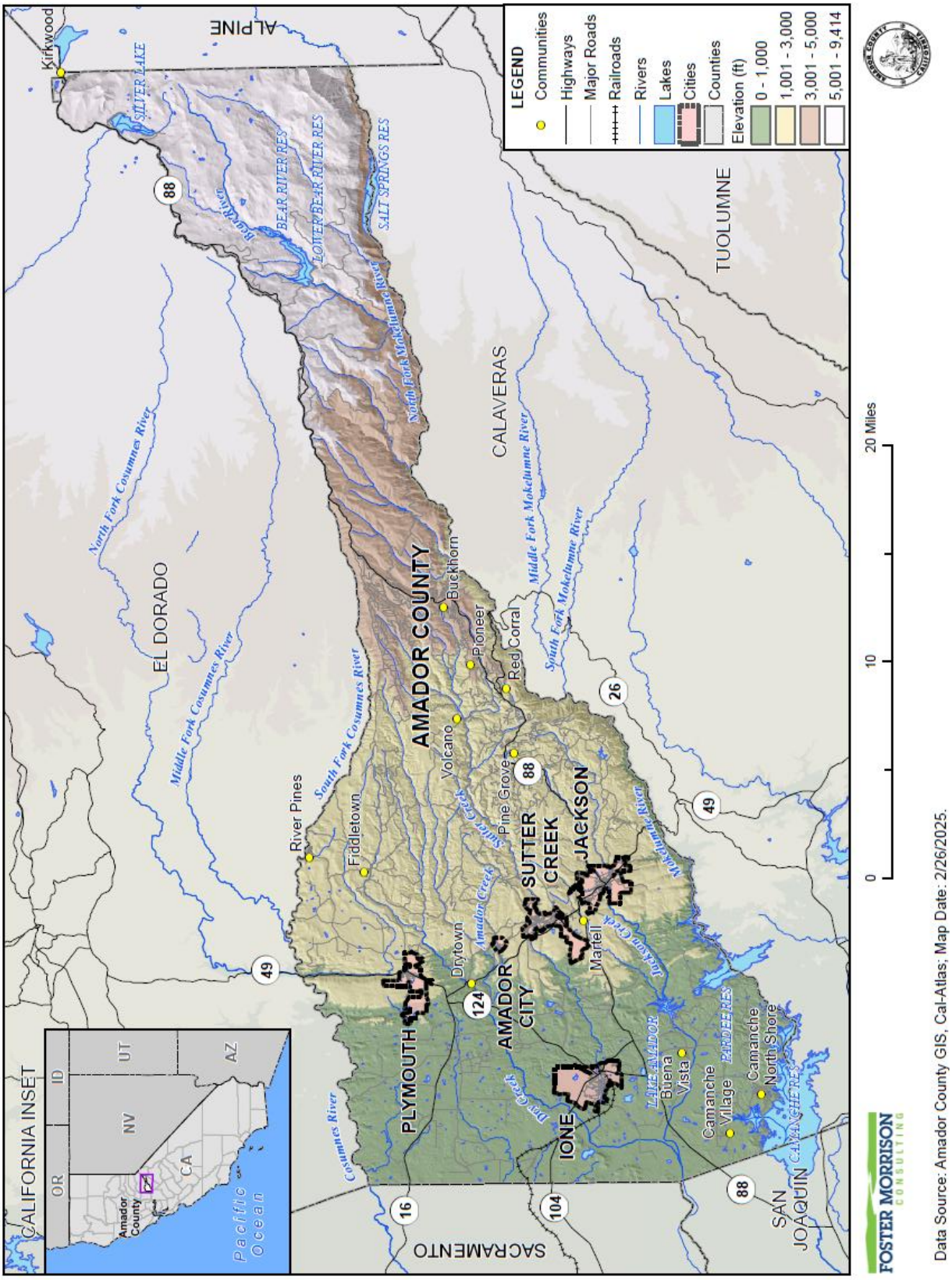


Figure 1-3 Amador County Planning Area – Land Ownership

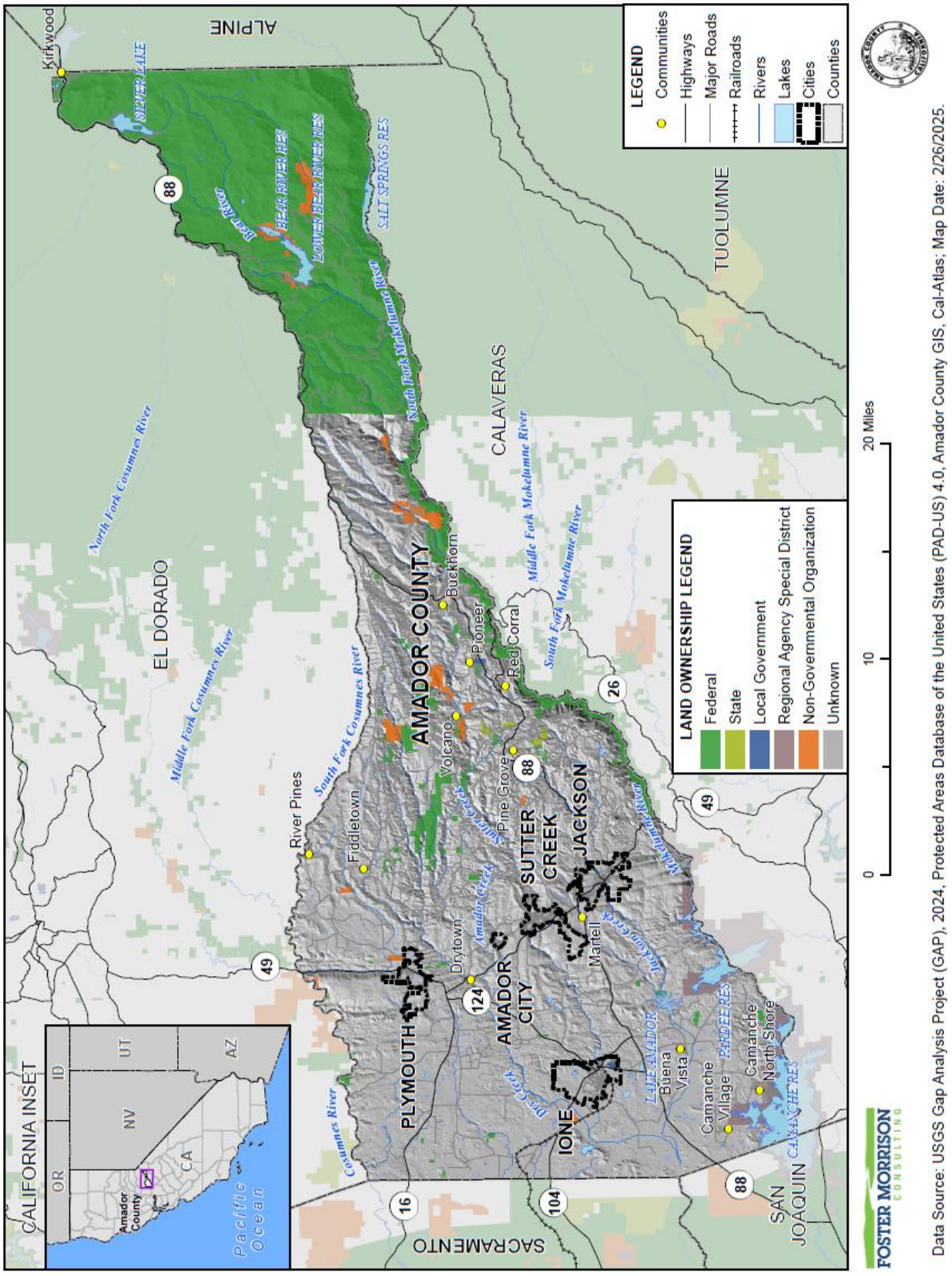


Table 1-1 Amador County Planning Area – Land Ownership by Jurisdiction

Jurisdiction / Land Ownership	Total Acres	% of Total Acres
Amador City		
Local Government	1.46	0.000%
Non-Designated Land Ownership (Countywide)*	196.56	0.038%
Amador City Total	**198.02**	**0.039%**
Ione		
Local Government	92.60	0.018%
Non-Designated Land Ownership (Countywide)*	2,866.15	0.558%
Ione Total	**2,958.75**	**0.576%**
Jackson		
Local Government	14.57	0.003%
Unknown/Other	0.97	0.000%
Non-Designated Land Ownership (Countywide)*	2,283.06	0.444%
Jackson Total	**2,298.59**	**0.447%**
Plymouth		
Local Government	27.81	0.005%
Non-Governmental Organization	0.80	0.000%
Non-Designated Land Ownership (Countywide)*	1,672.77	0.326%
Plymouth Total	**1,701.38**	**0.331%**
Sutter Creek		
Local Government	3.45	0.001%
Non-Designated Land Ownership (Countywide)*	1,713.39	0.333%
Sutter Creek Total	**1,716.84**	**0.334%**
Unincorporated Amador County		
Federal	223,196.50	43.434%
Local Government	72.95	0.014%
Non-Governmental Organization	4,637.08	0.902%
Parks/Recreation/Irrigation/Utility District	8,298.38	1.615%
State	598.43	0.116%
Unknown/Other	298.67	0.058%
Non-Designated Land Ownership (Countywide)*	267,895.65	52.133%
Unincorporated Amador County Total	**504,997.67**	**98.273%**
Grand Total	**513,871.25**	**100.000%**

Source: USGS

*This category is all other "blank/no data" areas

1.3.1. History

The eastern Miwok historically occupied Amador County and surrounding areas to the west. While the Plains Miwok shared a common language and cultural background, they consisted of a number of separate and politically independent groups. Each group used a number of permanently inhabited and seasonally occupied locales. The eastern Miwok relied on a broad spectrum of plant and animal food sources. Of the plant species, the Plains Miwok most valued the valley oak, but also used buckeye, laurel, and hazelnut. Various seeds include wild oats and balsam root, several species of edible roots, and greens such as wild pea and miner's lettuce, berries, and a number of different mushroom varieties. Tule elk and pronghorn antelope were the most important animal species. Various species of rabbit were hunted in the summer. Waterfowl and fish, especially salmon, were extremely important food sources for the eastern Miwok.

On January 28, 1848, John Marshall, a foreman working for John Sutter's sawmill near Coloma happened upon a discovery that would shape the history of California and the nation: gold. As word spread of the discovery, gold miners flooded to the Mother Lode to search for fortune. In 1849, the population of California surged from 14,000 to over 100,000, comprised of Americans and immigrants from around the world. Throughout the Mother Lode, small mining camps and towns sprung up to supply gold mines and miners – the demand for food, booze, supplies, building materials, and entertainment drove development along the American and Mokelumne Rivers, and deep into the Sierra foothills.

Early in the gold rush, streams were placer mined (1846–1857). Most of the important lode deposits were discovered in the 1850s. From the 1870s to the 1890s, mining expanded to maintain profitability. By 1875, mines such as the Keystone, South Spring Hill, Oneida, Old Eureka, and Plymouth had become large and highly profitable. As mining progressed to greater and greater depths, costs increased. The Argonaut, Kennedy, Central Eureka, Bunker Hill, Fremont Gover, and Lincoln Cons were major gold sources in the 1880s and 1890s.

By some estimates, merchants supplying gold miners made more than the miners themselves. In Amador County, a proliferation of other industries, like wine, lumber, and agriculture supplied mining camps and towns with provisions. During the 1850s, the soil in Shenandoah Valley was found to be excellent for growing grapes without irrigation. The official Amador County map of 1866 lists 8 sawmills, and the 1881 map lists 10 sawmills. During the 1870s, cattle ranching became commonplace. As the County developed, towns rose up around early mining settlements and homes and buildings reflecting the popular architectural styles were built.

Mining costs continued to increase, and during the early 1900s and World War I the South Spring Hill, Lincoln Cons, Oneida, Zeila, South Eureka, Bunker Hill and Treasure mines were shut down. However, the County continued to yield large amounts of gold as the Argonaut, Kennedy, Central Eureka, and other mines grew. Mining occurred at greater and greater depths until the Argonaut and Kennedy became the deepest mines in the country.

All of the mines were shut down soon after the beginning of World War II. The Central Eureka mine was reopened in 1945, but due to high costs and a federally fixed price on gold, the mine was shut down again in 1953. This was the last active major gold mine on the Mother Lode in Amador County. However, in

recent years, shaft mining activity has been resumed between the towns of Amador City and Sutter Creek, and gold panning continues to thrill hobbyists and professional gold miners alike.

Since the 1950s, Amador County has seen steady population growth, primarily in rural residential areas. As mining and timber production have declined, tourism has become more important to the County's economy.

1.3.2. Geography and Climate

The topography of the County ranges from low foothill to high Sierra Nevada Mountain areas, with elevations ranging from 150 feet above mean sea level (msl) in the western portion of the County to more than 9,000 feet above msl in the eastern portions of the County. The climate varies widely between the lower west foothill area to the alpine eastern portion of the County. In the western lowlands, summers are hot and winters are mild. Temperatures range from an average of 45 degrees Fahrenheit in January to 79 degrees Fahrenheit in July. Summers and winters are cooler in the higher elevations of the Sierra Nevada Mountains in the east and there is heavy snowfall in this area. Precipitation averages 20 and 60 inches in the western and eastern parts of the County, respectively.

1.3.3. Population and Demographics

The California Department of Finance 2024 estimates for population of Amador County and its jurisdictions are shown in Table 1-2.

Table 1-2 Amador County Population by Jurisdiction, 2024

Jurisdiction	Total Population
City of Amador City	196
City of Ione	8,842
City of Jackson	4,933
City of Plymouth	1,063
City of Sutter Creek	2,589
Unincorporated County	22,301
Total	**39,942**

Source: California Department of Finance, 2024 E-1 Report

Select social and economic information for the unincorporated Amador County are shown in Table 1-3.

Table 1-3 Unincorporated Amador County – Select Social and Economic Statistics

Statistic	Number
Populations	
Population under 5	3.9%
Population over 65	27.2%
Median Age	49.9

Statistic	Number
Race	
White	77.8%
Black or African American	2.0%
American Indian or Alaska Native	1.2%
Asian	1.4%
Native Hawaiian or Pacific Islander	0.1%
Some Other Race	5.3%
Two or more races	12.3%
Income and Poverty	
Median income	$81,526
Mean Income	$104,990
Poverty rate – All families	4.1%
Poverty rate – All people	7.8%
Unemployment Rate (December 2024)	5.3%

Source: 2020 US Census, 2023 US Census Bureau American Community Survey, California Employment Development Department

1.3.4. Economy and Tax Base

Amador County has a diverse economy. US Census estimate show economic characteristics for the unincorporated County. These are shown in Table 1-4 and Table 1-5.

Table 1-4 Unincorporated Amador County Civilian Employed Population 16 years and Over by Industry

Industry	Estimated Employment	Percent
Agriculture, forestry, fishing and hunting, and mining	501	3.1%
Construction	1,645	10.3%
Manufacturing	894	5.6%
Wholesale trade	295	1.8%
Retail trade	1,871	11.7%
Transportation and warehousing, and utilities	694	4.3%
Information	218	1.4%
Finance and insurance, and real estate and rental and leasing	892	5.6%
Professional, scientific, and management, and administrative and waste management services	1,814	11.3%
Educational services, and health care and social assistance	2,215	13.8%
Arts, entertainment, and recreation, and accommodation and food services	1,941	12.1%
Other services, except public administration	1,280	8.0%
Public administration	1,780	11.1%

Source: US Census Bureau American Community Survey 2023 Estimates

Table 1-5 Unincorporated Amador County – Income and Benefits

Income Bracket	Percent
<$10,000	2.5%
$10,000 – $14,999	0.6%
$15,000 - $24,9999	4.9%
$25,000 – $34,999	8.1%
$35,000 – $49,999	11.5%
$50,000 – $74,999	15.3%
$75,000 – $99,999	17.8%
$100,000 – $149,999	17.7%
$150,000 – $199,999	11.0%
$200,000 or more	9.6%

Source: US Census Bureau American Community Survey 2023 Estimates

Major employers in the County are shown in Table 1-6.

Table 1-6 Major Employers in Amador County Planning Area

Employer Name	Location	Industry
Amador County Sheriff	Jackson	Government Offices-County
American Legion Ambulance	Jackson	Ambulance Service
Beth Sogaard Catering	Plymouth	Caterers
Borjon Vineyard & Labor Svc	Plymouth	Farm Management Service
Forestry Fire Protctn CA Dept	Pine Grove	City Government-General Offices
Harrah's Northern CA Casino	Ione	Casinos
Ione Elementary School	Ione	Schools
Ione Junior High	Jackson	Schools
Jackson Cinema Is D'Place	Jackson	Theatres-Movie
Jackson Rancheria Casino Resrt	Jackson	Casinos
Kit Carson Nursing & Rehab	Jackson	Nursing & Convalescent Homes
Lake Camanche Marina & Grill	Ione	Marinas
Louie Oliver's Rstrnt & Bar	Ione	Restaurants
Lowe's Home Improvement	Jackson	Home Centers
Mule Creek State Prison	Ione	State Govt-Correctional Institutions
Raley's	Jackson	Grocers-Retail
Safeway	Jackson	Grocers-Retail
Save Mart	Jackson	Grocers-Retail
Sierra Pacific Industries	Martell	Lumber-Manufacturers
Sutter Amador Hospital	Jackson	Hospitals

Employer Name	Location	Industry
Timber Products Co	Sutter Creek	Lumber-Wholesale
Timber Products Co	Jackson	Lumber-Wholesale
United Home Care	Jackson	Home Health Service
Volcano Vision-Kirkwood Repair	Pine Grove	Television-Cable & CATV
Walmart	Jackson	Department Stores

Source: America's Labor Market Information System (ALMIS) Employer Database, 2025 1st Edition.

1.4 Plan Organization

The 2025 Amador County LHMP Update is organized as follows:

- Chapters
  - ✓ Chapter 1: Introduction
  - ✓ Chapter 2: Community Profile
  - ✓ Chapter 3: Planning Process
  - ✓ Chapter 4: Risk Assessment
  - ✓ Chapter 5: Mitigation Strategy
  - ✓ Chapter 6: Plan Adoption
  - ✓ Chapter 7: Plan Implementation and Maintenance

- Annexes
  - ✓ Annex A: City of Amador City
  - ✓ Annex B: City of Ione
  - ✓ Annex C: City of Jackson
  - ✓ Annex D: City of Plymouth
  - ✓ Annex E: City of Sutter Creek
  - ✓ Annex F: Amador Water Agency
  - ✓ Annex G: Jackson Valley Irrigation District

- Appendices
  - ✓ Appendix A: Planning Process
  - ✓ Appendix B: References
  - ✓ Appendix C: Mitigation Strategy
  - ✓ Appendix D: Adoption Resolution
  - ✓ Appendix E: Threatened and Endangered Species
  - ✓ Appendix F: Critical Facilities
  - ✓ Appendix G: FEMA National Risk Index
  - ✓ Appendix H: Hazus Reports

The **Base Plan** provides the overall framework for this multi-jurisdictional LHMP. It is the umbrella document that includes the planning process, methodologies, and process requirements for all participating jurisdictions (i.e., unincorporated County and all Jurisdictional Annexes). As such, Chapters 1-7 of the Base Plan apply to the unincorporated County, the five incorporated communities, and the two special Districts as participants to this LHMP Update seeking FEMA approval of the Plan. Because this is a multi-jurisdictional plan, the Base Plan addresses the LHMP hazard mitigation planning elements specific to the

Amador County Planning Area which includes data, information and analysis specific to all participating jurisdictions and also includes data, information, and analysis specific to unincorporated Amador County.

The **Jurisdictional Annexes** detail the hazard mitigation planning elements specific to each additional participating jurisdiction to this Amador County LHMP Update. Each annex is not intended to be a standalone document, but appends to, supplements, and incorporates by reference the information contained in the Base Plan document. As such, all Chapters 1-7 of the Base Plan, including the planning process and other procedural requirements and planning elements apply to and were met by each participating jurisdiction. The annexes provide additional information specific to each participating jurisdiction, with a focus on providing additional details on the risk assessment and mitigation strategy.

The **Appendices** provide additional information, data, and planning process documentation that applies to all participating jurisdictions (i.e., unincorporated County and all jurisdictional annexes) to this Amador County LHMP Update.

Chapter 2 What's New

44 CFR §201.6(d)(3) and §201.7(d)(3): A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within 5 years in order to continue to be eligible for mitigation project grant funding.

The previous 2020 Local Hazard Mitigation Plan (LHMP), being updated as part of this 2025 Amador County LHMP Update, contained descriptions of planning processes, the risk assessments of identified hazards, and mitigation strategies for reducing the risk and vulnerability from these hazards. Since approval of the 2020 LHMP by FEMA, progress has been made on implementation of the 2020 mitigation strategies, as applicable to the respective participating jurisdictions. As part of this LHMP Update, a thorough review and update of the 2020 LHMP was conducted to ensure that this 2025 Amador County LHMP Update reflects current conditions and priorities in order to realign the updated mitigation strategy for the forthcoming five-year planning period. This section of this LHMP Update includes the following:

- **What's New in the LHMP Update**. Section 2.1 provides an overview of the approach to updating the previous LHMP and identifies new analyses, data and information included in this LHMP Update to reflect current community conditions. This includes a summary of new hazard and risk assessment data as it relates to the Amador County Planning Area and participating jurisdictions as well as information on current and future development trends affecting hazard vulnerability and related issues. The actual updated data, discussions, and associated analyses are contained in their respective sections within this LHMP Update.
- **Summary of Significant Changes to Current Conditions, Planning Area Vulnerability, and Hazard Mitigation Program Priorities**. Section 2.2 provides a summary of significant changes in current conditions, changes in hazard vulnerability, and resulting modifications to the Amador County hazard mitigation program priorities since the 2020 LHMP.
- **2020 Mitigation Strategy Status and Successes**. Section 2.3.2 provides a description of the status of mitigation actions from the 2020 LHMP and also indicates whether a project is no longer relevant or is recommended for inclusion in the updated mitigation strategy. This section also highlights key mitigation success stories since the 2020 LHMP.

This What's New section provides documentation of Amador County Planning Area's progress or changes in risk and vulnerability to hazards and overall hazard mitigation programs. Completion of this LHMP Update further provides documentation of the participating jurisdictions to this Amador County Planning Area's continued commitment and engagement in the hazard mitigation planning process.

2.1 What's New in the Plan Update

Preparing the 2025 LHMP Update involved a comprehensive review and update of each section of the 2020 LHMP and includes an assessment of the success of the participating jurisdictions in evaluating, monitoring, and implementing the mitigation strategy outlined in the 2020 LHMP. Only the information and data still valid from the 2020 LHMP was carried forward as applicable into this LHMP Update.

Also to be noted, Chapter 7 Implementation and Maintenance of this LHMP Update identifies key requirements for updating future plans:

- Consider changes in vulnerability due to action implementation of mitigation actions;
- Document success stories where mitigation actions have proven effective;
- Document areas where mitigation actions were not effective;
- Document any new hazards that may arise or were previously overlooked;
- Incorporate new data or studies on hazards and risks;
- Incorporate new capabilities or changes in capabilities;
- Incorporate growth and development-related changes to inventories; and
- Incorporate new recommended mitigation actions or changes in the prioritization of mitigation actions.

These requirements and others as detailed throughout this Plan were addressed during this LHMP Update process.

As part of the comprehensive review and update of each section of the LHMP Update, the participating jurisdictions recognized that updated data, if available, would enhance the analysis presented in the risk assessment and utilized in the development of the updated mitigation strategy. Highlights of new data used for this LHMP Update are identified below and also sourced in context within both the Chapter 4 Risk Assessment and the jurisdictional annexes. Sources of specific data used are also provided throughout this LHMP Update and included in Appendix D References. This new data and associated analysis contributed to the development of the updated risk assessment and mitigation strategy presented in Chapter 4 and Chapter 5 of this LHMP Update, as well as within the jurisdictional annexes to this Plan.

Highlights of new information and analyses contained in this LHMP Update includes the following:

- A thorough countywide planning process was conducted for this multi-jurisdictional LHMP Update including outreaching and inviting a broad range of agency, public, and private stakeholders for all participating jurisdictions, including those supporting underserved and vulnerable populations in the Amador County Planning Area.
- Disaster declarations were updated, including federal, state, and USDA disaster declarations. NCDC Storm Events and past historic hazard occurrences since the previous plans were added for each jurisdiction.
- A Local Concerns section was added to each jurisdiction's vulnerability assessment to capture local issues and to support the resulting mitigation strategy.
- Incorporation and analysis of the updated California Department of Finance population data was utilized for this LHMP Update.
- A detailed discussion of socially vulnerable and underserved populations were added to the Base Plan and to each jurisdictional annex and included a discussion of how these populations could be affected by each hazard.
- An updated critical facility GIS layer was provided by the County and jurisdictions for the Amador County Planning Area. This allowed for an updated analysis of critical facilities for each mapped hazard in the Amador County Planning Area.
- Community lifelines were added to the overall asset inventory.
- Economic assets and community activities of value were added to the overall asset inventory.

- Development since the last plan was analyzed in detail for each jurisdiction.
- Future development was gathered from each jurisdiction and analyzed using the most recent hazard data. This was included in each participating jurisdiction's annex.
- A new section on Power Shortage/Failure was added. Public Safety Power Shutoff events were also added.
- Impacts of climate change, changes in population patterns, and changes in land use and development was reviewed and discussed for each hazard and for each jurisdiction.
- Cal-Adapt and other state and local climate change data was added to the climate change section, as well as to other hazards that are exacerbated by climate change.
- Most hazards from the 2020 plan were profiled in this LHMP Update, with the exception of pandemic. Levee failure was placed inside the flood hazard. No new hazards were added.
- An updated and enhanced assessment of each participating jurisdictions' continued compliance with the NFIP was conducted and used to support additional flood risk reduction measures.
- FEMA National Risk Index data for the County was added to all of the natural hazards in the Base Plan.
- New dam data provided by Cal OES and CA DSOD was used for the dam inventory and analysis. This data included an updated hazard classification for identified dams and updated inundation mapping. Assets at risk to dam inundation was analyzed. Critical facilities at risk to dams were tabulated.
- Additional Hazus runs were performed on three separate earthquake shake scenarios for the Amador County Planning Area.
- Deep seated landslide data was added to the landslide hazard profile and vulnerability analysis. An analysis was performed on values at risk (including populations, structures, critical facilities, and future development).
- New CAL FIRE mapping and analyses were conducted using the 2024 State Responsibility Area and the 2025 Local Responsibility Area Fire Hazard Severity Zones data.
- To better meet the revised FEMA plan review tool, a more extensive analysis of the extents to identified hazards was conducted and included in this LHMP Update for all jurisdictions.
- Special Districts' annexes include hazard maps and hazard extent tables for all mapped hazards of concern.
- A greater study of all jurisdiction's mitigation capabilities was added.
- All previous mitigation actions were updated, and many new actions were added to this LHMP Update, including mitigation actions to address issues related to mitigation planning for vulnerable and underserved populations.

2.2 Summary of Significant Changes to Current Conditions, Planning Area Vulnerability, and Hazard Mitigation Priorities

This section provides a summary by hazard of significant changes in current conditions, Amador County Planning Area vulnerabilities, and resulting modifications to the Amador County participating jurisdictions' mitigation program priorities since the 2020 LHMP. As a result of this analysis of factors resulting in changes in community vulnerability since the last Plan, mitigation planning priorities were modified by participating jurisdictions as reflected in each jurisdictions updated lists of priority hazards of concern, updated LHMP goals and objectives, and an updated list and prioritization of mitigation actions and projects for this 2025 LHMP Update.

2025 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Agricultural Hazards: Severe Weather/ Pests/ Invasives			X

- Since 2014, variable drought conditions have stressed local crops, timber, and grazing lands making them more susceptible to invasive species, and other issues.
- Noxious weeds can be more drought tolerant – better able to compete for water over local crops and vegetation and also increases wildfire risk.
- The discovery of the Golden mussel in the nearby Delta has significantly impacted the recreational industry in the County as illustrated by EBMUD's proactive closure of boating activities in the Commanche Reservoir, and threatens additional impacts.
- Successful crop production relies on predictable weather patterns.
- No Hydrilla occurrences detected since 2014.
- Water table seems to be dropping which can impact water supply for all users, including the Agricultural industry.

2025 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Avalanche		X	

- Avalanche risk changes from year to year depending on weather conditions, but overall Planning Area vulnerability to Avalanche has not significantly changed.
- No active avalanche areas were identified during the 2025 LHMP Update process.

2025 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Climate Change			X

- NWS data indicates temperatures are increasing resulting in more extreme heat days. Recent years (2021-2025) have been some of the hottest years on record.
- Snowpack levels have been occurring at higher elevations in recent years.
- Weather extremes, including precipitation, have been increasing and becoming more variable. Amador County is seeing increased precipitation and intensity, as seen with the atmospheric river events in recent years, as well as abnormally dry conditions.
- Changing climate conditions influence multiple hazards, such as heat, flooding, wildfire and others, as described in this LHMP Update.
- Increased temperatures associated with climate change increases the use and costs of energy leaving critical systems and infrastructure more vulnerable.
- Other ongoing impacts include impacts to food sources and food-related diseases, eco-system changes, impacts to natural resources, public health issues, etc.

2025 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Dam Failure		X	

- Risk increases over the years due to aging dam infrastructure. However, dams are more regulated than ever, with requirements for Emergency Action Plans, inspections, and maintenance.
- More people moving within Dam inundation areas will increase the County's vulnerability due to an increase in potentially affected population, not due to an increase in dam failure. However, population growth in Amador County has seen a decrease since 2020.

2025 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Drought and Water Shortage		X	

- Drought conditions since the 2014 LHMP, including water supply issues, have had an impact on the Amador County Planning Area and California. As a result, the drought hazard has become a significant priority for mitigation planning.
- Several disaster declarations occurred in 2023 related to heavy rains and storms and flooding. While these storms temporarily alleviated drought conditions in the County, due to the cyclical nature of drought and storm events, the County remains vulnerable to drought.
- State drought mandates, including conservations measures, to protect water supply throughout California have been implemented with some continuing within the Planning Area.
- Drought conditions, when present, contribute to an increase in tree mortality issues, dry fuels, and general increase in wildfire conditions.
- Drought impacts the stability of soils in the Planning Area leading to more erosion and other issues.
- Water quality concerns are exacerbated in drought conditions.
- Amador County is participating in the State's Drought Resilience Interagency and Partners (DRIP) collaborative, consistent with Senate Bill 552, and established to enhance California's resilience to droughts and water shortage.

2025 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Earthquake		X	

- Overall, Amador County is in a relatively low to moderate seismically active area.
- The primary factor that might change the earthquake vulnerability is additional development and more people moving to the area. However, adherence to current California building codes should ensure sound development in new development areas.

2025 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Flood: 1%/0.2% events			X

- Overall, the net increase or decrease in vulnerability to flood depends on the location within the Planning Area.
- The risk and vulnerability of 1% and 0.2% flood events remain somewhat constant, changing from year to year based on weather and new development in the Planning Area.
- Disaster declarations for heavy rains and storms and flooding occurred in 2021(1) and 2023 (3) causing significant flood impacts throughout the Planning Area and contributing to an increase in flood issues since the 2020 LHMP.
- Land use planning, flood control measures, and adherence to development requirements in identified floodplains have minimized additional exposure to this hazard in the Planning Area, even in years of heavy storms.

2025 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Flood: Localized Stormwater Flooding			X

- Climate change issues may result in more localized flooding as the climate warms and more frequent, wetter, and greater intensity storms create more runoff. Weather extremes seem more variable – the Planning Area seems to fluctuate between heavy rains and dry periods.
- New development in unmapped flood hazard areas could result in a net increase in vulnerability should these areas experience increased stormwater/localized flooding. However, development requirements that require mitigation of stormwater runoff help mitigate this hazard.
- Outdated and undersized drainage systems also contribute to a greater vulnerability to localized, stormwater flooding.
- 2020-2025 storms, many resulting in disaster declarations, including greater intensity atmospheric river events, resulted in more localized flooding throughout the Planning Area. Generally, damage occurs in low lying areas and around creeks and streams. Road damage and closures continue to occur during heavy storm events.
- Rain on snow events compound flooding in the Amador County Planning Area.
- Recent drought conditions in some areas have hardened soils and predisposed areas to worse flooding.
- Recent changes in vegetation caused by past drought conditions as well as large fires also contribute to more runoff, especially in post-fire burn scar areas.

2025 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Landslides, Mudslides, and Debris Flows			X

- With the most recent drought, compounded by several years of high intensity storms, much of the vegetation along sloped areas was lost contributing to a lack of vegetation to hold soil resulting in a greater landslide/mudslide potential.
- Compounded by climate change, heavy rains and higher intensity storm events, such as atmospheric rivers, contribute to saturated and barren soils, increasing the landslide potential, especially in post fire areas.

2025 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Severe Weather: Extreme Cold, Freeze, and Snow			X

- This is a new hazard of concern to Amador County, in part due to the impact to vulnerable and underserved populations in the County. Unhoused populations and economically challenged residents are particularly vulnerable to extreme weather conditions.
- Similar to other weather hazards, the overall vulnerability changes from year to year depending on the season.
- The agricultural industry is particularly vulnerable to increasing extreme cold, freeze, and snow events.

2025 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Severe Weather: Extreme Heat			X

- NWS data indicates temperatures are increasing resulting in more extreme heat days. Recent years (2021-2025) have been some of the hottest years on record.
- Climate change issues will continue to increase heat related impacts and vulnerabilities.
- Air quality issues increase with more extreme heat days.
- Vulnerable populations are at the greatest risk to this hazard. Economically challenged residents may not be able to afford air conditioning. Seniors, the very young, medically vulnerable, and the unhoused are not as resilient to this hazard. The increase in elderly/vulnerable populations increases the population at risk to this hazard.
- Extreme heat, combined with drought conditions, increases the potential for catastrophic wildfires.
- Extreme heat, combined with high winds, also contributes to the wildfire hazard, including the potential for a PSPS as well as other power outage events.

2025 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Severe Weather: Heavy Rains and Storms			X

- Similar to other weather hazards, the overall vulnerability of the Planning Area changes from year to year depending on the season. Recent years have seen significant and heavy rains, and an increase in atmospheric river events causing flooding and other adverse impacts to the County.
- Post fire conditions and areas previously impacted by drought conditions can be significantly vulnerable during periods of heavy rain and storms resulting in slope failures, mudslides, and debris flows.
- The potential for power outages increase during extreme storm events leaving the Planning Area and its residents more vulnerable.
- Outdated and undersized drainage systems also contribute to a greater vulnerability to localized, stormwater flooding during heavy rain events.
- Climate change brings renewed concern moving forward for heavy and more intense rains, storms, and associated issues to the County.

2025 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Severe Weather: High Winds and Tornadoes			X

- Severe wind events have had greater impact in recent years following several years of drought combined with years of heavy rains, resulting in dead and downed trees in the Planning Area. These conditions lead to compromised, hazardous trees often falling over during high wind events.
- High winds, combined with extreme heat, also contributes to the wildfire hazard, including the potential for a PSPS event

2025 LHMP Update Hazards	Decrease in Vulnerability	No Change in Vulnerability	Increase in Vulnerability
Wildfire (w/ smoke and air quality)			X

- Climate change continues to affect the nature and intensity of wildfires.
- Compounded by recent drought conditions (increasing tree mortality and overall wildfire conditions) and followed by significant heavy rain events, the wildfire hazard has substantially increased, and is no longer just a seasonal issue. The wildfire season, including the potential for a catastrophic wildfire, is now a year around concern.
- The increased development in WUI areas within the County also contributes to an increase in vulnerability.
- The road network and infrastructure, including construction, connectivity, and ingress-egress issues compound the wildfire vulnerability and impact.
- Wind has been a major contributor to the potential for a catastrophic wildfire. And when combined with extreme heat, also can trigger a PSPS which leaves the community at risk in other ways.
- With large wildfires occurring throughout California, the Planning Area has seen a significant change in air quality from smoke (both from fires inside and outside the County) resulting in more recorded bad air days.
- Limited preventative building construction standards in older areas of the County, and ineffective code enforcement has led to more communities being at risk and vulnerable to large, devastating wildfires

2.3 2020 LHMP Mitigation Strategy Successes and Status

The participating jurisdictions successfully implemented numerous mitigation actions identified in the 2020 LHMP mitigation strategies, thus working diligently towards meeting their 2020 goals and objectives, as follows:

Goal #1: Provide protection for people's lives, property, public health, and the environment and reduce losses from natural hazards.

- Minimize impact to existing development
- Minimize impact to future development
- Minimize risk and vulnerability to wildfire
- Minimize risk and vulnerability to flood
- Minimize economic and resource impact
- Promote resiliency strategies

Goal #2: Provide protection for critical facilities, infrastructure, utilities and services from hazard impacts

- Implement critical facility upgrades and mitigation measures to ensure reliability of services
- Update and maintain GIS list of critical facilities: Essential Services, At-Risk Populations, Hazardous Materials Facilities

Goal #3: Improve community (public and stakeholder) awareness, education, and preparedness to natural hazard events

- Enhance public and stakeholder outreach, education and preparedness program to include all hazards of concern
- Increase public and stakeholder knowledge about the risk and vulnerability to identified hazards and how to take responsibility for and mitigate these risks with a focus on high priority hazards such as wildfire and flood
- Leverage existing public outreach and education mechanisms such as community coalitions and other existing forums; expand social media presence and local community boards
- Increase use of technology to communicate hazard information (e.g., GIS)
- Provide education and outreach on evacuation routes, roles and responsibilities, as well as on various emergency communication modes

Goal #4: Increase communities' ability to be prepared for, respond to, and recover from a disaster event

- Improve community capabilities to mitigate hazards and reduce losses
- Improve interagency (local, state, federal) emergency coordination, communication, and operational capacity to ensure effective community preparedness, response and recovery
- Increase the capacity to respond and recover, countywide
- Improve emergency communication systems (cell phones, radios, sirens, reverse 911, multi-media, etc.)
- Increase first responder preparedness and education to hazards of concern
- Improve identification, education, and emergency notifications of vulnerable citizens
- Enhance the use of shared resources/Develop a strong mutual aid support system
- Make better use of technology (e.g., GIS)

- Establish and expand GIS technologies to map hazards and develop models of mitigation planning and to support hazard response and community recovery
- Maintain coordination of disaster plans, data, and related needs
- Mitigate future hazard losses through adequate land use/facilities planning

Goal #5: Maintain FEMA Eligibility/Position the communities for Grant funding

- Improve community ability to be competitive/successful with grant funding opportunities from application development to project delivery
- Establish and share best practices among agencies for development of grant applications, project permits, etc.
- Educate (and advocate) local officials to support local access to funding.

2.3.1. Success Stories

Since the 2020 LHMP, progress has been made on the implementation of the mitigation strategies contained within the previous Plan. Beyond the mitigation strategy implementation from the 2020 LHMP, the participating jurisdictions also continue to implement additional hazard mitigation measures not contained within the previous Plan. This section highlights key mitigation success since the 2020 LHMP.

Amador County

FireWise Community

The Amador Fire Protection District has made significant progress in community wildfire preparedness by utilizing the framework of Firewise USA. Firewise USA is a nationally recognized program developed by the National Fire Protection Association (NFPA), that encourages neighbors working together to reduce the risk of wildfires. The Firewise program strongly emphasizes community wildfire education, defensible space, home hardening, and community level fuel reduction work.

In Amador County, the Amador Fire Protection District serves as the coordinating agency for Firewise. What began as a grassroots effort with one motivated resident in Pioneer teaming up with Amador Fire, has evolved into a robust, countywide initiative with over 40 recognized Firewise Communities and several more currently in the application process. These communities are very active with many of them hosting annual wildfire preparedness events and seasonal clean-up days with the common goal of creating a wildfire resilient community.

In recent years, Amador Fire has integrated evacuation drills in an effort to better prepare our communities. These exercises are conducted in collaboration with allied agencies such as the Amador County Sheriff's Office, Office of Emergency Services (OES), the American Red Cross and local animal evacuation teams. These drills provide critical hands-on experience for residents, first responders, and provide opportunities to test and improve our emergency alert notification systems.

Another key aspect to our approach is education-based property inspections. Amador Fire offers free wildfire defensible space inspections to help educate and guide homeowners through the often-overwhelming process of vegetation management. We provide tailored advice and practical starting points,

helping residents take realistic steps toward better protecting their homes should a wildfire occur in their community.

Amador Fire also works closely with the Amador Fire Safe Council to secure funding for fuel reduction and vegetation mitigation projects. This collaboration provides, local, state, and federal grants, to support on-the-ground work that reduces wildfire risk on both public and private lands.

The success of the Firewise USA program in Amador County is the result of committed partnerships, grassroots engagement, and a shared vision of wildfire preparedness. Amador Fire is proud to lead this initiative and will continue using the Firewise framework to strengthen local capacity, educate residents, and promote long-term community wildfire resilience.

Following the close calls of the Tamarack and Caldor fires in 2021, the Kirkwood community opted to move forward with achieving Firewise USA designation. One of the Firewise requirements was implementing the defensible space standards of Public Resources Code 4291. However, the local tree ordinance in Kirkwood prohibited removal of trees unless they were dead, dying, or diseased, and County permits were required for tree cutting, pruning, or thinning. To eliminate confusion between the State and local policies, the County amended the Kirkwood tree ordinance by adding an exemption to the tree removal permitting requirements to allow for tree trimming and removal to meet the defensible space requirements of PRC 4291. The amendment also eliminated an administrative burden to property owners by abolishing the requirement for tree removal permits for dead, dying, diseased, and hazard trees if certified by an arborist, forester, or fire inspector.

Generators

Amador County has invested in permanently installed generators at critical facilities, ensuring essential services continue during power outages. These generators have already proven their value during recent Public Safety Power Shutoffs and severe winter storms. This uninterrupted power supply insured that the District Attorney's Office was able to continue processing cases, support victims, and coordinate with other law enforcement agencies. Installing a generator at the Pioneer Veteran's Hall has been especially valuable for community resilience. The Hall serves as a gathering place during Public Safety Power Shutoffs (PSPS) and can also be used as a Warming Center during winter storms. With a generator in place, the facility can now provide reliable heat, lighting, and power for charging medical equipment, phones, and other essentials.

Table 2-1 Example of Generator Installed

Ingress/Egress

The Amador Fire Safe Council is currently concluding two Ingress/Egress Grants from CalFire; with these grants, the AFSC sought to enhance wildfire safety in the Wildland-Urban Interface (WUI) through mapping and clearing roadside vegetation along ingress and egress routes. It was estimated this would benefit roughly 17,000 residents in Amador County.

With a substantial grant amount totaling $1,644,296 ($1,044,296.00 from the 1st iteration and $600,000 additional from a direct award grant) the AFSC sought to treat 90 miles or 425 acres of roadside vegetation, establish 6 new Firewise Communities, and develop a county-wide strategic plan for Ingress/Egress, and

hosting demonstration tours. The project has made significant progress, surpassing initial goals and resulting in a safer environment for the local community. By treating 113 miles or 520.73 acres of roadside vegetation, the initiative not only improved evacuation routes but also reduced the risk of wildfires spreading.

Additionally, the establishment of 32 new Firewise Communities has fostered a culture of preparedness and resilience among residents. These efforts, combined with a comprehensive strategic plan, have laid a strong foundation for ongoing wildfire mitigation and community engagement. Through collaborative efforts and continued education, Amador County is better equipped to face future challenges and protect its natural and human resources.

Jackson Creek Forest Health Project

The Jackson Creek Forest and Watershed Health Project, funded by CAL FIRE and managed by the Amador Resource Conservation District (ARCD), aimed to enhance forest and watershed health on 1,000 acres in Amador County. The project focused on reducing fire risk, conserving water, minimizing erosion, protecting water quality, and increasing forest resilience to drought and disease. With a grant of $3,603,152, the ARCD implemented a combination of treatment methods, including prescribed grazing, mastication, hand work, and prescribed fire. These treatments collectively worked to reduce fuel loading and protect local communities from severe wildfires. Given that the project was conducted on private land, community engagement was a key component of its success. The project aimed to create a sustainable and resilient forest ecosystem while providing educational opportunities and promoting long-term community involvement in forest management. Educational workshops and community events were organized to engage residents, equipping them with knowledge about fire prevention and sustainable land practices.

City of Sutter Creek

Dec 2022 to Jan 2023, heavy rains swelled creek leading to a fast and high current that eroded fill and armoring at bend in creek at base of WWTP. In Aug 2024, the Armor wall was reinforced protecting the WWTP.

Worley at Main Street: 2017-2018 storms caused the hillside to fall onto main street. Road was dug out and ultra block installed as temporary fix. After 3-5 years, ultra block was removed and Jute netting and Rice waddle were installed until vegetation returned to the hillside. Natural vegetation is impeding erosion currently.

Crestview Drainage on Meadow Crest – Sept 2023 Homeowner called City about drainage issues. No drainage was provided from upper development and too much flow was entering the residence on 310 Gopher Flat. City investigated and determined that the existing drainage pipe was too small and had been compromised. In fall of 2024, the City installed a 100 LF of new 18-inch pipe and 30 LF of 24-inch pipe, two new DI's and 2 DI's. Problem has been solved

Pump Station Debris – Over time dirt from unfinished road washed down into pump station vault (2020 to 2023). Vault was not above storm flows which would allow storm flow to enter pump station. Debris was removed and vault lip is now above storm flows. Issue solved for next 10 years, possible issue if high storm flows return, monitor debris accumulation and remove as necessary. Pump station vault needs to be lifted.

The City has passed an ordinance to remove fire debris and or to create a fire break on residents property. The City has worked to clear dense vegetation areas throughout town including the Mine head site which is a known area of vegetation overgrowth. The City is working with CAL FIRE to clear dense vegetation roads. The ordinance allows the City to hire clearing crews for lots deemed with excessive vegetation growth. Vegetation management is a considerable expense to the City that is occurring every year around town.

Amador Water Agency

AWA received $1.660,533 in HMGP funding to remove 3 old redwood water storage tanks and replace with wildfire hardened steel tanks. This project was completed in 2022. Additionally, AWA received $1,706,830 in HMGP funding to retrofit the La Mel water treatment building against wildfires. This project is still ongoing.

2.3.2. 2020 Mitigation Strategy Update

The 2020 LHMP contained separate mitigation strategies for each participating jurisdiction. These have been combined below. The 2020 LHMP contained 93 separate mitigation actions for the jurisdictions. Of these, 8 are complete, 2 have portions that are complete and portions that are ongoing, 70 are ongoing, and 13 have not been started. 62 actions have been identified for inclusion in this LHMP Update and have been carried forward in Chapter 5. Table 2-2 provides a status summary of the mitigation action projects from the 2020 LHMP. Following the table is a description of the status of each project.

Table 2-2 Amador County Planning Area 2020 LHMP: Mitigation Action Status Summary

Action Title	Complete	Ongoing	Not Yet Started	In 2025 Update*
Amador County				
All Hazard Actions				
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	X			Y
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness		X		Y
Action 3. Evaluate All Major and Minor Structures Along Evacuation Routes within Amador County Right of Way			X	Y
Action 4. Evaluate All Roadways Used as Evacuation Routes within Amador County Right of Way			X	Y
Action 5. Harden and Enhance Cell service: Additional Cell/Repeater Towers/Mobile Repeaters, Generator Backup, Etc.		X		Y
Action 6. Amador County Evacuation planning for all Hazards; Include Establishment of Sheltering in Place and Refuge areas.		X		Y
Action 7. Reverse 911 Enhancements		X		Y
Action 8. Enhance Agency Communications		X		Y
Action 9. PRC 4290 Compliant Street and Address Signage for Rural Areas		X		Y

Action Title	Complete	Ongoing	Not Yet Started	In 2025 Update*
Action 10. Fixed Generators to Essential County Facilities		X		Y
Action 11. Implement modern GIS capabilities in Amador County		X		Y
Avalanche Actions				
Action 12. Annual Review of Kirkwood Ski Area Avalanche Mitigation Program		X		N
Agricultural Hazards Actions				
Action 13. Invasive Insect Pests		X		Y
Action 14. Invasive Weed Pests		X		Y
Climate Change Actions				
Action 15. Energy Action Plan			X	N
Dam Failure, Flood, Localized Flood, Landslide, and Levee Failure Actions				
Action 16. Improve Storm Water Management Along Road Segments Exhibiting Repetitive Losses From Localized Flooding and Landslides		X		Y
Action 17. Review and Amend Flood Ordinance as Appropriate		X		N
Action 18. Evaluate All Areas With Localized Flooding Along Amador County Maintained Roadways			X	Y
Action 19. Monitor Shakeridge Road (upcountry) for Landslide or Road Movement		X		Y
Action 20. Evaluate Each Roadways That is Subject to Local Land Movement and Minimize Debris Removal within Amador County Right of Way		X		N
Earthquake Actions				
Action 21. Identify Un-Reinforced Masonry (URM) and other seismically vulnerable buildings in the County			X	Y
Wildfire and Drought and Water Shortage Actions				
Action 22. Evaluate Evacuation Routes for Wildfire That Serve Critical Infrastructure	X			N
Action 23. Community Ingress/Egress – Phase I: Fire Safe Programs and Public Education Activities*		X		Y
Action 24. Community Ingress/Egress – Phase II: Brush Clearing and Fuels Reduction*		X		Y
Action 25. Construction of Mitchell Mine Fuelbreak*	X			N
Action 26. Outreach and Public Information Immobile Citizen Evacuation*		X		Y
Action 27. Development of Firewise Communities in Amador County*		X		Y
Action 28. Pine Acres Vegetation Management Program (2526 Acres)		X		Y
Action 29. Shake Fiddletown Vegetation Management Program (2526 Acres)		X		Y

Action Title	Complete	Ongoing	Not Yet Started	In 2025 Update*
City of Amador City Actions				
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan		X		Y
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness		X		Y
Action 3. Wastewater Plant Emergency Power		X		Y
Action 4. Midtown Sewer Crossing			X	N
Action 5. Vegetation Management	X	X		Y
Action 6. Landslide and Slope Failure Mitigation		X		Y
City of Ione Actions				
Multi-Hazard Actions				
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan		X		Y
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness		X		Y
Action 3. Harden and Enhance Cell Service: Additional Call/repeater towers/mobile repeaters generator back up		X		N
Action 4. Shelter Upgrades to Evalyn Bishop Hall (E.B. Hall)		X		Y
Action 5. Backup generators		X		Y
Flood, Localized Flood, and Levee Failure Actions				
Action 6. Flood Ordinance Review and Update		X		Y
Action 7. Develop and Implement Storm Water Master Plan		X		Y
Action 8. Develop Watershed Based Flood Reduction Programs		X		N
Action 9. Stream Maintenance and Debris/Sediment Removal		X		Y
Action 10. Replace Five Mile Bridge			X	N
Action 11. Pursue certification of the Levee along Sutter Creek			X	N
Wildfire Actions				
Action 12. Ordinance Review – Wildland Urban		X		N
City of Jackson Actions				
Multi-Hazard Actions				
Action 1.Integrate Local Hazard Mitigation Plan into Safety Element of General Plan		X		Y
Action 2.Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness		X		Y
Action 3.Station 131 generator		X		Y
Dam Failure, Flood, Localized Flood Actions				
Action 4.Buena Vista Flood Mitigation Project			X	N
Action 5.Busi Parking Lot Slope Drainage	X			N
Action 6.Annual Creek Cleaning		X		Y

Action Title	Complete	Ongoing	Not Yet Started	In 2025 Update*
Wildfire Actions				
Action 7.Starks Lane Bridge		X		N
Action 8.Defensible Space		X		Y
Action 9.Picardo Bridge			X	N
City of Plymouth Actions				
Multi-Hazard Actions				
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan		X		Y
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness		X		Y
Action 3. Secure City Hall as Critical Infrastructure with Commercial Generator	X			N
Action 4. Indian Creek Stream Restoration & Culvert Improvement in Flood Hazard Zone	X	X		N
Action 5. Maintain and Enhance Water Canal by Converting Earthen Arroyo Ditch to Fixed Pipeline or Gunite Lined Canal		X		N
Action 6. Develop a Community Wildfire Prevention Plan		X		Y
City of Sutter Creek Actions				
Multi-Hazard Actions				
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan		X		Y
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness		X		Y
Action 3. Development of Walking Paths, Native Tree Protection & Native Tree Species Planting		X		Y
Action 4. Installation of Generator at City Hall and Community Center	X			N
Action 5. Upgrade Ditches and Culverts		X		Y
Action 6. Develop a Stormwater Management Plan		X		Y
Floods and Localized Flood Actions				
Action 7. Sutter Creek City Hall Flooding		X		Y
Action 8. Sutter Creek Bank Stabilization		X		Y
Wildfire Actions				
Action 9. Perimeter Wildfire Protection Fuel Break		X		Y
Amador Water Agency Actions				
Multi-Hazard Actions				
Action 1. AWP Standby Generators		X		N
Ag Hazards and Aquatic Invasive Species Actions				
Action 2. Amador and Ione Water Systems Taste and Odor Mitigation		X		Y

Action Title	Complete	Ongoing	Not Yet Started	In 2025 Update*
Climate Change Actions				
Action 3. Lower Bear Reservoir Expansion Study		X		Y
Drought and Water Shortage and Wildfire Actions				
Action 4. Replacement of Two Hypalon Lined and Covered Tanks with New Tanks		X		Y
Action 5. Mt. Crossman Main Area Tank for Upper CAWP System		X		Y
Action 6. Upgrade Fire Pumps		X		Y
Flood and Localized Flood Actions				
Action 7.Mace Meadows Pump Station Flooding	X			N
Action 8.Eggiman Lane Flooding	X			N
Jackson Valley Irrigation District Actions				
Ag Hazards Actions				
Action 1. Outreach to Farmers regarding Agricultural Hazards in the Area		X		N
Aquatic Invasive Species Actions				
Action 2. Lake Amador Aquatic Invasive Species Monitoring		X		Y
Climate Change Actions				
Action 3. Long Term Water Solutions Analysis Due to Climate Change		X		Y
Dam Failure Actions				
Action 4. Jackson Creek Dam Immediate Inundation Area Public Outreach – Dam Failure		X		N
Action 5. Jackson Creek Dam Spillway Apron Extension Project		X		Y
Drought and Water Shortage and Wildfire Actions				
Action 6. JVID Water Meter Maintenance Program			X	N
Action 7. JVID Water Procurement and Additional Water Storage Study		X		Y
Action 8. Lake Amador Spillway Rubber Dam Project		X		Y
Earthquake Actions				
Action 9. Jackson Creek Dam Seismic Evaluation and Liquefaction Study		X		N
Flood Actions				
Action 10. Lake Amador Drive Box Culvert Expansion Project		X		Y
Levee Failure Actions				
Action 11. Jackson Creek Levee Maintenance Project		X		Y
Severe Weather Actions				
Action 12. JVID Office Backup Generator	X			N
Action 13. JVID Freeze Protection Project			X	N
Wildfire Actions				

Action Title	Complete	Ongoing	Not Yet Started	In 2025 Update*
Action 14. JVID Fire Hydrant Expansion Project			X	N

* Actions not carried forward were determined by the jurisdictions to be no longer feasible, relevant, lacked funding and local resources to implement, and/or no longer considered a priority.

Chapter 3 Planning Process

44 CFR §201.6(b) and §201.6(c)(1): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include:
1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval;
2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia, and other private and nonprofit interests to be involved in the planning process; and
3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.
[The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

Amador County, as the project lead, and the other participating jurisdictions to this 2025 Amador County LHMP Update, recognized the need for and importance of the update process for their 2020 LHMP and initiated its development. After securing funding for this LHMP Update, Amador County contracted with Foster Morrison Consulting, Ltd. (Foster Morrison) to facilitate and develop the Plan. Jeanine Foster, a professional planner with Foster Morrison, was the project manager in charge of overseeing the planning process and the development of this LHMP Update. Chris Morrison, also a professional planner with Foster Morrison, was the lead planner for the development of this LHMP Update. The Foster Morrison's team's role was to:

- Assist in establishing the Hazard Mitigation Planning Committee (HMPC) as defined by the Disaster Mitigation Act (DMA);
- Meet the DMA requirements as established by federal regulations and following FEMA's planning guidance;
- Support objectives under the National Flood Insurance Program (NFIP) and the Flood Mitigation Assistance (FMA) program;
- Facilitate the entire planning process;
- Identify the data requirements that HMPC participants could provide and conduct the research and documentation necessary to augment that data;
- Assist in facilitating the public input process;
- Produce the draft and final plan documents; and
- Coordinate with the California Office of Emergency Services (Cal OES) and FEMA Region IX Plan reviews.

3.1 Local Government Participation

Amador County and the other participating jurisdictions made a commitment to this 2025 Amador County Multi-Jurisdictional LHMP Update. The DMA planning regulations and guidance stress that each local

government (participating jurisdiction) seeking FEMA approval of their mitigation plan must participate in the planning effort in the following ways:

- Participate in the process as part of the HMPC;
- Detail where within the Amador County Planning Area the risk differs from that facing the entire area;
- Identify potential mitigation actions; and
- Formally adopt the Plan.

For all participating jurisdictions, "participation" meant the following:

- Attending and participating in the HMPC meetings;
- Completing and returning the Data Collection Worksheets;
- Collecting and providing other requested data (as available);
- Coordinating information sharing between internal and external agencies;
- Managing administrative details;
- Making decisions on LHMP process and content;
- Discussing their participation in the NFIP and any identified repetitive loss properties;
- Addressing changes in development since the 2020 LHMP and new development considerations;
- Providing status of 2020 actions and identifying mitigation actions for the Plan;
- Identifying opportunities for integrating the completed Plan into other planning mechanisms;
- Identifying jurisdictional capabilities to support mitigation strategy implementation;
- Making decisions on LHMP process and content;
- Identifying mitigation actions for the Plan;
- Reviewing and providing comments on Plan drafts;
- Providing Draft documents of the LHMP for public review;
- Informing the public, local officials, and other interested stakeholders about the planning process and providing opportunity for them to comment on the draft Plan; and
- Coordinating the formal adoption of the Plan by the governing boards for each jurisdiction.

The participating jurisdictions seeking FEMA approval of this LHMP Update met all of these participation requirements. Multiple representatives from participating jurisdictions attended the HMPC meetings described in Table 3-3 and also brought together an internal planning team to help collect data, identify mitigation actions and implementation strategies, and review and provide data on Plan drafts. Appendix A provides additional information and documentation of the planning process.

Individuals representing various departments and other representatives from the participating jurisdictions to this Amador County LHMP Update were actively involved throughout the Plan Update process as identified in Appendix A in the sign-in sheets for the meetings and as evident through the data, information and input provided by HMPC representatives for the development of this LHMP Update. This Chapter 3 and Appendix A provides additional information and documentation of the planning process and participants to this LHMP Update, including members of the HMPC.

3.2 The 10-Step Planning Process

Foster Morrison established the planning process for updating the Amador County LHMP using the DMA planning requirements and FEMA's associated guidance. Specifically, the LHMP was developed pursuant to the requirements of DMA 2000, published at 44 CFR 201.6 and new FEMA LHMP guidance, LHMP

Policy Guide FP 206-21-0002 effective April 11, 2025, as well as applicable California laws and mitigation requirements. This guidance is structured around a four-phase process:

1. Organize Resources;
2. Assess Risks;
3. Develop the Mitigation Plan; and
4. Implement the Plan and Monitor Progress.

Into this process, Foster Morrison integrated a more detailed 10-step planning process used for FEMA's CRS and FMA programs. The modified 10-step process used for this Plan meets the requirements of six major programs: FEMA's Hazard Mitigation Grant Program (HMGP); Pre-Disaster Mitigation (PDM) program; CRS program; FMA Program; Severe Repetitive Loss (SRL) program; and new flood control projects authorized by the U.S. Army Corps of Engineers (USACE).

Table 3-1 shows how the modified 10-step process fits into FEMA's four-phase process. The sections that follow describe each planning step in more detail.

Table 3-1 Mitigation Planning Processes Used to Develop the 2025 Amador County Local Hazard Mitigation Plan Update

DMA Process	Modified CRS Process
1) Organize Resources	
201.6(c)(1)	1) Organize the Planning Effort
201.6(b)(1)	2) Involve the Public
201.6(b)(2) and (3)	3) Coordinate with Other Departments and Agencies
2) Assess Risks	
201.6(c)(2)(i)	4) Identify the Hazards
201.6(c)(2)(ii)	5) Assess the Risks
3) Develop the Mitigation Plan	
201.6(c)(3)(i)	6) Set Goals
201.6(c)(3)(ii)	7) Review Possible Activities
201.6(c)(3)(iii)	8) Draft an Action Plan
4) Implement the Plan and Monitor Progress	
201.6(c)(5)	9) Adopt the Plan
201.6(c)(4)	10) Implement, Evaluate, and Revise the Plan

As part of this LHMP Update, all sections of the 2020 LHMP were reviewed and updated to reflect new data, processes, and resulting mitigation strategies. Only the information and data still valid from the 2020 LHMP were carried forward as applicable into this 2025 LHMP Update.

3.2.1. Phase 1: Organize Resources

Planning Step 1: Organize the Planning Effort

With each participating jurisdiction's commitment to participate in the DMA planning process, Foster Morrison worked with Amador County's Office of Emergency Services (County OES), as overall project lead, to establish the framework and organization for development of this LHMP. An initial meeting was held with County OES to discuss the organizational and process aspects of this 2025 LHMP Update.

The initial project kick-off meeting was held on December 4, 2024. Invitations to the kickoff meeting were extended to key county and city departments and special districts, as well as to other federal, state, and local stakeholders, including representatives from the public, which might have an interest in participating in the planning process. Representatives from the HMPC members to the 2020 LHMP and other identified stakeholders were used as a starting point for the invite list, with additional invitations extended as appropriate throughout the planning process. The list of invitees is included in Appendix A.

Hazard Mitigation Planning Committee

The HMPC was established as a result of these initial meetings, as well as through interest generated through the initial public meeting and outreach conducted for this project as detailed later in this chapter. The HMPC, comprised of county, city, special district, and other government and stakeholder representatives and the public, developed the Plan with leadership from County OES and facilitation by Foster Morrison. This list includes all HMPC members that were active participants in the Plan development process as evidenced through their attendance at one or more HMPC meetings, as well as those who provided key input into the Plan development process. Although not official participating jurisdictions seeking FEMA approval of the LHMP, several key local stakeholders should be noted for their ongoing participation and significant contribution to the LHMP development process. These key planning partners include the Amador County Fire Safe Council, Amador County Air Quality District, local representatives from the Red Cross and ARC, and others. The following individuals participated on the HMPC:

Table 3-2 Amador County Hazard Mitigation Planning Committee

Organization	Name
Amador County Participants	
Amador County Sheriff	Sheriff Gary Redman
Amador County Sheriff	Lt Jeff Bellotti
Amador County Sheriff	Sgt Matt Girton - OES Coordinator
Amador County Board of Supervisors	Supervisor Jeff Brown
Amador County Board of Supervisors	Supervisor Patrick Crew
Amador County Board of Supervisors	Supervisor Logan Carnell
Amador County Board of Supervisors	Supervisor Dan Epperson
Amador County Board of Supervisors	Supervisor Brian Oneto

Organization	Name
Amador County C.O.A.	Chuck Iley
Amador County Health Officer	Dr. Rita Kerr
Amador County Social Services	Director - Anne Watts
Amador County Behavioral Health	Director - Melissa Cranfill
Amador County Public Health	Director - Joanne Hasson
Amador County Public Health	Diana Haley
Amador County Public Health	Tracy Dehn
Amador County Public Works	Director - Rich Vela
Amador County Public Works	Jack O'Brien
Amador County Waste Management	Jeff Gardner
Amador County Air District	Hermina Perry
Amador County Environmental Health	Scott Meyer
Amador County Animal Control	Director - Evan Jacobs
Amador County Ag Dept	Director - Eric Mayberry
Amador County Ag Dept	Barry Clark
Amador County Planning	Chuck Beatty
Amador County GSA	Director - Glenn Spitzer
Amador County Environmental Health	Scott Meyer
Amador County Building Department	Todd Barr
City's Participants	
City of Jackson	City Manager – Carl Simpson
City of Ione	Council Member – Stacy Rhoades
City of Sutter Creek	City Manager – Tom Dubois
City of Sutter Creek	Public Works Director – Dan Lafontaine
City of Sutter Creek	Vice Mayor – Julia Sierk
City of Sutter Creek	Steve Christensen
City of Amador City	City Manager – Dave Groth
City of Amador City	Mayor – Sandra Staples
City of Plymouth	City Manager – Margaret Roberts
City of Plymouth	City Manager – Cameron Begbie
City of Plymouth	Public Works Director – Cathleen Johnson
Law Participants	
Jackson Police Department	Captain - Jose Arevalos
Fire Participants	
U.S. Forest Service	James Thornock
Amador Fire Protection District	Chief - Rob Withrow
Amador Fire Protection District	Battalion Chief - Justin Yelinek

Organization	Name
Amador Fire Protection District	Ashley Anaya
Amador Fire Protection District	Public Information Officer - Kayla Dale
Jackson Fire Department	Chief - Ryan Pidgeon
Ione Fire Department	Chief - Ken Mackey
Sutter Creek Fire Department	Chief - Dominic Moreno
Jackson Valley Fire District	Chief - Randy Makemson
Medical & Health Participants	
Amador County Public Health	Director - Joanne Hasson
Amador County Public Health	Diana Haley
Amador County Public Health	Tracy Dehn
Sutter Amador Hospital	Emergency Planner - Rachael Dimmer
American Legion Ambulance	President - Alan McNany
American Legion Ambulance	Vice President - Michelle Tyer
MACT Health Care Board	Laura Ellison
Water Districts Participants	
Amador Water Agency	Rick Ferriera
Amador Water Agency	Lucas Carthew
Amador Water Agency	Brandt Cook
Amador Water Agency	Antero Acierto
Jackson Valley Irrigation District	General Manager - Steve Fredricks
River Pines Public Utility District	Amy Gedney
Other Utilities & Transportation Participants	
PG&E	James Croshurst
PG&E	Kim Johansen
PG&E	Samantha Hill
PG&E	Andrew Murray
PG&E	Kevin Quakenbush
PG&E	Mother Lode Hydro Manager - Clint Harris
Volcano Communications	General Manager - Frank Leschinsky
Cal-Trans	Wes Bingham
Cal-Trans	Nick Uselton
Misc Participants	
Foster Morrison	Jeanine Foster
Red Cross	Regional Director - Rebecca Mich
Red Cross	Lisa Baker
Cal-OES	Emergency Services Coordinator - John Anger,

Organization	Name
ARC Amador	Executive Director - Karyn Gregorius
ARC Amador	Lurali Moore
Amador Chamber of Commerce	President - Matt Toma
Amador Chamber of Commerce	Jim Guidi
Amador Chamber of Commerce	Director - Ashley Carnicello
Amador Resource Conservation District	Executive Director - Amanda Watson
Amador Fire Safe Council	Todd Bertwell, RCD/FSC
Ione Citizen	Larry Rhoades
Ione Citizen	Bette Rhoades
ACART	Kitten Chapman

Utilizing a Common Planning Process

The County and all participating jurisdictions developed this LHMP Update utilizing a common Plan development process utilizing the "whole community" approach. This included establishing an HMPC that included key stakeholders for all jurisdictions ensuring that the five required categories of stakeholders, specific to each jurisdiction, were identified and included. Utilizing a common planning process involving all jurisdictional stakeholders promoted better stakeholder participation for all jurisdictions. This approach respected the time and availability of stakeholders, while maximizing participation of a common group of jurisdictional stakeholders by not requiring them to come to duplicate (or really 8 separate meetings) on the same Plan development element(s), which for this Plan would have resulted in 40 separate meetings to cover the 5 primary HMPC topics and meetings. It also spurred conversations between jurisdictions, as well as their public stakeholders, who were invited to come to these meetings. Additional considerations and benefits for utilizing a common planning process for the development of the LHMP Update include:

- The small rural nature of Amador County, the five cities, and two participating special districts was best suited for a common plan development process.
- Common group of stakeholders to all participating jurisdictions necessitated a common plan development process.
- Several of the jurisdictions have shared or overlapping boundaries and economic ties, often work under the same authorities, and have similar needs and capabilities.
- A common plan development process brings key stakeholders together in the same meetings instead of siloing them to specific jurisdictional meetings. This adds value by getting different groups discussing key issues collectively with different experiences and perspectives to bring to the table.
- Improves stakeholder communication and coordination by increasing stakeholder attendance in support of all jurisdictions and not diluting their participation by requiring attendance at multiple, duplicate meetings that they won't be able to attend.
- Key public stakeholders invited to be part of the HMPC were better able to attend a limited set of meetings.
- All participating jurisdictions face similar threats and hazards which drive the resulting mitigation strategy that benefits the Amador County Planning Area as a whole by promoting a comprehensive and regional approach to mitigation.

Additionally, Amador County, as the project lead, has been developing successful multi-jurisdictional LHMPs and LHMP Updates for nearly 20 years. Utilizing this common planning process resulted in multiple entities being engaged and in the room at the same time. All of this is shown in detail throughout this chapter and in Appendix A.

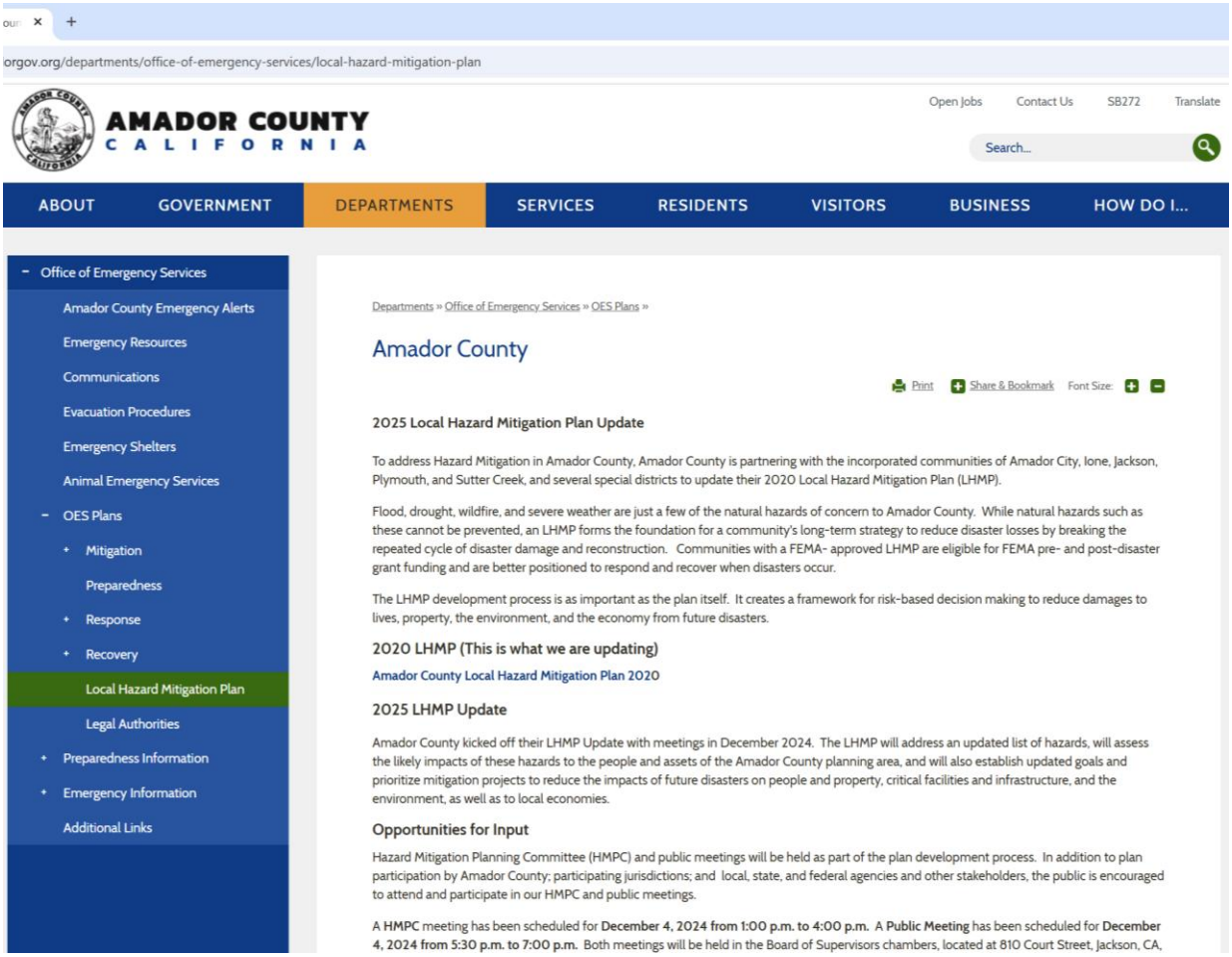
Meetings

The planning process officially began with a kick-off meeting of the HMPC held on December 4, 2024, followed by a public kick-off meeting held the same day at 5:30 pm. The meetings covered the scope of work and an introduction to the DMA requirements. During the HMPC meetings, participants were provided with data collection worksheets to facilitate the collection of information necessary to support development of the Plan. Using FEMA guidance, these worksheets were designed to capture information on past hazard events, identify hazards of concern to each of the participating jurisdictions, identify values at risk to identified hazards, inventory existing capabilities, record possible mitigation actions, and to capture information on the status of mitigation action items from the 2020 LHMP. A copy of the worksheets for this project are included in Appendix A. Each participating jurisdiction seeking FEMA approval of this LHMP Update completed and returned the worksheets to Foster Morrison for incorporation into this 2025 LHMP Update

During the planning process, the HMPC communicated through virtual Team and Zoom meetings, email, telephone conversations, Dropbox websites, and through a County developed webpage dedicated to the Plan development process. This later website was developed to provide information to the HMPC, the public and all other stakeholders on the LHMP process. Draft documents were also posted on these websites so that the HMPC members, stakeholders, and the public could easily access and review them.

The Amador County LHMP website (as shown on Figure 3-1) can be accessed online at: https://www.amadorgov.org/departments/office-of-emergency-services/local-hazard-mitigation-plan.

Figure 3-1 Amador County Local Hazard Mitigation Plan Update Website



Source: Amador County

The HMPC met formally five times during the planning period (December 2024 – October 2025) which adequately covers the four phases of DMA and the 10-Step CRS planning process. Internal jurisdictional meetings were held throughout the planning process to further support Plan development. The key meetings and topics discussed are described in Table 3-3. Invitations, agendas and sign-in sheets for each of the meetings are included in Appendix A.

Table 3-3 Amador County Internal and HMPC Meetings

Meeting Type	Meeting Topic	Meeting Date	Meeting Location(s)
Amador County Internal Kickoff Meeting	1) Overview of LHMP plan development process 2) Initial identification of participating jurisdictions and HMPC members 3) Discussion of GIS and other data needs	October 23, 2024	Virtual Zoom Meeting

Meeting Type	Meeting Topic	Meeting Date	Meeting Location(s)
HMPC #1 Kick-off Meeting	1) Introduction to DMA and the planning process 2) Overview of current LHMP; 3) Organize Resources (CRS Steps 1,2&3): the role of the Planning Committee, planning for public involvement, coordinating with other agencies/stakeholders 4) Introduction to Hazard Identification	December 4, 2024	Amador County Board of Supervisors Chambers Jackson, CA
HMPC #2	1) Risk assessment overview and work session -CRS Step 4: Assess the Hazard -CRS Step 5: Assess the Problem	April 9, 2025	Amador County Board of Supervisors Chambers Jackson, CA
HMPC #3	1) Review of risk assessment summary 2) Review and update of mitigation goals 3) Intro to Mitigation Action Strategy -CRS Step 6: Set Goals -CRS Step 7: Review possible activities	June 11, 2025	Amador County Board of Supervisors Chambers Jackson, CA
HMPC #4	1) Review of mitigation alternatives 2) Review and update of mitigation actions from the 2020 LHMP 3) Identify updated list of mitigation actions by hazard 4) Review of mitigation selection criteria 5) Update and prioritize mitigation actions 6) Mitigation Action Strategy Implementation and Draft Action Development -CRS Step 7: Review possible activities -CRS Step 8: Draft an Action Plan	June 12, 2025	Amador County Board of Supervisors Chambers Jackson, CA
HMPC #5	1) Review of final HMPC, jurisdictional and public comments and input to Plan 2) Review and documentation of changed conditions, vulnerabilities, and mitigation priorities 3) CRS Step 8: Draft an Action Plan 4) CRS Step 9 & 10: Plan Maintenance and Implementation Procedures	October 9, 2025	Amador County Board of Supervisors Chambers Jackson, CA

Planning Step 2: Involve the Public

Public stakeholders for all participating jurisdictions are generally defined as any stakeholder not attached to local government in the Amador County Planning Area. Up-front coordination discussions with Amador County established the initial plan for public involvement. Public involvement activities for this LHMP Update included press releases, social media communications, stakeholder and public meetings, development of an LHMP webpage and associated website postings, and the collection of public and stakeholder comments on the draft Plan through a variety of mechanisms. This included other public outreach activities as further described below and targeted outreach to different groups of people and other agencies throughout the Plan development process. At the internal kick-off meeting, the HMPC discussed additional strategies for public involvement and agreed to an approach using established public information mechanisms and resources within the County.

Early Public Outreach Activities

Public outreach for this LHMP Update began at the beginning of the Plan development process with the development of a 2025 LHMP webpage and outreach on the LHMP development process through a variety of mechanisms as described below:

- Development of an Amador County 2025 LHMP Update webpage
- Inclusion of an Advertisement in the local community printed newspaper – The Ledger Dispatch, November 8, 2024, edition advertising the LHMP project kickoff and inviting the public to the kickoff meetings
- Posting of LHMP Public Information Flyer on community bulletin boards:
  - ✓ Amador City, City Hall, Amador City California
  - ✓ Amador County Administration Building, Jackson California
  - ✓ Amador County Department of Health and Human Services, Sutter Creek California
  - ✓ Amador County Transportation Commission Office, Sutter Creek California
  - ✓ Comanche Blue's General Store, Ione California
  - ✓ Ione City Hall, Ione California
  - ✓ Jackson City Hall, Jackson California
  - ✓ Jackson Fire Department, Jackson California
  - ✓ Jackson Library, Jackson California
  - ✓ Plymouth City Hall, Plymouth California
  - ✓ Sutter Creek City Hall, Sutter Creek California
  - ✓ Young's Payless Market, Pioneer California
  - ✓ Pioneer Branch Library, Pioneer California
  - ✓ Pioneer Veteran's Hall, Pioneer California
  - ✓ Fiddletown Community Center, Fiddletown California
  - ✓ Pine Grove Town Hall and Library, Pine Grove California
  - ✓ Pine Grove Market, Pine Grove California
  - ✓ River Pines Town Hall, River Pines California
  - ✓ Volcano Post Office, Volcano California
  - ✓ Sizemore County Store, Volcano California
- Post on the Amador County Sheriff's Office Facebook page, November 14, 2024

The HMPC Risk Assessment Meeting was also advertised in the April 1, 2025 Fiddletown Community e-newsletter, The Fiddler.

The purpose of this outreach was to inform the public and other stakeholders of the Amador County LHMP Update project, how they could get involved, and how to provide comments on the draft LHMP prior to submittal to Cal OES/FEMA. The outreach also invited the public stakeholders to the HMPC meetings for the project. Information on these outreach efforts can be seen in Appendix A to this LHMP.

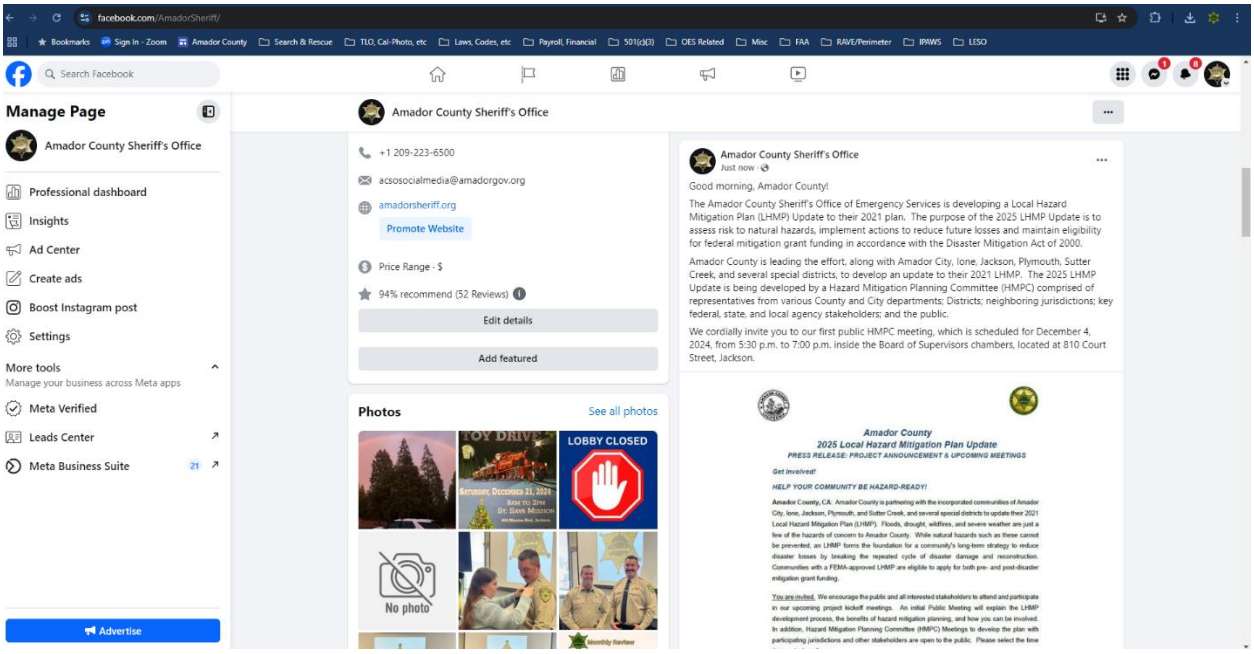
Public Meetings

Two public meetings were planned for this LHMP Update project, during key times of the LHMP development process:

Public Meeting #1: LHMP Kickoff

Public outreach for this LHMP Update began at the beginning of the Plan development process with the early public outreach activities to inform the public of the purpose of the DMA and the hazard mitigation planning process for Amador County and all participating jurisdictions. A press release was also issued at the beginning of the project to invite the public to attend either the public meeting or HMPC meetings. Figure 3-2 captures the Amador County Sheriff's Office Facebook page November 14, 2024, post.

Figure 3-2 Amador County Sheriff's Office Facebook Page, November 14, 2024



Source: Amador County

Public Meeting #2: On the Draft LHMP

The first draft of the LHMP Update was provided to the HMPC in August 2025, with a public review draft provided in September 2025. A public meeting was held on the evening of October 8, 2025, to present the draft LHMP and to collect public comments on the public review draft prior to finalization and submittal to Cal OES/FEMA. The public meeting was advertised in a variety of ways to maximize outreach efforts to both targeted groups and to the public at large and included an advertisement in local newspapers inviting the public to attend either the formal public meetings or the HMPC meeting at their convenience. The advertisement in the local newspaper included information on the date, location, and time of the meeting; where the draft Plan could be accessed in the community; and how to provide comments on the draft LHMP Update. In addition to a copy of the public review draft being placed on the Amador County LHMP website in advance of these meetings, a hard copy of the draft Plan was made available in the Amador County Sheriff's Office, 700 Court St. Jackson, CA 95642. Documentation to support the final public meeting, including meeting outreach, can be found in Appendix A.

In addition to the advertisement for public participation, notices of meetings were sent directly to all persons on the HMPC contact list and also to other agency and key stakeholders (including the public) with an interest in the Amador County Planning Area. The majority of these people reside in the Amador County Planning Area or in surrounding communities. Because this is a multi-jurisdictional planning effort, all public outreach activities for this LHMP Update were conducted in cooperation with and on behalf of the Amador County and all participating jurisdictions to this 2025 LHMP Update. Additional outreach for review of the Draft LHMP and final meetings included:

- Issuing of a Press Release on the Final Meetings and how to provide comments on the Draft LHMP
- Website additions announcing the final HMPC and Public meetings and how to provide comments on the Draft LHMP
- An advertisement/public notice in the Amador County Ledger Dispatch Print edition on September 19 and 26, 2025 announcing the final HMPC and Public meetings and how to provide comments on the Draft LHMP
- Posting of LHMP Public Information Flyer on the Draft LHMP at the following community bulletin boards:
  - ✓ Amador City, Amador City Post Office, Amador City California
  - ✓ Amador County Administration Building, Jackson California
  - ✓ Amador County Department of Health and Human Services, Sutter Creek California
  - ✓ Amador County Transportation Commission Office, Sutter Creek California
  - ✓ Comanche Blue's General Store, Ione California
  - ✓ Ione City Hall, Ione California
  - ✓ Plymouth City Hall, Plymouth California
  - ✓ Sutter Creek City Hall, Sutter Creek California
  - ✓ Pioneer Branch Library, Pioneer California
  - ✓ Fiddletown Community Center, Fiddletown California
  - ✓ Pine Grove Market, Pine Grove California
  - ✓ River Pines Town Hall, River Pines California
  - ✓ Sizemore County Store, Volcano California
  - ✓ Volcano Post Office, Volcano California
  - ✓ Young's Payless Market, Pioneer, California
- Post on the Amador County Sheriff's Office Facebook page, September 15, 2025

The formal public meetings for this project are summarized in Table 3-4.

Table 3-4 Schedule of Public and Stakeholder Meetings

Meeting Type	Meeting Topic	Meeting Date	Meeting Locations
Early Public Kickoff Meeting #1	1) Intro to DMA, CRS and mitigation planning 2) 2025 LHMP Update Process	December 4, 2024	Amador County Board of Supervisors Chambers Jackson, CA
Final Public Meeting #2 on the Draft LHMP	1) Presentation of Draft LHMP and solicitation of public and stakeholder comments	October 8, 2025	Amador County Board of Supervisors Chambers Jackson, CA

Where appropriate, stakeholder and public comments and recommendations were incorporated into the final LHMP throughout the Plan development process, including the sections that address the risk assessment and mitigation goals and strategies. Public comments were solicited throughout the planning process and prior to LHMP submittal to Cal OES and FEMA. No public comments were received as part of the 2025 LHMP Update project. All press releases, newspaper advertisements and articles, website postings, and public outreach efforts are on file with County OES and are included in Appendix A. The draft Plan is currently available online on the Amador County website at: https://www.amadorgov.org/departments/office-of-emergency-services/local-hazard-mitigation-plan.

Planning Step 3: Coordinate with Other Departments and Agencies

Early in the planning process, the HMPC determined that data collection, mitigation strategy development, and LHMP review and approval would be greatly enhanced by inviting other local, state and federal agencies and organizations to participate in the Plan development process. Based on their involvement in hazard mitigation planning, their landowner status in the Amador County Planning Area, and/or their interest as a neighboring or involved jurisdiction, representatives from the following agencies were invited to participate on the Planning Committee:

- American Red Cross
- Cal DWR
- CAL FIRE
- Cal OES
- Cal Trans
- California Department of Education
- California Department of Fish and Wildlife
- California Native Plant Society
- Federal Emergency Management Agency, Region IX
- National Weather Service
- Pacific Gas & Electric
- U.S Bureau of Reclamation
- U.S. Geological Survey
- U.S. Army Corps of Engineers
- United States Forest Service

In addition, coordination with other key agencies, organizations, and advisory groups occurred throughout the planning process as needed to inform them on how to participate in the LHMP Update process and if they had any expertise or assistance, they could lend to the LHMP Update, including information on hazards, risks and vulnerability of the Amador County Planning Area, and any input on possible risk reduction measures. As part of the overall stakeholder and agency coordination effort, the HMPC coordinated with and utilized input to the LHMP Update from the following agencies:

- Cal-Adapt
- Cal Atlas
- Cal OES
- CAL FIRE
- Cal Trans
- California Department of Conservation
- California Department of Finance

- California Department of Fish and Wildlife
- California Department of Food and Agriculture
- California Department of Parks and Recreation
- California Department of Water Resources
- California Division of Mines and Geology
- California Employment Development Department
- California Geological Survey
- California Invasive Plant Council
- California Natural Resources Agency
- FEMA Region IX
- Library of Congress
- National Drought Mitigation Center
- National Levee Database
- National Oceanic and Atmospheric Association
- National Performance of Dams Program
- National Register of Historic Places
- National Resource Conservation Service
- National Response Center
- National Weather Service
- Pacific Gas & Electric
- Public Policy Institute of California
- United States Army Corps of Engineers
- United States Bureau of Land Management
- United States Bureau of Reclamation
- United States Department of Agriculture
- US Department of Transportation
- United States Forest Service
- United States Geological Survey
- Western Regional Climate Center

Several opportunities were provided for the groups listed above to participate in the planning process. At the beginning of the planning process, invitations were extended to many of these groups to actively participate on the HMPC. Specific participants from these groups are detailed in Appendix A. Others assisted in the process by providing data directly as requested in the Data Worksheets or through data contained on their websites or as maintained by their offices. Further as part of the public outreach process, all groups were invited to attend the public and HMPC meetings and to review and comment on the draft LHMP prior to submittal to CAL OES and FEMA.

Other Community Planning Efforts and Hazard Mitigation Activities

Coordination with other community planning efforts is also paramount to the success of this LHMP Update. Hazard mitigation planning involves identifying existing policies, tools, and actions that will reduce a community's risk and vulnerability to hazards. Amador County and the participating jurisdictions to this Plan use a variety of comprehensive planning mechanisms, such as general plans and ordinances, to guide growth and development. Integrating existing planning efforts and mitigation policies and action strategies into this LHMP Update establishes a credible and comprehensive Plan that ties into and supports other community programs. The development of this LHMP Update incorporated information from the following existing plans, studies, reports, and initiatives as well as other relevant data from neighboring communities

and other jurisdictions. This gives a general overall list of plans, studies, and reports. More can be found in Appendix B to this Plan Update.

- 2023 State of California Hazard Mitigation Plan
- CAL FIRE Plans and data
- CAL OES plans and data
- Cal-Adapt reports and data
- California Department of Finance demographic documents
- California Department of Public Health
- California Department of Water Resources plans and information
- California DWR Division of Safety of Dams plans and information
- California Geological Survey Plans
- Capital Improvement Plans for each jurisdiction
- Climate Adaptation Plans
- Climate Change and Health Profile Report – Amador County
- CWPPs
- Dam Emergency Action Plans
- Emergency Operations Plans
- Evacuation Plans
- FEMA mitigation planning documents
- Flood Insurance Studies
- General Plans for each of the jurisdictions
- General Plan Background Reports
- Housing Elements f for each of the jurisdictions
- National Weather Service documents
- Stormwater Master Plans
- US Department of Agriculture Reports
- US Department of Interior Plans
- US Fish and Wildlife reports
- USDA reports
- USGS Reports

Specific source documents are referenced at the beginning of each section of Chapter 4 and in Appendix B. These and other documents were reviewed and considered, as appropriate, during the collection of data to support Planning Steps 4 and 5, which include the hazard identification, vulnerability assessment, and capability assessment. Data from these plans and documents were incorporated into the hazard risk assessment sections of the LHMP. Where data and information from the existing studies and reports is used in this LHMP Update, the source document is referenced throughout this Plan. The information was also used to identify potential hazard mitigation strategies for inclusion in this LHMP Update and in assessing the capabilities of the participating jurisdictions in implementing the resulting mitigation strategy. Appendix B, References, provides a detailed list of references used in the preparation of this LHMP Update.

Coordination with Underserved Communities and Socially Vulnerable Populations

As detailed in FEMA's new 2025 LHMP Guidance, the LHMP development process should utilize the Whole Community approach to hazard mitigation planning. New 2025 FEMA guidance defines planning for the "Whole Community" as a focus on enabling the participation in national preparedness activities of a wider range of players from the private and nonprofit sectors, including nongovernmental organizations

and the general public, in conjunction with the participation of all levels of government in order to foster better coordination and working relationships.

In consideration of these new FEMA requirements as well as applicable California state laws and LHMP requirements, the plan development process focused on key sectors of public and private entities that would enhance hazard mitigation planning for Amador County. Thus, engagement and coordination with a variety of community-based organizations that work directly with or provide support to underserved communities and socially vulnerable populations was a critical component to Amador County in addressing equity in mitigation planning and implementation.

For this LHMP project, significant efforts were made to identify and engage appropriate community members and groups to support the Plan development process. In Amador County, vulnerable populations groups primarily include seniors, children, low income, homeless populations, people with disabilities, those with lack of or limited mobility, and those with limited access to public transportation services in the more rural areas for evacuations and other hazard response needs. There is also a migrant population that arrives for the summer, many of which are Spanish speakers, which can create challenges during hazard events. The concept of Amador County being vulnerable due to its location and status as a small, rural, and somewhat remote community was determined to be a major descriptor of the County's underserved and vulnerable populations.

Given the small, rural nature of Amador County, much of the support for these groups fell to applicable local government agencies, primarily the County. Thus, reaching out to the County departments providing these types of services was the most effective approach to meeting this element. As part of the planning process, efforts made to identify and engage these groups in the Amador County 2025 LHMP Update project included the following:

- **Amador County Health and Human Service** –The mission of Amador County's Department of Health and Human Services (DHHS) is to provide benefits and services in a quality manner, promoting personal responsibility, job readiness and self-sufficiency in order to strengthen individuals and families. Representatives from the DHHS were invited to be on the HMPC and provide input into the Plan development process. Numerous (6) DHHS representatives, with varying roles and responsibilities, participated on the HMPC and provided input into the LHMP Update, including input on mitigation actions. Amador County DHHS divisions include Public Health, Social Services, and Behavioral Health.
- **Sutter Amador Hospital** – The Sutter Amador Hospital's comprehensive services include a full array of programs designed for the needs of the communities it serves. Representatives of the Hospital were invited to be on the HMPC and review and provide comments on the Public Review Draft LHMP. The Hospital's emergency planner attended and participated as part of the HMPC.
- **American Legion Ambulance** – The American Legion Post No. 108 Ambulance Service provides Advanced Life Support (ALS) emergency 911 response to Amador and Calaveras Counties. Its mission is to continue the relentless pursuit of perfection in quality health care and compassion for its patients. American Legion Ambulance representatives were invited to be on the HMPC and review and provide comments on the Public Review Draft LHMP. The Ambulance Company's President attended and participated as part of the HMPC.
- **Mountain County EMSA-** Mountain County EMSA is a State and County authorized service agency composed of Emergency Medical Service (EMS) specialists who coordinate and regulate local

emergency service for our 4 county EMS system in California, including Amador, Alpine, Calaveras and Mariposa counties. Mountain County EMSA representatives were invited to be on the HMPC and review and provide comments on the Public Review Draft LHMP.

- **MACT Health Board** – The MACT Health Board provides services to Mariposa, Amador, Alpine, Calaveras, and Tuolumne counties. Their clinics are specialized and allow patients to receive affordable care for most medical, dental, behavioral health, optometry and chiropractic needs. MACT Health Board representatives were invited to be on the HMPC and review and provide comments on the Public Review Draft LHMP. A Board representative attended and participated as part of the HMPC.
- **ARC Amador** - The Arc of Amador and Calaveras' mission is to provide support and services to persons with intellectual and developmental disabilities so they can better learn, work, live and recreate in the mainstream of life. Since 1971, the Arc has been providing support and services to people with developmental disabilities. The Arc is a nonprofit membership corporation open to anyone with an interest in the welfare of individuals with developmental disabilities. ARC representatives were invited to be on the HMPC and review and provide comments on the Public Review Draft LHMP. Multiple representatives attended and participated as part of the HMPC.
- **Red Cross** - The Sierra-Delta Chapter of the Red Cross covers multiple counties including Amador. The Red Cross mission in Amador County is to prevent and alleviate human suffering in the face of emergencies. This involves providing relief to individuals and communities impacted by disasters, teaching life-saving skills, and supporting those in need through various services. Specifically, in Amador County, the Red Cross focuses on disaster relief, including providing shelter, food, and health services during emergencies. They also offer training in first aid, CPR, and other life-saving skills. Local Red Cross representatives were invited to be on the HMPC and review and provide comments on the Public Review Draft LHMP. Multiple representatives attended and participated as part of the HMPC.
- **Victory Village** - Victory Village is in its fourteenth year of serving veterans in the Central Sierra Nevada Foothills of California at two offices, one in Jackson, CA and one in Auburn, CA. Victory Village's purpose and mission is to develop affordable housing with innovative supportive services and programs for veterans, seniors, families, women, and children experiencing homelessness, poverty, and vulnerability in underserved communities. Victory Village representatives were invited to be on the HMPC and review and provide comments on the Public Review Draft LHMP.
- **Homeless Task Force** – The Homeless Task Force, part of Amador County, serves the homeless populations, identifying needs and gaps in services in order to efficiently address homelessness in the County. Representative of the Homeless Task Force were invited to be on the HMPC and review and provide comments on the Public Review Draft LHMP.
- **Area 12 Agency on Aging** - The Area 12 Agency on Aging, established as a five county Joint Powers Agency in 1987, provides services to approximately 54,000 older adults. It is part of an aging network which includes 33 Area Agencies on Aging statewide and over 675 nationwide. The Area 12 Agency on Aging is responsible for providing funds, through an impartial request for proposal process, to community senior service providers which exhibit a high standard of program excellence. As an advocate for older adults, the Area 12 Agency on Aging strives to ensure opportunities for independence and the highest possible quality of life are available to all Area 12 residents age 60+. Area 12 Agency of Aging representatives were invited to be on the HMPC and review and provide comments on the Public Review Draft LHMP.

- **Jackson Senior Center** – The Amador Senior Center exists to provide activities, education, and support services to the Seniors of Amador County. Representatives from the Jackson Senior Center were invited to be on the HMPC and review and provide comments on the Public Review Draft LHMP.
- **Fiddletown Community Center** - The Fiddletown Community Center is a nonprofit, all volunteer, community-based organization serving residents of Fiddletown and the surrounding area. Started over 60 years ago, this organization continues to be a vital part of local life providing an affordable event center, a free library and tutoring center, providing local gatherings throughout the year, and much more. Fiddletown Community Center representatives were invited to be on the HMPC and review and provide comments on the Public Review Draft LHMP.

3.2.2. Phase 2: Assess Risks

Planning Steps 4 and 5: Identify the Hazards and Assess the Risks

Foster Morrison led the HMPC in a research effort to identify, document, and profile all the hazards that have, or could have, an impact to the Amador County Planning Area. Starting with the 2020 LHMP, natural hazards of concern were added, deleted, and modified for this LHMP Update. Data collection worksheets were developed and used in this effort to aid in determining hazards and vulnerabilities and where the risk varies across the Amador County Planning Area. Geographic information systems (GIS) were used to display, analyze, and quantify hazards and vulnerabilities.

The HMPC also conducted a capability assessment to review and document Amador County's and each participating jurisdictions' current capabilities to mitigate risk from and vulnerability to hazards. By collecting information about existing County/City/District programs, policies, regulations, ordinances, and emergency plans, the HMPC could assess those activities and measures already in place that contribute to mitigating some of the risks and vulnerabilities identified. A more detailed description of the risk assessment process, methodologies, and results are included in Chapter 4 Risk Assessment.

NFIP Participation

Also addressed in the risk assessment and mitigation strategy of this 2025 LHMP is an assessment of the County and five Cities' floodplain management programs and participation in the NFIP, including a discussion of their continued compliance with NFIP requirements. However, it should be noted that this applies only to eligible NFIP communities. Participating special districts to this LHMP Update do not address their compliance with the NFIP as they are not eligible jurisdictions for purposes of the NFIP.

3.2.3. Phase 3: Develop the Mitigation Plan

Planning Steps 6 and 7: Set Goals and Review Possible Activities

Foster Morrison facilitated brainstorming and discussion sessions with the HMPC that described the purpose and process of developing planning goals and objectives, a comprehensive range of mitigation alternatives, and a method of selecting and defending recommended mitigation actions using a series of selection criteria. This information is included in Chapter 5 Mitigation Strategy. Additional documentation on the process the HMPC used to develop the goals and mitigation strategy is in Appendix C.

Planning Step 8: Draft an Action Plan

Based on input from the HMPC regarding the draft risk assessment and the goals and activities identified in Planning Steps 6 and 7, a complete first draft of the LHMP Update was developed. This complete draft was provided for HMPC review and comment via a Dropbox web link. HMPC comments were integrated into the second public review draft, which was advertised and distributed to collect public input and comments. The HMPC integrated comments and issues from the public, as appropriate, along with additional internal review comments and produced a final draft for CAL OES and FEMA Region IX to review and approve, contingent upon final adoption by governing boards of all participating jurisdictions.

3.2.4. Phase 4: Implement the Plan and Monitor Progress

Planning Step 9: Adopt the Plan

In order to secure buy-in and officially implement the LHMP Update, the Plan was adopted by the governing boards of each participating jurisdiction using the sample resolutions contained in Appendix D.

Planning Step 10: Implement, Evaluate, and Revise the Plan

The true worth of any mitigation plan is in the effectiveness of its implementation. Up to this point in the planning process, the HMPC's efforts have been directed at researching data, coordinating input from participating entities, and developing appropriate mitigation actions and projects. Each recommended action includes key descriptors, such as a lead manager and possible funding sources, to help initiate implementation. An overall implementation strategy is described in Chapter 7 Plan Implementation and Maintenance.

Finally, there are numerous organizations within the Amador County Planning Area whose goals and interests interface with hazard mitigation. Coordination with these other planning efforts, as addressed in Planning Step 3, is paramount to the implementation and ongoing success of this plan and mitigation in the Amador County Planning Area and is addressed further in Chapter 7.

Implementation and Maintenance Process: 2020 Amador County LHMP

The previous 2020 LHMP included a process for Plan maintenance and implementation of the mitigation strategy as well as formal updates to the LHMP. The 2020 process called for annual reviews, including a review of the status of mitigation strategy implementation. In addition, the 2020 processes called for a formal plan update as required by DMA regulations every 5 years. With respect to the 2020 LHMP, no formal process was followed for annual reviews. This 2025 LHMP Update, once approved and adopted, will meet the DMA formal 5-year update requirement for all participating jurisdictions.

In addition, the 2025 LHMP was relied on and integrated into other planning mechanisms in the Amador County Planning Area. Table 3-5 lists the planning mechanism the 2020 LHMP Update was integrated into by unincorporated Amador County. Specific to other participating jurisdictions, the jurisdictional annexes identify the planning mechanisms the 2020 LHMP were integrated into by each jurisdiction.

Table 3-5 Unincorporated Amador County Incorporation of 2020 Amador County LHMP into Other Planning Mechanisms

Planning Mechanism 2020 LHMP Was Incorporated or Implemented Through	Details
Amador County General Plan (2016)	Incorporated by reference within Safety Element in accordance with AB2140. Also, integrated as part of our Emergency Response.
Amador County Emergency Operations Plan (2024)	Hazard I.D & Analysis, Hazard Summary, Hazard Mitigation, and just generally referenced.
Amador County Integrated Preparedness Plan (2023)	Hazard I.D.

The plan implementation and maintenance process as set forth in the 2020 Plan has been updated for this LHMP Update. The revised update implementation and maintenance process for the Amador County 2025 LHMP Update is set forth in Section 7 of this Plan document. A strategy for continued public involvement for this update process is also included in Chapter 7.

Chapter 4 Risk Assessment

44 CFR Requirement §201.6(c)(2): [The plan shall include] A risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.

As defined by the Federal Emergency Management Agency (FEMA), risk is a combination of hazard, vulnerability, and exposure. "It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage."

The risk assessment process identifies and profiles relevant hazards and assesses the exposure of lives, property, and infrastructure to these hazards. The process allows for a better understanding of a community's potential risk to natural hazards and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

This risk assessment followed the methodology described in the FEMA publication Understanding Your Risks—Identifying Hazards and Estimating Losses (FEMA 386-2, 2002), which breaks the assessment down into a four-step process:

1. Identify Hazards;
2. Profile Hazards;
3. Inventory Assets; and
4. Estimate Losses.

Data collected through this process has been incorporated into the following sections of this chapter:

- **Section 4.1 Hazard Identification** identifies the natural hazards that threaten the Amador County Planning Area and unincorporated Amador County and describes why some hazards have been omitted from further consideration.
- **Section 4.2 Amador County Planning Area Assets Inventory and Growth and Development Trends** identifies the populations; structures and values; critical facilities and community lifelines; cultural, historical, and natural resources; and economic and community activities of value. It also identifies past growth in the Amador County Planning Area and reviews future development trends. This information is not hazard specific and covers the entire Amador County Planning Area and unincorporated Amador County.
- **Section 4.3 Hazard Profiles and Vulnerability Assessment** provides an overview of each hazard, its location and extent, and discusses the risk, vulnerability, and impacts of each natural hazard to the Amador County Planning Area and unincorporated Amador County. The hazard profile also describes previous occurrences of hazard events and the likelihood of future occurrences. The vulnerability assessment evaluates the Amador County's exposure to natural hazards considering: populations; structures and values; critical facilities and infrastructure; community lifelines; natural, historic, and

cultural resources; economic assets and community activities; and future development trends, and where possible, estimates potential hazard losses.

- **Section 4.4 Capability Assessment** inventories existing mitigation activities and policies, regulations, plans, and programs that pertain to hazards and mitigation in the Amador County Planning Area and unincorporated Amador County and can affect net vulnerability.
- **Section 4.5 Natural Hazard Summary** summarizes the results of the risk assessment and whether a hazard is considered a priority for mitigation strategy planning.

This risk assessment covers the entire geographical extent of Amador County (i.e., the Amador County Planning Area) and unincorporated Amador County. And as required by FEMA, this risk assessment for the Amador County Planning Area also includes an evaluation of how the hazards and risks vary across the Planning Area.

This LHMP Update involved a comprehensive review and update of each section of the 2020 LHMP. Information from the 2020 LHMP was used in this Update where valid and applicable. As part of the risk assessment update, new data was used, where available, and new analyses were conducted. Where data from existing studies and reports was used, the source is referenced throughout this risk assessment. Refinements, changes, and new methodologies used in the development of this risk assessment update are summarized in Chapter 2 What's New and are also detailed in this risk assessment portion of the Plan Update.

4.1 Hazard Identification

44 CFR Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the type…of all natural hazards that can affect the jurisdiction.

The Amador County Hazard Mitigation Planning Committee (HMPC) conducted a hazard identification study to determine the hazards that threaten the Planning Area. This section details the methodology and results of this effort.

Data Sources

The following data sources were used for this Hazard Identification portion of the plan:

- National Climatic Data Center Storm Events Database
- 2020 Amador County Hazard Mitigation Plan
- 2016 Amador County General Plan
- 2023 State of California Hazard Mitigation Plan
- FEMA Disaster Declaration Database
- HMPC input

4.1.1. Results and Methodology

Using existing hazards data and input gained through planning meetings, the HMPC agreed upon a list of hazards that could affect the Amador County Planning Area. Hazards data from the California Office of Emergency Services (Cal OES), FEMA, California Department of Water Resources, the National Oceanic

and Atmospheric Administration (NOAA), and many other sources were examined to assess the significance of these hazards to the Planning Area.

The following hazards in Table 4-1, listed alphabetically, were identified and investigated for this LHMP Update. As a starting point, the 2020 Amador County LHMP Update and the 2023 California State Hazard Mitigation Plan were consulted to evaluate the applicability of new hazards of concern to the State to the Amador County Planning Area. Building upon this effort, hazards from the past plan were also identified, and comments explain how hazards were updated from the previous plan. Most hazards from the 2020 plan were profiled in this LHMP Update, with the exception of pandemic. Levee failure was placed inside the flood hazard. No new hazards were added.

Table 4-1 Amador County Hazard Identification and Comparison between 2020 and 2025 LHMP

2025 Hazards	2020 Hazards	Comment
Agricultural Hazards (severe weather/pests/invasive species)	Ag Hazards: Severe Weather/Insect Pests	This hazard was kept.
–	Aquatic Invasive Species	This hazard was integrated into the Agricultural Hazards
Avalanche	Avalanche	This hazard was kept.
Climate Change	Climate Change	This hazard was kept.
Dam Failure	Dam Failure	This hazard was kept.
Drought & Water shortage	Drought and Water Shortage	This hazard was kept.
Earthquake (w/subhazards)	Earthquake (minor/major)	This hazard was kept and slightly renamed.
Floods: 1%/0.2% annual chance (w/ levee failure)	Flood: 100/500-year	This hazard was kept and levee failure was added.
Floods: Localized Stormwater	Flood: Localized/Stormwater	This hazard was kept.
Landslide, Mudslide, Debris Flow	Landslide, Mudslide, and Debris Flows	This hazard was kept.
–	Levee failure	This was put into the flood hazard.
–	Pandemic	This hazard was dropped from the LHMP.
Severe Weather: Extreme Cold, Freeze, and Snow	Severe Weather: Winter Storms and Freeze	This hazard was renamed.
Severe Weather: Extreme Heat	Severe Weather: Extreme Heat	This hazard was kept.
Severe Weather: Heavy Rains and Storms (Hail, Lightning)	Severe Weather: Heavy Rains and Storms (winds, hail, lightning)	This hazard was kept.
Severe Weather: High Winds and Tornadoes	Severe Weather: High Winds/Tornadoes	This hazard was kept.
Wildfire (w/smoke and air quality)	Wildfire	This hazard was kept, and smoke and air quality subhazards were added.

Certain other hazards were excluded from consideration for this Plan Update. They are shown in Table 4-2.

Table 4-2 Amador County – Excluded Hazards

Hazard Excluded	Why Excluded
Coastal Flooding, Erosion, and Sea Level Rise	The County is not on the coast.
Hurricane	The County is not on the coast.
Tsunami	The County is not on the coast.
Volcano	Given the location of active or potentially active volcanoes relative to the Planning Area, it was felt this hazard was not of concern to the County.

Table 4-3 was completed by the County and HMPC to identify, profile, and rate the significance of identified hazards. Those hazards identified as a high or medium significance in Table 4-3 are considered priority hazards for mitigation planning. Those hazards that occur infrequently or have little or no impact in Amador County were determined to be of low significance and not considered a priority hazard. Significance was determined based on the hazard profile, focusing on key criteria such as frequency, extent, and resulting damage, including deaths/injuries and property, natural and cultural resources, and economic damage.

Table 4-3 Amador County Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Agricultural Hazards (severe weather/pests/invasive species)	Extensive	Highly Likely	Limited	Medium	Medium
Avalanche	Limited	Likely	Critical	Medium	Medium
Climate Change	Extensive	Likely	Limited	Medium	--
Dam Failure	Limited	Unlikely	Critical	Medium	Medium
Drought & Water Shortage (w/ tree mortality)	Extensive	Likely	Critical	Medium	High
Earthquake (w/subhazards)	Extensive	Unlikely	Catastrophic	Medium	Low
Floods: 1%/0.2% annual chance (w/ levee failure)	Significant	Occasional/Unlikely	Critical	Medium	Medium
Floods: Localized Stormwater	Extensive	Highly Likely	Limited	Medium	Medium
Landslide, Mudslide, Debris Flow	Limited	Likely	Critical	Medium	Medium
Severe Weather: Extreme Cold, Freeze, and Snow	Extensive	Highly Likely	Limited	Medium	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Limited	Medium	High
Severe Weather: Heavy Rains and Storms (Hail, Lightning)	Extensive	Highly Likely	Limited	Medium	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Highly Likely	Limited	Medium	Medium
Wildfire (w/smoke and air quality)	Extensive	Highly Likely	Catastrophic	High	Medium

Geographic Extent

Limited: Less than 10% of planning area

Significant: 10-50% of planning area

Extensive: 50-100% of planning area

Likelihood of Future Occurrences

Highly Likely: Near 100% chance of occurrence in next year, or happens every year.

Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.

Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.

Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Magnitude/Severity

Catastrophic: More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths

Critical: 25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability

Limited: 10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability

Negligible: Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance

Low: Minimal potential impact

Medium: Moderate potential impact

High: Widespread potential impact

Climate Change Influence

Low: Minimal potential impact

Medium: Moderate potential impact

High: Widespread potential impact

4.1.2. Disaster Declaration History

One method used to identify hazards was the researching of past events that triggered federal and/or state emergency or disaster declarations in the Amador County Planning Area. Federal and/or state disaster declarations may be granted when the severity and magnitude of an event surpasses the ability of the local government to respond and recover. Disaster assistance is supplemental and sequential. When the local government's capacity has been surpassed, a state disaster declaration may be issued, allowing for the provision of state assistance. Should the disaster be so severe that both the local and state governments' capacities are exceeded, a federal emergency or disaster declaration may be issued allowing for the provision of federal assistance.

The federal government may issue a disaster declaration through FEMA, the U.S. Department of Agriculture (USDA), and/or the Small Business Administration (SBA). FEMA also issues emergency declarations, which are more limited in scope and without the long-term federal recovery programs of major disaster declarations. The quantity and types of damage are the determining factors.

A USDA declaration will result in the implementation of the Emergency Loan Program through the Farm Services Agency. This program enables eligible farmers and ranchers in the affected county as well as contiguous counties to apply for low interest loans. A USDA declaration will automatically follow a major disaster declaration for counties designated major disaster areas and those that are contiguous to declared counties, including those that are across state lines. As part of an agreement with the USDA, the SBA offers low interest loans for eligible businesses that suffer economic losses in declared and contiguous counties that have been declared by the USDA. These loans are referred to as Economic Injury Disaster Loans. Disaster declarations for these programs are discussed in Section 4.3.6.

Based on the disaster declaration history provided in Table 4-4, Amador County is among the many counties in California susceptible to disaster. Details on federal and state disaster declarations were obtained by the HMPC, FEMA, and Cal OES and compiled in chronological order in Table 4-4. A review of state declared disasters indicates that Amador County received 31 state declarations between 1950 and 2025. Of the 31 state declarations: 22 were associated with severe winter storms, heavy rains, or flooding; 3 were for fire; 2 were for drought; 2 were from pandemic, 1 was for freeze and severe weather conditions; and 1 was from economic disaster. A review of federal disasters shows 27 federal disaster declarations from 1950 to 2025. Of these 27 federal declarations: 20 were associated with severe winter storms, heavy rains, or flooding; 2 for fire; 2 were from pandemic, 1 for drought; 1 was for seismic sea wave (which was declared for the entire State of California); and 1 was for hurricane (a nationwide declaration for Katrina evacuations). A summary of these events by disaster type is shown in Table 4-5.

Table 4-4 Amador County Federal and State Disaster Declarations, 1950-2025

Year	Disaster Name	Disaster Type	Disaster Cause	State Declaration # and Date	Federal Declaration # and Date
2023	California Severe Winter Storms, Straight-line Winds, Flooding, Landslides, and Mudslides	Storm	Storm	–	DR-4699 4/3/2023
2023	California Severe Winter Storms, Flooding, Landslides, and Mudslides	Flood	Severe winter storms	3/01/2023	EM-3592 3/10/2023
2023	California Severe Winter Storms, Flooding, Landslides, and Mudslides	Flood	Severe winter storms	2023-01 1/4/2023	DR-4683 1/14/2023
2021	December 2021 Storms	Storm	Storm	2022-03 12/30/2021	–
2021	California Caldor Fire	Fire	Fire	2021-06 8/17/2021 9/1/2021	EM-3571 9/1/2021
2020	California Covid-19 Pandemic	Biological	Biological	3/22/2020	DR-4482 3/22/2020
2020	California Covid-19 Pandemic	Biological	Biological	3/13/2020	EM-3428 3/13/2020
2019	California Severe Winter Storms, Flooding, Landslides, And Mudslides	Storms	Storms	2019-03 5/18/2019	DR-4434 5/18/2019
2017	Severe Winter Storms, Flooding, Mudslides in California	Flood	Storms	2017-03 3/7/2017	DR-4308 4/1/2017
2017	Severe Winter Storms, Flooding, and Mudslides in California	Storm	Storm	2017-01 1/23/2017	DR-4301 2/14/2017
2015	California Butte Fire	Fire	Fire	–	FM-5111 8/16/2016
2015	California Drought/Tree Mortality	Drought	Drought	2015-05 10/10/2015	–
2015	Summer 2015 Wildfires	Fire	Fire	2015-03 8/27/2015	–

Year	Disaster Name	Disaster Type	Disaster Cause	State Declaration # and Date	Federal Declaration # and Date
2007	2007 Severe Freeze	Freeze	Freeze	2007-02 01/12/07, 01/16/07, 01/19/07, 01/20/07, 01/26/07	–
2006	California Severe Storms, Flooding, Landslides, and Mudslides	Flood	Storms	2006-03 4/10/2006	DR-1646 6/5/2006
2005/2006	Severe Storms, Flooding, Mudslides, and Landslides in California	Flood	Storms	2006-01 1/12/2006	DR-1628 2/3/2006
2005	Hurricane Katrina Evacuations	Economic	Hurricane	–	EM-3248 2/3/2006
2001	Energy Emergency	Economic	Greed	1/1/2001	–
1998	California Severe Winter Storms and Flooding	Flood	Storms	–	DR-1203 2/9/1998
1997	California Severe Storms/flooding	Flood	Storms	97-01 1/2/1997-1/31/1997	DR-1155 1/4/1997
1995	California Severe Winter Storms, Flooding, Landslides, Mud Flows	Flood	Storms	95-03-N 95-04-S 3/12/1995-3/24/1995	DR-1046 3/12/1995
1995	California Severe Winter Storms, Flooding, Landslides, Mud Flows	Flood	Storms	95-01 1/09/1995-2/17/1995	DR-1044 1/10/1995
1986	California Severe Storms, Flooding	Flood	Storms	86-01 2/18/1986-3/12/1986	DR-758 2/21/1986
1982	Heavy Rain and Flooding	Flood	Storms	82-03 4/1/1982	–
1980	April Storms	Flood	Storms	80-01 4/1/1980	–
1977	California Drought	Drought	Drought	–	EM-3023 1/20/1977

Year	Disaster Name	Disaster Type	Disaster Cause	State Declaration # and Date	Federal Declaration # and Date
1976	1976 Drought	Drought	Drought	2/9/76, 2/13/76, 2/24/76, 3/26/76, 7/6/76	–
1969	California Severe Storms, Flooding	Flood	Storms	1/23/69, 1/25,69, 1/28/69, 1/29/69, 2/8/69, 2/10/69, 2/16/69, 3/12/69	DR-253 1/26/1969
1964	California Heavy Rains & Flooding	Flood	Storms	12/22/64, 12/23/64, 12/28/64, 1/5/65, 1/14/65	DR-183 12/24/1964
1964	Seismic Sea Wave	Other	Other	–	DR-169 4/1/1964
1963	Severe Storms, Heavy Rains and Flooding	Flood	Storms	2/7/63, 2/26/63, 2/29/63, 4/22/63	DR-145 2/25/1963
1962	Severe Storms and Flooding	Flood	Storms	–	DR-138 10/24/1962
1961	1961 Widespread Fires	Fire	Fire	9/8/1961	–
1959	1959 Heavy Rains	Flood	Storms	9/17/1959	–
1958	1958 April Storms and Floods	Flood	Storms	4/2/1958	DR-82 4/4/1958
1958	1958 February Storms and Floods	Flood	Storms	2/26/1958	–
1955	1955 Floods	Flood	Flood	12/22/1955	12/23/1955
1950	1950 Floods	Flood	Flood	50-01 11/21/1950	DR-15 2/15/1954

Source: Cal OES, FEMA. Retrieved March 2025.

Table 4-5 Amador County – Federal and State Disaster Declarations Summary 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	2	1976, 2015	1	1977

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Economic	1	2001	0	–
Fire	3	1961, 2015, 2021	2	2016, 2021
Flood	22	1950, 1955, 1958 (twice), 1959, 1963, 1964, 1969, 1980, 1982, 1986, 1995 (twice*), 1997, 2006 (twice*), 2017 (twice*), 2019*, 2021, 2023 (twice*)	20	1950, 1955, 1958, 1962, 1963, 1964, 1969, 1986, 1995 (twice*), 1997, 1998, 2006 (twice*), 2017 (twice*), 2019*, 2023 (three*)
Freeze	1	2007	0	
Hurricane	0	–	1	2005
Pandemic	2	2020 (twice)	2	2020 (twice)
Seismic Sea Wave (Tsunami)	0	–	1	1964
Totals	**31**	–	**27**	**–**

Source: Cal OES, FEMA. Retrieved March 2025.

Amador County Disasters since 2020 LHMP

- 2020 California Covid-19 Pandemic (2 state and 2 federal declarations)
- 2021 California Caldor Fire (state and federal declaration)
- 2021 December 2021 Storms (state declaration)
- 2023 California Severe Winter Storms, Flooding, Landslides, and Mudslides (2 state and 3 federal declarations)

4.2 Amador County Asset Inventory and Growth and Development Trends

As a starting point for analyzing the Amador County Planning Area's vulnerability to identified hazards, a variety of data was used to define a baseline against which all disaster impacts could be compared. If a catastrophic disaster was to occur in the Amador County Planning Area, this section describes significant lands, assets, and other resources at risk. This section is broken into two parts:

- **Asset Inventory** – The assets inventory identifies the Amador County Planning Area's and unincorporated Amador County's total assets, including the people and populations: structures; critical facilities and infrastructure, and community lifelines; natural, historic, and cultural resources; and economic assets and community activities of value. This data is not hazard specific, but is representative of total assets within the Amador County Planning Area and unincorporated Amador County, potentially at risk to identified hazards as discussed in Section 4.3 Hazard Profiles and Vulnerability Assessment.
- **Growth and Development Trends** – A discussion of growth and development trends in the Amador County Planning Area with a focus on unincorporated Amador County, both current and future, is presented.

Data Sources

- 2016 Amador County General Plan
- 2021-2029 Amador County Housing Element
- 2024 Amador County Parcel/Assessor Data
- 2016 Amador County General Plan Land Use Element
- Amador County GIS
- CalAtlas
- California Department of Conservation
- California Department of Finance
- California Department of Fish and Wildlife Service
- California Department of Parks and Recreation Office of Historic Preservation
- California Department of Water Resources (CA DWR) Special Populations and Disadvantaged Community Mapping
- California Environmental Protection Agency (Cal EPA) Disadvantaged Communities
- California Environmental Quality Act (CEQA)
- California Natural Diversity Database
- Center for Disease Control (CDC) Social Vulnerability Index
- Amador County Building Department and Planning Department
- Amador County GIS
- FEMA Community Disaster Resilience Zones
- FEMA National Risk Index
- Hazus-MH 6.1
- National Environmental Policy Act (NEPA)
- State of California Department of Conservation
- US Census Bureau

4.2.1. Assets Inventory

If a catastrophic disaster was to occur in the Amador County Planning Area, this section describes populations, structures, critical facilities and infrastructure, and other key assets and resources at risk that comprise the existing built environment. Assets inventoried in this baseline assessment include:

- People and Populations
- Structures
- Critical Facilities and Infrastructure,
- Community Lifelines
- Natural, Historic, and Cultural Resources
- Economic Assets and Community Activities of Value

Populations

Life safety is a priority issue for hazard mitigation planning. The people that work and recreate in the Amador County Planning Area, and those that live and work in surrounding communities are also potentially at risk during a natural hazard event.

The estimated population of Amador County (both incorporated communities and the unincorporated County) for January 1, 2025 was 39,563. Populations potentially at risk are described in the Table 4-6 based on California Department of Finance estimates. The most recent estimates are dated 1/1/2025, which are shown in the table below.

Table 4-6 Amador County Planning Area – Populations

Jurisdiction	Population
Amador City	196
Ione	9,037
Jackson	4,822
Plymouth	1,122
Sutter Creek	2,538
Unincorporated Amador County	21,848
Total	**39,563**

Source: Cal DOF E-1. 1/1/2025

Table 4-7 illustrates the pace of population growth in Amador County dating back to 1940. The data on population and housing growth shows that Amador County saw tremendous growth during the late 20th century. That growth slowed somewhat between 2000 and 2010, and the County has seen smaller population growth since 2010, with a slight decline in population since the 2020 LHMP. Details on population growth in the cities is included in their respective annexes to this LHMP Update.

Table 4-7 Amador County Planning Area – Population Growth 1940-2024

Year	Population	Percent Increase
1940	8,973	–
1950	9,151	2.0%
1960	9,990	9.2%
1970	11,821	18.3%
1980	19,500	54.0%
1990	30,039	16.8%
2000	35,100	8.3%
2010	38,011	8.3%
2020	40,474	6.5%
2025	39,563	-2.3%

Sources: 2021-2029 Amador County Housing Element Background Report, California Department of Finance, US Census Bureau

Vulnerable and Underserved Populations

Vulnerable populations include those who may be disproportionately affected by hazards or may need additional help or accommodation during a hazard event or disaster. The vulnerable and underserved populations discussion for the Amador County Planning Area is based on the following sources:

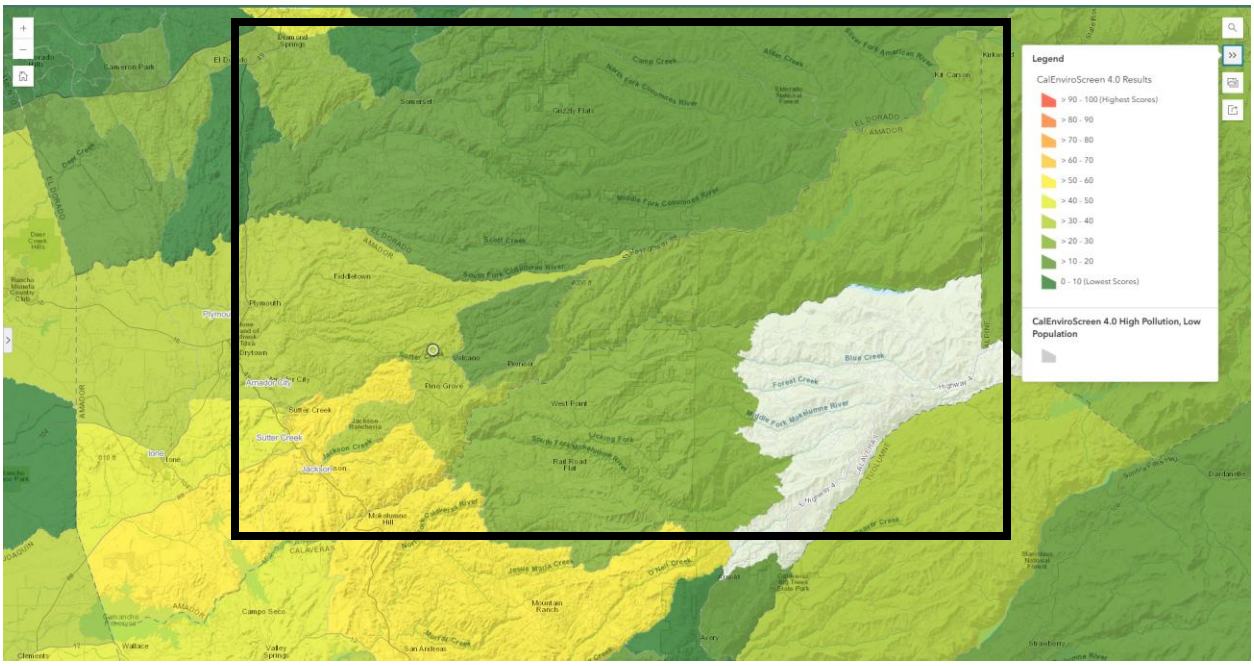
- California Environmental Protection Agency (Cal EPA) Disadvantaged Communities
- Center for Disease Control (CDC) Social Vulnerability Index
- California Department of Water Resources (CA DWR) Special Populations and Disadvantaged Community Mapping
- FEMA Community Disaster Resilience Zones
- FEMA National Risk Index
- Local Input

Note: These sources below show information for the Amador County Planning Area and unincorporated Amador County. Information on specific data for the incorporated jurisdictions can be found in their respective annexes to this Plan Update.

Cal EPA Disadvantaged Communities

Disadvantaged communities are defined by CalEPA as the top 25 percent of communities experiencing disproportionate amounts of pollution, environmental degradation, and socioeconomic and public health conditions according to the Office of Environmental Health Hazard Assessment's CalEnviroScreen tool. CalEPA is responsible for identifying disadvantaged communities for the purposes of the Cap-and-Trade funding program. This uses the CalEnviroScreen 4.0 Tool. Maps showing these areas in the Planning Area are shown on Figure 4-1.

Figure 4-1 Amador County Planning Area – Cal EPA Disadvantaged Communities

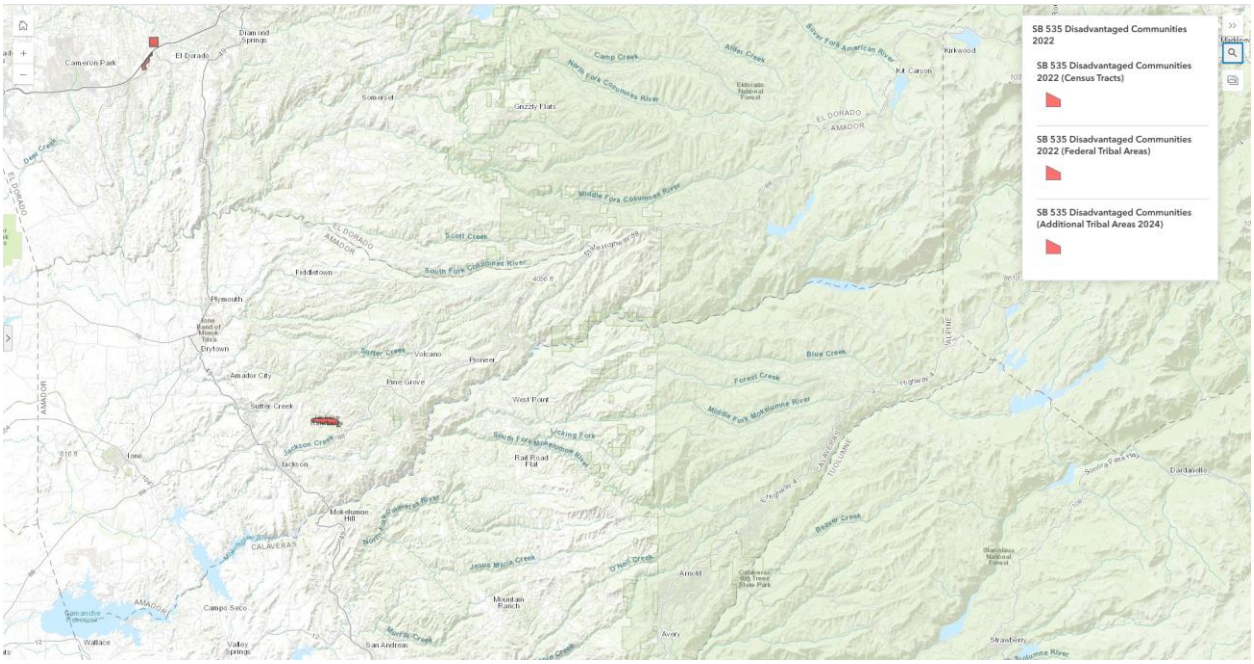


Source: Cal EPA, map retrieved 01/28/2025.

Cal EPA has another way to track disadvantaged communities. California Climate Investments are funds (Greenhouse Gas Reduction Fund and appropriated by the Legislature) from the proceeds of the State's Cap-and-Trade Program specifically targeted for investment in disadvantaged communities in California. These funds must be used for programs that further reduce emissions of greenhouse gases. Senate Bill 535

directed that at least a quarter of the proceeds go to projects that provide a benefit to disadvantaged communities and at least 10 percent of the funds go to projects located within those communities. Cal EPA has also mapped these communities. Those communities that fall inside this program in Amador County are shown on Figure 4-2. As shown, these areas are very limited in Amador County.

Figure 4-2 Amador County SB 535 Disadvantaged Communities (2022)



Source: Cal EPA, map retrieved 01/28/2025.

CDC Social Vulnerability Index

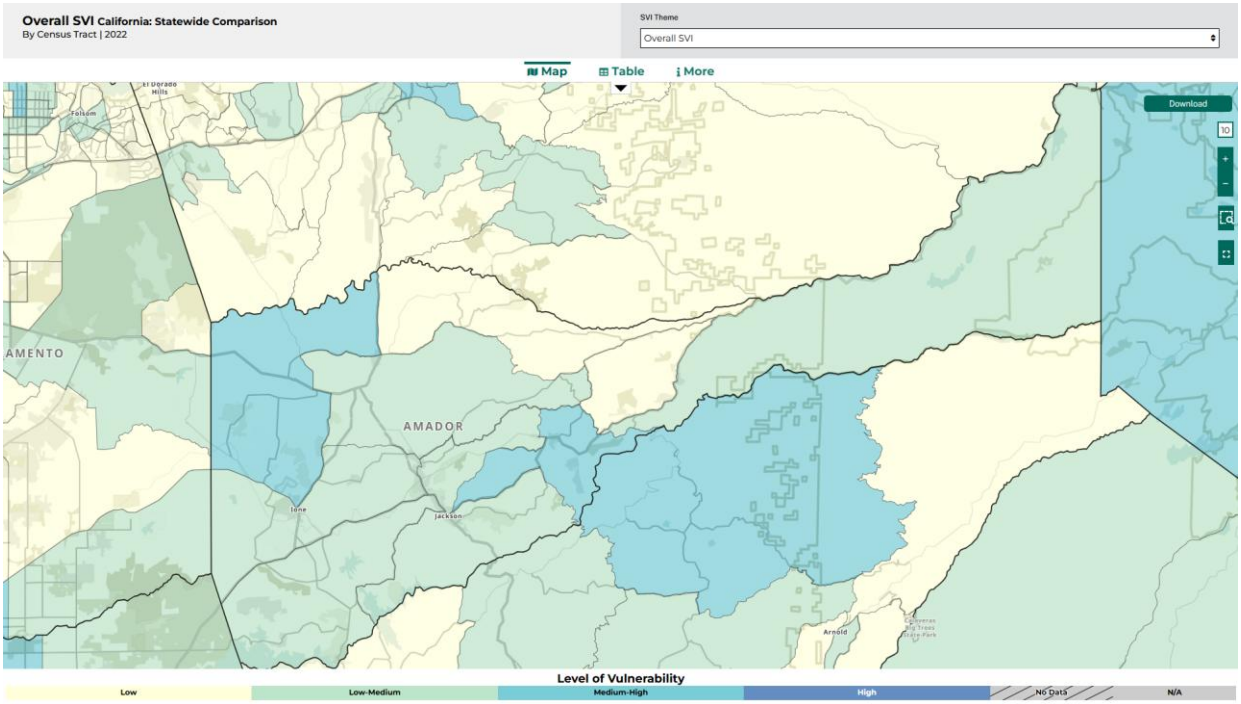
Every community must prepare for and respond to hazardous events, whether a natural disaster like a tornado or disease outbreak, or a human-made event such as a harmful chemical spill. A number of factors, including poverty, lack of access to transportation, and crowded housing may weaken a community's ability to prevent human suffering and financial loss in a disaster. These factors are known as social vulnerability.

Social vulnerability refers to the potential negative effects on communities caused by external stresses on human health. Such stresses include natural or human-caused disasters, or disease outbreaks. Reducing social vulnerability can decrease both human suffering and economic loss. CDC Social Vulnerability Index (CDC SVI) uses 15 U.S. census variables to help local officials identify communities that may need support before, during, or after disasters.

The Agency for Toxic Substances and Disease Registry's (ATSDR) Geospatial Research, Analysis & Services Program (GRASP) created databases to help emergency response planners and public health officials identify and map communities that will most likely need support before, during, and after a hazardous event. CDC SVI uses U.S. Census data to determine the social vulnerability of every census tract. Census tracts are subdivisions of counties for which the Census collects statistical data. The CDC SVI ranks each tract on 15 social factors, including poverty, lack of vehicle access, and crowded housing, and groups them into four related themes. Each tract receives a separate ranking for each of the four themes,

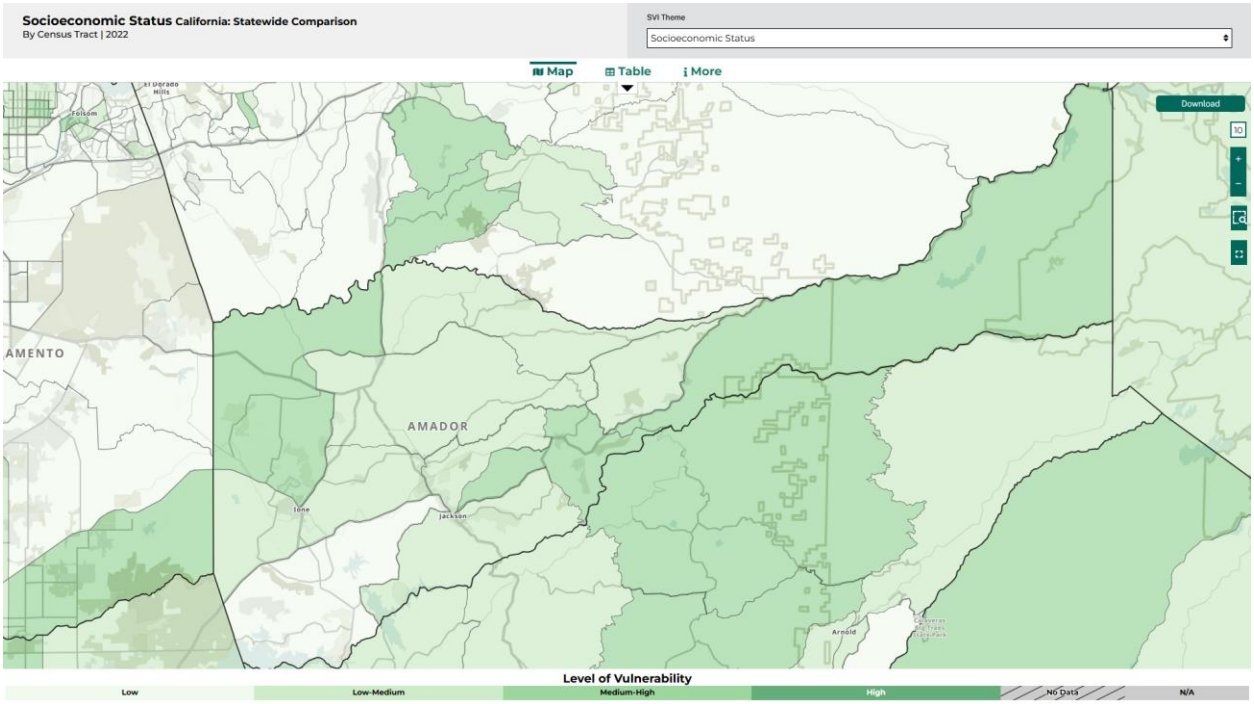
as well as an overall ranking. Maps of the four themes are shown in the Amador County Planning Area below. The overall SVI map is shown in Figure 4-3; the socioeconomic SVI for the Planning Area is shown in Figure 4-4; the household composition SVI is shown in Figure 4-5; the minority and language SVI is shown in Figure 4-6; and the housing and transportation SVI is shown in Figure 4-7. As shown on all of these maps, the County shows only minor changes across the County in social vulnerability.

Figure 4-3 Amador County Planning Area – Overall Social Vulnerability



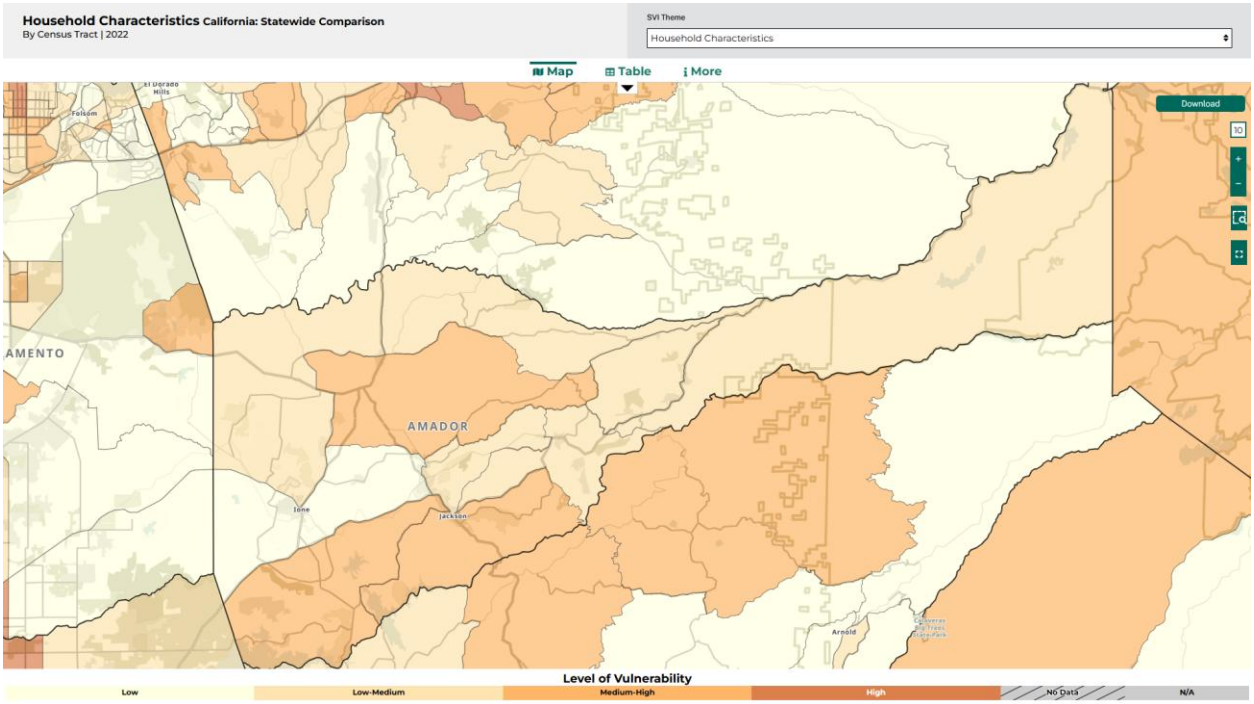
Source: CDC Social Vulnerability Index – map retrieved 12/16/2024.
Level of Vulnerability Rating: **Yellow** – Low; **Green** – Low/Medium; **Aqua** – Medium/High; **Blue** – High; **Grey Hatched** – No Data; **Grey** – Not Available

Figure 4-4 Amador County Planning Area – Socioeconomic Status Vulnerability



Source: CDC Social Vulnerability Index – map retrieved 12/16/2024.
Level of Vulnerability Rating: **Faint Green** – Low; **Light Green** – Low/Medium; **Green** – Medium/High; **Dark Green** – High; **Grey Hatched** – No Data; **Grey** – Not Available

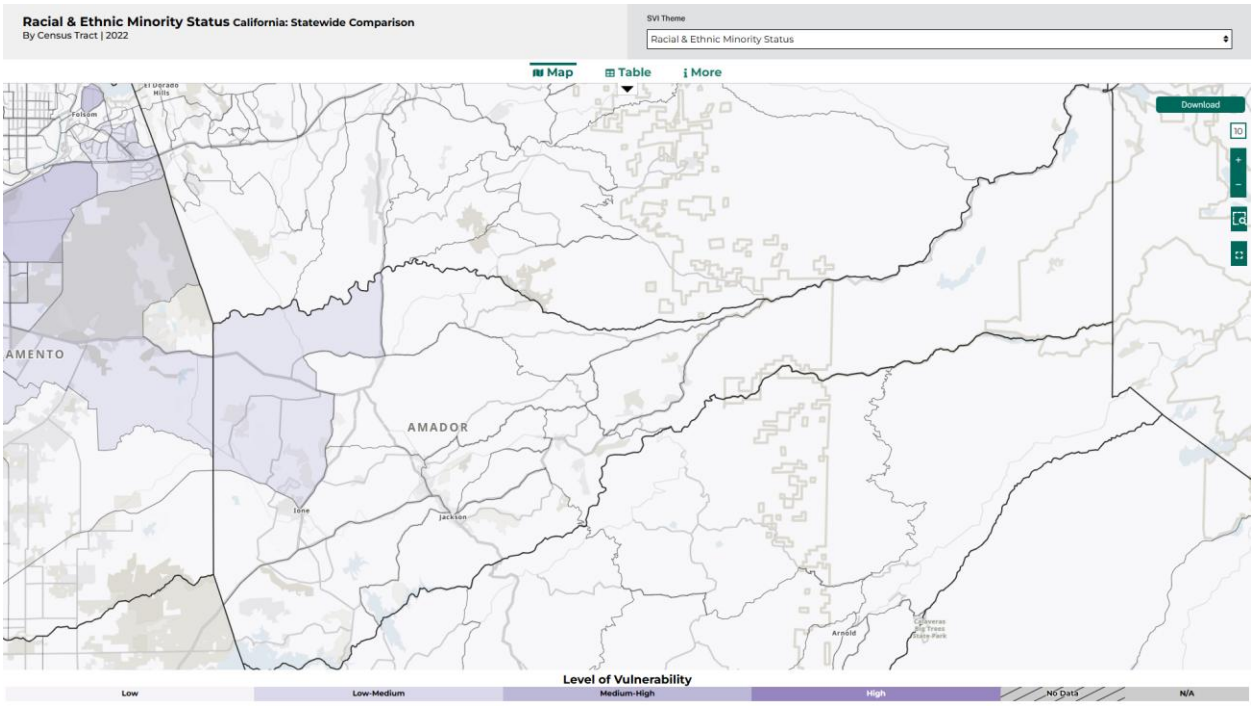
Figure 4-5 Amador County Planning Area – Household Composition and Disabilities Social Vulnerability



Source: CDC Social Vulnerability Index – map retrieved 12/16/2024.

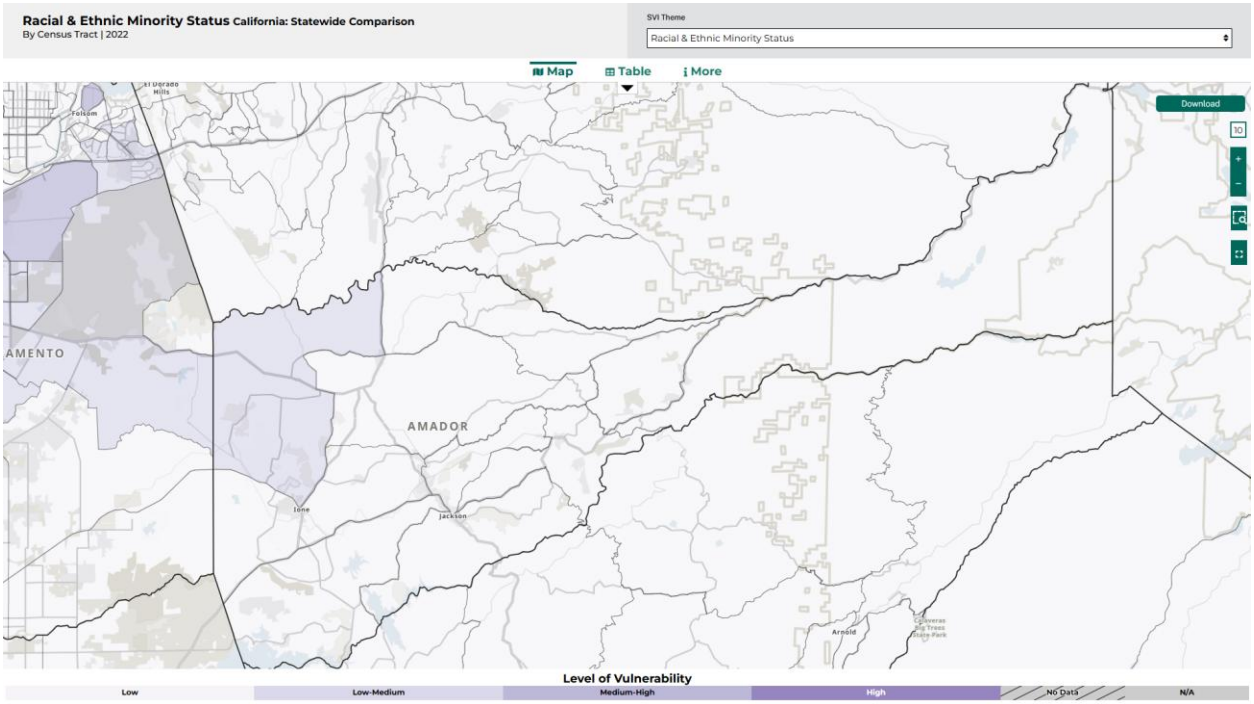
Level of Vulnerability Rating: **Faint Orange** – Low; **Light Orange**– Low/Medium; **Orange** – Medium/High; **Dark Orange** – High; **Grey Hatched** – No Data; **Grey** – Not Available

Figure 4-6 Amador County Planning Area – Minority/Language Social Vulnerability



Source: CDC Social Vulnerability Index – map retrieved 12/16/2024.
Level of Vulnerability Rating: **Faint Purple** – Low; **Light Purple** – Low/Medium; **Purple** – Medium/High; **Dark Purple** – High; **Grey Hatched** – No Data; **Grey** – Not Available

Figure 4-7 Amador County Planning Area – Housing/Transportation Social Vulnerability



Source: CDC Social Vulnerability Index – map retrieved 12/16/2024.
Level of Vulnerability Rating: **Faint Blue** – Low; **Light Blue** – Low/Medium; **Blue** – Medium/High; **Dark Blue** – High; **Grey Hatched** – No Data; **Grey** – Not Available

California DWR Disadvantaged Community Mapping Tool

The State of California's Proposition 1 Disadvantaged Community (DAC) Involvement Program is designated to ensure the involvement of DACs as well as Economically Distressed Areas and Underrepresented Communities, which DWR collectively refers to as DACs. The Cal DWR definition for a Disadvantaged Community is a community with an annual median household income (MHI) that is less than 80% of the Statewide annual MHI (PRC Section 75005(g)), and those census geographies with an annual MHI less than 60% of the Statewide annual MHI are considered "Severely Disadvantaged Communities". Those areas in the Planning Area considered disadvantaged are shown in Figure 4-8.

Figure 4-8 Amador County Planning Area – Disadvantaged Areas

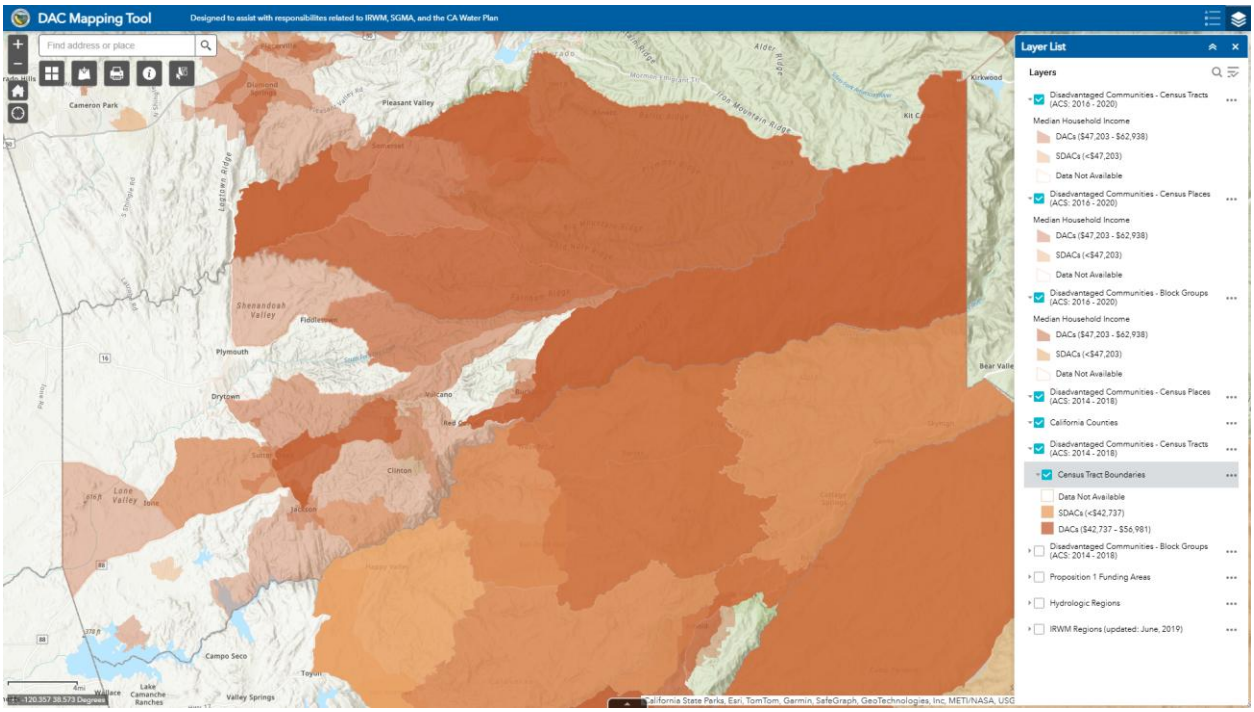
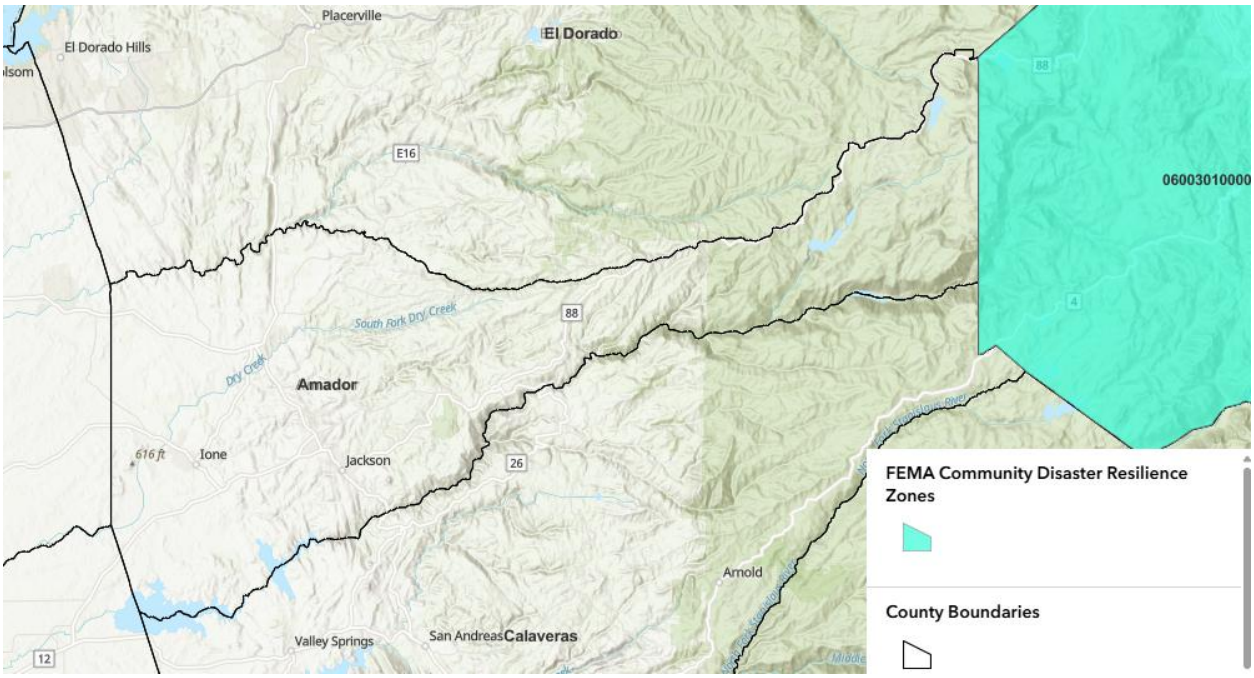

DAC Mapping Tool
Designed to assist with responsibilities related to IRWM, SGMA, and the CA Water Plan
Find address or place
Layer List
Layers
Disadvantaged Communities - Census Tracts (ACS: 2016 - 2020)
Median Household Income
DACs ($47,203 - $62,938)
SDACs (<$47,203)
Data Not Available
Disadvantaged Communities - Census Places (ACS: 2016 - 2020)
Median Household Income
DACs ($47,203 - $62,938)
SDACs (<$47,203)
Data Not Available
Disadvantaged Communities - Block Groups (ACS: 2016 - 2020)
Median Household Income
DACs ($47,203 - $62,938)
SDACs (<$47,203)
Data Not Available
Disadvantaged Communities - Census Places (ACS: 2014 - 2018)
California Counties
Disadvantaged Communities - Census Tracts (ACS: 2014 - 2018)
Census Tract Boundaries
Data Not Available
SDACs (<$42,737)
DACs ($42,737 - $56,981)
Disadvantaged Communities - Block Groups (ACS: 2014 - 2018)
Proposition 1 Funding Areas
Hydrologic Regions
IRWM Regions (updated: June, 2019)
Cameron Park
Pleasant Valley
Shenandoah Valley
Fiddletown
Plymouth
Drytown
Volcano
Clinton
Jackson
Lane Valley
Campo Seco
Valley Springs
Lake Camanche Ranches
Wallace
Kirkwood
Bear Valley
Eastern Ridge
Alder Ridge
Iron Mountain Ridge
Red Corral Ridge
Sutter Creek
Pine Grove
Mokelumne Hill
Jackson Valley
Rancho Arroyo
Rancho Seco
Teyon
Sloughhouse
Latrobe
Somerset
Diamond Springs
Kit Carson
Mormon Emigrant Trail
Shingle Rd
Latrobe Rd

Figure 4-9 Amador County Planning Area – FEMA Community Disaster Resilience Zones



Source: FEMA. Map retrieved 1/29/2025.

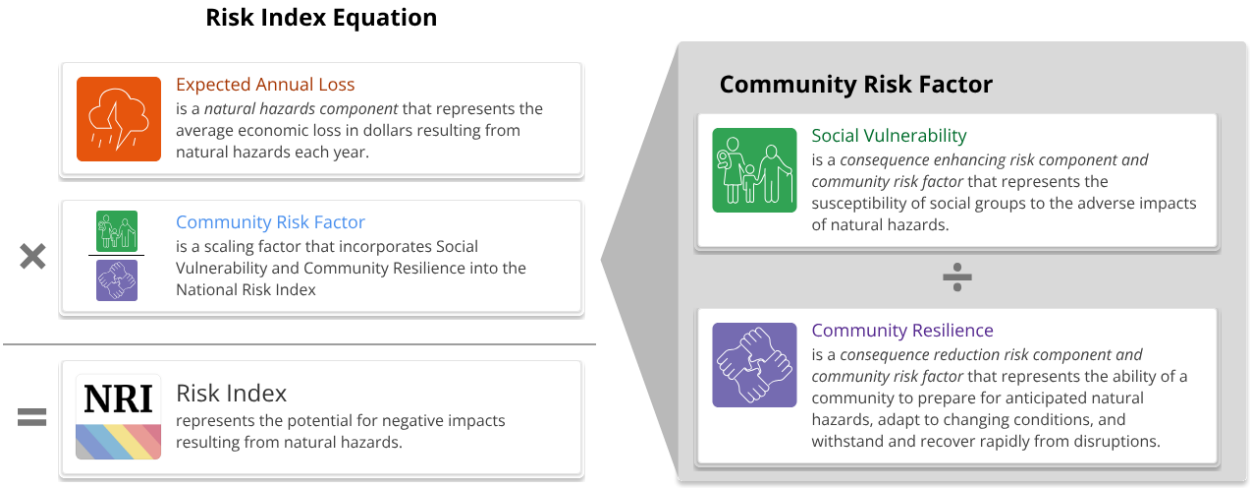
FEMA National Risk Index

Beginning in 2016, FEMA's Natural Hazards Risk Assessment Program (NHRAP) started work on the National Risk Index by adopting an established vision for a multi-hazard view of risk that combines the likelihood and consequence of natural hazards with social factors and resilience capabilities. The goal was to take a broad, holistic view and create a nationwide baseline of natural hazard risk.

A community's susceptibility to natural hazards varies from location to location. The National Risk Index is a dataset and online tool to help illustrate the United States communities most at risk for 18 natural hazards. It was designed and built by FEMA in close collaboration with various stakeholders and partners in academia; local, state, and federal government; and private industry. In the National Risk Index, risk is defined as the potential for negative impacts as a result of a natural hazard.

The risk equation behind the Risk Index includes three components (see Figure 4-10): a natural hazards component (Expected Annual Loss), a consequence enhancing component (Social Vulnerability), and a consequence reduction component (Community Resilience).

Figure 4-10 National Risk Index Equation



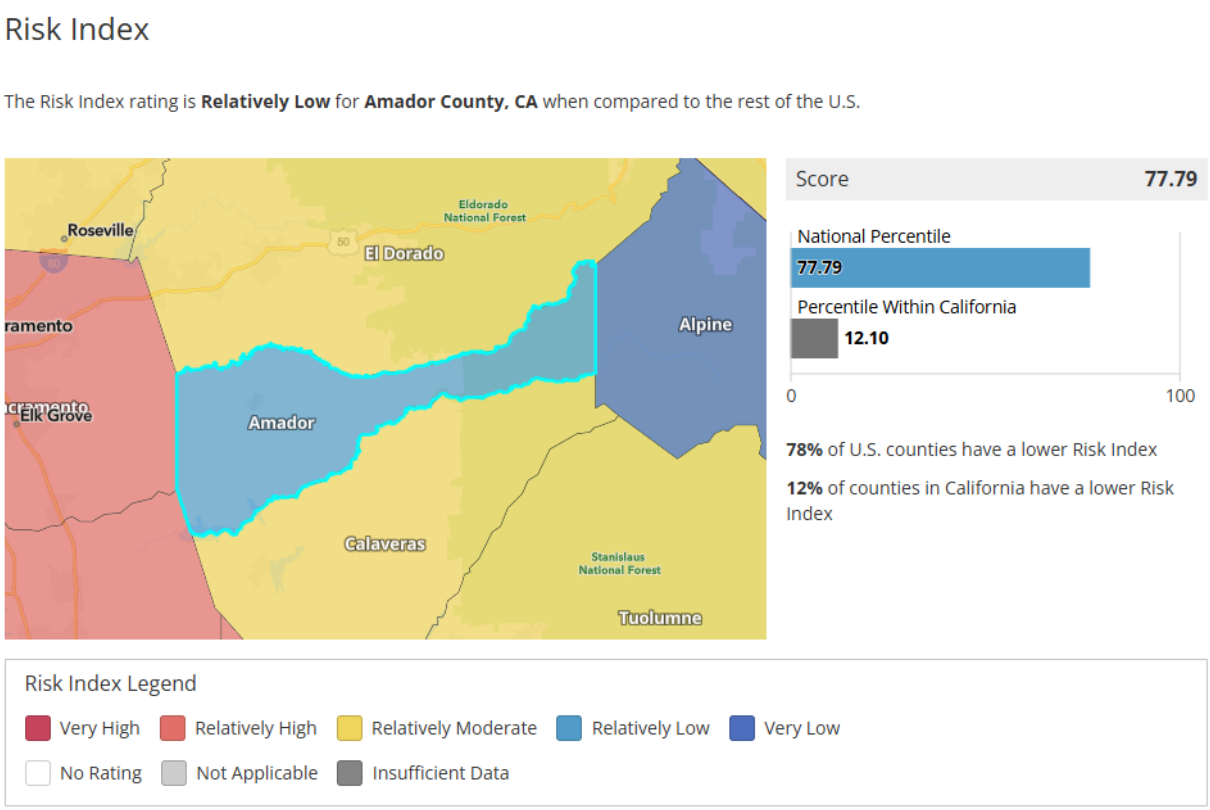
Source: FEMA National Risk Index

Using these three components, composite Risk Index values and hazard type Risk Index values are calculated for each community (county and Census tract) included in the Index. Risk Index values form an absolute basis for measuring Risk within the National Risk Index, and they are used to generate Risk Index percentiles and ratings across communities.

Data from the National Risk Index for the Amador County Planning Area is seen below. Figure 4-11 shows a summary map and score for the County. As shown, Amador County's Risk Index rating is Relatively Low. Figure 4-12 shows the expected annual loss map and score. As shown, Amador County's expected annual loss rating is Relatively Low. Figure 4-13 shows the social vulnerability map and score. As shown, Amador County has a Relatively Moderate social vulnerability. Figure 4-14 shows the community resilience map and score. As shown, communities in Amador County have a Relatively Moderate ability to prepare for anticipated natural hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions.

The Amador County FEMA National Risk Index Report is included in its entirety in Appendix G.

Figure 4-11 FEMA National Risk Index – Summary Map and Score for Amador County

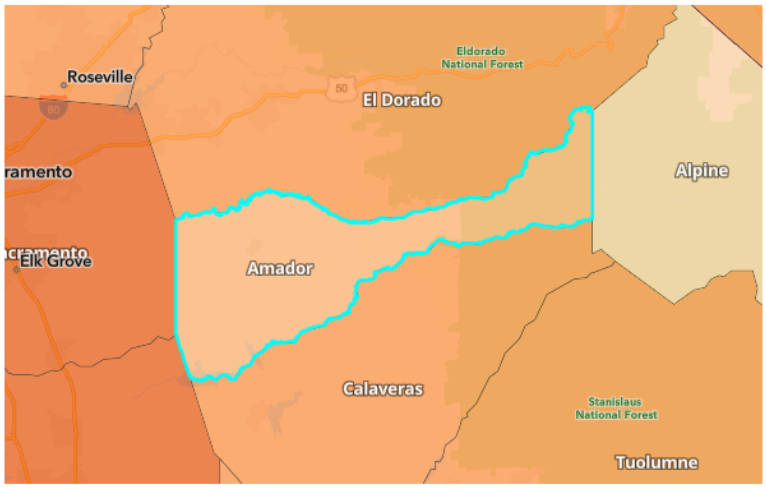


Source: FEMA National Risk Index, retrieved 01/09/2025.

Figure 4-12 FEMA National Risk Index – Expected Annual Loss Map and Score for Amador County

Expected Annual Loss

In **Amador County, CA**, expected loss each year due to natural hazards is **Relatively Low** when compared to the rest of the U.S.



Score **78.06**

National Percentile
78.06

Percentile Within California
17.20

0 100

78% of U.S. counties have a lower Expected Annual Loss

17% of counties in California have a lower Expected Annual Loss

Expected Annual Loss Legend

Very High | Relatively High | Relatively Moderate | Relatively Low | Very Low

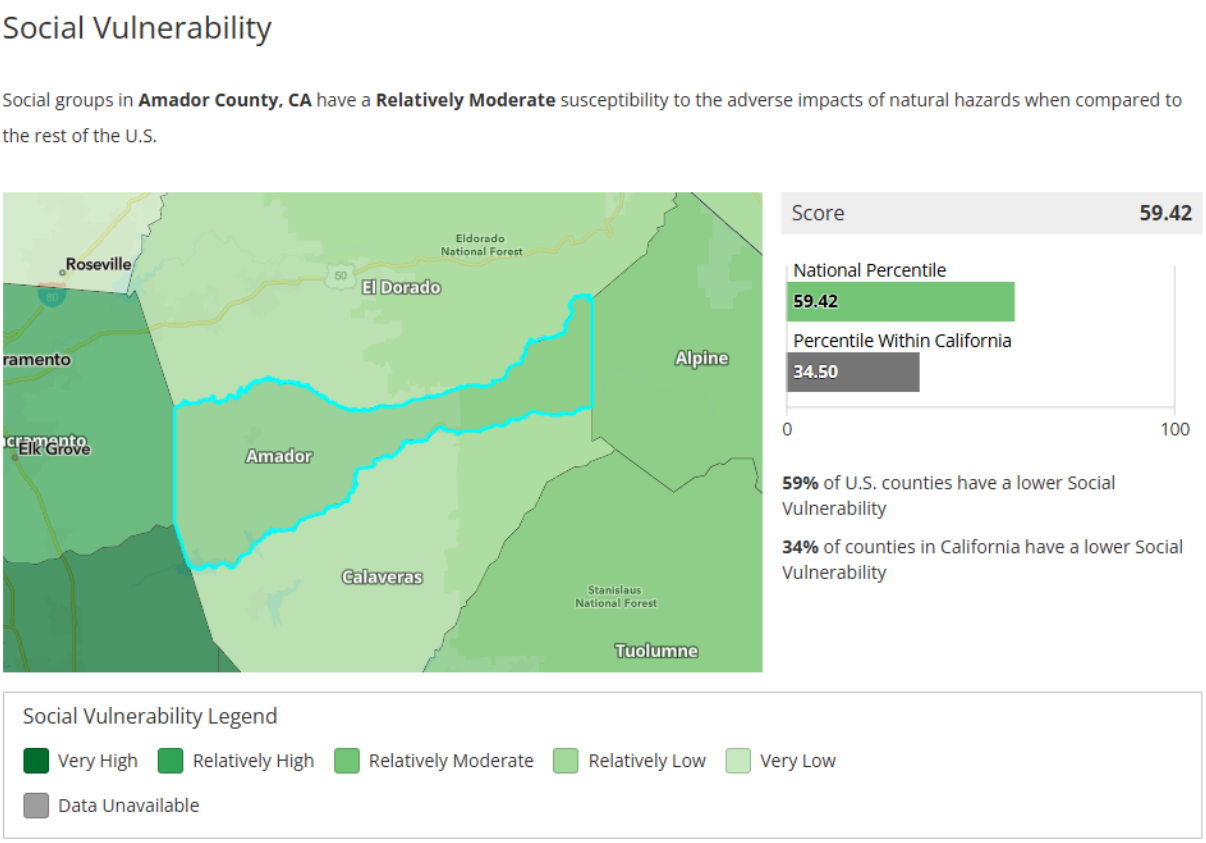
No Expected Annual Losses | Not Applicable | Insufficient Data

Composite Expected Annual Loss	**$16,309,058.75**
Composite Expected Annual Loss Rate National Percentile	**81**

Building EAL	**$8,622,287.36**	Population EAL	**0.20** fatalities
Building EAL Rate	**$1 per $942.43 of building value**	Population EAL Rate	**1 per 203.42K people**
Agriculture EAL	**$5,381,404.03**	Population Equivalence EAL	**$2,305,367.36**
Agriculture EAL Rate	**$1 per $6.61 of agriculture value**		

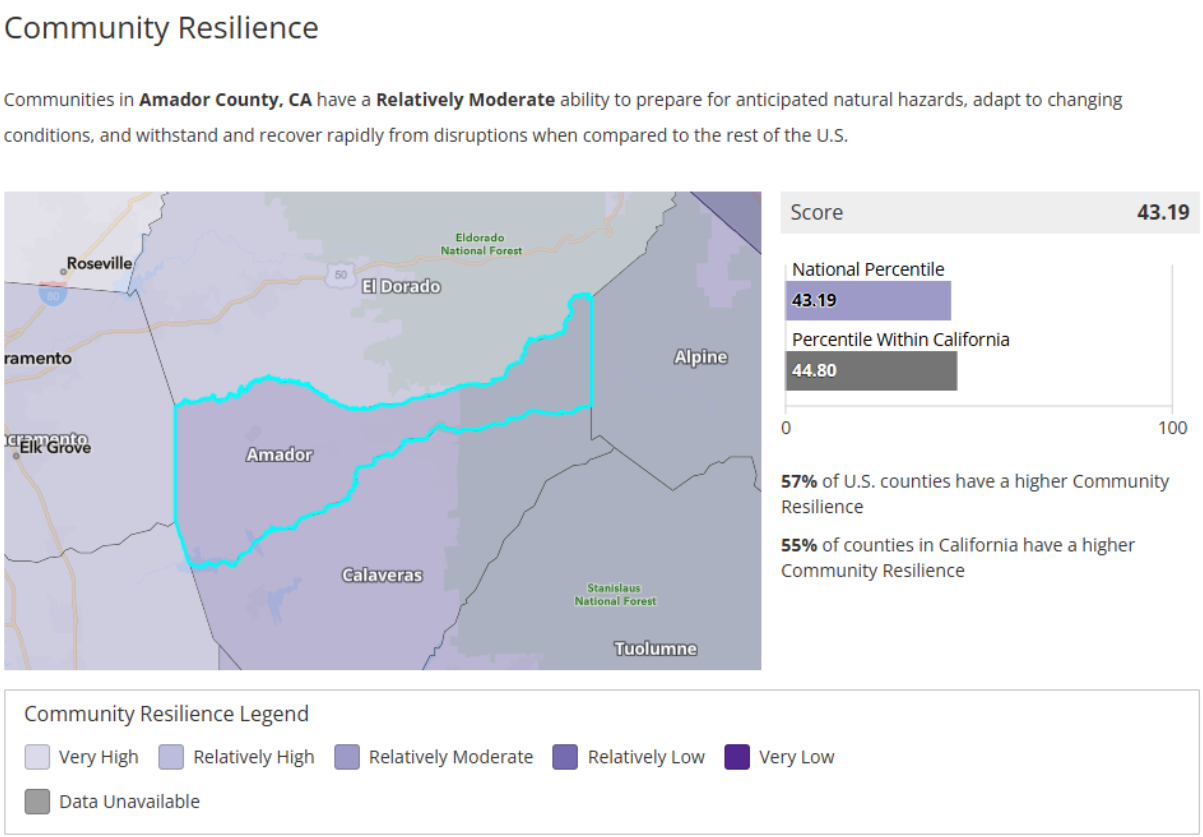
Source: FEMA National Risk Index, retrieved 01/09/2025.

Figure 4-13 FEMA National Risk Index – Social Vulnerability Map and Score for Amador County



Source: FEMA National Risk Index, retrieved 01/09/2025

Figure 4-14 FEMA National Risk Index – Community Resilience Map and Score for Amador County



Source: FEMA National Risk Index, retrieved 01/09/2025.

Local Input

The County noted that there is a somewhat sizable homeless population in Amador County. This causes issues with fire and pandemic as well as with other hazards. Additionally, there are limited transportation services for elderly and other vulnerable populations in rural areas for evacuations and other hazard response needs. There is a migrant population that arrives for summer. Many of these are Spanish speakers, which can also create challenges during hazard events and any necessary evacuations. The County Social Services Director provided information on vulnerable and underserved populations in the County. These can be seen in Table 4-8.

Table 4-8 Amador County Planning Area – Vulnerable and Underserved Population Vulnerabilities and Data

Population	Vulnerabilities	Data/Comments
Foster youth	Dependents of the court who Amador County is responsible for; mental health needs; placement instability; Other counties place foster youth in Amador County but Amador County DSS is unaware of who they are and where they are placed.	Amador County DSS typically has 45-50 children in out of home placement.
In Home Supportive Services recipients	Limited mobility; medical equipment; communication barriers; at risk of out of home care	Amador County has approximately 520 IHSS recipients.
Elderly	Limited mobility, isolated, communication barriers	Per July 2023 census data, approx. 28.1% of Amador County's population identified as 65 years old or older. Higher than the state average.
Adult Protective Services clients	Victims of abuse/neglect; elderly and dependent adults; limited mobility; medical equipment; communication barriers	Amador DSS receives approx. 35-40 reports of elder/dependent adult abuse/neglect each month.
Homeless	Communication barriers; limited alternative resources; isolated; challenge to locate	Although a smaller portion of the population, the homeless face challenges due to a lack of stable shelter options and limited access to emergency services. This makes them particularly vulnerable during extreme weather events or other disasters
People with disabilities	Mobility challenges; cognitive impairments; hearing or vision impaired; communication barriers	May need specialized support during emergencies. In events like prolonged power outages, accessible evacuation routes and shelters are essential.
Non-English speaking	Communication barriers	According to the American Community Survey, 3.4% of Amador County residents speak English less than "very well." The largest demographic of this 3.4% are the 2.2% of Amador County residents who primarily speak Spanish, but speak English less than "very well." California recently passed AB 1638 which requires local governments to provide emergency information in all languages spoken by 5% or more of the population that speak English less than "very well." Although Amador County, as mentioned above, does not meet this threshold, we (using the Amador County Emergency Alerts system) distribute these emergency notifications in English and in Spanish.

Source: Amador County Social Services

Additionally, Amador County Public Health noted that Vulnerable populations face several hazard-related concerns that can significantly impact their health and well-being.

In Amador County, CA, vulnerable populations include:

- Low-Income Families: Economic challenges can limit access to healthcare, healthy food, and other resources.
- Elderly Population: Older adults may have mobility issues and chronic health conditions that require frequent medical attention.
- Children and Adolescents: Young people may lack access to preventive care, mental health services, and educational resources.
- Ethnic and Racial Minorities: Minority populations may experience disparities in healthcare access and outcomes due to language barriers, cultural differences, and systemic racism.
- Individuals with Disabilities: Those with disabilities may face additional barriers to accessing healthcare and other essential services.

The ways they can be impacted include:

- Limited Access to Healthcare: Economic and social barriers can limit access to healthcare in our rural setting, making it difficult for vulnerable populations to receive timely medical treatment and preventive care.
- Displacement and Homelessness: Natural disasters, economic instability, and other factors can lead to displacement and homelessness, which exacerbate health risks and reduce access to essential services in our rural county.
- Mental Health Issues: The stress and trauma from experiencing hazards, displacement, and economic hardship can lead to mental health issues such as anxiety, depression, and PTSD.
- Social Isolation: Elderly individuals and those with disabilities may experience social isolation, which can negatively impact their mental and physical health.
- Lack of Emergency Preparedness: Limited resources and information can hinder the ability of vulnerable populations to prepare for and respond to emergencies, increasing their risk during disasters.

Housing Element Special Populations

The County Planning Team noted that the Amador County 2021-2029 Housing Element discusses special populations in the County. Households with special housing needs often have greater difficulty in finding decent and affordable housing. As a result, these households may experience a higher prevalence of overpaying, overcrowding, and other housing problems. These are discussed below.

Seniors

The number of households with a head of household who is 65 years or older in 2019 increased by about 33.6% or 1,538 households when compared to 2010. The overall population in Amador County increased by approximately 0.3% between 2010 and 2019 with the number of 65+ persons increasing by 38.5%. The continuing growth of 65+ persons in the County indicates a need to provide more services for this segment of the community.

Many of the senior households owned their own homes, with 5,333 households with a householder 65 years of age or older living in owner-occupied units; only 777 of these households lived in rental housing. The 2015-2019 ACS data indicates that 148 or 1.5% of seniors 65 and older live below the poverty level in Amador County. Because seniors tend to live on fixed incomes dictated by Social Security and other retirement benefits, those who do not own their homes are significantly affected by rising housing costs. Also, while some seniors may prefer to live in single-family detached homes, others may desire smaller, more affordable homes with less upkeep, such as condominiums, townhouses, apartments, or mobile homes. According to the DOF E-5 Report, in 2021 about 82.0% of Amador County's housing stock was made up of single-family detached homes, leaving 19.0% of the housing stock for those who choose to or must live in other forms of housing.

Disabled Citizens

A "disability" includes, but is not limited to, any physical or mental disability as defined in California Government Code Section 12926. Physical, mental, and/or developmental disabilities could prevent a person from working, restrict a person's mobility or make caring for oneself difficult. Therefore, disabled persons often require special housing needs related to potential limited earning capacity, the lack of accessible and affordable housing, and higher health costs associated with disabilities. Amador County has 2,550 residents that are defined as disabled according to the ACS Census Data.

The number of people employed with a disability increased by 6.0% from 800 people in 2015 to 848 people in 2019. Additionally, the number of unemployed with disabilities also increased by 3.8% from 290 people in 2015 to 301 in 2019. Similarly, the number of people with a disability not in the labor force increased by about 16.8% from 1,460 persons in 2015 to 1,706 persons in 2019.

A developmental disability is a disability which originates before an individual attains age 18, continues or can be expected to continue indefinitely, and constitutes a substantial handicap for the individual. This term includes the diagnoses of intellectual disability, cerebral palsy, epilepsy, and autism. This term also includes handicapping conditions found to be closely related to mental retardation or requiring treatment similar to that required for persons with an intellectual disability, but does not include other handicapping conditions that are solely physical in nature. While the US Census does not identify the subpopulation that has a developmental disability, the Valley Mountain Regional Center is responsible for serving this population group in 5 counties, including Amador. The data is reported by zip code, and thus is an approximate estimate of the total of >249 in 2021.

Large Family Households

In unincorporated Amador County, 1,006 households have five or more persons. On average, most of these large family households own their homes according to the Census, however, large households that rent have a disproportionate rate of housing problems including overcrowding, units lacking complete kitchen facilities, and units lacking complete plumbing facilities. In many cases, housing units of this size constitute a small portion of the total housing supply, forcing families to continue to live in what may be considered as overcrowded units. There is a need County wide for larger, affordable housing for these larger households.

Female-Headed Households

While the majority of households in the County are either married couple or single person households, 11.3 percent of family households are headed by a single female. These households are homes with children under the age of 18 at home and don't include single male headed households. These households generally have a higher ratio between their income and their living expenses. Therefore, finding affordable, decent, and safe housing is often more difficult for female-headed households. Additionally, female-headed households have special needs involving access to daycare or childcare, health care and other supportive services. With over 6,331 households in unincorporated areas of Amador County, there are 575 households with female heads, making up approximately 9.1% of households in unincorporated areas of Amador County. In 2019, about 27.5% of female-headed families in Amador County had incomes below the poverty line while families in poverty made up only 11.5% of all households in Amador County.

Farmworkers

Amador County is situated in the California Shenandoah Valley in Sierra Nevada Mountains of California. The Shenandoah Valley is one of the principal viticultural regions of California. Agricultural workers play an important role in the region's wine industry. Estimating the size of the agricultural labor force can be problematic as farmworkers are historically undercounted by the census and other data sources. For instance, the U.S. Census Bureau does not track farm labor separate from mining, fishing and hunting, and forestry, nor does the U.S. Census Bureau provide definitions that address the specific nuances of farm labor (e.g., field laborers versus workers in processing plants), length of employment (e.g., permanent or seasonal), or place of work (e.g., the location of the business versus agricultural field).

Although agriculture is an important part of Amador County economy, based on 2015-2019 ACS data, with over 13,665 residents employed in Amador County, only 702 persons (2.1% of Amador County residents) were estimated to be in the agriculture, forestry, fishing, hunting, and mining industry.

Homeless Persons

Homeless individuals and families have perhaps the most immediate housing need of any group. They also have one of the most difficult sets of housing needs to meet, due to both the diversity and complexity of the factors that lead to homelessness, and to community opposition to the siting of facilities that serve homeless clients. Similar to every other community in California, Amador County has a portion of its population experiencing homelessness. Every two years, there is a Point in Time count (PIT) of those who are homeless on a selected day in January. The counts derived from this effort not only establish funding thresholds for federal and state funds, but they also provide a snapshot of who is experiencing homelessness in each community.

The 2022 PIT count was able to count 184 persons in total. Traditionally, the PIT count is considered to likely undercount the number of people who are homeless, since it relies on volunteers canvassing communities to find individuals who are willing to participate in the survey on that one day. Therefore, the number of homeless in Amador County may be somewhat higher than shown. In addition to people and households that are homeless, there are also households at risk of becoming homeless due to various circumstances. The need for one-bedroom affordable units for single individuals will contribute significantly to long-term solutions.

Structures

Structures include buildings used for a variety of purposes and reflect the Amador County Planning Area's existing built environment. Depending on the nature and extent of a hazard event or disaster, all structures may be exposed to some level of risk, where certain buildings or concentrations of buildings are more vulnerable. This section captures the structures, and associated land and contents values, which comprise the Amador County Planning Area's and unincorporated Amador County's existing built environment.

Parcel and Structure Inventory and Assessed Values

An inventory of structures located within the Amador County Planning Area and unincorporated County was developed utilizing data from the Amador County Assessor's Office. It is based on the 2024 Assessor's data/Parcel layer provided by Amador County GIS. This data represents best available data.

While conducting an inventory of structure assets within the Amador County Planning Area is a key element of this asset inventory, understanding the total assessed value of structures and built environment is a starting point to understanding the overall value of identified assets in the Planning Area. When the total assessed values are combined with potential values associated with other community assets such as area populations, public and private critical infrastructure, historic and cultural resources, and natural resources, and other identified assets, the big picture emerges as to what is potentially at risk and vulnerable to the damaging effects of natural hazards within the Amador County Planning Area.

Methodology

The 2024 Amador County Assessor's data and County Parcel layer was utilized as the basis for the inventory of assessed values for both improved and unimproved parcels within the Amador County Planning Area. This data provides the land and improved values assessed for each parcel, along with key information such as property use. Other GIS data, such as jurisdictional boundaries, roads, streams, and area features, was also obtained from Amador County and CalAtlas to support mapping and analysis of the existing built environment.

Data Limitations & Notations

Although based on best available data, the resulting information should only be used as an initial guide to overall values in the Amador County Planning Area. In the event of a disaster, structures and other infrastructure improvements are at the greatest risk of damage. Depending on the type of hazard and resulting damages, the land itself may not suffer a significant loss. For that reason, the values of structures and other improvements are of greatest concern. Also, it is critical to note a specific limitation to the assessed values data within the Amador County Planning Area, created by Proposition 13. Instead of adjusting property values annually, no adjustments are made until a property transfer occurs. As a result, overall property value information is likely significantly low and does not reflect current market, replacement, or true potential loss values for properties within the Amador County Planning Area.

Another limitation to this data is found in the Williamson Act, also known as the California Land Conservation Act of 1965, that enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. When the

County enters into a contract with the landowners under the Williamson Act, the landowner agrees to limit the use of the land to agriculture and compatible uses for a period of at least ten years and the County agrees to tax the land at a rate based on the agricultural production of the land rather than its real estate market value. This further affects the County's overall values for assessed taxable lands and structures.

Property Use Categories

The Amador County Planning Area Assessor data included property use categories which provides detailed descriptive information about how each property is generally used, such as residential, commercial, or industrial. The property use codes were refined and categorized into the following property use categories and linked back to the Assessor data. The final property use categories for the Amador County Planning Area include:

- Agricultural
- Commercial
- Industrial
- Miscellaneous
- Residential

Once property uses were grouped into categories, the number of total and improved parcels and land and improved values were inventoried for the Amador County Planning Area by property use.

Estimated Content Replacement Values

The Amador County Planning Area assigned property use categories were used to develop estimated content replacement values (CRVs) that are potentially at loss from hazards. FEMA's standard CRV factors, derived from Hazus, were utilized to develop more accurate loss estimates for the total assets inventory and for all mapped hazard analyses. FEMA's CRV factors estimate content values as a percent of improved structure value by property use. Table 4-9 shows the breakdown of the different property uses in the Amador County Planning Area and their estimated CRV factors.

Table 4-9 Amador County Planning Area – Content Replacement Factors by Property use

Amador County Property Use Categories	Hazus Property Use Categories	Hazus Content Replacement Values
Agricultural	Agricultural	100%
Commercial	Commercial	100%
Industrial	Industrial	150%
Miscellaneous	Miscellaneous	0%
Residential	Residential	50%
Unknown	–	0%

Source: Hazus 6.1

Parcel and Structure Asset Inventory with Values Results

Values associated with land and improved structures were identified and summed in order to determine assessed values at risk in the Amador County Planning Area. Together, the land and improved structure values make up the majority of assessed values associated with each identified parcel or asset. Improved parcel counts were based on the assumption that a parcel was improved if a structure value was present. Content replacement values were then added to the assessed values, as described below, to provide an estimate of land and structure values at risk in the Planning Area.

Table 4-10 shows the total values or exposure for the entire Amador County Planning Area broken out by jurisdiction. The values for unincorporated Amador County are broken out by property use category and are provided in Table 4-11. More information on parcels and structures at risk for each jurisdiction can be found in their respective annexes.

Table 4-10 Amador County Planning Area – Total Parcels and Structures by Jurisdiction

Jurisdiction	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Amador City	180	111	$19,124,377	$21,078,306	$12,365,357	$52,568,040
Ione	2,205	1,976	$223,741,829	$496,467,157	$258,084,980	$978,293,966
Jackson	2,124	1,756	$201,851,988	$567,874,739	$380,312,415	$1,150,039,142
Plymouth	625	488	$85,143,363	$118,367,406	$69,262,141	$272,772,910
Sutter Creek	1,434	1,160	$133,675,205	$331,339,861	$197,619,665	$662,634,731
Unincorporated Amador County	17,828	12,434	$1,687,406,507	$3,026,753,541	$1,764,724,121	$6,478,884,169
Grand Total	**24,396**	**17,925**	**$2,350,943,269**	**$4,561,881,010**	**$2,682,368,677**	**$9,595,192,956**

Source: 2024 Amador County Parcel/Assessor Data

Table 4-11 Unincorporated Amador County – Total Parcels and Structures by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	1,789	1,161	$283,023,440	$217,062,083	$217,062,083	$717,147,606
Commercial	436	304	$96,801,856	$290,561,506	$290,561,506	$677,924,868
Industrial	52	30	$35,032,988	$13,475,594	$20,213,391	$68,721,973
Miscellaneous	821	75	$20,963,766	$13,813,018	$0	$34,776,784
Residential	14,555	10,778	$1,213,794,783	$2,473,774,282	$1,236,887,141	$4,924,456,206
Unknown	175	86	$37,789,674	$18,067,058	$0	$55,856,732
Unincorporated Amador County Total	**17,828**	**12,434**	**$1,687,406,507**	**$3,026,753,541**	**$1,764,724,121**	**$6,478,884,169**

Source: 2024 Amador County Parcel/Assessor Data

Critical Facilities and Infrastructure

Beyond just structures, it is important to identify the critical facilities and infrastructure that are critical for life safety and the economy. Critical facilities commonly include all public and private facilities that a community considers essential for the delivery of vital services and for the protection of the community. They usually include emergency response facilities (fire stations, police stations, rescue squads, and emergency operation centers [EOCs]), custodial facilities (jails and other detention centers, long-term care facilities, hospitals, and other health care facilities), schools, emergency shelters, utilities (water supply, wastewater treatment facilities, and power), communications facilities, and any other assets determined by the community to be of critical importance for the protection of the health and safety of the population.

For purposes of this plan, a critical facility is defined as:

> ***Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.***

A critical facility is classified by the following categories: (1) Essential Services Facilities, (2) At-risk Populations Facilities, (3) Hazardous Materials Facilities.

- **Essential Services Facilities** – include, without limitation, public safety, emergency response, emergency medical, designated emergency shelters, communications, public utility plant facilities and equipment, and government operations. Sub-Categories:
  - ✓ Public Safety - Police stations, fire and rescue stations, emergency operations centers
  - ✓ Emergency Response - Emergency vehicle and equipment storage and essential governmental work centers for continuity of government operations.
  - ✓ Emergency Medical - Hospitals, emergency care, urgent care, ambulance services.
  - ✓ Designated Emergency Shelters.
  - ✓ Communications - Main hubs for telephone, main broadcasting equipment for television systems, radio, and other emergency warning systems.
  - ✓ Public Utility Plant Facilities - including equipment for treatment, generation, storage, pumping and distribution (hubs for water, wastewater, power, and gas).
  - ✓ Essential Government Operations - Public records, courts, jails, building permitting and inspection services, government administration and management, maintenance and equipment centers, and public health.
- **At Risk Population Facilities** – include, without limitation, pre-schools, public and private primary and secondary schools, before and after school care centers with 12 or more students, with 12 or more children, group homes, and assisted living residential or congregate care facilities with 12 or more residents.
- **Hazardous Materials Facilities** – include, without limitation, any facility that could, if adversely impacted, release hazardous material(s) in sufficient amounts during a hazard event that would create harm to people, the environment and property.

Note: The Hazardous Materials Facilities, while considered critical facilities for purposes of this Plan Update, are not mapped in this Plan due to the lack of an available GIS layer. In addition to the mapped critical facilities, it should further be noted that additional critical facilities, including infrastructure, utilities, and others have been identified for the Amador County Planning Area but are not included in the mapping and inventory due to privacy and security concerns.

Critical facilities in the Amador County Planning Area are shown on Figure 4-15. A summary of critical facilities in the Planning Area is shown in Table 4-12 and detailed in Table 4-13. Additional details of individual critical facilities can be found in Appendix F of this Plan Update.

Figure 4-15 Amador County Planning Area – Critical Facilities

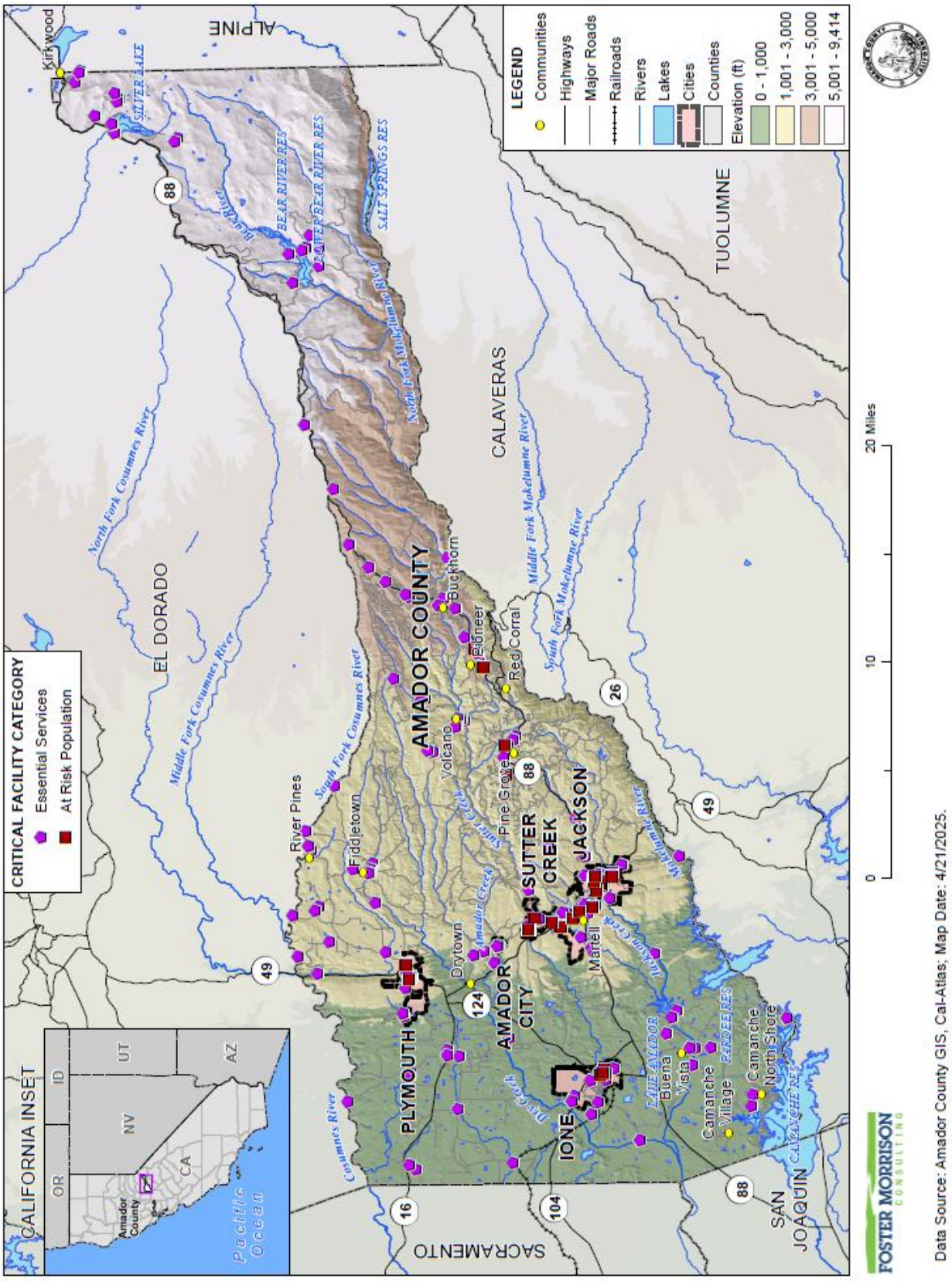


Table 4-12 Amador County Planning Area – Critical Facilities by Jurisdiction and Critical Facility Category

Jurisdiction / Critical Facility Category	Facility Count
City of Amador City	
Essential Services Facilities	3
At Risk Population Facilities	0
City of Amador City Total	**3**
City of Ione	
Essential Services Facilities	13
At Risk Population Facilities	5
City of Ione Total	**18**
City of Jackson	
Essential Services Facilities	35
At Risk Population Facilities	13
City of Jackson Total	**48**
City of Plymouth	
Essential Services Facilities	8
At Risk Population Facilities	1
City of Plymouth Total	**9**
City of Sutter Creek	
Essential Services Facilities	7
At Risk Population Facilities	6
City of Sutter Creek Total	**13**
Unincorporated Amador County	
Essential Services Facilities	138
At Risk Population Facilities	7
Unincorporated Amador County Total	**145**
Unincorporated Alpine County	
Essential Services Facilities	1
At Risk Population Facilities	0
Unincorporated Alpine County Total	**1**
Grand Total	**237**

Source: Amador County GIS

Table 4-13 Amador County Planning Area – Critical Facilities by Jurisdiction and Critical Facility Category and Facility Type

Jurisdiction / Critical Facility Category	Critical Facility Type	Facility Count
Amador City		
Essential Services	Fire Station	1
	Post Office	1
	Public Administration Building	1
	Total	**3**
Amador City Total		**3**
Ione		
Essential Services	Bridge	1
	Clinic	1
	EMS Station	2
	Evacuation Shelter	1
	Fire Station	2
	Library	1
	Other	1
	Police Station	1
	Post Office	1
	Prison	1
	Public Administration Building	1
	Essential Services Total	**13**
At Risk Population	School	5
	At Risk Population Total	**5**
Ione Total		**18**
Jackson		
Essential Services	Civic Center	1
	Clinic	9
	Communications	1
	Community Center	2
	Court House	1
	DMV	1
	EOC	1
	Evacuation Shelter	2
	Fire Station	2
	Government Administration	1
	Healthcare/School Services	1
	Hospital	1

Jurisdiction / Critical Facility Category	Critical Facility Type	Facility Count
	Jail	1
	Library	1
	Police Station	3
	Post Office	1
	Public Administration Building	2
	School District Office	1
	Wastewater Facility	2
	Wastewater Treatment Plant	1
	Essential Services Total	**35**
At Risk Population	Community Center	1
	Other	1
	Residential Care Facility	4
	School	5
	Veterans Services	2
	At Risk Population Total	**13**
Jackson Total		**48**
Plymouth		
Essential Services	Bridge	1
	Clinic	1
	EMS Station	1
	Evacuation Shelter	1
	Fire Station	1
	Library	1
	Post Office	1
	Public Administration Building	1
	Essential Services Total	8
At Risk Population	School	1
	At Risk Population Total	**1**
Plymouth Total		**9**
Sutter Creek		
Essential Services	Community Center	2
	Fire Station	2
	Police Station	1
	Post Office	1
	Public Administration Building	1
	Essential Services Total	**7**
At Risk Population	Residential Care Facility	1

Jurisdiction / Critical Facility Category	Critical Facility Type	Facility Count
	School	5
	At Risk Population Total	**6**
Sutter Creek Total		**13**
Unincorporated Amador County		
Essential Services	Animal Shelter	1
	Bridge	31
	Clinic	4
	Community Center	5
	EMS Station	2
	Evacuation Shelter	1
	Fire Station	15
	Library	2
	Other	5
	Post Office	4
	Public Administration Building	1
	Public Water System	64
	Ranger Station	1
	Veterans Services	1
	Wastewater Facility	1
	Essential Services Total	**138**
At Risk Population	Clinic	1
	School	5
	Veterans Services	1
	At Risk Population Total	**7**
Unincorporated Amador County Total		**145**
Unincorporated Alpine County		
Essential Services	Fire Station	1
	Essential Services Total	**1**
Unincorporated Alpine County Total		**1**
Grand Total		**237**

Source: Amador County GIS

Community Lifelines

Assessing the vulnerability of the Amador County Planning Area to natural hazards and disasters also involves reviewing and inventorying the community lifelines in place that could be affected. It is important to include these items in hazard discussions as the continuous operation of critical government and business

functions is essential to human health and safety and/or economic security. Information on community lifelines include:

- Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function.
- FEMA has developed a construct for objectives-based response that prioritizes the rapid stabilization of Community Lifelines after a disaster.
- The integrated network of assets, services, and capabilities that provide lifeline services are used day-to-day to support the recurring needs of the community and enable all other aspects of society to function.
- When disrupted, decisive intervention (e.g., rapid re-establishment or employment of contingency response solutions) is required to stabilize the incident.

For this Plan, Community Lifelines includes the following (as defined by FEMA):

- **Safety and Security** – Law Enforcement/Security, Fire Service, Search and Rescue, Government Service, Community Safety
- **Food, Hydration, Shelter** – Food, Water, Shelter, Agriculture
- **Health and Medical –** Medical Care, Public Health, Patient Movement, Medical Supply Chain, Fatality Management
- **Energy –** Power Grid, Fuel
- **Communications** – Infrastructure, Responder Communications, Alerts Warnings and Messages, Finance, 911 and Dispatch
- **Transportation** – Highway/Roadway/Motor Vehicle, Mass Transit, Railway, Aviation, Maritime
- **Hazardous Material –** Facilities, HAZMAT, Pollutants, Contaminants
- **Water Systems** – Potable Water Infrastructure, Wastewater Management

In the Amador County Planning Area, these community lifelines are all in place and functional as part of regular government operations. It should also be noted that these community lifelines collectively include many of the individual components of other community assets inventoried for this LHMP including structures and critical facilities and infrastructure.

After the HMPC reviewed the list of hazards from Table 4-3, it was determined that most hazards that occur would not overwhelm the community lifelines in the County. A matrix was put together in Table 4-14 for the hazards of concern in the Amador County Planning Area. As shown, only earthquake and wildfire are thought be able to (temporarily) overwhelm the community lifelines in the County. The remaining hazards would likely not overwhelm community lifelines.

Note: This inventory of community lifelines and hazard analysis only occurs in this overall asset inventory for Amador County. To limit redundancy, it is not discussed further in the hazard profiles and vulnerability assessments in Section 4.3 below.

Table 4-14 Amador County Planning Area – Hazards and their Potential to Overwhelm Community Lifelines

Hazard	Potential to Overwhelm Community Lifelines	Hazard	Potential to Overwhelm Community Lifelines
Severe Weather: Extreme Cold, Freeze, and Snow	Limited	Dam Failure	Moderate
Severe Weather: Extreme Heat	Limited	Drought and Water Shortage	Limited
Severe Weather: Heavy Rains and Storms	Limited	Earthquake	High
Severe Weather: High Winds and Tornado	Limited	Flood: 1%/0.2% Annual Chance	Moderate
Agricultural Hazards	Limited	Flood: Localized Flooding	Limited
Avalanche	Limited	Landslide, Mudslide, and Debris Flow	Limited
Climate Change	Limited	Wildfire	High

Source: Amador County Planning Team

Efforts to mitigate potential impacts to community lifelines are key to building resilience. These community lifelines connect to the sectors in the National Mitigation Framework and the Recovery Support Functions under the National Disaster Recovery Framework; the same agencies and departments that support these sectors also often support community lifelines and the recovery mission.

Specific information on these community lifelines in the Amador County Planning Area and how they may be affected by a hazard event or disaster are discussed in more detail in each jurisdictional annex to this Base Plan.

Natural, Historical, and Cultural Resources

Assessing the vulnerability of the Amador County Planning Area to disaster also involves inventorying the natural, historic, and cultural assets of the area. This step is important for the following reasons:

- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- If these resources are impacted by a disaster, knowing so ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts are higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.

Natural Resources

Natural resources are important to include in cost/benefit analyses for future projects and may be used to leverage additional funding for mitigation projects that also contribute to community goals for protecting

sensitive natural resources. Awareness of natural resource assets can lead to opportunities for meeting multiple objectives. For instance, protecting wetlands areas protects sensitive habitat as well as reducing the force of and storing floodwaters.

The County's broad range of elevation and topography results in a rich diversity of natural and biological resources. The western half of the County is characterized by rolling hills covered with oak woodland, grassland, and chaparral. The forested upcountry, which is part of the Eldorado National Forest, has a more rugged topography characterized by steep slopes, deep river canyons, and high mountain peaks covered by forests, montane shrublands, and lakes.

The South Fork Cosumnes River, the North Fork Mokelumne River, Dry Creek, Sutter Creek, Jackson Creek, Lake Camanche, Pardee Reservoir, and Lake Amador all provide vital fish spawning, rearing, and/or migratory habitat for a diverse range of fish.

Deer migration corridors are also a concern in many foothill counties, including Amador County. The County is home to both resident and migratory deer populations, with critical winter range for deer found at elevations between 2,000 and 4,000 feet above sea level, and summer critical habitat at 4,000 to 9,000 feet above sea level.

The vernal pool complexes and Ione chaparral of western Amador County, and the riparian habitats along corridors such as the Cosumnes River, the Mokelumne River, and Dry Creek are examples of some of the sensitive communities found throughout the County. These sensitive communities are a part of the county's biological wealth and are home to some of its unique plant and animal species. Future residential, commercial, and infrastructure development and expansion of agricultural or mining activities have the potential to directly remove, degrade, or fragment these sensitive habitats.

Special Status Species

To further understand natural resources that may be particularly vulnerable to a hazard event, as well as those that need consideration when implementing mitigation activities, it is important to identify at-risk species (i.e., endangered species) in the Planning Area. An endangered species is any species of fish, plant life, or wildlife that is in danger of extinction throughout all or most of its range. A threatened species is a species that is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range. Both endangered and threatened species are protected by law and any future hazard mitigation projects are subject to these laws. Candidate species are plants and animals that have been proposed as endangered or threatened but are not currently listed.

The California Natural Diversity Database, a program that inventories the status and locations of rare plants and animals in California, was queried to create an inventory of special status species in Amador County. A summary list of these species is found below in Table 4-15. Appendix E lists the name, federal status, state status, California Department of Fish and Wildlife status, and the California Rare Plant rank of species in Amador County.

Table 4-15 Amador County Planning Area – Summary of Special Status Species

Type	Number
Animals - Amphibians	5
Animals - Birds	52
Animals - Crustaceans	5
Animals - Fish	18
Animals - Insects	10
Animals - Mammals	10
Animals – Mollusks	2
Animals – Reptiles	3
Community – Terrestrial	9
Plants – Vascular	38

Source: California Natural Diversity Database. Retrieved January 2025.

Wetlands

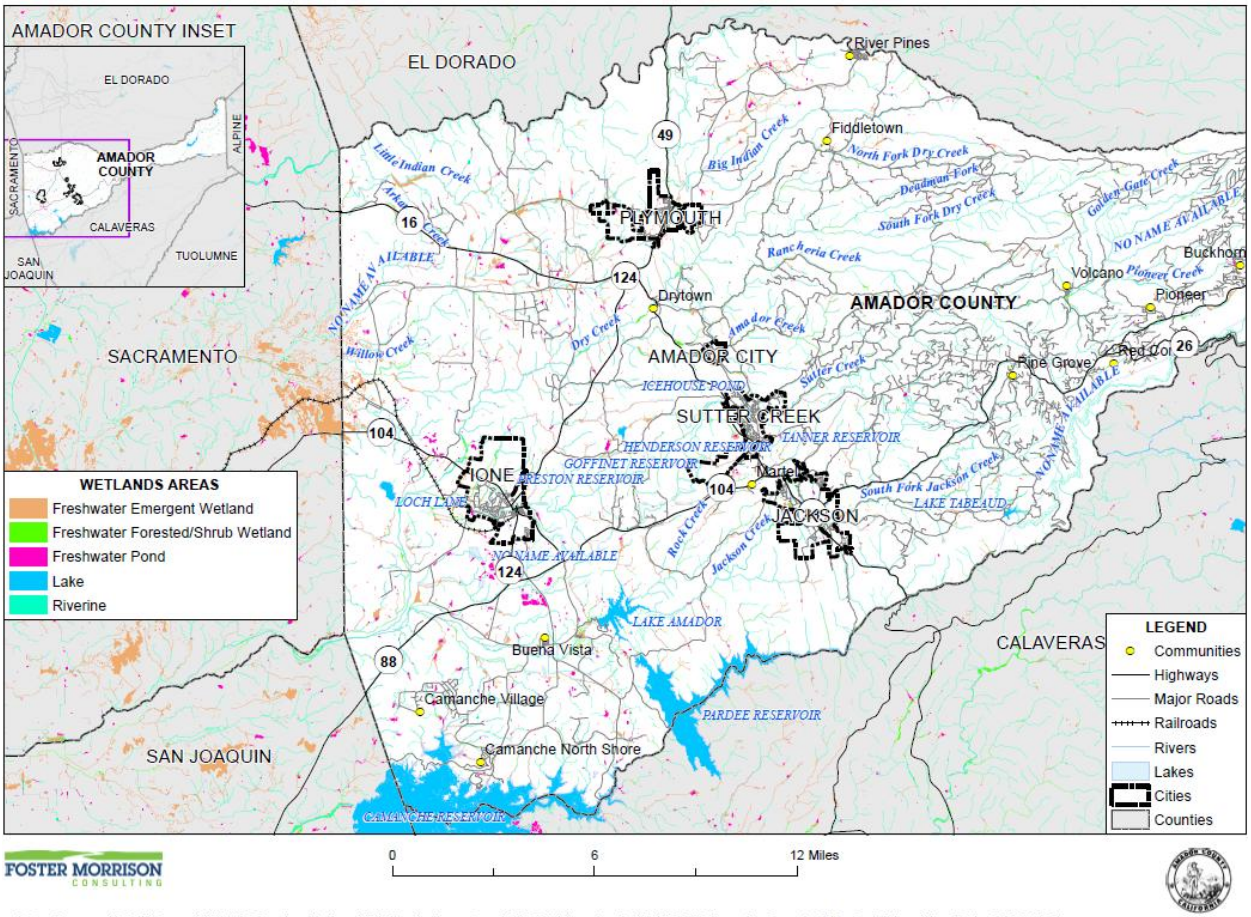
Wetlands are habitats in which soils are intermittently or permanently saturated or inundated. Wetland habitats vary from rivers to seasonal ponding of alkaline flats and include swamps, bogs, marshes, vernal pools, and riparian woodlands. Wetlands are considered to be waters of the United States and are subject to the jurisdiction of the U.S. Army Corps of Engineers (USACE) as well as the California Department of Fish and Wildlife (CDFW). Where the waters provide habitat for federally endangered species, the U.S. Fish and Wildlife Service may also have authority.

Wetlands are a valuable natural resource for communities providing beneficial impact to water quality, wildlife protection, recreation, and education, and play an important role in hazard mitigation. Wetlands provide drought relief in water-scarce areas where the relationship between water storage and streamflow regulation is vital and reduce flood peaks and slowly release floodwaters to downstream areas. When surface runoff is dampened, the erosive powers of the water are greatly diminished. Furthermore, the reduction in the velocity of inflowing water as it passes through a wetland helps remove sediment being transported by the water.

Fresh emergent wetland habitats occur in Amador County on virtually all exposures and slopes, provided a basin or depression is saturated or at least periodically flooded. They are most common on level to gently rolling topography. They are found in various depressions or at the edge of rivers or lakes. Soils are predominantly silt and clay, although coarser sediments and organic material may be intermixed. In some areas organic soils (peat) may constitute the primary growth medium. Climatic conditions are highly variable and range from the extreme summer heat to winter temperatures well below freezing.

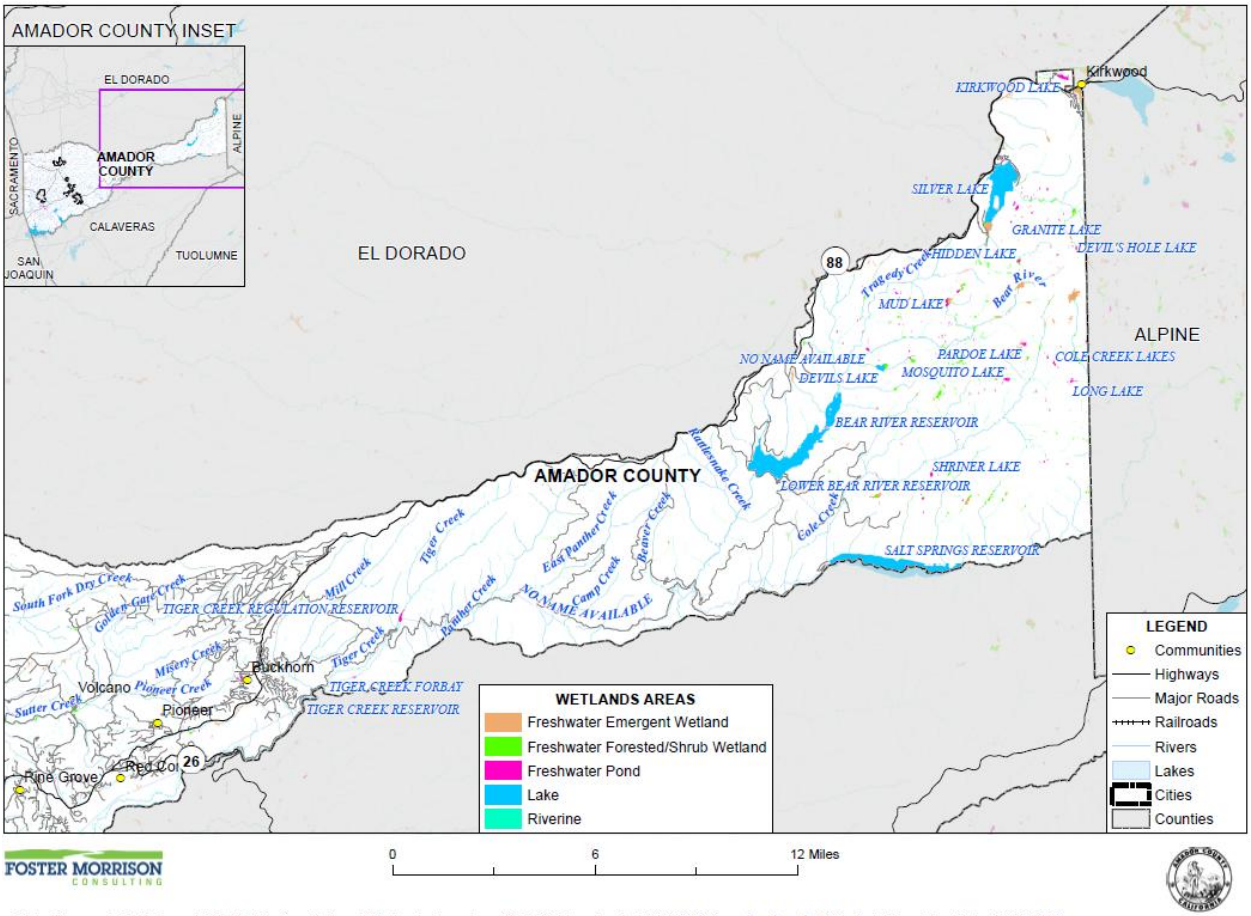
The US Fish and Wildlife Service has maps of wetlands in the United States. Those wetlands that fall in Amador County are shown on Figure 4-16 for the western County and on Figure 4-17 for the eastern County. They are detailed in Table 4-16 and are shown separated by jurisdiction. More information on the locations of wetlands in each City can be found in their respective annexes to this LHMP Update.

Figure 4-16 Amador County Western Planning Area – Wetlands Locations



Data Source: U.S. Fish and Wildlife Service National Wetlands Inventory 10/2024 (downloaded 01/2025), Amador County GIS, Cal-Atlas; Map Date: 2/26/2025.

Figure 4-17 Amador County Eastern Planning Area – Wetlands Locations



Data Source: U.S. Fish and Wildlife Service National Wetlands Inventory 10/2024 (downloaded 01/2025), Amador County GIS, Cal-Atlas; Map Date: 2/26/2025.

Table 4-16 Amador County Planning Area – Wetlands

Wetlands Area Type	Wetlands Count	Wetlands Area (in Acres)
Unincorporated Amador County		
Freshwater Emergent Wetland	2,099	2,074.47
Freshwater Forested/Shrub Wetland	864	880.27
Freshwater Pond	1,385	1,216.43
Lake	48	6,850.05
Riverine	2,298	2,980.06
Unincorporated Amador County Total	**6,694**	**14,001.29**

Source: USFWS October 2024 National Wetlands Inventory

Wetlands Natural and Beneficial Functions

Wetlands are often found in floodplains and depressional areas of a watershed. Many wetlands receive and store floodwaters, thus slowing and reducing downstream flow. Wetlands perform a variety of ecosystem functions including food web support, habitat for insects and other invertebrates, fish and wildlife habitat,

filtering of waterborne and dry-deposited anthropogenic pollutants, carbon storage, water flow regulation (e.g., flood abatement), groundwater recharge, and other human and economic benefits.

Wetlands, and other riparian and sensitive areas, provide habitat for insects and other invertebrates that are critical food sources to a variety of wildlife species, particularly birds. There are species that depend on these areas during all parts of their lifecycle for food, overwintering, and reproductive habitat. Other species use wetlands and riparian areas for one or two specific functions or parts of the lifecycle, most commonly for food resources. In addition, these areas produce substantial plant growth that serves as a food source to herbivores (wild and domesticated) and a secondary food source to carnivores.

Wetlands slow the flow of water through the vegetation and soil, and pollutants are often held in the soil. In addition, because the water is slowed, sediments tend to fall out, thus improving water quality and reducing turbidity downstream.

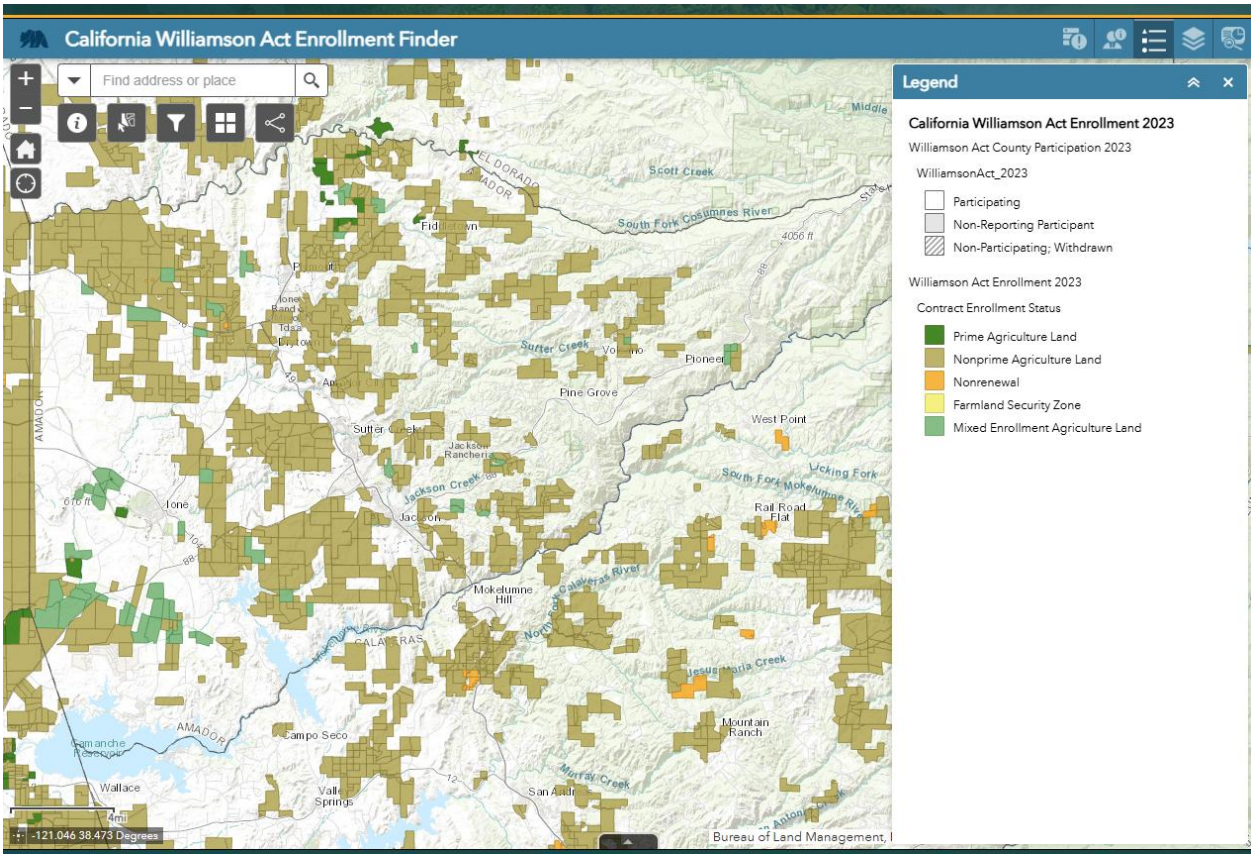
These natural floodplain functions associated with the natural or relatively undisturbed floodplain that moderates flooding, such as wetland areas, are critical for maintaining water quality, recharging groundwater, reducing erosion, redistributing sand and sediment, and providing fish and wildlife habitat. Preserving and protecting these areas and associated functions are a vital component of sound floodplain management practices for the Amador County Planning Area.

Farmlands

Williamson Act

The Williamson Act, also known as the California Land Conservation Act of 1965, enables local governments to enter into contracts with private landowners for the purpose of restricting specific parcels of land to agricultural or related open space use. When the County enters into a contract with the landowners under the Williamson Act, the landowner agrees to limit the use of the land to agriculture and compatible uses for a period of at least ten years and the County agrees to tax the land at a rate based on the agricultural production of the land rather than its real estate market value. This affects the County's overall values for assessed taxable lands. The County has designated areas as agricultural preserves within which the County will enter into contracts for the preservation of the land in agriculture. Locations from the most recent map (dated 2023) can be seen on Figure 4-18 for western Amador County. There are no Williamson Act lands in eastern Amador County.

Figure 4-18 Amador County – Williamson Act Lands



Source: California Department of Conservation. Retrieved 03/11/2025.

State Inventory of Important Farmland

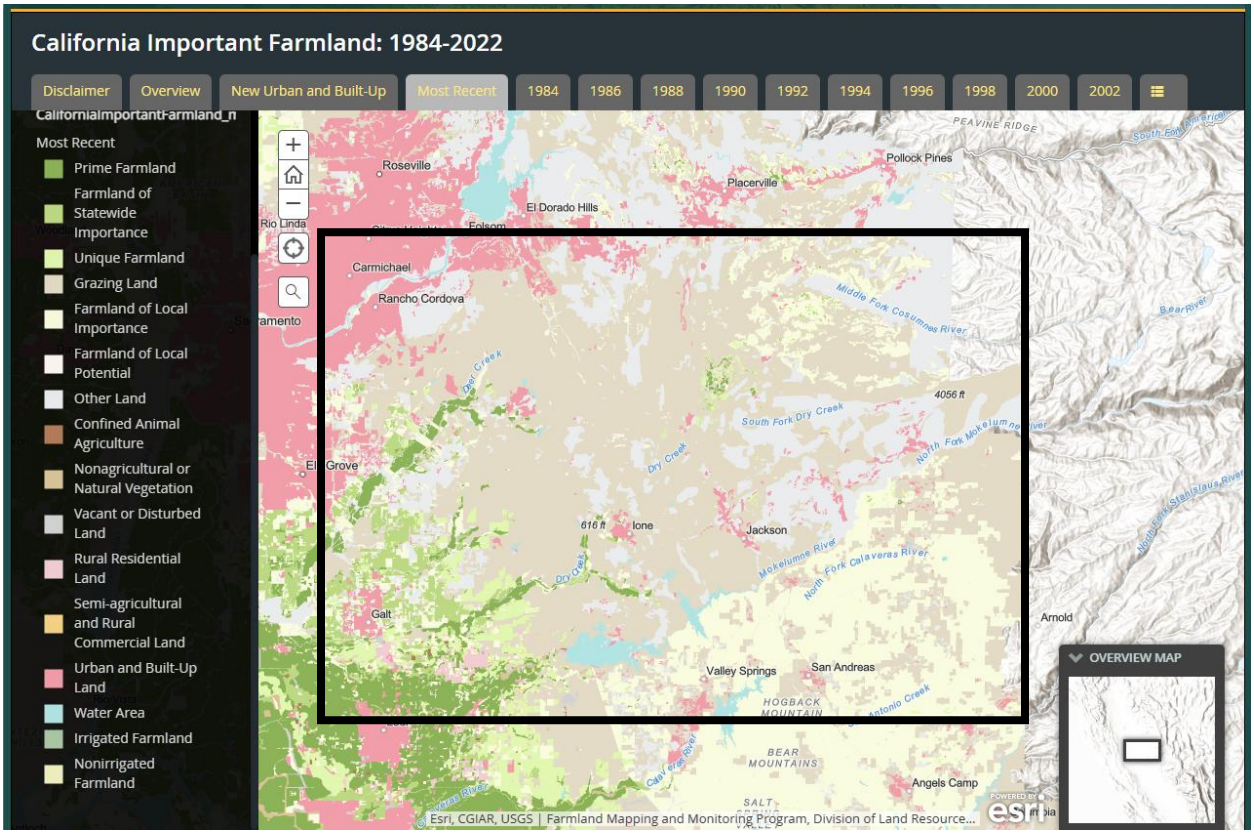
The Farmland Mapping and Monitoring Program was established in 1984 to document the location, quality, and quantity of agricultural lands and conversion of those lands over time. The program provides impartial analysis of agricultural land use changes throughout California. For inventory purposes, several categories were developed to describe the qualities of land in terms of its suitability for agricultural production. The State Department of Conservation utilizes the following classification system:

- The Prime Farmland category describes farmland with the best combination of physical and chemical features able to sustain long term agricultural production. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.
- Farmland of Statewide Importance is farmland similar to Prime Farmland but with minor shortcomings, such as greater slopes or less ability to store soil moisture. Land must have been used for irrigated agricultural production at some time during the four years prior to the mapping date.
- Unique Farmland is farmland of lesser quality soils used for the production of the state's leading agricultural crops. This land is usually irrigated but may include non-irrigated orchards or vineyards as found in some climatic zones in California. Land must have been cropped at some time during the four years prior to the mapping date.

- Farmland of Local Importance is either currently producing crops or has the capability of production. This farmland category is determined by each county's board of supervisors and a local advisory committee.

The 2022 maps are the most recent versions. These lands are shown in Figure 4-19.

Figure 4-19 Amador County – Map of Important Farmlands 2022



Source: State of California Department of Conservation. Retrieved 03/11/2025.

Cultural and Historical Resources

Amador County has a large stock of historically significant homes, public buildings, and landmarks. To inventory these resources, the HMPC collected information from a number of sources. The California Department of Parks and Recreation Office of Historic Preservation (OHP) was the primary source of information. The OHP is responsible for the administration of federally and state mandated historic preservation programs to further the identification, evaluation, registration, and protection of California's irreplaceable archaeological and historical resources. OHP administers the National Register of Historic Places, the California Register of Historical Resources, California Historical Landmarks, and the California Points of Historical Interest programs. Each program has different eligibility criteria and procedural requirements.

- The **National Register of Historic Places** is the nation's official list of cultural resources worthy of preservation. The National Register is part of a national program to coordinate and support public and

private efforts to identify, evaluate, and protect historic and archeological resources. Properties listed include districts, sites, buildings, structures, and objects that are significant in American history, architecture, archeology, engineering, and culture. The National Register is administered by the National Park Service, which is part of the U.S. Department of the Interior.

- The **California Register of Historical Resources** program encourages public recognition and protection of resources of architectural, historical, archeological, and cultural significance and identifies historical resources for state and local planning purposes; determines eligibility for state historic preservation grant funding; and affords certain protections under the California Environmental Quality Act. The Register is the authoritative guide to the state's significant historical and archeological resources.
- **California Historical Landmarks** are sites, buildings, features, or events that are of statewide significance and have anthropological, cultural, military, political, architectural, economic, scientific or technical, religious, experimental, or other value. Landmarks #770 and above are automatically listed in the California Register of Historical Resources.
- **California Points of Historical Interest** are sites, buildings, features, or events that are of local (city or county) significance and have anthropological, cultural, military, political, architectural, economic, scientific or technical, religious, experimental, or other value. Points designated after December 1997 and recommended by the State Historical Resources Commission are also listed in the California Register.

Historical resources included in the programs above are identified in Table 4-17.

Table 4-17 Amador County Planning Area – Historical Resources

Resource Name (Plaque Number)	National Register	State Landmark	Point of Interest	Date Listed	City/ Community
Amador City (P498)			X	5/5/1977	Amador City
Lancha Plana (30)		X		8/1/1932	Buena Vista
Drytown (31)		X		8/1/1932	Drytown
Oleta (Old Fiddletown) (35)		X		8/1/1932	Fiddletown
Rammed Earth Adobe (P107)			X	12/11/1968	Fiddletown
Fiddletown (N627)	X			6/7/1978	Fiddletown
Community Methodist Church of Ione (506)		X		7/31/1953	Ione
Ione City Centenary Church (N498)	X			5/26/1977	Ione
Five Mile Drive--Sutter Creek Bridge (N1437)	X			4/11/1986	Ione
Scully Ranch (N706)	X			11/21/1978	Ione
D. Stewart Co. Store (788)		X		11/21/1963	Ione
Preston Castle (867)		X		1/11/1974	Ione
Middle Bar (36)		X		8/1/1932	Jackson
Pioneer Hall (34)		X		8/1/1932	Jackson
Jackson Gate (118)		X		3/29/1933	Jackson
Argonaut And Kennedy Mines (786)		X		9/18/1963	Jackson
Amador County Hospital Building (N148)	X			2/23/1972	Jackson

Resource Name (Plaque Number)	National Register	State Landmark	Point of Interest	Date Listed	City/ Community
Site of Jackson's Pioneer Jewish Synagogue (865)		X		11/16/1973	Jackson
Kennedy Mine Tailing Wheels (P397)			X	5/9/1975	Jackson
Kennedy Tailing Wheels (N959)	X			7/7/1981	Jackson
House and Indian Museum, Grace Blair Depue (P582)			X	3/1/1982	Jackson
Depue, Grace Blair, House and Indian Museum (N1101)	X			5/7/1982	Jackson
Saint Sava Serbian Orthodox Church (N1426)	X			3/6/1986	Jackson
Chichizola Family Store Complex (N1788)	X			8/14/1992	Jackson
Jackson Downtown Historic District (N2090)	X			4/14/2000	Jackson
Paugh, William H., House (N2364)	X	X		6/5/2007	Jackson
Butterfield, John A., House (N1461)	X			9/11/1986	Jackson
Butte Store (39)		X		8/1/1932	Jackson
Maiden's Grave (28)		X		8/1/1932	Kirkwood
Old Emigrant Road (662)		X		11/5/1958	Kirkwood
Clinton (37)		X		8/1/1932	Pine Grove
Irishtown (38)		X		8/1/1932	Pine Grove
Plymouth Trading Post (470)		X		8/30/1950	Plymouth
D'Agostini Winery (762)		X		4/28/1961	Plymouth
Sutter Creek (322)		X		7/12/1939	Sutter Creek
Knight's Foundry and Shops (N375)	X			7/1/1975	Sutter Creek
Sutter Creek Grammar School (N456)	X			12/12/1976	Sutter Creek
Knight Foundry (1007)		X		8/21/1992	Sutter Creek
Site of First Amateur Astronomical Observatory of Record in California (715)		X		10/6/1959	Unincorporated County
Volcano (29)		X		8/1/1932	Volcano
Indian Grinding Rock (N74)	X			5/6/1971	Volcano
St. George Hotel (N1301)	X			9/7/1984	Volcano

Source: California Department of Parks and Recreation Office of Historic Preservation. Retrieved 12/3/2024.

It should be noted that these lists may not be complete, as they may not include those currently in the nomination process and not yet listed. Additionally, as defined by the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA), any property over 50 years of age is considered a historic resource and is potentially eligible for the National Register. Thus, in the event that the property is to be altered, or has been altered, as the result of a major federal action, the property must be evaluated under the guidelines set forth by CEQA and NEPA. Structural mitigation projects are considered alterations for the purpose of this regulation.

Economic Assets and Community Activities of Value

Assessing the vulnerability of the Amador County Planning Area to natural hazards and disasters also involves inventorying the economic assets and community activities of value to the Amador County Planning Area.

Economic Assets

After a disaster, economic resiliency is one of the major drivers of a speedy recovery. Each community has specific economic drivers. These include:

- Primary Economic Sectors
- Major employers
- Commercial Centers

The HMPC and County Auditor noted that the economic drivers are Government – State & Local and Tourism such as it relates to wineries and grape growers, casinos, retailers, and restaurants. It was also discussed that the airport is an economic asset and could be more susceptible to threats and hazards than currently thought. More information on these drivers related to Tourism include:

- Tourism and Hospitality – Amador County is known for its Gold Rush history, award-winning wineries, outdoor recreation and small towns, making tourism and hospitality key industries. Historic towns like Sutter Creek, Jackson, and Volcano have various sites, museums, and other attractions that draw visitors year-round, which include the Kennedy Mine (Jackson), Preston Castle (Ione), the Knights Foundry (Sutter Creek), the Amador Whitney Museum (Amador City), the Indian Grinding Rock State Historic Park (Pine Grove), Kirkwood Ski Resort, and the Black Chasm Cavern (Volcano).
- Wineries & Vineyards: Amador County is home to 50+ wineries which comprise the Amador Vintners Association. This includes numerous boutique wineries and tasting rooms, which draws both regional and international tourists. In May of 2024, the Amador County Board of Supervisors established the Amador County Wine Heritage District. This district imposes an annual assessment rate of 1% on gross direct-to-consumer sales revenue from winery sales within the county. The funds generated are intended to support marketing, quality enhancement, and educational programs for the wineries. See https://amadorwine.com/ for more information.
- Lodging: Amador County hosts a mix of boutique hotels, historic inns, and bed & breakfasts. Vacation rentals and VRBOs/Airbnbs have increased in popularity. Some wineries and/or vineyards also offer lodging.

Note: This inventory of economic assets is only included in this overall asset inventory for Amador County. To limit redundancy, it is not discussed further in the hazard profiles and vulnerability assessments in Section 4.3 below. However, depending on the type, location, magnitude and extent of future hazard events and disasters, the County's economic assets may be vulnerable.

More information on economic assets for the incorporated jurisdictions in the County can be found in the respective jurisdictional annexes to this Base Plan.

Community Activities of Value

Inventorying economic assets in the Amador County Planning Area and their vulnerability to natural hazards and disasters also involves inventorying activities that have value to the community. This includes activities that are important to a community, like long-standing traditions such as a festival or fair. Some areas rely on seasonal industries to sustain them throughout the year. Many of these activities provide economic benefits to the Planning Area. A hazard event that cancels or shortens these can affect a community's livelihood and can make disaster recovery more difficult or prolonged. This includes activities such as:

- Festivals and Fairs
- Sporting Events
- Tourism

Community Events (include but are not limited to): Amador County Fair (Plymouth), Dandelion Days (Jackson), Sutter Creek Parade of Lights (Sutter Creek), Preston Castle Haunt (Ione), Sutter Creek Duck Race (Sutter Creek), Italian Benevolent Society Crab Feed (Sutter Creek), Ione Rotary Crab Feed (Ione), Amador County Fair Foundation Casino Night (Plymouth), Jackson Lions Club Crab Feed (Jackson), Margaret Dalton Golden Acorn Awards Dinner (Jackson Rancheria Casino), Knight Foundry Dinner (Sutter Creek), Ione Picnic Association Hoedown (Ione), Amador Wedding & Party Showcase (Jackson), Italian Benevolent Society Shrimp Feed (Sutter Creek), Celebrate our Children (Jackson), 49er Wagon Train (throughout the County), Ione Homecoming (Ione), Mother Lode Cruise Car Show (Jackson), Italian Picnic (Sutter Creek), Music at the Mine (Jackson) Picnic in the Park, Beer Fest (Sutter Creek), An Evening Under the Stars (Volcano), Vines & Steins (Ione), Amador Farm Tours & Dinner (Various), Show in the Park (Pioneer), Feast at the Foundry (Sutter Creek), Purple Tie Gala (varies location), Fall Harvest Festivals (Various), Halloween Parade (Jackson), Christmas Delights (Jackson), Sutter Creek Open House (Sutter Creek), Veteran's Day Parade (Jackson), Big Crush Harvest Wine Festival (various wineries), Amador Four Fires Food & Wine Festival (Plymouth) and a multitude of flea markets and farmer's markets throughout the County.

Note: This inventory of community activities of value only occurs in this overall asset inventory for Amador County. To limit redundancy, it is not discussed further in the hazard profiles and vulnerability assessments in Section 4.3 below. However, depending on the type, location, magnitude and extent of future hazard events and disasters, the County's economic assets may be vulnerable.

More information on community activities of value specific to participating jurisdictions can be found in the respective jurisdictional annexes to this Base Plan.

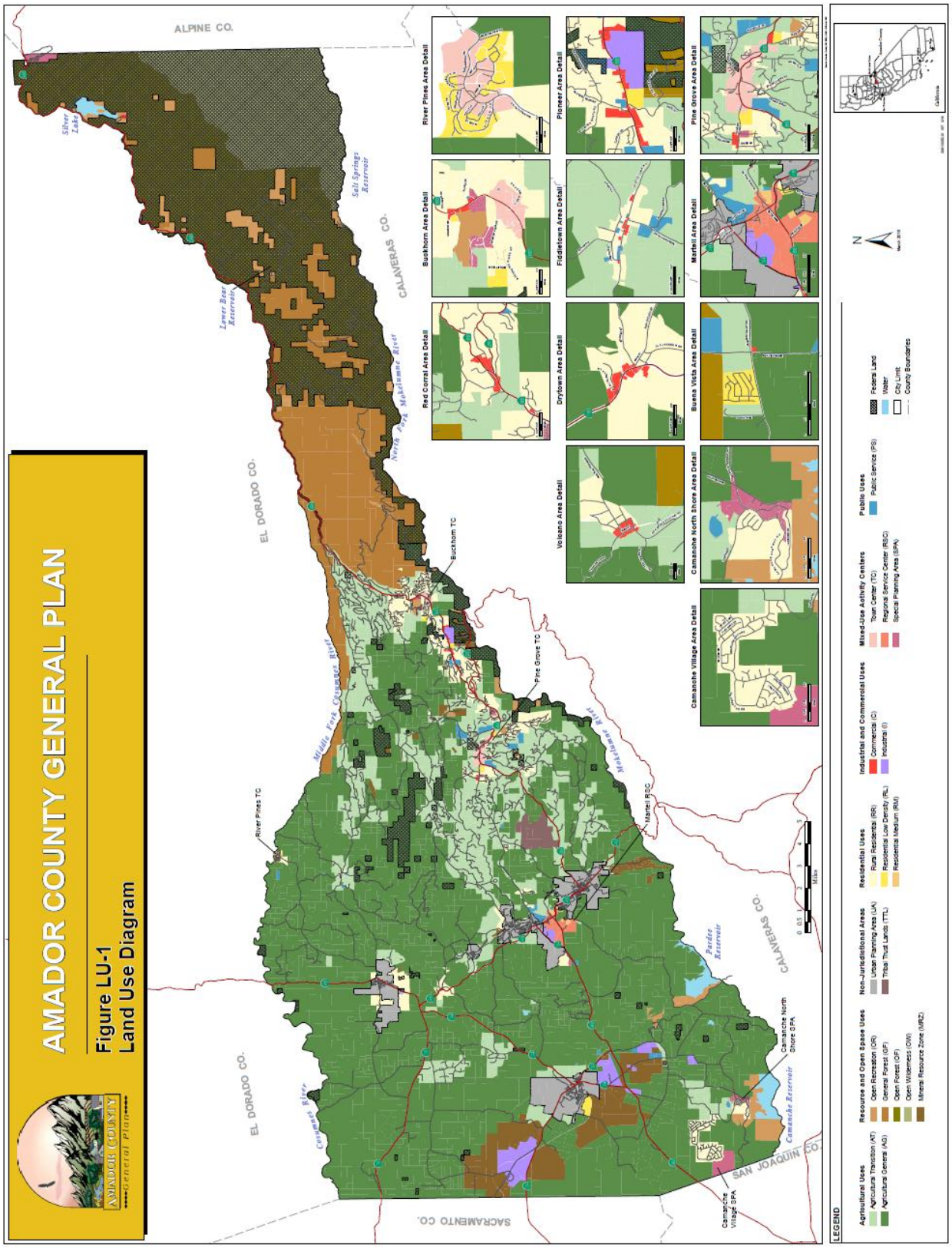
4.2.2. Growth and Development Trends

As part of the planning process, trends in growth and development, both current and future, were examined, both as a whole and in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability over time. This discussion focuses on unincorporated Amador County.

Land Use

The future use of land in the County is fundamental to attaining the vision of a balanced, self-sustaining community. A land use pattern which balances growth between rural and urban areas, as well as providing a balance between housing, employment, natural resources, and services in the County is a key element in maintaining the quality of life and unique character of the County. Descriptions of allowed uses for each classification are detailed in the Amador County General Plan Land Use Element. Figure 4-20 is sourced from this section.

Figure 4-20 Amador County General Plan Land Use



Source: Amador County 2016 General Plan Land Use Element

Population Projections

As indicated in the previous section, Amador County had been steadily growing from 1940 to 2020, with a recent slowing in population growth. Long term forecasts by the California Department of Finance project population growth in Amador County continuing through 2070. Table 4-18 shows the population projections for the County Planning Area as a whole through 2070. As shown, populations are expected to grow slowly over time.

Table 4-18 Population Projections for the Amador County Planning Area (incorporated and unincorporated), 2025-2070

	2025	2030	2035	2040	2045	2050	2055	2060	2065	2070
Amador County	40,289	41,327	43,076	44,815	46,549	48,299	49,927	51,844	53,901	56,182

Source: California Department of Finance, P-2 Report

Development since 2020 Plan

The Amador County Planning Department sought to track total building permits issued since 2020 for unincorporated Amador County. A summary of this development is shown in Table 4-19. Development by known flood and fire hazard areas is shown in Table 4-20. All development in the identified hazard areas, including the 1% annual chance floodplains and high wildfire risk areas, were completed in accordance with the current and applicable development codes and standards in place at the time. Thus, with the exception of more people living in the area potentially exposed to natural hazards, this growth should not cause a significant change in vulnerability of the County to identified priority hazards.

Table 4-19 Unincorporated Amador County Development 2020–2024 Summary

Property Use	2020	2021	2022	2023	2024
Residential	22	44	44	49	36
Commercial	0	3	0	1	3
Industrial	0	0	0	0	0
Other	1322	1329	1421	1294	1193
Total	**1,344**	**1,376**	**1,465**	**1,344**	**1,232**

Source: Amador County Planning Department

Table 4-20 Unincorporated Amador County Development in Hazard Areas since 2020

Property Use	Moderate or Higher Fire Hazard Severity Zones	1% Annual Chance Flood	Landslide Potential Areas	Other
Residential	195	0	0	0
Commercial	7	0	0	0
Industrial	0	0	0	0

Property Use	Moderate or Higher Fire Hazard Severity Zones	1% Annual Chance Flood	Landslide Potential Areas	Other
Other	6559	0	0	0
Total	**6761**	**0**	**0**	**0**

Source: Amador County Planning Department

Additionally, the County Planning Department noted that with respect to the above tables, winery-related permits are considered agricultural and not industrial or commercial. Also, the large number of "other" permits reflects everything from minor repairs and alterations, to major building additions. Another important item is that almost all of the unincorporated area of the County is designated as moderate or higher fire severity, so all of the permits fall in that category.

Future Development Areas

It is important to review future development plans for the County. Future development should be sited in areas that are away from known hazard risks. If this is not possible, mitigation should be done to ensure that future development is protected against future hazard events and disasters.

The County noted five areas where expansion is approved to occur, or is proposed to occur. This includes:

- A - Plymouth Casino – approved commercial area of 130 acres.
- B - SGI Quarry Expansion – proposed industrial area of 50 acres.
- C - Palisades Unit 6 – approved residential area of 13 acres (with 22 planned residences.
- D - Thunder Mountain- approved residential area of 2.5 acres (with 15 planned residences)
- E - Timber Creek Townhomes – approved residential area of 2 acres (with 20 planned residences)

These areas are analyzed in the GIS analysis below.

In addition to the planned areas analyzed below, the Amador County Planning Department Director noted that there are talks about building a Town Center in Pine Grove and in Pioneer, but neither have gotten off the ground and their timeframe is unknown. The Board of Supervisors are currently reviewing plans for a new subdivision that could bring 300-700 new homes along Wicklow Way over the next 30 years. The status and timeframe to start building is unknown at this time. Lastly, there are plans to build a 4-story hotel in Martell (Highway 49/Jackson Gate Road). There is a rock-creek box drain issue that will require some engineering from the developers, but again, a build-start date is unknown.

GIS Analysis

Amador County provided five future development areas which were used as the basis for the inventory of future development for unincorporated Amador County. These were mapped in GIS. Figure 4-21 show the locations of the future development areas. Table 4-21 shows the details of the future development areas by acreage and parcel count.

Figure 4-21 Unincorporated Amador County – Future Development Areas

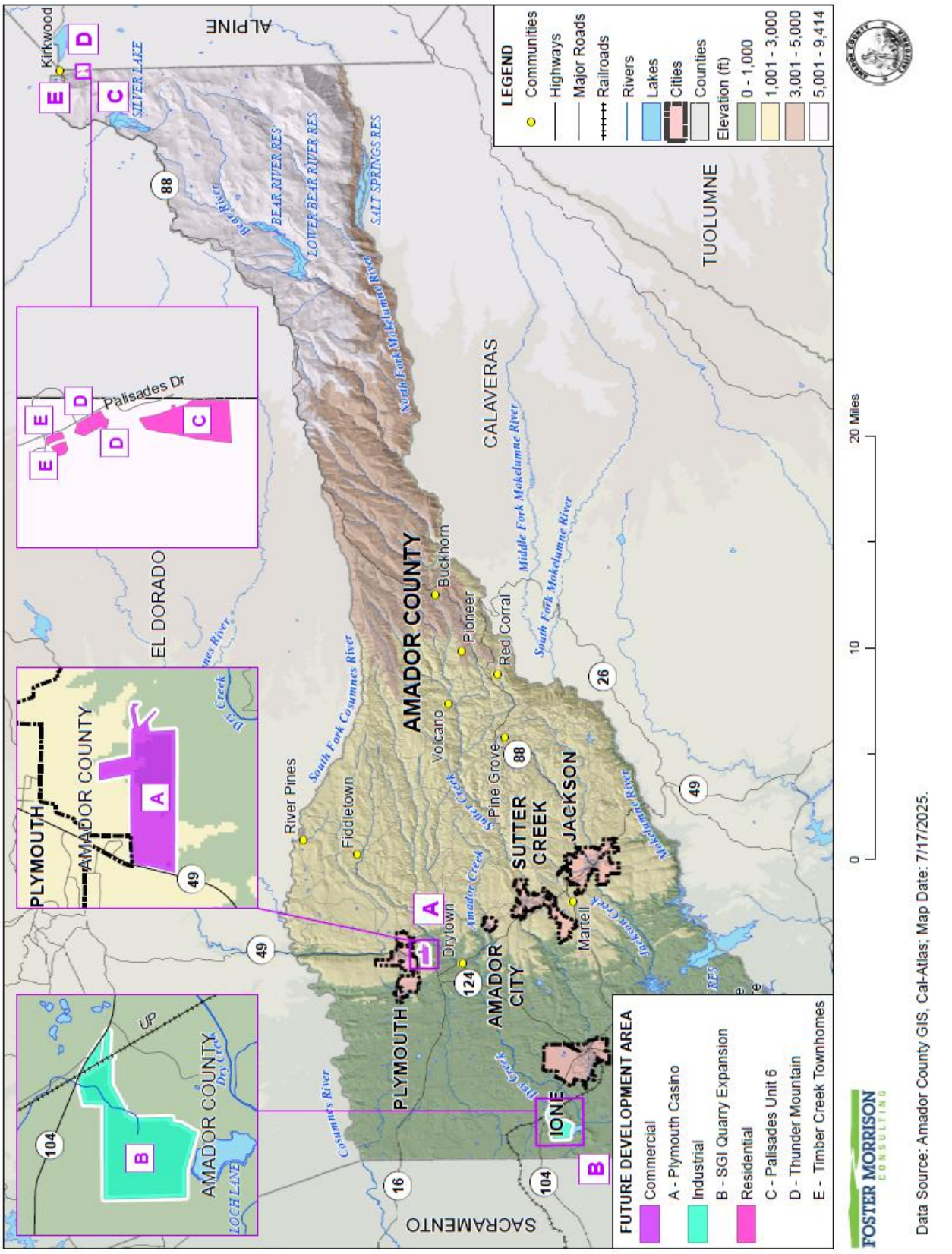


Table 4-21 Unincorporated Amador County – Future Development Parcels and Acres by Property Use

Property Use /Site/Map ID - Future Development	Unimproved Parcel Count	Total Unimproved Acres
Commercial		
A - Plymouth Casino	1	130
Commercial Total	**1**	**130**
Industrial		
B - SGI Quarry Expansion	1	50
Industrial Total	**1**	**50**
Residential		
C - Palisades Unit 6	1	13
D - Thunder Mountain	2	2.5
E - Timber Creek Townhomes	2	2
Residential Total	**5**	**17.5**
Grand Total	**7**	**197.5**

Source: Amador County

4.3 Hazard Profiles and Vulnerability Assessment

44 CFR Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the…location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.
44 CFR §201.6(c)(2)(i): [The risk assessment shall include a] description of the…location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.
44 CFR §201.6(c)(2)(ii): [The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.
44 CFR §201.6(c)(2)(ii)(A): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.
44 CFR §201.6(c)(2)(ii)(B): [The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate.
44 CFR §201.6(c)(2)(ii)(C): [The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

The hazards identified in Section 4.1 Hazard Identification, are profiled individually in this section. The Hazard Profiles set the stage for the Vulnerability Assessment, where the vulnerability is quantified, as data allows, for each of the identified hazards.

Hazard Profiles Methodology

Each hazard is profiled in the following format:

- **Hazard/Problem Description**—This section gives a description of the hazard and associated issues followed by details on the hazard specific to the Amador County Planning Area and unincorporated Amador County. Where known, this includes information on the hazard extent, location, seasonal patterns, speed of onset/duration, and magnitude and/or any secondary effects.
- **Past Occurrences**—This section contains information on historical incidents, including impacts where known. Hazard research, historical incident worksheets and other input from the Hazard Mitigation Planning Committee were used to capture information on past occurrences.
- **Likelihood of Future Occurrence**—The frequency of past events is used in this section to gauge the likelihood of future occurrences. Where possible, frequency was calculated based on existing data. It was determined by dividing the number of events observed by the number of years on record and multiplying by 100. This gives the percent chance of the event happening in any given year (e.g., three droughts over a 30-year period equates to a 10 percent chance of experiencing a drought in any given year). The likelihood of future occurrences is categorized into one of the following classifications:
  - ✓ **Highly Likely**—Near 100 percent chance of occurrence in next year or happens every year.
  - ✓ **Likely**—Between 10 and 100 percent chance of occurrence in next year or has a recurrence interval of 10 years or less.

- ✓ **Occasional**—Between 1 and 10 percent chance of occurrence in the next year or has a recurrence interval of 11 to 100 years.
- ✓ **Unlikely**—Less than 1 percent chance of occurrence in next 100 years or has a recurrence interval of greater than every 100 years.

- ➢ **Climate Change**—This section contains the effects of climate change (as applicable). The possible influence of climate change on the hazard is discussed.

Vulnerability Assessment Methodology

With the Amador County Planning Area's hazards identified and profiled, a vulnerability assessment was conducted to describe the vulnerability and impact that each hazard would have on the Amador County Planning Area and specific to each jurisdiction. The vulnerability assessment quantifies, to the extent feasible using best available data, assets at risk to identified hazards and estimates potential losses. This section focuses on the vulnerabilities of the Amador County Planning Area as a whole and specific to unincorporated Amador County. The vulnerability assessment is done in the following format:

- ➢ **General Vulnerability Discussion** – An assessment of the vulnerability of Amador County Planning Area to each hazard is provided in addition to the estimate of the risk of future occurrence. This is followed by a general discussion of the hazard and its vulnerability on the unincorporated Amador County. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into one of the following classifications:
  - ✓ **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
  - ✓ **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
  - ✓ **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
  - ✓ **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
  - ✓ **Extremely High**—Very widespread with catastrophic impact.
- ➢ **Local Concerns** – This includes information on how unincorporated Amador County is uniquely affected by or vulnerable to each hazard. Information contained in this section also supports the resulting mitigation strategy for the unincorporated County. Local concerns section specific to each of the other participating jurisdictions are included in their jurisdictional annexes to this Plan.
- ➢ **Assets at Risk** – A discussion of the assets at risk follows. This includes sections on: People and Populations; Structures; Critical Facilities and Infrastructure; and Natural, Historic, and Cultural Resources. These are discussed in specific terms for mapped hazards, and in more general terms for those hazards that are unmapped.
  - ✓ **FEMA NRI Hazard Vulnerability** – For each hazard in the FEMA National Risk Index in Amador County, the relevant portions of the hazard analysis done by FEMA is presented. This includes the Hazard Risk Index Rating, Expected Annual Loss Values, Exposure Values, and the Historic Loss Ratio Rating.

- **Impacts** – A discussion on hazard impacts is included. Impacts describe how each hazard can affect the County and its assets. The type and severity of impacts reflect both the potential magnitude of the hazard and the vulnerability of the asset.
- **Future Conditions/Future Development** – A discussion of how future conditions will influence or affect the hazard over time is included here and considers factors related to climate change, changes in population patterns, and changes in land use and development. This section also discusses future development plans relative to each hazard as well as mitigating measures that should be considered in the development process. Future conditions and future development is addressed specifically for mapped hazards, and in more general terms for those hazards that are unmapped.

Existing Built Environment and Assets at Risk

Vulnerability can be quantified in those instances where there is a known, identified hazard area, such as a mapped floodplain. In these instances, the numbers and types of assets subject to the identified hazard can be counted and their values tabulated. Other information can be collected in regard to the hazard area, such as the location of critical facilities, historic structures, and valued natural resources. Together, this information conveys the impact, or vulnerability, of the Amador County Planning Area and unincorporated Amador County to that hazard.

The vulnerability assessment identified five hazards in the Amador County Planning Area for which specific geographical hazard areas have been defined and for which sufficient data exists to support a quantifiable vulnerability analysis. These five hazards are:

- Dam Failure
- Earthquake
- Flood: 1%/0.2%
- Landslide, Mudslides, and Debris Flows
- Wildfire

These hazards were analyzed using GIS, Amador County data, and hazard data.

The vulnerability and potential impacts from the nine priority hazards that do not have specific mapped areas nor the data to support additional vulnerability analysis are discussed in more general terms. These include:

- Agricultural Hazards
- Avalanche
- Climate Change
- Drought and Water Shortage
- Flood: Localized/Stormwater
- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rain and Storms
- Severe Weather: High Winds and Tornadoes

Power Outages/Failure: A Common Vulnerability of all Hazards

An additional impact or vulnerability common to most all hazards is power outage or power failure. The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the Department of Energy, major blackouts are on the upswing. Over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. Electric power disruptions can be generally grouped into two categories: intentional and unintentional.

Intentional Disruptions

There are four types of intentional disruptions:

- **Planned**: Some disruptions are intentional and can be scheduled based on maintenance or upgrading needs.
- **Unscheduled**: Some intentional disruptions must be done "on the spot." in response to an emergency.
- **Demand-Side Management**: Some customers (i.e., on the demand side) have entered into an agreement with their utility provider to curtail their demand for electricity during periods of peak system loads.
- **Load Shedding**: When the power system is under extreme stress due to heavy demand and/or failure of critical components, it is sometimes necessary to intentionally interrupt the service to selected customers to prevent the entire system from collapsing, resulting in rolling blackouts.

The California Independent System Operator (CAISO) is tasked with managing the power distribution grid that supplies most of California, except in areas served by municipal utilities. CAISO is thus the entity that coordinates statewide flow of electrical supply. CAISO uses a series of stage alerts to the media based on system conditions. The alerts are:

- Stage 1 – reserve margin falls below 7 percent
- Stage 2 – reserve margin falls below 5 percent
- Stage 3 – reserve margin falls below 1.5 percent

Rotating blackouts become a possibility when Stage 3 is reached. Rotating outages and/or blackouts such as those experienced in 2000/2001 and 2006 can occur due to losses in transmission or generation and/or extremely severe temperatures that lead to heavy electric power consumption. Key California events include the following:

On January 17, 2001, CAISO declared a Stage 3 Emergency and notified the then Governor's Office of Emergency Services that PG&E was dropping firm load of 500 megawatts (MW) in Northern California leading to rolling blackouts. Cal OES, in turn, issued an Electrical Emergency Message to all Emergency Services Agencies to prepare for rolling blackouts. This scenario was repeated the following day, January 18, 2001, and again on March 19, 2001.

A July 2006 heat storm event affected the entire state as well as most of the West, producing record energy demand levels in California. The State was able to avoid rotating outages due to a combination of favorable

factors that included no major transmission outages, lower than typical generator outages, significant customer response to pleas for energy conservation, high imports from the Pacific Northwest despite unusually high loads, outstanding cooperation among western control area operators, and prompt response to fires that potentially threatened major interties. However, the event brought to light the vulnerability of the electric distribution system, as over 3,500 distribution transformers failed, leaving over two million customers without power at various times over the ten-day event, many for several hours and a small minority for up to three days.

In 2020, the state battled both extreme heat and wildfires. As a result of extreme heat, the CAISO declared a Stage 3 emergency. PG&E initiated rotating outages in August at the request of California's grid operator. The outages, which impacted 220,000 customers, occurred during periods of high heat. These rolling blackouts lasted less than a week.

Unintentional Disruptions

Unintentional or unplanned disruptions are outages that come with essentially no advance notice. This type of disruption can be the most problematic. The following are categories of unplanned disruptions:

- Accident by the utility, utility contractor, or others
- Malfunction or equipment failure
- Equipment overload (utility company or customer)
- Reduced capability (equipment that cannot operate within its design criteria)
- Tree contact other than from storms
- Vandalism or intentional damage
- Weather, including lightning, wind, earthquake, flood, and broken tree limbs taking down power lines
- Wildfire that damages transmission lines

Public Safety Power Shutoff

A new intentional disruption type of power shortage/failure event has recently occurred in California. In recent years, several wildfires have started as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), coordinated to prepare all Californians for the threat of wildfires and power outages during times of extreme weather. To help protect customers and communities during extreme weather events, electric power may be shut off for public safety in an effort to prevent a wildfire. This is called a Public Safety Power Shutoff (PSPS).

Public Safety Power Shutoff Criteria

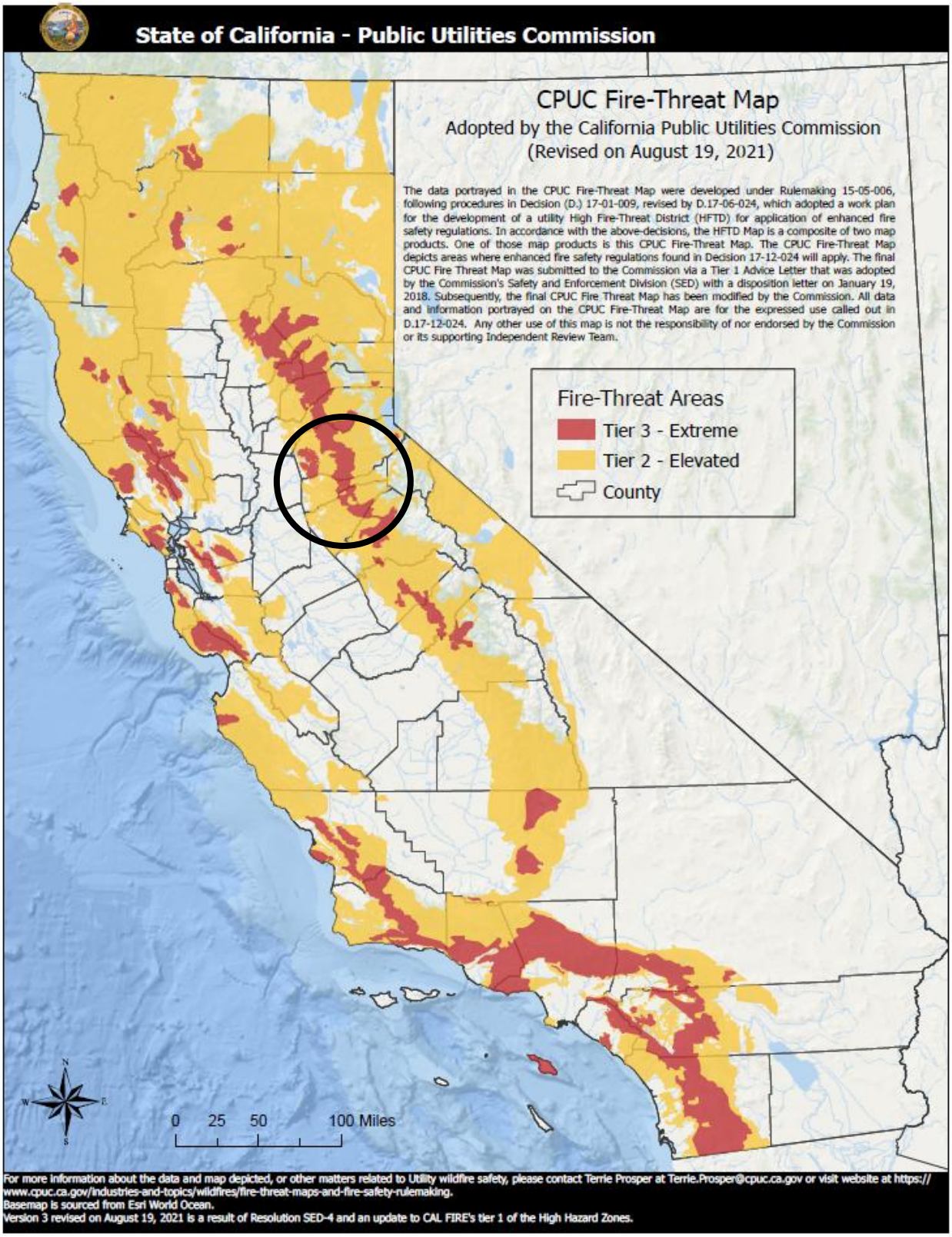
The Wildfire Safety Operations Center (WSOC) monitors fire danger conditions across PG&E's service area, including PSPS conditions. These factors include:

- A Red Flag Warning declared by the National Weather Service
- Low humidity levels generally 20% and below
- Forecasted sustained winds generally above 25 mph and wind gusts in excess of approximately 45 mph, depending on location and site-specific conditions such as temperature, terrain and local climate
- Condition of dry fuel on the ground and live vegetation (moisture content)

- On-the-ground, real time observations from PG&E's WSOC and field observations from PG&E crews

The most likely electric lines to be considered for shutting off for safety will be those that pass through areas that have been designated by the CPUC as at elevated (Tier 2) or extreme (Tier 3) risk for wildfire (seen on Figure 4-22). This includes both distribution and transmission lines. The specific area and number of affected customers will depend on forecasted weather conditions and which circuits PG&E needs to turn off for public safety. Although a customer may not live or work in a high fire-threat area, their power may also be shut off if their community relies upon a line that passes through an area experiencing extreme fire danger conditions. This means that any customer who receives electric service from PG&E should be prepared for a possible PSPS. PSPS events, while preventative in nature, can cause a variety of issues related to the lack of power to those impacted by the PSPS. For the Amador County Planning Area, a significant concern is the impact to their communication systems as well as on other critical infrastructure and services. PSPS events also cause concerns for certain vulnerable populations. As seen on Figure 4-22, Amador County has areas inside the Tier 2 and Tier 3 areas, as well as areas outside of them.

Figure 4-22 State of California Tier 2 and 3 Areas



PG&E noted that extreme weather threats can change quickly. When possible, PG&E will provide customers with advance notice prior to turning off the power, as well as updates until power is restored. Timing of notifications (when possible) are:

- Approximately 48 hours before power is turned off
- Approximately 24 hours before power is turned off
- Just before power is turned off
- During the public safety outage
- Once power has been restored

Power outages that affect Amador County residents do happen, though these outages are becoming less frequent and are not sustained as long as past years. This is due to PG&E's hardening and undergrounding projects along with its enhanced vegetation management practices. During these outages, PG&E provides contacts and tools to assist the residents and officials with current outage information for planning purposes. PG&E works with county officials to assist and help mitigate outages affecting the residents of Amador County.

Public Safety Power Shutoffs (PSPS) are another tool that PG&E uses to help eliminate and minimize ignitions caused by objects coming in contact with electrical circuits and causing fires. Severe weather, such as high winds, low humidity, and dry vegetation are some of the key elements to trigger a PSPS event in high fire threat areas (Tier 2 & Tier 3). By proactively shutting off power in areas that are very prone and susceptible to catastrophic wildfires, PG&E can help minimize the chance of a fire caused by electrical infrastructure. PG&E doesn't take lightly the shutting off power to residents, business, and critical customers and has a strict protocol for these actions.

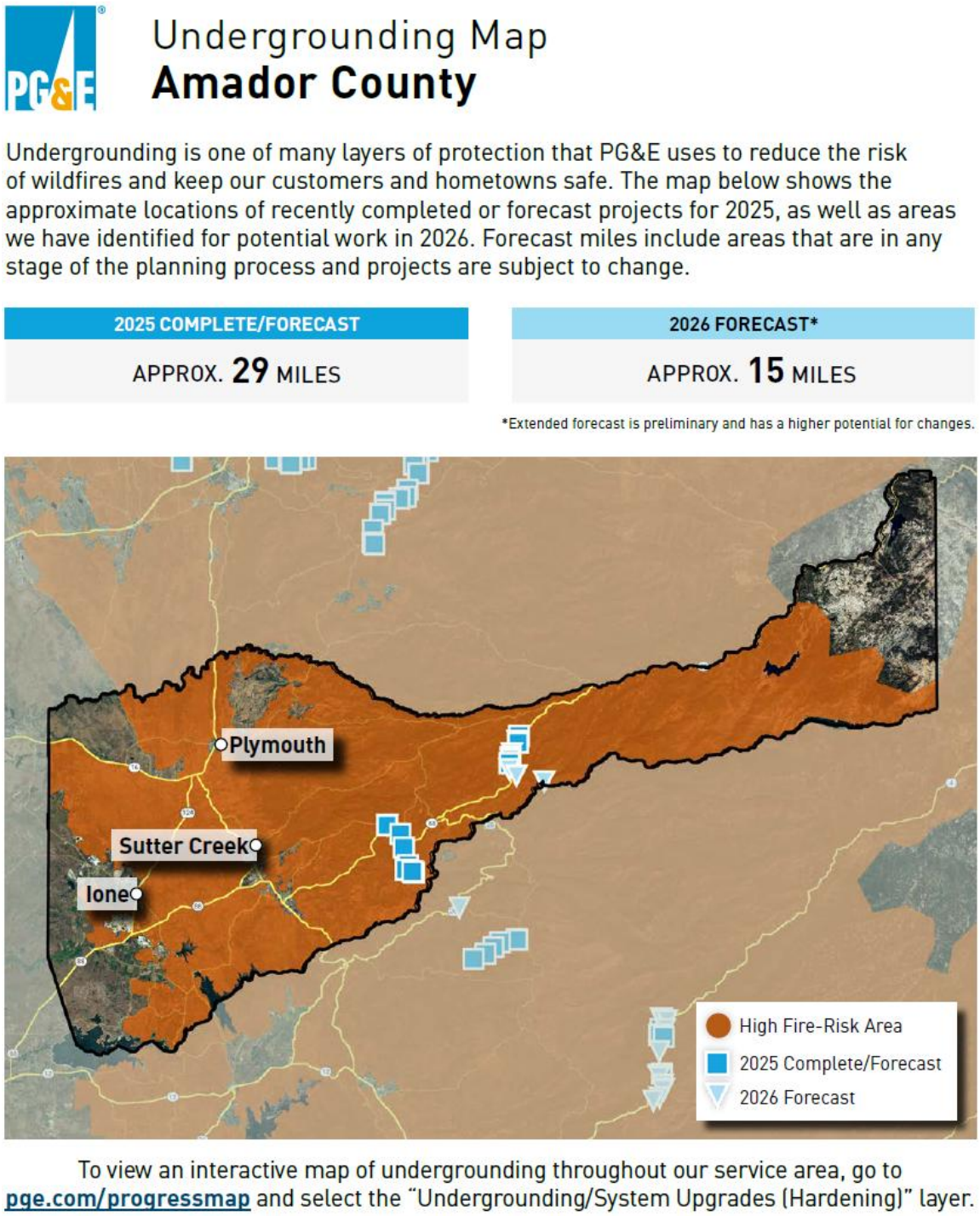
When a PSPS is forecasted, PG&E will notify County Emergency Management Agencies so they may monitor and make any plans they see needed. Customers affected will also get notified so they may also take steps to plan and make arrangements they deem necessary for the event. PG&E will support the customers with Community Resource Centers (CRC) near the affected areas of the PSPS and offer other programs to qualified customers. We will also work with the public safety agencies in the area to help mitigate any other issues related to the PSPS event. PG&E offers many tools to help assist the agencies in monitoring and planning for these events. The County noted that there have been events in the past where wildfires have not occurred, but wildfire conditions were high. During these times of high winds, high temps, and high wildfire risk, a PSPS occurred in the County. These events are discussed below and in each jurisdiction's respective annex to this Base Plan:

- Oct 9 – 12, 2019; 16,400 customers impacted.
- Oct 23 – 25, 2019; 10,400 customers impacted.
- Oct 26 - Nov 1, 2019; 18,800 customers impacted.

A search of the CPUC PSPS Dashboard showed no events since October of 2021. The HMPC noted no events between 2019 and 2021. It should be noted that "customers" in PG&E vernacular refer to both households or business addresses.

PG&E has started to underground more power lines to reduce wildfire risks. The most recent map for Amador County showing this progress is included in Figure 4-23.

Figure 4-23 Amador County – PG&E Undergrounding



Source: PG&E – January 2025.

It was also noted that PG&E is working to enhance its power network with Enhanced Powerline Safety Settings (EPSS) capable lines. EPSS are advanced safety settings. They allow PG&E powerlines to automatically turn off power within one-tenth of a second. This can happen when there is a hazard, like a tree branch falling into a powerline, which can cause a fire. These settings are in high fire-risk and surrounding areas. These have not yet been installed in and near the Amador County area, as PG&E focuses on other very high fire hazard areas in its service territory first. It is thought these EPSS capable lines will eventually come to the Amador County Planning Area.

Climate Change and Power Outages/Failures (Energy Shortage)

Changing climate is expected to bring more frequent and intense natural disasters. Key climate parameters are starting to move outside of historically observed variability at a rate that makes historical data a poor predictor of future climate. For example, the warmest years on record in California occurred in 2014, 2015, 2016, and 2019. 2023 was a remarkably hot year as well. In addition, the 2016-2017 year broke the record as the wettest ever recorded in the northern Sierra Nevada Mountains.

Changes in temperatures, precipitation patterns, extreme events, and sea level rise have the potential to decrease the efficiency of thermal power plants and substations, decrease the capacity of transmission lines, render hydropower less reliable, spur an increase in electricity demand, and put energy infrastructure at risk of flooding.

With climate warming, higher costs from increased demand for cooling in the summer are expected to outweigh the decreases in heating costs in the cooler seasons. Hotter temperatures in California will mean more energy (typically measured in "cooling-degree days") needed to cool homes and businesses both during heat waves and on a daily basis, during the daytime peak of the diurnal temperature cycle. During future heat waves, historically cooler coastal cities (e.g., San Francisco and Los Angeles) are projected to experience greater relative increases in temperature, such that areas that never before relied on air conditioning will experience new cooling demands.

Secondary impacts of energy shortages are most often felt by vulnerable populations. For example, those who rely on electric power for life-saving medical equipment, such as respirators, are extremely vulnerable to power outages. Also, during periods of extreme heat emergencies, the elderly and the very young are more vulnerable to the loss of cooling systems requiring power sources.

Additional impacts from a power disruption can also affect remote areas. This can affect evacuation messaging and coordination difficulties, and a reduction in firefighting capabilities due to lack of water access in more remote areas (especially for those on wells).

Hazard Profiles and Vulnerability Assessment by Hazard

The following sections provide the hazard profile and vulnerability assessments for each of the hazards identified in Section 4.1 Hazard Identification. ***The severe weather hazards are discussed first to paint the picture of the Amador County's Planning Area's climate and hazard environment which often lead to other hazards such as flood and wildfire. The remainder of the hazards follow alphabetically.***

Data Sources

In general, information provided by the County, participating jurisdictions, and the HMPC is integrated into this section with information from other data sources. The data sources listed below formed the basis for this Hazard Profiles portion of the plan. Where data and information from these studies, plans, reports, and other data sources were used, the source is referenced as appropriate throughout this risk assessment.

- 2014 California Natural Resources Report
- 2016 Amador County General Plan Conservation Element
- 2016 Amador County General Plan Safety Element
- 2017 California Adaptation Planning Guide
- 2020 Amador County LHMP Update
- 2020 US Census Bureau Average Household Size
- 2021 California Climate Adaptation Study
- 2023 Amador County Crop Report
- 2023 State of California Hazard Mitigation Plan
- 2024 Amador County Flood Insurance Study
- 2024 Amador County Parcel/Assessor Data
- Amador County Agricultural Commissioner
- Amador County Agricultural Commissioner Crop Reports (2020-2023)
- Amador County Archives
- Amador County Digital Flood Insurance Rate Map
- Amador County Emergency Operations Plan
- Amador County Fire Hazard Protection Plan Addendum, 2010
- Amador County Geographic Information Services
- Amador County Office of Emergency Management
- American Society of Civil Engineers
- Bureau of Land Management
- Cal Adapt – Extended Drought Scenarios
- CAL FIRE
- CAL FIRE (FHSZ SRA 2024, FHSZ FRA 2007)
- CAL FIRE (LRA 2025)
- Cal-Adapt
- Cal-Adapt – Number of Extreme Heat Days by Year
- Cal-Adapt – Precipitation: Decadal Averages Map
- Cal-Adapt – Temperature: Decadal Averages Map
- Cal-Adapt 2017/2023
- Cal-Adapt Climate Projections
- California Climate Adaptation Strategy
- California Department of Conservation's Farmland Mapping and Monitoring Program
- California Department of Public Health
- California Department of Water Resources
- California Department of Water Resources 2012-2016 California Drought: Historical Perspective
- California Department of Water Resources Best Available Maps
- California Department of Water Resources Division of Safety of Dams
- California Division of Mines and Geology

- California Geological Survey
- California Invasive Plant Council
- California Natural Resource Agency
- California Office of Emergency Services
- California Public Utilities Commission
- California's Adaptation Planning Guide: Understanding Regional Characteristics
- Center for Western Weather and Water Extremes
- Climate Change and Health Profile Report – Amador County
- Design-Magnitude Avalanche Mapping and Mitigation Analyses
- DSOD/Cal OES/NID Dam Status 1/25
- Federal Emergency Management Agency – DFIRM 1/20/2016
- Federal Emergency Management Agency – Disaster Declaration Database
- Federal Emergency Management Agency – National Flood Hazard Layer
- Federal Emergency Management Agency – Wind Zones in the United States
- Federal Emergency Management Agency: Building Performance Assessment: Oklahoma and Kansas Tornadoes
- Fire and Resource Assessment Program
- Foxweather.com
- Geology Open File Report 84-52 (1994)
- Hazus-MH 6.1
- Intergovernmental Panel on Climate Change
- Jackson Valley Irrigation District
- Multi-Hazard Identification and Risk Assessment, FEMA 1997
- National Aeronautics and Space Administration
- National Avalanche Center
- National Center for Atmospheric Research
- National Climate Assessment
- National Climatic Data Center Storm Events Database.
- National Drought Mitigation Center
- National Earthquake Information Center
- National Flood Insurance Program
- National Integrated Drought Information System
- National Inventory of Dams
- National Oceanic and Atmospheric Administration
- National Oceanic and Atmospheric Administration Storm Prediction Center
- National Oceanic and Atmospheric Administration's National Climatic Data Center
- National Park Service
- National Performance of Dams Program
- National Weather Service
- National Weather Service HeatRisk
- National Weather Service XMAC site
- Public Policy Institute of California
- Sierra Avalanche Center
- Smoke Impacts CA: 2020 Lessons – 2021 Actions
- State of California Department of Conservation Farmland Mapping and Monitoring Program
- Susceptibility to Deep-Seated Landslides map – CSG Map Sheet 58 (05/2011)

- UC Davis Health (Phillips MC, LaRocque RC, Thompson GR. Infectious Diseases in a Changing Climate. *JAMA.* 2024;331(15):1318–1319. doi:10.1001/jama.2023.27724)
- University of California, Berkeley's Department of Environmental Science, Policy, and Management
- US Army Corps of Engineers
- US Department of Agriculture
- US Department of Agriculture – Farm Service Agency Secretarial Disasters Declarations
- US Drought Monitor
- US Farm Service Agency
- US Fish and Wildlife Service
- US Forest Service
- US Geological Survey Earthquake Intensity Zonation and Quaternary Deposits, Miscellaneous Field Studies Map 9093, 1977
- US Geological Survey Emergency Assessment of Post-Fire Debris Flow Hazards
- US Geological Survey National Earthquake Information Center
- US Geological Survey Open File Report 2015-3009
- Vaisala National Lightning Detection Network
- Western Regional Climate Center

4.3.1. Severe Weather: General

Severe weather is generally any destructive weather event, but usually occurs throughout the Amador County Planning Area as temperature extremes, localized storms that bring heavy rain and strong winds, and other extreme weather events.

The National Oceanic and Atmospheric Administration's (NOAA's) National Climatic Data Center (NCDC) has been tracking severe weather since 1950. Their Storm Events Database contains data on the following: all weather events from 1993 to current (except from 6/1993-7/1993); and additional data from the Storm Prediction Center, which includes tornadoes (1950-1992), thunderstorm winds (1955-1992), and hail (1955-1992). This database contains 1,145 severe weather events that occurred in Amador County between January 1, 1950, and July 31, 2024. Table 4-22 summarizes these events.

Table 4-22 NCDC Severe Weather Events for Amador County 1950-7/31/2024*

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Avalanche	5	2	0	3	0	$0	$0
Blizzard	5	0	0	0	0	$0	$0
Cold/Wind Chill	41	0	0	0	0	$0	$0
Debris Flows	1	0	0	0	0	$100,000	$0
Dense Fog	18	9	9	44	19	$3,210,000	$0
Dense Smoke	2	0	0	0	0	$0	$0
Drought	158	0	0	0	0	$0	$1,500,000,000
Excessive Heat	43	12	2	2	0	$0	$0

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Extreme Cold/Wind Chill	3	0	0	0	0	$0	$0
Flash Flood	3	0	0	0	0	$0	$0
Flood	40	3	0	0	0	$4,450,000	$7,800,000
Frost/Freeze	17	0	0	0	0	$700,000	$25,000,000
Funnel Cloud	3	0	0	0	0	$0	$0
Hail	2	0	0	0	0	$0	$0
Heat	81	2	3	18	3	$0	$0
Heavy Rain	6	0	0	0	0	$0	$0
Heavy Snow	131	3	3	2	1	$1,225,000	$0
High Wind	91	3	0	6	0	$17,276,000	$48,000
Strong Wind	66	6	1	4	3	$6,219,100	$0
Thunderstorm Wind	3	0	0	0	0	$3,000	$0
Wildfire	48	5	0	32	32	$1,225,000	$0
Winter Storm	272	1	1	3	1	$191,000	$0
Winter Weather	106	1	3	0	2	$100	$0
Total	**1145**	**47**	**22**	**114**	**61**	**$34,599,200**	**$1,532,848,000**

Source: NCDC

*Note: Losses reflect totals for all impacted areas, some of which fell outside of Amador County

The NCDC table above summarizes severe weather events that occurred in Amador County. Only a few of the events actually resulted in federal and state disaster declarations. It is further interesting to note that different data sources capture different events during the same time period, and often display different information specific to the same events. While the HMPC recognizes these inconsistencies, they see the value this data provides in depicting the County's "big picture" hazard environment.

As previously mentioned, most all of Amador County's federal and state disaster declarations have been a result of severe weather. For this Plan Update, severe weather is discussed in the following subsections:

- Severe Weather: Extreme Cold, Freeze, and Snow
- Extreme Heat
- Heavy Rains and Storms
- High Winds and Tornadoes

Due to size of the County and changes in elevation (i.e., from approximately 250 feet to almost 10,000 feet above mean sea level (msl)) and climate, weather conditions can vary greatly across the County. For purposes of this Plan, the County will be divided into two distinct sections, as applicable: western Amador County, which is predominantly below an elevation of 2,000 feet above msl, is generally below the snowfall line, and includes the land to the west (including all incorporated communities); and eastern Amador County, which is generally above 2,000 feet above msl, and receives snowfall. The profiles that follow provide information, where possible, from two weather stations located in these two different parts of the

County: Sutter Hill Ranger Station (elevation: 1,580 feet above msl) in west Amador County and Twin Lakes Weather Station (elevation: 7,840 feet above msl), in eastern Amador County.

4.3.2. Severe Weather: Extreme Cold, Freeze, and Snow

Hazard Profile

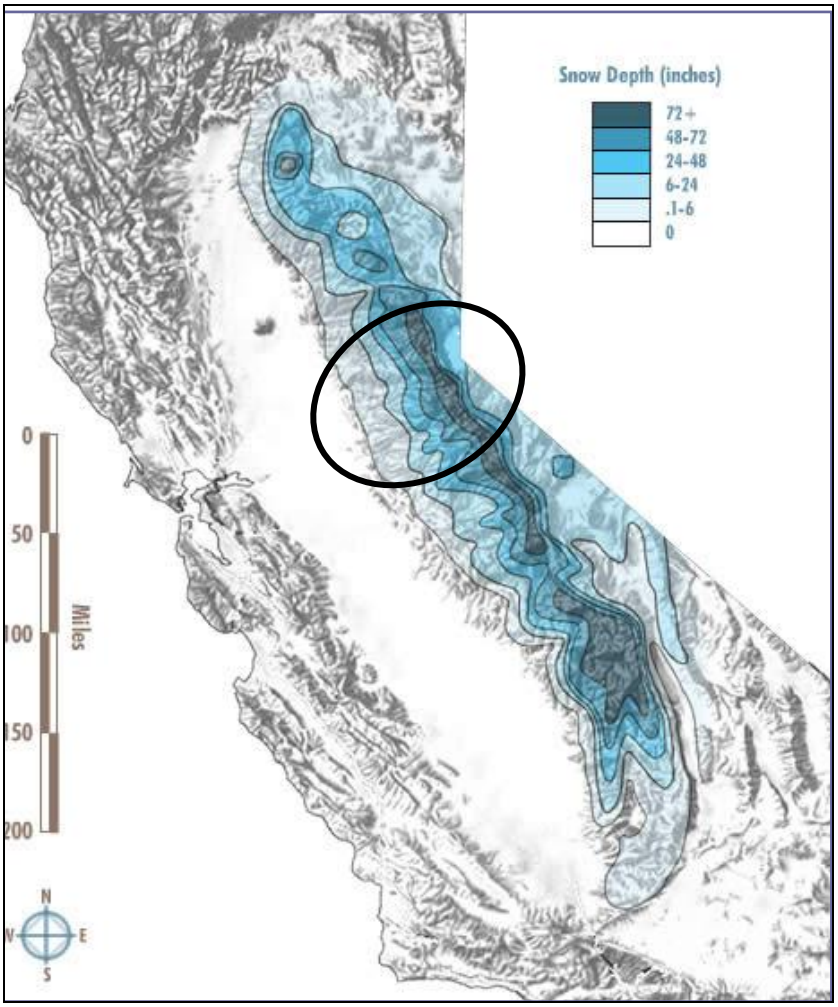
This hazard profile contains multiple sections that detail how this hazard can affect the Amador County Planning Area and unincorporated Amador County. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; likelihood of future occurrences; and how climate change can affect or influence this hazard.

Hazard/Problem Description

According to the National Weather Service (NWS) and the Western Regional Climate Center (WRCC), extreme cold often accompanies a winter storm (and snow event) or is left in its wake. Prolonged exposure to cold can cause frostbite or hypothermia and can be life-threatening. Infants and the elderly are most susceptible. Pipes may freeze and burst in homes or buildings that are poorly insulated or without heat. Freezing temperatures can cause significant damage to the agricultural industry. The effects of freezing temperatures on agriculture in Amador County are discussed further in Section 4.3.6 Agricultural Hazards.

Snowfall in the Sierras increases with elevation. The lower foothills rarely receive any measurable snow. Middle elevations receive a mix of snow and rain during the winter. Above about 6,000 ft., the majority of precipitation falls as snow. It is not unusual, in some locations, to have ten feet of snow on the ground for extended periods. Figure 4-24 shows the average maximum measured snow depth in the Sierra Nevada for the month of March (the month of greatest average snow depths).

Figure 4-24 Average Maximum Snow Depths of Sierra Nevada Mountains in March



Source: http://www.sierranevadaphotos.com. This image is no longer available publicly. It was retrieved for the 2015 and 2020 Amador County LHMPs.

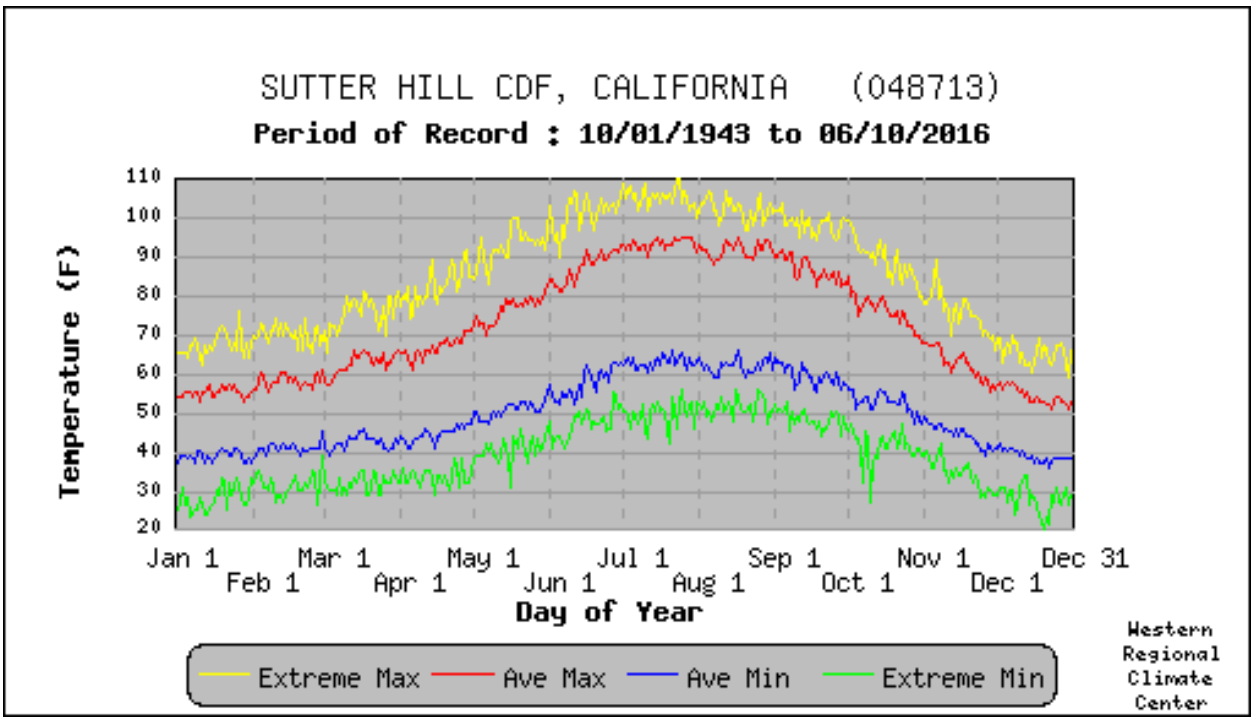
As discussed in Section 4.3.1 above, due to size of the County and changes in elevation and climate, weather conditions can vary greatly across the County. The profiles that follow provide information, where possible, from two weather stations located in these two different parts of the County: Sutter Hill Ranger Station (elevation: 1,580 feet above msl) in western Amador County and Twin Lakes Weather Station (elevation: 7,840 feet above msl), in eastern Amador County.

In addition to this difference in elevation in the County, it should be noted that the WRCC and NWS maintain data on weather normal and extremes in the western United States. Each of these data sources maintain data in slightly different ways. Data from the WRCC stopped being collected in April of 2016. NWS covers the entire time period to present. Therefore, both data sets are shown below. WRCC and NWS data for both the western and eastern County is summarized below.

Western Amador County—Sutter Hill Ranger Station Weather Station (WRCC), Period of Record 1943 to 2016

According to the WRCC, in western Amador County monthly average minimum temperatures from November through April range from the upper-30s to mid-50s. The lowest recorded daily extreme was 20°F on December 20, 1998. In a typical year, minimum temperatures fall below 32°F on 5.2 days with no days falling below 0°F. Table 4-23 shows the record low temperatures by month for western Amador County. Average daily temperatures for western Amador County are shown in Figure 4-25.

Figure 4-25 Western Amador County – Sutter Hill Ranger Station (WRCC) Daily Temperature Averages and Extremes 1943 to 2016



Source: Western Regional Climate Center. Retrieved 3/10/2025.

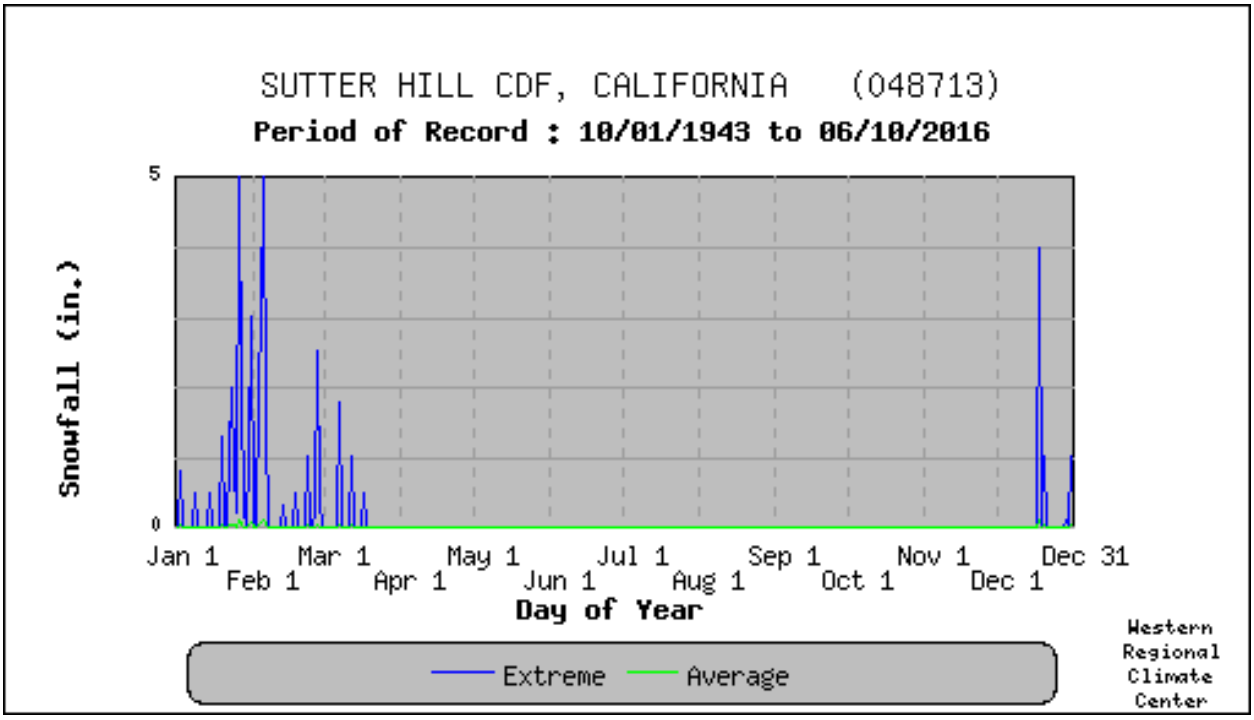
Table 4-23 Western Amador County – Sutter Hill Ranger Station (WRCC) Record Low Temperatures 1943 to 2016

Month	Record Low	Date	Month	Record Low	Date
January	23°	1/6/2007	July	42°	7/16/1999
February	26°	2/27/2011	August	47°	8/2/2010
March	28°	3/5/2009	September	44°	9/20/2004
April	29°	4/15/2009	October	32°	10/7/2011
May	31°	5/16/1999	November	28°	11/26/2006
June	41°	6/02/1999	December	20°	12/20/1998

Source: Western Regional Climate Center

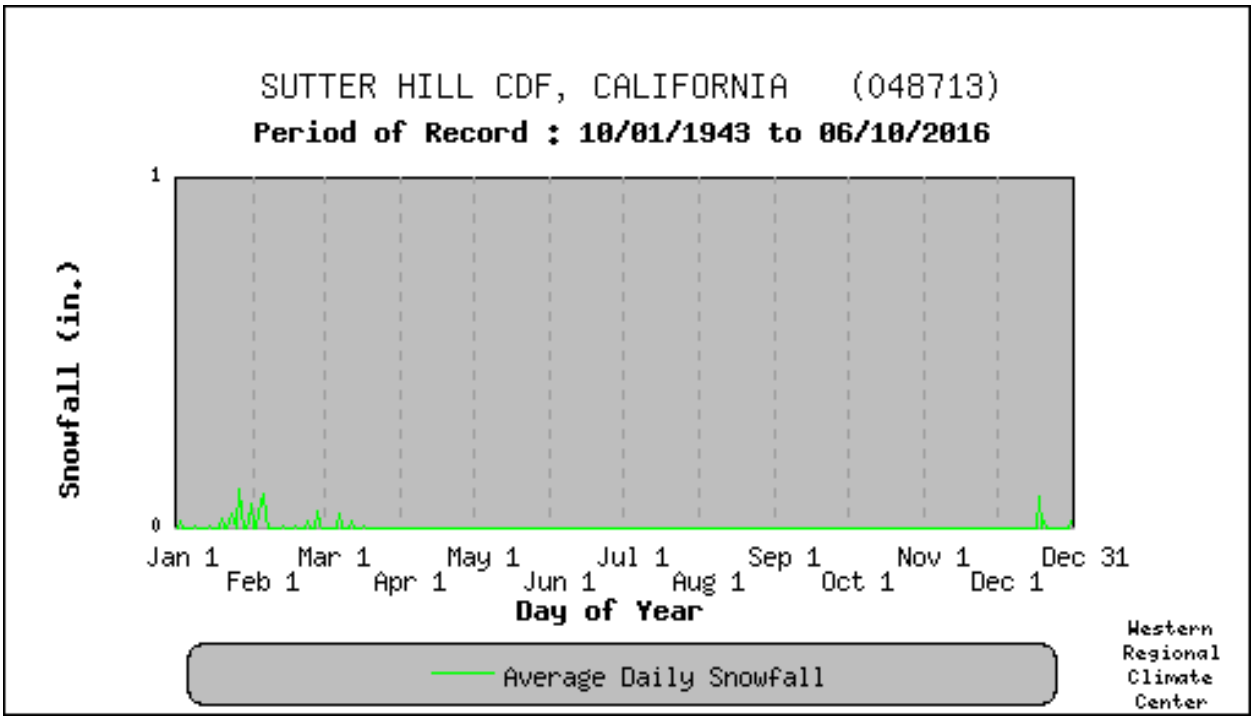
According to the WRCC, average snowfall on the western side of the County is 1.42 inches, as shown in Figure 4-26. The highest annual snowfall fell in 1967, when 9.0 inches fell. Highest monthly snowfall accumulation came in February of 1948, when 6.5 inches fell. Average snow depths in January through March are minimal. This can be seen in Figure 4-27.

Figure 4-26 Western Amador County – Sutter Hill Ranger Station (WRCC) Snowfall Averages and Extremes 1943 to 2016



Source: Western Regional Climate Center. Retrieved 3/10/2025.

Figure 4-27 Western Amador County – Sutter Hill Ranger Station (WRCC) Snow Depth Averages and Extremes 1943 to 2016



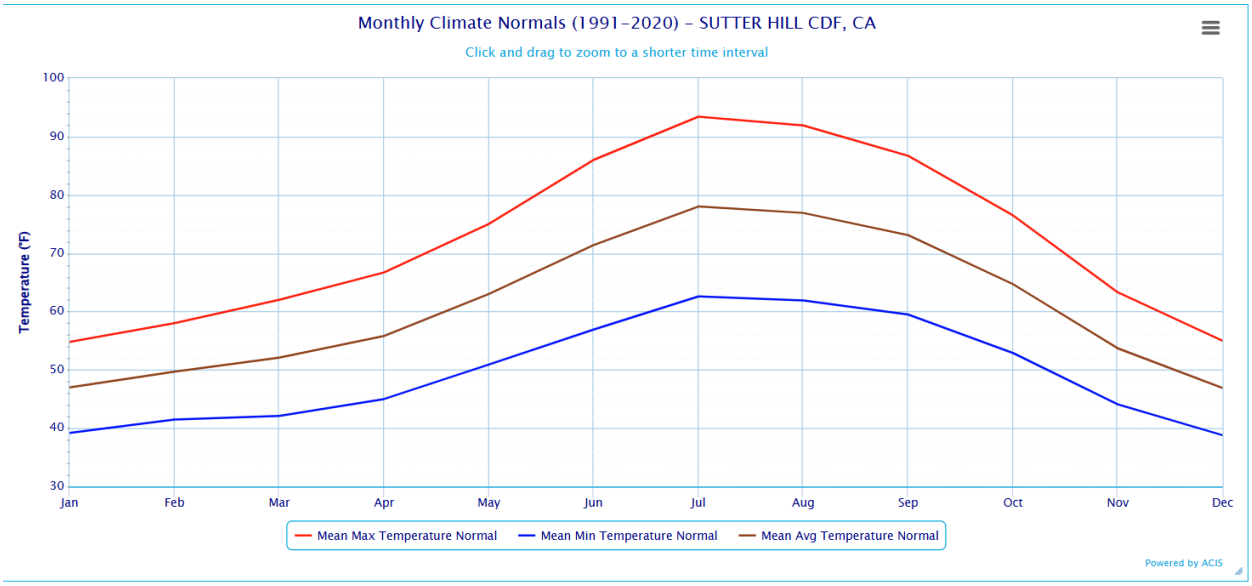
Source: Western Regional Climate Center. Retrieved 3/10/2025.

Western Amador County—Sutter Hill Ranger Station Weather Station (NWS), Period of Record 1943 to 2025

Note: While the overall period of record for this NWS station is 1943 to 2025, not all data is recorded for those dates. Snowfall is covered from 1943 to November 2024. Snow depth is covered from January 1947 to November 2024. Extreme temperatures are covered from December 1968 to February 2025.

According to the NWS, monthly average minimum temperatures in the coldest months (December through February) range from the mid-40s to mid-50s. The lowest recorded daily extreme was 20°F on December 20, 1998. Figure 4-28 shows the average daily low temperatures and extremes for the County. Table 4-24 shows the record low temperatures for the County.

Figure 4-28 Western Amador County – Sutter Hill Ranger Station (NWS) Daily Temperature Averages and Extremes, 1991-2020



Month	Mean Max Temperature Normal (°F)	Mean Min Temperature Normal (°F)	Mean Avg Temperature Normal (°F)
January	54.8	39.2	47.0
February	58.0	41.5	49.7
March	62.0	42.1	52.1
April	66.7	45.0	55.8
May	75.0	50.9	63.0
June	86.0	56.9	71.4
July	93.4	62.6	78.0
August	91.9	61.9	76.9
September	86.7	59.5	73.1
October	76.5	52.9	64.7
November	63.3	44.1	53.7
December	55.0	38.8	46.9
Annual	72.4	49.6	61.0

Source: National Weather Service XMAC site. Retrieved 3/12/2025

Table 4-24 Western Amador County – Sutter Hill Ranger Station (NWS) Record Low Temperatures 1968 to 2025

Temperature	Date
20.0°	12/20/1998
21.0°	12/22/1998
22.0°	12/19/2006
23.0°	12/20/2008
23.0°	1/6/2007
23.0°	12/18/2006
23.0°	12/21/1968
24.0°	3/2/2023
24.0°	2/25/2023

Temperature	Date
24.0°	12/8/2009

Source: National Weather Service XMAC site. Retrieved 3/12/2025

Table 4-25 shows historical data of the highest daily snowfall on January 26, 1957, when 5.0 inches fell. The maximum snow depth came on the same day, with a depth of 4.0 inches. This can be seen in Table 4-26. There was no available data for monthly average snowfall.

Table 4-25 Western Amador County –Sutter Hill Ranger Station (NWS) Highest Daily Snowfall 1943 to 2025

Snowfall in Inches	Date
5.0	1/26/1957
5.0	2/5/1948
4.0	12/18/1967
3.0	1/31/1968
3.0	2/4/21946
2.5	2/27/1951
2.0	1/27/1968
2.0	2/3/1949
2.0	1/23/1949
1.8	3/7/1952

Source: National Weather Service XMAC site. Retrieved 3/12/2025

Table 4-26 Western Amador County – Sutter Hill Ranger Station (NWS) Maximum Snow Depth 1947 to 2025

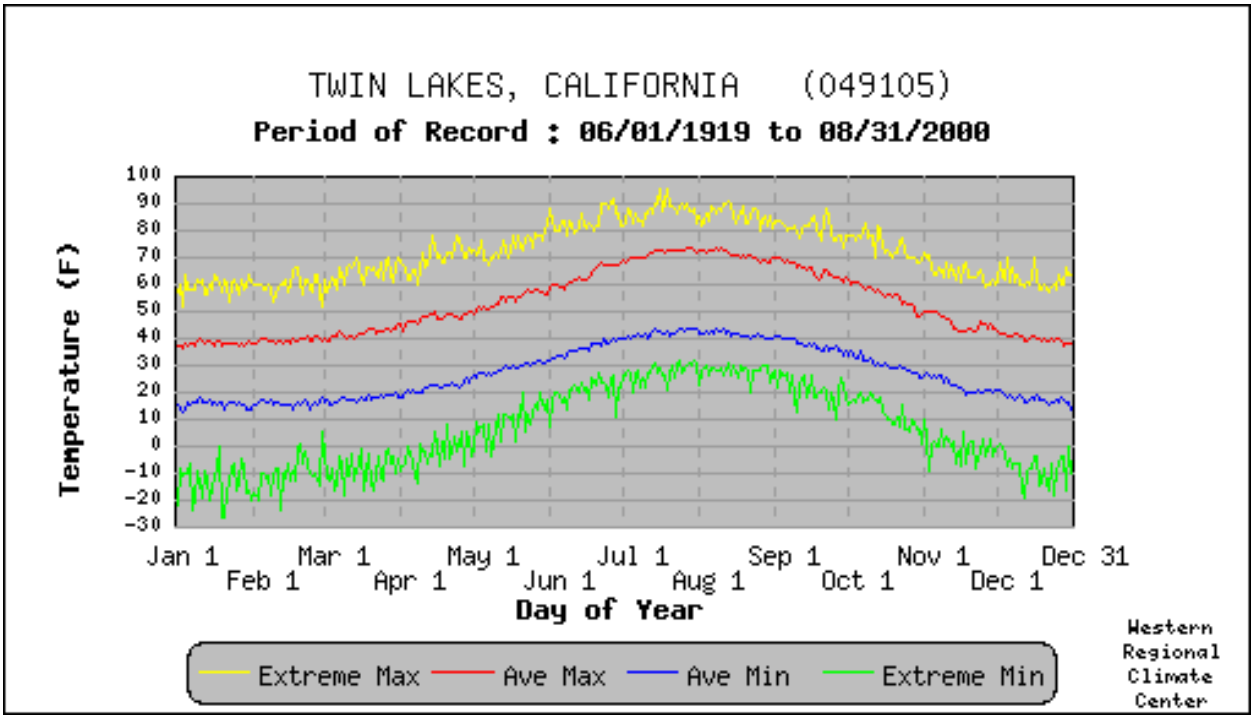
Snow Depth in Inches	Date
4.0	1/26/1957
4.0	1/24/1949
4.0	2/6/1948
4.0	2/5/1948
3.0	1/23/1949
2.0	12/18/1967
2.0	1/27/1957
2.0	3/7/1952
2.0	2/3/1949
2.0	1/28/1947

Source: National Weather Service XMAC site. Retrieved 3/12/2025

Eastern Amador County—Twin Lakes Weather Station (WRCC), Period of Record 1919 to 2000

According to the WRCC, in eastern Amador County monthly average minimum temperatures from November through April range from the mid-10s to mid-20s. The lowest recorded daily extreme was -26°F on January 19, 1937. In a typical year, minimum temperatures fall below 32°F on 231.4 days with 8.5 days falling below 0°F. Table 4-27 shows the record low temperatures by month for eastern Amador County. Average daily temperatures for eastern Amador County are shown in Figure 4-29.

Figure 4-29 Eastern Amador County— Twin Lakes (WRCC) Daily Temperature Averages and Extremes 1919 to 2000



Source: Western Regional Climate Center. Retrieved 3/11/2025.

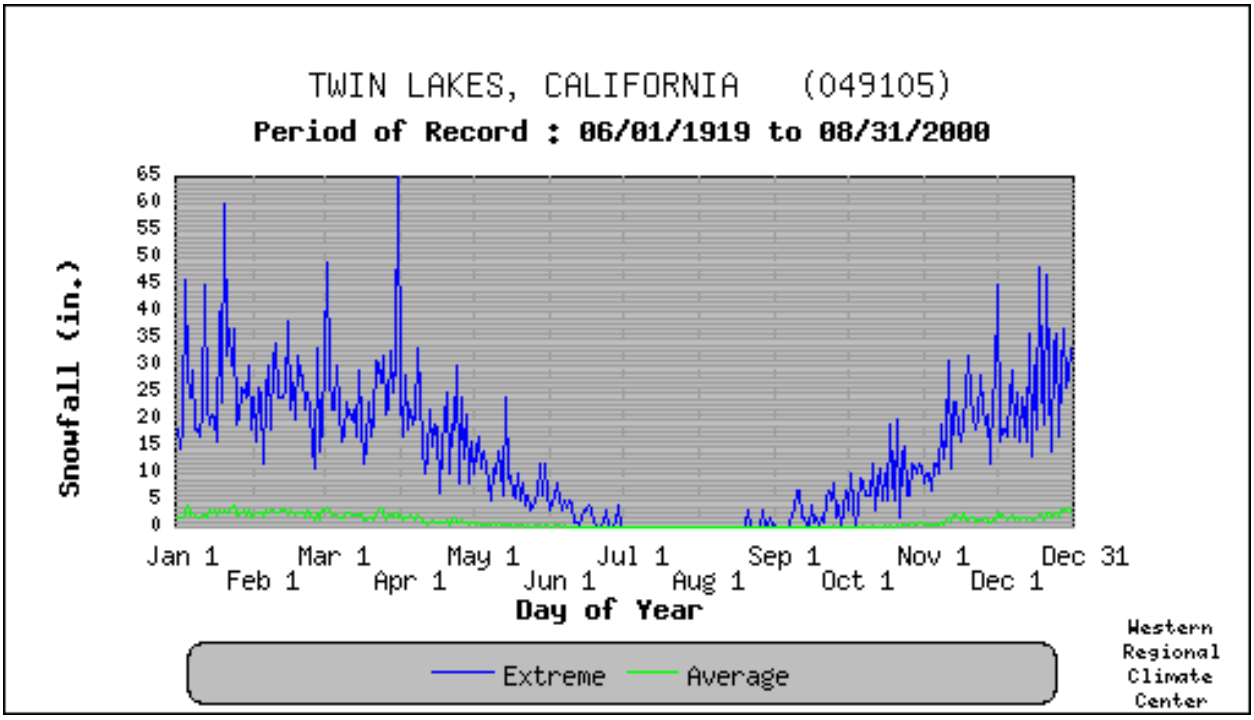
Table 4-27 Eastern Amador County – Twin Lakes (WRCC) Record Low Temperatures 1919 to 2000

Month	Record Low	Date	Month	Record Low	Date
January	-26°	1/19/1937	July	19°	7/1/1997
February	-24°	2/12/1949	August	20°	8/22/1947
March	-18°	3/9/1935	September	7°	9/25/1934
April	-14°	4/8/1929	October	1°	10/31/1935
May	-4°	5/8/1933	November	-9°	11/3/1935
June	7°	6/1/1929	December	-19°	12/12/1932

Source: Western Regional Climate Center

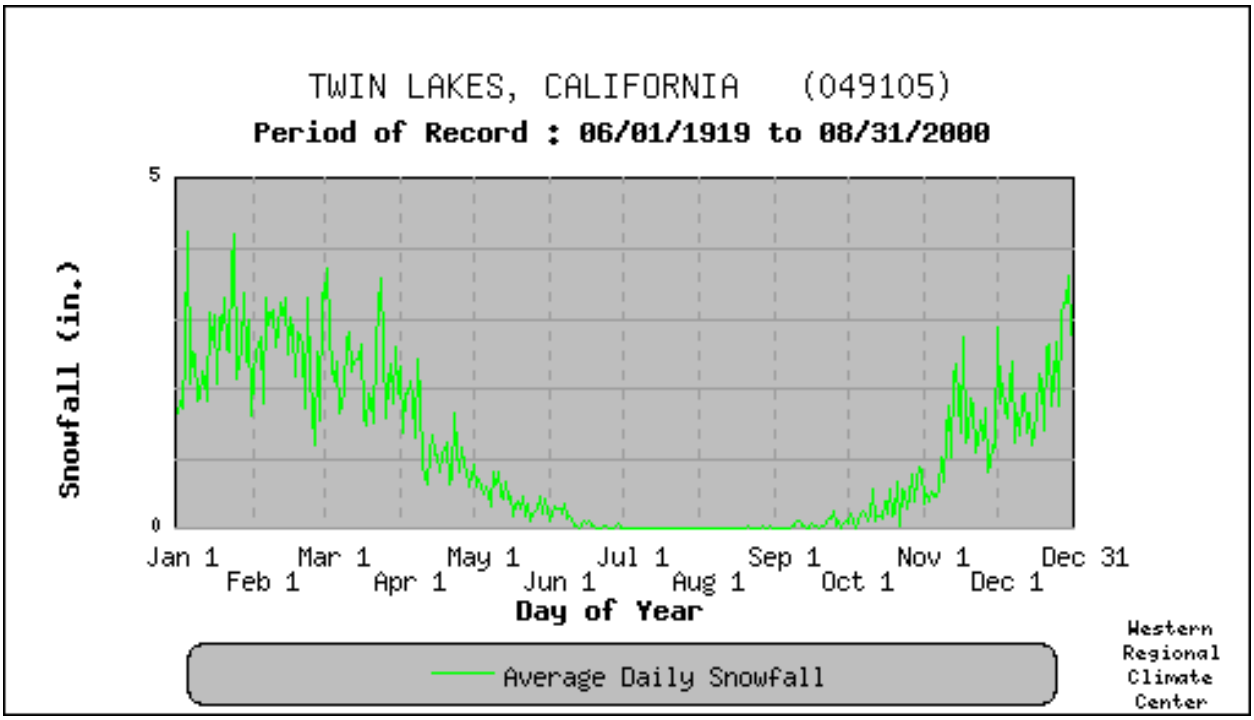
According to the WRCC, average snowfall on the eastern side of the County is 380.2 inches, as shown in Figure 4-26. The highest annual snowfall fell in 1982, when 693.4 inches fell. Highest monthly snowfall accumulation came in February of 1920, when 266.0 inches fell. Average snow depths in January through March vary from 48 to 76 inches. This can be seen in Figure 4-27.

Figure 4-30 Eastern Amador County – Twin Lakes (WRCC) Snowfall Averages and Extremes 1919 to 2000



Source: Western Regional Climate Center. Retrieved 3/11/2025.

Figure 4-31 Eastern Amador County – Twin Lakes (WRCC) Snow Depth Averages and Extremes 1919 to 2000



Source: Western Regional Climate Center. Retrieved 3/11/2025.

Eastern Amador County—NWS Twin Lakes Weather Station, Period of Record 1919 to 2000

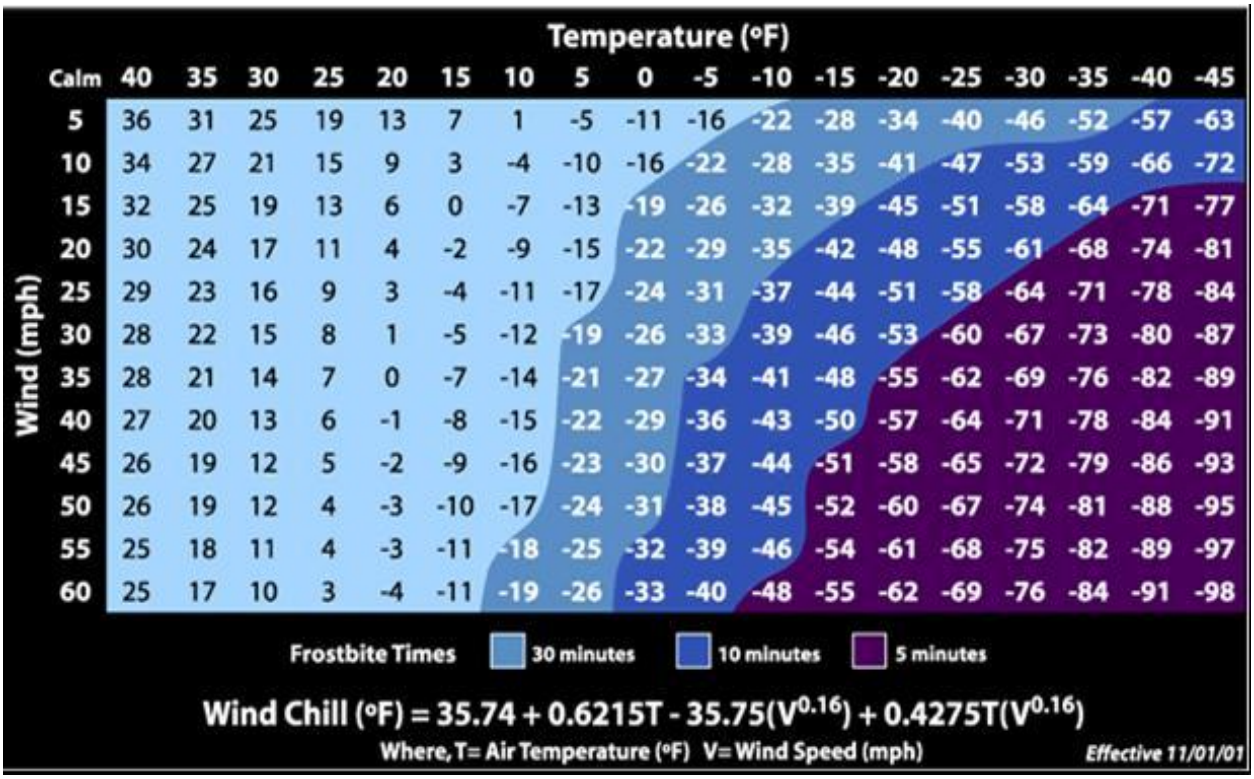
While the western Amador County weather station presented data using graphs, no graphing data was available for the Twin Lakes Weather station.

Location and Extent

Extreme cold and freeze events occur on a regional basis. Extreme cold can occur in any location of the County. All portions of the County are at risk to extreme cold, with the upper elevations of the County at greater risk.

In 2001, the NWS implemented an updated Wind Chill Temperature index (shown in Figure 4-32), which is reproduced below. This index was developed to describe the relative discomfort/danger resulting from the combination of wind and temperature. Wind chill is based on the rate of heat loss from exposed skin caused by wind and cold. As the wind increases, it draws heat from the body, driving down skin temperature and eventually the internal body temperature.

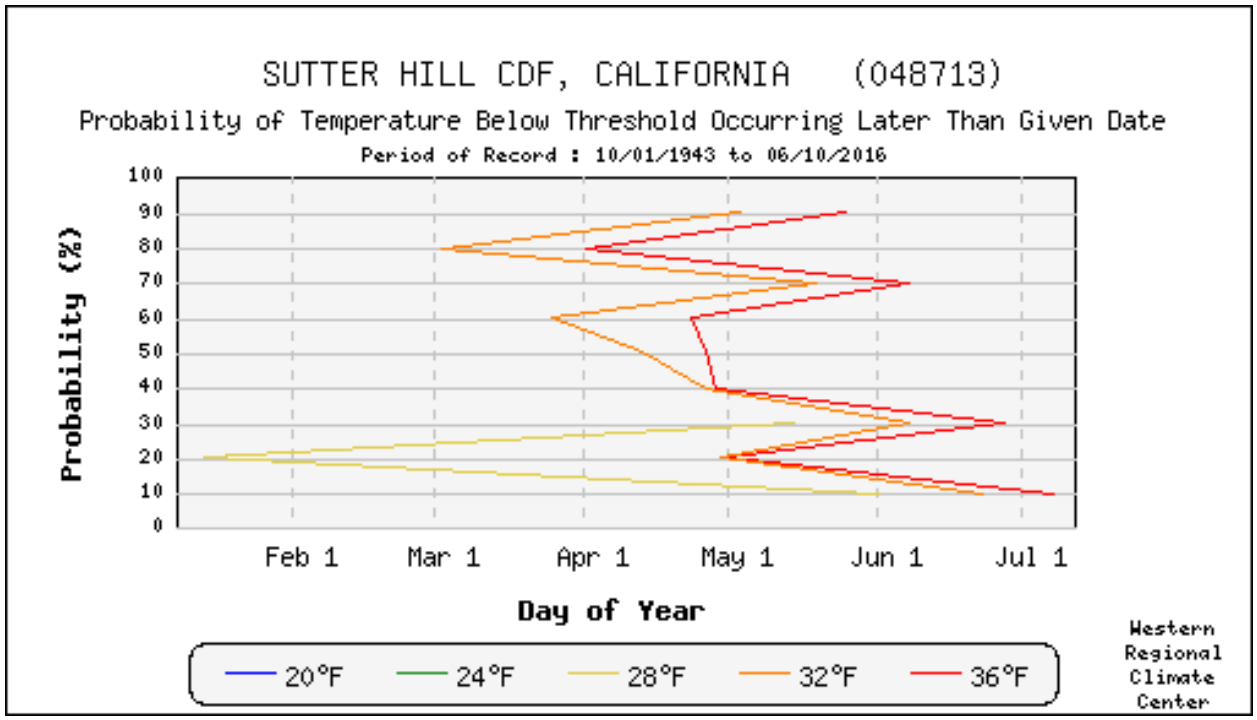
Figure 4-32 Wind Chill Temperature Chart



Source: National Weather Service

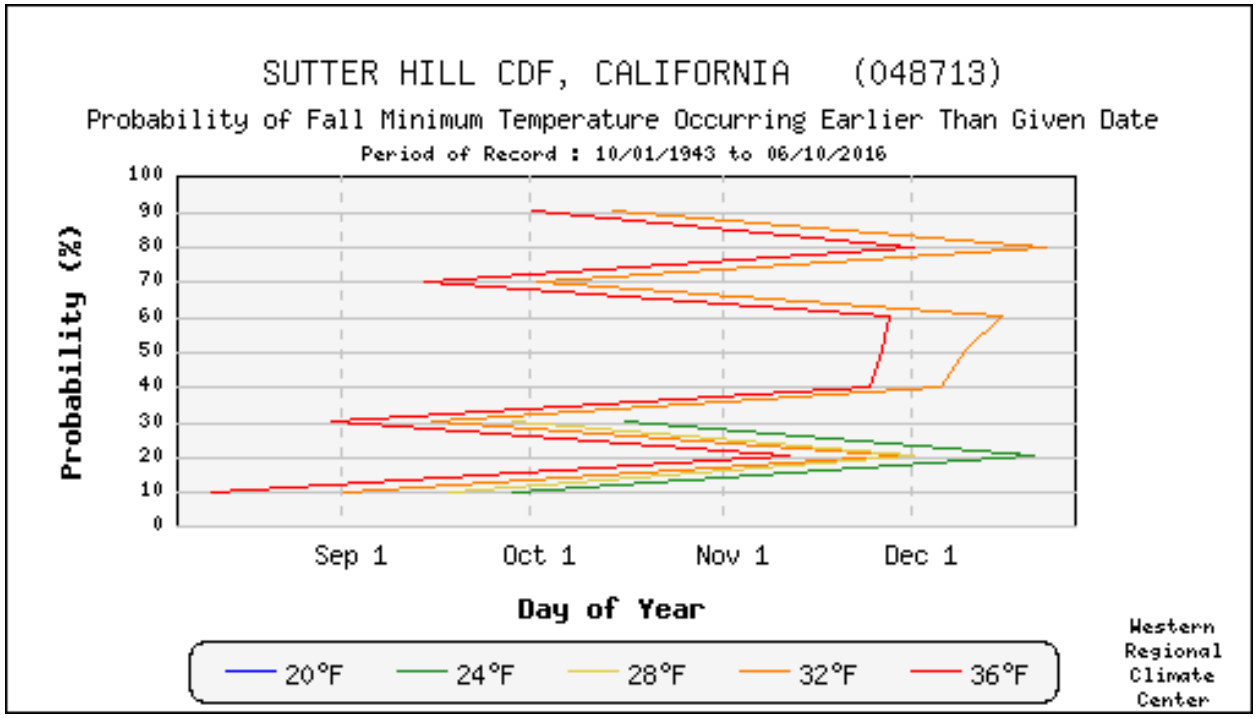
Extreme cold can affect agricultural products in the County. Freeze damages reduce the values of agricultural crops (discussed further in Section 4.3.6). While there is no scale (i.e. Richter, Enhanced Fujita) to measure the effects of freeze, temperature data from the County from the WRCC indicates that there are 25.1 days that fall below 32°F. ***Note***: there are no National Weather Service XMAC freeze probabilities, so only the WRCC is captured below. Freeze has a slow onset and can be generally be predicted in advance for the County. Freeze events can last for hours (in a cold overnight), or for days to weeks at a time. Figure 4-33 and Figure 4-34 show the probabilities in the western County of freeze for both spring and fall. There has not been a past occurrence of freeze in the months of May through September.

Figure 4-33 Western Amador County – Sutter Hill Ranger Station (WRCC) Spring Freeze Probabilities 1943 to 2016



Source: Western Regional Climate Center. Retrieved 3/11/2025.

Figure 4-34 Western Amador County – Sutter Hill Ranger Station (WRCC) Fall Freeze Probabilities 1943 to 2016

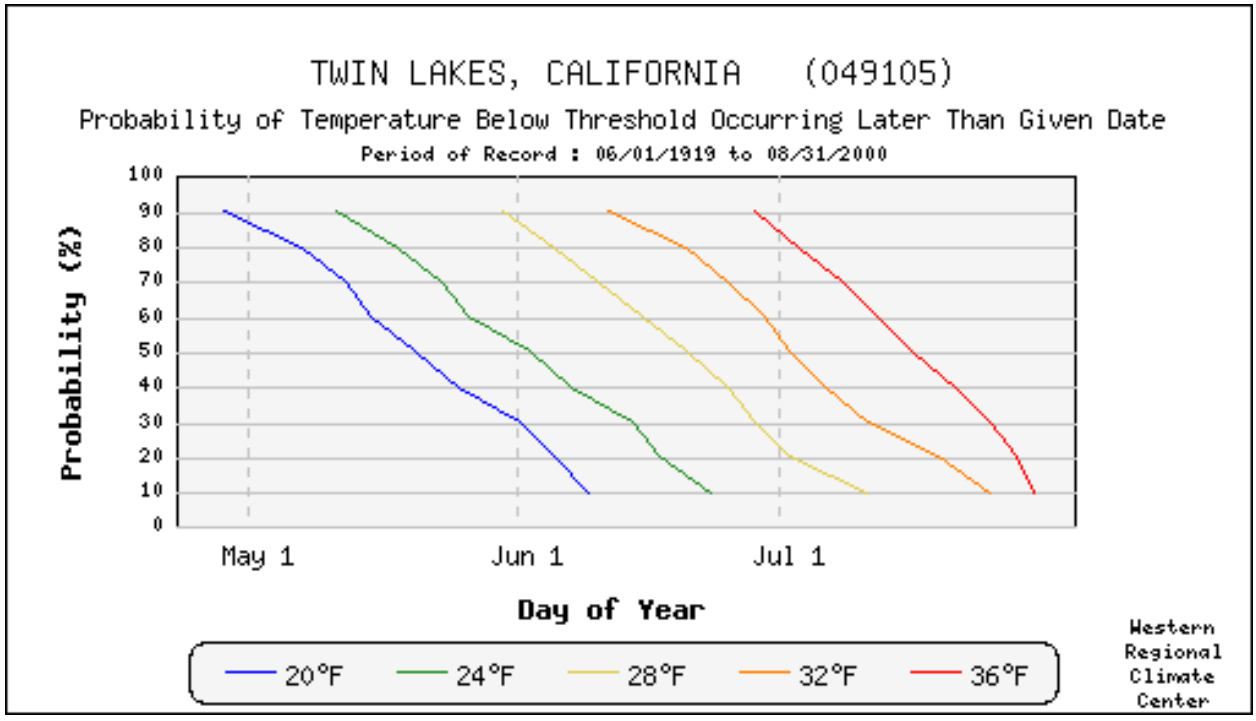


Source: Western Regional Climate Center. Retrieved 3/11/2025.

Figure 4-35 and Figure 4-36 show the probabilities in the eastern County of freeze for both spring and fall. There have been multiple past occurrences of freeze in the months of May through September. Average number of days below 32° by month are:

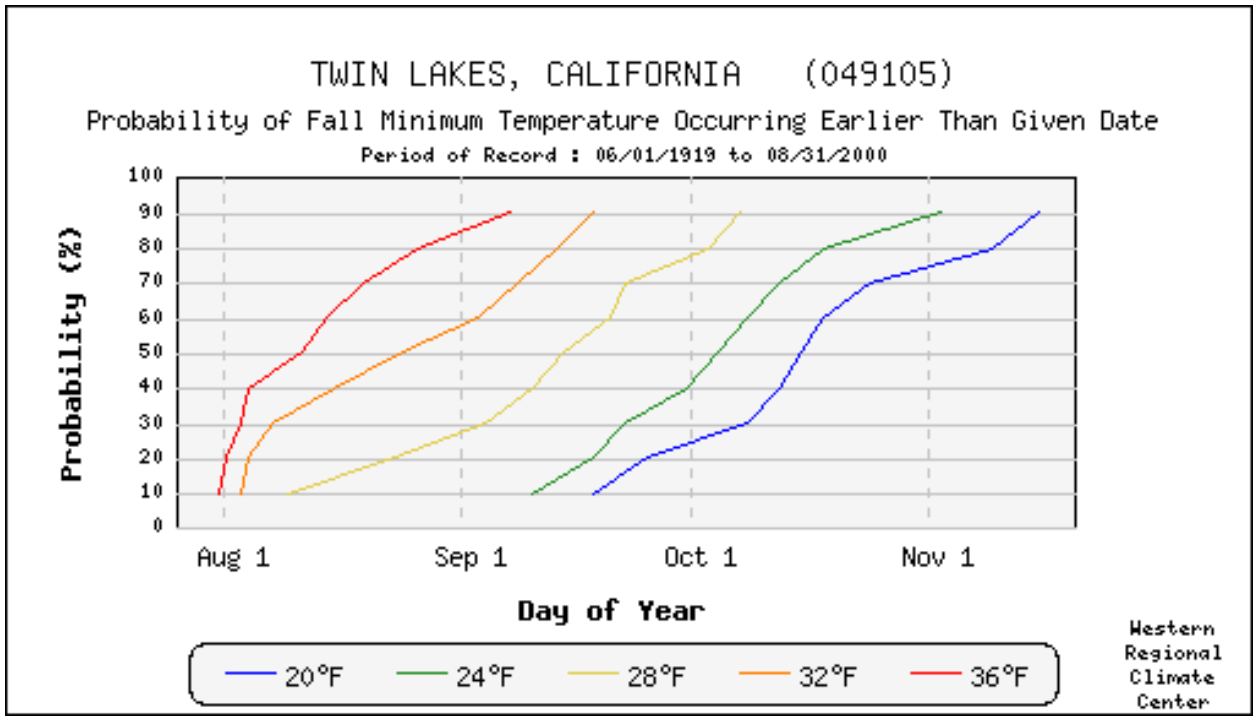
- May – 20.9 days
- June – 9.2 days
- July – 1.8 days
- August – 2.2 Days
- September – 6.5 days

Figure 4-35 Eastern Amador County – Twin Lakes (WRCC) Spring Freeze Probabilities 1919 to 2000



Source: Western Regional Climate Center. Retrieved 3/11/2025.

Figure 4-36 Eastern Amador County – Twin Lakes (WRCC) Fall Freeze Probabilities 1919 to 2000



Source: Western Regional Climate Center. Retrieved 3/11/2025.

Past Occurrences

Disaster Declaration History

The County has had no past federal and one past state disaster declaration for extreme cold and freeze. Table 4-28 shows the dates of the disaster declarations. More information on USDA disaster declarations (twice in 2022) from cold and freeze can be found in Table 4-48 in the Past Occurrences in Section 4.3.6.

Table 4-28 Amador County – Federal and State Disaster Declarations for Freeze 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Freeze	1	2007	0	

Source: Cal OES, FEMA

NCDC Events

The NCDC data shows 575 extreme cold, freeze, and snow incidents for Amador County since 1993. Information for these events is shown in Table 4-29.

*Table 4-29 NCDC Cold and Freeze Events for Amador County 1950-7/31/2024**

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Blizzard	5	0	0	0	0	$0	$0
Cold/Wind Chill	41	0	0	0	0	$0	$0
Extreme Cold/Wind Chill	3	0	0	0	0	$0	$0
Frost/Freeze	17	0	0	0	0	$700,000	$25,000,000
Heavy Snow	131	3	3	2	1	$1,225,000	$0
Winter Storm	272	1	1	3	1	$191,000	$0
Winter Weather	106	1	3	0	2	$100	$0
Total	**575**	**5**	**7**	**5**	**4**	**$2,116,100**	**$25,000,000**

Source: NCDC

*Note: Losses reflect totals for all impacted areas, some of which fell outside of Amador County

Hazard Mitigation Planning Committee Events

The HMPC noted that the heavy levels of snow in eastern Amador County combined with other inclement weather in the western portion of Amador County create many issues that impact the area. Extreme weather events associated with snow and blizzard events include those listed in previous tables and occur almost on an annual basis. Winter storms occur countywide and involve heavy rains, snow, ice, and high winds causing downed trees and power lines, power outages, accidents, and road closures. There are typically few injuries and limited damages. Most problems arise from snow packed roads, as well as downed trees and power lines. There have been instances where the Amador County Road Department crews have plowed non-stop for 72+ hours.

Specific events include the following:

In February of 2019, snowstorms occurred near Pioneer in Amador County. An elderly woman was trapped in her house without electricity. Amador County Sherriff's Deputies dug through knee high snow in order to remove the wheelchair bound woman from her home.

2023 - a hard freeze occurred in 2023, affected the Shenandoah area.

March 2023 Snow Deluge: The 2023 water year was marked by an extraordinary snow season across California, driven by cold temperatures and frequent atmospheric rivers. While specific snowfall totals for Amador County are not detailed, the Sierra Nevada, including areas near Amador, saw snowpack levels at 186–269% of normal.

In late February to early March 2024, large winter weather events occurred, but the County had prepared well for the incidents.

April 4, 2024, a cold spring storm prompted the Amador County Unified School District to close schools due to expected snowfall and hazardous road conditions. While exact snowfall amounts are not specified,

this event indicated measurable snow accumulation, likely in the range of a few inches to a foot in higher elevations like Pioneer.

Amador County Public Works noted no other incidents since 2020 where damages, injuries, or deaths occurred.

Likelihood of Future Occurrence

Highly Likely—Extreme cold, freeze, and snow are likely to continue to occur annually in the Amador County Planning Area, especially in the eastern portion of the County. In a typical year, minimum temperatures fall below 32°F on 231.4 days in eastern Amador County. Snow falls in the County every year. There have been 575 NCDC events since 1993. This equates to a likelihood of future occurrences being considered highly likely.

It is likely that climate change will decrease the chance of future occurrence as well as future impacts. More information on climate change and extreme cold, freeze, and snow can be found in the next section. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate Change and Extreme Cold and Freeze

According to the 2021 California Climate Adaptation Study (CAS), freezing spells are likely to become less frequent in California as climate temperatures increase. If emissions increase, freezing events could occur only once per decade in large portion of the State by the second half of the 21st century. According to a California Natural Resources Report in 2014, it was determined that while fewer freezing spells would decrease cold related health effects, too few freezes could lead to increased incidence of disease as vectors and pathogens do not die off. Recent studies, including a 2024 review from UC Davis Health, note that shorter, warmer winters reduce natural die-off of vectors and pathogens, increasing risks of diseases like Lyme disease, malaria, and fungal infections. Warmer conditions allow vectors to remain active longer, even into winter months, and expand into new regions.

Vulnerability Assessment

Vulnerability—Medium

Extreme cold, freeze, and snow events happen in the Amador County Planning Area each year. It can impact key assets in the Planning Area. The whole of the Planning Area has some measure of vulnerability to extreme cold, freeze, and snow. An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to unincorporated Amador County and the Amador County Planning Area. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect both the entire Amador County Planning Area as well as the unincorporated portions of Amador County. How the hazard affects the other participating jurisdictions can be found in their respective annexes to this LHMP Update. These sections below include assets at risk, impacts, and how future development may affect the vulnerability of the County to this hazard.

Local Concerns (unincorporated Amador County)

The unincorporated County has specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerabilities to this hazard.

The varying elevations in the County, in part, determine the extent to which a given area is affected by freeze, cold, and snow. The agricultural industry is especially vulnerable to extreme temperatures. Freezing temperatures can cause significant loss to crops. Historically, extreme cold and freeze have caused losses to agricultural crops and have resulted in USDA disaster declarations including the two noted above in the Past Occurrences section.

Heavy snow events occur on an annual basis in the higher elevations of the County. Snow removal is an ongoing issue in the upcountry areas of the eastern County. Snow removal is constant during the snowiest months, with the County and other agencies providing snow removal on public roads. Individuals and road associations are a primary snow removal resource for all the private roads. Impacts to the County as a result of winter snowstorms include damage to infrastructure, utility outages, road closures, traffic accidents, and interruption in business and school activities. Also of concern as described below is the impact to populations with additional needs such as the elderly, low income individuals, and those requiring the use of medical equipment, should the power go out. Delays in emergency response services can be of significant concern during large storm events. Further, there are economic impacts (tree clearing, damage to buildings, and snow clearing) associated with areas prone to heavy snow. Although the eastern portion of the County is the most vulnerable to the effects of snow, snowfall occurring in the lower elevations can create significant issues, as they may not be as prepared for snowfall.

Local concerns for each of the jurisdictions can be found under the Local Concerns heading in each respective jurisdictional annex to this LHMP Update.

Assets at Risk

Assets at risk from extreme cold, freeze, and snow include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections for the Amador County Planning Area and unincorporated Amador County.

Additionally, for each hazard in the FEMA National Risk Index in Amador County, the relevant portions of the hazard analysis done by FEMA is presented below. This includes the Hazard Risk Index Rating, Expected Annual Loss Values, Exposure Values, and the Historic Loss Ratio Rating. These are presented for the Amador County Planning Area as a whole.

People and Populations

All populations within the Amador County Planning Area are vulnerable to extreme cold and freeze, but this hazard generally affects people spending large amounts of time outside to a greater extent. Prolonged exposure to cold can cause frostbite or hypothermia and can be life-threatening. Vulnerable populations to cold, freeze, and snow include the unhoused; individuals who exercise or train outdoors; outdoor workers; individuals that lack the resources to afford heat; and the young, old, or medically fragile individuals that

are more susceptible to cold related impacts. In addition to vulnerable populations, pets and livestock are at risk to freeze, cold, and snow.

Structures

Structures in the Amador County Planning Area have some measure of risk from extreme cold, freeze, and snow. Buildings in the upper elevations of the County can be affected directly by freeze; pipes that feed buildings can be damaged during periods of extreme cold and cause water damage and other related impacts to a structure. High snow loads that accumulate on roofs can impact structures. Structures can also be damaged by downed trees and power lines during freeze and winter storm events.

Critical Facilities and Infrastructure

Winter storms (though rare in the County) typically involve snow and ice, occasionally accompanied by high winds and cold temperatures, which can cause downed trees and power lines, power outages, accidents, and road closures. Transportation networks, communications, and utilities infrastructure are the most vulnerable physical assets in the County. Depending on the facility type and function, critical facilities and infrastructure may be affected directly by freeze and extreme cold and winter weather events. Damage to pipes that feed buildings can be damaged during periods of extreme cold. Other equipment may also be affected. Infrastructure such as roads, highways, and bridges can become slippery, causing accidents and road closures.

Natural, Historic, and Cultural Resources

Depending on how low the temperatures go and the duration of an extreme cold, freeze or snow event, natural resources in the Amador County Planning Area may be affected. During periods of freeze, trees in the Planning Area may be damaged. This is especially true if a freeze occurs during a winter storm with winds and precipitation. Other natural resources like wildlife may be at risk during a period of freeze. While it is rare for buildings to be affected directly by freeze, damages to pipes that feed historic buildings can be damaged during periods of extreme cold and cause additional impacts to the structures.

FEMA NRI Hazard Vulnerability Assessment

The FEMA NRI was queried for additional specific data on Amador County's vulnerability to Extreme Cold, Freeze, and Snow. The NRI contains data and analysis for 18 separate natural hazards. The NRI hazards related to Amador County's Extreme Cold, Freeze, and Snow hazards are: cold wave, ice storm, and winter weather. As shown in Table 4-30, while cold waves and ice storms are expected to cause no expected annual losses and are given no historic loss ratio, winter weather could cause a total of $18,927 in expected annual losses, with a rating of relatively low. Winter weather has a relatively moderate rating for both social vulnerability and community resilience, with a risk index score of 25.9 out of 100. According to the NRI, there have been 132 events on record between the years 2005-2021, with an average of 8.1 events per year

Table 4-30 Amador County Planning Area – Cold Wave, Ice Storm, and Winter Weather Vulnerability Ratings from FEMA NRI

NRI Hazard	Hazard Risk Index Rating*	Expected Annual Loss Values (total)**	Exposure Value (total)***	Historic Loss Ratio Rating
Cold Wave	0	$0	$0	–
Ice Storm	0	$0	$0	–
Winter Weather	25.9	$ 18,927	$477,114,646,325	Very Low

Source: FEMA NRI Report, retrieved 4/1/2025.

*Hazard Risk Index is calculated using data for only a single hazard type, and reflect a communities expected annual loss value, community risk factors, and the adjustment factor used to calculate the risk value.

**Expected annual loss represents the average economic loss in dollars resulting from natural hazards each year.

***Exposure is a natural hazard consequence factor that is the representative value of buildings, populations, or agriculture potentially exposed to a natural hazard occurrence.

Additional information on the FEMA NRI can be found in Section 4.2 and Appendix G.

Impacts from Severe Weather: Extreme Cold, Freeze, and Snow

Extreme cold, freeze, and snow can affect critical facilities and infrastructure, down trees, break pipes, and can be a life safety issue. Transportation networks, communications, and utilities infrastructure are often the most vulnerable physical assets in the Amador County Planning Area. Infrastructure such as roads and utilities are at risk to freezing temperatures and snow, causing failures and hazardous road conditions. When extreme cold is coupled with high winds and freezing storms, power lines may be downed, resulting in power outages and an interruption of utilities and critical services. During periods of extremely low or prolonged cold temperatures, other impacts to the Planning Area include can include interruption in business and school activities.

The elderly, the young, and those experiencing medical issues are often more vulnerable to temperature extremes, but anyone can be affected. Exposure to cold temperatures can cause hypothermia and frostbite. Those exercising or recreating outdoors, outdoor workers, and the unhoused may be at higher risk.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future hazard conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on these factors for Amador County include the following:

- Climate change is unlikely to exacerbate extreme cold, freeze, and snow and their associated impacts to the County.

- The population of Amador County is expected to slowly increase as time progresses. Future population growth should be considered, as having more or less people in a community affects the overall hazard vulnerability to the County. Changes in populations patterns should also be considered. Especially vulnerable individuals to this hazard include older adults, children, outdoor workers, , those below the poverty line and the unhoused. During hazard events, existing inequities can get worse, and these groups are the most likely to be affected and may require extra assistance. Planning for population changes will help to decrease the County's overall vulnerability. Changes in population and population patterns may or may not increase the impacts and vulnerability of the County to this hazard depending on the location and nature of population growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. County building codes are in effect to reduce this risk and should be updated as necessary to continue to address future freeze, extreme cold, and snow conditions. Due to adherence to protective building codes, changes in land use and development will likely not increase the impacts and associated vulnerabilities of the County to this hazard.

Future development built to code should be able to withstand extreme cold, freeze, and heavy snow. Current building codes provide such provisions for new construction. Older buildings and infrastructure should be evaluated to ensure that extreme cold and freeze will not cause negative impacts. Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements such as building codes are followed, and varying needs for different demographic groups that reside within the County are considered can help make for a more resilient community.

4.3.3. Severe Weather: Extreme Heat

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Amador County Planning Area. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect or influence this hazard.

Hazard/Problem Description

According to information provided by FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Heat kills by taxing the human body beyond its abilities. In a normal year, about 175 Americans succumb to the demands of summer heat. In the 40-year period from 1936 through 1975, nearly 20,000 people were killed in the United States by the effects of heat and solar radiation. In the heat wave of 1980, more than 1,250 people died. Recently in California, records were set across the state during a July 2024 heat event. 2024 was considered the hottest on record. Extreme heat as it affects agriculture in Amador County is discussed further in the agricultural hazard discussion in Section 4.3.6.

Heat disorders generally have to do with a reduction or collapse of the body's ability to shed heat by circulatory changes and sweating or a chemical (salt) imbalance caused by too much sweating. When heat gain exceeds a level at which the body can remove it, or when the body cannot compensate for fluids and salt lost through perspiration, the temperature of the body's inner core begins to rise, and heat-related illness

may develop. Elderly persons, small children, those on certain medications or drugs, and persons with weight and alcohol problems are particularly susceptible to extreme heat. Extreme heat can also affect the agricultural industry.

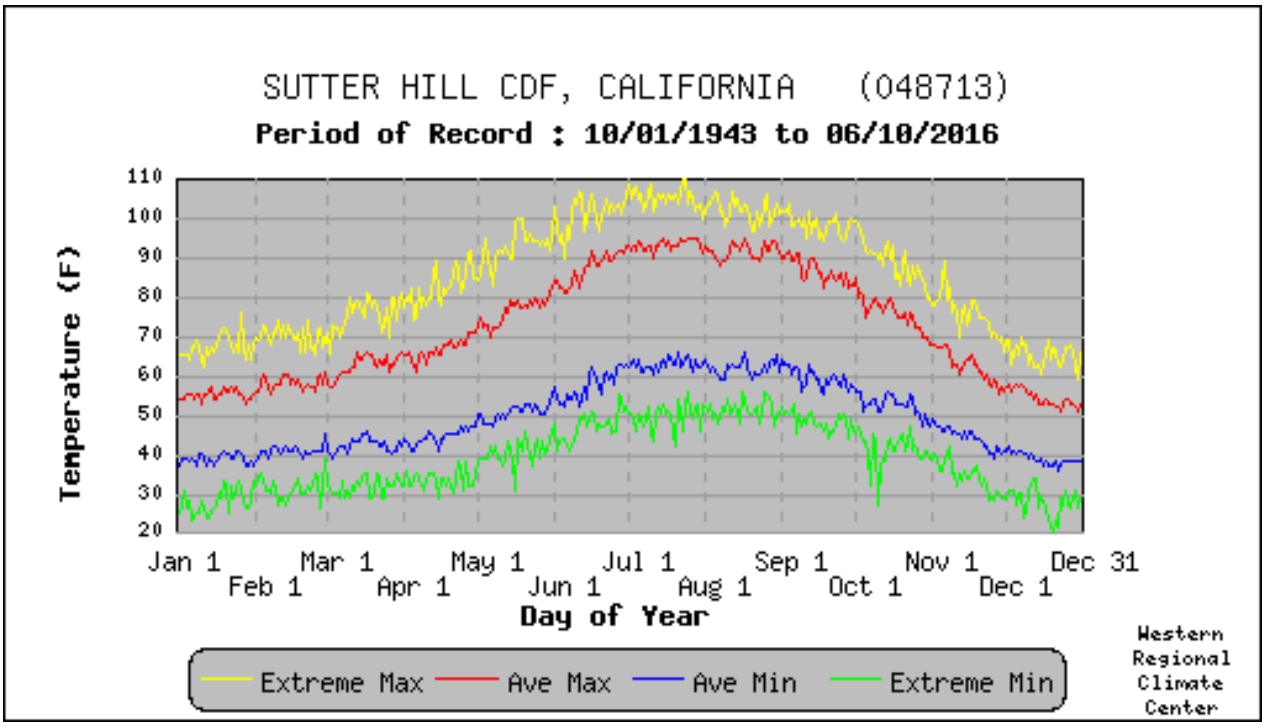
Location and Extent

Extreme heat events occur on a regional basis. Extreme heat can occur in any location of the County. All portions of the County are at risk to extreme heat. Extreme heat occurs throughout the Planning Area primarily during the summer months. The WRCC and NWS maintain data on weather normal and extremes in the western United States. Each of these data sources maintain data in slightly different ways. Data from the WRCC stopped being collected in April of 2016. NWS covers the entire time period to present. Therefore, both data sets are shown below. WRCC and NWS data for the County is summarized below.

Western Amador County —Sutter Hill Ranger Weather Station (WRCC), Period of Record 1948 to 2016

According to the WRCC, in western Amador County, monthly average maximum temperatures in the warmest months (May through October) range from the mid-70s to the low 90s. The highest recorded daily extreme was 110°F on July 14, 2006. In a typical year, maximum temperatures exceed 90°F on 69.3 days. Figure 4-37 shows the average daily high temperatures and extremes for the County. Table 4-31 shows the record high temperatures by month for the western County.

Figure 4-37 Western Amador County – Sutter Hill Ranger Station (WRCC) Daily Temperature Averages and Extremes 1943 to 2016



Source: Western Regional Climate Center. Retrieved 3/19/2025

Table 4-31 Western Amador County – Sutter Hill Ranger Station (WRCC) Record High Temperatures 1943 to 2016

Month	Record High	Date	Month	Record High	Date
January	68°	1/17/2007	July	110°	7/14/2006
February	73°	2/4/2009	August	107°	8/9/1998
March	81°	3/30/2004	September	104°	9/2/1998
April	92°	4/28/2004	October	99°	10/2/2001
May	100°	5/17/2008	November	89°	11/27/2010
June	106°	6/16/2012	December	70°	12/26/2000

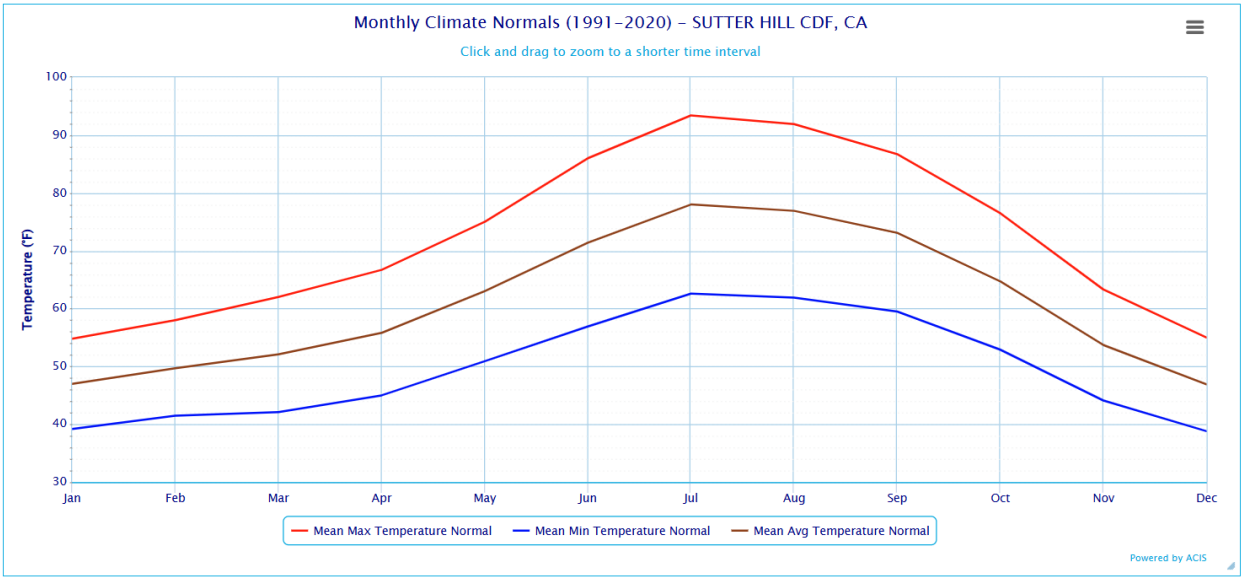
Source: Western Regional Climate Center

Western Amador County—Sutter Hill Ranger Station Weather Station (NWS), Period of Record 1943 to 2025

Note: While the overall period of record for this NWS station is 1943 to 2025, not all data is recorded for those dates. Extreme temperatures are covered from December 1968 to February 2025.

According to the NWS, monthly average maximum temperatures in the warmest months (May through October) range from the mid-70s to the low 90s. The highest recorded daily extreme was 110°F on July 24, 2006. Figure 4-38 shows the average daily high temperatures and extremes for the County. Table 4-24 shows the record low temperatures for the western County.

Figure 4-38 Amador County – Sutter Hill Ranger Station (NWS) Daily Temperature Averages and Extremes, 1991-2020



Month	Mean Max Temperature Normal (°F)	Mean Min Temperature Normal (°F)	Mean Avg Temperature Normal (°F)
January	54.8	39.2	47.0
February	58.0	41.5	49.7
March	62.0	42.1	52.1
April	66.7	45.0	55.8
May	75.0	50.9	63.0
June	86.0	56.9	71.4
July	93.4	62.6	78.0
August	91.9	61.9	76.9
September	86.7	59.5	73.1
October	76.5	52.9	64.7
November	63.3	44.1	53.7
December	55.0	38.8	46.9
Annual	72.4	49.6	61.0

Source: National Weather Service XMAC site. Retrieved 3/12/2025

Table 4-32 Western Amador County – Sutter Hill Ranger Station (NWS) Record High Temperatures 1968 to 2025

Temperature	Date
110.0°	7/24/2006
110.0°	7/23/2006
109.0°	7/1/2015
109.0°	7/10/2002
108.0°	7/11/2021
108.0°	8/29/2017
108.0°	7/4/2017
107.0°	7/17/2023
107.0°	7/10/2021

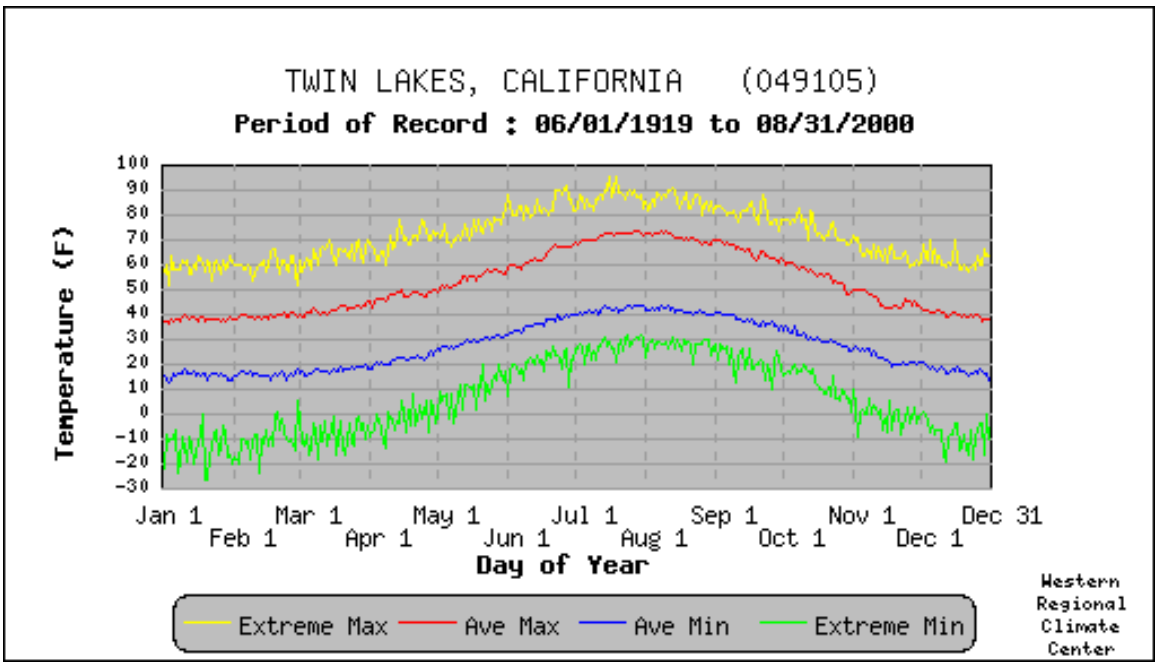
Temperature	Date
107.0°	6/19/2021

Source: National Weather Service XMAC site. Retrieved 3/12/2025

Eastern Amador County—WRCC Twin Lakes Weather Station, Period of Record 1919 to 2000

According to the WRCC, in eastern Amador County, monthly average maximum temperatures in the warmest months (May through October) range from the mid-50s to the low 70s. The highest recorded daily extreme was 95°F on July 7,1998. In a typical year, maximum temperatures exceed 90°F on 0.3 days. Figure 4-39 shows the average daily high temperatures and extremes for the eastern portion of the County. Table 4-33 shows the record high temperatures by month for the eastern County.

Figure 4-39 Eastern Amador County – Twin Lakes (WRCC) Daily Temperature Averages and Extremes 1919-2000



Source: Western Regional Climate Center, www.wrcc.dri.edu/. Retrieved 3/12/2025

Table 4-33 Eastern Amador County – Twin Lakes (WRCC) Record High Temperatures 1919 to 2000

Month	Record High	Date	Month	Record High	Date
January	74°	1/9/1928	July	95°	7/17/1998
February	76°	2/11/1980	August	91°	8/13/1929
March	70°	3/27/1926	September	88°	9/22/1928
April	78°	4/14/1926	October	83°	10/8/1928
May	82°	5/31/1926	November	72°	11/1/1966
June	92°	6/27/1926	December	74°	12/27/1975

Source: Western Regional Climate Center. Retrieved 3/12/2025.

Eastern Amador County—Amador Twin Lakes Weather Station (NWS), Period of Record 1919 to 2000

While the western weather station presented data using graphs, no averaging graphing data was available for the Twin Lakes Weather station.

Heat emergencies are often slower to develop, taking several days of continuous, oppressive heat before a significant or quantifiable impact is seen. Heat waves do not strike victims immediately, but rather their cumulative effects slowly take the lives of vulnerable populations. Heat waves do not generally cause damage or elicit the immediate response of floods, fires, earthquakes, or other more "typical" disaster scenarios. While heat waves are obviously less dramatic, they are potentially deadlier. According to the 2018/2023 California State Hazard Mitigation Plan, the worst single heat wave event in California occurred in Southern California in 1955, when an eight-day heat wave resulted in 946 deaths.

The NWS has in place a system to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color (green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Table 4-34.

Table 4-34 National Weather Service HeatRisk Categories

Category	Level	Meaning
Green	0	No Elevated Risk
Yellow	1	Low Risk for those extremely sensitive to heat, especially those without effective cooling and/or adequate hydration
Orange	2	Moderate Risk for those who are sensitive to heat, especially those without effective cooling and/or adequate hydration
Red	3	High Risk for much of the population, especially those who are heat sensitive and those without effective cooling and/or adequate hydration
Magenta	4	Very High Risk for entire population due to long duration heat, with little to no relief overnight

Source: National Weather Service

The NWS office in Sacramento can issue the following heat-related advisory as conditions warrant.

- **Heat Advisories** are issued during events where the HeatRisk is on the Orange/Red threshold (Orange will not always trigger an advisory)
- **Excessive Heat Watches/Warnings** are issued during events where the HeatRisk is in the Red/Magenta output

Past Occurrences

Disaster Declaration History

There have been no FEMA or Cal OES disasters related to extreme heat, as shown in Table 4-4.

There have been no USDA disaster declarations for extreme heat.

NCDC Events

The NCDC data shows 124 extreme heat incidents for Amador County since 1993. Information for these events are shown in Table 4-35.

*Table 4-35 NCDC Extreme Heat Events in Amador County 1993 to 7/31/2024**

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Excessive Heat	43	12	2	2	0	$0	$0
Heat	81	2	3	18	3	$0	$0
Total	**124**	**14**	**5**	**20**	**3**	**$ 0**	**$ 0**

Source: NCDC

*Deaths, injuries, and damages are for the entire event, and may not be exclusive to the County.

Hazard Mitigation Planning Committee Events

The HMPC noted some extreme heat events in Amador County. These include the following events:

July 21, 2016 – Information on the Amador County website was found on an extreme heat event in July of 2016. Amador County Public Health and the Amador County Sheriff's Office of Emergency Services urge residents to prepare for extreme temperatures predicted to reach over 100 degrees this weekend. The National Weather Service indicates that temperatures will climb and remain above 100° into next week.

September 2017 – The Amador County Sheriff's Office of Emergency Services urged residents to be prepared for an Excessive Heat Warning issued by the National Weather Services for this Labor Day weekend. High temperatures were seen in Amador County, as well as in much of central California.

August 31, 2022 - Governor Gavin Newsom declared a state of emergency due to extreme heat across California, including Amador County. Lower elevations likely saw temperatures of 100–105°F during peak hours (2:00 p.m. to 10:00 p.m.), straining the electrical grid and prompting the use of backup generators.

July 2023 was one of the hottest months globally, with California breaking or tying 358 maximum temperature records. Nearby Redding hit 119°F, and Palm Springs reached 124°F. Amador County's lower areas likely saw 105–110°F, with higher elevations like Pioneer in the mid-90s, under widespread heat advisories

The HMPC noted that extreme heat is a yearly event, but could not recall any other specific incidents since 2020 that caused damages, injuries, or deaths.

Likelihood of Future Occurrence

Highly Likely—Temperature extremes are likely to continue to occur annually in the Amador County Planning Area. Temperatures at or above 90°F are common most summer days in the western portion of the County. More information on climate change and extreme heat can be found in the next section. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate Change and Extreme Heat

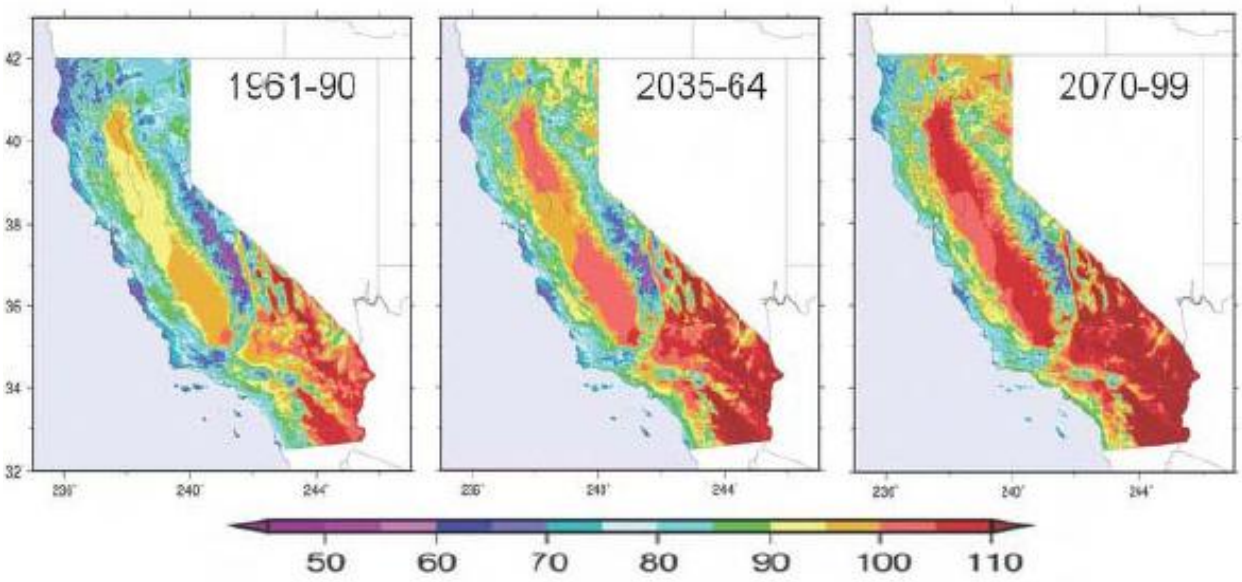
Climate change and its effect on extreme heat in the County has been discussed by three sources:

- California Climate Adaptation Strategy (CAS) – 2021 (as well as the 2024 Draft CAS)
- Climate Change and Health Profile Report –Amador County
- Cal-Adapt

Climate Adaptation Strategy

The 2021 CAS (as well as the 2024 Draft CAS), citing a California Energy Commission study, states that "over the past 15 years, heat waves have claimed more lives in California than all other declared disaster events combined." This study shows that California is getting warmer, leading to an increased frequency, magnitude, and duration of heat waves. These factors may lead to increased mortality from excessive heat, as shown in Figure 4-40.

Figure 4-40 California Historical and Projected Temperature Increases – 1961 to 2099



Source: Dan Cayan; California Climate Adaptation Strategy

As temperatures increase, California and Amador County will face increased risk of death from dehydration, heat stroke, heat exhaustion, heart attack, stroke and respiratory distress caused by extreme heat. According to the 2021 CAS (as well as the 2024 Draft CAS) report and the 2023 State of California Hazard Mitigation Plan, by 2100, hotter temperatures are expected throughout the state, with projected increases of 3-5.5°F (under a lower emissions scenario) to 8-10.5°F (under a higher emissions scenario). These changes could lead to an increase in illnesses and deaths related to extreme heat in Amador County.

Climate Change and Health Profile Report – Amador County

The CCHPR noted for Amador County that increased temperatures manifested as heat waves and sustained high heat days directly harm human health through heat-related illnesses (mild heat stress to fatal heat

stroke) and the exacerbation of pre-existing conditions in the medically fragile, chronically ill, and vulnerable. Increased heat also intensifies the photochemical reactions that produce smog and ground level ozone and fine particulates (PM2.5), which contribute to and exacerbate respiratory disease in children and adults. Increased heat and carbon dioxide enhance the growth of plants that produce pollen, which are associated with allergies. Increased temperatures add to the heat load of buildings in urban areas and exacerbate existing urban heat islands adding to the risk of high ambient temperatures.

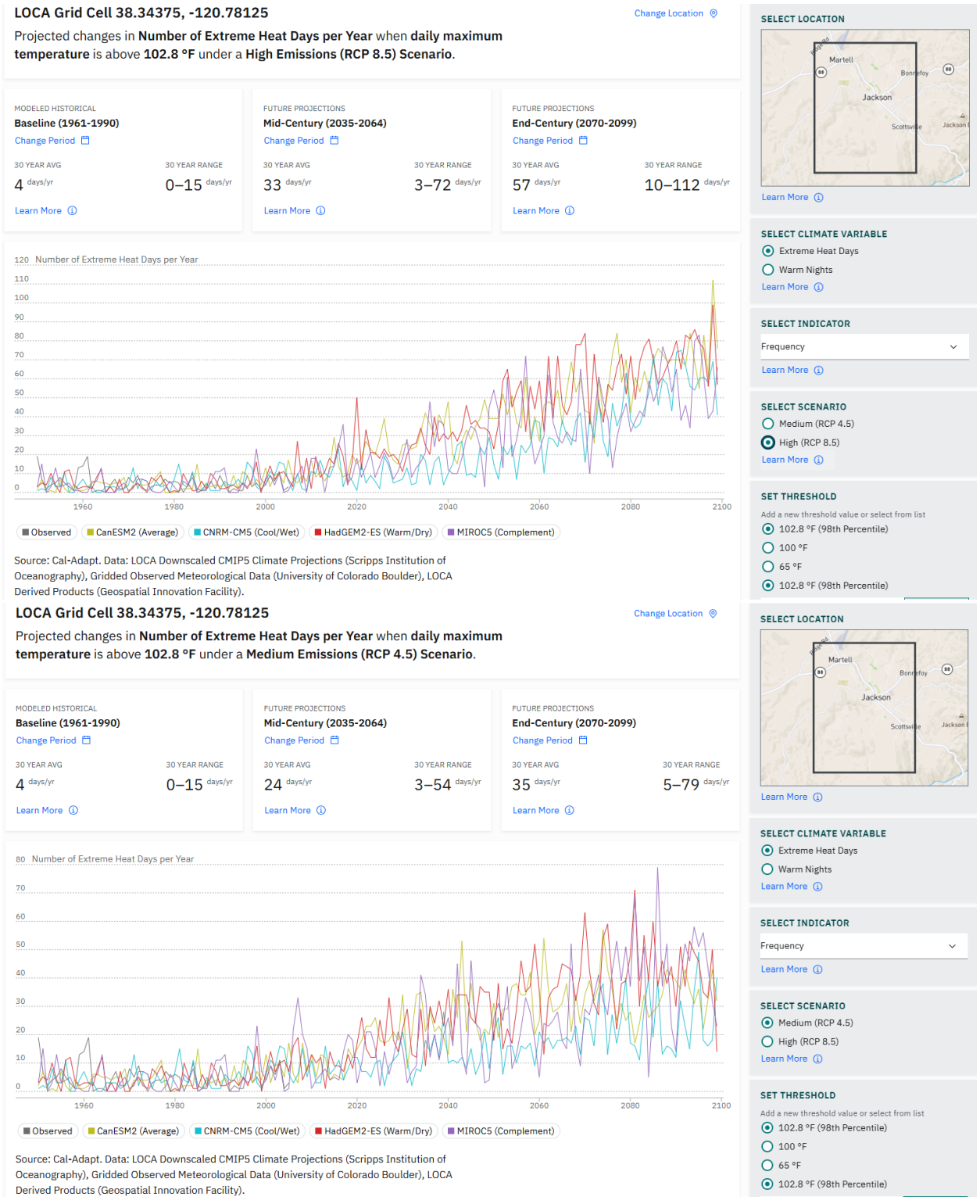
Cal-Adapt

Cal Adapt also noted that overall temperatures are expected to rise substantially throughout this century. During the next few decades, scenarios project average temperature to rise between 1 and 2.3°F; however, the projected temperature increases begin to diverge at mid-century so that, by the end of the century, the temperature increases projected in the higher emissions scenario (Representative Concentration Pathways (RCP) 8.5) are approximately twice as high as those projected in the lower emissions scenario (RCP 4.5).

These projections also differ depending on the time of year and the type of measurement (highs vs. lows), all of which have different potential effects to the state's ecosystem health, agricultural production, water use and availability, and energy demand. Future temperature estimates from Cal-Adapt for the Amador County Planning are shown in Figure 4-41. It shows the following:

- The upper chart shows the number of days in a year when daily maximum temperature is above the extreme heat threshold of 102.8°F. Data is shown for Amador County under the RCP 8.5 scenario in which emissions continue to rise through 2050 and maintain that trend into 2100.
- The lower chart shows the number of days in a year when daily maximum temperature is above the extreme heat threshold of 102.8 °F. Data is shown for Amador County under the RCP 4.5 scenario in which emissions show continued rise with more erratic patterns into 2100.

Figure 4-41 Amador County – Future Temperature Estimates in Low and High Emission Scenarios



Source: Cal-Adapt – Number of Extreme Heat Days by Year. Retrieved 2/6/2024.

Vulnerability Assessment

Vulnerability—Medium

Extreme heat happens in Amador County each year. Extreme heat may overload demands for electricity to run air conditioners and other utilities in homes and businesses during prolonged periods of exposure and presents health concerns to individuals outside in the temperatures. Extreme heat may also be a secondary effect of droughts or may cause drought-like conditions in a temporary setting. For example, several weeks of extreme heat increases evapotranspiration and reduces moisture content in vegetation, leading to higher wildfire vulnerability for that time period even if the rest of the season is relatively moist. Extreme heat, when combined with wind, can also lead to PSPS events in the County. Extreme heat also contributes to poor air quality during extended events.

Vulnerable populations are at the greatest risk to the effects of extreme heat. The Public Health Alliance has developed a composite index to identify cumulative health disadvantages in California. Factors such as those bulleted above were combined to show what areas are at greater risk to hazards like extreme heat. These sections below include assets at risk, impacts, and how future development may affect the vulnerability of the County to this hazard.

Local Concerns (unincorporated Amador County)

The unincorporated County has specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerabilities to this hazard.

The County noted that extreme heat can cause crop damages. These can be substantial if extreme heat occurs during periods of plant susceptibility to heat. Extreme heat contributes to PSPS and wildfire issues in the County. Heat domes have settled over the County in the past, which has caused the County to open cooling centers. The County is also worried about the effects on vulnerable populations. It was also noted that extreme heat contributes to unhealthy air quality.

Local concerns for each of the jurisdictions can be found under the Local Concerns heading in each respective jurisdictional annex to this LHMP Update.

Assets at Risk

Assets at risk from extreme heat include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections for both the Amador County Planning Area and unincorporated Amador County.

Additionally, for each hazard in the FEMA National Risk Index in Amador County, the relevant portions of the hazard analysis done by FEMA is presented below. This includes the Hazard Risk Index Rating, Expected Annual Loss Values, Exposure Values, and the Historic Loss Ratio Rating. These are presented for the Amador County Planning Area as a whole.

People and Populations

All populations within the Amador County Planning Area are vulnerable to extreme heat, but it generally affects people spending large amounts of time outside or without means of cooling indoor structures. During extended periods of high temperatures, extreme heat may overload the demands for electricity to run air conditioners and can present health concerns to individuals. When interruptions in power occur during extreme heat, the risk of heat related illnesses and deaths increase. Extreme heat is a significant concern to vulnerable populations. The unhoused; individuals who exercise or train outdoors; outdoor workers; individuals that lack the resources to afford heat; and the young, old, or medically fragile individuals that are more susceptible to heat related impacts. In addition to vulnerable populations, pets and livestock are at risk to extreme heat conditions.

Structures

Extreme heat normally does not generally impact structures, but individuals working in structures may be affected during periods of extended heat, especially in structures that might not be equipped with air conditioning or other means of cooling. In the Amador County Planning Area, extreme heat has caused interruptions to power in the past. Also depending on the structure, sensitive contents such as IT equipment can be impacted, especially if a power outage occurs.

Critical Facilities and Infrastructure

Depending on their type and function, critical facilities and infrastructure can also be affected by extreme heat. Interruptions in power caused by extreme heat can lead to system failures. Schools without air conditioning may have to close or operate on a reduced schedule.

Natural, Historic, and Cultural Resources

Park areas and natural resource assets in the Amador County Planning Area may be vulnerable during periods of extreme heat. These include turfed areas; landscapes, trees, wildlife and habitat areas, and wetlands and marsh lands. Recently, trees were lost in areas of Amador County that were weakened by drought and extreme heat. Extreme heat may also cause drought-like conditions, contributing to other issues. For example, several weeks of extreme heat increases evapotranspiration and reduces moisture content in vegetation, leading to higher wildfire vulnerability in the region for that time period, even if the rest of the season is relatively moist. Historic and cultural resources are not expected to be affected by extreme heat.

FEMA NRI Hazard Vulnerability Assessment

The FEMA NRI was queried for additional specific data on Amador County's vulnerability to Extreme Heat. The NRI contains data and analysis for 18 separate natural hazards. The NRI hazard related to Amador County's Extreme Heat is a heat wave. As shown in Table 4-36, heatwaves could cause a total of $1,761,917 in expected annual losses, with a historic loss rating of relatively low. Heat wave has a relatively moderate rating for both social vulnerability and community resilience, with a risk index score of 94.3 out of 100. According to the NRI, there have been 30 events on record between the years 2005-2021, with an average of 1.9 events per year.

Table 4-36 Amador County Planning Area – Heat Wave Vulnerability Ratings from FEMA NRI

NRI Hazard	Hazard Risk Index Rating*	Expected Annual Loss Values (total)**	Exposure Value (total)***	Historic Loss Ratio Rating
Heat Wave	94.3	$1,761,917	$477,114,646,325	Relatively Low

Source: FEMA NRI Report, retrieved 4/1/2025.

*Hazard Risk Index is calculated using data for only a single hazard type, and reflect a communities expected annual loss value, community risk factors, and the adjustment factor used to calculate the risk value.

**Expected annual loss represents the average economic loss in dollars resulting from natural hazards each year.

***Exposure is a natural hazard consequence factor that is the representative value of buildings, populations, or agriculture potentially exposed to a natural hazard occurrence.

Additional information on the FEMA NRI can be found in Section 4.2 and Appendix G.

Impacts from Severe Weather: Extreme Heat

The County experiences temperatures in excess of 100°F during the summer and fall months. The temperature moves to 105-110°F in rather extreme situations. Health issues are the primary concern with this hazard with vulnerable populations at greater risk, although economic impacts can also be an issue. Air quality can also be an issue during extreme heat.

During these times, drought conditions may worsen, and the Planning Area may see an increase in dry fuels contributing to wildfires. For example, several weeks of extreme heat increases evapotranspiration and reduces moisture content in vegetation, leading to higher wildfire vulnerability for that time period even if the rest of the season is relatively moist. Also, power outage and PSPS events may occur during these times as well. Drought is discussed further in Section 4.3.10 and wildfire in Section 4.3.15.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future hazard conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for Amador County include the following:

- Climate change is likely to exacerbate future extreme heat conditions and associated impacts and vulnerability of the County.
- Future population growth should be considered, as having more or less people in a community affects the overall hazard vulnerability to the County. Population is expected to increase for Amador County and, as such, the vulnerability to this hazard may increase, specifically affecting growing vulnerable populations as the senior citizen population continues to reside in and age within the communities of the County. Along with this, low income and the unhoused population are at risk to extreme heat which can put strain on emergency services and shelters. Changes in population and population patterns may

or may not increase the impacts and vulnerability of the County to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.

- Land use planning should be proactive to address future hazard conditions. County building codes are in effect to reduce this risk and should be updated as necessary to continue to address future extreme heat conditions. Due to adherence to protective building codes, changes in land use and development will likely not increase the impacts and associated vulnerabilities of the County to this hazard.

Future development in the County will take extreme heat into account. Backup generators are currently in use at many County facilities, and additional generators and backup power sources are being sought for other locations. The Office of Emergency maintains one, towable (portable) generator that can be used to support a facility that does not currently have a backup generator. One way to reduce the negative impacts of an extreme heat event is to develop a comprehensive heat response plan that combines individual strategies into an integrated approach. The County has one of these plans, and it is discussed in the Capability Assessment in Section 4.4.1. Components of such a plan might include forecasting and monitoring, education and awareness, and heat wave preparedness and response.

In addition to a comprehensive heat response plan, local officials can help areas adapt to extreme heat in the short-term by improving the resilience of infrastructure. Transportation planners can protect or modify roads, bridges, and other structures—for example, by using materials that are more resilient and heat tolerant—to help these systems withstand higher temperatures and reduce service disruptions. They can also implement energy efficiency and conservation efforts to reduce stress on electricity systems during heat waves and help avoid power outages.

Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements such as building codes are followed, and varying needs for different demographic groups that reside within the County are considered can help make for a more disaster resilient community.

4.3.4. Severe Weather: Heavy Rains and Storm

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Amador County Planning Area. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; likelihood of future occurrences; and how climate change can affect or influence this hazard.

Hazard/Problem Description

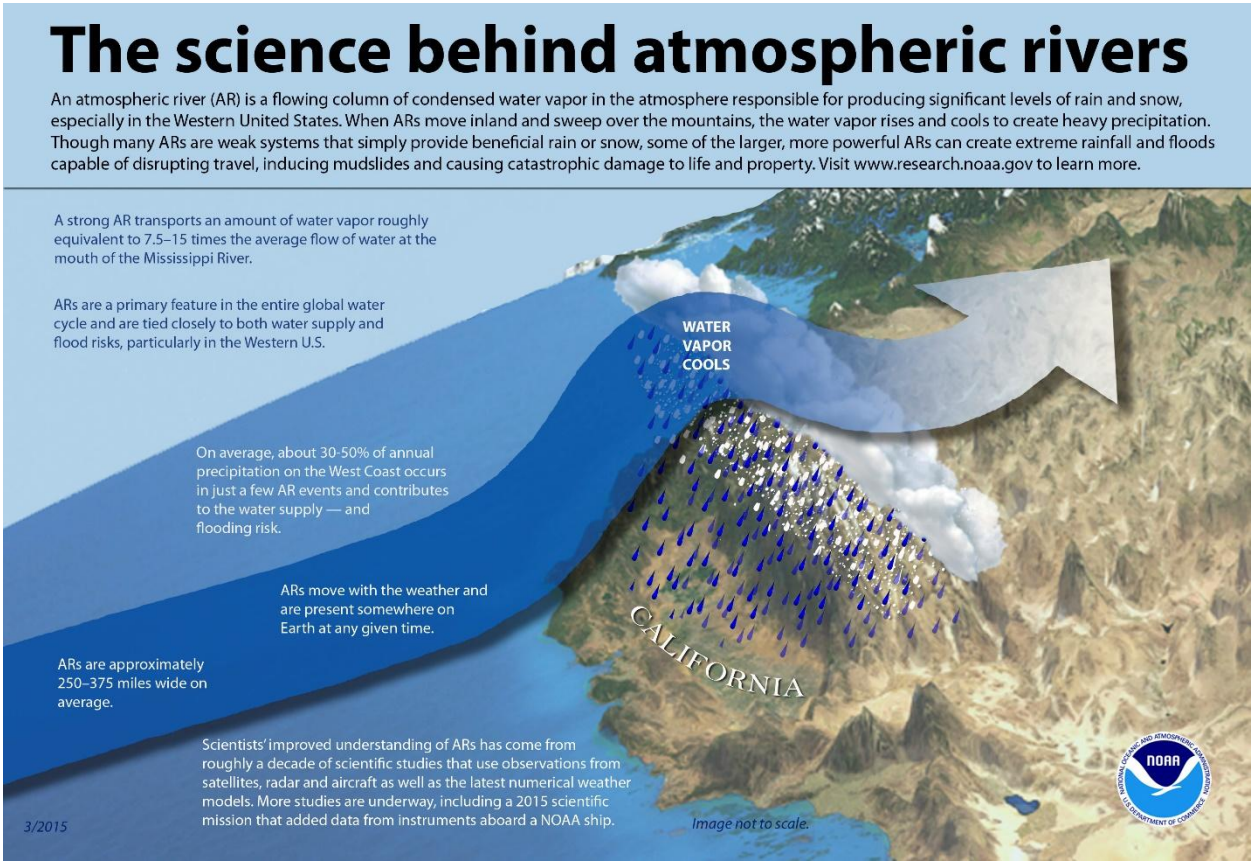
Storms in the Amador County Planning Area occur throughout the Planning Area and are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the Amador County area falls mainly in the fall, winter, and spring months.

Heavy Rain and Storms

The NWS reports that storms and thunderstorms result from the rapid upward movement of warm, moist air. They can occur inside warm, moist air masses and at fronts. As the warm, moist air moves upward, it cools, condenses, and forms cumulonimbus clouds that can reach heights of greater than 35,000 ft. As the rising air reaches its dew point, water droplets and ice form and begin falling the long distance through the clouds towards earth's surface. As the droplets fall, they collide with other droplets and become larger. The falling droplets create a downdraft of air that spreads out at Earth's surface and causes strong winds associated with thunderstorms.

The County and the rest of California can be affected by a phenomenon known as an atmospheric river. According to the NOAA, atmospheric rivers are relatively long, narrow regions in the atmosphere – like rivers in the sky – that transport most of the water vapor outside of the tropics. These columns of vapor move with the weather, carrying an amount of water vapor roughly equivalent to the average flow of water at the mouth of the Mississippi River. When the atmospheric rivers make landfall, they often release this water vapor in the form of rain or snow. This can be seen in Figure 4-42.

Figure 4-42 Atmospheric Rivers



Source: NOAA

Although atmospheric rivers come in many shapes and sizes, those that contain the largest amounts of water vapor and the strongest winds can create extreme rainfall and floods, often by stalling over watersheds

vulnerable to flooding. These events can disrupt travel, induce mudslides and cause catastrophic damage to life and property. A well-known example is the "Pineapple Express," a strong atmospheric river that is capable of bringing moisture from the tropics near Hawaii over to the U.S. West Coast.

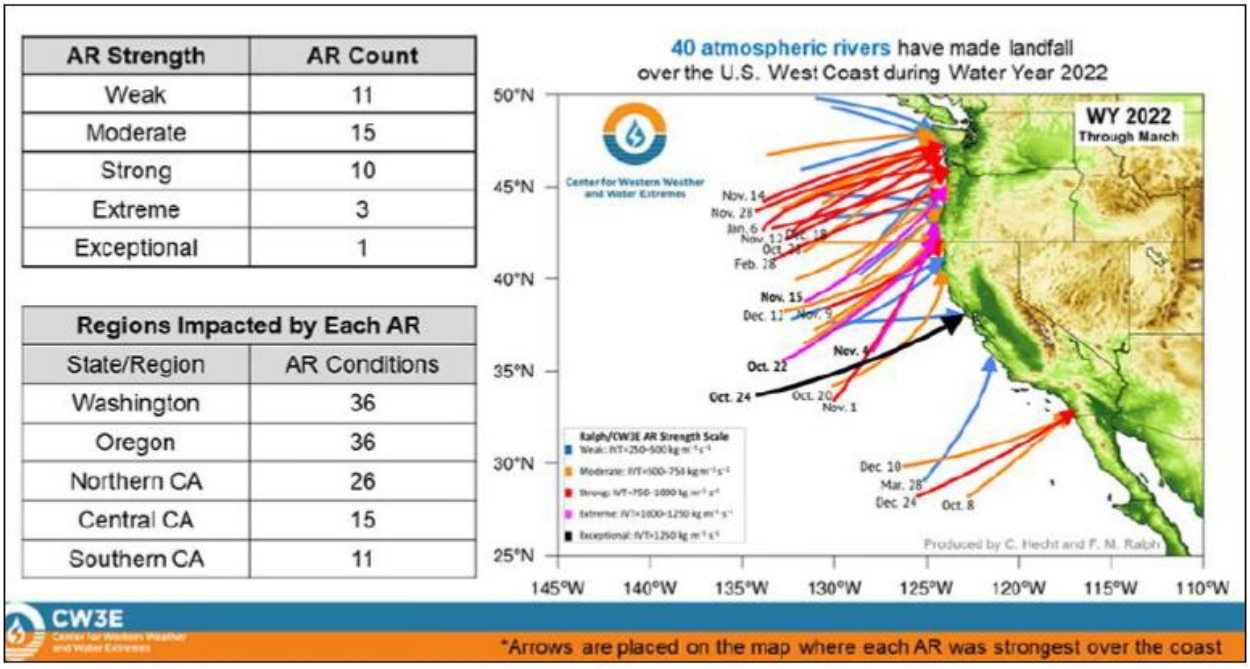
Not all atmospheric rivers cause damage; most are weak systems that often provide beneficial rain or snow that is crucial to the water supply. Atmospheric rivers are a key feature in the global water cycle and are closely tied to both water supply and flood risks — particularly in the western United States.

While atmospheric rivers are responsible for great quantities of rain that can produce flooding, they also contribute to beneficial increases in snowpack. A series of atmospheric rivers fueled the strong winter storms that battered the U.S. West Coast from western Washington to southern California from Dec. 10–22, 2010, producing 11 to 25 inches of rain in certain areas. These rivers also contributed to the snowpack in the Sierras, which received 75 percent of its annual snow by Dec. 22, the first full day of winter. Another example of this happened in 2022. Multiple atmospheric river storms occurred in the County and the rest of California. This can be seen in Figure 4-43. This also happened in the 2023 as well as in 2024, which can be seen in Figure 4-44 and Figure 4-45, respectively.

Figure 4-43 2022 Atmospheric River Events

AR Strength	AR Count
Weak	11
Moderate	15
Strong	10
Extreme	3
Exceptional	1

Regions Impacted by Each AR	
State/Region	AR Conditions
Washington	36
Oregon	36
Northern CA	26
Central CA	15
Southern CA	11

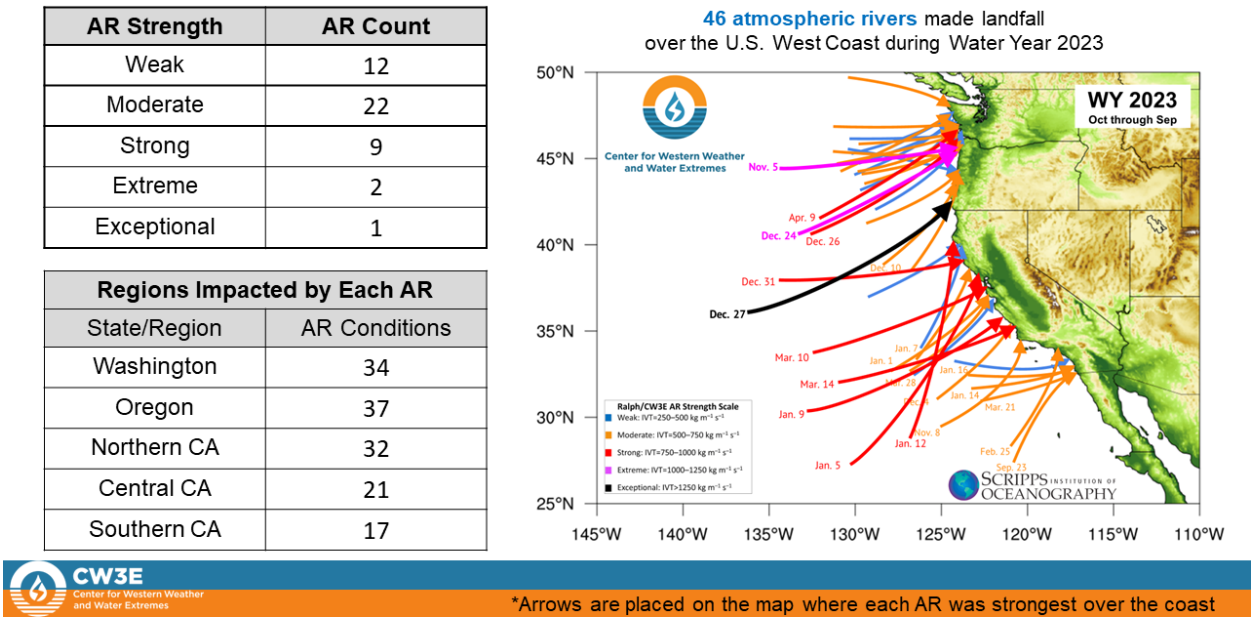


Source: Center for Western Weather and Water Extremes. Retrieved 12/18/2024.

Figure 4-44 2023 Atmospheric River Events

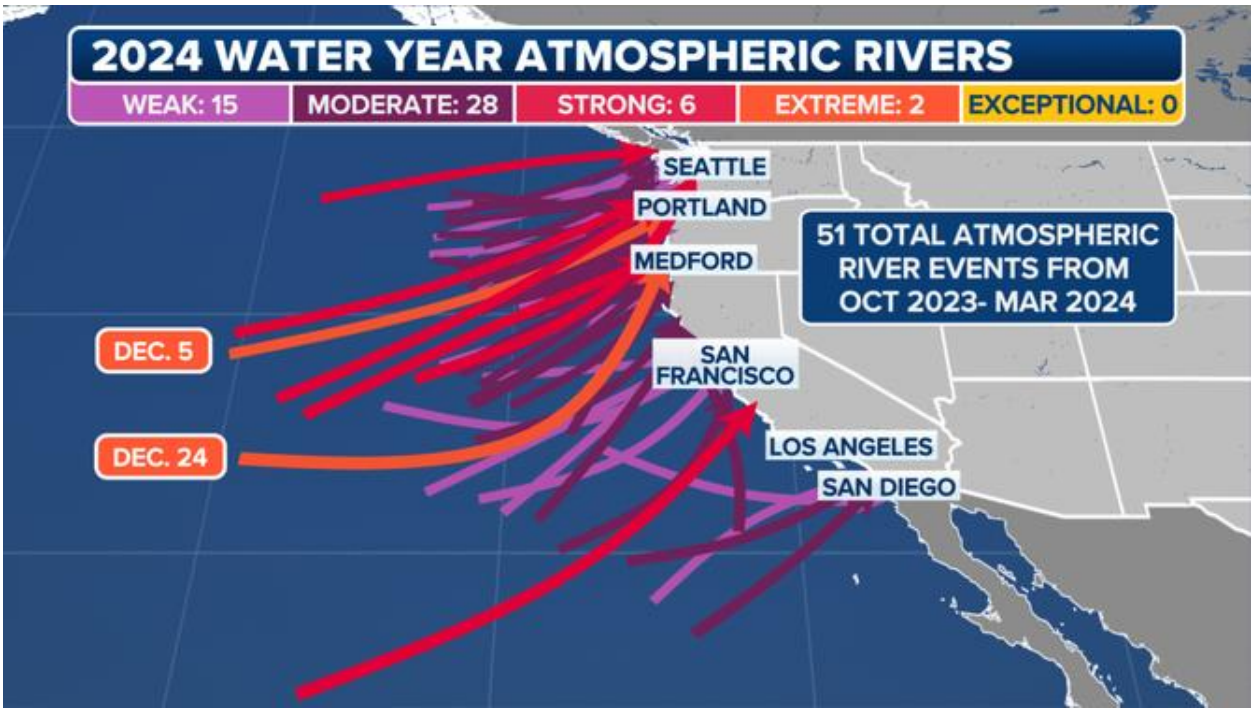
AR Strength	AR Count
Weak	12
Moderate	22
Strong	9
Extreme	2
Exceptional	1

Regions Impacted by Each AR	
State/Region	AR Conditions
Washington	34
Oregon	37
Northern CA	32
Central CA	21
Southern CA	17



Source: Center for Western Weather and Water Extremes. Retrieved 12/18/2024.

Figure 4-45 2024 Atmospheric Rivers



Source: Foxweather.com. Retrieved 12/18/2024.

Short-term, heavy storms can cause both widespread flooding as well as extensive localized drainage issues. In addition to the flooding that often occurs during these storms, strong winds, when combined with saturated ground conditions, can down very mature trees.

Location and Extent of Heavy Rains and Storms

Heavy rain events occur on a regional basis. Rains and storms can occur in any location of the County. All portions of the County are at risk to heavy rains and storms. Most of these rains occur during the winter months, as discussed below.

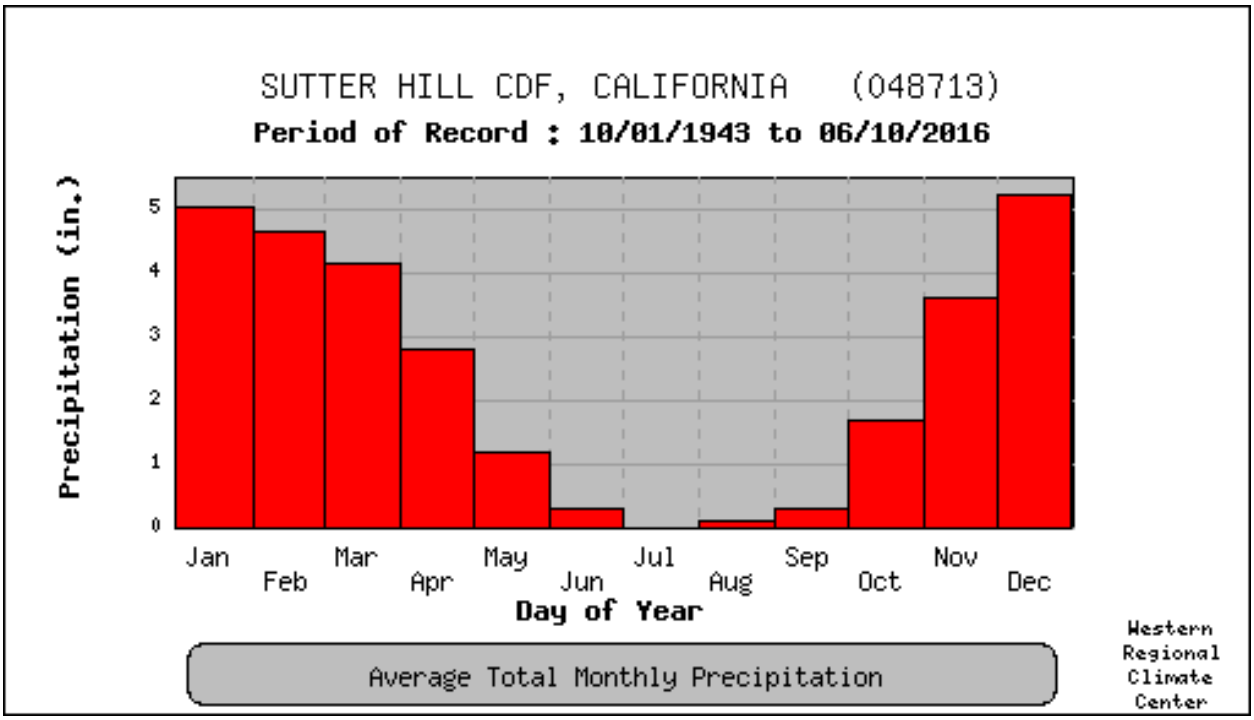
There is no scale by which heavy rains are measured – usually it is measured in terms of rainfall amounts. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of thunderstorms in California is often short, ranging from minutes to hours. This can cause localized flooding, which is discussed in more detail in Section 4.3.13.

The WRCC and NWS maintain data on weather normal and extremes in the western United States. Each of these data sources maintain data in slightly different ways. Data from the WRCC stopped being collected in April of 2016. NWS covers the entire time period to present. Therefore, both data sets are shown below. WRCC and NWS data for both the western and eastern County is summarized below.

Western Amador County—Sutter Hill Ranger Station Weather Station (WRCC), Period of Record 1943 to 2016

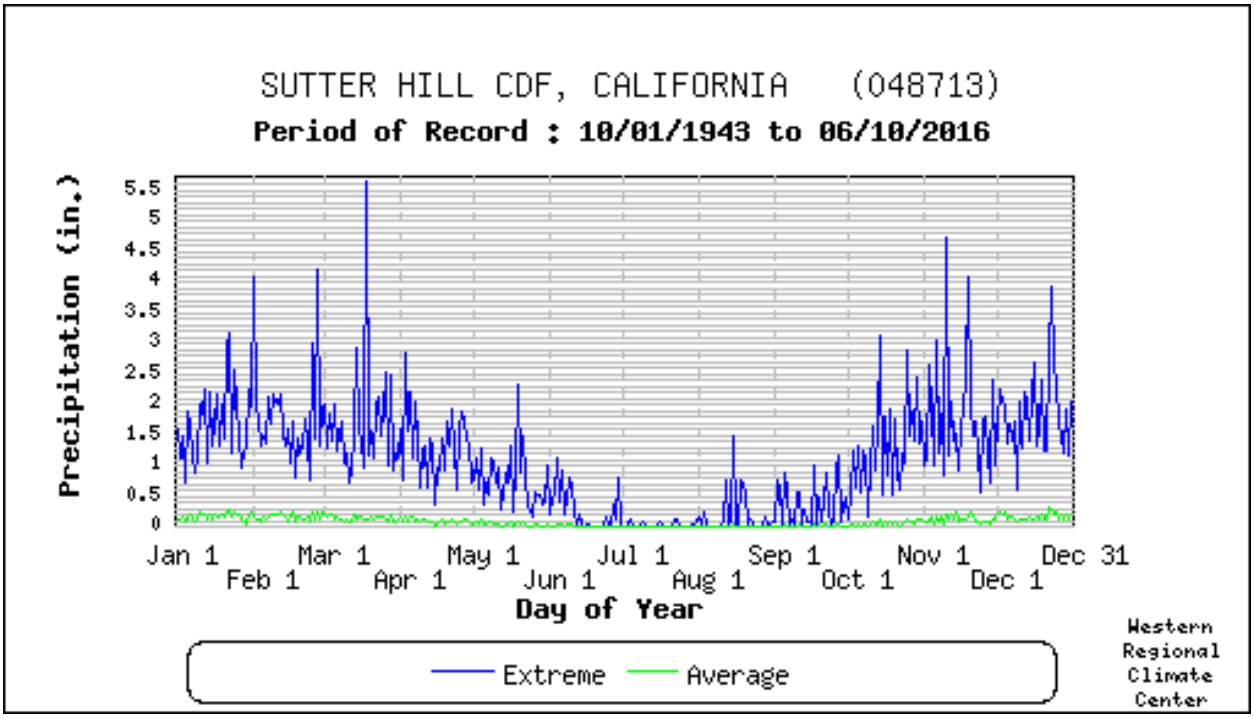
According to the WRCC, average annual precipitation in western Amador County is 26.55 inches per year. The highest recorded annual precipitation is 46.19 inches in 1950; the highest recorded precipitation for a 24-hour period is 5.62 inches on March 18, 2012. The lowest recorded annual precipitation was 10.17 inches in 1976. Average monthly precipitation for western Amador County is shown in Figure 4-46. Daily average and extreme precipitations are shown in Figure 4-47.

Figure 4-46 Western Amador County – Sutter Hill Ranger Station (WRCC) Monthly Average Total Precipitation 1943 to 2016



Source: Western Regional Climate Center, www.wrcc.dri.edu/. Retrieved 3/12/2025.

Figure 4-47 Western Amador County –Sutter Hill Ranger Station (WRCC) Daily Average and Extreme Precipitation 1943 to 2016

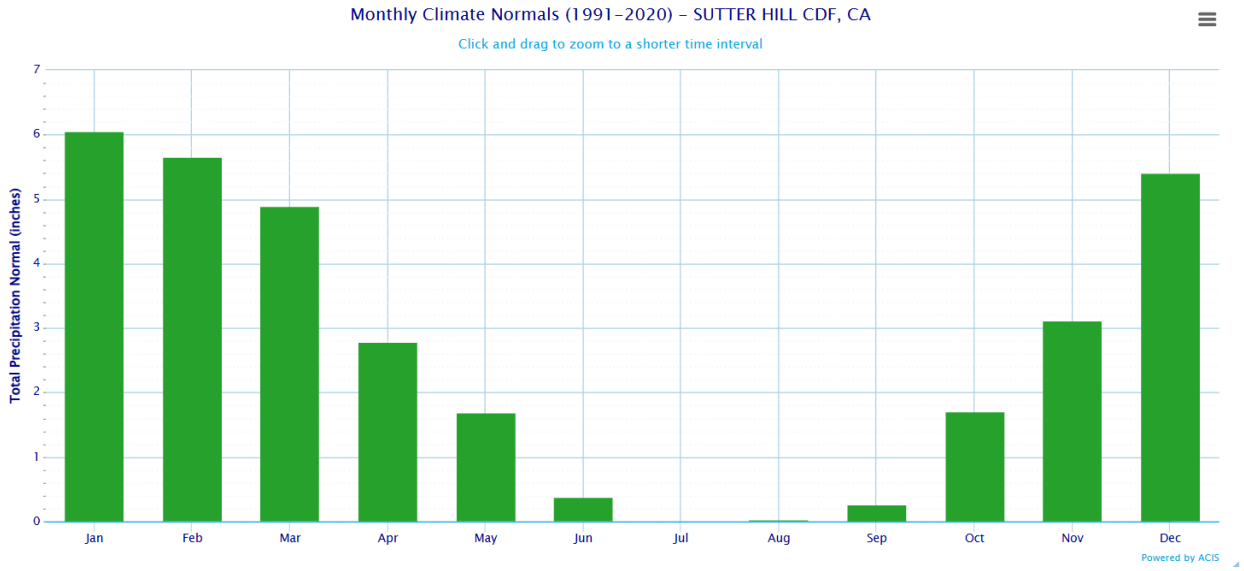


Source: Western Regional Climate Center, www.wrcc.dri.edu/. Retrieved 3/12/2025.

Western Amador County—Sutter Hill Ranger Station (NWS), Period of Record 1943 to 2024

According to the NWS, average annual precipitation in western Amador County is 31.6 inches per year. Average monthly precipitation for western Amador County is shown in Figure 4-48. The highest recorded precipitation for a 24-hour period is 5.62 inches on March 18, 2012. One day extreme precipitations are shown on Table 4-37.

Figure 4-48 Western Amador County— Sutter Hill Ranger Station (NWS) Monthly Average Total Precipitation 1991 to 2020



Source: National Weather Service XMAC site. Retrieved 3/12/2025.

Table 4-37 Western Amador County – Sutter Hill Ranger Station (NWS) 24 Hour Rainfall Extremes from 1943 to 2025

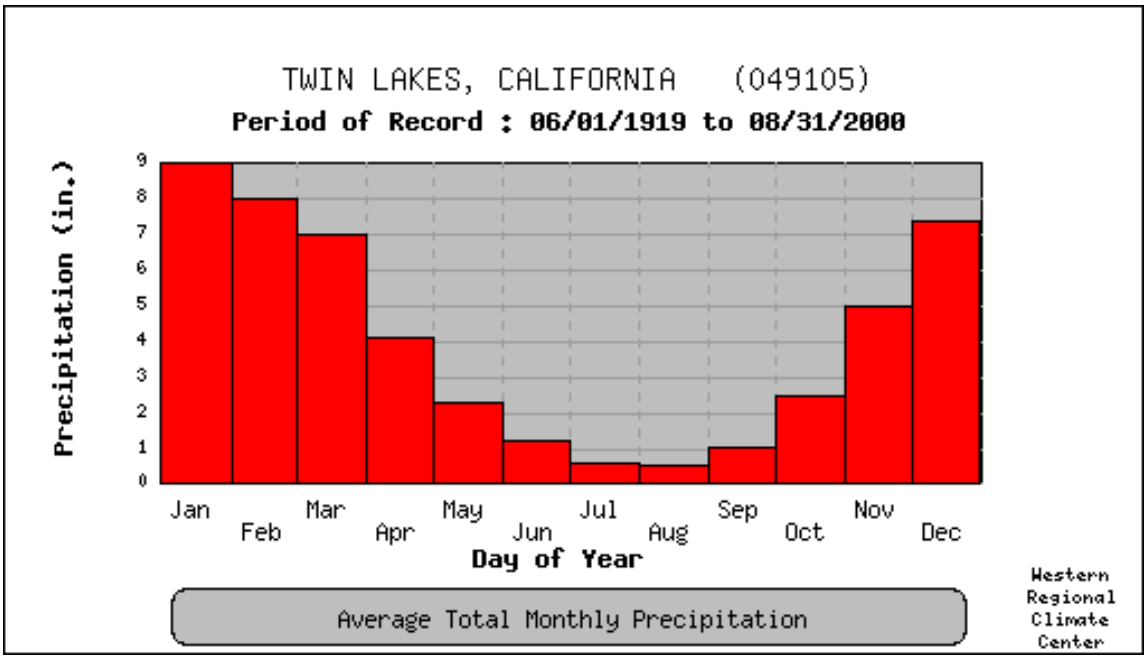
Rainfall in Inches	Date
5.62	3/18/2012
5.40	10/25/2021
4.69	11/10/1944
4.20	2/27/2011
4.08	11/19/1950
4.05	2/1/1963
3.90	12/23/1964
3.70	1/23/2017
3.13	1/22/1967
3.12	12/11/2022

Source: National Weather Service XMAC site. Retrieved 3/12/2025.

Eastern Amador County—Twin Lakes Weather Station (WRCC), Period of Record 1919 to 2000

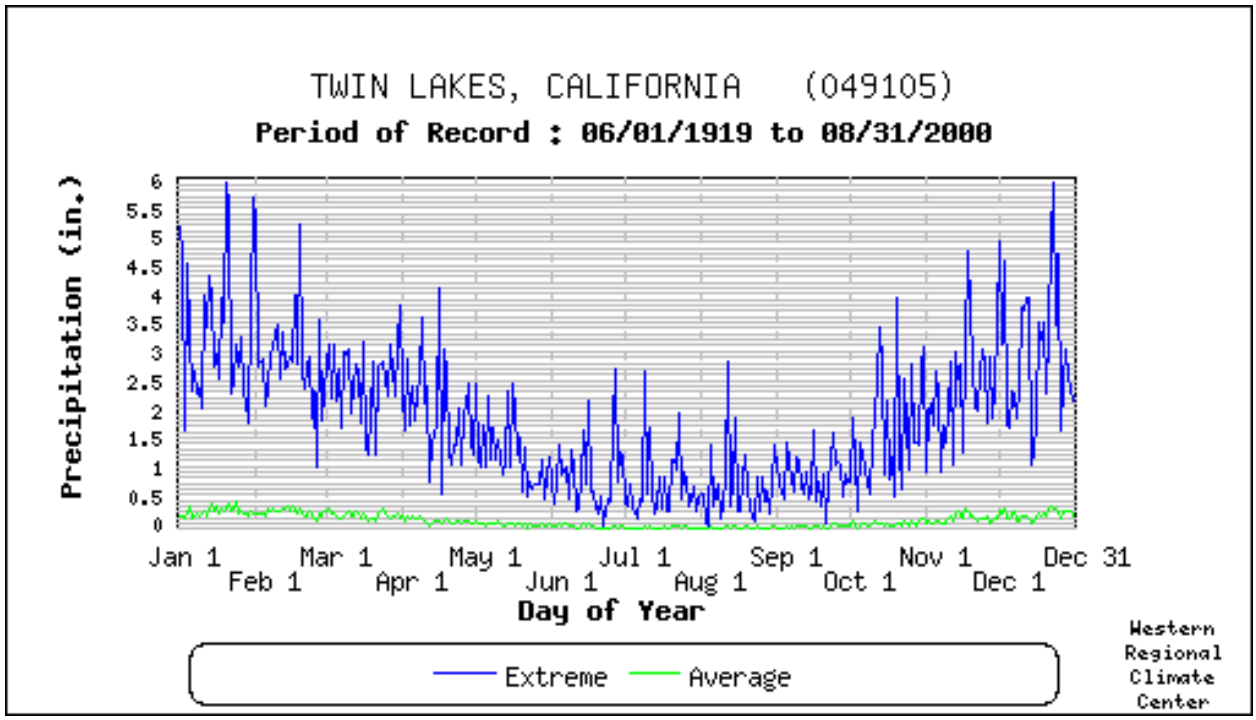
According to the WRCC, average annual precipitation in eastern Amador County is 47.05 inches per year. The highest recorded annual precipitation is 85.21 inches in 1983; the highest recorded precipitation for a 24-hour period is 9.35 inches on December 13, 1919. The lowest recorded annual precipitation was 10.17 inches in 1976. Average monthly precipitation for eastern Amador County is shown in Figure 4-49. Daily average and extreme precipitations are shown in Figure 4-50.

Figure 4-49 Eastern Amador County – Twin Lakes (WRCC) Monthly Average Total Precipitation 1919 to 2000



Source: Western Regional Climate Center, www.wrcc.dri.edu/. Retrieved 3/12/2025.

Figure 4-50 Eastern Amador County – Twin Lakes (WRCC) Daily Average and Extreme Precipitation 1919 to 2000



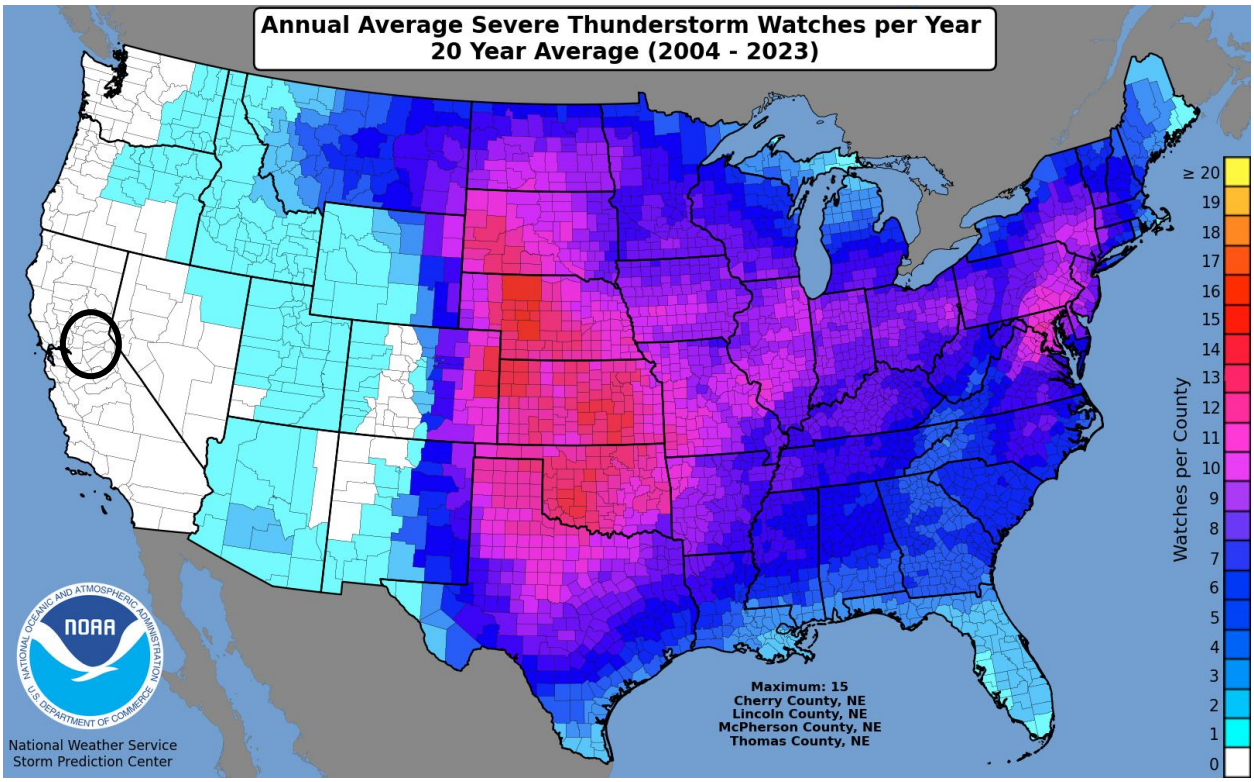
Source: Western Regional Climate Center, www.wrcc.dri.edu/. Retrieved 3/12/2025.

Eastern Amador County—Twin Lakes Weather Station (NWS), Period of Record 1919 to 2000

The NWS XMAC site did not have graphical or tabular data for heavy rains and storms; as such, no analysis is presented here.

The NOAA Storm Prediction Center tracks thunderstorm watches on a county basis. Figure 4-51 shows thunderstorm watches in Amador County and the United States for a 20-year period between 2004 and 2023.

Figure 4-51 Amador County – Average Thunderstorm Watches per Year (2004 to 2023)



Source: NOAA Storm Prediction Center. Retrieved 3/5/2025.

Hail

Hail can occur throughout the Planning Area during storm events, though it is rare in the County. Hail is formed when water droplets freeze and thaw as they are thrown high into the upper atmosphere by the violent internal forces of thunderstorms. Hail is sometimes associated with severe storms within the Amador County Planning Area. Hailstones are usually less than two inches in diameter and can fall at speeds of 120 miles per hour (mph). Severe hailstorms can be quite destructive, causing damage to roofs, buildings, automobiles, vegetation, and crops.

The National Weather Service classifies hail by diameter size, and corresponding everyday objects to help relay scope and severity to the population. Table 4-38 indicates the hailstone measurements utilized by the National Weather Service.

Table 4-38 Hailstone Measurements

Average Diameter	Corresponding Household Object
.25 inch	Pea
.5 inch	Marble/Mothball
.75 inch	Dime/Penny
.875 inch	Nickel
1.0 inch	Quarter

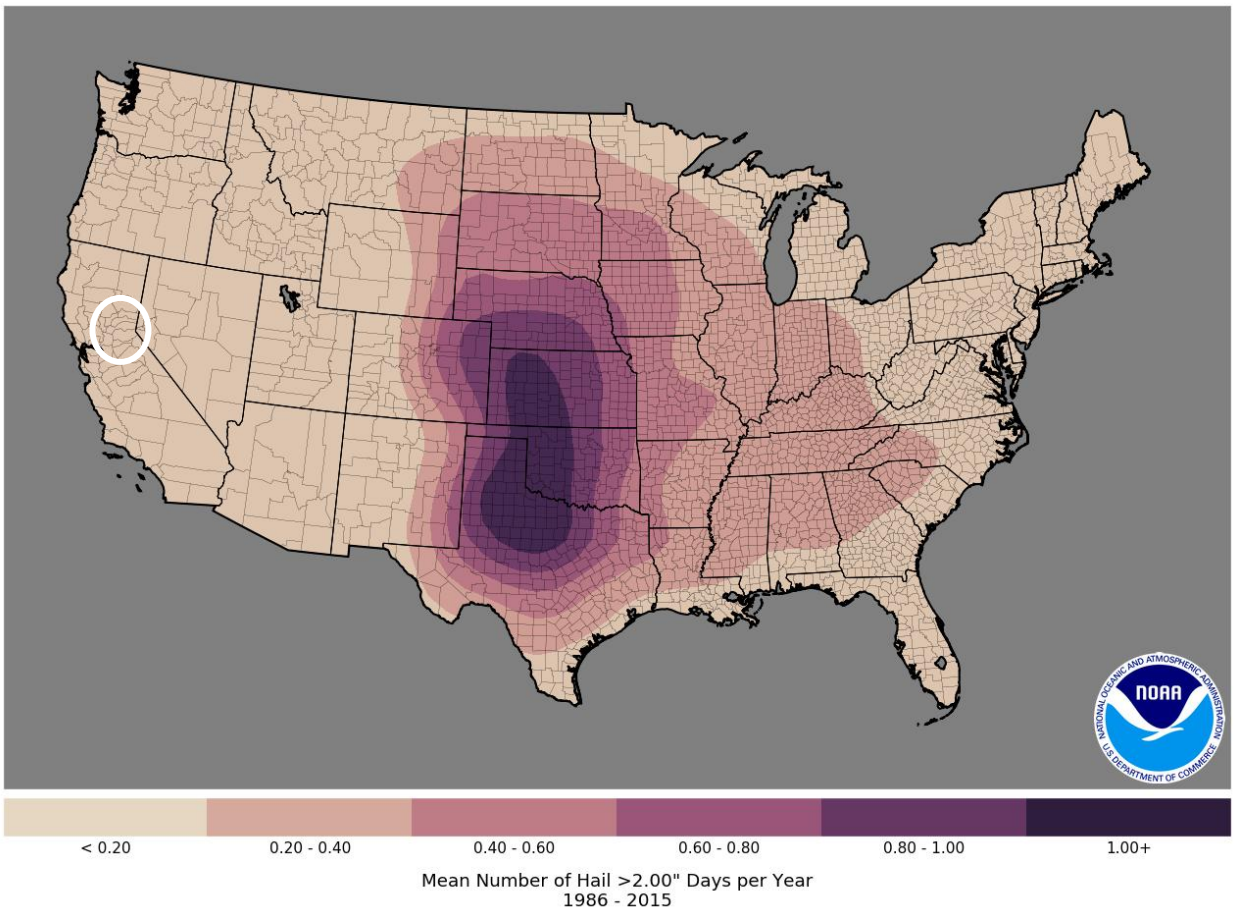
Average Diameter	Corresponding Household Object
1.5 inch	Ping-pong ball
1.75 inch	Golf-Ball
2.0 inch	Hen Egg
2.5 inch	Tennis Ball
2.75 inch	Baseball
3.00 inch	Teacup
4.00 inch	Grapefruit
4.5 inch	Softball

Source: National Weather Service

Location and Extent of Hail

Hail events can occur in any location of the County. All portions of the County are at risk to hail. Hail tends to be rare in California. There is no scale in which to measure hail, other than hail stone size as detailed above. The speed of onset of hail can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of thunderstorms that can cause hail in California is often short, ranging from minutes to hours. Hail events last shorter than the duration of the total thunderstorm. The National Weather Service tracks hail events. Figure 4-52 shows the average days each year where hail of greater than 1" in diameter occurred during a 20-year period from 1986 to 2015 (the most recent data available).

Figure 4-52 Amador County – Average Hail Days per Year (1986 to 2015)



Source: National Weather Service. Retrieved 3/5/2024.

Lightning

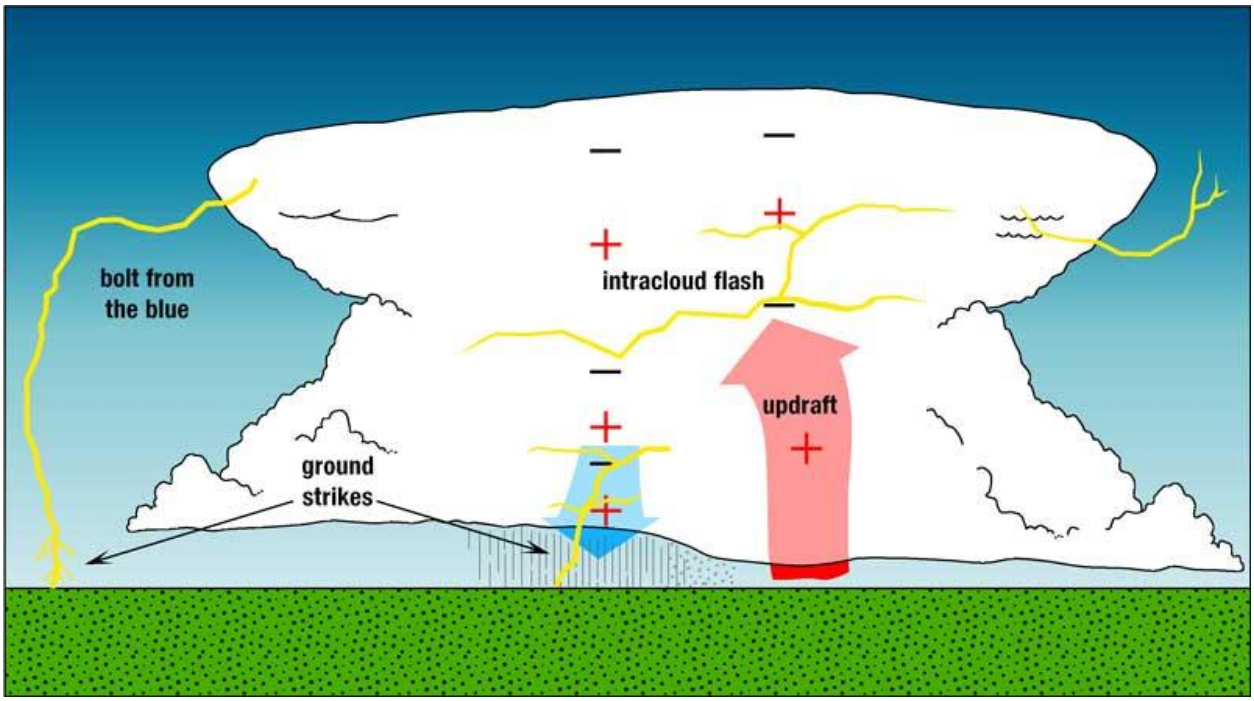
Lightning can occur throughout the County during storm events. Lightning is defined by the NWS as any and all of the various forms of visible electrical discharge caused by thunderstorms. Thunderstorms and lightning are usually (but not always) accompanied by rain. Cloud-to-ground lightning can kill or injure people by direct or indirect means. Objects can be struck directly, which may result in an explosion, burn, or total destruction. Or, damage may be indirect, when the current passes through or near an object, which generally results in less damage.

Intra-cloud lightning is the most common type of discharge. This occurs between oppositely charged centers within the same cloud. Usually it takes place inside the cloud and looks from the outside of the cloud like a diffuse brightening that flickers. However, the flash may exit the boundary of the cloud, and a bright channel, similar to a cloud-to-ground flash, can be visible for many miles.

Cloud-to-ground lightning is the most damaging and dangerous type of lightning, though it is also less common. Most flashes originate near the lower-negative charge center and deliver negative charge to earth. However, a large minority of flashes carry positive charge to earth. These positive flashes often occur during the dissipating stage of a thunderstorm's life. Positive flashes are also more common as a percentage

of total ground strikes during the winter months. This type of lightning is particularly dangerous for several reasons. It frequently strikes away from the rain core, either ahead or behind the thunderstorm. It can strike as far as 5 or 10 miles from the storm in areas that most people do not consider to be a threat (see Figure 4-53). Positive lightning also has a longer duration, so fires are more easily ignited. And, when positive lightning strikes, it usually carries a high peak electrical current, potentially resulting in greater damage.

Figure 4-53 Cloud to Ground Lightning



Source: National Weather Service

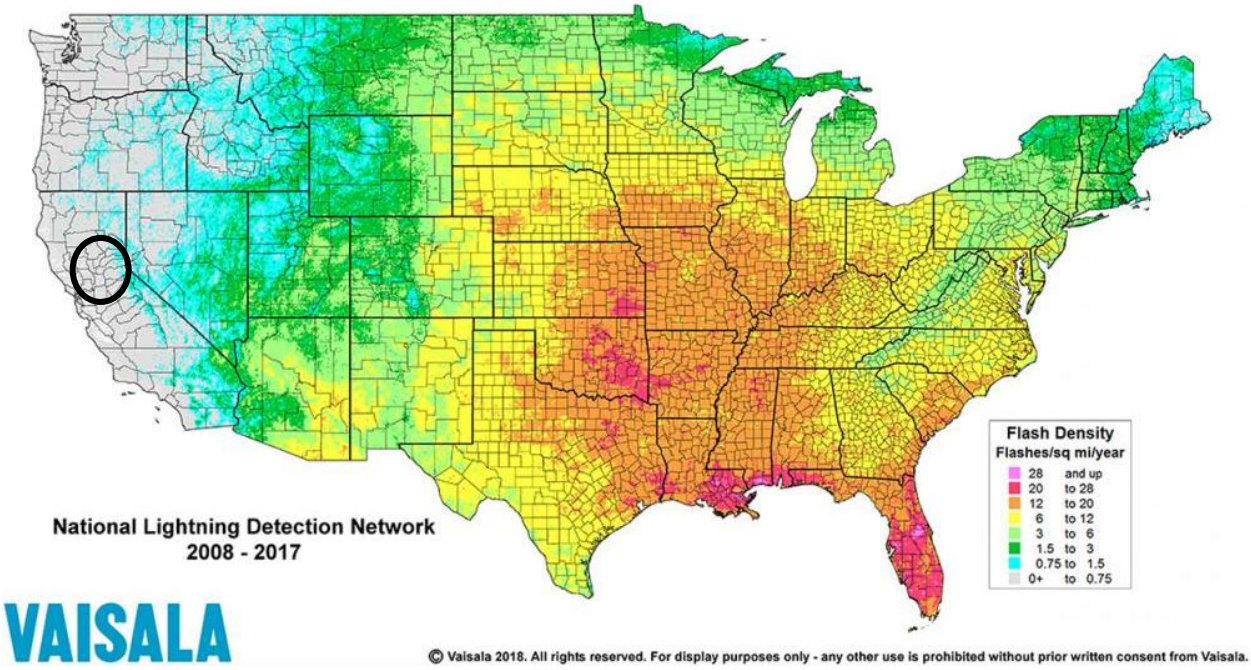
Lightning in the County is also a concern due to the number of fires that are started by lightning strikes. Wildfire is discussed in more detail in Section 4.3.15.

Location and Extent of Lightning

Lightning events can occur in any location of the County and are often associated with thunderstorms. All portions of the County are at risk to lightning. Lightning tends to be somewhat infrequent in the County, with more lightning events occurring in the higher elevations of the County, as discussed in the extent section below.

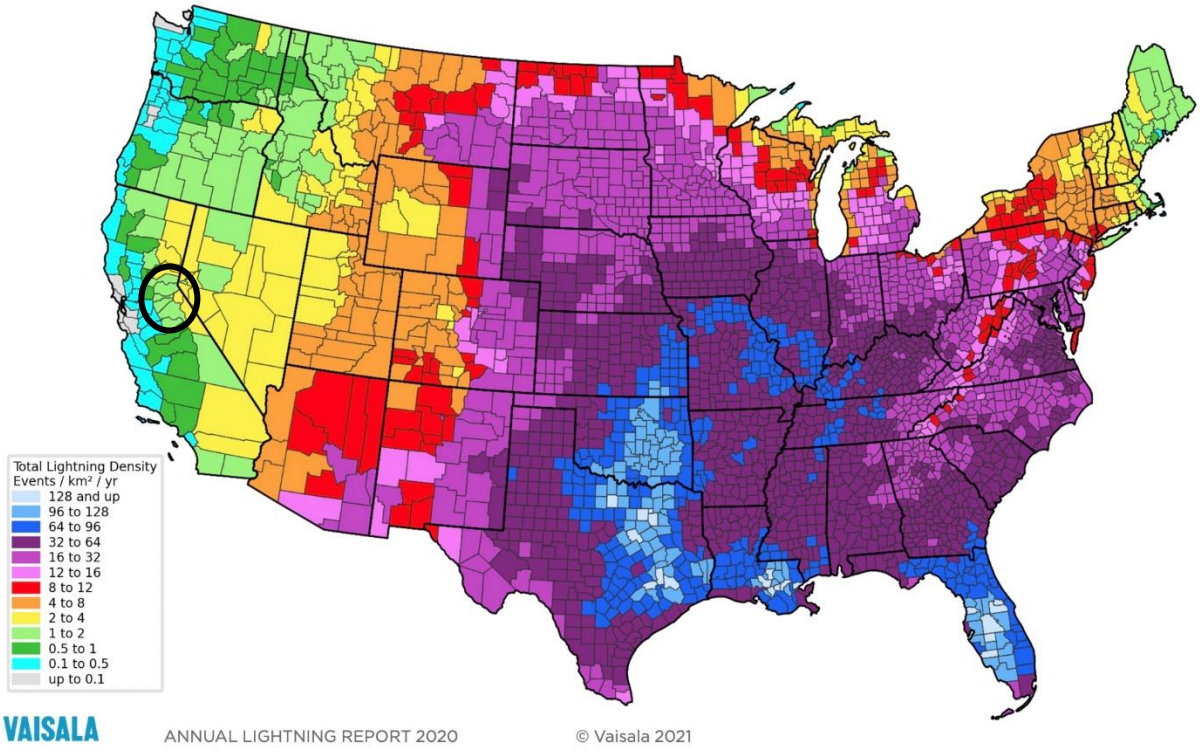
Lightning in the County can occur during thunderstorms. The speed of onset of thunderstorms that can cause lightning can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of thunderstorms in California is often short, ranging from minutes to hours. Thunderstorms and lightning are rare in the County. Lightning can also occur in the County outside of a thunderstorm event. Vaisala maintains the National Lightning Detection Network. It tracks cloud to ground lightning incidences in the United States. Figure 4-54 shows lightning incidences in the County and the rest of the United States from 2008 to 2017 (the most recent long term tracking map available). Figure 4-55 shows a more recent lightning density by county map.

Figure 4-54 Amador County – Lightning Incidence Map 2008 to 2017



Source: Vaisala National Lightning Detection Network. Retrieved 3/20/2025.

Figure 4-55 Amador County – Average US Total Lightning Density per County 2015-2019



Source: Vaisala National Lightning Detection Network. Retrieved 3/20/2025.

Past Occurrences

Disaster Declaration History

A search of FEMA and Cal OES disaster declarations turned up multiple events. Heavy rains and storms have caused flooding in the County. Events where flooding and heavy rains and storms resulted in a state or federal disaster declaration are shown in Table 4-39.

More information on USDA disaster declarations from heavy rain and storms (once in 2016 and once in 2017) can be found in Table 4-48 in the Past Occurrences in Section 4.3.6.

Table 4-39 Amador County – Disaster Declarations from Heavy Rain and Storms 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	22	1950, 1955, 1958 (twice), 1959, 1963, 1964, 1969, 1980, 1982, 1986, 1995 (twice), 1997, 2006 (twice), 2017 (twice), 2019*, 2021, 2023 (twice)	20	1950, 1955, 1958, 1962, 1963, 1964, 1969, 1986, 1995 (twice), 1997, 1998, 2006 (twice), 2017 (twice), 2019, 2023 (three)

Source: FEMA, Cal OES

NCDC Events

The NCDC data recorded 8 hail and heavy rain weather incidents for Amador County since 1950. Winter weather events tend to be rain in the lower elevations of the County, while snow falls in the upper elevations. No incidents of lightning were found in the NCDC database for the County. A summary of these events is shown in Table 4-40.

*Table 4-40 NCDC Severe Weather Events in Amador County 1950-7/31/2024**

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Hail	2	0	0	0	0	$0	$0
Heavy Rain	6	0	0	0	0	$0	$0
Winter Weather	106	1	3	0	2	$100	$0
Total	**114**	**1**	**3**	**0**	**2**	**$ 100**	**$ 0**

Source: NCDC

*Note: Losses reflect totals for all impacted areas, some of which fell outside of Amador County

Hazard Mitigation Planning Committee Events

The HMPC noted some events of heavy rain and storm that caused agricultural impacts. Those are discussed in the Past Occurrences in Section 4.3.6. The HMPC also noted that Amador County experience localized heavy rains yearly. This creates potential flooding in localized area, such as upper Sutter Creek and unnamed drainages, within the County. Additionally, the County noted many of these past events are

discussed in the Section 4.3.12 Flood: 1%/0.2% Annual Chance and Section 4.3.13 Flood: Localized Stormwater Flooding.

Likelihood of Future Occurrence

Highly Likely – Based on NCDC data and HMPC input, 114 heavy rain and storm incidents over a 75-year period (1950-2024) equates to a severe storm event every year. Severe weather is a well-documented seasonal occurrence that will continue to occur often in the Amador County Planning Area.

It is likely that climate change will increase the chance of future occurrence as well as future impacts. More information on climate change and heavy rains and storms can be found in the next section. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

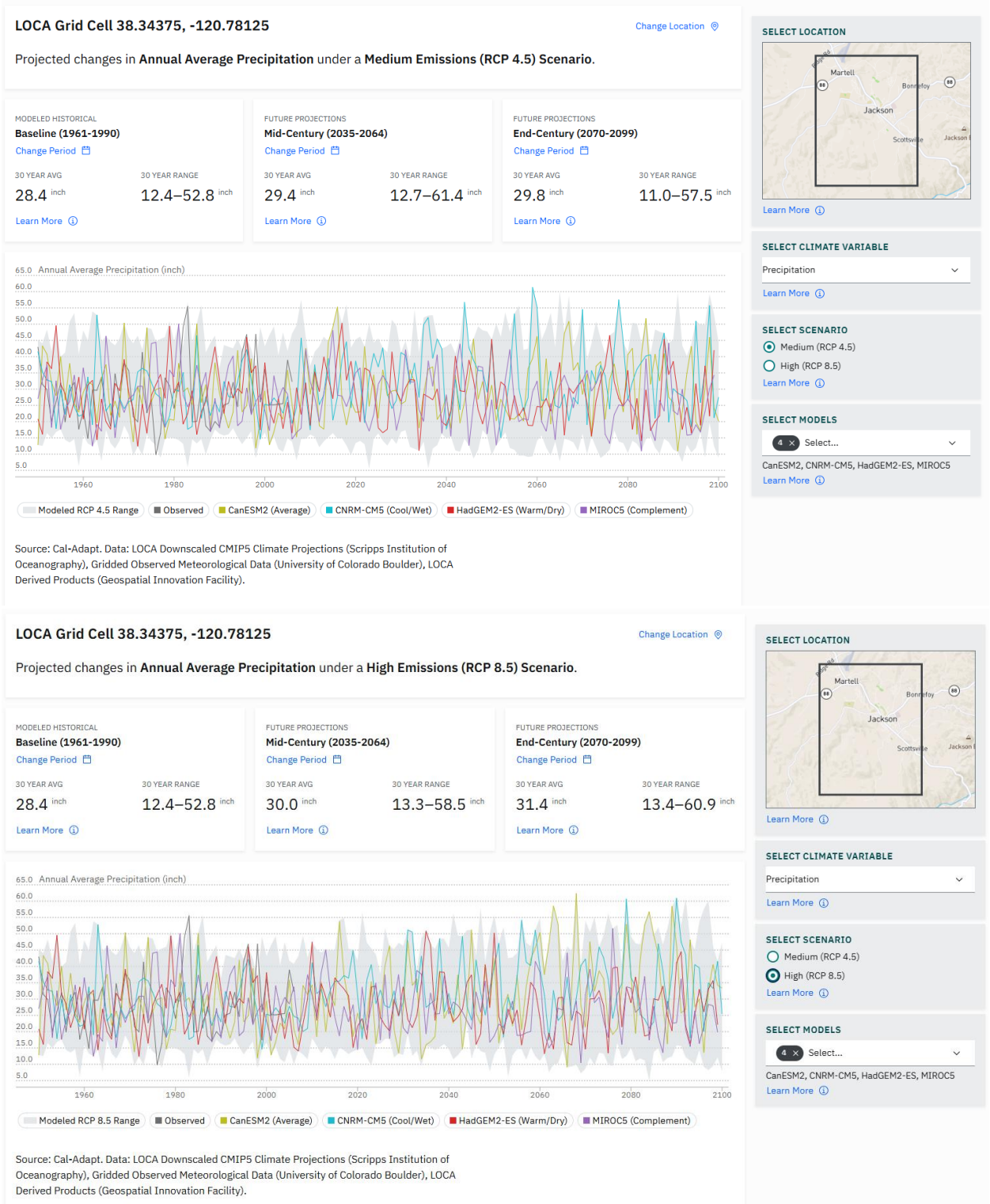
Climate Change and Heavy Rains and Storms

According to the 2021 CAS (as well as the 2024 Draft CAS), while average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is unlikely that hail will become more common in the County. The amount of lightning is not projected to change.

Cal-Adapt noted that, on average, the projections show little change in total annual precipitation in California. Furthermore, among several models, precipitation projections do not show a consistent trend during the next century. The Mediterranean seasonal precipitation pattern is expected to continue, with most precipitation falling during winter from North Pacific storms. One of the four climate models projects slightly wetter winters, and another projects slightly drier winters with a 10 to 20 percent decrease in total annual precipitation. However, even modest changes would have a significant impact because California ecosystems are conditioned to historical precipitation levels and water resources are nearly fully utilized. Future precipitation estimates for the County are shown in Figure 4-56.

- The upper chart shows annual averages of observed and projected Precipitation values for the selected area on map under the RCP 4.5 scenario. The gray line (1950 – 2005) is observed data. The colored lines (2006 – 2100) are projections from 10 LOCA downscaled climate models selected for California. The light gray band in the background shows the least and highest annual average values from all 32 LOCA downscaled climate models.
- The lower chart shows annual averages of observed and projected Precipitation values for the selected area on map under the RCP 8.5 scenario. The gray line (1950 – 2005) is observed data. The colored lines (2006 – 2100) are projections from 10 LOCA downscaled climate models selected for California. The light gray band in the background shows the least and highest annual average values from all 32 LOCA downscaled climate models.

Figure 4-56 Amador County– Future Precipitation Estimates: High and Low Emission Scenarios



Source: Cal-Adapt – Precipitation: Decadal Averages Map. Retrieved 2/6/2025.

Vulnerability Assessment

Vulnerability—Medium

According to historical hazard data, heavy rains and storms, including hail and lightning, are an annual occurrence in the Amador County Planning Area. Heavy rains can cause both localized flooding and flooding in the floodplains. Atmospheric river storms, which have been more frequent in recent years, are of great concern as they can dump large amounts of water in single storms, or in back-to-back storms.

An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to unincorporated Amador County. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect both the entire Amador County Planning Area as well as the unincorporated portions of Amador County. How the hazard affects the other participating jurisdictions can be found in their respective annexes to this LHMP Update. These sections below include assets at risk, impacts, and how future development may affect the vulnerability of the County to this hazard.

Local Concerns (unincorporated Amador County)

The unincorporated County has specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce the risk and vulnerabilities to this hazard.

One of the primary concerns of the County to heavy rains and storms is the resulting flooding that occurs during extreme storm events. These include large flood events as detailed in the Flood: 1%/0.2% annual chance flood hazard section and the localized flooding that occurs following these storms. Localized flood problem areas in the unincorporated County are shown in Table 4-113.

With the increased growth of the area, the lack of adequate drainage systems has become an increasingly important issue.

Local concerns for each of the other participating jurisdictions can be found under the Local Concerns heading in each respective jurisdictional annex to this LHMP Update.

Assets at Risk

Assets at risk from heavy rain and storms include people and populations; structures; critical facilities and infrastructure and community lifelines; natural, historic, and cultural resources; and economic assets and community activities of value. These are discussed in the following sections for the Amador County Planning Area and unincorporated Amador County.

Additionally, for each hazard in the FEMA National Risk Index in Amador County, the relevant portions of the hazard analysis done by FEMA is presented below. This includes the Hazard Risk Index Rating, Expected Annual Loss Values, Exposure Values, and the Historic Loss Ratio Rating. These are presented for the Amador County Planning Area as a whole.

People and Populations

All populations in the Amador County Planning Area have some measure of risk to heavy rains and storms. Those populations that work or recreate outside and unhoused individuals are more vulnerable to impacts from heavy storm events. Heavy rains and storms occur every year and do not generally cause significant adverse impacts to individuals; it is the secondary hazard, flooding, that poses the biggest impact to people. Populations at risk to flooding resulting from heavy rains and storm events include those who live in floodplains. (discussed in further detail in the Flood: 1%/0.2% Annual Chance in Section 4.3.12) and those who live in and near localized flooding areas floodplains (discussed in further detail in the Flood: Localized Stormwater Flooding in Section 4.3.13).

Structures

Structures in the Amador County Planning Area have some risk to heavy rains and storms. Structures built to modern building codes are built to withstand heavy rains and storms (including thunderstorm winds and lightning). During a heavy storm, localized flooding may cause water intrusion into buildings from the outside. Trees can be downed causing impacts to structures. Older homes and buildings may be at increased risk to heavy rains and storms. Power outages during severe storm events can occur, impacting the use of structures until the power is back online.

Critical Facilities and Infrastructure

Heavy rain and storms can affect critical facilities and infrastructure, and community lifelines during large events. Power outages may occur taking facilities offline. High winds can down power lines and trees impacting facilities. Water intrusion into facilities and infrastructure can impact operations. Local roads, streets, and bridges can be impacted resulting in closures restricting traffic flow in the Planning Area. In certain areas, large storms can cause erosion and localized landslides which can impact affected facilities. Many critical facilities are built to modern design standards that take heavy rains and storms into account when siting and building these structures, and others may need to be retrofitted to better withstand these events.

Natural, Historic, and Cultural Resources

Large storm events and associated flooding can affect natural, historic, and cultural resources. Silt and sediment can damage natural areas. Trees can be uprooted and downed by high winds. Extended periods of rainfall can erode natural banks along waterways and degrade soil stability for terrestrial species. While some natural systems can be adversely impacted during these large storms, heavy rain events can also provide benefits. Groundwater and wetland areas can be recharged and water supplies replenished. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to structures affected by large storm events, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged, and lost during extreme storm and flood events.

FEMA NRI Hazard Vulnerability Assessment

The FEMA NRI was queried for additional specific data on Amador County's vulnerability to Heavy Rains and Storms. The NRI contains data and analysis for 18 separate natural hazards. The NRI hazard related

to Amador County's Heavy Rains and Storms are: hail and lightning. As shown in Table 4-41, hail could cause a total of $2,739 in expected annual losses, with a historic loss rating of very low. Lightning could cause a total of $21,900 in expected annual losses with a historic loss ratio rating of very high. Hail and lighting have a relatively moderate rating for both social vulnerability and community resilience, with a risk index score of 4.4 out of 100 for hail and 24.6 out of 100 for lightning. According to the NRI, there have been 5 hail events between the years 1986-2021 with an average of 0.1 events per year and 43 lightning events on record between the years 1991-2012, with an average of 1.9 events per year.

Table 4-41 Amador County Planning Area – Hail and Lightning Vulnerability Ratings from FEMA NRI

NRI Hazard	Hazard Risk Index Rating*	Expected Annual Loss Values (total)**	Exposure Value (total)***	Historic Loss Ratio Rating
Hail	4.4	$2,739	$477,114,656,936	Very Low
Lightning	24.6	$21,900	$477,079,067,642	Very High

Source: FEMA NRI Report, retrieved 4/1/2025.

*Hazard Risk Index is calculated using data for only a single hazard type, and reflect a communities expected annual loss value, community risk factors, and the adjustment factor used to calculate the risk value.

**Expected annual loss represents the average economic loss in dollars resulting from natural hazards each year.

***Exposure is a natural hazard consequence factor that is the representative value of buildings, populations, or agriculture potentially exposed to a natural hazard occurrence.

Additional information on the FEMA NRI can be found in Section 4.2 and Appendix G.

Impacts from Heavy Rains and Storms

Impacts from heavy rains and storms include damage to property, critical facilities and infrastructure, and the natural landscape. This includes: erosion, downed trees, damaged utility structures and infrastructure; power outages; road damage and blockages; and lightning strikes to critical infrastructure and people. Lightning can also cause wildfires and urban fires to occur. Landslides occur when the soil on slopes becomes oversaturated and fails. Climate change may cause these impacts to worsen.

Actual damage associated with the primary effects of severe storms and heavy rains has been somewhat limited. It is the secondary hazards caused by these severe weather events, such as floods, landslides, and erosion that have had the greatest impact on the Planning Area. The risk and vulnerability associated with these secondary hazards are discussed in other sections of this Plan (Section 4.3.12 Flood: 100/500-year, Section 4.3.13 Flood: Localized Stormwater – specifically in the localized flood areas shown on Table 4-113, Section 4.3.9 Dam Failure, and Section 4.3.14 Landslide).

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future hazard conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for Amador County include the following:

- Climate change is likely to exacerbate future heavy rain and storm conditions and associated impacts and vulnerability of the County to flooding.
- Future population growth should be considered as having more or less people in a community affects the overall hazard vulnerability to the County. Population is expected to increase slowly for Amador County; however, the vulnerability may change depending on changes to the makeup of more vulnerable populations. Certain vulnerable populations, such as the unhoused, outdoor workers, and others could experience disproportional effects from this hazard. and should be addressed as the County continues to grow. Thus, changes in population and population patterns may or may not increase the impacts and vulnerability of the County to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. Changes in land use may also amplify the impacts of heavy rains and storms, as additional impervious surfaces can cause additional runoff and localized flooding throughout the County. Building codes in the County ensure that new development is built to current building standards, which should reduce the risk to future development in the County from heavy rains and storms. New critical facilities such as communications towers and others should be built to withstand hail damage, lightning, and thunderstorm winds. With adherence to development standards, changes in land use and development will not likely increase the impacts and associated vulnerabilities of the County to this hazard.

Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements, such as building codes, are followed, and varying needs for different demographic groups with intersecting identities that reside within the County are considered can help make for a more resilient community.

4.3.5. Severe Weather: High Winds and Tornadoes

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Amador County Planning Area. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; likelihood of future occurrences; and how climate change can affect or influence this hazard.

Hazard/Problem Description

High Winds

High winds, often accompanying severe storms and thunderstorms, can cause significant property and crop damage, threaten public safety, and have adverse economic impacts from business closures and power loss. High winds, as defined by the NWS glossary, are sustained wind speeds of 40 mph or greater lasting for 1

hour or longer, or winds of 58 mph or greater for any duration. These winds may occur as part of a seasonal climate pattern or in relation to other severe weather events such as thunderstorms.

Straight-line winds may also exacerbate existing weather conditions by increasing the effect on temperature and decreasing visibility due to the movement of particulate matters through the air, as in dust and snow storms. The winds may also exacerbate fire conditions by drying out the ground cover, propelling fuel around the region, and increasing the ferocity of exiting fires. These winds may damage crops, push automobiles off roads, damage roofs and structures, and cause secondary damage due to flying debris.

Location and Extent

The entire Planning Area is subject to significant, non-tornadic (straight-line), winds. Each area of the County is at risk to high winds. Magnitude of winds is measured often in speed and damages. These events are often part of a heavy rain and storm event, but can occur outside of storms. The speed of onset of winds can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of winds in California is often short, ranging from minutes to hours. The Beaufort scale is an empirical measure that relates wind speed to observed conditions at sea or on land. Its full name is the Beaufort wind force scale. Figure 4-57 shows the Beaufort wind scale.

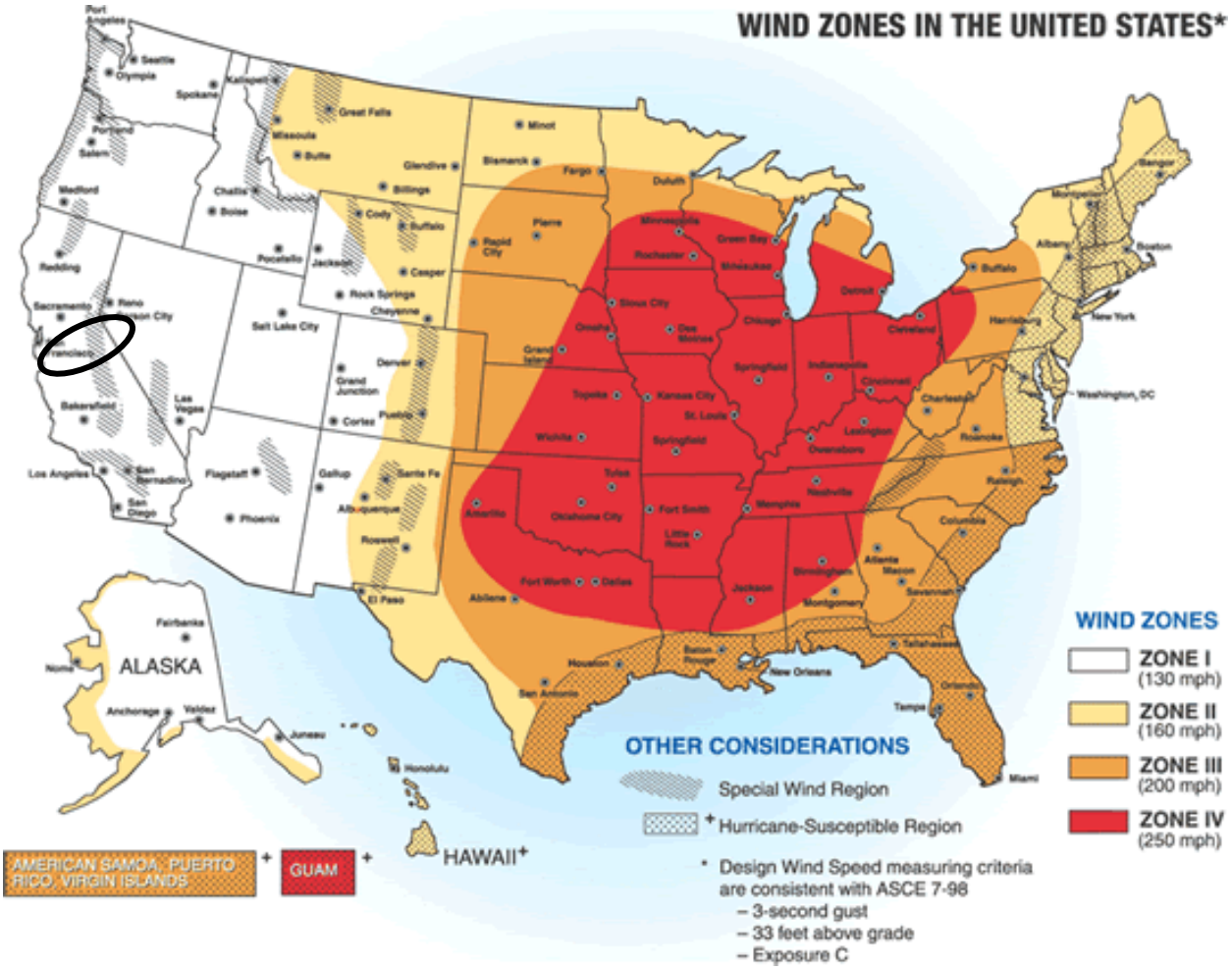
Figure 4-57 Beaufort Wind Scale

Beaufort Number	Wind Speed (miles/hour)	Wind Speed (km/hour)	Wind Speed (knots)	Description	Wind Effects on Land
0	< 1	< 1	< 1	Calm	Calm. Smoke rises vertically.
1	1-3	1-5	1-3	Light Air	Wind motion visible in smoke.
2	4-7	6-11	4-6	Light Breeze	Wind felt on exposed skin. Leaves rustle.
3	8-12	12-19	7-12	Gentle Breeze	Leaves and smaller twigs in constant motion.
4	13-18	20-28	11-16	Moderate Breeze	Dust and loose paper are raised. Small branches begin to move.
5	19-24	29-38	17-21	Fresh Breeze	Small trees begin to sway.
6	25-31	39-49	22-27	Strong Breeze	Large branches are in motion. Whistling is heard in overhead wires. Umbrella use is difficult.
7	32-38	50-61	28-33	Near Gale	Whole trees in motion. Some difficulty experienced walking into the wind.
8	39-46	62-74	34-40	Gale	Twigs and small branches break from trees. Cars veer on road.
9	47-54	75-88	41-47	Strong Gale	Larger branches break from trees. Light structural damage.
10	55-63	89-102	48-55	Storm	Trees broken and uprooted. Considerable structural damage.
11	64-72	103-117	56-63	Violent Storm	Widespread damage to structures and vegetation.
12	> 73	> 117	> 64	Hurricane	Considerable and widespread damage to structures and vegetation. Violence.

Source: National Weather Service

Figure 4-58 depicts wind zones for the United States. The map denotes that Amador County falls into Zone I, which is characterized by high winds of up to 130 mph. Portions of the County are also located in a special wind hazard region, which is a result of foehn winds. A foehn wind is a type of dry down-slope wind that occurs in the lee (downwind side) of a mountain range. Winds of this type are called "snow-eaters" for their ability to make snow melt or sublimate rapidly. This snow-removing ability is caused not only by warmer temperatures, but also the low relative humidity of the air mass coming over the mountain(s). They are also associated with the rapid spread of wildfires, making some regions which experience these winds particularly fire prone. Burn patterns of almost all historic large wildfires in the County indicate they occurred during foehn winds. This is discussed in greater detail in the wildfire profile in Section 4.3.15.

Figure 4-58 Wind Zones in the United States

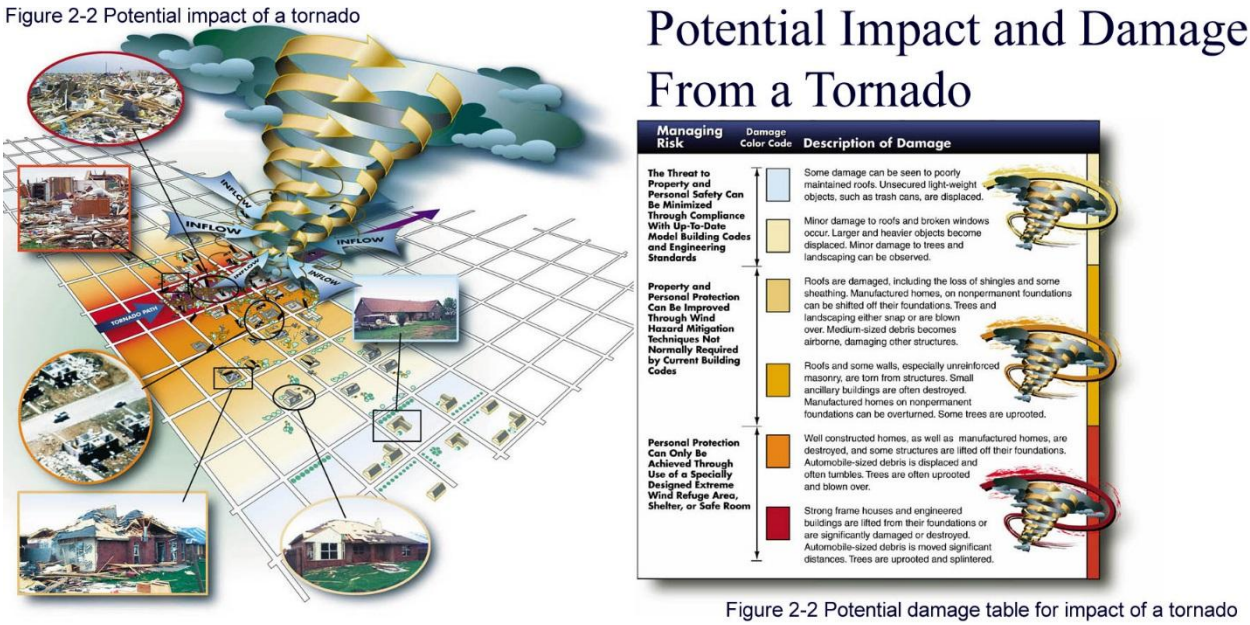


Source: FEMA

Tornadoes

Tornadoes and funnel clouds can also occur during these types of severe storms. Tornadoes are another severe weather hazard that, though rare, can affect anywhere within the Amador County Planning Area, but most often in the lower elevations, and primarily occur during the storm season in the late fall and early spring. Tornadoes form when cool, dry air sits on top of warm, moist air. Tornadoes are rotating columns of air marked by a funnel-shaped downward extension of a cumulonimbus cloud whirling at destructive speeds of up to 300 mph, usually accompanying a thunderstorm. Tornadoes are the most powerful storms that exist. They can have the same pressure differential across a path only 300 yards wide or less as 300-mile-wide hurricanes. Figure 4-59 illustrates the potential impact and damage from a tornado.

Figure 4-59 Potential Impact and Damage from a Tornado



Source: FEMA: Building Performance Assessment: Oklahoma and Kansas Tornadoes

Location and Extent

Tornadoes, while rare, can occur at any location in the County, but most often occur in the lower elevations. All areas of the County are at risk to tornadoes.

Prior to February 1, 2007, tornado intensity was measured by the Fujita (F) scale. This scale was revised and is now the Enhanced Fujita scale. Both scales are sets of wind estimates (not measurements) based on damage. The new scale provides more damage indicators (28) and associated degrees of damage, allowing for more detailed analysis and better correlation between damage and wind speed. It is also more precise because it considers the materials affected and the construction of structures damaged by a tornado. Table 4-42 shows the wind speeds associated with the original Fujita scale ratings and the damage that could result at different levels of intensity. Table 4-43 shows the wind speeds associated with the Enhanced Fujita Scale ratings.

Table 4-42 Original Fujita Scale

Fujita (F) Scale	Fujita Scale Wind Estimate (mph)	Typical Damage
F0	< 73	Light damage. Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
F1	73-112	Moderate damage. Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
F2	113-157	Considerable damage. Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.

Fujita (F) Scale	Fujita Scale Wind Estimate (mph)	Typical Damage
F3	158-206	Severe damage. Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
F4	207-260	Devastating damage. Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown, and large missiles generated.
F5	261-318	Incredible damage. Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yards); trees debarked; incredible phenomena will occur.

Source: National Oceanic and Atmospheric Administration Storm Prediction Center, www.spc.noaa.gov/faq/tornado/f-scale.html

Table 4-43 Enhanced Fujita Scale

Enhanced Fujita (EF) Scale	Enhanced Fujita Scale Wind Estimate (mph)
EF0	65-85
EF1	86-110
EF2	111-135
EF3	136-165
EF4	166-200
EF5	Over 200

Source: National Oceanic and Atmospheric Administration Storm Prediction Center, www.spc.noaa.gov/faq/tornado/ef-scale.html

It is difficult to predict a tornado or the conditions that preclude a tornado far in advance. Tornadoes can strike quickly with very little warning. In California it is rare for tornadoes to exceed EF3 magnitude. Most tornadoes that touch down are not long lived.

Past Occurrences

Disaster Declaration History

There have been no past federal or state disaster declarations due to high winds or tornadoes, according to Table 4-4. There was one USDA Secretarial Disaster Declaration for high winds from 2016, which can be found in Table 4-48 in Section 4.3.6 below.

NCDC Events

The NCDC data recorded 160 high wind, 3 funnel cloud, and no tornado incidents for Amador County since 1950. A summary of these events is shown in Table 4-44.

Table 4-44 NCDC High Wind and Tornado Events in Amador County 1950-7/31/2024

Event Type	Number of Events	Deaths	Deaths (indirect)t	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Funnel Cloud	3	0	0	0	0	$0	$0
High Wind	91	3	0	6	0	$17,276,000	$48,000

Event Type	Number of Events	Deaths	Deaths (indirect)t	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Strong Wind	66	6	1	4	3	$6,219,100	$0
Thunderstorm Wind	3	0	0	0	0	$3,000	$0
Total	**163**	**9**	**1**	**10**	**3**	**$23,498,100**	**$48,000**

Source: NCDC

Hazard Mitigation Planning Committee Events

The HMPC noted that winds have affected the agricultural industry in the past. Those events are discussed in the Past Occurrences in Section 4.3.6. HMPC members also noted that:

2004 – the Power Fire was a wind driven event that consumed 16,993 acres, affecting national forest, industrial timberlands, and electric transmission lines. Amador County experience localized high winds, due to topography within the County. This results in downed limbs or trees along roadway.

2019 – high winds downed trees throughout the Amador County resulting in debris removal and road repairs that was reimbursed by FEMA.

Amador County Public Works could recall no wind events since 2020 that caused damages, injuries, or deaths. They also noted that no damaging tornadoes could be recalled, including tornadoes since 2020. Two tornado warnings occurred (April 21, 2022 and January 10, 2023) for Amador and surrounding counties, but no tornadoes occurred.

Likelihood of Future Occurrence

Highly Likely/Occasional – Based on NCDC data and HMPC input, 163 wind and tornado incidents over a 74-year period (1950-2024) equates to a severe wind/tornado event every year. High winds are a well-documented seasonal occurrence that will continue to occur annually in the Amador County Planning Area. Tornadoes tend to be rare in the County and warrant a likelihood of future occurrence rating of occasional.

Climate change may increase the chance of future occurrence as well as future impacts. More information on climate change and high winds and tornadoes can be found in the next section. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate Change and High Winds

According to the 2021 CAS (as well as the 2024 Draft CAS), while average annual rainfall may increase or decrease slightly, the intensity of individual thunderstorm events is likely to increase during the 21st century. This may bring stronger thunderstorm winds. The CAS does not discuss non-thunderstorm winds.

Vulnerability Assessment

Vulnerability—Medium

The Amador County Planning Area is subject to potentially destructive high winds and tornadoes. High winds are common throughout the area and can happen during most times of the entire year and outside of a severe storm event. Tornadoes are rare. High winds and tornadoes can be a significant public safety and economic concern.

The whole of the Planning Area has some measure of vulnerability to high winds and tornadoes. An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to unincorporated Amador County. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect both the entire Amador County Planning Area as well as the unincorporated portions of Amador County. How the hazard affects the other participating jurisdictions can be found in their respective annexes to this LHMP Update. These sections below include assets at risk, impacts, and how future development may affect the vulnerability of the County to this hazard.

Local Concerns (unincorporated Amador County)

The unincorporated County has specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The County noted that while there has been some scattered record keeping describing the impacts of windstorms, there is little information to indicate that straight-line winds are little more than a nuisance. For example, while winds can blow weeds that can create an additional expense for farmers, they often cause little long-term damage and there is little justification for allocating resources to combat them. Trees may be downed in the County. As detailed in the wildfire discussion, one of the most significant concerns in the County is the effect of high winds in fueling wildfires. Even before a wildfire starts, high winds can cause PG&E to put PSPS events into effect.

Local concerns for each of the jurisdictions can be found under the Local Concerns heading in each respective jurisdictional annex to this LHMP Update.

Assets at Risk

Assets at risk from winds and tornadoes include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections for the Amador County Planning Area and unincorporated Amador County.

Additionally, for each hazard in the FEMA National Risk Index in Amador County, the relevant portions of the hazard analysis done by FEMA is presented below. This includes the Hazard Risk Index Rating, Expected Annual Loss Values, Exposure Values, and the Historic Loss Ratio Rating. These are presented for the Amador County Planning Area as a whole.

People and Populations

All populations are at some vulnerability to high winds and tornadoes. Certain vulnerable populations are at the greatest risk to the effects of high winds and tornadoes. These include the unsheltered, residents who live in mobile homes, residents who live in older buildings not built to withstand high winds and that may not have areas to shelter, such as below ground floors, and those working or caught outdoors during a wind or tornado event.

Structures

All structures in the Amador County Planning Area have some measure of risk from high wind and tornadoes. Though most structures are built to withstand winds, high wind speeds can still cause damages in the Planning Area. Though rare, a tornado could cause damage to virtually all facilities in the tornado touchdown path. This would affect homes, businesses, commercial property, as well as government and critical facilities. During a wind or tornado event, power lines in the Planning Area can be damaged causing power outages and falling trees can cause damage to nearby structures. High winds are also a cause for PSPS events to be declared, causing power outages to occur. High winds and tornadoes could cause sparks from electric wires and other sources, which could lead to wildfire ignition. Once ignited, high winds can also cause wildfires to rapidly spread and become out of control. High wind conditions can cause wildfires to move into more urban areas destroying structures and whole subdivisions, as seen in recent wildfire events in the California.

Critical Facilities and Infrastructure

Though most critical facilities are built to withstand winds, high wind speeds can still cause damage to critical facilities and infrastructure in the Amador County Planning Area. Though rare, a tornado could cause damage to virtually all facilities in the tornado touchdown path. Winds can cause PSPS events and lead to out of control wildfires, which can damage critical facilities and impact their abilities to perform their critical roles in the community.

Natural, Historic, and Cultural Resources

Natural resources, such as trees, are vulnerable to winds. Increased levee and streambank erosion can occur during periods of high water and high winds. High wave action during significant wind events can cause levee and streambank erosion and impact marsh lands and habitat areas. Soil erosion can also occur during high winds. Most all natural, historic, or cultural resources are at risk to tornadoes. Tornadoes can tear apart habitats, causing fragmentation across ecosystems and can damage and destroy historic structures and cultural resources.

FEMA NRI Hazard Vulnerability Assessment

The FEMA NRI was queried for additional specific data on Amador County's vulnerability to High Winds and Tornadoes. The NRI contains data and analysis for 18 separate natural hazards. The NRI hazard related to Amador County's High Winds and Tornadoes are: strong winds and tornadoes. As shown in Table 4-45, strong winds could cause a total of $5,715 in expected annual losses, with a historic loss rating of relatively low. Tornadoes could cause a total of $23,039 in expected annual losses with a historic loss ratio rating of

very low. Strong winds and tornadoes have a relatively moderate rating for both social vulnerability and community resilience, with a risk index score of 2.5 out of 100 for strong winds and 6.2 out of 100 for tornadoes. According to the NRI, there have been 2 strong wind events between the years 1986-2021 with an average of 0 events per year and 0 tornado events on record between the years 1950-2021, with an average of 0 events per year.

Table 4-45 Amador County Planning Area – Strong Wind and Tornado Vulnerability Ratings from FEMA NRI

NRI Hazard	Hazard Risk Index Rating*	Expected Annual Loss Values (total)**	Exposure Value (total)***	Historic Loss Ratio Rating
Strong Wind	2.5	$5,715	$477,114,656,936	Relatively Low
Tornado	6.2	$23,039	$477,114,656,936	Very Low

Source: FEMA NRI Report, retrieved 4/1/2025.

*Hazard Risk Index is calculated using data for only a single hazard type, and reflect a communities expected annual loss value, community risk factors, and the adjustment factor used to calculate the risk value.

**Expected annual loss represents the average economic loss in dollars resulting from natural hazards each year.

***Exposure is a natural hazard consequence factor that is the representative value of buildings, populations, or agriculture potentially exposed to a natural hazard occurrence.

Additional information on the FEMA NRI can be found in Section 4.2 and Appendix G.

Impacts from Severe Weather: High Wind and Tornado

Wind and tornadoes can cause damage to property and loss of life. While most tornado damage is caused by violent winds, the majority of injuries and deaths generally result from flying debris. Property damage can include damage to buildings, fallen trees, and power lines. Local industries may also be damaged or destroyed. Access roads and streets may be blocked by debris, delaying necessary emergency response. Winds can push automobiles off roads, damage roofs and structures, cause power outages, and cause secondary damage due to flying debris and hazardous trees. High winds can also contribute to the spread and intensity of wildfires.

Tornadoes can cause damage to property and loss of life. While most tornado damage is caused by violent winds, the majority of injuries and deaths generally result from flying debris. Property damage can include damage to buildings, fallen trees and power lines, broken gas lines, broken sewer and water mains, and the outbreak of fires. Agricultural crops and industries may also be damaged or destroyed. Access roads and streets may be blocked by debris, delaying necessary emergency response.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future hazard conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for Amador County include the following:

- Climate change is likely to exacerbate future wind conditions and associated impacts and vulnerability of the County. Climate change is not likely to affect future tornado conditions.
- Future population growth should be considered as having more or less people in a community affects the overall hazard vulnerability to the County. Population growth in Amador County is expected to continue slowly. Vulnerable populations could experience disproportional effects from this hazard and should be planned for as development of the County continues. Changes in population and population patterns may or may not increase the impacts and vulnerability of the County to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. Building codes in the County ensure that new development is built to current building standards to withstand high winds, which should reduce the risk to future development in the County from high winds and tornadoes. With adherence to development standards, future losses to new development should be minimal. Changes in land use and increased development may amplify the impacts of high winds and tornadoes, as additional structures in the County increase the number of buildings at risk to high winds and tornadoes.

Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements, such as building codes, are followed, and varying needs for different demographic groups with intersecting identities that reside within the County are considered can help make for a more resilient community. Utilities at risk to high winds should be undergrounded as new facilities are improved or added. Whether high winds and tornadoes will occur, where, when, and of what intensity are all factors that evolve over the days and hours before they form and after they do. Improved weather forecasts coupled with new information technologies, including social media, has resulted in an increasingly large volume of risk information that is available to people when tornadoes and high winds threaten. Development trends in the County are not expected to increase vulnerability to this hazard.

4.3.6. Agricultural Hazards: Severe Weather/Pests/Invasive Species

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Amador County Planning Area. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; likelihood of future occurrences; and how climate change can affect or influence this hazard.

Hazard/Problem Description

Farming and related agricultural industries are not only the backbone of Amador County's economy, they also play a central role in the way of life of County residents and help define the character of the County. Agriculture has always been an integral part of Amador County and has continually grown and changed

along with the County. Today, the soils and climate of Amador County make it an ideal area to sustain many agricultural endeavors. Agriculture in Amador County is a mosaic of farm, grazing, and timber lands intermingled with other uses in the rural setting which typifies much of the County. In recent years, grape growing and the wine industry has become a key component of the agricultural industry in Amador. This agricultural hazard focuses on severe weather, as well as certain native and invasive species (insects, pests and weeds), all which can significantly affect the agricultural industry in the County.

Agricultural losses occur on an annual basis and can be affected by a variety of natural hazards, but are most often affected by severe weather events, including heavy rains, floods, freeze, heat, and drought. The 2023 State of California Multi-Hazard Mitigation Plan attributes most of the agricultural disasters statewide to drought, freeze, and insect infestations. Other agricultural hazards include fires, crop and livestock disease, insects, and noxious weeds.

In addition to severe weather, certain native and invasive species can affect the agricultural industry in the County. Invasive species are organisms that are introduced into an area beyond their natural range and become a pest in the new environment. This hazard addresses the issues related to both native and invasive insects, pests, and weeds that are considered a nuisance and pose a significant threat to the agricultural industry in the Amador County Planning Area. This hazard does not address pests and plants that cause impacts to human health, as those issues are addressed in other planning mechanisms in the County.

Amador County is geographically and ecologically diverse, extending from the western edge of California's Central Valley east into the Sierra Nevada Mountains. Foothill growers produce a wide diversity of crops in a range of microclimates. Agricultural production in Amador County remains a significant contributor to the local economy. According to the California Department of Conservation's Farmland Mapping and Monitoring Program (FMPP), as of 2022 the County has 2,635 acres of prime farmland, 1,390 acres of farmland of statewide importance, 3,107 acres of unique farmland, 2,535 acres of farmland of local importance, and 187,804 acres of grazing land. These numbers have been reduced since 2006 due in part to increased development in the County. (see Table 4-46).

Table 4-46 Amador County Farmland Inventory – 2006, 2016, and 2022

Soil Category	2006 Acres	2016 Acres	2022 Acres
Prime Farmland	3,610	2,822	2,635
Farmland of Statewide Importance	1,717	1,419	1,390
Unique Farmland	3,596	3,397	3,107
Farmland of Local Importance	1,272	2,299	2,535
Grazing Land	188,569	188,115	187,804
Urban and Built-Up Land	8,094	8,791	9,192
Other Land	88,191	88,275	88,673
Water area	5,322	5,253	5,036
Total Area Inventoried	**300,371**	**300,371**	**300,371**

Source: State of California Department of Conservation Farmland Mapping and Monitoring Program, www.conservation.ca.gov/

According to the 2023 Amador County Crop Report, many commodities are grown in Amador County. This includes timber products; fruit and nut crops; livestock and poultry; and field crops. The top three commodities for the County in 2022 were fruit and nut crops (grapes), livestock (cattle), and field crops.

According to the 2023 Crop Report, the gross value of Amador County's agricultural production in 2023 was $35,701,766. This is a decrease of 7.1% in comparison to the estimated value in 2022. A summation of crop production values, sourced from the Amador County Agricultural Commissioner's Annual Crop Reports, from 2020-2023 for Amador County is shown in Table 4-47.

Table 4-47 Amador County – Value of Agricultural Production 2020-2023

Crop	2020	2021	2022	2023
Fruit & Nut	$17,347,460	$25,409,569	$13,632,517	$14,977,377
Field Crops	$5,425,201	$6,144,723	$6,914,849	$5,449,186
Livestock Productions	$11,967,192	$12,284,218	$17,262,390	14,965,155
Livestock & Poultry Products	$105,250	$61,059	$52,053	$41,828
Miscellaneous	$415,661	$444,587	$277.221	$301,633
Timber	$3,102,503	$1,010,696	$39,606	$0
Total	**$38,363,267**	**$45,354,851**	**$38,203,048**	**$35,701,766**

Source: Amador County Agricultural Commissioner Reports. Retrieved 3/12/2025.

Location and Extent

Agricultural hazards occur throughout the County where lands are used for farming, grazing, and other agricultural uses. The County has large swaths of agricultural lands in the lower elevations of the County. These are shown in the Land Use Map for the County on Figure 4-20 above. Areas not as greatly affected by severe weather, insects, pests, and weeds are the cities, with limited agricultural uses, as well as the upper elevations of the County which all contain fewer agricultural acres. However, while the cities may not be directly affected, they are indirectly affected economically when agricultural losses occur.

There is no scale that measures agricultural hazards. Agriculture in the County is at risk to many hazards: insects, weeds, severe weather, as well as downturns in commodity prices. Each of these has a different duration and speed of onset. Some, such as freeze, can have a short onset and a short duration. Drought can have a long onset and long duration. Insects, pests, and weeds can have short or long onset, and short or long durations. All agricultural losses can have a significant impact on affected communities.

Past Occurrences

Disaster Declaration History

The agricultural lands of Amador County have historically been affected by weather related events such as extreme heat, freeze, heavy rain, and drought. The severe weather events can have devastating effects leading to losses in yield and affecting quality. The US Farm Services Agency provided information on disaster declarations from 2014 through 2024. These are shown in Table 4-48.

Table 4-48 Amador County – USDA Disaster Declarations 2012 to 2024

Year Declared/Disaster Type	Designation Number	Primary or Contiguous	Begin Date
2012			
Drought-FAST TRACK	S3268	Contiguous	7/12/2012
Drought-FAST TRACK	S3351	Contiguous	8/22/2012
Drought	S3379	Contiguous	9/5/2012
Drought	S3452	Primary	12/19/2012
2013			
Drought – FAST TRACK	S3558	Contiguous	7/31/2013
Drought – FAST TRACK	S3569	Primary	8/21/2013
2014			
Drought – FAST TRACK	S3626	Primary	1/15/2014
Drought – FAST TRACK	S3743	Primary	1/1/2014
2015			
Drought – FAST TRACK	S3784	Primary	1/1/2015
2016			
Drought – FAST TRACK	S3952	Primary	1/1/2016
Excessive rain, high winds, cold temperatures, and hail	S4170	Contiguous	3/1/2016
2017			
Drought – FAST TRACK	S4144	Contiguous	1/1/2017
Drought – FAST TRACK	S4163	Primary	10/1/2016
Excessive rain	S4237	Contiguous	10/1/2016
2018			
–	–	–	–
2019			
–	–	–	–
2020			
Drought – FAST TRACK	S4697	Contiguous	4/21/2020
2021			
Drought – FAST TRACK	S4916	Primary	10/1/2020
2022			
Drought – FAST TRACK	S5146	Primary	4/8/2022
Freeze	S5229	Contiguous	7/1/2022
Freeze	S5230	Primary	7/1/2022
2023			
Drought – FAST TRACK	S5371	Primary	10/1/2022

Year Declared/Disaster Type	Designation Number	Primary or Contiguous	Begin Date
2024			
–	–	–	–

Source: Amador County Agricultural Commissioner, US Farm Service Agency

NCDC Events

The NCDC does not track agriculture events.

Hazard Mitigation Planning Committee Events

The HMPC noted that there have been other documented instances in which adverse weather events have occurred, not all of which warranted USDA Secretarial Disaster Declarations:

- **In 1982**, rains causing agricultural losses were reported in the County. Crop damage statistics were unavailable.
- **In 1988**, severe winter storms and flooding were reported in the County. Crop damage statistics were unavailable.
- **In 2003,** excessive rains and wheat stripe rust were reported in the County. Crop damage statistics were unavailable.
- **In 2003,** extreme heat and unseasonable rainfall occurred in the County. Crop damage statistics from the USDA were unavailable.
- **In 2003,** unseasonable rainfalls were reported in the County. Crop damage statistics were unavailable.
- **In 2005**, severe high temperatures, low humidity, and strong winds occurred in the County. Crop damage statistics from the USDA were unavailable.
- **In 2005**, rains causing agricultural losses were reported in the County. Crop damage statistics were unavailable.
- **In 2005**, the HMPC noted that there was damage to the agricultural industry from strong winds in the County that warranted a USDA Secretarial Disaster Declaration.
- **In 2005**, cold wet weather occurred in the County. Crop damage estimates were unavailable.
- **In 2006**, a record setting heat wave occurred in the County. Crop damage statistics from the USDA were unavailable.
- **In 2007,** extremely low temperatures and drought conditions occurred in the County. Crop damage estimates were unavailable.
- **In 2008,** freezing temperatures occurred in the County. Crop damage estimates were unavailable.
- **2020-2022 –** The Public Policy Institute noted that the prolonged drought from 2020 to 2022 severely affected Amador County's agriculture, particularly its wine grape industry, which constitutes a substantial portion of the county's agricultural output. Reduced precipitation and surface water availability led to increased groundwater pumping, raising production costs. The Public Policy Institute of California reported that statewide, farmers faced $1.7 billion in revenue losses and 14,600 job losses in 2021, with Amador County part of the impacted Sacramento Valley region.
- **2021 -** The Western North America heat wave (June 25–July 1, 2021) brought temperatures 20–35°F above average, likely exceeding 105–110°F in Amador's lower elevations (e.g., Jackson, Ione). This heat stressed crops, particularly grapes, which are sensitive to extreme temperatures during fruit development, reducing yields and quality. High temperatures can cause fruit to drop or spoil, as seen

with walnuts in the Central Valley, where 40% of the 2021 crop was lost due to heat following rain. Similar impacts likely affected Amador's vineyards, though specific losses are not documented.

- **In 2022,** freezing temperatures occurred in the County in mid-April. This caused crop damage to the grape crop in the County. This caused a loss of yield of about 30-40% of the grape crop for the 2022 farming season.
- **2023** – Relentless storms and atmospheric rivers in early 2023 caused widespread flooding across California, with Amador County affected by heavy rainfall. While specific flood damage in Amador is not detailed, the storms led to hundreds of millions in agricultural losses statewide, particularly for crops like strawberries and leafy green. Flooded fields in Amador likely delayed planting and damaged vineyards, especially in low-lying areas. Saturated soils can cause root rot in grapevines, reducing yields. Dairy and livestock operations faced challenges with flooded pastures, increasing feed costs. The USDA offered recovery assistance for crop, land, and livestock losses in California, indicating Amador's eligibility.
- **July 2024** saw prolonged heat with temperatures likely hitting 105–110°F in lower Amador County, followed by another heat wave in September 2024 (100–105°F). These events increased wildfire risks and stressed crops, particularly late-season grapes. Heat waves reduce grape quality (e.g., sugar content) and can cause sunburn on fruit, lowering market value. The 2023 statewide heat wave cost $1.6 billion in fruit and nut losses, suggesting similar, though smaller-scale, impacts in Amador. The Electra Fire in Amador and Calaveras counties burned 4,478 acres, threatening vineyards and grazing lands. While direct crop losses were not quantified, smoke taint from wildfires can render grapes unusable for winemaking, a significant concern for Amador's wine industry.
- **2025** – Golden mussels threats in the County caused Camanche Reservoir to be closed. No mussels were found, but the threat was of great enough concern that the Reservoir was closed.

Likelihood of Future Occurrence

Highly Likely—As long as severe weather events, insects, pests, and weeds continue to be an ongoing concern to the Amador County Planning Area, the potential for agricultural losses remains.

It is likely that climate change will increase the chance of future occurrence as well as future impacts. More information on climate change and agricultural hazards can be found in the next section. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate Change and Agricultural Hazards

According to the 2021 CAS (as well as the 2024 Draft CAS), addressing climate change in agriculture will encompass reducing vulnerability through adapting to the ongoing and predicted impacts of climate. Agriculture in California is vulnerable to predicted impacts of climate change, including less reliable water supplies, increased temperatures, and increased pests.

The 2023 California State Hazard Mitigation Plan noted that California farmers contend with a wide range of crop-damaging invasive pests and pathogens. Continued climate change is likely to alter the abundance and types of many pests, lengthen pests' breeding season, and increase pathogen growth rates. It also noted that change in climate can directly impact crop growth through new temperature patterns and northward

shifts of pests and disease. Additionally, longer growing seasons may enable pest species to complete more reproductive cycles, which can increase severity of infestations.

Finally, the 2023 State Plan noted that temperature is not the only climatic influence on pests. For example, some insects are unable to cope in extreme drought, while others cannot survive in extremely wet conditions. Furthermore, while warming speeds up the life cycles of many insects, suggesting that pest problems could increase, some insects may grow more slowly as elevated carbon dioxide levels decrease the protein content of the leaves on which they feed.

Vulnerability Assessment

Vulnerability—High

According to historical hazard data, severe weather affecting agriculture and agricultural pests and weeds are an annual occurrence in the Amador County Planning Area. If left unchecked, insects, pests, and weeds, including invasive species, can threaten native species, biodiversity, ecosystem services, recreation, water resources, agricultural and forest production, cultural resources, economies and property values, public safety, and infrastructure.

An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to unincorporated Amador County. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect both the entire Amador County Planning Area as well as the unincorporated portions of Amador County. How the hazard affects the other participating jurisdictions can be found in their respective annexes to this LHMP Update. These sections below include assets at risk, impacts, and how future development may affect the vulnerability of the County to this hazard.

Local Concerns (unincorporated Amador County)

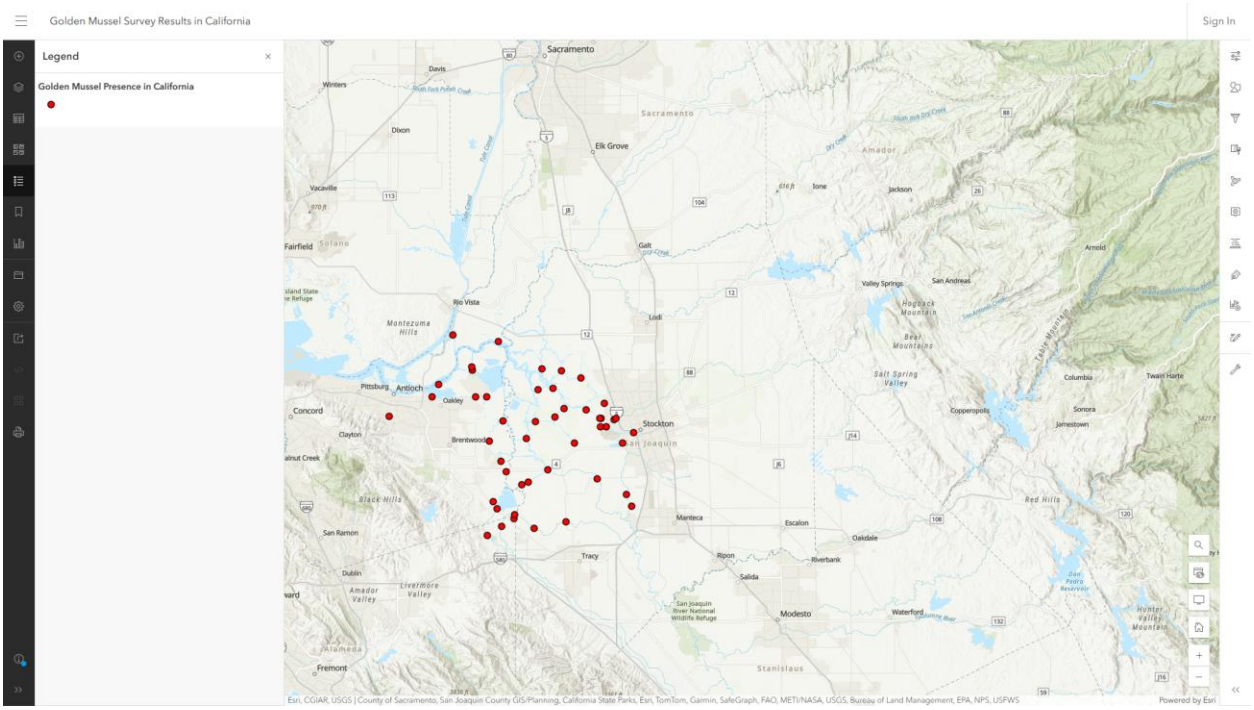
The unincorporated County has certain specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce vulnerabilities to this hazard.

Invasive and Native Species (Insects/Pests)

Amador County is threatened by a number of insects that, under the right circumstances, can cause severe economic and environmental harm to the agricultural industry. Insects of concern to plants and crops include Glassy-winged sharp shooter, Gypsy moth, Japanese beetle, Mediterranean fruit fly, Melon fruit fly, Oriental fruit fly, and Bark beetle. Pest detection is a proactive program that seeks to identify exotic, invasive insects. These pests have a wide host ranges and are difficult and costly to manage once established. Early detection is essential for quick and efficient eradication. Public participation is critical to the success of this program, since staff relies on the goodwill of property owners who allow traps to be placed on their properties. The Amador County Department of Agriculture traps and monitors all of these agricultural pests.

Aquatic invasive species include: Zebra and Quagga Mussels, invasive fish species, and aquatic weeds such as hydrilla, water hyacinth, arundo, loosestrife, sesbania, South American Spongeplant, and cyanobacteria. An additional (and relatively new) invasive is the golden mussel. Golden mussel (*Limnoperna fortunei*), an invasive, non-native freshwater bivalve, was recently discovered in the Port of Stockton by California Department of Water Resources staff while conducting routine operations. Suspected golden mussels have also been identified at O'Neill Forebay in Merced County and are currently undergoing genetic testing for confirmation. This discovery is the first known occurrence of golden mussels in North America. The species poses a significant immediate threat to the ecological health of the Delta and all waters of the state, water conveyance systems, infrastructure and water quality. While not yet in Amador County, they are in areas to the west of the County, as seen on Figure 4-60.

Figure 4-60 Golden Mussels Survey Results near Amador County



Source: CA Dept. of Fish and Wildlife, retrieved 8/1/2025.

Due to the spread of the golden mussel recently discovered in Northern California, the East Bay Municipal Utility District (EBMUD) kept boat launches closed to private vessels for the 2025 season. This closure was to allow EBMUD time to study how to prevent and respond to golden mussel infestation. Although boat quarantines and decontamination stations can help reduce the likelihood of introduction, risk remains. EBMUD is working closely with state and federal agencies, research institutions, and other water managers to track the spread and prepare long-term plans in the event the mussel is introduced into the reservoirs. The closure applies to private boats and other watercraft, including kayaks and paddleboards, excluding boats with a permanent slip for Camanche that were in the water or in onsite dry storage when boat launches closed in November 2024. This had an effect on the County, as its largest reservoir was restricted from being used for recreational purposes.

Weeds (both invasive and native)

Noxious weeds, defined as any plant that is or is liable to be troublesome, aggressive, intrusive, detrimental, or destructive to agriculture, silviculture, or important native species, and difficult to control or eradicate, are also of concern. Noxious weeds within the Planning Area include those listed on Table 4-49.

Table 4-49 Amador County Weeds of Concern

Species of Concern				
Rush Skeletonweed	Giant Reed	Oblong Spurge	Tamarisk	Yellow Starthistle
Scotch Broom	Perrenial Pepperweed	Scotch Thistle	Spanish Broom	Barb Goatgrass
French Bloom	Medusahead	Diffuse Knapweed	Spotted Knapweed	

Source: California Invasive Plant Council

The Amador County Department of Agriculture uses mechanical and chemical control measures to contain these agricultural weeds.

Natural Disasters and Severe Weather

According to the USDA, every year natural disasters, such as droughts, earthquakes, extreme heat and cold, floods, fires, earthquakes, hail, landslides, and tornadoes, challenge agricultural production. Because agriculture relies on the weather, climate, and water availability to thrive, it is easily impacted by natural events and disasters. Agricultural impacts from natural events and disasters most commonly include contamination of water bodies, loss of harvest or livestock, increased susceptibility to disease, and destruction of irrigation systems and other agricultural infrastructure. These impacts can have long lasting effects on agricultural production including crops, forest growth, and arable lands, which require time to mature. Specific impacts by hazard are listed below:

- Drought's most severe effects on agriculture include water quality and quantity issues. Other impacts include decreased crop yields, impact to feed and forage, altered plant populations and tree mortality.
- Earthquakes, though rare in Amador County, can strike without warning and cause dramatic changes to the landscape of an area that can have devastating impacts on agricultural production and the environment. These impacts could include loss of harvest or livestock and destruction of irrigation systems and other agricultural infrastructure.
- Extreme cold may result in loss of livestock, increased deicing, downed power lines, and increased use of generators. Deicing can impact agriculture by damaging local ecosystems and contaminating water bodies. Downed power lines cause people to run generators more often, which can release harmful air pollutants.
- Hot weather and extreme heat can worsen ozone levels and air quality as well as leading to drought conditions. Excessive heat and prolonged dry or drought conditions can impact agriculture by creating worker safety issues for farm field workers, severely damaging crops, and reducing availability of water and food supply for livestock.
- Wildfires can spread quickly and devastate thousands of acres of land, which may include agricultural lands. This devastation could lead to large losses in crops, forestry, livestock, and agricultural infrastructure.

- Flooding causes many impacts to agricultural production, including water contamination, damage to crops, loss of livestock, increased susceptibility of livestock to disease, flooded farm machinery, and environmental damage to and from agricultural chemicals.
- Landslides and debris flow occur in all 50 states and commonly occur in connection with other major natural disasters such as earthquakes, volcanoes, wildfires, and floods. Some of the threats from landslides and debris flow include rapidly moving water and debris that can cause trauma; broken electrical, water, gas, and sewage lines; and disrupted roadways and railways. This can lead to agricultural impacts including contamination of water, change in vegetation, and harvest and livestock losses.

The Amador County Agricultural Commissioner noted that of the above, the County is most concerned with drought, freeze, and insect infestations.

Local concerns for each of the participating jurisdictions can be found under the Local Concerns heading in each respective jurisdictional annex to this LHMP Update.

Assets at Risk

Assets at risk from agricultural hazards include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections for the Amador County Planning Area and unincorporated Amador County.

Additionally, for each hazard in the FEMA National Risk Index in Amador County, the relevant portions of the hazard analysis done by FEMA is presented below. This includes the Hazard Risk Index Rating, Expected Annual Loss Values, Exposure Values, and the Historic Loss Ratio Rating. These are presented for the Amador County Planning Area as a whole.

People and Populations

Agricultural hazards (severe weather, and both native and invasive species) have a minimal effect on people and populations in Amador County, including vulnerable populations. However, damage to crops from invasive and nuisance species can cause significant increases in food prices and food insecurity among low-income communities.

Structures

Structures in Amador County may be indirectly affected by agricultural hazards. The effects of severe weather on structures are included in the discussions on severe weather above. This section focuses then on native and invasive species and pests and weeds. Some species can impact vegetation and can result in stream bank instability, erosion, and increased sedimentation, impacting ground stabilization and possibly causing foundation issues for nearby structures. If species cause trees and other vegetation to die, there is an increased risk of damage to roadways, powerlines, and buildings, and increased risk to wildfire. Some invasive plants have been shown to destabilize soil due to high densities and shallow root systems, negatively impacting nearby buildings and septic systems. Other nuisance plant species have been known to clog culverts and streams, increasing flooding risk.

Critical Facilities and Infrastructure

Critical facilities and infrastructure in Amador County may be affected by agricultural hazards, though these effects are expected to be limited. The effects of severe weather on critical facilities are included in the discussions on severe weather above. This section focuses then on native and invasive species and insects, pests, and weeds. The 2023 State of California Hazard Mitigation Plan noted that water treatment plants could be impacted by invasive and nuisance species. Water that becomes polluted due to increased sedimentation and erosion will require additional treatment. If the system becomes clogged with these pollutants or with nuisance aquatic species, the ability of water treatment plants to operate may become impaired. Additionally, soil that becomes unstable due to decaying vegetation can impact critical facilities that are built on or around these soils.

Natural, Historic, and Cultural Resources

Natural resources can be affected by agricultural hazards. The effects of severe weather on these resources are included in the discussions on severe weather above. This section focuses then on native and invasive species, and insects, pests, and weeds. Negative impacts of these to natural resources include the following:

- Loss of wildlife habitat and reduced wildlife numbers;
- Loss of native plant species;
- Reduced livestock grazing capacity;
- Increased soil erosion and topsoil loss;
- Diminished water quality and fish habitat.

Historic and cultural resources have a more limited risk from agricultural hazards.

FEMA NRI Hazard Vulnerability Assessment

Agricultural hazards are not an NRI hazard, therefore no data is presented.

Impacts from Agricultural Hazards

According to the California Invasive Plants Council. California annually suffers over $3 billion in agricultural losses due to these invasive species. The magnitude of this problem cannot be understated, as both the United States and California Departments of Agriculture are mandated to protect against the invasion of exotic pests and diseases.

The consequences of agricultural disasters to the Planning Area include ruined plant crops, dead livestock, ruined feed and agricultural equipment, monetary loss, job loss, and possible multi-year effects (i.e., trees might not produce if damaged, loss of markets, food shortages, increased prices, possible spread of disease to people, and loss or contamination of animal products). When these hazards cause a mass die-off of livestock, other issues occur that include the disposal of animals, depopulation of affected herds, decontamination, and resource problems. Those disasters related to severe weather may also require the evacuation and sheltering of animal populations. Overall, any type of severe agricultural disaster can have significant economic impacts on both the agricultural community and the entire Amador County Planning Area.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future hazard conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for Amador County include the following:

- Climate change is likely to exacerbate future conditions that may impact the agricultural industry in Amador County.
- Future population growth should be considered as having more or less people in a community affects the overall hazard vulnerability to the County. Population growth in Amador County is expected to increase. Population changes are unlikely to affect the vulnerability of the County to this hazard unless the population growth significantly increases, displacing agricultural uses. Changes in population and population patterns may or may not increase the impacts and vulnerability of the County to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. Limited growth is occurring in the County, which should result in limited changes to land uses that would affect the agricultural industry. As the County continues to add new development, land uses may change resulting in a reduction in agricultural uses. However, for the next five years covered by this LHMP Update, changes in land use and development will likely not increase the impacts and associated vulnerabilities of the County to this hazard.

Future development in the County is not likely to have an impact on agricultural hazards in Amador County, except to the extent that agricultural lands are taken out of production as new development occurs reducing available land for agricultural uses, including those related to farming, timber production and grazing. In addition, with additional development in the County, there may be additional competition for water resources thus possibly impacting the agricultural industry.

4.3.7. Avalanche

Hazard Profile

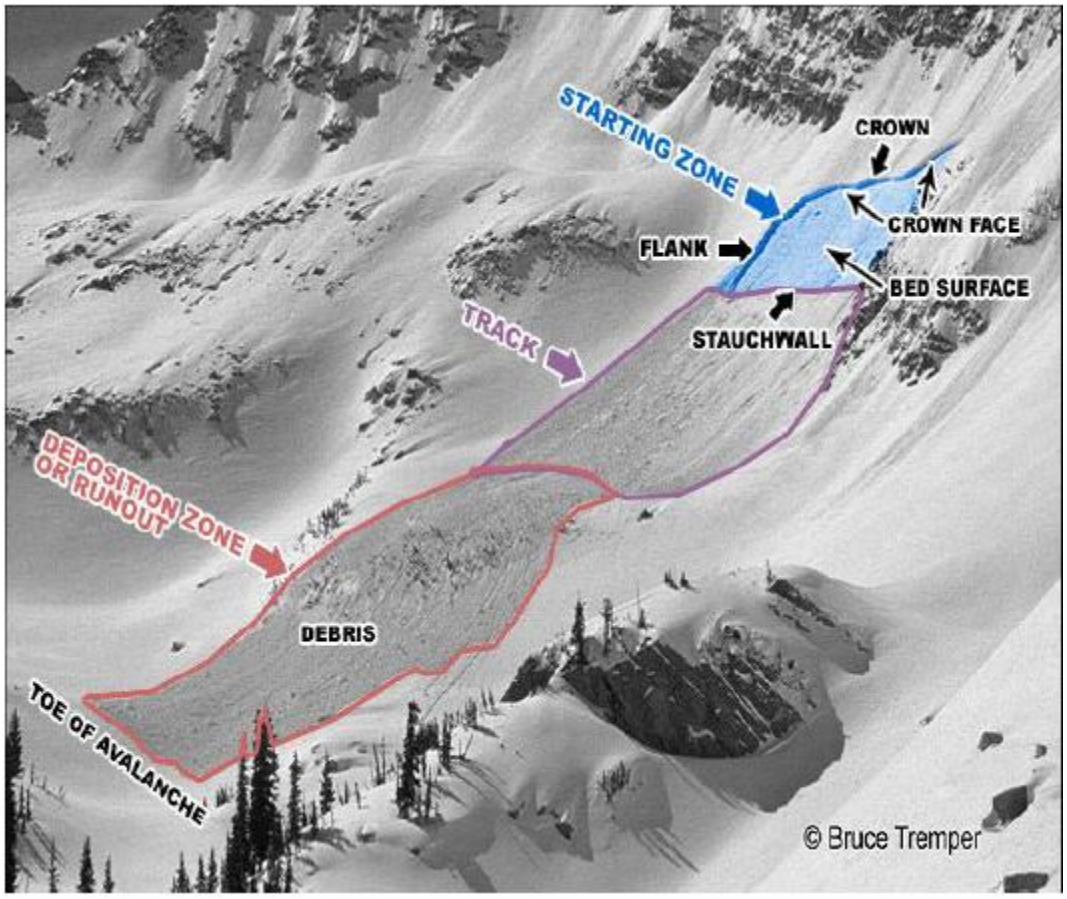
This hazard profile contains multiple sections that detail how this hazard can affect the Amador County Planning Area. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; likelihood of future occurrences; and how climate change can affect or influence this hazard.

Hazard/Problem Description

According to the 2016 Amador County General Plan Safety Element, avalanches occur when loading of new snow increases stress at a rate faster than strength develops, and the slope fails. Avalanches are a rapid down-slope movement of snow, ice and debris triggered by ground shaking, sound, or human or animal

movement. Avalanches consist of a starting zone where the ice or snow breaks loose, a track which is the grade or channel the debris slides down and a run-out zone where the snow is deposited. This can be seen in Figure 4-61.

Figure 4-61 Avalanche Zones



Source: Sierra Avalanche Center

Critical stresses develop more quickly on steeper slopes and where deposition of wind-transported snow is common. The vast majority of avalanches occur during and shortly after storms. This hazard generally affects a small number of people, such as snowboarders, skiers, and hikers who venture into backcountry areas during or after winter storms. Roads and highway closures, damaged structures, and destruction of forests are also a direct result of avalanches.

Location and Extent

The combination of steep slopes, abundant snow, weather, snowpack, and an impetus to cause movement to create an avalanching episode. Avalanche hazards exist in eastern Amador County, where combinations of the above criteria occur. The two primary factors impacting avalanche activity are weather and terrain. Large, frequent storms deposit snow on steep slopes to create avalanche hazards. Additional factors that contribute to slope stability are the amount of snow, rate of accumulation, moisture content, wind speed and direction and type of snow crystals. Topography also plays a vital role in avalanche dynamics. Slope

angles between 30 to 45 degrees are optimal for avalanches. The risk of avalanches decreases on slope angles below 30 degrees. At 50 or more degrees they tend to produce sluff or loose snow avalanches that account for only a small percentage of avalanche deaths and property damage annually.

Avalanche-prone areas are found upcountry along SR 88 in the Devil's Gate and Kirkwood areas (in the eastern portions County) where these combinations readily occur. Speed of onset of avalanche is short, as is the duration of each event. Most avalanches occur during and shortly after storms between January and March. A scale of avalanche danger has been created for North America. This can be found in Table 4-50.

Table 4-50 North American Public Avalanche Danger Scale

Danger Level	Travel Advice	Likelihood of Avalanche	Avalanche Size or Distribution.
5 – Extreme	Avoid all avalanche terrain	Natural and human-triggered avalanches certain	Large to very large avalanches in many areas
4 – High	Very dangerous avalanche conditions. Travel in avalanche terrain not recommended	Natural avalanches likely; human-triggered avalanches very likely	Large avalanches in many areas; or very large avalanches in specific areas
3 – Considerable	Dangerous avalanche conditions. Careful snowpack evaluation, cautious route-finding and conservative decision making essential	Natural avalanches possible; human-triggered avalanches likely	Small avalanches in many areas; or large avalanches in specific areas; or very large avalanches in isolated areas
2 – Moderate	Heightened avalanche conditions on specific terrain features. Evaluate snow and terrain carefully; identify features of concern	Natural avalanches unlikely; human-triggered avalanches possible	Small avalanches in specific areas; or large avalanches in isolated areas
1 – Low	Generally safe avalanche conditions. Watch for unstable snow on isolated terrain features	Natural and human-triggered avalanches unlikely	Small avalanches in isolated areas or extreme terrain

Source: National Avalanche Center

Past Occurrences

Disaster Declaration History

There have been no federal or state disaster declarations related to avalanche in Amador County, as shown in Table 4-4.

NCDC Events

The NCDC shows five avalanche events in the County since 1993, as shown on Table 4-51.

Table 4-51 NCDC Avalanche Events in Amador County 1993-7/31/2024

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Avalanche	5	2	0	3	0	$0	$0

Source: NCDC.

Hazard Mitigation Planning Committee Events

Historically, avalanches occur within the eastern portion of the County between the months of January and March, following snowstorms. Past events include those listed below.

In **1982/1983**, an avalanche destroyed some USFS lease summer cabins located west of Highway 88. The cabins are only allowed to be occupied during the summer months, and no one was injured.

In **1982/1983**, the mountain manager for Kirkwood ordered an evacuation of homes in this area during a multiple day Sierra snowstorm. A representative from Kirkwood provided one unconfirmed report of a local skier getting caught in an avalanche and digging out and skiing away. It is likely that other avalanche incidents such as this one go unreported.

In **1993**, a man was buried in an avalanche in Kirkwood's Button Bowl. He was buried for nearly 15 minutes under five feet of snow before he was discovered by one of the resort's avalanche rescue dogs. He survived but suffered a broken back and ribs.

2018 – an avalanche occurred that resulted in two deaths. A mother and her son died skiing back to their cabin in Kirkwood.

2019 – This SR 88 spur was closed an estimated 28 days in 2019 for avalanche conditions and mitigation.

Cal-Trans noted that the winter of **2022-23** (with the heavy snow) led to numerous occasions where the Kirkwood community faced isolation with the highway being closed in both directions for longer durations than usual.

In March of 2024, an avalanche closed Highway 88 in Amador County. Transportation officials said the highway was closed from 3.5 miles east of Silver Lake to Kirkwood/Carson Spur. As far as singular "avalanche events" are concerned, 2024 had one of the most dramatic when three USFS leased cabins were destroyed in the Devil's Gate Tract.

Likelihood of Future Occurrence

Likely – Given the topography and amount of snow falling on an annual basis in Eastern Amador County, avalanches will continue to occur. The loss of life due to an avalanche is usually due to people recreating in remote areas at the wrong time. Avalanche warnings are posted after winter storms; therefore, information is available to reduce the risk to those in avalanche prone areas.

Climate Change and Avalanche

According to the CAS, climate change may exacerbate the avalanche hazard in the County. Avalanches stemming from a weather pattern of heavy snowfalls followed by thawing may increase – a dangerous combination that can be expected with climate change.

Vulnerability Assessment

Vulnerability—Medium

Avalanche events happen in the Amador County Planning Area each year. These often occur in the backcountry where no roads or structures exist. However, avalanche can impact key assets in the Planning Area. The upper elevations of the Planning Area has some measure of vulnerability to extreme cold, freeze, and snow.

An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to unincorporated Amador County. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect both the entire Amador County Planning Area as well as the unincorporated portions of Amador County. How the hazard affects the other participating jurisdictions can be found in their respective annexes to this LHMP Update. These sections below include assets at risk, impacts, and how future development may affect the vulnerability of the County to this hazard.

Local Concerns (unincorporated Amador County)

The unincorporated County has specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Avalanche impacts vary, but include risk to property, injury, or death. Avalanches generally affect a few snowboarders, skiers, and hikers who venture into backcountry areas during or after winter storms. Avalanches cause road closures, and can damage structures and forests.

In Amador County, avalanche-prone areas are found upcountry along SR 88 in the Devil's Gate and Kirkwood areas, where these combinations readily occur (discussed in more detail below). Most avalanches occur during and shortly after storms between January and March. On the way to Kirkwood, there is a Spur of the Highway that is very vulnerable to traffic backups from Kirkwood. Because traffic flow is an issue in this area – the backed up cars could easily be affected by an avalanche. Cal Trans representatives on the HMPC noted that in addition to the highway issues, as far as Amador County is concerned, the marked increase in winter recreation would be of concern, as well as the overall awareness of avalanche areas that would be encountered by emergency service workers.

Highway 88 and Devils Gate area

With respect to Highway 88, Caltrans is responsible for avalanche mitigation. There have been no known fatalities or injuries within this area. The HMPC noted that the area of significant concern to the County (besides Kirkwood) is the spur leading up to Kirkwood on HWY 88. Avalanches and mitigation on Hwy 88 are managed by Cal Trans. They conduct a weekly conference call regarding conditions. Challenges to effective mitigation include older equipment, access, and qualified operators that can get to the area.

Kirkwood Resort Ski area

The Kirkwood Ski Area has conducted a series of Design-Magnitude Avalanche Mapping and Mitigation Analyses to guide future development of the area. Design-magnitude avalanches are of a size and destructive potential that should be considered in land-use planning and engineering. The design-magnitude avalanche path boundaries are subdivided into "red", "blue" and "white" zones which indicate

the potential hazard severity based on the resulting impact pressure and return period (or frequency). Land use recommendations and restrictions are then applied to the identified hazard zones. This methodology for the identification of avalanche zones and the associated land use recommendations is relatively unique to the United States, and is based on similar methodologies used in other countries with development in and near avalanche areas (e.g., Switzerland and Austria). A summary of land use recommendations for identified zones is provided below.

- **Red Zone (High Hazard)** – Residential development within the red zone is not recommended. Avalanche pressure potentials are beyond the practical design limits of most residential structures; avalanche frequency is high; and detached structural protection is difficult or impossible to build. Additionally, any development that concentrates human activity in Red zones (e.g., ski-lift terminals, ticket areas, parking lots, trail heads, skating ponds, and public buildings) should be avoided. Even though structural protection of some facilities might be feasible, people standing or working outside of these facilities could be exposed to avalanches. Road construction through some red zones might be acceptable unless the frequency of avalanches is high. Utilities should be buried whenever possible.
- **Blue Zone (Moderate Hazard)** – By definition, blue zones are subject to much lower levels of avalanche frequency and energy than red zones. Thus construction of private buildings may be acceptable, but only if reinforced or protected for design avalanche loads. Even with structural protection, property owners must be made aware of the fact that living in an area designated as a blue zone means assuming the possibility of property damage or personal injury from avalanches because people outside may be exposed. Because of the potential for a greater concentration of people at public facilities, construction of public buildings in blue zones should be avoided. Other public facilities such as parking lots and ski-lift terminals should, if possible, be located near the outer limits of the blue zone and the area should be posted as potentially hazardous. Utilities should be buried. Road construction is acceptable.
- **White Zone (Hazard Free)** – There are no identified land use recommendations or development restrictions associated with Hazard Free White Zones.

There are approximately 50 major avalanche starting zones in Amador County that were mapped by an avalanche consultant prior to the formation of the ski resort. The avalanche zones are within Kirkwood's Special Use Permit (SUP) boundary on Forest Service land. Another 50 plus major avalanche starting zones are in Alpine County in the SUP boundary. According to representatives from the resort, the number of avalanches over the years in these areas would total in the thousands. There are a few starting zones that, while within the SUP, are outside of the current ski area boundary. Some avalanche control work has been done in this area over the years. Some of these starting zones are actually above existing housing in Amador County and nearest to Highway 88. The potential for a serious avalanche accident is greatest in this area of Amador County at Kirkwood.

The County is proactive in avalanche mitigation. In problem areas, roads are closed after significant storms for avalanche control. There is constant monitoring of the snow loads in problem areas. Much of this is done by Cal Trans. Likewise, Cal Trans is also responsible for monitoring and mitigating landslide areas along State routes. The County did note that slide paths are changing with new fire activity, wind changes, etc. The Caldor fire affected areas that were prone to avalanche sliding.

Local concerns for each of the other participating jurisdictions can be found under the Local Concerns heading in each respective jurisdictional annex to this LHMP Update.

Assets at Risk

Assets at risk from extreme cold and freeze include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections for the Amador County Planning Area and unincorporated Amador County.

Additionally, for each hazard in the FEMA National Risk Index in Amador County, the relevant portions of the hazard analysis done by FEMA is presented below. This includes the Hazard Risk Index Rating, Expected Annual Loss Values, Exposure Values, and the Historic Loss Ratio Rating. These are presented for the Amador County Planning Area as a whole.

People and Populations

Most of the populations within the Amador County Planning Area have limited vulnerable to avalanche. Those at risk include those traveling in the upper elevations of the County, as well as those who ski in these areas. Vulnerable populations to avalanche are not well known. The 2023 California State Hazard Mitigation Plan noted that in determining whether equity priority populations are exposed to the threat of avalanches, the best method available at the time of this Plan update is to consider how the counties in which avalanches take place score on existing social vulnerability indexes. Using that, Amador is relatively moderate in its social vulnerability index.

Structures

Structures in the Amador County Planning Area have some measure of risk from avalanche. Buildings in the upper elevations of the County can be affected directly by avalanche events. Most of these events occur away from structures in the Amador County Planning Area.

Critical Facilities and Infrastructure

Avalanche can cause downed trees and power lines, power outages, accidents, and road closures. Transportation networks, communications, and utilities infrastructure are the most vulnerable physical assets in the County. Depending on the facility type and function, critical facilities and infrastructure may be affected directly by avalanche events. Infrastructure such as roads, highways, and bridges can be blocked during these events.

Natural, Historic, and Cultural Resources

Depending on the location of an avalanche event, natural resources in the Amador County Planning Area may be affected. During periods of avalanche, trees in the Planning Area may be damaged, which may in turn cause increased fire risk due to an increase in wildfire fuels. Other natural resources like wildlife may be at risk during a period of avalanche. Historic structures in the County are located outside of the avalanche prone areas.

FEMA NRI Hazard Vulnerability Assessment

The FEMA NRI was queried for additional specific data on Amador County's vulnerability to avalanche. The NRI contains data and analysis for 18 separate natural hazards, including avalanches. As shown in Table 4-52, avalanches could cause a total of $61,612 in expected annual losses, with a historic loss rating of relatively moderate. Avalanche has a relatively moderate rating for both social vulnerability and community resilience, with a risk index score of 26.4 out of 100. According to the NRI, there has been 1 event on record between the years of 1960-2019, with an average of 0 events per year.

Table 4-52 Amador County Planning Area – Avalanche Vulnerability Ratings from FEMA NRI

NRI Hazard	Hazard Risk Index Rating*	Expected Annual Loss Values (total)**	Exposure Value (total)***	Historic Loss Ratio Rating
Avalanche	26.4	$61,612	$59,000,000	Relatively Moderate

Source: FEMA NRI Report, retrieved 4/1/2025.

*Hazard Risk Index is calculated using data for only a single hazard type, and reflect a communities expected annual loss value, community risk factors, and the adjustment factor used to calculate the risk value.

**Expected annual loss represents the average economic loss in dollars resulting from natural hazards each year.

***Exposure is a natural hazard consequence factor that is the representative value of buildings, populations, or agriculture potentially exposed to a natural hazard occurrence.

Additional information on the FEMA NRI can be found in Section 4.2 and Appendix G.

Impacts from Avalanche

Avalanches occur when the weight of new snow increases stress faster than strength of the snowpack develops, causing the slope to fail. Avalanche conditions develop more quickly on steeper slopes and where wind-blown snow is common. The combination of steep slopes, abundant snow, weather, snowpack, and a trigger to cause movement create avalanches.

The most significant impacts from snow avalanches are the closure of transportation corridors, which can isolate populations and interrupt commodity flows. Avalanches tend to occur independently of other types of hazards, although it is possible for avalanches to be triggered by severe weather and earthquakes. There may be occasions where avalanches contribute to the presence of other hazards, such as flash floods resulting from mountainside erosion. Avalanches might cause erosion on sloped terrain, thereby increasing the likelihood of future landslides. In addition, debris deposited in a river or stream because of avalanches might alter its flow and contribute to flooding later.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future hazard conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on these factors for Amador County include the following:

- Climate change may exacerbate avalanches and their associated impacts to the County.
- The population of Amador County is expected to slowly increase as time progresses. Future population growth should be considered, as having more or less people in a community affects the overall hazard vulnerability to the County. Changes in populations patterns should also be considered. During hazard events, existing inequities can get worse, and vulnerable groups are the most likely to be affected and may require extra assistance. Planning for population changes will help to decrease the County's overall vulnerability. It was noted that there is very limited housing stock in the avalanche areas. Changes in population and population patterns may or may not increase the impacts and vulnerability of the County to this hazard depending on the location and nature of population growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. County building codes, including those specific to building in avalanche zones, are in effect to reduce this risk and should be updated as necessary to continue to avalanche conditions. Due to adherence to protective building codes, changes in land use and development will likely not increase the impacts and associated vulnerabilities of the County to this hazard.

Future development considerations should be ongoing and proactive. Outside of any future development at the Kirkwood ski area where avalanche is comprehensively addressed in the siting of future structures, future development is unlikely to occur in avalanche prone areas.

4.3.8. Climate Change

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Amador County Planning Area. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; likelihood of future occurrence; and how climate change can affect or influence this hazard.

Hazard/Problem Description

Climate change is the distinct change in measures of weather patterns over a long period of time, ranging from decades to millions of years. More specifically, it may be a change in average weather conditions such as temperature, rainfall, snow, ocean and atmospheric circulation, or in the distribution of weather around the average. While the Earth's climate has cycled over its 4.5-billion-year age, these natural cycles have taken place gradually over millennia, and the Holocene, the most recent epoch in which human civilization developed, has been characterized by a highly stable climate – until recently.

This LHMP Update is concerned with human-induced climate change that has been rapidly warming the Earth at rates unprecedented in the last 1,000 years. Since industrialization began in the 19th century, the

burning of fossil fuels (coal, oil, and natural gas) at escalating quantities has released vast amounts of carbon dioxide and other greenhouse gases responsible for trapping heat in the atmosphere, increasing the average temperature of the Earth.

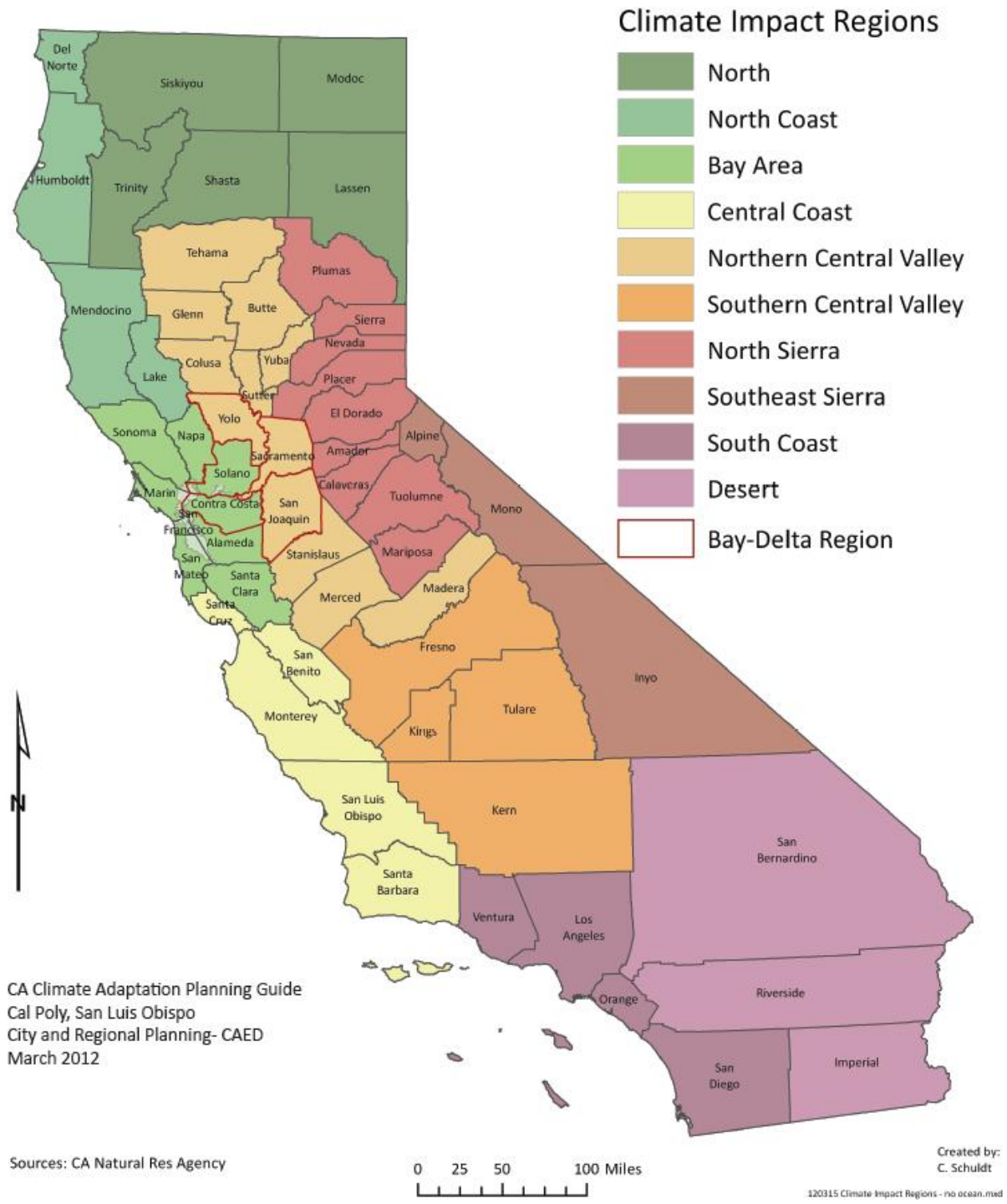
In Amador County, the HMPC noted that each year it seems to get a bit warmer. California's Adaptation Planning Guide: Understanding Regional Characteristics has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations (as shown in Figure 4-62). Amador County falls within the North Sierra Region characterized as a sparsely settled mountainous region where the region's economy is primarily tourism-based. The region is rich in natural resources, biodiversity, and is the source for the majority of water used by the state. Table 4-53 provides a summary of Cal-Adapt Climate Projections for the North Sierra Region.

Table 4-53 North Sierra Region and Amador County – Cal Adapt Climate Projections

Effect	Ranges
Temperature Change, 1990-2100	January increase in average temperatures: 2.5 °F to 4°F by 2050 and 6°F to 7°F by 2100. The largest changes are observed in the southern part of the region. July increase in average temperatures: 4 °F to 5°F by 2050 and I 0°F by the end of the century, with the greatest change in the northern part of the region. (Modeled average temperatures; high emissions scenario)
Precipitation	Precipitation decline is projected throughout the region. The amount of decrease varies from 3 to 5 inches by 2050 and 6 inches to more than 10 inches by 2100, with the larger rainfall reductions projected for the southern portions of the region. (CCSM3 climate model; high carbon emissions scenario)
Heat wave	Heat waves are defined as five consecutive days over 83 °F to 97°F depending on location. By 2050, the number of heat waves per year is expected to increase by two. A dramatic increase in annual heat waves is expected by 2100, eight to I 0 more per year.
Snowpack	Snowpack levels are projected to decline dramatically in many portions of the region. In southern portions of the region, a decline of nearly 15 inches in snowpack levels - a more than 60 percent drop - is projected by 2090. (CCSM3 climate model; high carbon emissions scenario)
Wildfire	Wildfire risk is projected to increase in a range of 1.1 to 10.5 times throughout the region, with the highest risks expected in the northern and southern parts of the region. (GFDL climate model; high carbon emissions scenario)

Source: Cal-Adapt 2017/2023.

Figure 4-62 Amador County – Climate Impact Regions



Source: Cal-Adapt 2017/2023

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the County. There is no scale to measure the extent of climate change. Climate change exacerbates other hazard, such as drought, extreme

heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known but is feared to be tens to hundreds of years.

Past Occurrences

Disaster Declaration History

Climate change has never been directly linked to any declared disasters, as shown in Table 4-4.

NCDC Events

The NCDC does not track climate change events.

Hazard Mitigation Planning Committee Events

While the HMPC noted that climate change is of concern, no specific climate change incidents could be recalled. HMPC members noted that the strength of storms does seem to be increasing and the temperatures seem to be getting hotter. The HMPC also noted that snow levels seem to be higher (or larger) each year and the recent atmospheric river winter rains were more intense. In addition, the Amador County Air Quality District noted that within the last five years, Amador County has experienced extreme droughts that have affected the health of the forest. The lack of rain lead to the Bark Beetle infestation, causing thousands upon thousands of trees to die. This has led to large areas of Amador County to be declared high fire hazardous zones as well. The combined effects of the drought, decline in the health of the forest, temperature changes, and wildfires in and around neighboring counties, much contributed to climate change, have also steered our way to poor air quality.

Likelihood of Future Occurrence

Highly Likely – Climate change is virtually certain to continue without immediate and effective global action. According to NASA, 2023 was one of the hottest years on record as was 2024. Without significant global action to reduce greenhouse gas emissions, the United Nations Intergovernmental Panel on Climate Change (IPCC) concludes in its Sixth Assessment Synthesis Report (2022) that average global temperatures are likely to exceed 1.5°C by the end of the 21st century, with consequences for people, assets, economies and ecosystems, including risks from heat stress, storms and extreme precipitation, inland and coastal flooding, landslides, air pollution, drought, water scarcity, sea level rise and storm surges.

Climate Scenarios

The United Nations IPCC developed several greenhouse gas (GHG) emissions scenarios based on differing sets of assumptions about future economic growth, population growth, fossil fuel use, and other factors. The emissions scenarios range from "business-as-usual" (i.e., minimal change in the current emissions trends) to more progressive (i.e., international leaders implement aggressive emissions reductions policies). Each of these scenarios leads to a corresponding GHG concentration, which is then used in climate models to examine how the climate may react to varying levels of GHGs. Climate researchers use many global climate models to assess the potential changes in climate due to increased GHGs.

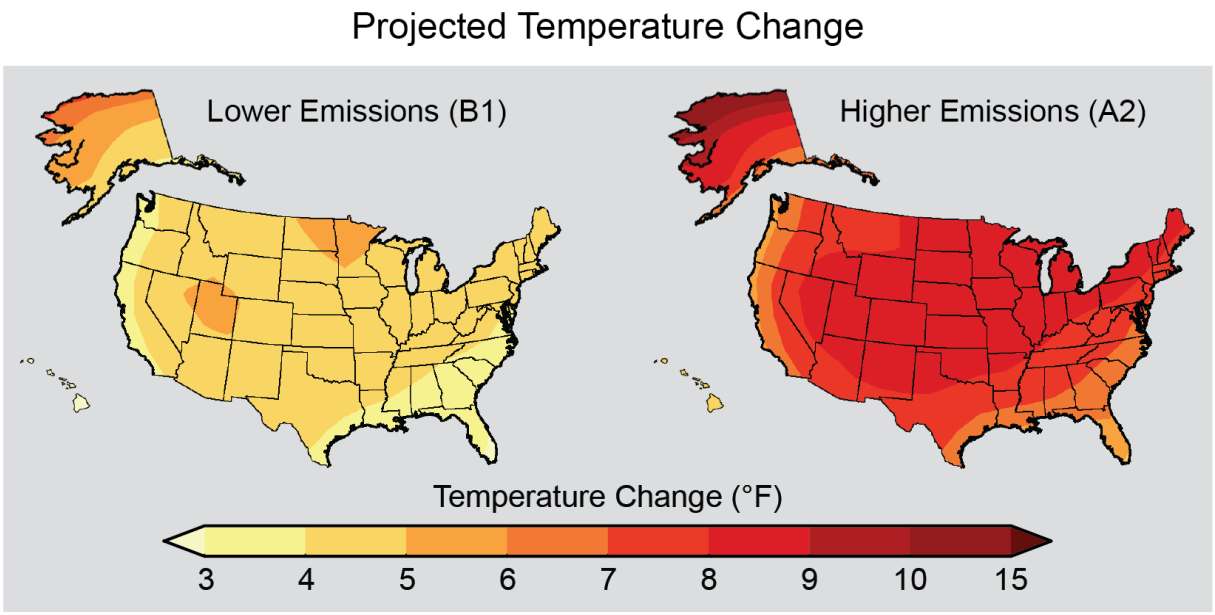
Key Uncertainties Associated with Climate Projections

- Climate projections and impacts, like other types of research about future conditions, are characterized by uncertainty. Climate projection uncertainties include but are not limited to:
  - ✓ Levels of future greenhouse gas concentrations and other radiatively important gases and aerosols,
  - ✓ Sensitivity of the climate system to greenhouse gas concentrations and other radiatively important gases and aerosols,
  - ✓ Inherent climate variability, and
  - ✓ Changes in local physical processes (such as afternoon sea breezes) that are not captured by global climate models.

Even though precise quantitative climate projections at the local scale are characterized by uncertainties, the information provided can help identify the potential risks associated with climate variability/climate change and support long term mitigation and adaptation planning.

Maps show projected change in average surface air temperature in the later part of this century (2071-2099) relative to the later part of the last century (1970-1999) under a scenario that assumes substantial reductions in heat trapping gases and a higher emissions scenario that assumes continued increases in global emissions. These are shown in Figure 4-63.

Figure 4-63 Projected Temperature Change – Lower and Higher Emissions Scenario



Source: National Climate Assessment

According to the California Natural Resource Agency (CNRA), climate change is already affecting California and is projected to continue to do so well into the foreseeable future. Current and projected changes include increased temperatures, sea level rise, a reduced winter snowpack altered precipitation patterns, and more frequent storm events. Over the long term, reducing greenhouse gases can help make these changes less severe, but the changes cannot be avoided entirely. Unavoidable climate impacts can

result in a variety of secondary consequences including detrimental impacts on human health and safety, economic continuity, ecosystem integrity and provision of basic services.

The CNRA's 2021 CAS (as well as the 2024 Draft CAS) delineated how climate change may impact and exacerbate natural hazards in the future, including wildfires, extreme heat, floods, and drought:

- Climate change is expected to lead to increases in the frequency, intensity, and duration of extreme heat events and heat waves in Amador County and the rest of California, which are likely to increase the risk of mortality and morbidity due to heat-related illness and exacerbation of existing chronic health conditions. Those most at risk and vulnerable to climate-related illness are the elderly, individuals with chronic conditions such as heart and lung disease, diabetes, and mental illnesses, infants, the socially or economically disadvantaged, and those who work outdoors.
- Higher temperatures will melt the Sierra snowpack earlier and drive the snowline higher, resulting in less snowpack to supply water to California users.
- Droughts are likely to become more frequent and persistent in the 21st century.
- Intense rainfall events, periodically ones with larger than historical runoff, will continue to affect California with more frequent and/or more extensive flooding.
- Storms and snowmelt may coincide and produce higher winter runoff from the landward side, while accelerating sea-level rise will produce higher storm surges during coastal storms. Together, these changes may increase the probability of floods and levee and dam failures, along with creating issues related to saltwater intrusion.
- Warmer weather, reduced snowpack, and earlier snowmelt can be expected to increase wildfire through fuel hazards and ignition risks. These changes can also increase plant moisture stress and insect populations, both of which affect forest health and reduce forest resilience to wildfires. An increase in wildfire intensity and extent will increase public safety risks, property damage, fire suppression and emergency response costs to government, watershed and water quality impacts, vegetation conversions and habitat fragmentation.

Vulnerability to Climate Change

Vulnerability—Medium

Climate change adaptation is a key priority of the State of California. The 2023 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

The whole of the County is at some measure of vulnerability to climate change. An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to unincorporated Amador County. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect both the entire Amador County Planning Area as well as the unincorporated portions of Amador County. How the hazard affects the other

participating jurisdictions can be found in their respective annexes to this LHMP Update. These sections below include assets at risk, impacts, and how future development may affect the vulnerability of the County to this hazard.

Local Concerns (unincorporated Amador County)

The unincorporated County has specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Amador County OES Concerns

Anthropogenic and other greenhouse gasses will continue to cause more extreme climate change conditions unless steps taken to minimize greenhouse gases and carbon footprints. The County's roadways, infrastructure in flood zones, disadvantaged communities, agriculture sector and sensitives species habitat are among the most vulnerable to climate change impacts.

Climate change threatens the food security and economic viability of agriculture in Amador County. Drought, flood, and severe weather are all poised to intensify as climate change continues to impact California. Agricultural practices need updating to become resilient and can be part of the solution to climate change in our region.

Amador County Air District Concerns

The Amador County Air District noted the following local concerns: Climate change brings on changes in our temperatures. Heat waves lead to poor air quality which impact public health. The changes in temperatures recently experienced (low temperatures at night/morning and mid to warm temperatures in the day) create inversion layers that trap air low to the ground exposing the public to bad air quality for longer periods of time. If Amador was to be hit with a wildfire during an inversion, the effects could be catastrophic. There is too much fuel present in the County. Drought affects crops in the County and health of the forest.

Amador County Public Health Concerns

Amador County Public Health noted the following local concerns: The chief public health concerns related to climate change are numerous and significant. Here are some of the most pressing issues:

- Respiratory and Cardiovascular Diseases: Increased air pollution and allergens can exacerbate conditions like asthma and heart disease.
- Extreme Weather Events: This can lead to injuries, illnesses, and deaths.
- Infectious Diseases: Changes in temperature and precipitation patterns can alter the distribution of disease vectors.
- Food and Waterborne Illnesses: Changes in precipitation and temperature can affect food and water safety.
- Mental Health: The stress and trauma from experiencing extreme weather events and displacement can lead to mental health issues like anxiety and depression.

- Vulnerable Populations: Certain groups, such as the elderly, unhoused, children, and those with pre-existing health conditions, are more susceptible to the health impacts of climate change.

CAL FIRE Concerns

CAL FIRE noted that wildfires pose several significant public health concerns. Here are some of the chief local concerns:

- Respiratory Issues: Wildfire smoke contains fine particulate matter (PM2.5) that can penetrate deep into the lungs and even enter the bloodstream, exacerbating conditions like asthma, bronchitis, and chronic obstructive pulmonary disease (COPD).
- Cardiovascular Problems: Exposure to wildfire smoke can increase the risk of heart attacks, arrhythmias, and other cardiovascular issues.
- Vulnerable Populations: Certain groups, such as children, the unhoused, the elderly, pregnant women, and those with pre-existing health conditions, are more susceptible to the health impacts of wildfire smoke.
- Mental Health: The stress and trauma from experiencing wildfires and displacement can lead to mental health issues like anxiety, depression, and post-traumatic stress disorder (PTSD).
- Long-term Health Effects: Prolonged exposure to wildfire smoke can have lasting health impacts, including increased rates of respiratory infections and other chronic conditions.
- Emergency Room Visits and Hospitalizations: Increased air pollution from wildfires can lead to a rise in emergency room visits and hospitalizations for respiratory and cardiovascular issues which could overcome our small rural hospital's ability to care for patients.

Assets at Risk

Assets at risk from climate change include people and populations; structures; critical infrastructure and vulnerable uses (with community lifelines); natural, historic, and cultural resources; and economic assets and community activities of value. These are discussed in the following sections for the Amador County Planning Area and unincorporated Amador County.

Additionally, for each hazard in the FEMA National Risk Index in Amador County, the relevant portions of the hazard analysis done by FEMA is presented below. This includes the Hazard Risk Index Rating, Expected Annual Loss Values, Exposure Values, and the Historic Loss Ratio Rating. These are presented for the Amador County Planning Area as a whole.

People and Populations

Climate change affects people and populations within a community, especially those climate change issues related to increases in temperature over time. While all populations can be affected by temperature extremes, populations particularly vulnerable include the very old and very young, medically fragile people, people without means of shelter (and air conditioning) or transportation, people who are socially isolated and other socially vulnerable or underserved populations (as shown in Special Populations discussion in Section 4.2.1). Acclimatization to heat may help reduce risks from heat waves in the healthy general population but may not be sufficient to protect those with underlying issues and lack of resources.

Structures

Climate change, on its own, does not generally impact structures. However, structures in areas of increased wildfire, drought, extreme heat, or flood areas exacerbated by the effects of climate change would be at increased risk, as described throughout this LHMP. Due to the slow onset of climate change, many structures in the County are expected to undergo improvements and adapt over time to a new climate normal.

Critical Infrastructure and Vulnerable Uses

As with structures, critical and vulnerable facilities in areas of increased wildfire, flood areas, or in other hazard areas exacerbated by climate change, would be at increased risk. Climate change is expected to increase the general vulnerability of critical and vulnerable facilities to natural hazards. Due to the slow onset of climate change, critical and vulnerable facilities and community lifelines in the County are expected to undergo improvements and adapt over time to a new climate normal.

Natural, Historic, and Cultural Resources

The rivers, streams, and open space areas of the County supports rich biodiversity, including many special-status species. These are all at risk from the effects of climate change. In addition, if heat changes wildfire patterns, all areas (on land) of the County are at increased risk from fire – including natural, historic, and cultural resources. Furthermore, if climate change exacerbates the drought hazard, areas of wetlands in the County may dry up temporarily, which could damage habitat areas for waterfowl and other species that depend on these areas.

FEMA NRI Hazard Vulnerability Assessment

Climate change is not an NRI hazard, therefore no data is presented.

Impacts from Climate Change

The 2017 California Adaptation Planning Guide (APG) North Central Valley Region identifies area specific impacts and vulnerabilities to the Amador County Planning Area. These impacts include:

- Increased temperatures
- Reduced precipitation
- Public health – heat and air pollution
- Reduced agricultural productivity
- Inland flooding
- Reduced tourism

Secondary impacts include changes in precipitation patterns, the global water cycle, melting glaciers and ice caps, and rising sea levels. According to the IPCC, climate change will "increase the likelihood of severe, pervasive and irreversible impacts for people and ecosystems" if unchecked.

Through changes to oceanic and atmospheric circulation cycles and increasing heat, climate change affects weather systems around the world. Climate change increases the likelihood and exacerbates the severity

of extreme weather – more frequent or intense storms, floods, droughts, and heat waves. The 2023 State of California Hazard Mitigation Plan noted that there are direct and secondary impacts:

- Direct Impacts
  - ✓ Increase in average temperature
  - ✓ Changes in annual precipitation
- Secondary Impacts
  - ✓ Increased frequency, intensity, and duration of extreme heat days and heat waves/events
  - ✓ Increased flooding
  - ✓ Increased wildfire
  - ✓ Loss of snowpack and decreased water supplies

Consequences for human society include loss of life and injury, damaged infrastructure, long-term health effects, loss of agricultural crops, disrupted transport and freight, and more. Climate change is not a discrete event but a long-term hazard, the effects of which communities are already experiencing.

In addition to these sources, the 2023 State of California Hazard Mitigation Plan noted that according to California's Fourth Climate Change Assessment, the state will experience the following climate impacts:

- Annual average daily high temperatures are expected to rise by 2.7 °F by 2040, 5.8°F by 2070, and 8.8°F by 2100 compared to observed and modeled historical conditions. These changes are statewide averages.
- Heat waves are projected to become longer, more intense, and more frequent.
- Warming temperatures are expected to increase soil moisture loss and lead to drier conditions. Summer dryness may become prolonged, with soil drying beginning earlier in the spring and lasting longer into the fall and winter.
- Droughts are likely to become more frequent and persistent through 2100.
- The strength of the most intense precipitation and storm events affecting California is expected to increase.
- Snowpack levels are projected to decline significantly by 2100 due to reduced snowfall and faster snowmelt.
- Marine layer clouds are projected to decrease.
- Extreme wildfires (i.e., fires larger than 24,710 acres) would occur 50 percent more frequently. The maximum area burned statewide may increase 178 percent by the end of the century.
- Sea level rise is expected to continue to increase beach, cliff, and bluff erosion.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future hazard conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for Amador County include the following:

- As climate change continues to accelerate over time, climate related impacts to the County will continue to increase.
- Climate change can influence population growth in the County over time. While the County is expected to see slow and steady growth, the County could see population fluctuations as a result of climate impacts relative to those experienced in other regions, and these fluctuations are expected to impact demand for housing and other development. While there are currently no formal studies of specific migration patterns expected to impact the County region, climate-induced migration was recognized within the UNFCCC Conference of Parties Paris Agreement of 2015 and is expected to be the focus of future studies. So while changes in population and population patterns are not expected to increase the impacts associated with this hazard, climate change may instead influence future population growth in the County.
- Land use planning should be proactive to address future hazard conditions. The increasing severity and frequency of storms and other weather events due to the changing climate should be taken into account while considering land use planning for the County. Ensuring that regulatory requirements, such as building codes, are updated and followed will help reduce future impacts to this hazard. Due to adherence to protective building codes, changes in land use and development will likely not increase the impacts and associated vulnerabilities of the County to this hazard.

Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements, such as building codes, are followed, and varying needs for different demographic groups with intersecting identities that reside within the County are considered can help to make for a more disaster resilient community.

4.3.9. Dam Failure

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Amador County Planning Area. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect or influence this hazard.

Hazard/Problem Description

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any one year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped or fail. Overtopping is the primary cause of earthen dam failure in the United States.

Dam failures can also result from any one or a combination of the following causes:

- Earthquake
- Inadequate spillway capacity resulting in excess overtopping flows
- Internal erosion caused by embankment or foundation leakage, or piping or rodent activity
- Improper design
- Improper maintenance
- Negligent operation
- Failure of upstream dams on the same waterway

In general, there are three types of dams: concrete arch or hydraulic fill, earth and rockfill, and concrete gravity. Each type of dam has different failure characteristics. A concrete arch or hydraulic fill dam can fail almost instantaneously; the flood wave builds up rapidly to a peak then gradually declines. An earth-rockfill dam fails gradually due to erosion of the breach; a flood wave will build gradually to a peak and then decline until the reservoir is empty. A concrete gravity dam can fail instantaneously or gradually with a corresponding buildup and decline of the flood wave.

The CA DWR Division of Safety of Dams (DSOD) has jurisdiction over impoundments that meet certain capacity and height criteria. Embankments that are less than six feet high and impoundments that can store less than 15 acre-feet are non-jurisdictional. Additionally, dams that are less than 25 feet high can impound up to 50 acre-feet without being jurisdictional. FEMA and CA DWR Division of Safety of Dams (DSOD) assign hazard potential classifications to dams within the State that provides information on the potential impact should a dam fail. The following two factors are considered when assigning hazard ratings: existing land use and land use controls (zoning) downstream of the dam. FEMA categorizes the downstream hazard potential into three categories in increasing severity: Low, Significant, and High. DSOD adds a fourth category of Extremely High. Dams are classified in these four categories that identify the potential hazard to life and property:

- **Extremely High Hazard** – Expected to cause considerable loss of human life or would result in an inundation area with a population of 1,000 or more.
- **High Hazard** – Expected to cause loss of at least one human life.
- **Significant Hazard** – No probable loss of human life but can cause economic loss, environmental damage, impacts to critical facilities, or other significant impacts.
- **Low Hazard** – No probable loss of human life and low economic and environmental losses. Losses are expected to be principally limited to the owner's property.

Location and Extent

According to data provided by Cal DWR, DSOD data, there are 20 dams in Amador County constructed for flood control, storage, electrical generation, and recreational purposes. Of these, 4 are rated as extremely high, 9 rated as High Hazard, 1 as Significant Hazard, and 6 as Low Hazard. In addition to these dams located within Amador County, there are 16 other dams (2 Extremely High, 8 High Hazard, 4 Significant Hazard, and 2 Low Hazard) outside the County (located in San Joaquin, El Dorado, Calaveras, Alpine Counties) with the potential to affect people and property in Amador County. All 6 Extremely High and 16 of the 17 High Hazard dams (all but Patterson in El Dorado County) have inundations in Amador County. There is no inundation data available for any of the Significant or Low Hazard dams. Figure 4-64 identifies

the dams that have inundation areas located in the Amador County Planning Area. Table 4-54 gives information on each of the dams in the County, and the dams outside the County that could affect areas in Amador County.

Figure 4-64 Amador County Dam Inventory (Including Dams from Outside the County)

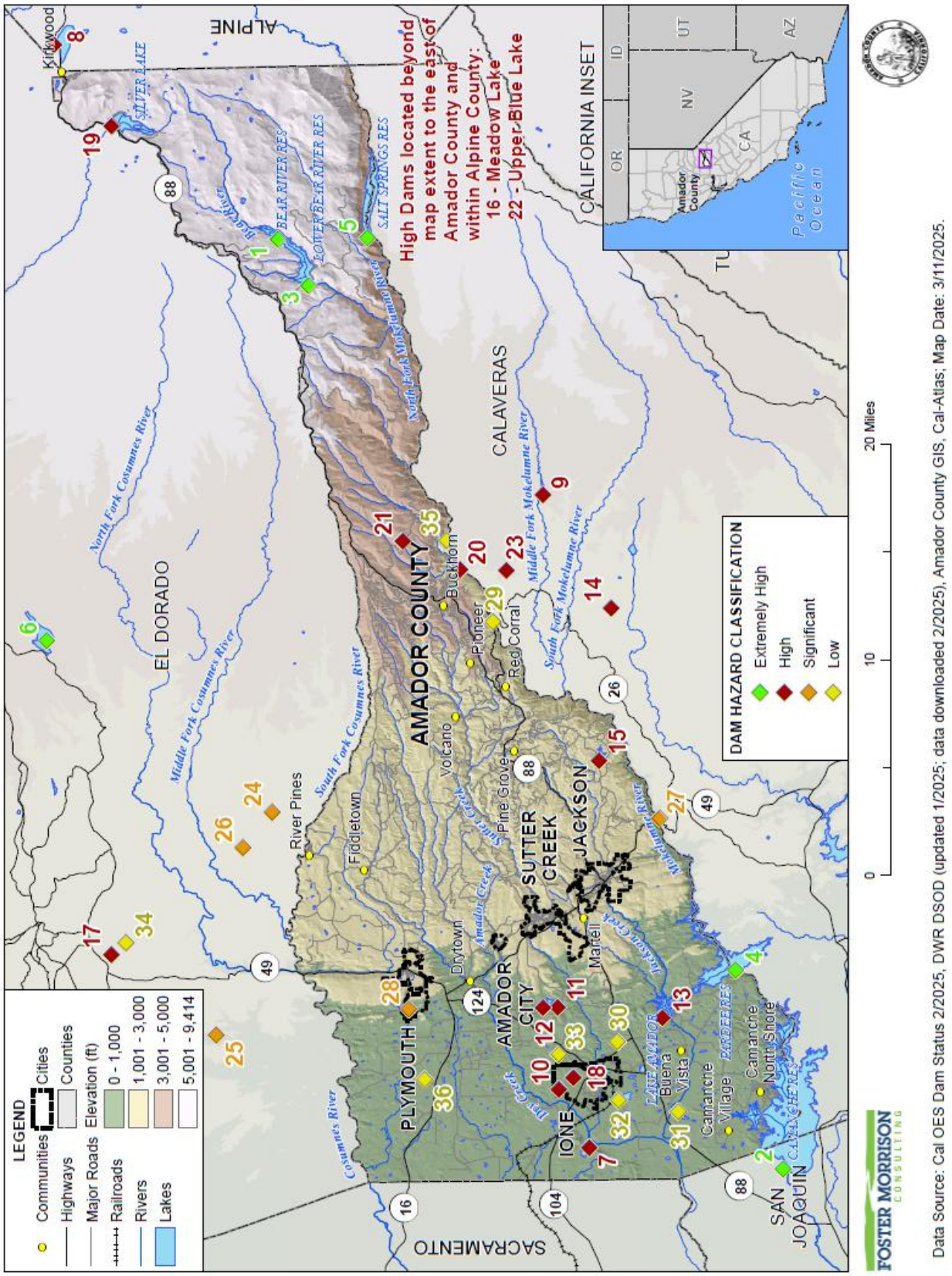


Figure 4-65 Dam Hazard Map Legend

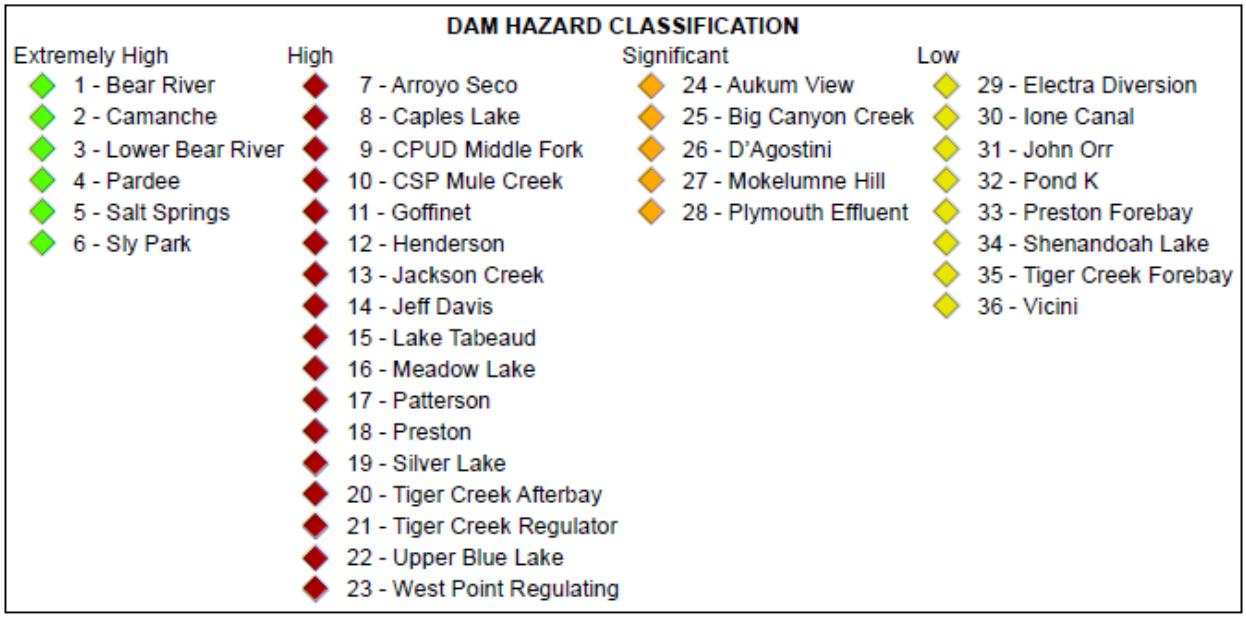


Table 4-54 Amador County – Dam Inventory (both Inside and Outside the County)

Name	Owner	Hazard Classification	Dam Type	River/Stream	Structural Height (ft)	Maximum Storage (acre-ft)	Map Location/ Mapped Inundation
Bear River	PG&E	Extremely High	Rockfill	Bear River	83	6,818	Y/Y
Camanche**	East Bay Municipal Utility District	Extremely High	Earth	Mokelumne River	171	417,120	Y/Y
Lower Bear River	PG&E	Extremely High	Rockfill	Bear River	253	48,750	Y/Y
Pardee	East Bay Municipal Utility District	Extremely High	Concrete Gravity	Mokelumne River	345	197,950	Y/Y
Salt Springs	PG&E	Extremely High	Rockfill	North Fork Mokelumne River	332	141,900	Y/Y
Sly Park**	El Dorado Irrigation District	Extremely High	Earth	Sly Park Creek	182	41,000	Y/Y
Arroyo Seco	Greenrock Ranch Lands LLC	High	Earth	Tributary of Dry Creek	67	2,433	Y/Y

Name	Owner	Hazard Classification	Dam Type	River/Stream	Structural Height (ft)	Maximum Storage (acre-ft)	Map Location/ Mapped Inundation
Caples Lake**	El Dorado Irrigation District	High	Earthen Rockfill	Caples Creek	71	21,580	Y/Y
CPUD Middle Fork**	Calaveras Public Utility District	High	Earth	Middle Fork of American River	98	1,700	Y/Y
CSP Mule Creek	California Department of Corrections and Rehabilitation	High	Earth	Offstream	51	535	Y/Y
Goffinet	Private Owner	High	Earth	Jackass Creek	38	197	Y/Y
Henderson	Amador Regional Sanitation Authority	High	Earth	Jackass Creek	56	500	Y/Y
Jackson Creek	Jackson Valley Irrigation District	High	Earth Concrete	Jackson Creek	193	22,000	Y/Y
Jeff Davis**	Calaveras Public Utility District	High	Earth	Mokelumne River	114	2,059	Y/Y
Lake Tabeaud	PG&E	High	Earth	South Fork of Jackson Creek	123	1,170	Y/Y
Meadow Lake**	PG&E	High	Earth Rockfill	Tributary of Fordyce Creek	37	4,930	Y/Y
Patterson**	Private	High	Earth	Offstream	37	350	Y/Y
Preston	Amador Regional Sanitation Authority	High	Earth	Tributary Mule Creek	40	268	Y/Y
Silver Lake	El Dorado Irrigation District	High	CRIB	Silver Fork	26	3,840	Y/Y
Tiger Creek Afterbay**	PG&E	High	VARA	North Fork Mokelumne River	115	3,960	Y/Y
Tiger Creek Regulator	PG&E	High	SLBT	Tiger Creek	112	523	Y/Y
Upper Blue Lake**	PG&E	High	Earth Rockfill	Blue Creek	31	7,576	Y/Y

Name	Owner	Hazard Classification	Dam Type	River/Stream	Structural Height (ft)	Maximum Storage (acre-ft)	Map Location/ Mapped Inundation
West Point Regulating**	Calaveras County Water District	High	Earth	Ruse Creek	36	60	Y/Y
Aukum View**	Showcase Ranches Community Services District	Significant	Earth	Tributary of Flat Creek	32	136	Y/N
Big Canyon Creek**	Private	Significant	Earth	Big Canyon Creek	63	395	Y/N
D'Agostini**	Private	Significant	Earth	Spanish	32	355	Y/N
Mokelumne Hill**	Mokelumne Hill Sanitary District	Significant	Earth	Mokelumne River	52	52	Y/N
Plymouth Effluent	City of Plymouth	Significant	Earth	Tributary of Lower Indian Creek	59	187	Y/N
Electra Diversion**	PG&E	Low	Gravel	North Fork Mokelumne River	44	65	Y/N
Ione Canal	Amador Water Agency	Low	Earth	Ione Canal	48	24	Y/N
John Orr	Private Owner	Low	Earth	Tributary of Jackson Creek	20	152	Y/N
Pond K	US Mine Corporation	Low	Earth	none	22	1,056	Y/N
Preston Forebay	Amador Regional Sanitation Authority	Low	Earth	Offstream	40	30	Y/N
Shenandoah Lake**	Renwood Ranch	Low	Earth	Pigeon Creek	33	168	Y/N
Tiger Creek Forebay	PG&E	Low	Earth	Tributary of Tiger Creek	33	36	Y/N
Vicini	Private Owner	Low	Earth	Tributary of Willow Creek	19	150	Y/N

Source: DSOD/Cal OES/NID Dam Status 1/25, National Performance of Dams Program

*One Acre Foot=326,000 gallons

**Located outside of Amador County, but inundating areas inside Amador County

Once a list of dams was established, dam inundation layers were obtained from DSOD and Cal OES in GIS. Only extremely high and high hazard dams were analyzed for this LHMP due to the potential for these dams to cause loss of life in the Amador County Planning Area should a dam failure occur. All 6 of the

extremely high dams and all of the 17 high hazard dams had available inundation mapping. Of these, all 6 extremely high and 16 of the 17 high hazard dams (all but Patterson in El Dorado County) have inundations that extend into Amador County. Dams with an inundation area in the Amador County Planning Area are shown on Figure 4-66 for extremely high hazard dams, and Figure 4-67 for high hazard dams. As shown, only the unincorporated County has areas located in the extremely high hazard dam inundation areas. The high hazard dam inundation zones are located in the unincorporated County, as well as in Ione and Jackson. Geographic flood extents as shown on the dam inundation maps are detailed by dam in Table 4-55 for both extremely high and high hazard dams for the unincorporated County. Information on the high hazard dam extents by jurisdiction can be found in their respective annexes to this Plan.

Figure 4-66 Amador County Planning Area – Extremely High Hazard Dam Inundation Areas

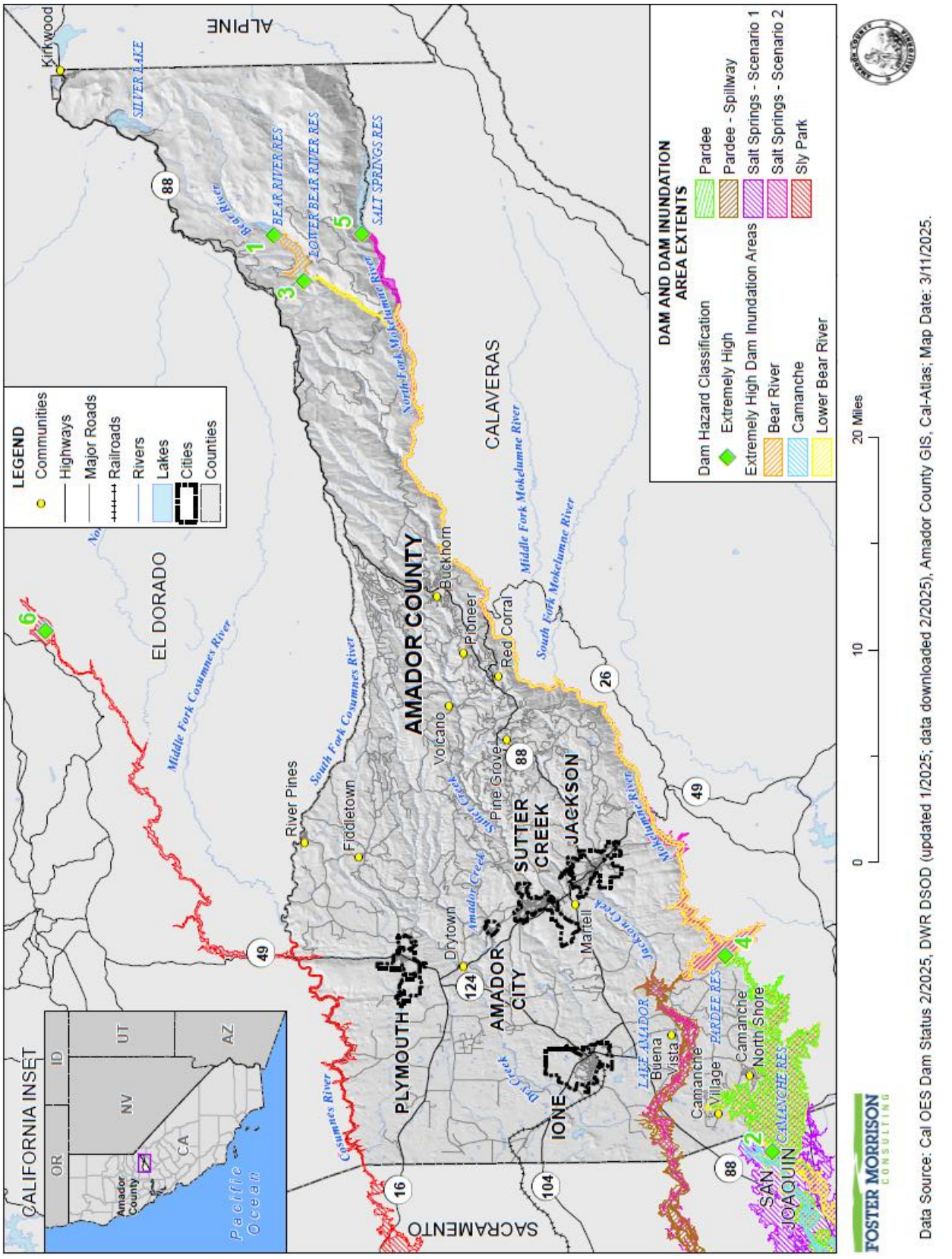


Figure 4-67 Amador Planning Area – High Hazard Dam Inundation Areas

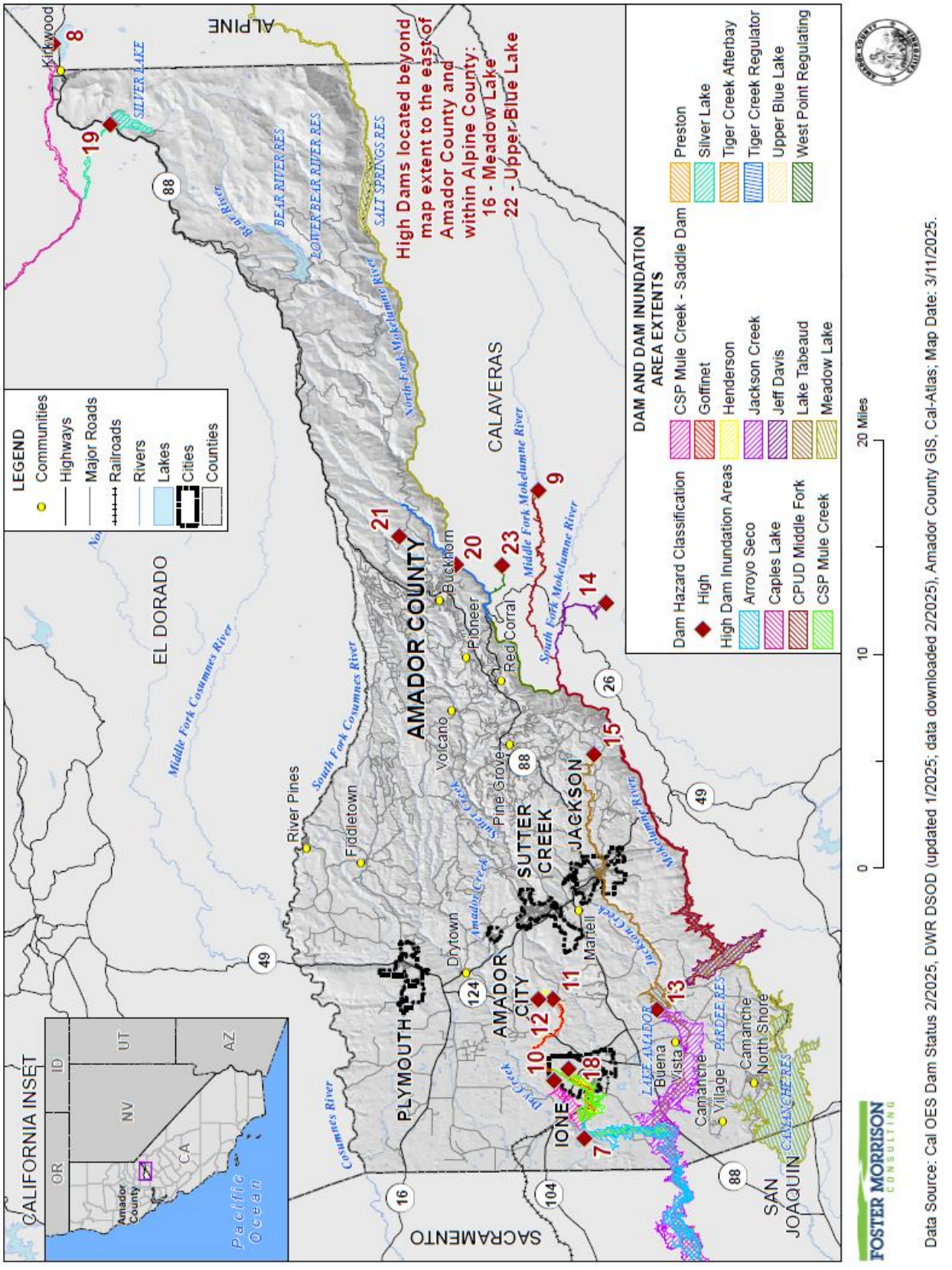


Table 4-55 Amador County Planning Area – Geographical Dam Inundation Extents

Jurisdiction / Dam Inundation Area	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Extremely High Hazard Dams						
Unincorporated Amador County						
Bear River	8,749	2.3%	300	0.2%	8,448	3.9%
Camanche	6	0.001%	0	0	6	0.003%
Lower Bear River	7,893	2.1%	268	0.2%	7,625	3.6%
Pardee	4,606	1.2%	162	0.1%	4,444	2.1%
Pardee - Spillway	3,651	1.0%	2,670	1.6%	980	0.5%
Salt Springs - Scenario 1	8,520	2.2%	334	0.2%	8,186	3.8%
Salt Springs - Scenario 2	5,548	1.5%	1,623	1.0%	3,925	1.8%
Sly Park	720	0.2%	348	0.2%	372	0.2%
High Hazard Dams						
City of Ione						
CSP Mule Creek	373	12.6%	65	9.4%	308	13.5%
CSP Mule Creek - Saddle Dam	44	1.5%	0	0.0%	44	1.9%
Goffinet	123	4.1%	18	2.7%	104	4.6%
Henderson	239	8.0%	45	6.4%	195	8.5%
Preston	179	6.0%	35	5.1%	144	6.3%
City of Jackson						
Lake Tabeaud	80	3.5%	31	3.9%	50	3.3%
Unincorporated Amador County						
Arroyo Seco	1,525	0.4%	909	0.6%	616	0.3%
Caples Lake	8	0.002%	-		8	0.004%
CPUD Middle Fork	637	0.2%	26	0.02%	612	0.3%
CSP Mule Creek	976	0.3%	636	0.4%	340	0.2%
CSP Mule Creek - Saddle Dam	1,147	0.3%	846	0.5%	301	0.1%
Goffinet	194	0.05%	113	0.07%	80	0.04%

Jurisdiction / Dam Inundation Area	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Henderson	418	0.1%	258	0.2%	160	0.1%
Jackson Creek	4,701	1.2%	3,856	2.3%	845	0.4%
Jeff Davis	1,380	0.4%	31	0.02%	1,349	0.6%
Lake Tabeaud	2,071	0.5%	1,475	0.9%	596	0.3%
Meadow Lake	5,670	1.5%	44	0.03%	5,626	2.6%
Preston	156	0.04%	71	0.04%	85	0.04%
Silver Lake	519	0.1%	510	0.3%	9	0.004%
Tiger Creek Afterbay	1,540	0.4%	39	0.02%	1,501	0.7%
Tiger Creek Regulator	151	0.04%	0	0.0003%	150	0.07%
Upper Blue Lake	645	0.2%	-		645	0.3%
West Point Regulating	65	0.02%	1	0.001%	64	0.03%

Source: DSOD/Cal OES/NID Dam Status 01/25

There is no scale with which to measure dam failure, only a scale to measure dam failure vulnerability based on size of dam and proximity to development. Dam failure may range from a small breach to a total failure. While a dam may fill slowly with runoff from winter storms, a dam break can have a very quick speed of onset. The duration of dam failure is not long – only as long as it takes to empty the reservoir of water the dam held back.

For dam overtopping, the speed of onset is somewhat slower than that of a dam break, and the duration is longer (as evidenced in the 2017 Oroville Dam event). The Amador County Planning Area would be affected for as long as the flood waters from the dam failure takes to drain downstream.

Past Occurrences

Disaster Declaration History

There have been no disaster declarations related to dam failure in Amador County, as shown in Table 4-4.

NCDC Events

There have been no NCDC dam failure events in Amador County.

National Performance of Dams Program Events

The National Performance of Dams Program at Stanford University tracks dam failures. A search of the National Performance of Dams Program database showed no past dam failure events in Amador County.

Hazard Mitigation Planning Committee Events

No other events of dam failure were noted to have occurred in Amador County.

Likelihood of Future Occurrence

Unlikely—No dam failure events have occurred in the County. Further, based on historical data and input from the HMPC, it is unlikely that major dam failure event will occur in Amador County. There is concern that many of the State's older dams, including those in Amador County, could start experiencing problems.

It is likely that climate change will increase the chance of future occurrence as well as future impacts. More information on climate change and dam failure can be found in the next section. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate Change and Dam Failure

The 2023 California State Hazard Mitigation Plan noted that modeling described in California's Fourth Climate Change Assessment projects less frequent but more extreme daily precipitation. Year-to-year precipitation will become more volatile, and the number of dry years will increase by mid-century. As the climate continues to warm, atmospheric rivers will carry more moisture, and extreme precipitation may increase. Climate model projections show a tendency for the northern part of the State to become wetter. Increases in both precipitation and heat causing snow melt in areas upstream of dams could increase the potential for dam failure and uncontrolled releases in Amador County.

Vulnerability Assessment

Vulnerability—High

Dam failure flooding can occur as the result of a partial or complete collapse of an impoundment. Dam failures often result from prolonged rainfall and flooding. An earthquake event can also contribute to a dam failure. The primary danger associated with dam failure is the high velocity flooding of those properties downstream of the dam. A dam failure can range from a small, uncontrolled release to a catastrophic failure. Vulnerability to dam failures is generally confined to the areas subject to inundation downstream of the facility. Secondary losses would include loss of the multi-use functions of the facility and associated revenues that accompany those functions. Dam failure flooding would vary by community depending on which dam fails and the nature and extent of the dam failure and associated flooding.

An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to unincorporated Amador County. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect both the entire Amador County Planning Area as well as the unincorporated portions of Amador County. How the hazard affects the other participating jurisdictions can be found in their respective annexes to this LHMP Update. These sections below include assets at risk, impacts, and how future development may affect the vulnerability of the County to this hazard.

Local Concerns (unincorporated Amador County)

The unincorporated County has specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce the risk and vulnerability to this hazard.

The County noted that per DWR DSOD Inundation Maps – there are multiple dams both inside the County, as well as outside the County, that could affect residents and structures in the County. These are discussed in the Assets at Risk section below. The County also noted that an early warning system could improve dam failure readiness and mitigation.

Local concerns for each of the jurisdictions can be found under the Local Concerns heading in each respective jurisdictional annex to this LHMP Update.

Assets at Risk from Dam Failure

Assets at risk from dam failure include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections for the Amador County Planning Area and unincorporated Amador County.

Additionally, for each hazard in the FEMA National Risk Index in Amador County, the relevant portions of the hazard analysis done by FEMA is presented below. This includes the Hazard Risk Index Rating, Expected Annual Loss Values, Exposure Values, and the Historic Loss Ratio Rating. These are presented for the Amador County Planning Area as a whole.

Methodology (Parcels and Structures)

In order to analyze people and populations, structures, and critical facilities at risk in dam inundation areas, GIS was used to quantify those values. The 2024 Amador County Parcel/Assessor Data was provided by Amador County and was used as the basis for the inventory of assessed values for both improved and unimproved parcels within the Amador County Planning Area. The dam inundation areas, obtained from DSOD, were then overlaid on the parcel layer. For the purposes of this analysis, if the dam inundation layer intersected any portion of a parcel polygon, the entire parcel was considered to be in the dam inundation area. The parcels were segregated and analyzed in this fashion for the entire Planning Area. This analysis was performed on extremely high and high hazard dam inundation areas only. No significant or low hazard dam analysis was performed, as significant and low hazard dams did not have available inundation mapping.

People and Populations

All people and populations located in dam inundation areas are vulnerable to dam failure. Certain vulnerable populations may be at increased risk to dam failure, especially during a large event with minimal advance notice. These vulnerable populations may include: the unhoused, those with limited mobility, and those that lack the resources to leave the area.

Amador County residents that live in these dam inundation areas are often the most vulnerable. Not only are the residents at risk, but their homes and contents are all at risk, compounding the impacts associated with significant dam failure events. To further evaluate the impact to the Amador County Planning Area's residential populations located in these hazard areas, a separate analysis was performed to determine residential populations in the dam inundation areas. The DSOD dam inundation areas were overlayed on the parcel layer and linked to the Assessor Data. Those residential parcel centroids that intersect the dam inundation areas were counted and multiplied by the Census Bureau average household factors for each jurisdiction. This is shown in Table 4-56.

Table 4-56 Amador County Planning Area – Improved Residential Parcels and Population by Dam Inundation Area (Extremely High and High Hazard) and Jurisdiction

Dam Hazard Class/Jurisdiction/Dam Inundation Area	Improved Residential Parcels	Population
Extremely High Hazard Dams		
Unincorporated Amador County		
Bear River	28	66
Lower Bear River	28	66
Pardee	8	19
Salt Springs	38	89
Sly Park	13	31
High Hazard Dams		
Unincorporated Amador County		
Arroyo Seco	3	7
CPUD Middle Fork	1	2
CSP Mule Creek	3	7
CSP Mule Creek Saddle	7	16
Goffinet	2	5
Henderson	3	7
Jackson Creek	52	122
Jeff Davis	2	5
Lake Tabeaud	27	63
Meadow Lake	4	9
Silver Lake	5	12
Tiger Creek Afterbay	4	9
West Point Regulating	3	7
Ione		
CSP Mule Creek	219	501
Goffinet	96	220
Henderson	185	424

Dam Hazard Class/Jurisdiction/Dam Inundation Area	Improved Residential Parcels	Population
Preston	165	378
Jackson		
Lake Tabeaud	84	185

Source: Cal OES, DSOD, 2024 Amador County Parcel/Assessor Data, 2020 US Census Bureau Average Household Size – City of Amador City (2.07); City of Ione (2.29); City of Jackson (2.20); City of Plymouth (2.80); City of Sutter Creek (2.07): Unincorporated Amador County (2.35).

Structures

Many structures in the Amador County Planning Area have some measure of risk to dam failure. Dam failure flooding can affect the built environment of many locations in the Amador County Planning Area. Structures in dam inundation areas are at risk and depending on flood depths, can range from slight damage to total inundation. Analysis by extremely high hazard dam and high hazard dam follows.

Extremely High Hazard Dam Analysis

Parcel counts, land, and improved values (i.e., those with a structure improvement on the parcel), estimated content replacement values, and total values that fall within each extremely high hazard dam inundation areas in the Planning Area are presented below by dam. For the extremely high hazard dam inundation areas, only the unincorporated County is affected. Analysis is presented in the following tables.

- Table 4-57 shows the summary counts and values of parcels in all extremely high hazard dam inundation areas in the Amador County Planning Area. It should be noted that only the unincorporated County is affected by extremely high hazard dam inundations.
- Table 4-58 shows the count and value of parcels in the Bear River Dam inundation area detailed by property use for the unincorporated County.
- Table 4-59 shows the count and value of parcels in the Camanche Dam inundation area detailed by property use for the unincorporated County.
- Table 4-60 shows the count and value of parcels in the Lower Bear River Dam inundation area detailed by property use for the unincorporated County.
- Table 4-61 shows the count and value of parcels in the Pardee Dam inundation area detailed by property use for the unincorporated County.
- Table 4-62 shows the count and value of parcels in the Pardee (Spillway) Dam inundation area detailed by property use for the unincorporated County.
- Table 4-63 shows the count and value of parcels in the Salt Springs (Scenario 1) Dam inundation area detailed by property use for the unincorporated County.
- Table 4-64 shows the count and value of parcels in the Salt Springs (Scenario 1) Dam inundation area detailed by property use for the unincorporated County.
- Table 4-65 shows the count and value of parcels in the Sly Park Dam inundation area detailed by property use for the unincorporated County.

Table 4-57 Amador County Planning Area– Summary Counts and Values of Parcels and Structures in Extremely High Hazard Dam Inundation Areas

Dam Inundation Area	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Bear River	203	39	$8,399,246	$12,512,142	$5,167,406	$26,078,794
Camanche	1	0	$0	$0	$0	$0
Lower Bear River	189	37	$8,046,063	$11,809,991	$4,465,255	$24,321,309
Pardee	49	13	$4,476,186	$5,996,392	$1,234,147	$11,706,725
Pardee - Spillway	120	69	$17,444,240	$120,892,069	$116,905,558	$255,241,867
Salt Springs - Scenario 1	209	47	$9,366,590	$13,403,332	$5,217,659	$27,987,581
Salt Springs - Scenario 2	214	66	$17,930,215	$119,893,936	$116,321,589	$254,145,740
Sly Park	65	32	$5,976,770	$3,187,889	$2,122,001	$11,286,660

Source: Cal OES/DSOD, 2024 Amador County Parcel/Assessor Data

Table 4-58 Unincorporated Amador County – Count and Value of Parcels and Structures in Bear River Dam Inundation Area by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	17	6	$1,929,258	$849,894	$849,894	$3,629,046
Commercial	2	2	$0	$702,151	$702,151	$1,404,302
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	112	2	$1,597,046	$3,706,565	$0	$5,303,611
Residential	70	28	$4,695,072	$7,230,721	$3,615,361	$15,541,154
Unknown	2	1	$177,870	$22,811	$0	$200,681
Bear River Total	**203**	**39**	**$8,399,246**	**$12,512,142**	**$5,167,406**	**$26,078,794**

Source: Cal OES/DSOD, 2024 Amador County Parcel/Assessor Data

Table 4-59 Unincorporated Amador County – Count and Value of Parcels and Structures in Camanche Dam Inundation Area by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Miscellaneous	1	0	$0	$0	$0	$0
Residential	0	0	$0	$0	$0	$0
Unknown	0	0	$0	$0	$0	$0
Camanche Total	**1**	**0**	**$0**	**$0**	**$0**	**$0**

Source: Cal OES/DSOD, 2024 Amador County Parcel/Assessor Data

Table 4-60 Unincorporated Amador County – Count and Value of Parcels and Structures in Lower Bear River Dam Inundation Area by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	16	6	$1,576,075	$849,894	$849,894	$3,275,863
Commercial	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	101	2	$1,597,046	$3,706,565	$0	$5,303,611
Residential	70	28	$4,695,072	$7,230,721	$3,615,361	$15,541,154
Unknown	2	1	$177,870	$22,811	$0	$200,681
Lower Bear River Total	**189**	**37**	**$8,046,063**	**$11,809,991**	**$4,465,255**	**$24,321,309**

Source: Cal OES/DSOD, 2024 Amador County Parcel/Assessor Data

Table 4-61 Unincorporated Amador County – Count and Value of Parcels and Structures in Pardee Dam Inundation Area by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	9	3	$1,211,353	$178,467	$178,467	$1,568,287
Commercial	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	25	2	$1,208,545	$3,706,565	$0	$4,915,110
Residential	15	8	$2,056,288	$2,111,360	$1,055,680	$5,223,328
Unknown	0	0	$0	$0	$0	$0
Pardee Total	**49**	**13**	**$4,476,186**	**$5,996,392**	**$1,234,147**	**$11,706,725**

Source: Cal OES/DSOD, 2024 Amador County Parcel/Assessor Data

Table 4-62 Unincorporated Amador County – Count and Value of Parcels and Structures in Pardee Spillway Dam Inundation Area by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	43	34	$10,169,354	$7,414,842	$7,414,842	$24,999,038
Commercial	2	2	$197,644	$105,185,102	$105,185,102	$210,567,848
Industrial	2	2	$464,990	$579,316	$868,974	$1,913,280
Miscellaneous	28	0	$0	$0	$0	$0
Residential	40	28	$6,101,998	$6,873,280	$3,436,640	$16,411,918
Unknown	5	3	$510,254	$839,529	$0	$1,349,783
Pardee Spillway Total	**120**	**69**	**$17,444,240**	**$120,892,069**	**$116,905,558**	**$255,241,867**

Source: Cal OES/DSOD, 2024 Amador County Parcel/Assessor Data

Table 4-63 Unincorporated Amador County – Count and Value of Parcels and Structures in Salt Springs (Scenario 1) Dam Inundation Area by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	14	6	$1,554,370	$761,362	$761,362	$3,077,094
Commercial	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	103	2	$1,597,046	$3,706,565	$0	$5,303,611
Residential	89	38	$5,977,304	$8,912,594	$4,456,297	$19,346,195
Unknown	3	1	$237,870	$22,811	$0	$260,681
Salt Springs Scenario 1 Total	**209**	**47**	**$9,366,590**	**$13,403,332**	**$5,217,659**	**$27,987,581**

Source: Cal OES/DSOD, 2024 Amador County Parcel/Assessor Data

Table 4-64 Unincorporated Amador County – Count and Value of Parcels and Structures in Salt Springs (Scenario 2) Dam Inundation Area by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	50	36	$11,003,872	$7,318,703	$7,318,703	$25,641,278
Commercial	1	1	$66,727	$105,134,247	$105,134,247	$210,335,221
Industrial	2	2	$464,990	$579,316	$868,974	$1,913,280
Miscellaneous	110	0	$388,501	$0	$0	$388,501
Residential	45	23	$5,327,374	$5,999,330	$2,999,665	$14,326,369
Unknown	6	4	$678,751	$862,340	$0	$1,541,091

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Salt Springs Scenario 1 Total	**214**	**66**	**$17,930,215**	**$119,893,936**	**$116,321,589**	**$254,145,740**

Source: Cal OES/DSOD, 2024 Amador County Parcel/Assessor Data

Table 4-65 Unincorporated Amador County – Count and Value of Parcels and Structures in Sly Park Dam Inundation Area by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	31	18	$3,255,214	$1,037,100	$1,037,100	$5,329,414
Commercial	2	1	$36,562	$19,012	$19,012	$74,586
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	8	0	$0	$0	$0	$0
Residential	23	13	$2,684,994	$2,131,777	$1,065,889	$5,882,660
Unknown	1	0	$0	$0	$0	$0
Sly Park Total	**65**	**32**	**$5,976,770**	**$3,187,889**	**$2,122,001**	**$11,286,660**

Source: Cal OES/DSOD, 2024 Amador County Parcel/Assessor Data

High Hazard Dam Analysis

Parcel counts, land, and improved values (i.e., those with a structure improvement on the parcel), estimated content replacement values, and total values that fall within each high hazard dam inundation areas in the Planning Area are presented below by dam. For the high hazard dam inundation areas, both the cities of Ione (CSP Mule, CSP Mule Creek, Goffinet, Henderson, Preston) and Jackson (Lake Tabeaud) as well as the unincorporated County are affected. The results are presented in tables below by:

- Table 4-66 shows the shows the summary counts and values of parcels in all high hazard dam inundation areas in the Amador County Planning Area. This table includes summaries for both the unincorporated County, as well as the cities of Ione and Jackson.
- Table 4-67 shows the count and value of parcels in the Arroyo Seco Dam inundation area detailed by property use for the unincorporated County.
- Table 4-68 shows the count and value of parcels in the Caples Lake Dam inundation area detailed by property use for the unincorporated County.
- Table 4-69 shows the count and value of parcels in the CPUD Middle Fork Dam inundation area detailed by property use for the unincorporated County.
- Table 4-70 shows the count and value of parcels in the CSP Mule Creek Dam inundation area detailed by property use for the unincorporated County.
- Table 4-71 shows the count and value of parcels in the CSP Mule Creek - Saddle Dam
- Table 4-72 shows the count and value of parcels in the Goffinet Dam inundation area detailed by property use for the unincorporated County.

- Table 4-73 shows the count and value of parcels in the Henderson Dam inundation area detailed by property use for the unincorporated County.
- Table 4-74 shows the count and value of parcels in the Jackson Creek Dam inundation area detailed by property use for the unincorporated County.
- Table 4-75 shows the count and value of parcels in the Jeff Davis Dam inundation area detailed by property use for the unincorporated County.
- Table 4-76 shows the count and value of parcels in the Lake Tabeaud Dam inundation area detailed by property use for the unincorporated County.
- Table 4-77 shows the count and value of parcels in the Meadow Lake Dam inundation area detailed by property use for the unincorporated County.
- Table 4-78 shows the count and value of parcels in the Preston Dam inundation area detailed by property use for the unincorporated County.
- Table 4-79 shows the count and value of parcels in the Silver Lake Dam inundation area detailed by property use for the unincorporated County.
- Table 4-80 shows the count and value of parcels in the Tiger Creek Afterbay Dam inundation area detailed by property use for the unincorporated County.
- Table 4-81 shows the count and value of parcels in the Tiger Creek Regulator Dam inundation area detailed by property use for the unincorporated County.
- Table 4-82 shows the count and value of parcels in the Blue Lake Dam inundation area detailed by property use for the unincorporated County.
- Table 4-83 shows the count and value of parcels in the West Point Regulating Dam inundation area detailed by property use for the unincorporated County.

Table 4-66 Amador County Planning Area – Summary Counts and Values of Parcels and Structures in High Hazard Dam Inundation Areas

Dam Inundation Area	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Arroyo Seco	23	14	$20,862,899	$3,270,164	$2,928,662	$27,061,725
Caples Lake	1	0	$0	$0	$0	$0
CPUD Middle Fork	50	6	$993,450	$983,497	$728,387	$2,705,334
CSP Mule Creek*	302	244	$53,806,623	$76,590,963	$40,657,441	$171,055,027
CSP Mule Creek - Saddle Dam*	38	25	$19,158,308	$4,642,410	$3,738,516	$27,539,234
Goffinet*	153	116	$33,505,937	$35,475,863	$19,379,877	$88,361,677
Henderson*	261	211	$45,414,036	$67,183,685	$36,094,798	$148,692,519
Jackson Creek	140	104	$28,588,375	$126,907,691	$121,029,857	$276,525,923
Jeff Davis	52	7	$1,007,857	$1,101,609	$787,443	$2,896,909
Lake Tabeaud**	320	217	$39,194,635	$63,232,911	$50,887,510	$153,315,056
Meadow Lake	128	10	$2,004,451	$4,981,919	$784,547	$7,770,917

Dam Inundation Area	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Preston*	221	178	$36,796,108	$57,520,418	$29,960,587	$124,277,113
Silver Lake	19	8	$4,447,006	$3,549,172	$1,640,983	$9,637,161
Tiger Creek Afterbay	76	10	$2,145,973	$1,807,548	$1,272,912	$5,226,433
Tiger Creek Regulator	18	1	$369,457	$265,000	$265,000	$899,457
Upper Blue Lake	15	0	$0	$0	$0	$0
West Point Regulating	26	4	$1,138,221	$824,051	$544,526	$2,506,798

Source: Cal OES/DSOD, 2024 Amador County Parcel/Assessor Data

* Affect the City of Ione and the unincorporated County

** Affect the City of Jackson and the unincorporated County

Table 4-67 Unincorporated Amador County – Count and Value of Parcels and Structures in Arroyo Seco Dam Inundation Area by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	17	10	$20,571,811	$2,851,740	$2,851,740	$26,275,291
Commercial	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	4	3	$113,615	$153,843	$76,922	$344,380
Unknown	2	1	$177,473	$264,581	$0	$442,054
Arroyo Seco Total	**23**	**14**	**$20,862,899**	**$3,270,164**	**$2,928,662**	**$27,061,725**

Source: Cal OES/DSOD, 2024 Amador County Parcel/Assessor Data

Table 4-68 Unincorporated Amador County – Count and Value of Parcels and Structures in Caples Lake Dam Inundation Area by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	1	0	$0	$0	$0	$0
Residential	0	0	$0	$0	$0	$0
Unknown	0	0	$0	$0	$0	$0

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Caples Lake Total	**1**	**0**	**$0**	**$0**	**$0**	**$0**

Source: Cal OES/DSOD, 2024 Amador County Parcel/Assessor Data

Table 4-69 Unincorporated Amador County – Count and Value of Parcels and Structures in CPUD Middle Creek Dam Inundation Area by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	5	4	$569,033	$496,087	$496,087	$1,561,207
Commercial	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	37	0	$58,386	$0	$0	$58,386
Residential	6	1	$188,161	$464,599	$232,300	$885,060
Unknown	2	1	$177,870	$22,811	$0	$200,681
CPUD Middle Creek Total	**50**	**6**	**$993,450**	**$983,497**	**$728,387**	**$2,705,334**

Source: Cal OES/DSOD, 2024 Amador County Parcel/Assessor Data

Table 4-70 Unincorporated Amador County – Count and Value of Parcels and Structures in CSP Mule Creek Dam Inundation Area by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	26	16	$21,427,752	$3,426,117	$3,426,117	$28,279,986
Commercial	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	7	3	$246,965	$153,843	$76,922	$477,730
Unknown	2	1	$177,473	$264,581	$0	$442,054
CSP Mule Creek Total	**35**	**20**	**$21,852,190**	**$3,844,541**	**$3,503,039**	**$29,199,770**

Source: Cal OES/DSOD, 2024 Amador County Parcel/Assessor Data

Table 4-71 Unincorporated Amador County – Count and Value of Parcels and Structures in CSP Mule Creek Saddle Dam Inundation Area by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	23	16	$18,010,322	$3,093,488	$3,093,488	$24,197,298

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Commercial	0	0	$0	$0	$0	$0
Industrial	1	1	$360,228	$2,857	$4,286	$367,371
Miscellaneous	0	0	$0	$0	$0	$0
Residential	11	7	$610,285	$1,281,484	$640,742	$2,532,511
Unknown	2	1	$177,473	$264,581	$0	$442,054
CSP Mule Creek Saddle Total	**37**	**25**	**$19,158,308**	**$4,642,410**	**$3,738,516**	**$27,539,234**

Source: Cal OES/DSOD, 2024 Amador County Parcel/Assessor Data

Table 4-72 Unincorporated Amador County – Count and Value of Parcels and Structures in Goffinet Dam Inundation Area by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	23	16	$12,512,288	$3,302,580	$3,302,580	$19,117,448
Commercial	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	5	2	$839,343	$881,608	$440,804	$2,161,755
Unknown	2	0	$4,564,425	$0	$0	$4,564,425
Goffinet Total	**30**	**18**	**$17,916,056**	**$4,184,188**	**$3,743,384**	**$25,843,628**

Source: Cal OES/DSOD, 2024 Amador County Parcel/Assessor Data

Table 4-73 Unincorporated Amador County – Count and Value of Parcels and Structures in Henderson Dam Inundation Area by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	26	19	$12,641,098	$3,880,628	$3,880,628	$20,402,354
Commercial	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	1	0	$0	$0	$0	$0
Residential	6	3	$908,202	$1,091,345	$545,673	$2,545,220
Unknown	2	0	$4,564,425	$0	$0	$4,564,425
Henderson Total	**35**	**22**	**$18,113,725**	**$4,971,973**	**$4,426,301**	**$27,511,999**

Source: Cal OES/DSOD, 2024 Amador County Parcel/Assessor Data

Table 4-74 Unincorporated Amador County – Count and Value of Parcels and Structures in Jackson Creek Dam Inundation Area by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	5	4	$569,033	$496,087	$496,087	$1,561,207
Commercial	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	38	0	$58,386	$0	$0	$58,386
Residential	7	2	$202,568	$582,711	$291,356	$1,076,635
Unknown	2	1	$177,870	$22,811	$0	$200,681
Jackson Creek Total	**52**	**7**	**$1,007,857**	**$1,101,609**	**$787,443**	**$2,896,909**

Source: Cal OES/DSOD, 2024 Amador County Parcel/Assessor Data

Table 4-75 Unincorporated Amador County – Count and Value of Parcels and Structures in Jeff Davis Dam Inundation Area by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	5	4	$569,033	$496,087	$496,087	$1,561,207
Commercial	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	38	0	$58,386	$0	$0	$58,386
Residential	7	2	$202,568	$582,711	$291,356	$1,076,635
Unknown	2	1	$177,870	$22,811	$0	$200,681
Jeff Davis Total	**52**	**7**	**$1,007,857**	**$1,101,609**	**$787,443**	**$2,896,909**

Source: Cal OES/DSOD, 2024 Amador County Parcel/Assessor Data

Table 4-76 Unincorporated Amador County – Count and Value of Parcels and Structures in Lake Tabeaud Dam Inundation Area by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	68	56	$10,810,626	$7,448,050	$7,448,050	$25,706,726
Commercial	0	0	$0	$0	$0	$0
Industrial	1	1	$325,680	$90,189	$135,284	$551,153
Miscellaneous	26	0	$0	$0	$0	$0
Residential	38	27	$4,228,593	$6,034,698	$3,017,349	$13,280,640
Unknown	4	3	$435,547	$695,400	$0	$1,130,947

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Lake Tabeaud Total	**137**	**87**	**$15,800,446**	**$14,268,337**	**$10,600,683**	**$40,669,466**

Source: Cal OES/DSOD, 2024 Amador County Parcel/Assessor Data

Table 4-77 Unincorporated Amador County – Count and Value of Parcels and Structures in Meadow Lake Dam Inundation Area by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	8	4	$813,874	$272,722	$272,722	$1,359,318
Commercial	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	103	1	$388,501	$3,662,736	$0	$4,051,237
Residential	15	4	$624,206	$1,023,650	$511,825	$2,159,681
Unknown	2	1	$177,870	$22,811	$0	$200,681
Meadow Lake Total	**128**	**10**	**$2,004,451**	**$4,981,919**	**$784,547**	**$7,770,917**

Source: Cal OES/DSOD, 2024 Amador County Parcel/Assessor Data

Table 4-78 Unincorporated Amador County – Count and Value of Parcels, and Structures in Preston Dam Inundation Area by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	15	9	$11,795,247	$1,275,473	$1,275,473	$14,346,193
Commercial	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	3	0	$133,350	$0	$0	$133,350
Unknown	0	0	$0	$0	$0	$0
Preston Total	**18**	**9**	**$11,928,597**	**$1,275,473**	**$1,275,473**	**$14,479,543**

Source: Cal OES/DSOD, 2024 Amador County Parcel/Assessor Data

Table 4-79 Unincorporated Amador County – Count and Value of Parcels and Structures in Silver Lake Dam Inundation Area by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	0	0	$0	$0	$0	$0

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Commercial	3	2	$1,076,800	$1,418,746	$1,418,746	$3,914,292
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	9	1	$1,280,819	$1,685,952		$2,966,771
Residential	7	5	$2,089,387	$444,474	$222,237	$2,756,098
Unknown	0	0	$0	$0	$0	$0
Silver Lake Total	**19**	**8**	**$4,447,006**	**$3,549,172**	**$1,640,983**	**$9,637,161**

Source: Cal OES/DSOD, 2024 Amador County Parcel/Assessor Data

Table 4-80 Unincorporated Amador County – Count and Value of Parcels and Structures in Tiger Creek Afterbay Dam Inundation Area by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	8	5	$955,396	$761,087	$761,087	$2,477,570
Commercial	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	51	0	$388,501	$0	$0	$388,501
Residential	15	4	$624,206	$1,023,650	$511,825	$2,159,681
Unknown	2	1	$177,870	$22,811	$0	$200,681
Tiger Creek Afterbay Total	**76**	**10**	**$2,145,973**	**$1,807,548**	**$1,272,912**	**$5,226,433**

Source: Cal OES/DSOD, 2024 Amador County Parcel/Assessor Data

Table 4-81 Unincorporated Amador County – Count and Value of Parcels and Structures in Tiger Creek Regulator Dam Inundation Area by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	2	1	$353,351	$265,000	$265,000	$883,351
Commercial	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	15	0	$16,106	$0	$0	$16,106
Residential	1	0	$0	$0	$0	$0
Unknown	0	0	$0	$0	$0	$0
Tiger Creek Regulator Total	**18**	**1**	**$369,457**	**$265,000**	**$265,000**	**$899,457**

Source: Cal OES/DSOD, 2024 Amador County Parcel/Assessor Data

Table 4-82 Unincorporated Amador County – Count and Value of Parcels and Structures in Upper Blue Lake Regulator Dam Inundation Area by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	15	0	$0	$0	$0	$0
Residential	0	0	$0	$0	$0	$0
Unknown	0	0	$0	$0	$0	$0
Upper Blue Lake Total	**15**	**0**	**$0**	**$0**	**$0**	**$0**

Source: Cal OES/DSOD, 2024 Amador County Parcel/Assessor Data

Table 4-83 Unincorporated Amador County – Count and Value of Parcels and Structures in West Point Regulating Dam Inundation Area by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	2	1	$372,061	$265,000	$265,000	$902,061
Commercial	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	14		$330,115	$0	$0	$330,115
Residential	10	3	$436,045	$559,051	$279,526	$1,274,622
Unknown	0	0	$0	$0	$0	$0
West Point Regulating Total	**26**	**4**	**$1,138,221**	**$824,051**	**$544,526**	**$2,506,798**

Source: Cal OES/DSOD, 2024 Amador County Parcel/Assessor Data

Critical Facilities and Infrastructure

Dam failure presents a threat to critical facilities and infrastructure. For example, transportation routes, including bridges and highways, are vulnerable to dam inundation and have the potential to be unpassable and even destroyed, creating isolation and supply chain issues. Those critical facilities that are most vulnerable are those that are already in poor condition and would not be able to withstand a large water surge. The following GIS analysis identifies critical facilities and infrastructure at risk to dam inundation flooding, separated out by extremely high hazard and high hazard dams.

Extremely High Hazard Dam Inundation Analysis

Dam failure present a threat to critical facilities and infrastructure. The following analysis discusses critical facilities and infrastructure. A separate analysis was performed on the critical facility inventory in the Amador County Planning Area to determine critical facilities in extremely high hazard dam inundation areas. Using GIS, the DSOD extremely high hazard dam inundation areas were overlayed on the critical facility GIS layer. Figure 4-68 shows critical facilities, as well as the extremely high hazard dam inundation areas. Table 4-84 details critical facilities by extremely high hazard dam inundation areas by facility type and count for the Planning Area. Details of critical facility category, type, name and address by extremely high hazard dam inundation areas are listed in Appendix F. As shown, all critical facilities that fall in the extremely high hazard dam inundation area are located in the unincorporated County.

Figure 4-68 Amador County Planning Area – Critical Facilities in Extremely High Hazard Dam Inundation Areas

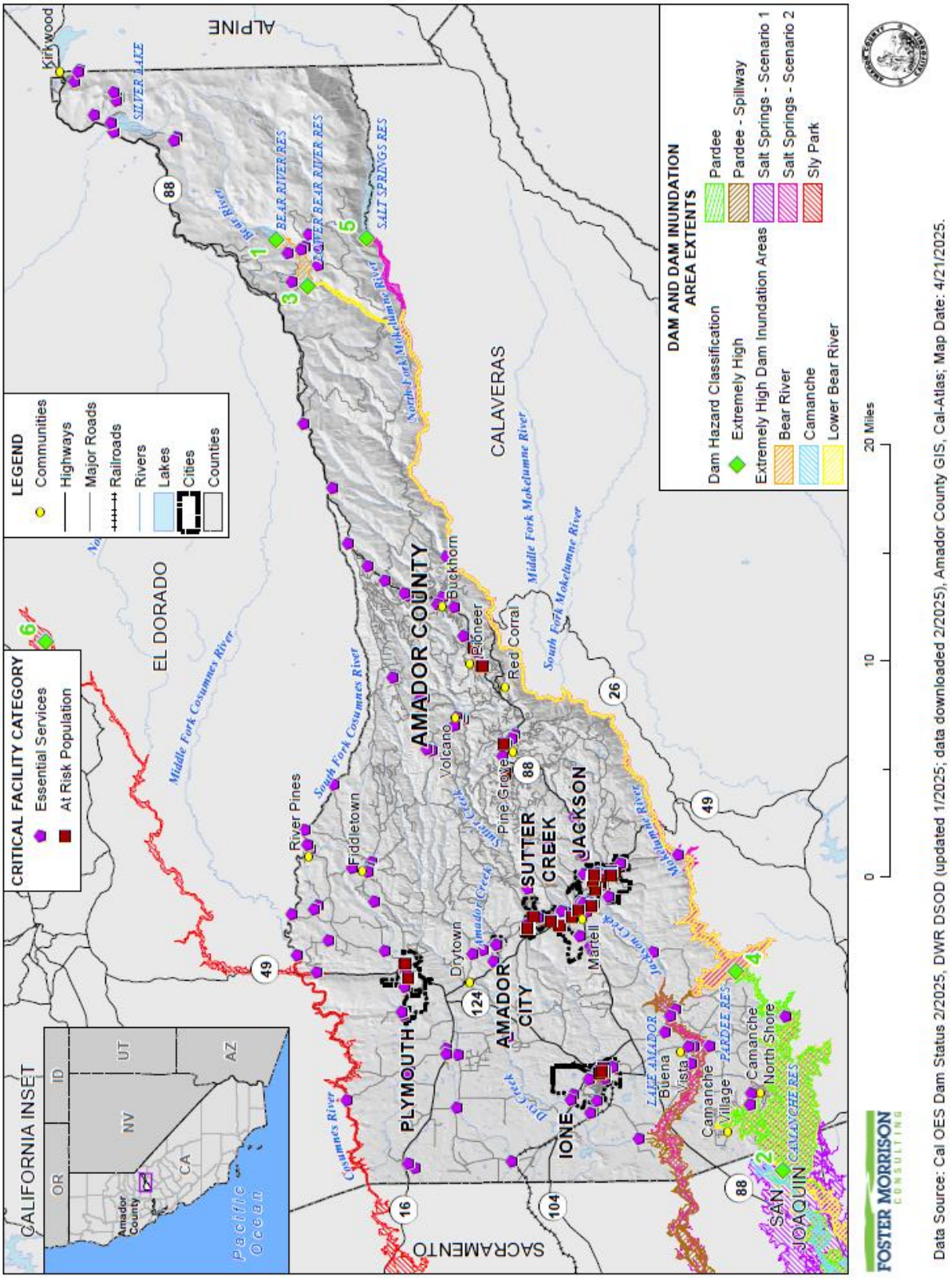


Table 4-84 Amador County Planning Area – Critical Facilities in Extremely High Hazard Dam Inundation Zones by Jurisdiction and Category

Jurisdiction / Category / Critical Facility Type	Dam Inundation Area						
	Bear River	Lower Bear River	Pardee	Pardee - Spillway	Salt Springs - Scenario 1	Salt Springs - Scenario 2	Sly Park
Unincorporated Amador County							
Essential Services							
Bridge	2	2	1	2	2	3	3
Public Water System	2	2	0	1	3	3	0
Essential Services Total	**4**	**4**	**1**	**3**	**5**	**6**	**3**
Unincorporated Amador County Total	**4**	**4**	**1**	**3**	**5**	**6**	**3**

Source: Cale OES/DSOD; Amador County GIS

High Hazard Dam Inundation Analysis

Dam failure present a threat to critical facilities and infrastructure. The following analysis discusses critical facilities and infrastructure. A separate analysis was performed on the critical facility inventory in the Amador County Planning Area to determine critical facilities in high hazard dam inundation areas. Using GIS, the DSOD high hazard dam inundation areas were overlayed on the critical facility GIS layer. Figure 4-69 shows critical facilities, as well as the high hazard dam inundation areas. Table 4-85 details critical facilities by high hazard dam inundation areas by facility type and count for the Planning Area. Details of critical facility category, type, name and address by high hazard dam inundation areas are listed in Appendix F. As shown, all critical facilities that fall in the extremely high hazard dam inundation area are located in the City of Ione, the City of Jackson, or the unincorporated County.

Figure 4-69 Amador County Planning Area – Critical Facilities in High Hazard Dam Inundation Areas

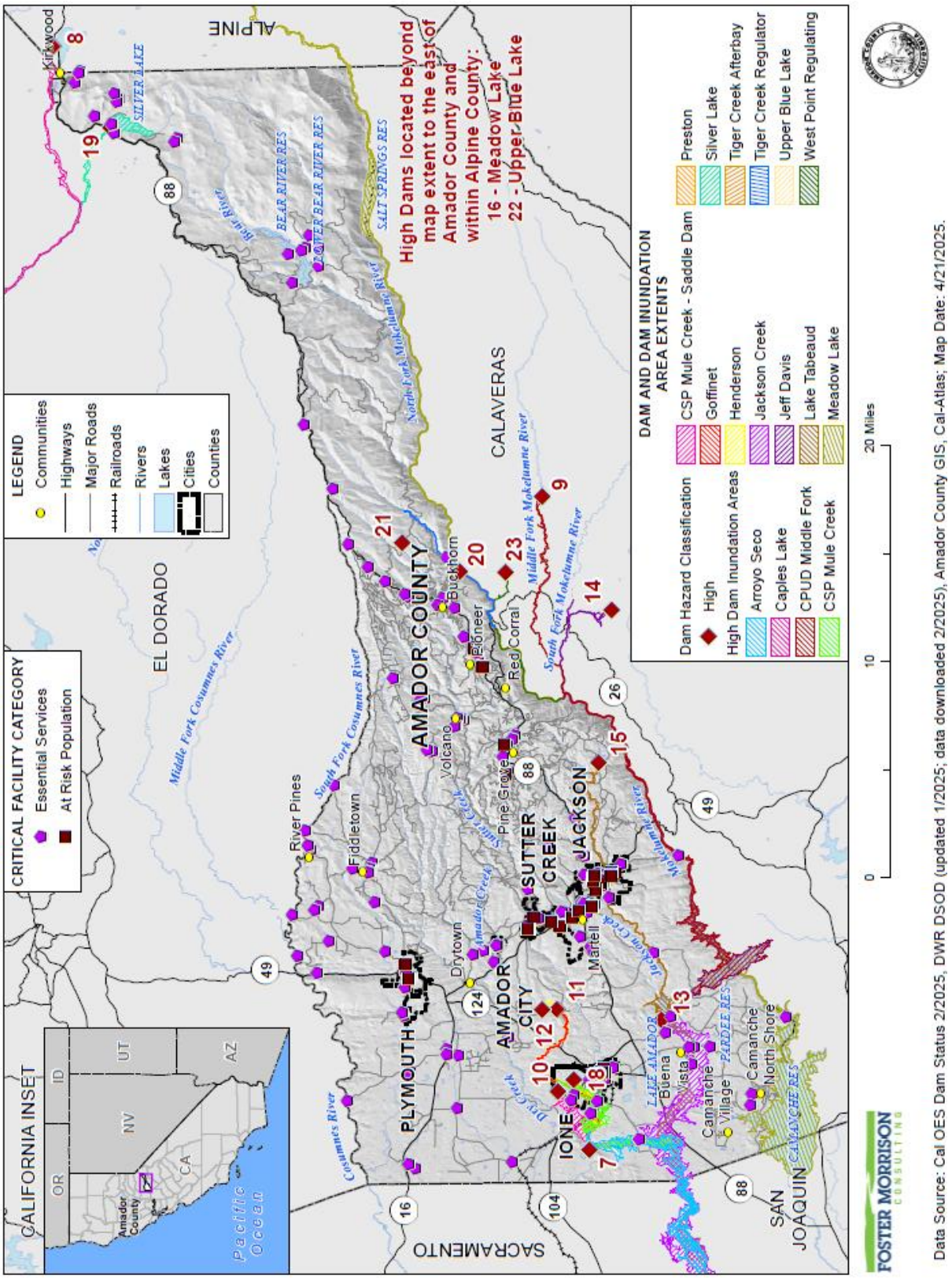


Table 4-85 Amador County Planning Area – Critical Facilities in High Hazard Dam Inundation Zones by Jurisdiction and Category

Jurisdiction / Critical Facility Category	Facility Count
City of Ione	
Essential Services Facilities	1
At Risk Population Facilities	0
City of Ione Total	**1**
City of Jackson	
Essential Services Facilities	5
At Risk Population Facilities	0
City of Jackson Total	**5**
Unincorporated Amador County	
Essential Services Facilities	11
At Risk Population Facilities	0
Unincorporated Amador County Total	**11**

Source: Cale OES/DSOD; Amador County GIS

Natural, Historic, and Cultural Resources

A major dam failure event and associated flooding could have a devastating impact on the Amador County Planning Area. Large flood events can affect all natural, historic, and cultural resources that lie in the dam inundation areas. There are a number of ways floodwaters associated with a dam failure event can impact natural resources and the environment. Wildlife habitats can be destroyed by floodwaters. Contaminated floodwater can pollute rivers and habitats. Silt and sediment can destroy natural areas. Riverbanks and natural levées can be eliminated as rivers reach bankfull capacity. Rivers can be widened, and deposition can increase downstream. Trees can be uprooted by high-velocity water flow. Plants that survive the initial flood may die due to being inundated with water. Historic structures and cultural resources may also be significantly affected and even destroyed. Generally, the impacts are associated with damage to these structures within the inundated areas Other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged, and lost during extreme flood events.

FEMA NRI Hazard Vulnerability Assessment

Dam failure is not an NRI hazard and thus has no data to present.

Impacts from Dam Failure

Impacts to the Amador County Planning Area from dam failure flooding could be extensive and widespread and include loss of life and injury, flooding and damage to property and structures, damage to critical facilities and infrastructure, loss of natural resources, and all other flood related impacts. Additionally, mass evacuations and associated economic losses can also be significant.

Other impacts associated with dam failure include landslides, bank erosion, and destruction of habitat. Dam failures can cause downstream flooding and can transport large volumes of sediment and debris and contaminants from the floodwaters. Other environmental impacts can include contamination from septic system failures and releases of contaminants from hazardous materials facilities, contamination of potable water supplies; changes in configurations of streams; loss of wildlife habitats; and degradation of wetlands. A large dam failure event could have significant and catastrophic impacts.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future hazard conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for Amador County include the following:

- Climate change is likely to exacerbate future rain and storm conditions and associated impacts and vulnerability of the County to dam failure.
- Population growth in Amador County is expected to slowly continue. Additional growth within the dam inundation areas of the County would place additional populations at risk to dam failure. Additional population growth would likely bring continued diversity to the County. Vulnerable population groups could face disproportionate effects from a dam failure and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the County to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. Locating new development, structures, and critical facilities and infrastructure within or near areas of dam failure risk may put additional development at risk. However, County building codes are in effect to partially reduce this risk and should be updated as necessary to continue to address future dam failure conditions. Thus, depending on the location of new development and adherence to protective building codes, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the County to this hazard.

Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements, such as building codes, are followed, and varying needs for different demographic groups with intersecting identities that reside within the County are considered can help to make for a more resilient community. Although new growth and development corridors would fall in the area flooded by a dam failure, given the limited potential of total dam failure and the large area that a dam failure would affect, development in the dam inundation area will continue to occur.

GIS Analysis

Amador County provided five future development areas which were used as the basis for the inventory of future development for the unincorporated County. These were mapped in GIS. Figure 4-70 and Figure

4-71 show the locations of the future development areas overlayed on the extremely high and high hazard dam inundation areas, respectively. As shown, no future development areas are located in either the extremely high and high hazard dam inundation areas; as such, no tabular analysis is presented.

Figure 4-70 Unincorporated Amador County – Future Development Areas in Extremely High Hazard Dam Inundation Areas

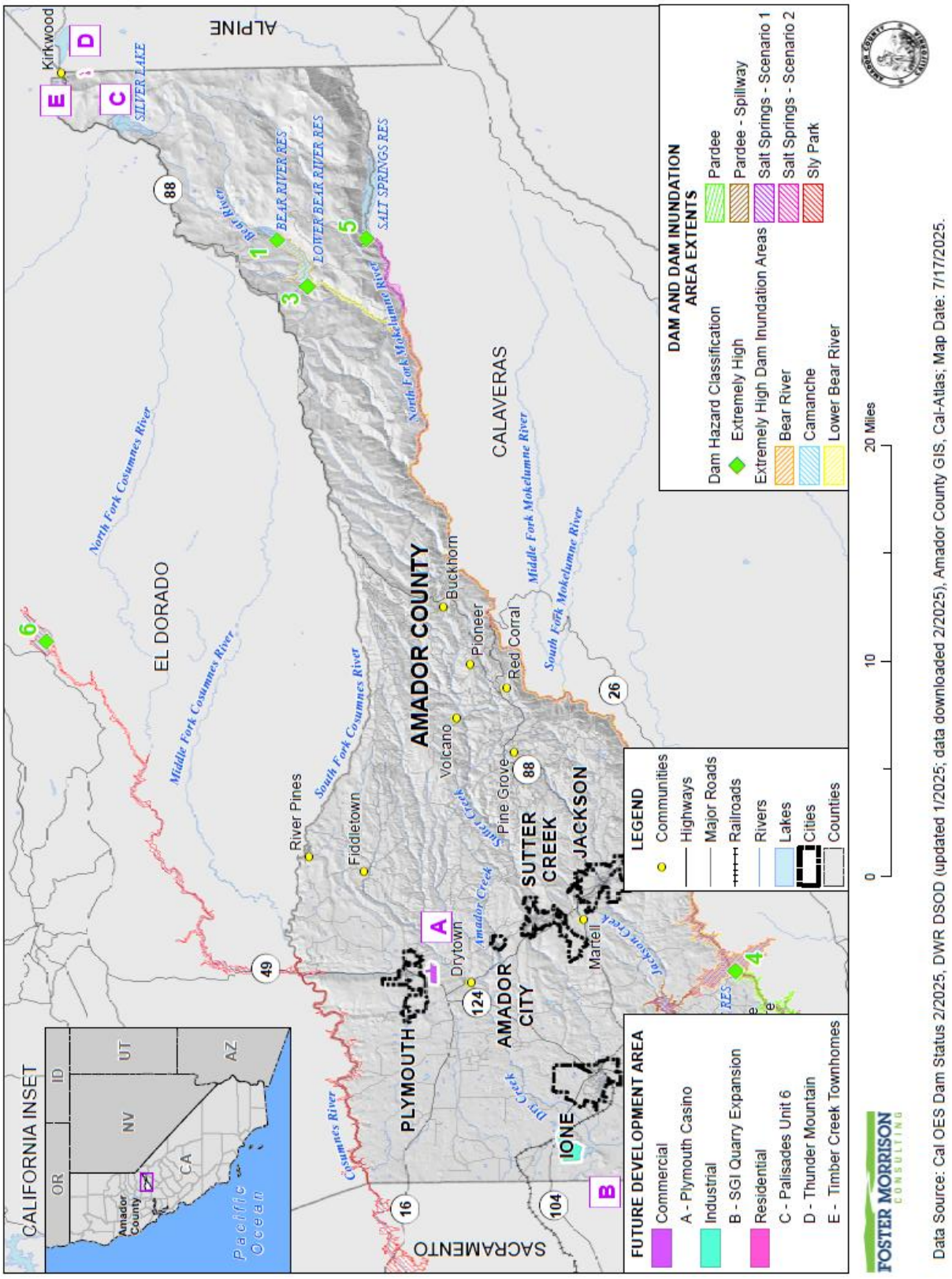
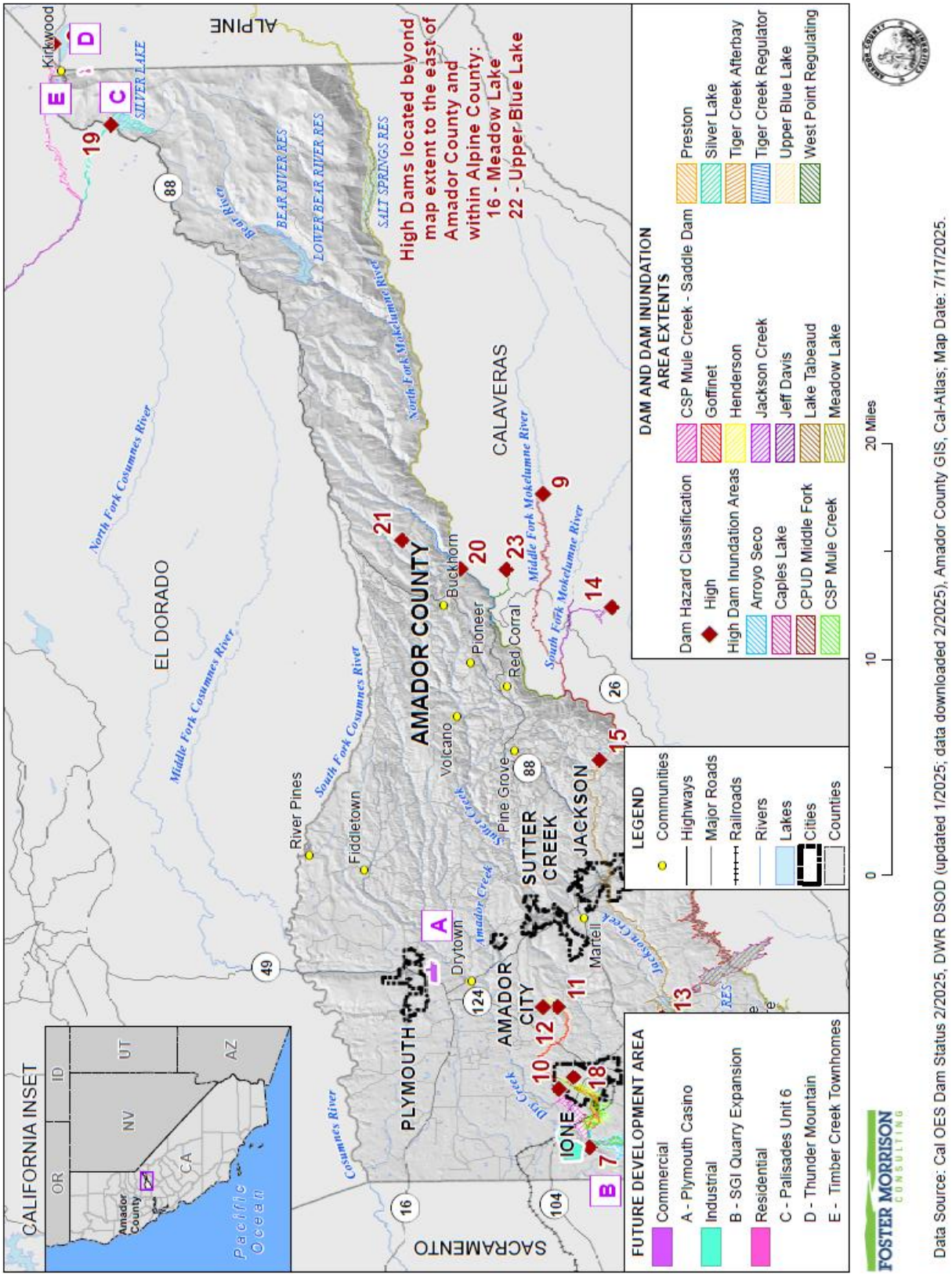


Figure 4-71 Unincorporated Amador County – Future Development Areas in High Hazard Dam Inundation Areas



4.3.10. Drought and Water Shortage (w/Tree Mortality)

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Amador County Planning Area. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; likelihood of future occurrences; and how climate change can affect or influence this hazard.

Hazard/Problem Description

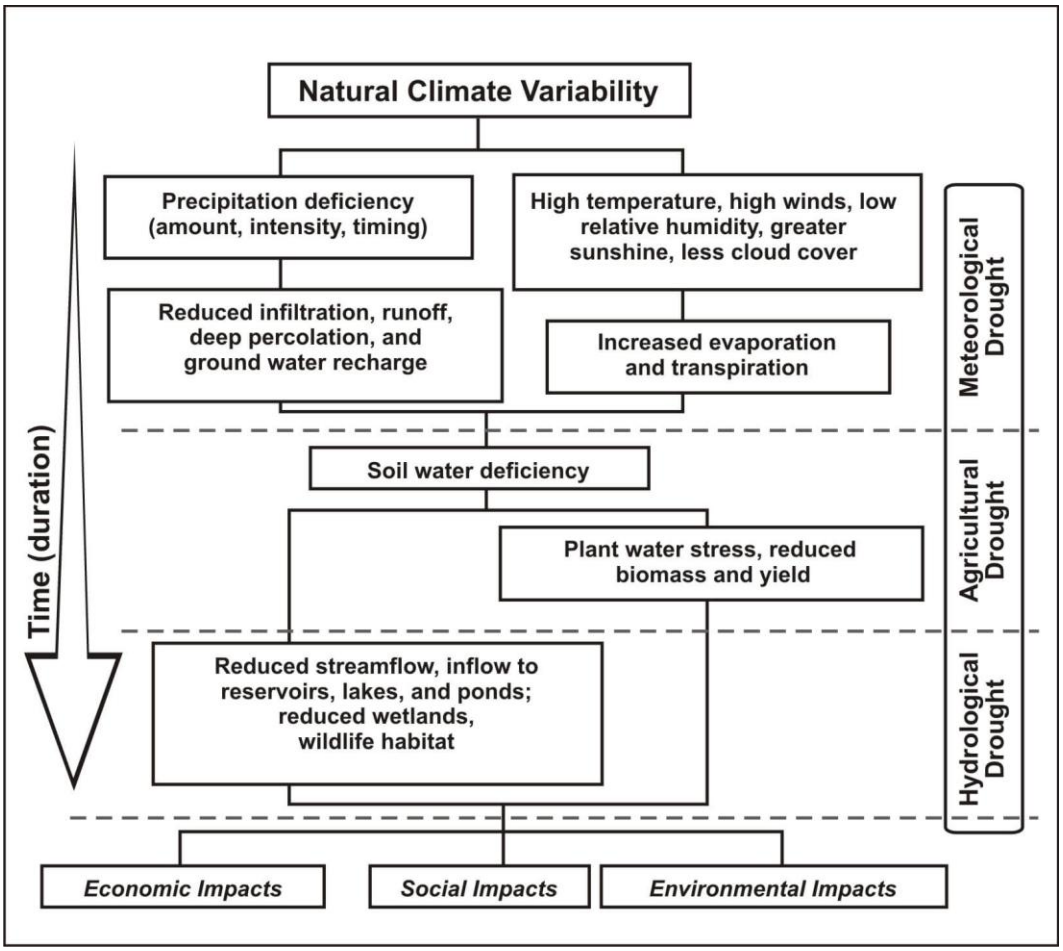
Drought

Drought is a gradual phenomenon. Although droughts are sometimes characterized as emergencies, they differ from typical emergency events. Most natural disasters, such as floods or forest fires, occur relatively rapidly and afford little time for preparing for disaster response. Droughts occur slowly, over a multi-year period, and it is often not obvious or easy to quantify when a drought begins and ends.

Drought is a complex issue involving (see Figure 4-72) many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area's usual water-consuming activities. Drought can often be defined regionally based on its effects:

- **Meteorological drought** is usually defined by a period of below average water supply.
- **Agricultural drought** occurs when there is an inadequate water supply to meet the needs of the state's crops and other agricultural operations such as livestock.
- **Hydrological drought** is defined as deficiencies in surface and subsurface water supplies. It is generally measured as streamflow, snowpack, and as lake, reservoir, and groundwater levels.
- **Socioeconomic drought** occurs when a drought impacts health, well-being, and quality of life, or when a drought starts to have an adverse economic impact on a region.

Figure 4-72 Causes and Impacts of Drought

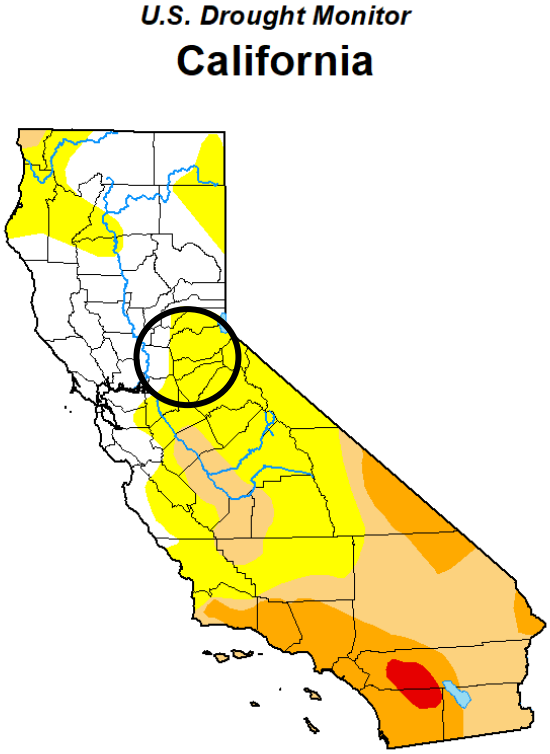


Source: National Drought Mitigation Center (NDMC)

Location and Extent of Drought

Drought is a regional phenomenon that affects the entire Amador County Planning Area. Drought in the United States is monitored by the National Integrated Drought Information System (NIDIS). A major component of this portal is the U.S. Drought Monitor. The Drought Monitor concept was developed jointly by the NOAA's Climate Prediction Center, the NDMC, and the USDA's Joint Agricultural Weather Facility in the late 1990s as a process that synthesizes multiple indices, outlooks and local impacts, into an assessment that best represents current drought conditions. The final outcome of each Drought Monitor is a consensus of federal, state, and academic scientists who are intimately familiar with the conditions in their respective regions. A snapshot of the current (and 2024) drought conditions in California and the Amador County Planning Area can be found in Figure 4-73. Snapshots from 2014 to 2023 are shown in Figure 4-74 and Figure 4-75. As seen in these figures and related data, the Planning Area has been in and out of drought over the past ten years since the last drought started in 2014.

Figure 4-73 Amador County Planning Area – Current (2025) and 2024 Drought Status



October 14, 2025
(Released Thursday, Oct. 16, 2025)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

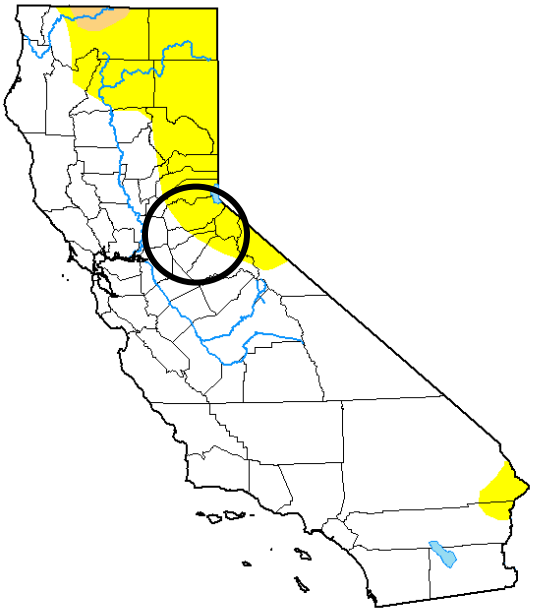
	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	27.30	72.70	38.52	15.64	1.25	0.00
Last Week 10-07-2025	27.20	72.80	38.52	15.64	1.25	0.00
3 Months Ago 07-15-2025	23.98	76.02	39.56	23.01	5.90	0.10
Start of Calendar Year 01-07-2025	39.11	60.89	35.93	10.43	1.06	0.00
Start of Water Year 10-01-2024	28.40	71.60	10.67	0.08	0.00	0.00
One Year Ago 10-15-2024	24.68	75.32	14.05	4.30	0.00	0.00

Intensity:
None
D0 Abnormally Dry
D1 Moderate Drought
D2 Severe Drought
D3 Extreme Drought
D4 Exceptional Drought

The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

Author:
Richard Tinker
CPC/NOAA/NWS/NCEP

droughtmonitor.unl.edu



July 9, 2024
(Released Thursday, Jul. 11, 2024)
Valid 8 a.m. EDT

Drought Conditions (Percent Area)

	None	D0-D4	D1-D4	D2-D4	D3-D4	D4
Current	80.72	19.28	0.77	0.00	0.00	0.00
Last Week 07-02-2024	94.25	5.75	0.00	0.00	0.00	0.00
3 Months Ago 04-09-2024	97.32	2.68	0.00	0.00	0.00	0.00
Start of Calendar Year 01-02-2024	96.65	3.35	0.00	0.00	0.00	0.00
Start of Water Year 09-26-2023	94.01	5.99	0.07	0.00	0.00	0.00
One Year Ago 07-11-2023	71.95	28.05	6.29	0.00	0.00	0.00

Intensity:
None
D0 Abnormally Dry
D1 Moderate Drought
D2 Severe Drought
D3 Extreme Drought
D4 Exceptional Drought

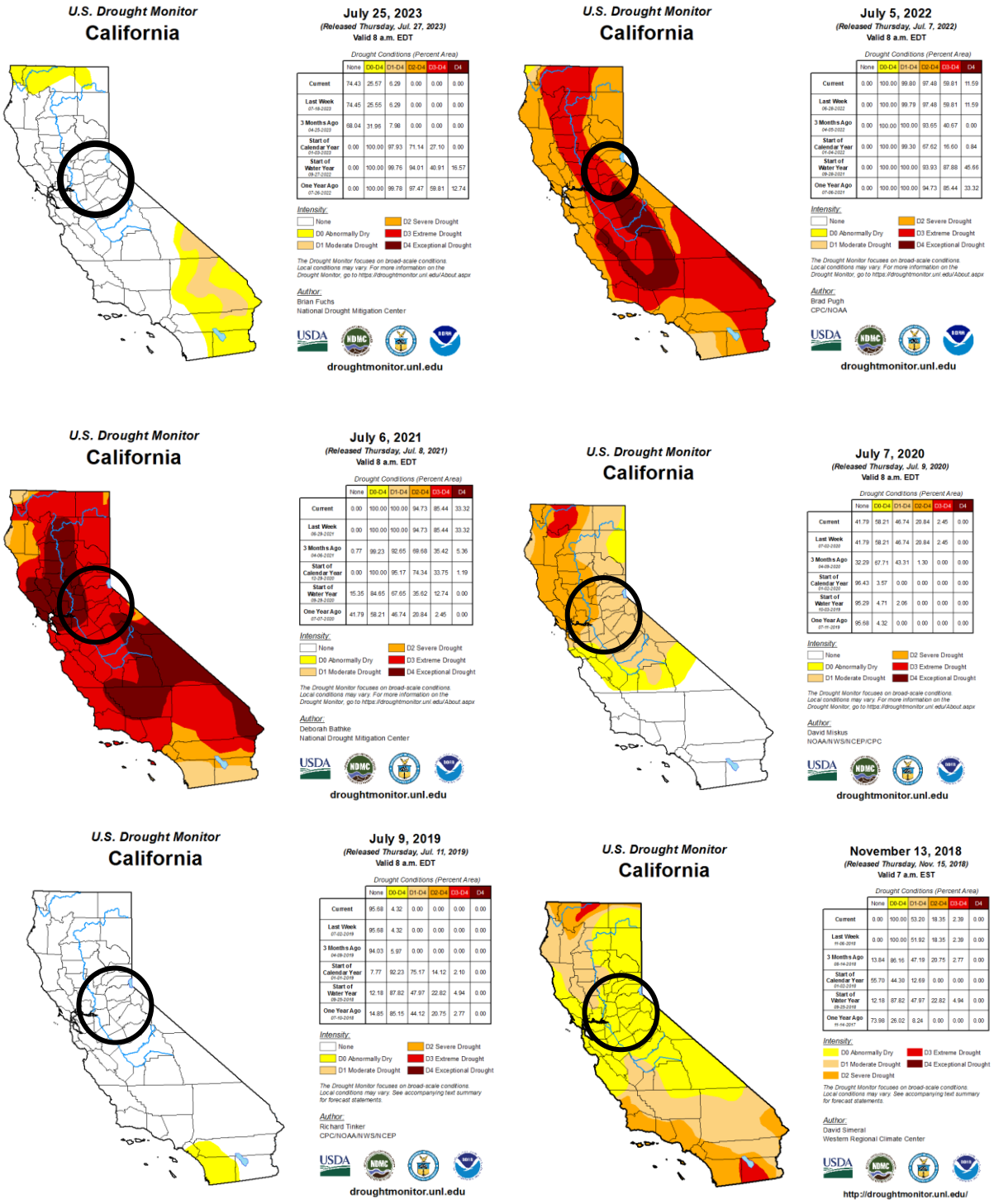
The Drought Monitor focuses on broad-scale conditions. Local conditions may vary. For more information on the Drought Monitor, go to https://droughtmonitor.unl.edu/About.aspx

Author:
Brian Fuchs
National Drought Mitigation Center

droughtmonitor.unl.edu

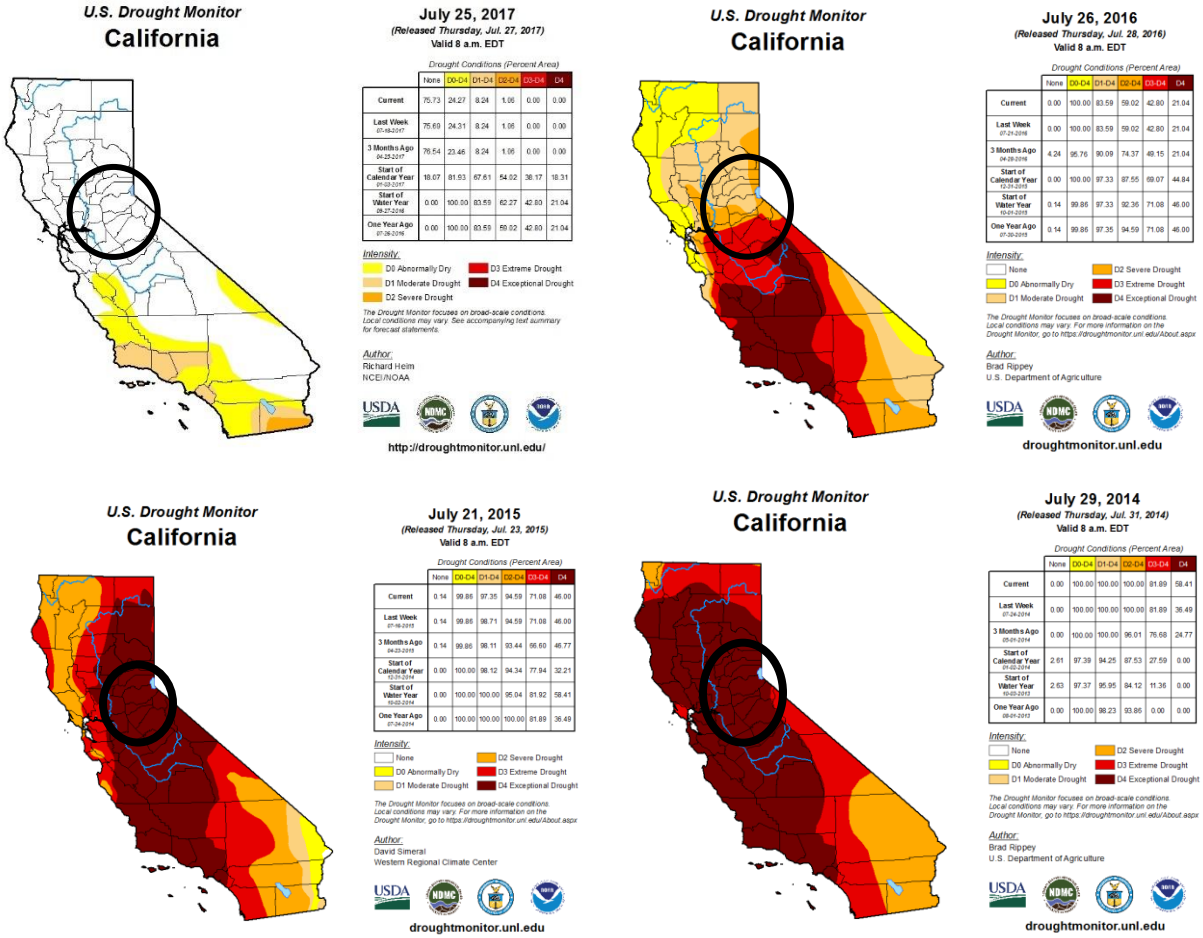
Source: US Drought Monitor

Figure 4-74 Previous Drought Status in Amador County (2018-2023)



Source: US Drought Monitor

Figure 4-75 Previous Drought Status in Amador County (2014-2017)



Source: US Drought Monitor

Cal DWR says the following about drought:

> ***One dry year does not normally constitute a drought in California. California's extensive system of water supply infrastructure—its reservoirs, groundwater basins, and inter-regional conveyance facilities—mitigates the effect of short-term dry periods for most water users. Defining when a drought begins is a function of drought impacts to water users. Hydrologic conditions constituting a drought for water users in one location may not constitute a drought for water users elsewhere, or for water users having a different water supply. Individual water suppliers may use criteria such as rainfall/runoff, amount of water in storage, or expected supply from a water wholesaler to define their water supply conditions.***

The drought issue in California is further compounded by water rights. Water is a commodity possessed under a variety of legal doctrines. The prioritization of water rights between domestic uses, farming and federally protected fish habitats in California further contributes to this issue.

As shown on the previous figures, drought is tracked by the US Drought Monitor. The Drought Monitor includes a scale to measure drought intensity:

- None
- D0 (Abnormally Dry)
- D1 (Moderate Drought)
- D2 (Severe Drought)
- D3 (Extreme Drought)
- D4 (Exceptional Drought)

Drought has a slow onset and long duration. Drought is not initially recognized as a problem because it normally originates in what is considered good weather, which typically includes a dry late spring and summer in Mediterranean climates, such as in California. This is particularly true in Northern California where drought impacts are delayed for most of the population by the wealth of stored surface and ground water. The drought complications normally appear more than a year after a drought begins. The most direct and likely most difficult drought impact to quantify is to local economies, especially agricultural economies. Drought has the potential to affect the entire Amador County Planning Area.

Water Shortage

Northern Sacramento Valley counties, including Amador County, generally have sufficient groundwater and surface water supplies to mitigate even the severest droughts of the past century. Many other areas of the State, however, also place demands on these water resources during severe drought

The 2016 Amador County General Plan Conservation Element noted that groundwater from individual wells represents a major water source in the unincorporated portions of the County. In most of Amador County, groundwater-bearing units and aquifers are poorly defined. The majority of available groundwater is transient and found in fractured rock. This fractured bedrock aquifer has not been adequately studied, and no information is available concerning the capacity of the aquifer. The Cosumnes Groundwater Subbasin underlies southwestern Amador County. The Cosumnes Subbasin is in overdraft; in other words, more water is leaving the groundwater basin than entering it.

According to the Amador Water Agency (AWA) 2024-2025 Annual Water Supply & Demand Assessment Shortage Report, the Agency has a significant surplus of water supply above current and projected demands. The Amador Water System (AWS) water supply is a pre-1914 water right that has never been curtailed in the most severe single-year or a multiple-year drought. In addition, while the water supply associated with the Central Amador Water Project (CAWP) was temporarily curtailed during the 2021/2022 drought years, the significant storage volume in the Lower Bear Reservoir has allowed previous water supply demands to be met, and are expected to be met in the future, even in dry years. The total well capacity for the portion of both systems reliant on groundwater are larger than current and projected demands.

Location and Extent of Water Shortage

Since water shortage generally happens on a regional scale, the entirety of the Amador County Planning Area is at risk. There is no established scientific scale to measure water shortage. The speed of onset of water shortage tends to be lengthy. The duration of water shortage can vary, depending on the severity of

the drought that accompanies it and the status of the water sources going into the drought. The extent of the drought considers several factors, including the nature, source, and reliability of water. While drought conditions persist, the Planning Area has generally sufficient water supply from water supplies, which lessens the extent of water shortage impacts in the Planning Area.

Past Occurrences

Disaster Declaration History

There have been 2 state and 1 federal disaster declarations for Amador County. These are shown on Table 4-86. More information on USDA disaster declarations from drought (24 events) can be found in Table 4-48 in the Past Occurrences in Section 4.3.6.

Table 4-86 Amador County – Federal and State Drought Disaster Declarations 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	2	1976, 2015	1	1977

Source: Cal OES, FEMA

NCDC Events

There have been 158 NCDC drought events in Amador County. This is shown on Table 4-87.

*Table 4-87 NCDC Drought Events for Amador County 1993-7/31/2024**

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Drought	158	0	0	0	0	$0	$1,500,000,000

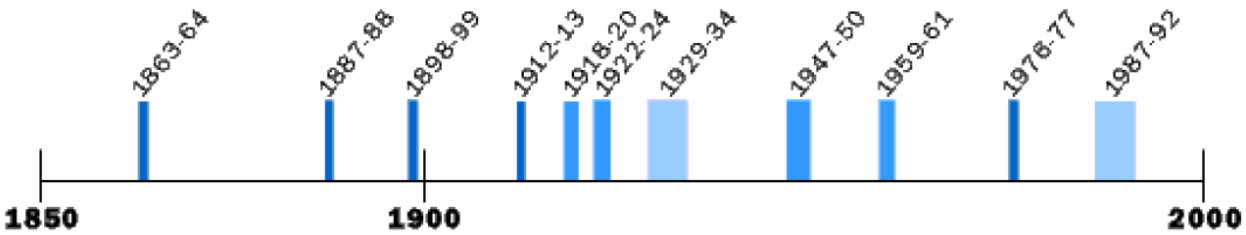
Source: NCDC

*Note: Losses reflect totals for all impacted areas, some of which fell outside of Amador County

CA DWR Events (with Hazard Mitigation Planning Committee Input)

Historically, California has experienced multiple severe droughts. According to the DWR, droughts exceeding three years are relatively rare in Northern California, the source of much of the State's developed water supply. Figure 4-76 depicts California's Multi-Year Historical Dry Periods, 1850-2000. The 1929-34 drought established the criteria commonly used in designing storage capacity and yield of large northern California reservoirs. Figure 4-77 compares the 1929-34 drought to the 1976-77, 1987-92, 2007-09, and 2012-2016 droughts.

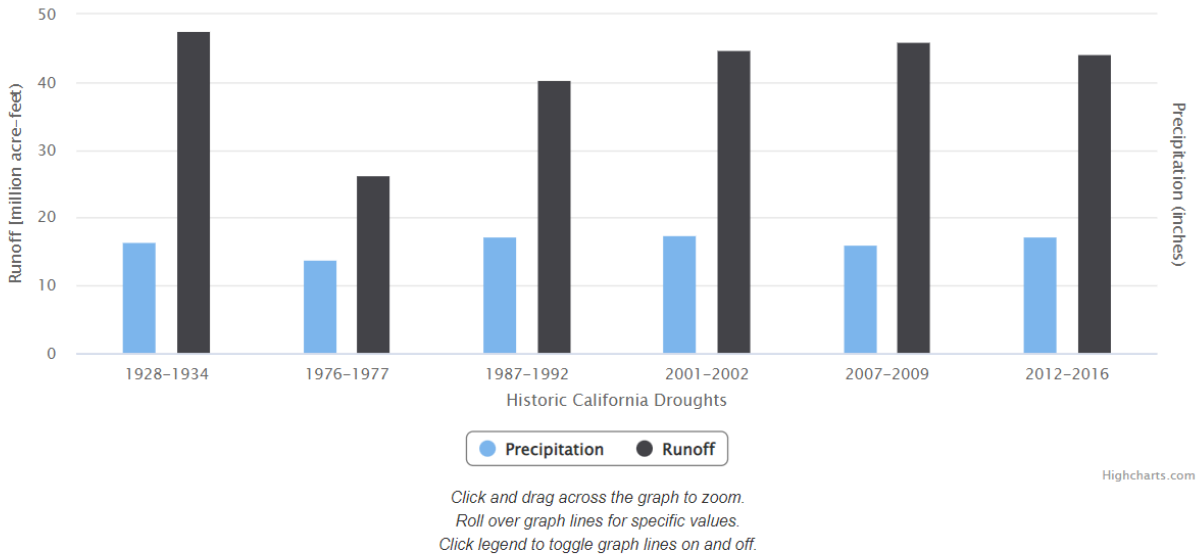
Figure 4-76 California's Multi-Year Historical Dry Periods, 1850-2000



Source: Cal DWR

Notes: Dry periods prior to 1900 estimated from limited data; covers dry periods of statewide or major regional extent

Figure 4-77 Average Annual Runoff and Precipitation for Historic Droughts

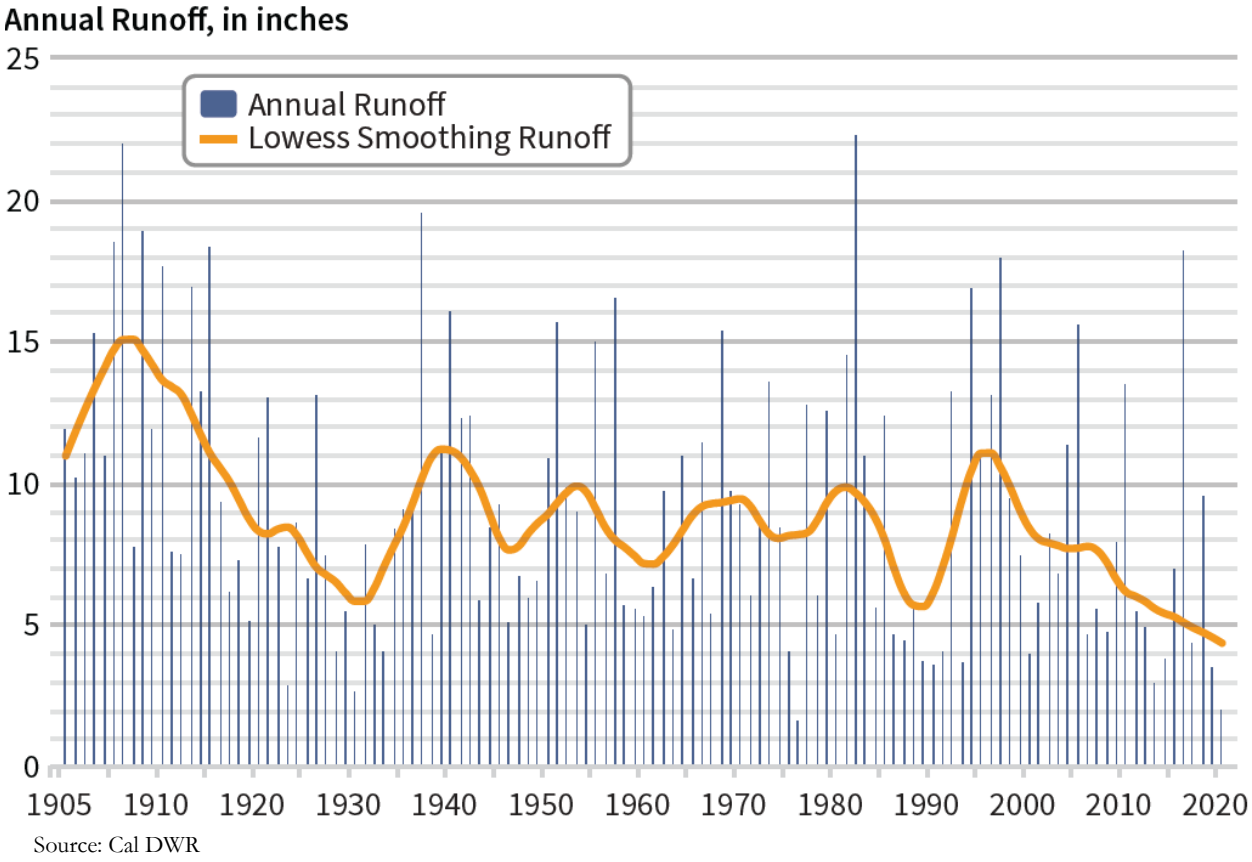


Runoff and precipitation conditions for California's six historical droughts. The most severe drought both in terms of precipitation and runoff was the drought of 1976-77. However, because it was just a two-year drought, the water supply impacts were not as severe as those associated with the longer duration droughts because shorter droughts can be partially mitigated by surface and groundwater storage.

Source: CA DWR – 2012-2016 California Drought: Historical Perspective (https://ca.water.usgs.gov/california-drought/california-drought-comparisons.html)

Figure 4-78 depicts runoff for the State from 1905 to 2021. This gives a historical context for the 2014-2021 drought to compare against past droughts.

Figure 4-78 Annual California Runoff –1905 to 2021



Source: Cal DWR

The 2018 and 2023 California State Hazard Mitigation Plan discussed the major droughts from 1900 to 2022. The discussion below appends to the tables and figures above.

The 1975-1977 Drought

From November 1975 through November 1977, California experienced one of its most severe droughts. Although people in many areas of the state are accustomed to very little precipitation during the growing season (April to October), they expect it in the winter. In 1976 and 1977, the winters brought only one-half and one-third of normal precipitation, respectively. Most surface storage reservoirs were substantially drained in 1976, leading to widespread water shortages when 1977 turned out to be even drier.

The 1987-1992 Drought

From 1987 to 1992, California again experienced a serious drought due to low precipitation and run-off levels. The hardest-hit region was the Central Coast, roughly from San Jose to Ventura. In 1988, 45 California counties experienced water shortages that adversely affected about 30 percent of the state's population, much of the dry-farmed agriculture, and over 40 percent of the irrigated agriculture. Fish and wildlife resources suffered, recreational use of lakes and rivers decreased, forestry losses and fires increased, and hydroelectric power production decreased. In February 1991, DWR and Cal OES surveyed drought conditions in all 58 California counties and found five main problems: extremely dry rangeland,

irrigated agriculture with severe surface water shortages and falling groundwater levels, widespread rural areas where individual and community supplies were going dry, urban area water rationing at 25 to 50 percent of normal usage, and environmental impacts.

Storage in major reservoirs had dropped to 54 percent of average, the lowest since 1977. The shortages led to stringent water rationing and severe cutbacks in agricultural production, including threats to survival of permanent crops such as trees and vines. Fish and wildlife resources were in critical shape as well. Not since the 1928-1934 drought had there been such a prolonged dry period. In response to those conditions, the Governor established the Drought Action Team. This team almost immediately created an emergency drought water bank to develop a supply for four critical needs: municipal and industrial uses, agricultural uses, protection of fish and wildlife, and carryover storage for 1992. The large-scale transfer program, which involved over 800,000 acre-feet of water, was implemented in less than 100 days with the help and commitment of the entire water community and established important links between state agencies, local water interests, and local governments for future programs.

The 2007-2009 Drought

Water years 2007-2009 were collectively the 15th driest three-year period for DWR's eight-station precipitation index, which is a rough indicator of potential water supply availability to the State Water Project (SWP) and Central Valley Project (CVP). Water year 2007 was the driest single year of that drought and fell within the top 20 percent of dry years based on computed statewide runoff. In June 2008, a state emergency proclamation was issued due to water shortage in selected Central Valley counties. In February 2009, for the first time in its history, the State of California proclaimed a statewide drought. The state placed unprecedented restrictions on CVP and SWP diversions from the Delta to protect listed fish species, a regulatory circumstance that exacerbated the impacts of the drought for water users.

The greatest impacts of the 2007–2009 drought were observed in the CVP service area on the west side of the San Joaquin Valley, where hydrologic conditions combined with reduced CVP exports resulted in substantially reduced water supplies (50 percent supplies in 2007, 40 percent in 2008, and 10 percent in 2009) for CVP south-of Delta agricultural contractors. Small communities on the west side highly dependent on agricultural employment were especially affected by land fallowing due to lack of irrigation supplies, as well as by factors associated with current economic recession. The coupling of the drought and economic recession necessitated emergency response actions related to social services, such as food banks and unemployment assistance.

The 2012-Current Drought (which is ongoing after a pause in 2017 and 2023)

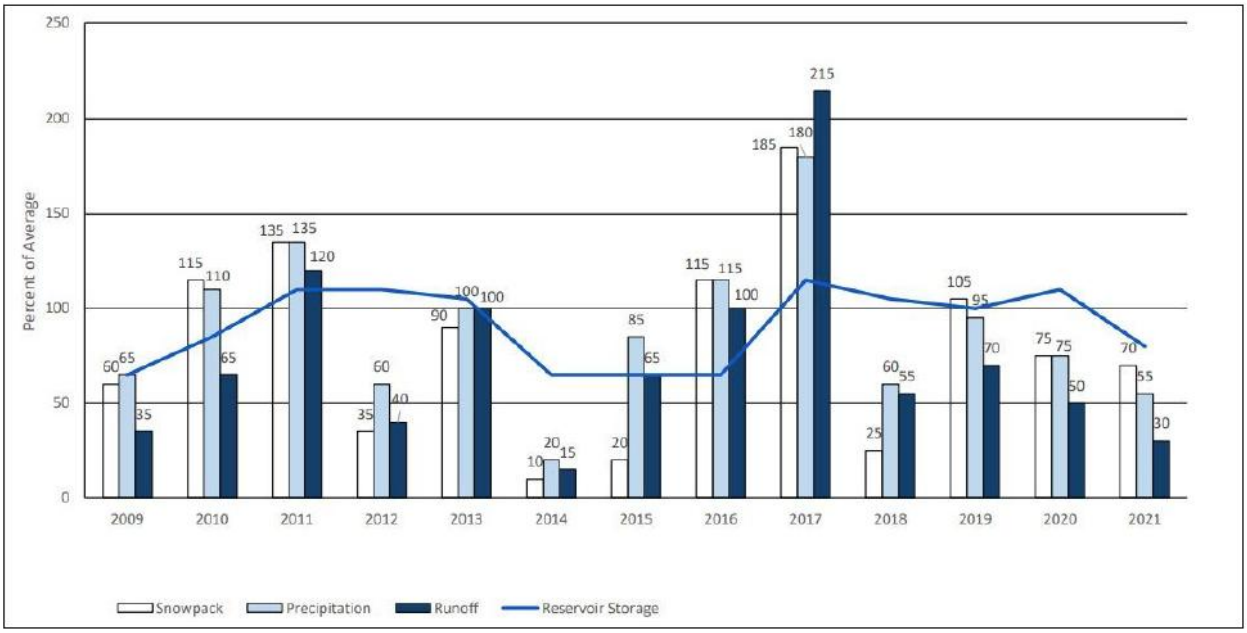
The statewide drought of 2012-2017, which is still ongoing, will be remembered as one of the most severe and costliest droughts of record in California. The drought that spanned water years 2012 through 2017 included the driest four-year statewide precipitation on record (2012-2015) and the smallest Sierra-Cascades snowpack on record (2015, with 5 percent of average). It was marked by extraordinary heat: 2014, 2015, and 2016 were California's first, second, and third warmest years in terms of statewide average temperatures. By the time the drought was declared officially over in April 2017, the state had expended $6.6 billion in drought response and mitigation programs and had been declared a federal disaster area.

Amador County issues a local proclamation for drought on March 5, 2021. This coincides with many of the drought declarations from the USDA (discussed in more detail in Section 4.3.6 above). The HMPC reported that fire danger in 2013 and 2014 reached record levels as the drought produced dry, highly flammable fuel loads. The HMPC also noted that multiple tree mortality declarations were issued in 2020, 2021, 2023, and 2024 from the elevated risk to tree mortality from drought. The Caldor Fire resulted from this drought.

Water Shortage

Figure 4-79 illustrates several indicators commonly used to evaluate water conditions in California. The percent of average values are determined by measurements made in each of the ten major hydrologic regions. The chart describes water conditions in California between 2009 and 2021. The chart illustrates the cyclical nature of weather patterns in California.

Figure 4-79 Water Supply Conditions, 2009 to 2021



Source: 2023 State of California Hazard Mitigation Plan

Likelihood of Future Occurrence

Drought

Likely—Historical drought data for the Amador County Planning Area indicate there have been 5 significant droughts in the last 87 years. This equates to a drought every 16.4 years on average or a 6.1 percent chance of a drought in any given year. Based on this data and given the multi-year length of droughts and future climate change affects, the Amador County Planning Area determined that future drought occurrence continues to be likely.

Water Shortage

Occasional — Recent historical data for water shortage indicates that Amador County may at some time be at risk to both short and prolonged periods of water shortage. Based on this it is possible that water shortages will affect the County in the future during extreme drought conditions. However, to date, Amador County has continued to have relatively consistent water supply.

It is likely that climate change will increase the chance of future occurrence as well as future impacts. More information on climate change and drought and water shortage can be found in the next section. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate Change and Drought and Water Shortage

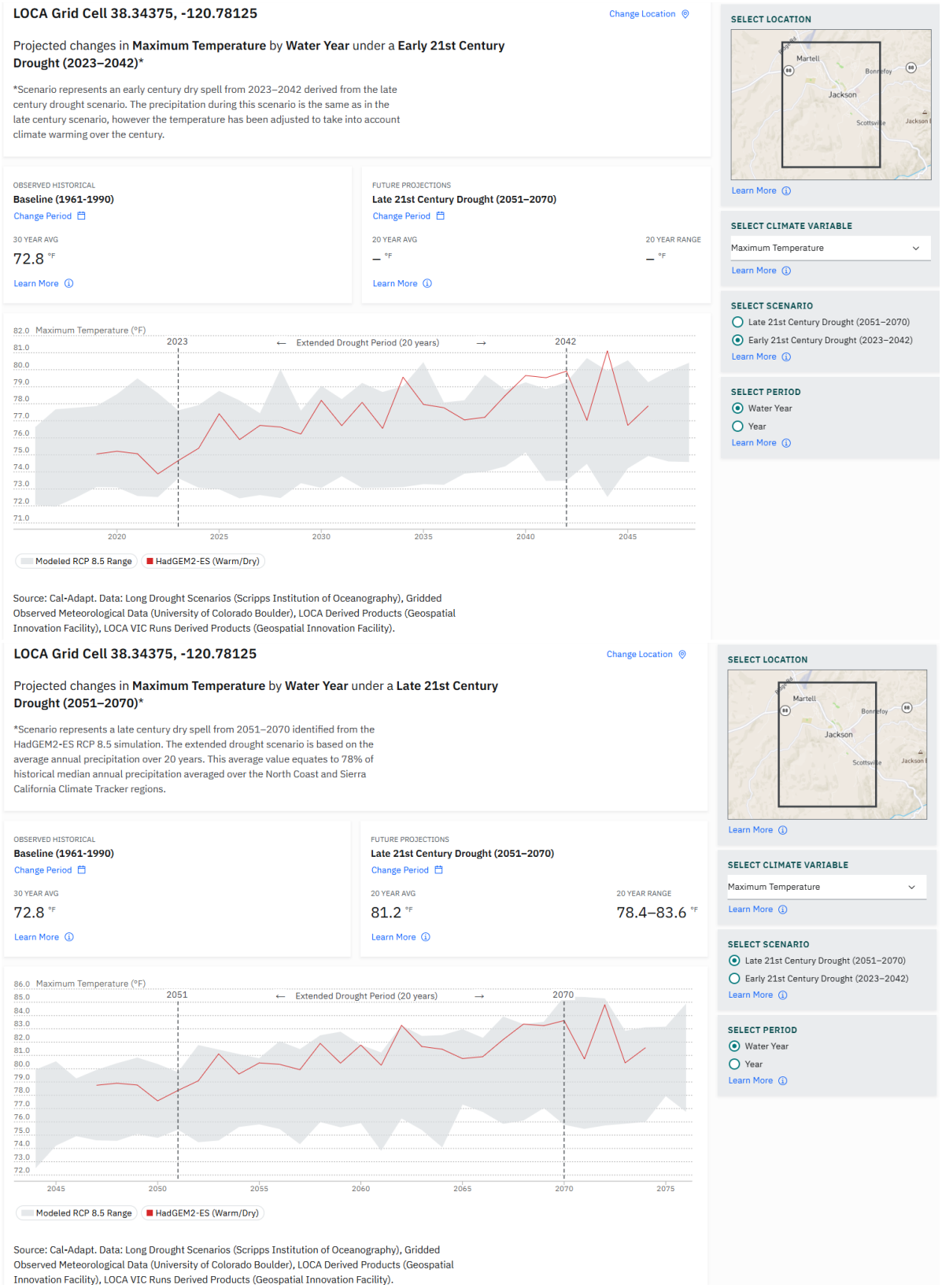
Climate scientists studying California find that drought conditions are likely to become more frequent and persistent over the 21st century due to climate change. The experiences of California during recent years underscore the need to examine more closely the state's water storage, distribution, management, conservation, and use policies. The 2021 CAS (as well as the 2024 Draft CAS) stresses the need for public policy development addressing long term climate change impacts on water supplies. The CAS notes that climate change is likely to significantly diminish California's future water supply, stating that: California must change its water management and uses because climate change will likely create greater competition for limited water supplies needed by the environment, agriculture, and cities.

A 2018 report from the Public Policy Institute of California noted that thousands of Californians – mostly in rural, small, disadvantaged communities – already face acute water scarcity, contaminated groundwater, or complete water loss. Climate change would make these effects worse.

Cal-Adapt has modeled future risk of drought. Recent research suggests that extended drought occurrence ("mega-drought") could become more pervasive in future decades. This tool explores data for two 20-year drought scenarios (using the quad that contains the City of Jackson in Figure 4-80) derived from LOCA downscaled meteorological and hydrological simulations – one for the earlier part of the 21st century, and one for the latter part:

- The upper chart represents a mid-century dry spell from 2023-2042 identified from the HadGEM2-ES RCP 8.5 simulation. The extended drought scenario is based on the average annual precipitation over 20 years. This average value equates to 78% of historical median annual precipitation averaged over the North Coast and Sierra California Climate Tracker regions.
- The lower chart represents a late century dry spell from 2051–2070 identified from the HadGEM2-ES RCP 8.5 simulation. The extended drought scenario is based on the average annual precipitation over 20 years. This average value equates to 78% of historical median annual precipitation averaged over the North Coast and Sierra California Climate Tracker regions.

Figure 4-80 Amador County Planning Area – Future Extended Drought Scenarios



Source: Cal Adapt – Extended Drought Scenarios (retrieved 2/26/2025)

Vulnerability Assessment

Vulnerability—High

Based on historical information, the occurrence of drought in California, including the Amador County Planning Area, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. The vulnerability to drought may vary and include reduction in water supply, turf losses, impacts to natural resources, and an increase in dry fuels and tree dieback.

An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to unincorporated Amador County. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect both the entire Amador County Planning Area as well as the unincorporated portions of Amador County. How the hazard affects the other participating jurisdictions can be found in their respective annexes to this LHMP Update. These sections below include assets at risk, impacts, and how future development may affect the vulnerability of the County to this hazard.

Tree Mortality and Drought

One of the specific impacts of drought in the Amador County Planning Area is the increased risk to trees from beetle kill and other insects, pathogens and parasites, and other tree mortality and die back issues. Drought weakens trees and makes them more susceptible to insect infestation and other pathogens. Insects, such as bark beetles and others, frequently attack trees weakened by drought, disease, injuries, or other factors that may stress the tree. These insects and other pathogens can contribute to the decline and eventual death of trees throughout the Planning Area, especially in those areas on the west where the elevations increase.

The tree mortality and dieback problem are a high priority because of the issue of hazardous trees and increased wildfire hazard in the wildland areas and the potential for worsening conditions and expansion into other forested sites in future years. Fuel loading and fire potential are greater in stands as compared to healthy stands due to the higher proportion of dead and dying material. Removal of dead and dying trees near structures, powerlines, and roadways is also a high priority because of the immediate falling hazard.

University of California, Berkeley's Department of Environmental Science, Policy, and Management (ESPM) was commissioned in 2021 to investigate the symptoms and possible causes of the dieback. Preliminary results show that the dieback is driven mostly by environmental stressors, including but not limited to drought, predisposing trees to disease caused by opportunistic pathogens. The report includes best management practices to limit the spread of pathogens. It is important to continue investigating the causes of the tree mortality and dieback to help Planning Area jurisdictional staff track changes over time, recognize where other areas may potentially be susceptible to tree mortality, and apply appropriate best management practices.

Under current drought conditions, competition for resources within forested areas will likely continue to intensify with greater stress increasing tree susceptibility to insect damage and disease, and ultimately increase mortality. In all vegetation types, drought extends the length of the fire season because of its effect on live and dead fuel moisture, with critical low fuel moisture levels occurring early in spring or summer and extending at least through the first significant rains that typically come in late fall.

According to the 2024 Strategic Fire Plan for the Amador-El Dorado Unit, in 2023, an estimated 28.8 million dead trees were counted across California. According to the 2023 USFS Aerial Detection Survey, the estimated number of dead trees by forested county within AEU was 2.2 million in El Dorado County, 930,000 in Alpine County, and 520,000 in Amador County. Unlike the previous wave of tree mortality across the state (2015-2016) that mostly impacted pine species, tree mortality in 2022 consisted of 77% true fir species (white fir and red fir), more true fir mortality than has ever been recorded.

The HMPC noted that noted several large trees which have fallen across the Amador Canal and Ione Canal causing damage to canal berms and embankments which were most likely aggravated by recent droughts in combination with recent high wind events. The HMPC noted that there have been multiple local emergency proclamations from tree mortality since 2020, including:

- 2021 (12 proclamations)
- 2022 (11 proclamations)
- 2023 (11 proclamations)
- 2024 (6 proclamations)

Following the record rain and snowfall of the 2022-2023 winter, tree mortality moderated over the summer of 2023; however, the quantity of standing and fallen dead trees from previous mortality waves remains high in forested areas and contributes to fuel loading and fire hazard in the forest.

Local Concerns (unincorporated Amador County)

The unincorporated County has specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerabilities to this hazard.

The drawdown of the groundwater table is one factor that has been recognized to occur during repeated dry years. Lowering of groundwater levels results in the need to deepen wells, which subsequently lead to increased pumping costs (which has happened in the recent past). These costs are a major consideration for residents relying on domestic wells and agricultural producers that irrigate with groundwater and/or use it for frost protection. Amador Water Agency (AWA) is the primary water company in the County. The primary concern they noted for the County is increased risk of wildfire due to extreme heat events and droughts which cause damage to AWA tanks, treatment plants, pump stations, homes, businesses, and other above or below ground infrastructure. In August 2021, Amador Water Agency received orders from the State Water Resources Control Board curtailing most pre- and post-1914 water rights, which stopped Amador Water Agency's ability to draw water from the Mokelumne River which is the single source of water for almost 90% of AWA water customers. These orders significantly impacted the County and AWA as AWA was then only authorized to use the limited stored water in the mountain reservoirs. This limited AWAs ability to produce potable water as there was no end date associated with the curtailment. Prolonged

curtailment orders can risk AWA's ability to produce potable water for AWA customers in Amador County, including at-risk populations, as well as provide fire suppression water to combat wildfires in critical areas. This has since been lifted.

In addition, the Amador County Air Quality District noted that within the last five years, Amador County has experienced extreme droughts that have affected the health of the forest. The lack of rain lead to the Bark Beetle infestation, causing thousands upon thousands of trees to die. This has led to large areas of Amador County to be declared high fire hazardous zones as well. The combined effects of the drought, decline in the health of the forest, temperature changes, and wildfires in and around neighboring counties, much contributed to climate change, have also steered our way to poor air quality.

Local concerns for each of the jurisdictions can be found under the Local Concerns heading in each respective jurisdictional annex to this LHMP Update.

Assets at Risk

Assets at risk from drought and water shortage include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections for the Amador County Planning Area and unincorporated Amador County.

Additionally, for each hazard in the FEMA National Risk Index in Amador County, the relevant portions of the hazard analysis done by FEMA is presented below. This includes the Hazard Risk Index Rating, Expected Annual Loss Values, Exposure Values, and the Historic Loss Ratio Rating. These are presented for the Amador County Planning Area as a whole.

People and Populations

The people and populations of the Amador County Planning Area are not directly affected by general drought conditions; although, their turfed areas, trees, and other water dependent resources can all be affected. In extreme drought conditions, however, residents and other populations within the Planning Area may be vulnerable to drought and water shortage issues. Drought and water shortage can lead to an increase in wildfires threatening Planning Area residents. Water shortages can have an effect on all of the population in the Planning Area, but often have a greater effect on the unhoused and other vulnerable populations that may be unable to access and afford clean drinking water during shortages. During periods of drought as the costs of water usage may increase, those who are economically disadvantaged may be unable to afford the increased costs of potable water.

Structures

Structures have a limited vulnerability to drought and water shortage. It is the secondary hazard of drought (wildfire) which causes risks to structures. Drought can also stress trees, causing die off. These trees may fall on structures adjacent to them.

Critical Facilities and Infrastructure

Most critical facilities and infrastructure have a limited vulnerability to drought and water shortage. Should drought conditions be severe enough to cause water shortage reliability issues, some facilities and infrastructure may be affected. Water and wastewater systems may be impacted during times of reduced water supply and need to employ contingencies to remain functional and fully operational. Other water dependent systems may also be adversely affected. Further, the secondary hazards of drought (increased tree mortality and potential for spread of urban fires and wildfire) can pose a significant risk to critical facilities and infrastructure. Drought can also stress trees, causing die off and lead to increased tree mortality. Dead and weakened trees may fall on critical infrastructure adjacent to them and impact power lines and other utilities. Fallen trees can also temporarily block roads and access which can impact first responders in an emergency.

Natural, Historic, and Cultural Resources

Drought and water shortage can have a significant impact on natural resources. Water levels in reservoirs and lakes may be reduced and a loss of wetlands and marsh areas may occur. Severe drought conditions can contribute to an increase in erosion of soils and lead to poor soil quality. Further, all of the trees in the Planning Area are at risk to drought impacts and a reduction in water supply. These trees provide a wealth of social and environmental benefits to Planning Area residents and visitors, from shade and beauty to air quality, carbon reduction and stormwater management. Increased tree mortality during extended droughts can be substantial and widespread. Increased tree mortality in the Planning Area can also add to the available fuel which can exacerbate the spread of wildfires. Drought can devastate crops and dry out pastures, dry out forests and critical habitat areas, and reduce food and water available for wildlife and livestock. Additionally, drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. It is unlikely that drought and water shortage would have a significant impact on historic and cultural resources in the Planning Area unless they are impacted by a drought precipitated wildfire type event.

FEMA NRI Hazard Vulnerability Assessment

The FEMA NRI was queried for additional specific data on Amador County's vulnerability to drought. The NRI contains data and analysis for 18 separate natural hazards, including drought. As shown in Table 4-88, drought could cause a total of $5,114,470 in expected annual losses, with a historic loss rating of relatively high. Drought has a relatively moderate rating for both social vulnerability and community resilience, with a risk index score of 98.7 out of 100. According to the NRI, there have been 1,260 drought events between the years 2000-2021 with an average of 53.4 events per year.

Table 4-88 Amador County Planning Area – Drought Vulnerability Ratings from FEMA NRI

NRI Hazard	Hazard Risk Index Rating*	Expected Annual Loss Values (total)**	Exposure Value (total)***	Historic Loss Ratio Rating
Drought	98.7	$5,114,470	$26,500,133	Relatively High

Source: FEMA NRI Report, retrieved 4/1/2025.

*Hazard Risk Index is calculated using data for only a single hazard type, and reflect a communities expected annual loss value, community risk factors, and the adjustment factor used to calculate the risk value.
**Expected annual loss represents the average economic loss in dollars resulting from natural hazards each year.
***Exposure is a natural hazard consequence factor that is the representative value of buildings, populations, or agriculture potentially exposed to a natural hazard occurrence.

Additional information on the FEMA NRI can be found in Section 4.2 and Appendix G.

Impacts from Drought and Water Shortage

The vulnerability to drought is Countywide, but impacts may vary and include reduction in water supply and an increase in dry fuels. The potential for a reduction in water supply during drought conditions generally leads to both mandated and voluntary conservations measures during extended droughts. During these times, the costs of water can also increase. Also of concern, the increased dry fuels and fuel loads associated with drought conditions can result in an increased fire danger. In areas of extremely dry fuels, the intensity and speed of fires can be significant. Water supply and flows for fire suppression can also be an issue during extended droughts. Drought that occurs during periods of extreme heat and high winds is a contributing factor to PSPS events to be declared in the Planning Area. More information on PSPS can be found in Section 4.3.1.

Other qualitative impacts associated with drought in the Amador County Planning Area are those related to water intensive activities such as municipal usage, commerce, tourism, and recreation use. With more precipitation likely falling as rain instead of snow and warmer temperatures causing decreased snowfall to melt faster and earlier, water supply is likely to become more unreliable. In addition, drought and water shortage is predicted to become more common. This means less water available for use over the long run, and additional challenges for water supply reliability, especially during periods of extended drought.

Drought Impact Reporter

Drought impacts are wide-reaching and may be economic, environmental, and/or societal. Tracking drought impacts can be difficult. The Drought Impact Reporter from the NDMC is a useful reference tool that compiles reported drought impacts nationwide. Table 4-89 show drought impacts for County from 1850 to March 2025. The data represented is skewed, with the majority of these impacts from records within the past ten years.

Table 4-89 Amador County Drought Impacts 1850-3/1/2025

Category	Amador County Number of Impacts
Agriculture	274
Business and Industry	79
Energy	41
Fire	104
Plants & Wildlife	137
Relief, Response, and Restrictions	366
Society and Public Health	237

Category	Amador County Number of Impacts
Tourism and Recreation	27
Water Supply and Quality	371
Total	**1,636**

Source: National Drought Mitigation Center. Retrieved 3/12/2025.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future hazard conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for Amador County include the following:

- Climate change is likely to exacerbate future drought conditions and associated impacts and vulnerability of the County to drought and water shortage.
- Future population growth should be considered as having more or less people in a community affects the overall hazard vulnerability to the County. Population growth in Amador County is expected to slowly increase. Amador County has access to large quantities of water through its groundwater as well as surface water. However, any future population growth in the County will add additional pressure to water companies during periods of drought and water shortage. Water companies will need to continue to plan for and add infrastructure capacity for population growth. As the population grows, the nature and makeup of populations will shift and change along with it. Vulnerable and underserved populations, such as those with low incomes and the unhoused that might not always have access to affordable, clean water, will need to be considered as future development continues, since they may experience a disproportionate impact from drought and water shortage. Potential population growth will be a challenge not only with regard to Amador County's water access for agricultural production, but state- and nation-wide with regard to food production. Should the County see a growth in population, it will increase the vulnerability and impacts to the County from this hazard.
- Land use planning should be proactive to address future hazard conditions. As the County continues to grow, more cropland will be taken out of production to provide housing to accommodate for population growth. As Amador's agricultural lands are reduced, it seems likely that there would be less of a competing demand for water. However, more development will also require an increase in water supply and associated infrastructure. Changes in land use and development may or may not increase the impacts and associated vulnerabilities of the County to this hazard depending on where and how this future growth occurs.

Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements, such as building codes, are followed, and varying needs for different demographic groups with intersecting identities that reside within the County are considered can help to make for a more resilient community.

4.3.11. Earthquake

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Amador County Planning Area. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; and how climate change can affect or influence this hazard.

Hazard/Problem Description

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction. This section briefly discusses issues related to types of seismic hazards.

Ground Shaking

Ground shaking is motion that occurs as a result of energy released during faulting. The damage or collapse of buildings and other structures caused by ground shaking is among the most serious seismic hazards. Damage to structures from this vibration, or ground shaking, is caused by the transmission of earthquake vibrations from the ground to the structure. The intensity of shaking and its potential impact on buildings is determined by the physical characteristics of the underlying soil and rock, building materials and workmanship, earthquake magnitude and location of epicenter, and the character and duration of ground motion.

Actual ground breakage generally affects only those buildings directly over or nearby the fault. Ground shaking generally has a much greater impact over a greater geographical area than ground breakage. The amount of breakage and shaking is a function of earthquake magnitude, type of bedrock, depth and type of soil, general topography, and groundwater. As with most communities in Northern California near active faults, much of Amador County would be susceptible to violent ground shaking.

Seismic Structural Safety

Older buildings constructed before building codes were established, and even newer buildings constructed before earthquake-resistance provisions were included in the codes, are the most likely to be damaged during an earthquake. Buildings one or two stories high of wood-frame construction are considered to be the most structurally resistant to earthquake damage. Older masonry buildings without seismic

reinforcement (unreinforced masonry) and soft story buildings are the most susceptible to the type of structural failure that causes injury or death.

The susceptibility of a structure to damage from ground shaking is also related to the underlying foundation material. A foundation of rock or very firm material can intensify short-period motions which affect low-rise buildings more than tall, flexible ones. A deep layer of water-logged soft alluvium can cushion low-rise buildings, but it can also accentuate the motion in tall buildings. The amplified motion resulting from softer alluvial soils can also severely damage older masonry buildings.

Other potentially dangerous conditions include, but are not limited to: building architectural features that are not firmly anchored, such as parapets and cornices; roadways, including column and pile bents and abutments for bridges and overcrossings; and above-ground storage tanks and their mounting devices. Such features could be damaged or destroyed during strong or sustained ground shaking.

Liquefaction Potential

Liquefaction is a process whereby soil is temporarily transformed to a fluid formed during intense and prolonged ground shaking. Areas most prone to liquefaction are those that are water saturated (e.g., where the water table is less than 30 feet below the surface) and consist of relatively uniform sands that are loose to medium density. In addition to necessary soil conditions, the ground acceleration and duration of the earthquake must be of sufficient energy to induce liquefaction.

Liquefaction during major earthquakes can cause severe damage to structures on level ground as a result of settling, titling, or floating. Such damage occurred in San Francisco on bay-filled areas during the 1989 Loma Prieta earthquake, even though the epicenter was several miles away. If liquefaction occurs in or under a sloping soil mass, the entire mass may flow toward a lower elevation. Also of particular concern in terms of developed and newly developing areas are fill areas that have been poorly compacted.

No known liquefaction areas exist in Amador County.

Landslide/Debris Flows

Landslides can occur as a result of horizontal seismic inertia induced in the slopes by the ground shaking. The most common earthquake-induced landslides include shallow, disrupted landslides such as rock falls, rockslides, and soil slides. Debris flows are created when surface soil on steep slopes becomes totally saturated with water. Once the soil liquefies, it loses the ability to hold together and can flow downhill at very high speeds, taking vegetation and/or structures with it. Slide risks increase after an earthquake during a wet winter. This is discussed in the vulnerability section below, and as a stand-alone hazard in Section 4.3.14.

Settlement

Settlement can occur in poorly consolidated soils during ground shaking. During settlement, the soil materials are physically rearranged by the shaking to result in a less stable alignment of the individual minerals. Settlement of sufficient magnitude to cause significant structural damage is normally associated with rapidly deposited alluvial soils or improperly founded or poorly compacted fill. These areas are known

to undergo extensive settling with the addition of irrigation water, but evidence due to ground shaking is not available.

Fire Following Earthquake

Fire ignitions and spread in following a major earthquake can further compound the potentially catastrophic impacts of a large earthquake event. Fire following earthquake is a major hazard in earthquake-prone areas which are densely developed and have high inventories of wood frame buildings. The capability of fire departments to combat fires following an earthquake is impacted by the regional nature of an earthquake, damage to transportation and water supply systems, and the potential failure of telecommunications. A local fire department may suffer impacts to its personnel, buildings, equipment, and communications systems. Moreover, fewer resources are immediately available as mutual aid – due to the commitment of nearby fire departments responding to the earthquake withing their own jurisdictions. Transportation system damage may adversely impact the mobilization of off-duty personnel and fire and rescue mutual aid resources from unaffected areas. Maneuvering fire crews within the affected areas of the earthquake may be impeded by debris or damage to roads and bridges. Additionally, the municipal water supply system which ordinarily supports firefighting operations is likely to be impacted.

Fire following earthquake is an issue that could impact any California community that experiences an earthquake – both urban and rural. According to the FM Global Insurance company, "Fires after earthquakes commonly initiate from electrical or fuel related sources because their use is widespread. In the US, natural gas is a factor 15 to 50 percent of the time, and electrical ignitions account for 40 percent or more of post-earthquake wildfires. Ignitable liquid spills, chemical reactions, and the contact of combustibles with heat sources have also initiated or contributed to many fires after earthquakes."

Location and Extent

California is seismically active because it sits on the boundary between two of the earth's tectonic plates. Most of the state - everything east of the San Andreas Fault (such as Amador) - is on the North American Plate. The cities of Monterey, Santa Barbara, Los Angeles, and San Diego are on the Pacific Plate, which is constantly moving northwest past the North American Plate. The relative rate of movement is about two inches per year. The San Andreas Fault is considered the boundary between the two plates, although some of the motion is taken up on faults as far away as central Utah.

Faults

A fault is defined as "a fracture or fracture zone in the earth's crust along which there has been displacement of the sides relative to one another." For the purpose of planning there are two types of faults, active and inactive. Active faults have experienced displacement in historic time, suggesting that future displacement may be expected. Inactive faults show no evidence of movement in recent geologic time, suggesting that these faults are dormant. This does not mean, however, that faults having no evidence of surface displacement within the last 11,000 years are necessarily inactive. For example, the 1975 Oroville earthquake, the 1983 Coalinga earthquake, and the 1987 Whittier Narrows earthquake occurred on faults not previously recognized as active. Potentially active faults are those that have shown displacement within

the last 1.6 million years (Quaternary). An inactive fault shows no evidence of movement in historic (last 200 years) or geologic time, suggesting that these faults are dormant.

Two types of fault movement represent possible hazards to structures in the immediate vicinity of the fault: fault creep and sudden fault displacement. Fault creep, a slow movement of one side of a fault relative to the other, can cause cracking and buckling of sidewalks and foundations even without perceptible ground shaking. Sudden fault displacement occurs during an earthquake event and may result in the collapse of buildings or other structures that are found along the fault zone when fault displacement exceeds an inch or two. The only protection against damage caused directly by fault displacement is to prohibit construction in the fault zone.

Amador County is located in a relatively aseismic area with respect to other more seismically active areas in California. Amador County itself is traversed by the Foothills fault system, a complex series of northwest trending-faults that are related to the Sierra Nevada uplift, and whose activity is little understood, running from about Oroville in the north to east of Fresno in the south. This system contains the closest and most potentially significant faults in the area, and includes the potentially active or active Bear Mountains fault, Melones fault, and Cleveland Hills fault, among others.

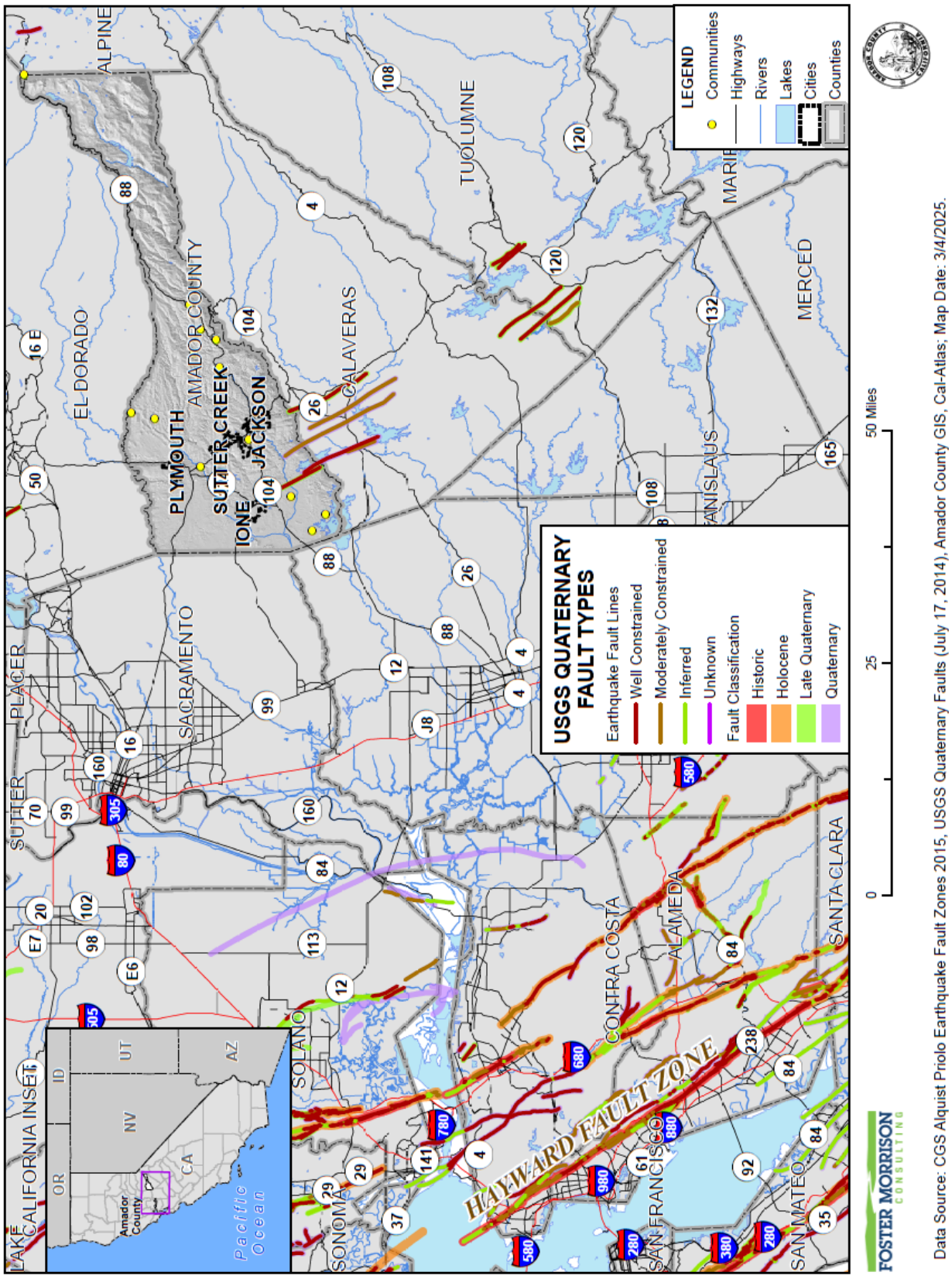
The California Division of Mines and Geology Open File Report 84-52 (1994) reports that special seismic zoning is not recommended for the fault system as the individual faults of the system are either poorly defined at the surface or lack evidence of Holocene (recent) faulting. The closest known source of large earthquakes is the Sierra Frontal Fault System along the eastern margin of the Sierra Nevada, which includes the Carson Valley Fault. This fault is located within a few miles of the eastern border to the County and has been evaluated as being able to generate earthquakes that produce levels of damage up to VII on the Mercalli Scale.

Additionally, western Amador County may experience ground shaking from distant major to great earthquakes on faults to the west and east. For example, to the west, both the San Andreas fault (source of the 8.0 estimated Richter magnitude San Francisco earthquake that caused damage in Sacramento in 1906, including the State Capitol, the full extent of which was not discovered until the mid-1970s) and the closer Hayward fault have the potential for experiencing major to great events (i.e., >6.7). The US Geological Survey recently (February 2004) estimated that there is a 62 percent probability of at least one 6.7 or greater magnitude earthquake occurring that could cause widespread damage in the greater San Francisco Bay area before 2032.

Another potential source for earthquakes in Amador County is the faults associated with the western edge of the Central Valley, recently defined as the Coast Range Central Valley (CRCV) boundary thrust fault system. Various documents define portions of this little known system as the Midland Fault Zone or the Dunnigan Hills fault where, as noted above, the 1892 Vacaville-Winters earthquake occurred. A southern part of the CRCV system may have been the source of the very damaging 1983 Coalinga earthquake.

Figure 4-81 shows fault locations in and near Amador County.

Figure 4-81 Faults in and near Amador County



The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales. One of the first was the Richter Scale, developed in 1932 by the late Dr. Charles F. Richter of the California Institute of Technology. The Richter Magnitude Scale is used to quantify the magnitude or strength of the seismic energy released by an earthquake. Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface (see Table 4-90). Seismic shaking is typically the greatest cause of losses to structures during earthquakes.

Table 4-90 Modified Mercalli Intensity (MMI) Scale

MMI	Felt Intensity
I	Not felt except by a very few people under special conditions. Detected mostly by instruments.
II	Felt by a few people, especially those on upper floors of buildings. Suspended objects may swing.
III	Felt noticeably indoors. Standing automobiles may rock slightly.
IV	Felt by many people indoors; by a few outdoors. At night, some people are awakened. Dishes, windows, and doors rattle.
V	Felt by nearly everyone. Many people are awakened. Some dishes and windows are broken. Unstable objects are overturned.
VI	Felt by everyone. Many people become frightened and run outdoors. Some heavy furniture is moved. Some plaster falls.
VII	Most people are alarmed and run outside. Damage is negligible in buildings of good construction, considerable in buildings of poor construction.
VIII	Damage is slight in specially designed structures, considerable in ordinary buildings, and great in poorly built structures. Heavy furniture is overturned.
IX	Damage is considerable in specially designed buildings. Buildings shift from their foundations and partly collapse. Underground pipes are broken.
X	Some well-built wooden structures are destroyed. Most masonry structures are destroyed. The ground is badly cracked. Considerable landslides occur on steep slopes.
XI	Few, if any, masonry structures remain standing. Rails are bent. Broad fissures appear in the ground.
XII	Virtually total destruction. Waves are seen on the ground surface. Objects are thrown in the air.

Source: Multi-Hazard Identification and Risk Assessment, FEMA 1997

Other Hazards

Earthquakes can also cause landslides and dam failures. Earthquakes may cause landslides (discussed in Section 4.3.14), particularly during the wet season, in areas of high water or saturated soils. Finally, earthquakes can cause dams to fail (see Section 4.3.7 Dam Failure). Earthquakes can also cause levees to fail (see Section 4.3.12 Flood: 1%/0.2% Annual Chance in the levee failure section).

Past Occurrences

Disaster Declaration History

There have been no disaster declarations in the County related to earthquakes, as shown on Table 4-4.

NCDC Events

Earthquake events are not tracked by the NCDC database.

USGS Events

The USGS National Earthquake Information Center database contains data on earthquakes in the Amador County area. Table 4-91 shows the approximate distances earthquakes can be felt away from the epicenter. According to the table, a magnitude 5.0 earthquake could be felt up to 90 miles away. The USGS database was searched for magnitude 5.0 or greater on the Richter Scale within 90 miles of the City of Jackson in Amador County. These 65 results are detailed in Table 4-92.

Table 4-91 Approximate Relationships between Earthquake Magnitude and Intensity

Richter Scale Magnitude	Maximum Expected Intensity (MM)*	Distance Felt (miles)
2.0 - 2.9	I – II	0
3.0 - 3.9	II – III	10
4.0 - 4.9	IV – V	50
5.0 - 5.9	VI – VII	90
6.0 - 6.9	VII – VIII	135
7.0 - 7.9	IX – X	240
8.0 - 8.9	XI – XII	365

*Modified Mercalli Intensity Scale.
Source: USGS Earthquake Intensity Zonation and Quaternary Deposits, Miscellaneous Field Studies Map 9093, 1977.

*Table 4-92 Magnitude 5.0 Earthquakes or greater within 90 Miles of Amador County**

Date	Richter Magnitude	Location
10/25/2022	5.06	15km ESE of Alum Rock, CA
7/8/2021	5.03	32km SE of Markleeville, CA
7/8/2021	6	Antelope Valley, CA
8/24/2014	6.02	South Napa
4/26/2008	5.1	1km NW of Mogul, Nevada
10/31/2007	5.45	San Francisco Bay area, California
9/12/1994	5.1	Northern California
9/12/1994	5.7	11km SE of Gardnerville Ranchos, Nevada
10/24/1990	5.8	Central California
6/13/1988	5.3	San Francisco Bay area, California
3/31/1986	5.7	Northern California
4/24/1984	6.2	Northern California
11/28/1980	5.1	Northern California
1/27/1980	5.4	San Francisco Bay area, California
1/24/1980	5.1	San Francisco Bay area, California

Date	Richter Magnitude	Location
1/24/1980	5.8	San Francisco Bay area, California
10/7/1979	5	Central California
8/2/1975	5.2	Northern California
8/2/1975	5.1	Northern California
8/1/1975	5.7	0km WSW of Palermo, California
9/12/1966	5.91	Northern California
4/13/1962	5.1	Central California
10/24/1955	5.4	San Francisco Bay area, California
9/5/1955	5.5	San Francisco Bay area, California
9/26/1953	5.3	Nevada
3/22/1953	5	Northern California
5/9/1952	5.1	Nevada
12/29/1948	6	Northern California
3/30/1943	5.3	Northern California
12/17/1942	5.1	Northern California
6/25/1933	6.1	Nevada
12/19/1919	5.2	Central California
4/5/1915	5	Central California
7/1/1911	6.6	San Francisco Bay area, California
6/23/1909	5.7	Northern California
3/3/1909	5	Northern California
8/3/1903	5.8	San Francisco Bay area, California
6/11/1903	5.8	San Francisco Bay area, California
5/19/1902	5.4	Northern California
6/7/1899	5.8	Northern California
3/31/1898	6.2	San Francisco Bay area, California
4/30/1892	5.5	Northern California
4/21/1892	6.2	Northern California
4/19/1892	6.4	Northern California
10/12/1891	5.5	Northern California
1/2/1891	5.5	San Francisco Bay area, California
7/31/1889	5.2	San Francisco Bay area, California
5/19/1889	6	San Francisco Bay area, California
6/3/1887	6.3	Nevada
4/10/1881	5.9	Northern California
7/10/1877	5	Nevada
4/2/1870	5.8	Near Berkeley, California
12/27/1869	6.2	Near Carson City, Nevada
12/27/1869	6.4	Northwest of Virginia City, Nevada

Date	Richter Magnitude	Location
10/21/1868	6.8	The 1868 Hayward Fault Earthquake, California
9/17/1868	5.6	Near Markleeville, California
5/30/1868	6	Near Virginia City, Nevada
7/15/1866	6	Southwest of Stockton, California
5/21/1864	5.8	Alameda County, California
3/5/1864	6.1	Alameda County, California
2/26/1864	6.1	Santa Clara County, California
7/4/1861	5.8	San Francisco Bay area, California
11/26/1858	6.1	San Francisco Bay area, California
9/3/1857	6	California-Nevada Border east of Truckee
1/25/1855	5.5	Sierra County, California

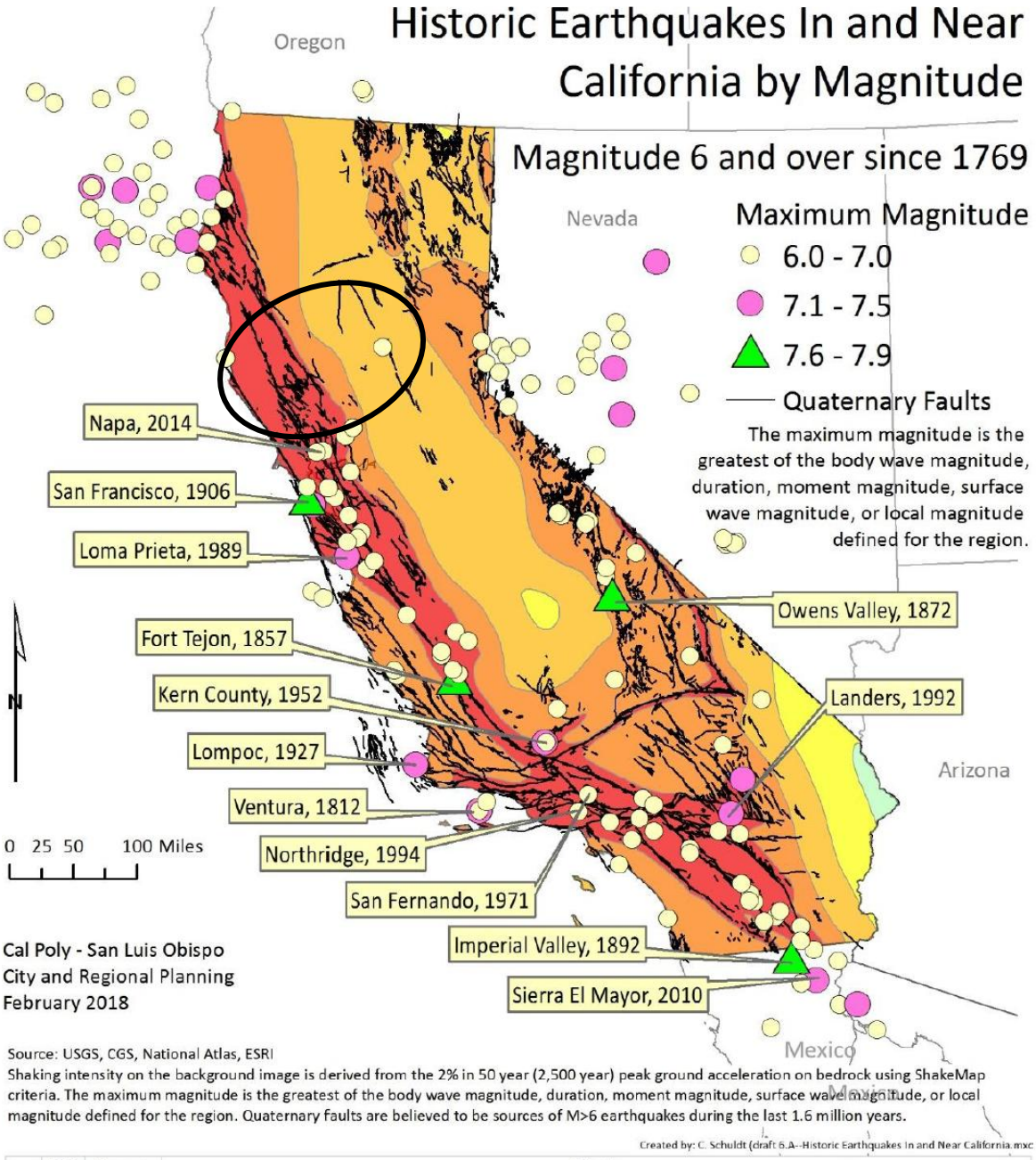
Source: USGS, National Earthquake Information Center
*Search dates 1950 – January 31, 2025

Figure 4-82 shows major historical earthquakes in California from 1769 to 2017. Since 2017, California has experienced four additional 6.0 or greater earthquakes:

- 2022 - 6.4 Ferndal
- 2021 - 6.0 Antelope Valley
- 2019 - 6.4 and 7.1 Ridgecrest

None of these earthquakes (over 6.0) since 2017 have affected the Amador County Planning Area.

Figure 4-82 Historic Earthquakes in California 1769 to 2017



	MMI	Damage	Effects
	X	Very Heavy	Some well-built, wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
	IX	Heavy	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
	VIII	Moderate to Heavy	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
	VII	Moderate	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly-built or badly designed structures; some chimneys broken.
	VI	Light	Felt by all, many frightened. Some heavy furniture moved; a few instance of fallen plaster. Damage slight.
	V	Very Light	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.

Source: 2023 State of California Multi-Hazard Mitigation Plan

Hazard Mitigation Planning Committee Events

The HMPC noted that during past regional earthquake events, Amador County has experienced groundshaking. In addition, in some instances, nearby earthquake events have caused cracking in the plaster on walls and in windowsills. This was the case on December 9, 2024. There was a 5.7 magnitude earthquake in Yerington, NV, that was felt in several areas of Amador County. No significant damages or injuries were reported.

Likelihood of Future Occurrence

Unlikely (major earthquake); Likely (minor earthquake) – No major earthquakes have been recorded within the County; although the County has felt ground shaking from earthquakes with epicenters located elsewhere. However, the possibility of an earthquake is an ever-present phenomenon in California and Amador County. The combination of plate tectonics and associated California coastal mountain range building geology essentially guarantees earthquake as a result of the periodic release of tectonic stresses.

It is likely that climate change will not affect the chance of future occurrence as well as future impacts. More information on climate change and earthquake can be found below the Mapping of Future Occurrences section. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Mapping of Future Occurrences

Mapping of future occurrences is presented in the following sections:

- CGS Analysis
- UCERF Analysis

CGS Analysis

Maps indicating the maximum expectable intensity of ground shaking for the County are available through several sources. Figure 4-83, prepared in 2016 by the California Division of Mines and Geology, shows the expected relative intensity of ground shaking and damage in California from anticipated future earthquakes. The shaking potential is calculated as the level of ground motion that has a 2% chance of being exceeded in 50 years, which is the same as the level of ground-shaking with about a 2,500-year average repeat time. Although the greatest hazard is in areas of highest intensity as shown on the map, no region is immune from potential earthquake damage.

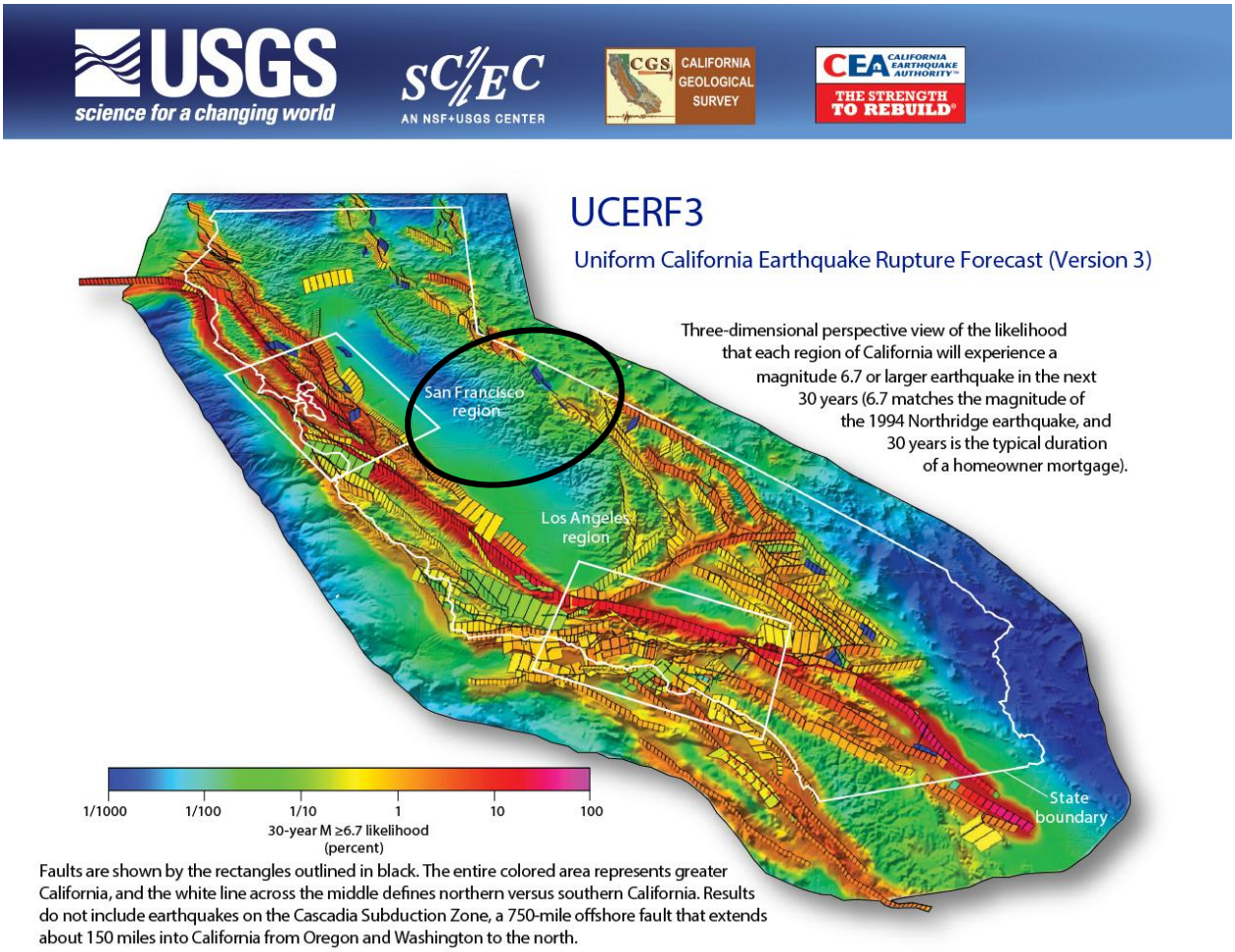
Figure 4-83 Maximum Expectable Earthquake Intensity – 2% Chance in 50 Years

Source: California Division of Mines and Geology (2016)

UCERF Analysis

In 2014, the USGS and the California Geological Survey (CGS) released the time-dependent version of the Uniform California Earthquake Rupture Forecast (UCERF III) model. The UCERF III results have helped to reduce the uncertainty in estimated 30-year probabilities of strong ground motions in California. The UCERF map is shown in Figure 4-84 and indicates that Amador County has a low to moderate risk of earthquake occurrence.

Figure 4-84 Probability of Earthquake Magnitudes Occurring in 30 Year Time Frame



Source: United States Geological Survey Open File Report 2015-3009

Climate Change and Earthquake

Climate change is unlikely to increase earthquake frequency or strength.

Vulnerability Assessment

Vulnerability—Extremely High

Earthquake vulnerability is primarily based on population and the built environment. Urban areas in high seismic hazard zones are the most vulnerable, while more rural areas, such as Amador are less vulnerable. The primary impacts of concern are life safety and property damage. Several faults are in and near the Amador County Planning Area, and seismic hazard mapping indicates that the Planning Area has low to moderate seismic hazard potential. Depending on the location and magnitude of an earthquake event, some degree of structural damage due to stronger seismic shaking could be expected.

An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to unincorporated Amador County. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect both the entire Amador County Planning Area as well as the unincorporated portions of Amador County. How the hazard affects the other participating jurisdictions can be found in their respective annexes to this LHMP Update. These sections below include assets at risk, impacts, and how future development may affect the vulnerability of the County to this hazard.

Local Concerns (unincorporated Amador County)

The unincorporated County has certain specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce the risk and vulnerability to this hazard.

Seismic events can have particularly negative effects on older buildings constructed of unreinforced masonry (URM), including materials such as brick, concrete and stone. The Uniform Building Code (UBC) identifies four seismic zones in the United States. The zones are numbered one through four, with Zone 4 representing the highest level of seismic hazard. The UBC establishes more stringent construction standards for areas within Zones 3 and 4. All of California lies within either Zone 3 or Zone 4. Amador County is within the less hazardous Zone 3. Amador County noted there are no URM or soft story buildings in the unincorporated County.

Amador County is home to a multitude of older and/or historic buildings with limited or no retrofitting, which can exacerbate risks. The HMPC noted that the California Building Code has appropriately addressed most local concerns. The Amador County Building Official noted that the chief concern would be foundation type concerns for habitable buildings. In the more developed western portion and the Kirkwood area located in the eastern portion of the County, which are generally the most vulnerable, new development is addressed appropriately by engineers and design professionals.

Amador County OES noted that Amador County has limited public transportation and the rural nature of the County means not everyone has an opportunity to use it. Further, and also due to the rural nature of Amador County, cellular coverage is lacking, or spotty in large swaths which can complicate emergency response efforts, and/or create situations where residents do not receive emergency notifications. This could cause issues during an earthquake emergency.

Finally, the County noted that given that they are in a fairly aseismic areas, one of the major concerns is if a big earthquake hits the Bay Area or other highly populated seismically active areas. There is concern that folks there will flee to Amador. This would cause housing and sheltering issues in the County.

Local concerns for each of the jurisdictions can be found under the Local Concerns heading in each respective jurisdictional annex to this LHMP Update.

Assets at Risk

Assets at risk from earthquake include people and populations; structures; critical facilities and infrastructure and community lifelines; natural, historic, and cultural resources; and economic assets and

community activities of value. These are discussed in the following sections for the Amador County Planning Area and unincorporated Amador County.

People and Populations

All people and populations are at risk from earthquake shaking. Those at heightened risk include:

- The unsheltered
- Infants and children under age five and their caregivers
- Elderly (65 and older)
- Individuals with disabilities
- Individuals dependent on medical equipment
- Individuals with impaired mobility

The greatest risk to people and populations from earthquake is death and injury. More information on people and populations at risk to earthquake shaking events can be seen in the Hazus scenarios developed for this LHMP and described in the Hazus Analysis section below.

Structures

All structures in the Amador County Planning Area are vulnerable to earthquakes, depending on the severity and location of the shake. Older buildings, unreinforced masonry and soft story buildings are at a much greater risk to earthquakes. More information on structures at risk can be seen in the Hazus scenarios below.

Critical Facilities and Infrastructure

Earthquakes present a tremendous threat to critical facilities and infrastructure. More information on structures at risk can be seen in the Hazus scenarios below.

Natural, Historic, and Cultural Resources

The 2023 State Hazard Mitigation Plan noted that environmental problems from earthquakes can be numerous. Earthquakes can significantly damage surrounding habitats. It is also possible for earthquakes to reroute streams, which can change the water quality, possibly damaging habitat and feeding areas. Streams fed by groundwater and/or springs may dry up because of changes in underlying geology. Another threat to the environment from earthquakes is the potential release of hazardous materials. Historical and cultural resources are at risk, often due to their age and construction types. The Hazus scenarios below are relatively silent on the vulnerability to natural, historic, and cultural resources, but impacts to these resources could be long lasting.

Hazus Analysis

Earthquake losses will vary across the Amador County Planning Area depending on the source and magnitude of the event. To further evaluate potential losses associated with earthquake activity in the

Planning Area, three Hazus-MH earthquake scenarios were run for this 2025 LHMP Update as detailed below.

FEMA's Hazus model, utilizing GIS technology, estimates potential losses from earthquakes by analyzing the built environment, including buildings, infrastructure, and population, along with hazard data and damage functions. The model incorporates inventory information about buildings, infrastructure (roads, utilities, etc.), and population to assess the potential impact of a hazard. It uses hazard-specific data, such as earthquake intensity and employs damage functions that relate the intensity of the hazard to the level of damage to buildings and infrastructure based on research and historical data. By combining the inventory, hazard, and damage function data, HAZUS estimates the potential losses in terms of direct physical damage, induced damage, and direct losses (e.g., building damage, debris generation, casualty rates, economic impacts). The results of HAZUS analysis can be used to identify vulnerable areas, prioritize mitigation actions, and develop disaster preparedness plans.

Hazus-MH 6.1 was utilized to model earthquake losses for the County. Level 1 analyses were run, meaning that only the default data was used and not supplemented with local building inventory or hazard data. This is a planning level analysis.

HAZUS Level 1 Runs

General Description of the Region: Amador County, California

- The geographical size of the region is 606.83 square miles and contains 10 census tracts.
- There are over 15 thousand households in the region which has a total population of 40,474 people.
- There are an estimated 17 thousand buildings in the region with a total building replacement value (excluding contents) of 8,125 (millions of dollars). Approximately 90.00 % of the buildings (and 69.00% of the building value) are associated with residential housing.
- The replacement value of the transportation and utility lifeline systems is estimated to be 2,267 and 2,439 (millions of dollars), respectively.

Hazus Scenarios

These events were chosen from data gathered from the Amador County General Plan Safety Element and the USGS' seismic scenarios catalog. For deterministic Hazus scenarios, a single scenario event is selected based on a specific fault, the epicenter location, and the potential magnitude of the event.

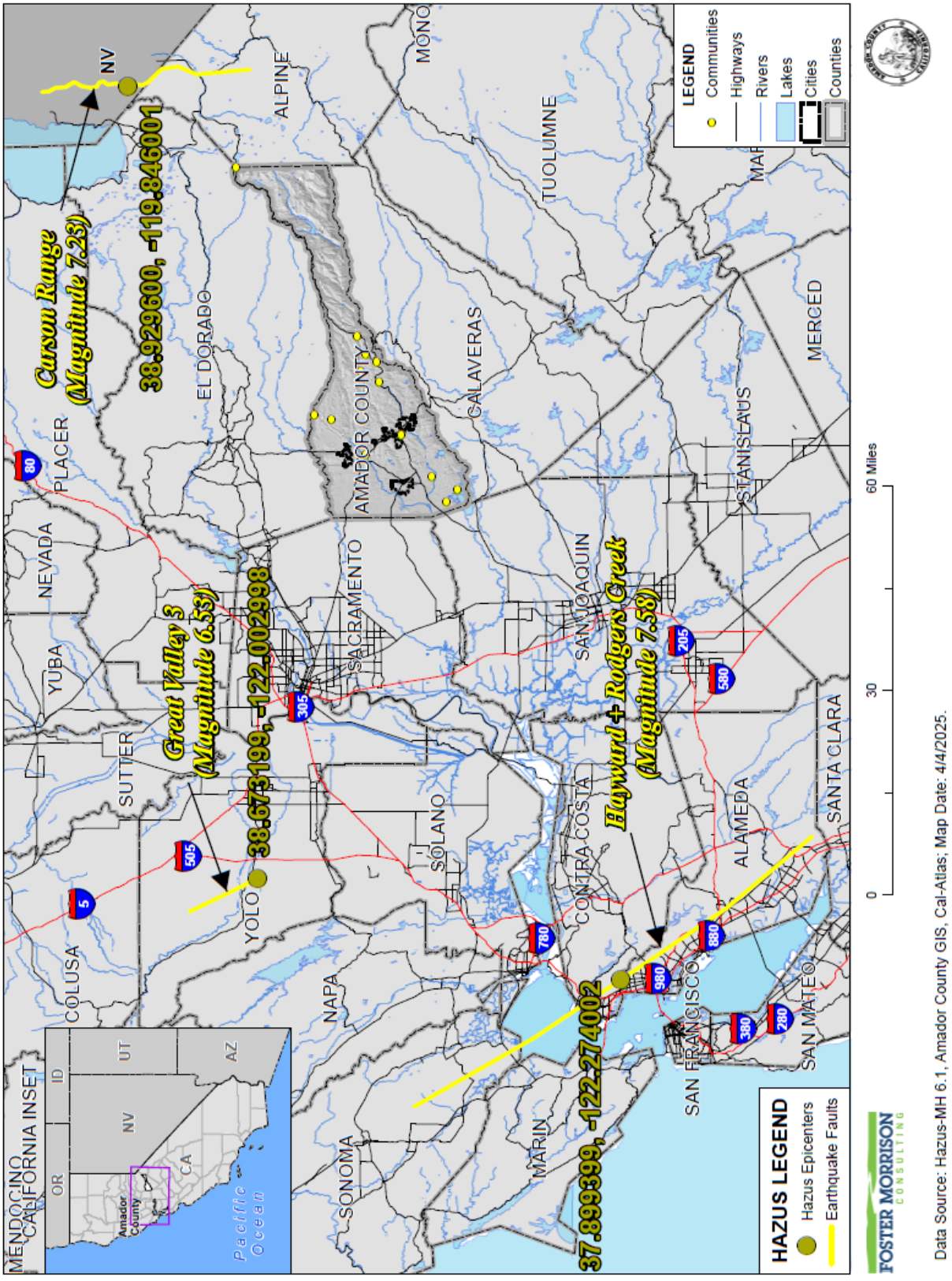
Table 4-93 Hazus Scenario Data from the USGS Earthquake Hazards Program Catalog

Hazus Fault Info	Hazus Catalog Information
Earthquake Fault	**Carson Range**
Epicenter	38.929600 , -119.846001
Scenario	Carson Range7.2M
Ruptures	Carson Range fault
Location	Carson Range-Kings Canyon fault
Magnitude	7.23
MMI	8.69

Hazus Fault Info	Hazus Catalog Information
Event ID	bssc20141285_1654_m7p23_se
Earthquake Fault	**Great Valley 3**
Epicenter	38.673199 , -122.002998
Scenario	Great Valley 03a Dunnigan Hills
Ruptures	Great Valley 03a Dunnigan Hills
Location	Great Valley 03a Dunnigan Hills
Magnitude	6.53
MMI	8.42
Event ID	bssc2014greatvalley03adunnig_m6p53_se
URL	https://earthquake.usgs.gov/scenarios/eventpage/bssc2014greatvalley03adunnig_m6p53_se/origin/detail
Earthquake Fault	**Hayward + Rodgers Creek**
Epicenter	37.899399 , -122.274002
Scenario	DETERM SH_NH_RC 7.58M EQ CT
Ruptures	Hayward: RC+HN+HS+HE
Location	Hayward: RC+HN+HS+HE
Magnitude	7.58
MMI	8.97
Event ID	bssc2014haywardrchnhsheshaw0_m7p58_se
URL	https://earthquake.usgs.gov/scenarios/eventpage/bssc2014haywardrchnhsheshaw0_m7p58_se/executive

These Hazus scenarios can be seen on Figure 4-85 and are captured in totality in Appendix H.

Figure 4-85 Amador County Planning Area – Hazus Earthquake Faults and Epicenter Locations



Carson Range Fault 7.23 Hazus Scenario

The Carson Range Fault deterministic scenario was developed utilizing data from the County General Plan and based on a seismic scenario obtained from the USGS seismic scenario catalog.

The results of the deterministic scenario are captured in Table 4-94. Key losses included the following:

- Total economic loss estimated for the earthquake was $59,140,000, which includes building losses and lifeline losses based on the Hazus-MH inventory.
- The total building-related losses were $5,870,000; 16 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 53 % of the total loss.
- 27 buildings in the County were at least moderately damaged. No buildings were completely destroyed.
- Before the earthquake, the region had 52 hospital beds available for use. On the day of the earthquake, the model estimates that only 51 hospital beds (98.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 100.00% of the beds will be back in service.
- Regardless of the time of earthquake, none had casualties.
- No households experienced a loss of potable water the first day after the earthquake.
- No households experienced a loss of electricity the first day after the earthquake.

Table 4-94 Amador County Planning Area – Carson Range Fault 7.23 Magnitude Deterministic Scenario Results

Type of Impact	Carson Range 7.23 Deterministic Scenario
Total Buildings Damaged (based on 17,747 buildings)	Slight: 231 Moderate: 26 Extensive: 1 Complete: 0
Building and Income Related Losses	$5,870,000
Total Economic Losses (Includes building, income and lifeline losses)	$59,140,000
Casualties (Based on 2 a.m. time of occurrence)	Without requiring hospitalization: 0 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0
Casualties (Based on 2 p.m. time of occurrence)	Without requiring hospitalization: 1 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0
Casualties (Based on 5 p.m. time of occurrence)	Without requiring hospitalization: 0 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0
Damage to Transportation Systems	None with at least moderate damage
Damage to Essential Facilities	None with at least moderate damage

Type of Impact	Carson Range 7.23 Deterministic Scenario	
Damage to Utility Systems	No facilities with at least moderate damage. 3 potable water line breaks, 2 wastewater line breaks, and 0 natural gas line breaks.	
Households without Power/Water Service (Based on 15,678 total households)	Power loss, Day 1: 0 Power loss, Day 3: 0 Power loss, Day 7: 0 Power loss, Day 30: 0 Power loss, Day 90: 0	Water loss, Day 1: 0 Water loss, Day 3: 0 Water loss, Day 7: 0 Water loss, Day 30: 0 Water loss, Day 90: 0
Displaced Households	0 displaced households	
Shelter Requirements	0 persons	
Debris Generation	0 tons	

Source: Hazus 6.1

Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.). The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Figure 4-86 shows the peak ground acceleration due to the Carson Range 7.23 earthquake. Figure 4-87 shows the total losses by census tract in Amador County due to the Carson Range 7.23 earthquake.

Figure 4-86 Amador County Planning Area – Carson Range 7.23 Magnitude Peak Ground Accelerations

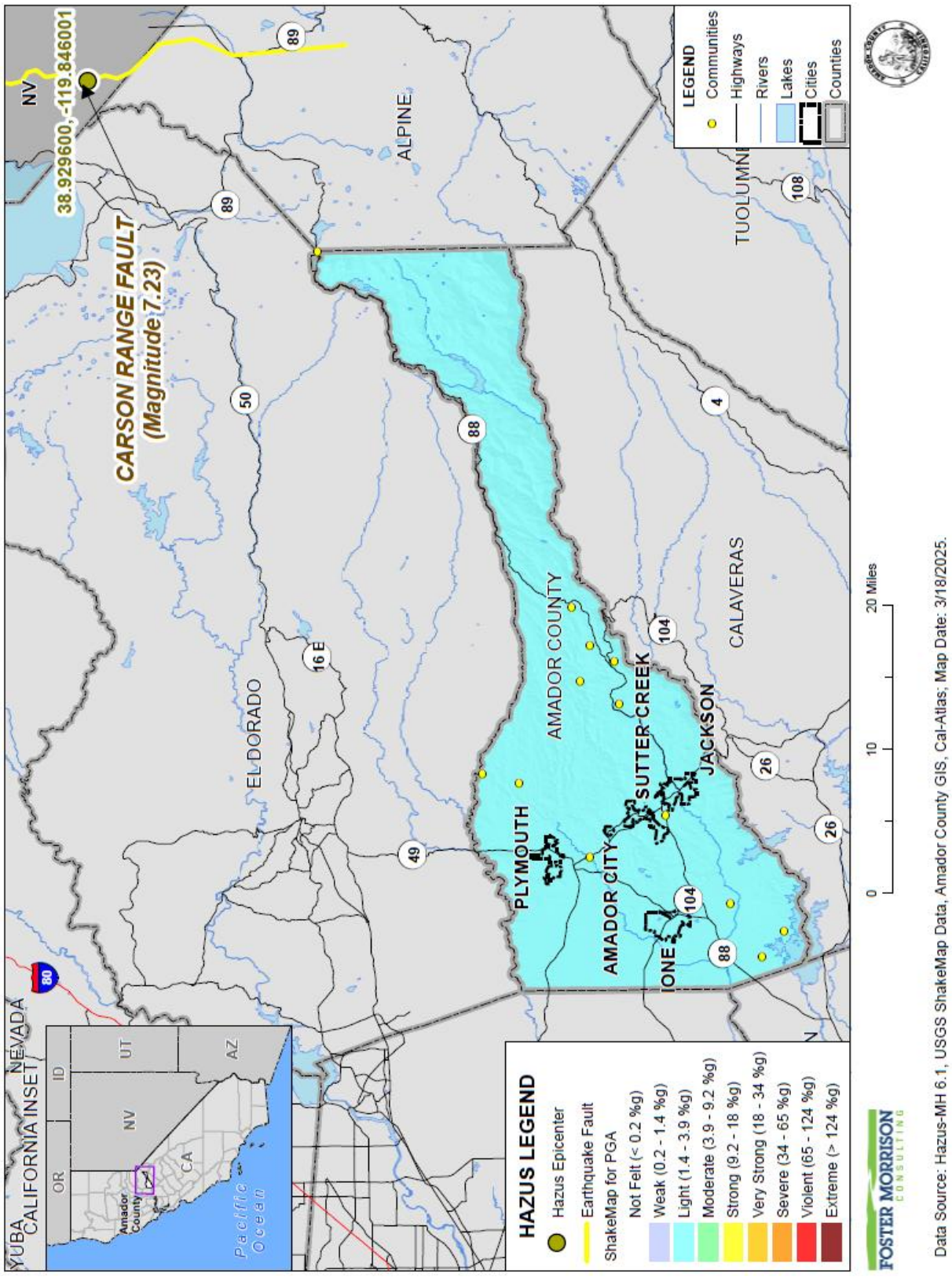
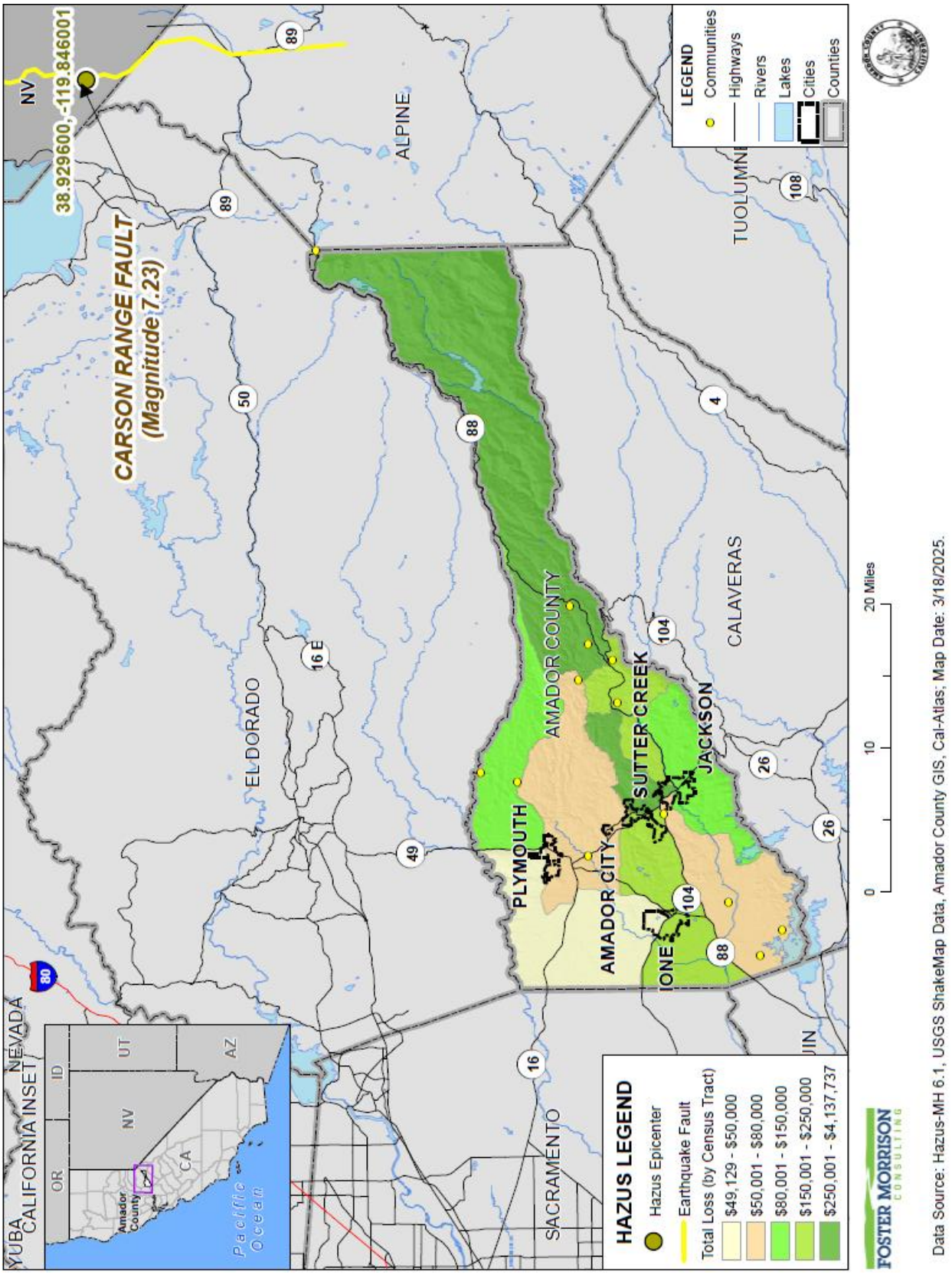


Figure 4-87 Amador County Planning Area – Carson Range 7.23 Magnitude Hazus Total Loss



Great Valley Fault 6.53 Hazus Scenario

The Great Valley Fault deterministic scenario was developed utilizing data from the County General Plan and based on a seismic scenario obtained from the USGS seismic scenario catalog.

The results of the deterministic scenario are captured in Table 4-95. Key losses included the following:

- Total economic loss estimated for the earthquake was $2,090,000, which includes building losses and lifeline losses based on the Hazus-MH inventory.
- The total building-related losses were $1,310,000; 23% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 53 % of the total loss.
- 6 buildings in the County were at least moderately damaged. No buildings were completely destroyed.
- Before the earthquake, the region had 52 hospital beds available for use. On the day of the earthquake, the model estimates that only 51 hospital beds (98.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 100.00% of the beds will be back in service.
- Regardless of the time of earthquake, none had casualties.
- No households experienced a loss of potable water the first day after the earthquake.
- No households experienced a loss of electricity the first day after the earthquake.

Table 4-95 Amador County Planning Area – Great Valley Fault 6.53 Magnitude Deterministic Scenario Results

Type of Impact	Great Valley 6.53 Deterministic Scenario
Total Buildings Damaged (based on 17,747 buildings)	Slight: 51 Moderate: 6 Extensive: 0 Complete: 0
Building and Income Related Losses	$2,090,000
Total Economic Losses (Includes building, income and lifeline losses)	$1,310,000
Casualties (Based on 2 a.m. time of occurrence)	Without requiring hospitalization: 0 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0
Casualties (Based on 2 p.m. time of occurrence)	Without requiring hospitalization: 0 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0
Casualties (Based on 5 p.m. time of occurrence)	Without requiring hospitalization: 0 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0
Damage to Transportation Systems	None with at least moderate damage
Damage to Essential Facilities	None with at least moderate damage

Type of Impact	Great Valley 6.53 Deterministic Scenario	
Damage to Utility Systems	No facilities with at least moderate damage. 1 potable water line breaks, 0 wastewater line breaks, and 0 natural gas line breaks.	
Households without Power/Water Service (Based on 15,678 total households)	Power loss, Day 1: 0 Power loss, Day 3: 0 Power loss, Day 7: 0 Power loss, Day 30: 0 Power loss, Day 90: 0	Water loss, Day 1: 0 Water loss, Day 3: 0 Water loss, Day 7: 0 Water loss, Day 30: 0 Water loss, Day 90: 0
Displaced Households	0 displaced households	
Shelter Requirements	0 persons	
Debris Generation	0 tons	

Source: Hazus 6.1

Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.). The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Figure 4-88 shows the peak ground acceleration due to the Great Valley 6.53 earthquake. Figure 4-89 shows the total losses by census tract in Amador County due to the Great Valley 6.53 earthquake.

Figure 4-88 Amador County Planning Area – Great Valley 6.53 Magnitude Hazus Peak Ground Acceleration

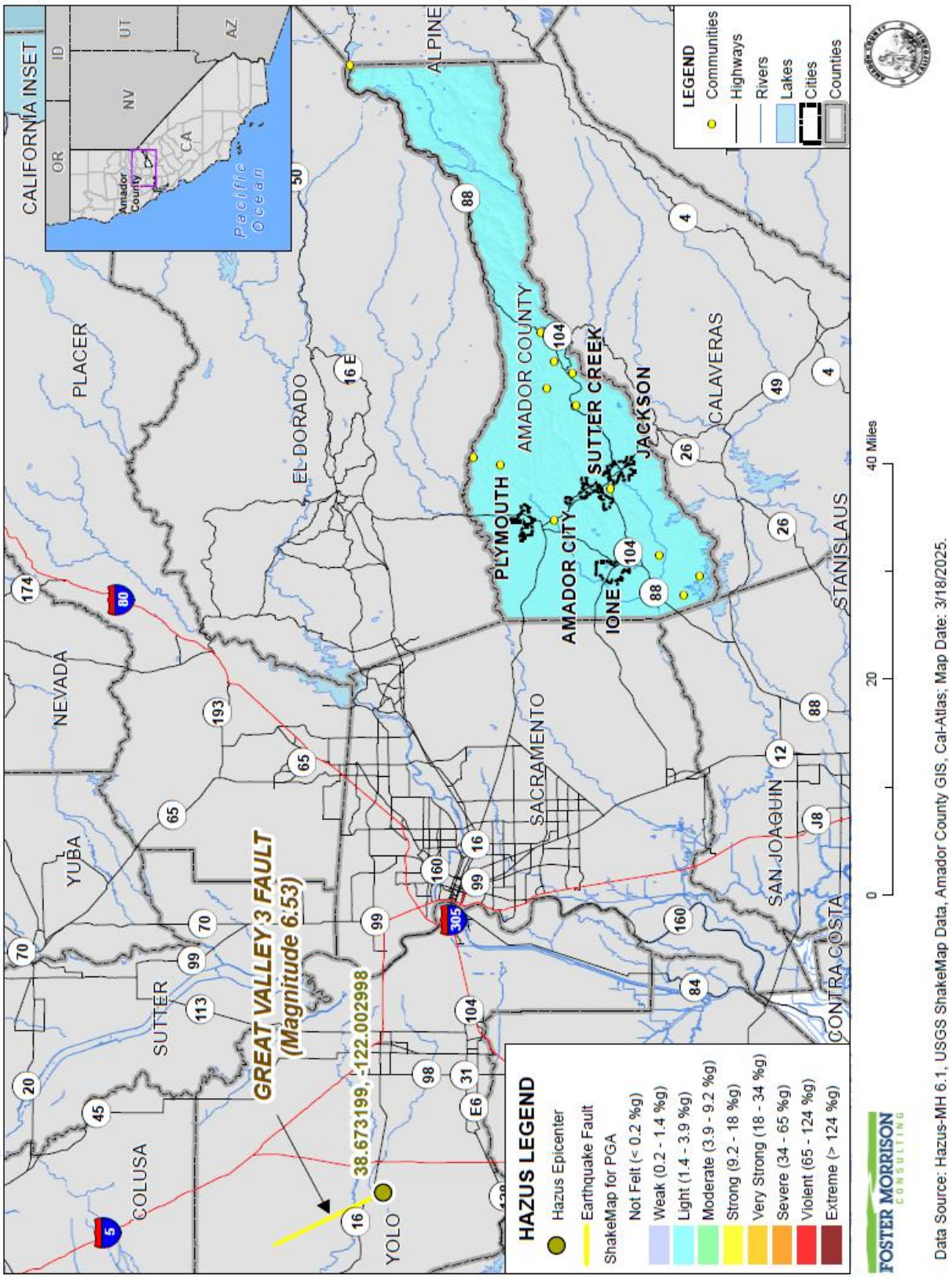
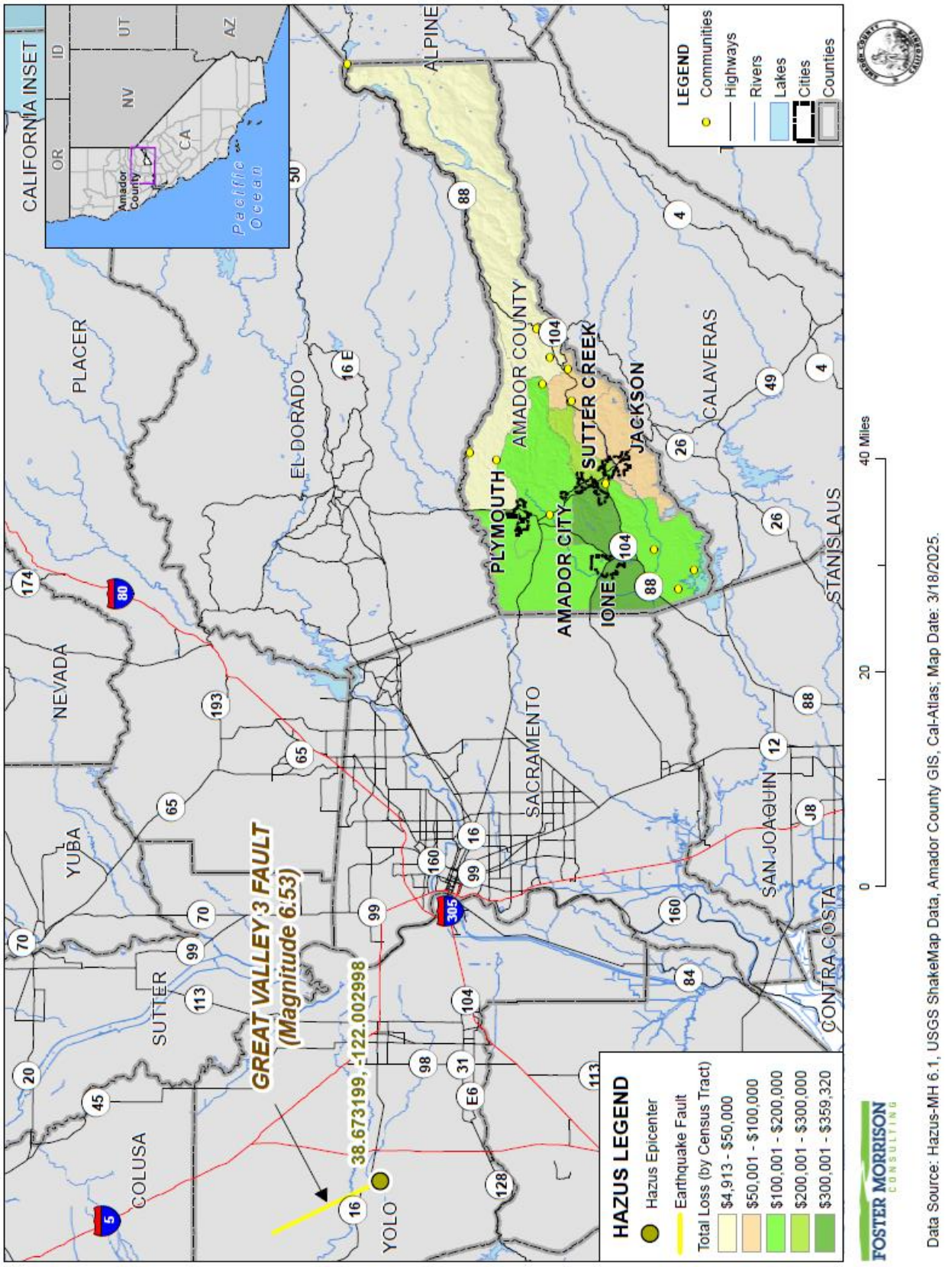


Figure 4-89 Amador County Planning Area – Great Valley 6.53 Magnitude Hazus Total Loss



Hayward + Rogers Creek 7.58 Hazus Scenario

The Great Valley Fault deterministic scenario was developed utilizing data from the County General Plan and based on a seismic scenario obtained from the USGS seismic scenario catalog.

The results of the probabilistic scenario are captured in Table 4-96. Key losses included the following:

- Total economic loss estimated for the earthquake was $9,930,000, which includes building losses and lifeline losses based on the Hazus-MH inventory.
- The total building-related losses were $3,680,000; 19% of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 53 % of the total loss.
- 27 buildings in the County were at least moderately damaged. No buildings were completely destroyed.
- Before the earthquake, the region had 52 hospital beds available for use. On the day of the earthquake, the model estimates that only 51 hospital beds (98.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 100.00% of the beds will be back in service.
- Regardless of the time of earthquake, none had casualties.
- No households experienced a loss of potable water the first day after the earthquake.
- No households experienced a loss of electricity the first day after the earthquake.

Table 4-96 Amador County Planning Area – Hayward + Rodgers Creek 7.58 Probabilistic Scenario Results

Type of Impact	Hayward + Rogers Creek 7.58 Deterministic Scenario
Total Buildings Damaged (based on 17,747 buildings)	Slight: 127 Moderate: 16 Extensive: 1 Complete: 0
Building and Income Related Losses	$5,870,000
Total Economic Losses (Includes building, income and lifeline losses)	$9,930,000
Casualties (Based on 2 a.m. time of occurrence)	Without requiring hospitalization: 0 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0
Casualties (Based on 2 p.m. time of occurrence)	Without requiring hospitalization: 0 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0
Casualties (Based on 5 p.m. time of occurrence)	Without requiring hospitalization: 0 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0
Damage to Transportation Systems	None with at least moderate damage
Damage to Essential Facilities	None with at least moderate damage

Type of Impact	Hayward + Rogers Creek 7.58 Deterministic Scenario	
Damage to Utility Systems	No facilities with at least moderate damage. 3 potable water line breaks, 1 wastewater line breaks, and 0 natural gas line breaks.	
Households without Power/Water Service (Based on 15,678 total households)	Power loss, Day 1: 0 Power loss, Day 3: 0 Power loss, Day 7: 0 Power loss, Day 30: 0 Power loss, Day 90: 0	Water loss, Day 1: 0 Water loss, Day 3: 0 Water loss, Day 7: 0 Water loss, Day 30: 0 Water loss, Day 90: 0
Displaced Households	0 displaced households	
Shelter Requirements	0 persons	
Debris Generation	0 tons	

Source: Hazus 6.1

Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.). The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Figure 4-86 shows the peak ground acceleration due to the Hayward + Rodgers Creek 7.58 earthquake. Figure 4-91 shows the total losses by census tract in Amador County due to the Hayward + Rodgers Creek 7.58 earthquake.

Figure 4-90 Amador County Planning Area – Hayward + Rogers Creek 7.58 Magnitude Hazus Peak Ground Acceleration

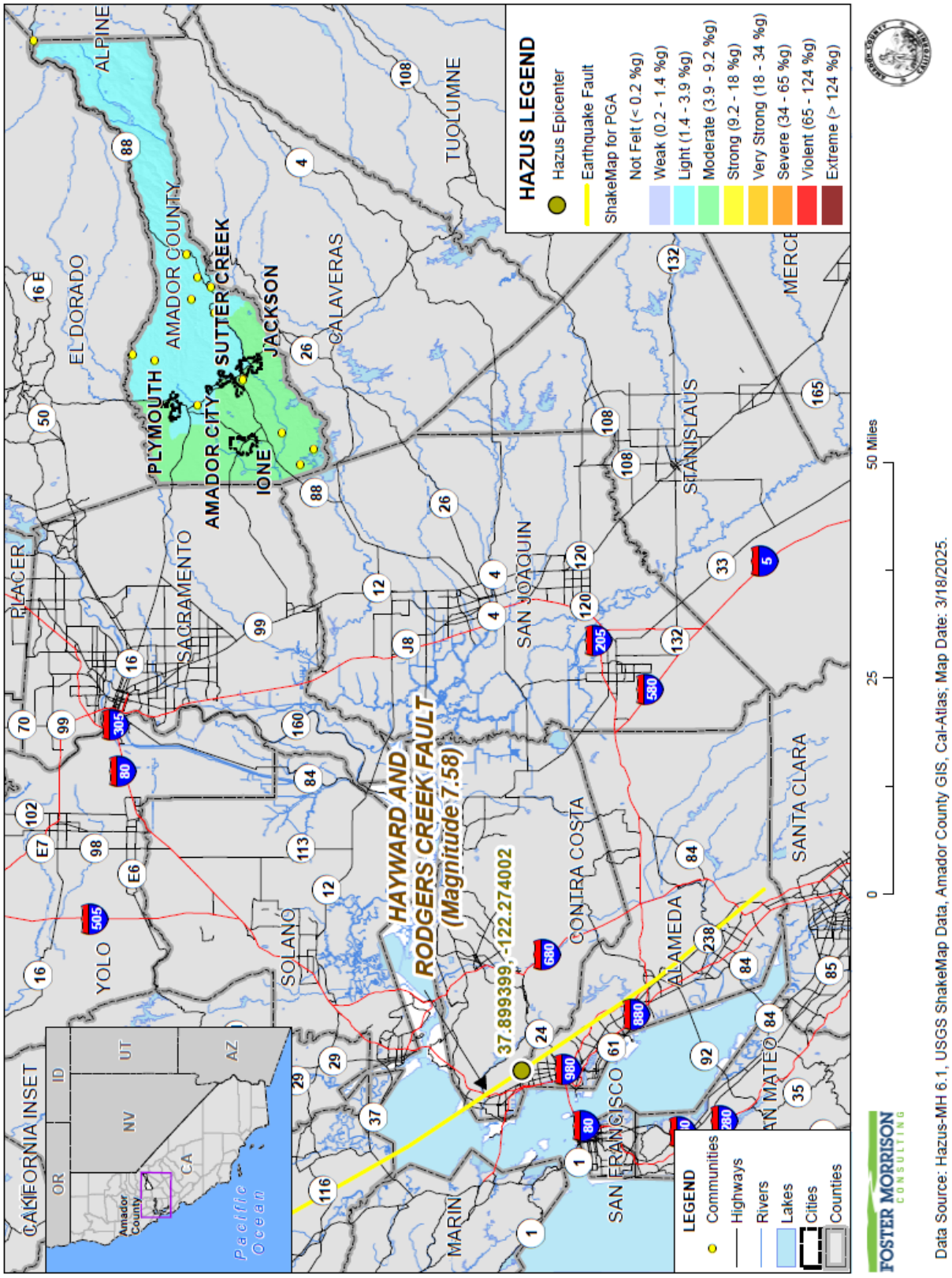
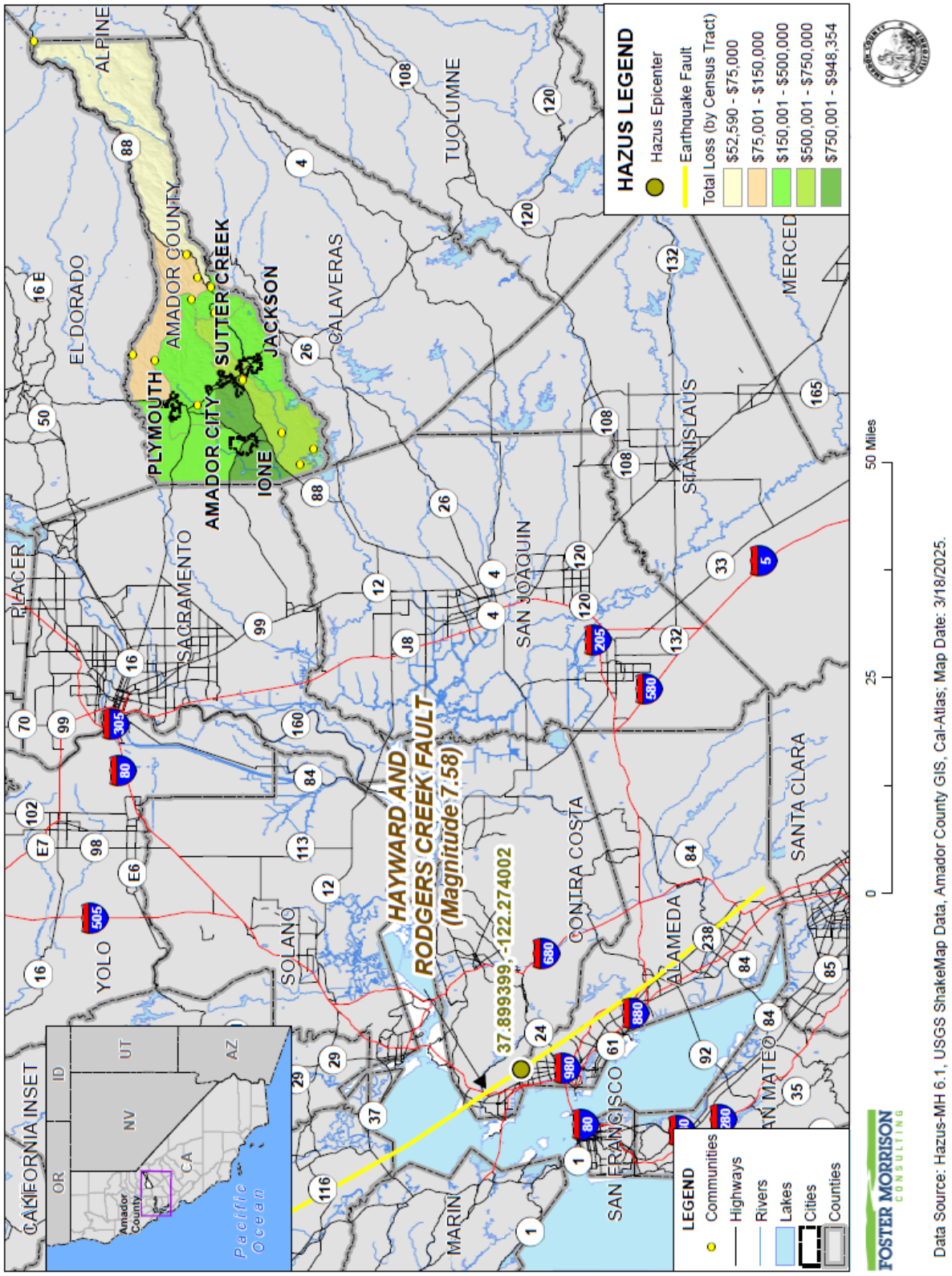


Figure 4-91 Amador County Planning Area – Hayward + Rogers Creek 7.58 Magnitude Hazus Total Loss



Hazus Scenario Comparisons

A comparison of the results of the three Hazus scenarios is shown on Table 4-97. Each of these reports are shown in their totality in Appendix H.

Table 4-97 Amador County – Comparison of Hazus Scenarios

Type of Impact	Carson Range 7.23 Deterministic Scenario		Great Valley 6.53 Deterministic Scenario		Hayward + Rogers Creek 7.58 Deterministic Scenario	
Total Buildings Damaged (based on 17,747 buildings)	Slight: 231 Moderate: 26 Extensive: 1 Complete: 0		Slight: 51 Moderate: 6 Extensive: 0 Complete: 0		Slight: 127 Moderate: 16 Extensive: 1 Complete: 0	
Building and Income Related Losses	$5,870,000		$2,090,000		$5,870,000	
Total Economic Losses (Includes building, income and lifeline losses)	$59,140,000		$1,310,000		$9,930,000	
Casualties (Based on 2 a.m. time of occurrence)	Without requiring hospitalization: 0 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0		Without requiring hospitalization: 0 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0		Without requiring hospitalization: 0 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0	
Casualties (Based on 2 p.m. time of occurrence)	Without requiring hospitalization: 1 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0		Without requiring hospitalization: 0 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0		Without requiring hospitalization: 0 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0	
Casualties (Based on 5 p.m. time of occurrence)	Without requiring hospitalization: 0 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0		Without requiring hospitalization: 0 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0		Without requiring hospitalization: 0 Requiring hospitalization: 0 Life threatening: 0 Fatalities: 0	
Damage to Transportation Systems	None with at least moderate damage		None with at least moderate damage		None with at least moderate damage	
Damage to Essential Facilities	None with at least moderate damage		None with at least moderate damage		None with at least moderate damage	
Damage to Utility Systems	No facilities with at least moderate damage. 3 potable water line breaks, 2 wastewater line breaks, and 0 natural gas line breaks.		No facilities with at least moderate damage. 1 potable water line breaks, 0 wastewater line breaks, and 0 natural gas line breaks.		No facilities with at least moderate damage. 3 potable water line breaks, 1 wastewater line breaks, and 0 natural gas line breaks.	
Households without Power/Water Service (Based on 15,678 total households)	Power loss, Day 1: 1,427 Power loss, Day 3: 802	Water loss, Day 1: 0 Water loss, Day 3: 0	Power loss, Day 1: 0 Power loss, Day 3: 0	Water loss, Day 1: 0 Water loss, Day 3: 0	Power loss, Day 1: 0 Power loss, Day 3: 0	Water loss, Day 1: 0 Water loss, Day 3: 0

Type of Impact	Carson Range 7.23 Deterministic Scenario		Great Valley 6.53 Deterministic Scenario		Hayward + Rogers Creek 7.58 Deterministic Scenario	
	Power loss, Day 7: 272 Power loss, Day 30: 16 Power loss, Day 90: 2	Water loss, Day 7: 0 Water loss, Day 30: 0 Water loss, Day 90: 0	Power loss, Day 7: 0 Power loss, Day 30: 0 Power loss, Day 90: 0	Water loss, Day 7: 0 Water loss, Day 30: 0 Water loss, Day 90: 0	Power loss, Day 7: 0 Power loss, Day 30: 0 Power loss, Day 90: 0	Water loss, Day 7: 0 Water loss, Day 30: 0 Water loss, Day 90: 0
Displaced Households	0 displaced households		0 displaced households		0 displaced households	
Shelter Requirements	0 persons		0 persons		0 persons	
Debris Generation	0 tons		0 tons		0 tons	

Source: Hazus 6.1

FEMA NRI Hazard Vulnerability Assessment

The FEMA NRI was queried for additional specific data on Amador County's vulnerability to earthquakes. The NRI contains data and analysis for 18 separate natural hazards, including earthquakes. As shown in Table 4-98, earthquakes could cause a total of $1,188,592 in expected annual losses, with a historic loss rating of relatively low. Earthquake has a relatively moderate rating for both social vulnerability and community resilience, with a risk index score of 82.4 out of 100. According to the NRI, there have been 0 earthquake events during the 2021 dataset with a 0.32% annual chance per year.

Table 4-98 Amador County Planning Area – Earthquake Vulnerability Ratings from FEMA NRI

NRI Hazard	Hazard Risk Index Rating*	Expected Annual Loss Values (total)**	Exposure Value (total)***	Historic Loss Ratio Rating
Earthquake	82.4	$1,188,592	$477,624,156,000	Relatively Low

Source: FEMA NRI Report, retrieved 4/1/2025.

*Hazard Risk Index is calculated using data for only a single hazard type, and reflect a communities expected annual los value, community risk factors, and the adjustment factor used to calculate the risk value.

**Expected annual loss represents the average economic loss in dollars resulting from natural hazards each year.

***Exposure is a natural hazard consequence factor that is the representative value of buildings, populations, or agriculture potentially exposed to a natural hazard occurrence.

Additional information on the FEMA NRI can be found in Section 4.2 and Appendix G.

Impacts from Earthquake

Earthquakes can strike without warning and cause dramatic changes to the landscape of an area that can have devastating impacts on the built environment. The greatest impact is to life safety of Amador County residents and visitors. Earthquakes can cause loss of life and injuries in affected areas. Other impacts to the Amador County Planning Area would include damages to infrastructure such as roads, bridges, and dams; damages and loss of services to utilities and critical infrastructure, including those related to gas, power, water, wastewater and communication systems; and damages to structures and other development.

Earthquakes can also cause failure of dams, levees, and reservoirs. Facilities and land downslope from dams or water reservoirs or behind levees might be subject to flooding, if the dams, reservoirs, or levees fail as a result of an earthquake. The County has locations with significant flood risk that include facilities downslope from dams or reservoirs or behind levees.

Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future hazard conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for Amador County include the following:

- Climate change is likely to have no effect on future earthquake conditions and associated impacts and vulnerability of the County.
- Population growth in Amador County has recently slowed, but is expected to continue slowly going forward. Any additional growth in the County would place additional populations at risk to earthquake. Additional population growth would likely bring continued diversity to the County. Vulnerable population groups could face disproportionate effects from an earthquake and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the County to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. County building codes are in effect to reduce structure damage, including damage to critical facilities and infrastructure, and should be updated as necessary to continue to address future earthquake conditions. Depending on the location of new development and adherence to protective building codes, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the County to this hazard.

Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements, such as building codes, are followed, and varying needs for different demographic groups with intersecting identities that reside within the County are considered can help to make for a more resilient community. Although new growth and development corridors would

fall in the area affected by earthquake, given the small chance of major earthquake and the building codes in effect, development in the earthquake area will continue to occur.

4.3.12. Flood: 1%/0.2% Annual Chance (w/Levee Failure)

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Amador County Planning Area. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; likelihood of future occurrence, and how climate change can affect or influence this hazard.

Hazard/Problem Description

Flooding is the rising and overflowing of a body of water onto normally dry land. Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Floods can cause substantial damage to structures, landscapes, and utilities and can cause life safety issues. Floods can be extremely dangerous. Six inches of moving water can knock over a person given a strong current. A car will float in less than two feet of moving water and can be swept downstream into deeper waters. Floods kill more people trapped in vehicles than anywhere else.

During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Floodwaters can transport large objects downstream which can damage or remove stationary structures, such as dam spillways. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services. Standing water can cause damage to crops, roads, foundations, and electrical circuits. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Where flooding occurs in populated areas, warning and evacuation will be of critical importance to reduce life and safety impacts from any type of flooding.

There are three primary types of freshwater flood events in the Amador County Planning Area: riverine and lake, flash flooding, and urban stormwater. Regardless of the type of flood, the cause is often the result of severe weather and excessive rainfall, either in the flood area or upstream reaches.

- **Riverine flooding** – Riverine flooding, defined as when a watercourse exceeds its "bank-full" capacity, generally occurs as a result of prolonged rainfall, or rainfall that is combined with already saturated soils from previous rain events. This type of flood occurs in river systems whose tributaries may drain large geographic areas and include one or more independent river basins. The onset and duration of riverine floods may vary from a few hours to many days. Factors that directly affect the amount of flood runoff include precipitation amount, intensity and distribution, the amount of soil moisture, seasonal variation in vegetation, snow depth, and water-resistance of the surface due to urbanization. In the Amador County Planning Area, riverine flooding is largely caused by heavy and continued rains, sometimes combined with snowmelt, and heavy flow from tributary streams. These intense storms can overwhelm the local waterways as well as the integrity of flood control structures. The warning time associated with slow rise floods assists in life and property protection.

- The term "**flash flood**" describes localized floods of great volume and short duration. In contrast to riverine flooding, this type of flood usually results from heavy rainfall on a relatively small drainage area. Precipitation of this sort usually occurs in the winter and spring. Flash floods often require immediate evacuation within the hour.
- **Stormwater/Urban** flood events have increased as land has been converted from fields or woodlands to roads and parking lots and lost its ability to absorb rainfall. Urbanization increases runoff by two to six times that of natural terrain. This is discussed in the Section 4.3.13 below.

In addition to the three types of flood events, there are two other types of flooding in Amador County: levee failure flooding and dam failure flooding. Regardless of the type of flood, the cause is often the result of severe weather and excessive rainfall, either in the flood area or upstream reach. The potential for flooding can change and increase through various land use changes and changes to land surface, resulting in a change to the floodplain. Environmental changes can create localized flooding problems in and outside of natural floodplains by altering or confining natural drainage channels. These changes are most often created by human activity.

Levee Failure

Levee failure flooding – A type of riverine flooding in Amador County is levee failure flooding. Levees reinforce the banks and help prevent flooding by containing higher flow events to the main stream channel. By confining the flow to a narrower steam channel, levees can also increase the speed of the water. Levees can be natural or man-made. A natural levee is formed when sediment settles on the stream bank, raising the level of the land around the stream. Levees provide strong flood protection, but they are not failsafe. Levees are designed to protect against a specific flood level and could be overtopped during severe weather events or dam failure. Levees reduce, not eliminate, the risk to individuals and structures located behind them. In the 2016 Amador County Flood Insurance Study, FEMA determined that there are no certified levees (i.e., levees providing 1% annual chance level of protection) that exist within Amador County. The FIS did note that although flood protection levees were built by the USACE along Sutter Creek in the City of Ione, the levees were not certified as providing protection from the 1% percent annual chance flood. In addition, flood and erosion-control retaining walls are located along Sutter Creek near the intersection of Preston and Main Streets; however, these structures also do not provide protection from the 1-percent annual chance flood. More information can be found in Ione's annex to this LHMP Update.

Dam Failure

The Amador County Planning Area is also at risk to flooding resulting from dams. Dam failure flooding is discussed separately in Section 4.3.9 of this document.

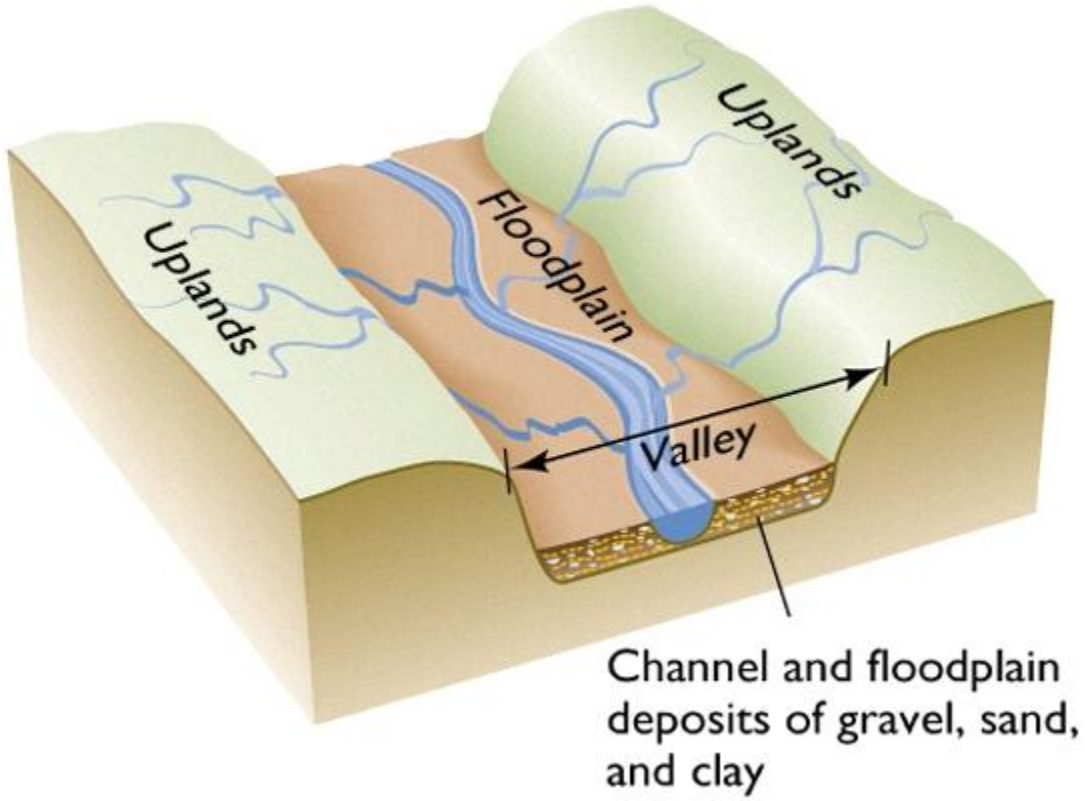
Location and Extent

Floodplains

The area adjacent to a channel is the floodplain (see Figure 4-92). Floodplains are illustrated on inundation maps, which show areas of potential flooding and water depths. In its common usage, the floodplain most often refers to that area that is inundated by the 1% annual chance (or 100-year) flood, the flood that has a one percent chance in any given year of being equaled or exceeded. The 1% annual chance flood is the

national minimum standard to which communities regulate their floodplains through the National Flood Insurance Program. The 500-year flood is the flood that has a 0.2% chance of being equaled or exceeded in any given year. The potential for flooding can change and increase through various land use changes and changes to land surface, which result in a change to the floodplain. A change in environment can create localized flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. These changes are most often created by human activity.

Figure 4-92 Floodplain Schematic



Source: FEMA

Hydrologic Regions

According to Cal DWR, California has 10 hydrologic regions. Amador County sits in the San Joaquin hydrologic region. This region encompasses the middle portion of the Central Valley bounded by the Sierra Nevada Mountains, the Coast Range, the divide between the American and Cosumnes river watersheds, and the divide between the San Joaquin and Kings River watersheds. The region also includes portions of the Sacramento-San Joaquin Delta. Although predominantly agricultural, this region has experienced increased urbanization in recent years and is subject to flooding from winter storm events and snowmelt.

A map of California's hydrological regions is provided in Figure 4-93.

Figure 4-93 California Hydrologic Regions

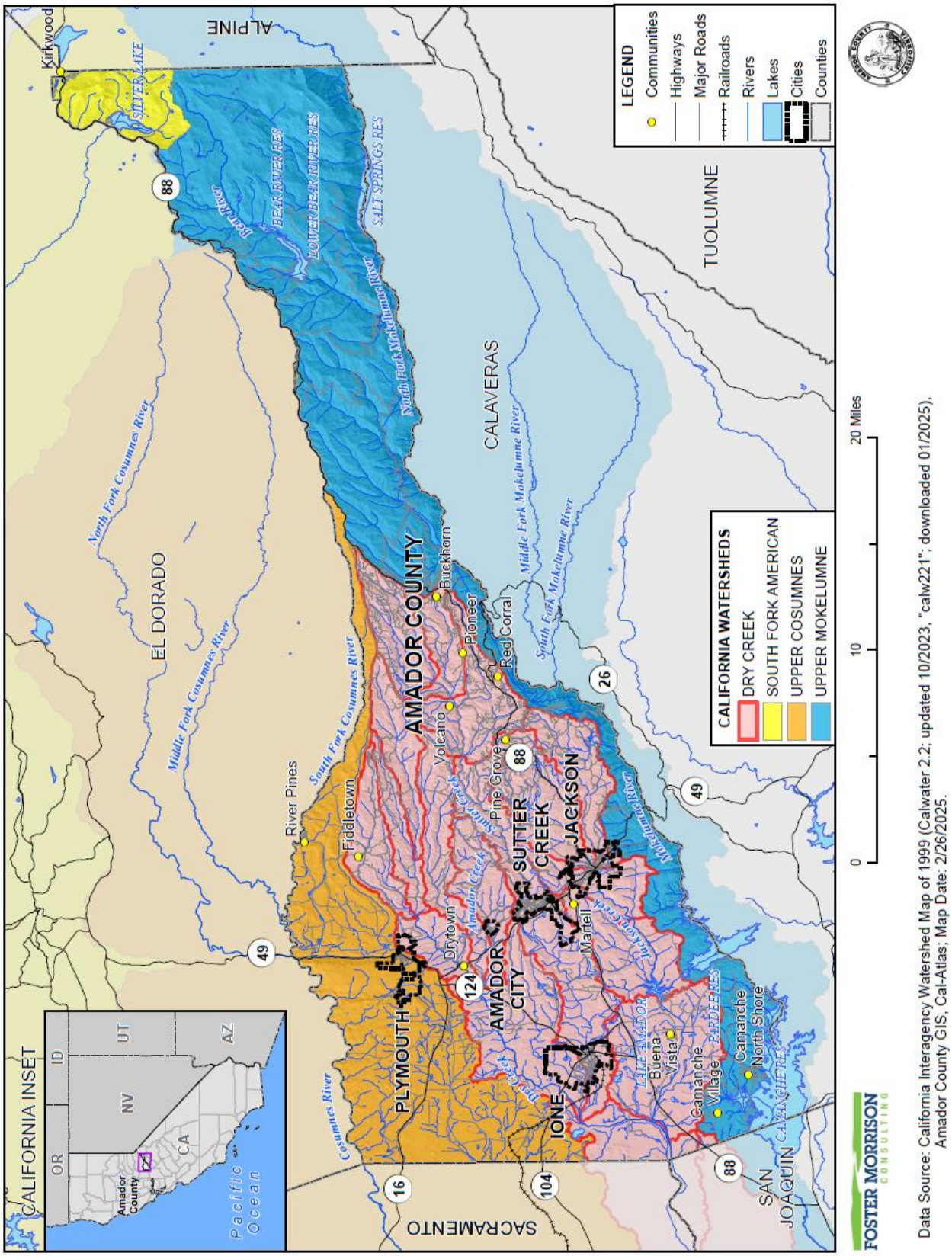
Source: California Department of Water Resources

The Amador County Waterway System

Amador County encompasses multiple rivers, streams, creeks, and associated watersheds. Amador County crosses three watersheds. Figure 4-94 illustrates the primary watersheds of Amador County, as well as the primary waterways in the County. These include the following watersheds:

- Dry Creek Watershed
- Mokelumne Creek
- Cosumnes Watershed

Figure 4-94 Primary Watersheds and Waterways of Amador County



Dry Creek Watershed

The Dry Creek watershed, an integral part of the Bay Delta System, covers more than 300 square miles, including 128 miles of streams, between the Upper Mokelumne River watershed and the Upper Cosumnes River, primarily in Amador County. The Creek flows west/southwest through the western slope of the foothills, joining with its two major tributaries, Sutter Creek and Jackson Creek along the way. It then flows to the floor of the Central Valley, just east of the town of Thornton (west of the City of Galt) where it empties into the Mokelumne River, while the Cosumnes River, enters the Mokelumne River approximately six miles downstream. The Mokelumne River then enters the complex network of tidally-influenced rivers and sloughs of the Sacramento-San Joaquin Delta. The delta waters eventually empty into the San Francisco Bay.

The majority of the Dry Creek Watershed is located in Amador County, but the lower elevation is split between Sacramento County on the north and San Joaquin County on the south. Incorporated cities within the watershed include Jackson, Sutter Creek, Amador City, and Ione in Amador County, and Galt in Sacramento County.

Streams in the Dry Creek Watershed are almost completely unregulated, except for several small dams and reservoirs on sub-watersheds. Lake Amador, located on the Jackson Creek south of the City of Ione, is the only significant dam and reservoir in the watershed with a capacity of 22,000 acre-feet. Lake Tabeaud (located on the South Fork of Jackson Creek), belongs to PG&E, and is the fore bay to the Electra Power House.

Most of the water served to Amador County's five cities flows through PG&E's Mokelumne River hydro-electric power facilities then passes through Lake Tabeaud and a piped conveyance and treatment system.

Another small dam and reservoir (50 acre-feet) New York Reservoir, is located on a tributary to Jackson Creek. It was part of the Amador Canal system.

Mokelumne Watershed

The Mokelumne River Watershed in Amador, Calaveras and Alpine Counties is a significant source of water for both consumption and energy production. The major land use in the upper watershed, owned both privately and publicly, is timber management. The cumulative effects of timber harvest on the beneficial downstream uses of water in this area have developed into an issue of growing importance. The East Bay Municipal Utility District (EBMUD) provides drinking water for 1.1 million customers in the San Francisco East Bay Area. The source of supply is the 585 square mile Mokelumne River watershed in the central Sierras. Runoff from the watershed is impounded in Pardee Reservoir, located in Amador and Calaveras counties, and is transported across the Central Valley by three aqueducts.

The Mokelumne River Basin is a relatively narrow and steep watershed. Elevations range from 570 feet at Pardee Dam to about 10,400 feet on the highest peaks within the basin. Annual precipitation and stream flow in the Mokelumne River Basin are extremely variable from month to month and from year to year. Most precipitation normally falls between November and May and very little falls between late spring and late fall. Peak flows in the Mokelumne River normally occur during winter storms or during the spring snowmelt season from March through June. Flows taper off to a minimum in late summer or fall. Snowmelt

from parts of Alpine, Amador, and Calaveras counties contribute to the Mokelumne River. The primary tributaries are the North, Middle and South Forks of the Mokelumne River, with the North Fork tributary draining over 80 percent of the Mokelumne watershed. Lesser tributaries include Summit Creek, Bear Creek, Cole Creek, Moore Creek, Blue Creek, Tiger Creek, Panther Creek, Forest Creek and Licking Fork.

The majority of the Mokelumne River watershed consists of open space and forest land with small concentrations of residential development and large tracts of designated wilderness. There are small agriculture areas, mainly orchards and vineyards, and several areas of recreational developments (including winter sports facilities). The watershed contains little area devoted to industrial or commercial use.

Historic impacts to the watershed include gold mining, deforestation, and livestock grazing. Current impacts include logging, grazing, deliberate and incidental toxic substance dumping, loss of wildlife habitat, low flow water quality, recreation, roadways, residential development, domestic wastes, and more. Efforts have been taken by the Upper Mokelumne River Watershed Authority (UMRWA) to better manage the watershed, including improving overall water quality.

Cosumnes Watershed

The Cosumnes River Watershed includes Amador, El Dorado and Sacramento Counties and drains a total of 936 square miles. The Cosumnes River, at a length of 80 miles, is considered the last untamed, free flowing river system west of the Sierra Nevada Mountains. The river has a natural flow regime, drying up in drought years and flooding in wet years. In the Upper Cosumnes River Watershed, beginning at approximately 7,600 feet msl in the Sierra Nevada Range, the river flows through bedrock formations, confining the river to basically a permanent channel. In the Lower Watershed, the river has meandered over time leaving behind deposits of fertile soil resulting in the creation of wetlands and streamside riparian habitat. The South Fork of the Cosumnes River runs through northern Amador County. The watershed empties into the Mokelumne River and is an integral part of the Sacramento Bay/Delta ecosystem.

In the early 1900's, agriculturists began intensively farming and ranching the land throughout the lower watershed. Levees were established along the river to help contain the occasional high flow event, allowing the land to be farmed year-round. This pattern of land use remained relatively constant through the last decade; however, flooding has become a more significant issue with the increased cost and value of agricultural operations. In addition to agriculture, a significant number of homes, communities, business, roads, and other infrastructure exist within the watershed. Privately owned levees, originally built to control flooding, have over time become aged and less stable. A break in a levee along the Cosumnes today not only impacts agricultural lands but results in flooded homes and businesses as well as damage to public roads, utilities, transportation, and emergency services. Impacts to the Southern California water supply may also occur. The USACE conducted a Reconnaissance Study of the lower watershed in 1999 and identified several issues including levee failure and flooding; erosion and channel incision; excessive sediment transport and degradation of the riverbed; constriction of the floodplain; isolation of the floodplain from the river channel; reduction of flows in summer and fall; and loss of aquatic and riparian habitat.

River flows are almost entirely a result of rainfall. Only 16 percent of the watershed lies above 5,000 feet; therefore, snowmelt contributes very little to stream flows. The river flows year-round in the upper watershed; however, in the lower watershed, flows are intermittent during the summer. Flooding on the

Cosumnes usually occurs November through April, generally as a result of heavy rains. According to the Cosumnes River Task Force Plan, peak flow years include: 1907, 1950 (27,600 cfs), 1955 (42,000 cfs), 1958 (29,300 cfs), 1963 (39,400 cfs), 1964 (37,500 cfs), 1980 (34,200), 1982 (37,000 cfs), 1986 (45,000 cfs), and 1997 (93,000 cfs). According to the 1999 study, the levees can hold a 5-year storm event of approximately 20,000 cfs. Flooding frequency is the greatest near the confluence with the Mokelumne; although most of the areas surrounding the river experience occasional or rare flooding frequency.

In 1997, the Cosumnes River Watershed experienced the largest flood event on record. Peak discharge was 93,000 cfs, 47,900 cfs more than the previously recorded high flow event of 1986. Approximately 34,000 acres of primarily farmland was inundated. Almost $7 million dollars in business losses occurred to orchards, vineyards, row and field crops and dairies. Agricultural losses to private property were estimated at $13 million. Most of the 1997 flood damage was associated with levee breaks. 82 homes or structures valued at $1.7 million were also damaged during the 1997 flood. Many bridges and roads were impassible and many incurred varying degrees of damage.

Amador County Flood Mapping

As part of the County's ongoing efforts to identify and manage their flood prone areas, Amador County relies on a variety of different mapping and related efforts. What follows is a brief description of FEMA and DWR mapping efforts covering the Amador County Planning Area.

FEMA Floodplain Mapping

FEMA established standards for floodplain mapping studies as part of the National Flood Insurance Program (NFIP). The NFIP makes flood insurance available to property owners in participating communities adopting FEMA-approved local floodplain studies, maps, and regulations. Floodplain studies that may be approved by FEMA include federally funded studies; studies developed by state, city, and regional public agencies; and technical studies generated by private interests as part of property annexation and land development efforts. Such studies may include entire stream reaches or limited stream sections depending on the nature and scope of a study. A general overview of floodplain mapping is provided in the following paragraphs. Details on the NFIP and mapping specific to the County is detailed in the Vulnerability Assessment below.

Flood Insurance Study (FIS)

The FIS develops flood-risk data for various areas of the community that will be used to establish flood insurance rates and to assist the community in its efforts to promote sound floodplain management. The current Amador County FIS is dated 1/20/2016. This study covers both the unincorporated and incorporated areas of the County.

Flood Insurance Rate Map (FIRM)

The FIRM is designed for flood insurance and floodplain management applications. For flood insurance, the FIRM designates flood insurance rate zones to assign premium rates for flood insurance policies. For floodplain management, the FIRM delineates 1% and 0.2% annual chancer floodplains, floodways, and the locations of selected cross sections used in the hydraulic analysis and local floodplain regulation. The

County FIRMs have been replaced by digital flood insurance rate maps (DFIRMs) as part of FEMA's Map Modernization program, which is discussed further below.

Letter of Map Revision (LOMR) and Map Amendment (LOMA)

LOMRs and LOMAs represent separate floodplain studies dealing with individual properties or limited stream segments that update the FIS and FIRM data between periodic FEMA publications of the FIS and FIRM.

Levee Considerations in Floodplain Mapping

Also, as part of FEMA's Map Modernization program, FEMA is mapping levees within communities, with a primary focus on maps determined to provide a 1% annual chance level of flood protection.

In August of 2005, FEMA Headquarters' issued Memo 34 Interim Guidance for Studies Including Levees. This memo recognizes the risk and vulnerability of communities with levees. The memo mandates the inclusion of levee evaluations for those communities that are undergoing map changes such as the conversion to DFIRMs. No maps can become effective without an evaluation of all levees within a community against the criteria set forth in 44 CFR 65.10 Mapping of Areas Protected by Levee Systems. Generally, these levee certification requirements include evaluations of freeboard, geotechnical stability and seepage, bank erosion potential due to currents and waves, closure structures, operations and maintenance, and wind wet and wave run-up. In short, these guidelines require certification of levees before crediting any levee with providing protection from the 1 percent annual event (e.g., the 100-year flood).

In Amador County, similar to other locations in California, levees and flood control facilities have been built and are maintained variously by public and private entities, including reclamation, irrigation and flood control districts, other state and local agencies, and private interests. Many of these facilities were constructed with flood control as secondary or incidental to their primary purpose, so are not considered as providing protection from the 1% annual chance or greater flood.

Digital Flood Insurance Rate Maps (DFIRM)

As part of its Map Modernization program, FEMA is converting paper FIRMS to digital FIRMs, DFIRMS. These digital maps:

- Incorporate the latest updates (LOMRs and LOMAs);
- Utilize community supplied data;
- Verify the currency of the floodplains and refit them to community supplied basemaps;
- Upgrade the FIRMs to a GIS database format to set the stage for future updates and to enable support for GIS analyses and other digital applications; and
- Solicit community participation.

DFIRMs for Amador County have been developed and most current Effective DFIRMs for Amador County are dated January 20, 2016, and are being used for the flood analysis for this LHMP Update. The DFIRM is shown in Figure 4-95, and DFIRM flood zones are shown on Table 4-99.

Figure 4-95 Amador County - DFIRM

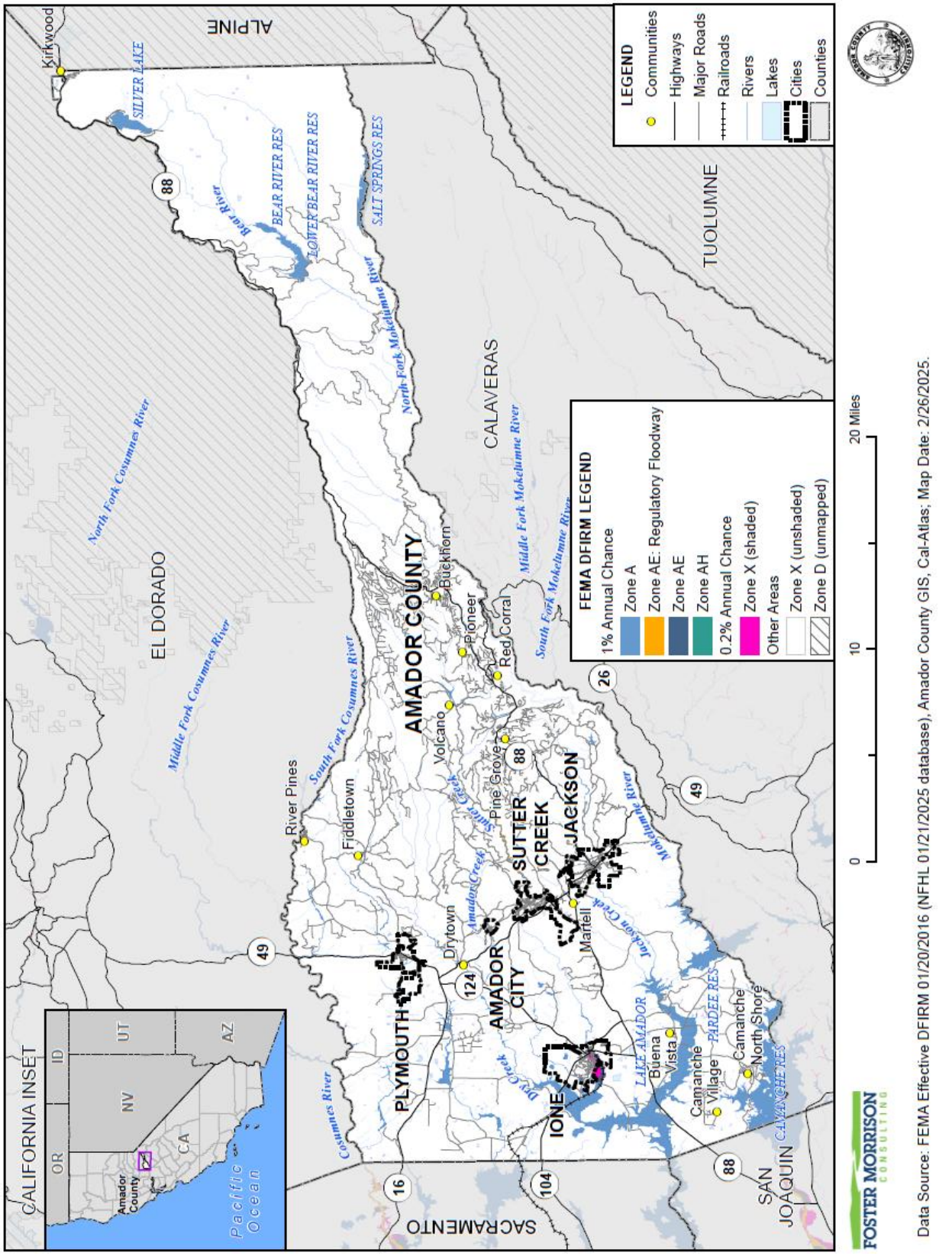


Table 4-99 Amador County – FEMA DFIRM Flood Zones by Jurisdiction

Flood Zone	Description	Present in City of Amador City	Present in City of Ione	Present in City of Jackson	Present in City of Plymouth	Present in City of Sutter Creek	Present in Unincorporated County
A	1% annual chance flooding: No base flood elevations provided		X	X	X	X	X
AE	1% annual chance flooding: Base flood elevations provided		X	X		X	X
AE Regulatory Floodway	1% annual chance flood: Regulatory floodway; Base flood elevations provided			X		X	X
AH	1% annual chance flood areas of shallow flooding between one to three feet deep. Regulatory floodway; Base flood elevations provided			X			X
Shaded X	0.2% annual chance flooding: The areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood		X	X		X	X
X (unshaded)	No flood hazard	X	X	X	X	X	X

Source: FEMA DFIRM 01/20/2016

California Floodplain Mapping

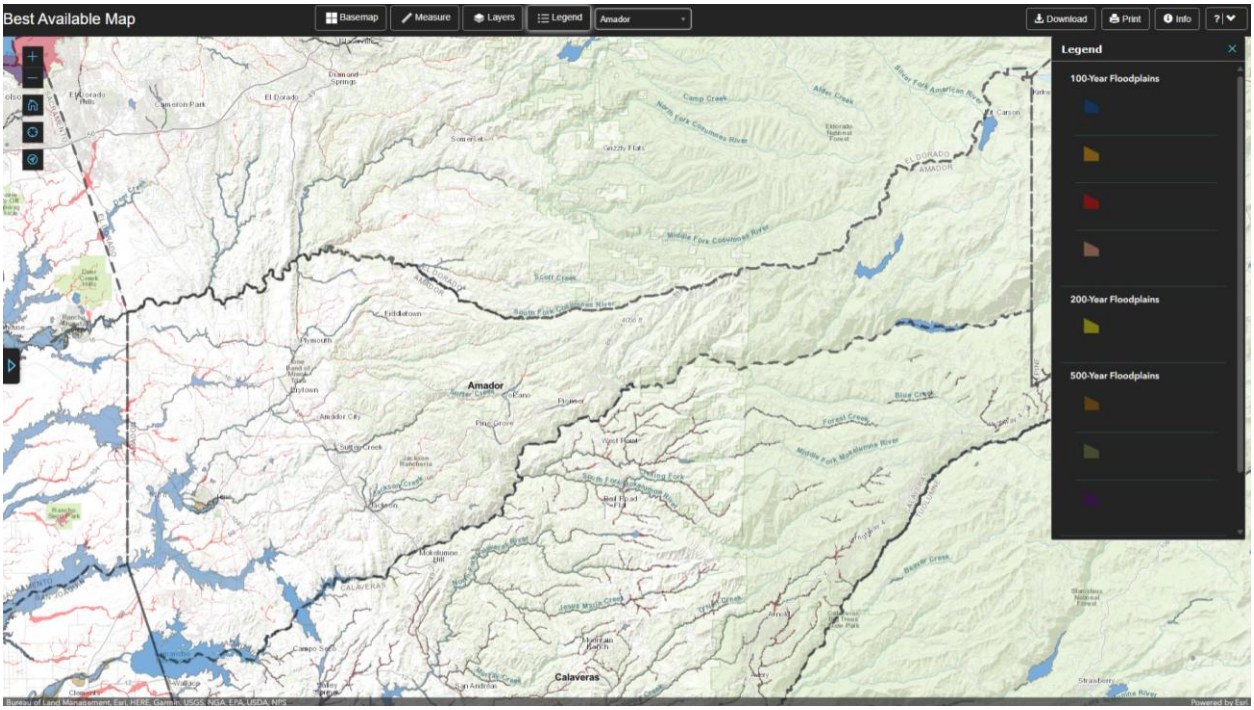
Also to be considered when evaluating the flood risks in Amador County are various floodplain maps developed by the California DWR for various areas throughout California, and in the Sacramento-San Joaquin Valley cities and counties. The FEMA regulatory maps provide just one perspective on flood risks in Amador County. Senate Bill 5 (SB 5), enacted in 2007, authorized Cal-DWR to develop the Best Available Maps (BAM) displaying 1% and 0.5% (200-year) annual chance floodplains for areas located within the Sacramento-San Joaquin (SAC-SJ) Valley watershed. This effort was completed by DWR in 2008. DWR has expanded the BAM to cover all counties in the State and to include 0.2% annual chance flood zones.

Different than the FEMA DFIRMs which have been prepared to support the NFIP and generally reflect only the 1% and 0.2% annual chance flood risks, the BAMs are provided for informational purposes and are intended to reflect current 1%, 0.5% (200-year) as applicable, and 0.2% annual chance flood risks using the best available data. The 100-year floodplain limits on the BAM are a composite of multiple 1% annual

chance floodplain mapping sources. It is intended to show all currently identified areas at risk for a 100-year flood event, including FEMA's 1% annual chance flood zones. The BAM are comprised of different engineering studies performed by FEMA, Corps, and DWR for assessment of potential 1%, 0.5%, and 0.2% annual chance floodplain areas. These studies are used for different planning and/or regulatory applications, and for each flood frequency may use varied analytical and quality control criteria depending on the study type requirements.

The value in the BAMs is that they provide a bigger picture view of potential flood risk to the County than that provided in the FEMA DFIRMs. This provides the community and residents with an additional tool for understanding potential flood hazards not currently mapped as a regulated floodplain. Improved awareness of flood risk can reduce exposure to flooding for new structures and promote increased protection for existing development. Informed land use planning will also assist in identifying levee maintenance needs and levels of protection. By including the FEMA 1% annual chance flood zone, it also supports identification of the need and requirement for flood insurance. Figure 4-96 shows the BAM for the Amador County Planning Area.

Figure 4-96 Amador County– Flood Awareness (Best Available) Map



Source: California DWR. Retrieved 3/5/2025

Legend explanation: **Blue** - FEMA 100-Year, Orange – Local 100-Year (developed from local agencies), **Red** – DWR 100-year (Awareness floodplains identify the 100-year flood hazard areas using approximate assessment procedures.), **Pink** – USACE 100-Year (2002 Sac and San Joaquin River Basins Comp Study), **Yellow** – USACE 200-Year (2002 Sac and San Joaquin River Basins Comp Study), **Tan** – FEMA 500-Year, **Grey** – Local 500-Year (developed from local agencies), **Purple** – USACE 500-Year (2002 Sac and San Joaquin River Basins Comp Study).

Flood extents are usually measured in depths of flooding and area flooded. Expected flood depths in the Amador County Planning Area vary. Flood durations in the County tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Geographical extents

of DFIRM flood zones for the unincorporated Amador County are detailed in Table 4-100. Details on each jurisdiction's DFIRM flood extents can be found in their respective annexes to this LHMP Update.

Table 4-100 Amador County Planning Area –Geographical DFIRM Flood Zone Extents

Jurisdiction / Flood Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Amador City						
1% Annual Chance Flood Hazard	0	0.0%	0	0.0%	0	0.0%
0.2% Annual Chance Flood Hazard	0	0.0%	0	0.0%	0	0.0%
Other Areas	198	0.05%	61	0.04%	137	0.06%
Amador City Total	**198**	**0.05%**	**61**	**0.04%**	**137**	**0.06%**
Ione						
1% Annual Chance Flood Hazard	251	0.06%	68	0.04%	183	0.08%
0.2% Annual Chance Flood Hazard	108	0.03%	76	0.05%	32	0.01%
Other Areas	2,613	0.67%	546	0.32%	2,068	0.94%
Ione Total	**2,973**	**0.77%**	**690**	**0.41%**	**2,283**	**1.04%**
Jackson						
1% Annual Chance Flood Hazard	104	0.03%	41	0.02%	63	0.03%
0.2% Annual Chance Flood Hazard	4	0.001%	2	0.001%	2	0.001%
Other Areas	2,194	0.6%	740	0.4%	1,454	0.7%
Jackson Total	**2,302**	**0.6%**	**782**	**0.5%**	**1,520**	**0.7%**
Plymouth						
1% Annual Chance Flood Hazard	30	0.01%	5	0.003%	25	0.01%
0.2% Annual Chance Flood Hazard	0	0.0%	0	0.0%	0	0.0%
Other Areas	1,668	0.4%	595	0.4%	1,073	0.5%
Plymouth Total	**1,698**	**0.4%**	**600**	**0.4%**	**1,098**	**0.5%**

Jurisdiction / Flood Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Sutter Creek						
1% Annual Chance Flood Hazard	28	0.01%	15	0.01%	13	0.01%
0.2% Annual Chance Flood Hazard	9	0.002%	5	0.003%	5	0.002%
Other Areas	1,671	0.4%	742	0.4%	929	0.4%
Sutter Creek Total	**1,709**	**0.4%**	**762**	**0.5%**	**947**	**0.4%**
Unincorporated Amador County						
1% Annual Chance Flood Hazard	16,510	4%	7,230	4%	9,280	4%
0.2% Annual Chance Flood Hazard	95	0.02%	32	0.02%	64	0.03%
Other Areas	363,006	93%	157,994	94%	205,012	93%
Unincorporated Amador County Total	**379,611**	**98%**	**165,256**	**98%**	**214,356**	**97%**
Grand Total	**388,490**	**100%**	**168,150**	**100%**	**220,340**	**100%**

Source: FEMA DFIRM 01/2016

Past Occurrences

Disaster Declaration History

A list of federal and state disaster declarations for Amador County from flooding, (including heavy rains and storms) is shown on Table 4-101.

Table 4-101 Amador County – Federal and State Disaster Declaration from Flood 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	22	1950, 1955, 1958 (twice), 1959, 1963, 1964, 1969, 1980, 1982, 1986, 1995 (twice*), 1997, 2006 (twice*), 2017 (twice*), 2019*, 2021, 2023 (twice)	20	1950, 1955, 1958, 1962, 1963, 1964, 1969, 1986, 1995 (twice*), 1997, 1998, 2006 (twice*), 2017 (twice*), 2019*, 2023 (three*)

Source: Cal OES, FEMA

*included a landslide component.

NCDC Events

The NCDC tracks flooding events for the County. Events have been tracked for flooding since 1993. Table 4-102 shows events in Amador County since 1993.

*Table 4-102 NCDC Flood Events in Amador County 1993 to 7/31/2024**

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Flash Flood	3	0	0	0	0	$0	$0
Flood	40	3	0	0	0	$4,450,000	$7,800,000
Total	**43**	**3**	**0**	**0**	**0**	**$4,450,000**	**$7,800,000**

Source: NCDC

*Note: Losses reflect totals for all impacted areas, much of which fell outside of Amador County

FIS Events

The 2016 FIS noted that documented flooding from Sutter Creek occurred in January 1980 and January 1995.

1980 Event

An article in the Amador Dispatch indicated that during the 1980 flood event there was overflow of the channel near the Marlette Street mobile home park, approximately 0.5 mile upstream of the Five Mile Drive crossing of Sutter Creek. It was reported that the area was sandbagged, and that evacuation of the mobile home park was considered; however, the flow receded, and no major damage was reported. No flooding was documented in any of the restudy area upstream of the mobile home park. During this event, the maximum recorded peak discharge was 6,950 cubic feet per second (cfs), which is the maximum recorded peak discharge for the 40 years of record at the gage. Based on the hydrologic analyses, the peak discharge would be approximately 9,000 cfs at the study area.

1995 Event

The downstream portion of the restudy area was again subjected to shallow flooding on January 2, 1995. Overtopping occurred at several locations between the new Five Mile Drive Bridge of Sutter Creek and the right-angle bend in the channel alignment located approximately 400 feet downstream of the intersection of Spring Creek Drive and Marlette Street. Flooding was experienced by several properties located between the south bank of the creek and Marlette Street. South of Marlette Street, shallow flooding was experienced by some properties immediately west of the channel bend located west of Spring Creek Drive.

Farther to the west, flooding was primarily contained in the streets south of Marlette Street. A portion of the overflow flowed west, down Marlette Street, and returned to Sutter Creek immediately upstream of the Five Mile Drive Bridge. Flow to the south also occurred over the undeveloped area immediately east of the most easterly treatment-plant pond.

Street flooding, resulting from backwater from drainage outfall, was experienced at Spring Creek Drive at the bend approximately 1,000 feet north of Marlette Street and at the intersection with Marlette Street. Ponding of flood waters was also experienced on the golf course located on the north side of the creek, approximately 500 feet upstream of Five Mile Drive.

The abandoned Five Mile Drive Bridge experienced erosion damage and has been permanently removed. The new Five Mile Drive Bridge was not damaged. There are available estimates of discharges for the 1995 event. Based on the overtopping in the downstream area near the Marlette Street mobile home park, the discharge would probably have been equal to or greater than the 1980 event. There was no flooding in the upstream portion of the restudy area near the Preston Avenue (Highway 104) crossing of Sutter Creek. The flow was contained by the existing channel and levees. The measured high-water mark was approximately 1.2 feet below the Highway 104 bridge soffit. There has been no documented flooding in the area immediately upstream and downstream of Highway 104.

Hazard Mitigation Planning Committee Events

The following flood event summaries are taken verbatim from information on file with the County Archives and provided by the Amador County OES.

1849/50 – No specific data available. See references below.

1852 – The great flood of 1852. On March 4 or 5, unceasingly through March 8, torrents fell. By March 10, the Sacramento River was a half foot above its high water mark during the 1850 flood. Raging creeks and rivers roared down their channels and beds to sweep scores of bridges downstream to destruction. The Sacramento Daily Union carried clips from the Chronicle of March 13th which reported: "On the Mokelumne River the loss cannot fall short of $50,000. We hear of Palmer and Co.'s bridge (worth $10,000) at Oregon Bar was carried away. At Middle Bar, the massive bridge of McKinney and Co. (worth $12,000) was swept away with a large ferry boat worth $15,000. All the homes on the north bank of the river at this bar were torn from foundations and carried down the fierce torrent and smashed to pieces against the rocks. All the stores and tents along the south bank to Big Bar were overloaded, leaving them miserable wrecks. At least one minor drowned trying to cross the bridgeless torrent in a canoe. The Chronicle reported the Mokelumne had risen at least 18 feet during the flood, being 4 to 6 feet higher than the winter of 1849-50. It may have gone even higher. The Middle Bar Bridge was 20 feet above normal water level and it still did not survive.

1862 – January 10 thru 12 - Worst storm in memory, almost a biblical deluge. On January 10th, the water in the river rose a foot an hour and water poured through every gulch like thunder. The Mokelumne River rose 44 feet above low water or 5 to 18 feet higher than in 1852. The tempest swept the river clean of flumes, dams, bridges, ferries, hovels, and homes. Roads were impassable. Travel and communication between the mountains and valley ceased. Provisions could not be restocked. Prices zoomed. For the first time in history all of Stockton was under water and for the second time Sacramento was totally flooded. Big buildings in Jackson were lifted off foundations and floated into the rampaging middle fork; Ione valley was flooded.

1878 – Sudden deluge. That Sunday morning dense banks of clouds were noticed southeast and northwest, gorged with water and collision bent. At 3 pm the towering banks of cloud cleaved, and spawned for an hour and a half, the greatest torrent of rain this area has ever witnessed. While probably raining elsewhere, the rain burst nonetheless seemed confined to Jackson and the watershed of the three forks of Jackson Creek which converge near downtown. Within an hour the north fork topped its banks and swept away or damaged most of the creekside dwellings down to the fork's confluence with the other branches. Chinatown on the west side of Main and hugging the creek was struck worst. Most flimsy and frame Chinese stores floated off foundations and headed downstream, some with occupants inside or clinging to the remains. Despite the catastrophe that hit Chinatown the rest of the town was not apprehensive. It also had no time for fear about a half hour later when a wall of water appeared racing down the middle fork. It arrived later but proved more destructive for these reasons: The middle fork is much longer and has more tributaries and capacity than the north fork and the breaking of the New York Ranch reservoir released its storage into the middle forks surge. That water careened into New York gulch, struck the middle fork near French garden, severely damaging that vegetable basket, and merged madly with the high water coming from upstream. About 4:30 pm into Jackson rushed the wave or wall of water. If it was not high enough then to leap the creek's banks, it soon was. All the driftwood, flotsam, and debris it carried soon dammed up against the Broadway Bridge. Almost instantly the water engulfed the north bank and Water streets, flooding all yards on the south side of the street and wreaking much chaos. There was more long-lasting damage, particularly in Jackson Valley, where bodies, buildings, driftwood and all debarked including a plague of rattlesnakes from foothill pits.

1907 – The Great lone Flood: According to the March 22, 1907, Dispatch, a storm began that Monday early in the afternoon and beat down in copious sheets until dawn the next day. By 2:30 pm on Monday, Jackson creek was a raging torrent judged to be higher than any time in 25 years. The south fork washed the Zeile mine footbridge off and there was not a bridge left spanning the Mokelumne below Middle bar nor was there any bridge left between Lancha Plana and Lodi. The peak of the foothill runoff hit Stockton in the valley later on Tuesday and by midnight Stockton had its greatest flood since 1862.

From various sources (personal recollections, the FIS, the NCDC, and SHELDUS) the HMPC also provided information on the following flood events.

January 1980 – Lake Amador, located in the Jackson Valley Irrigation District (JVID), experienced a very large spill event, (i.e., 4-feet over spill). Damaged infrastructure included JVID Sacrificial road and structures. There was additional Levee and Jackson Creek damage to private parties. Request letters are on file asking assistance. Most letters do not specify dollar amount of damage. One estimated repair at $75,000. Assistance to these private parties was denied. An article in the Amador Dispatch indicated that during the 1980 flood event there was overflow of the channel near the Marlette Street mobile home park, approximately 0.5 mile upstream of the Five Mile Drive crossing of Sutter Creek. It was reported that the area was sandbagged, and that evacuation of the mobile home park was considered; however, the flow receded, and no major damage was reported. No flooding was documented in any of the restudy area upstream of the mobile home park. During this event, the maximum recorded peak discharge was 6,950 cubic feet per second, which is the maximum recorded peak discharge for the 40 years of record at the gage.

1986 – Heavy rains caused Sutter Creek to swell and exceed its banks causing low-level flooding to adjacent structures located on Main Street (Highway 49), Eureka Street, Badger Street, and Spanish Street. Damage to property occurred; amounts are unknown.

January 1995, DR1044 – Three days of record-setting rainfall culminated in widespread flooding of small rivers. Flooding occurred on JVID Jiminez property. Damages included eroded embankment/levee and damage to distribution pipeline. Total damages estimated at $1,999; relief funding estimated at $1,514. Heavy rains also caused Sutter Creek to swell and exceed its banks causing low-level flooding to adjacent structures located on Main Street (Highway 49), Eureka Street, Badger Street, and Spanish Street. Damage to property occurred; amounts are unknown.

March 1995, DR1046 – A rainstorm wreaked havoc from one end of the county to the other as gusty winds wiped out power lines, felled trees, and damaged property. Downed power lines left approximately 7,000 households without power. An uprooted cedar tree crashed into the roof of Amador High School and ripped up roof sheeting at Ione Elementary School. Highway 88 flooded with three feet of water at the Carson Spur west of Kirkwood. A tornado was spotted in western Amador County. There were no damages reported. Flooded basements and sewer backups were reported in Sutter Creek. Trees toppled throughout the county including one that crashed into a Pine Grove Home. Water went over the spillway at Pardee Reservoir for the first time since 1986. Damage estimates to roads and public buildings came in at approximately $240,140.00. According to the FIS:

Based on the overtopping in the downstream area near the Marlette Street mobile home park, the discharge would probably have been equal to or greater than the 1980 event. However, based on the hydraulic model developed for this restudy and the measured high-water mark, the estimated discharge would bring the order of 20 percent lower than indicated by the downstream overtopping. There was no flooding in the upstream portion of the restudy area near the Preston Avenue (Highway 104) crossing of Sutter Creek. The flow was contained by the existing channel and levees. The measured high-water mark was approximately 1.2 feet below the Highway 104 bridge soffit. There has been no documented flooding in the area immediately upstream and downstream of Highway 104.

January 1997, DR1155 –Amador County was seriously impacted by heavy rain, heavy snow, utility disruption and related storm damage that began on December 20, 1996. The County declared a local emergency on December 23, 1996. The storm caused flooding in the lower elevations and major damage due to 4-5 feet of heavy, wet snow in the higher elevations. Emergency fire and medical services could not be provided to the affected areas due to the magnitude of the storm, along with the hazardous conditions of downed power lines, power poles and trees. Power was out for over one week to many homes in the affected area and only medical evacuations were possible for much of that time. Emergency snow removal equipment and operators were brought in by both Amador County and PG&E in an attempt to restore emergency access for fire, law, and medical services as well as for PG&E to restore electrical service. In the City of Ione, Sutter Creek overflowed its banks causing evacuations in flooded areas. In Jackson, Jackson Creek flooded causing water to go over the Pit Street and Broadway Street bridges, propane tanks broke loose and floated down the creek, evacuations of homes and businesses along the creek were ordered. The parking garage in downtown Jackson was under water. In the City of Sutter Creek, the heavy rains caused Sutter Creek to swell and exceed its banks causing low level flooding to adjacent structures located on Main Street (Highway 49), Eureka Street, Badger Street, and Spanish Street. Mandatory water

conservation orders were issued upcountry due to turbidity issues at Tiger Creek Reservoir. In River Pines, the sewer and water treatment plant flooded. Evacuation centers were established throughout the county for county residents that were evacuated from their homes. In addition, evacuation centers were established for residents evacuated from neighboring Sacramento and El Dorado County. Damage estimates for private property exceeded $2 million dollars and damages to roadways and utilities exceeded $5.18 million dollars. The FIS reported that:

Overtopping occurred at several locations between the new Five Mile Drive Bridge of Sutter Creek and the right angle bend in the channel alignment located approximately 400 feet downstream of the intersection of Spring Creek Drive and Marlette Street. Flooding was experienced by several properties located between the south bank of the creek and Marlette Street. South of Marlette Street, shallow flooding was experienced by some properties immediately west of the channel bend located west of Spring Creek Drive. Farther to the west, flooding was primarily contained in the streets south of Marlette Street. A portion of the overflow flowed west, down Marlette Street, and returned to Sutter Creek immediately upstream of the Five Mile Drive Bridge. Flow to the south also occurred over the undeveloped area immediately east of the most easterly treatment-plant pond. Street flooding, resulting from backwater from drainage outfall, was experienced at Spring Creek Drive at the bend approximately 1,000 feet north of Marlette Street and at the intersection with Marlette Street. Ponding of flood waters was also experienced on the golf course located on the north side of the creek, approximately 500 feet upstream of Five Mile Drive. The abandoned Five Mile Drive Bridge experienced erosion damage and has been permanently removed. The new Five Mile Drive Bridge was not damaged.

January 1998 - Heavy rains from a strong Pacific storm caused widespread but minor flooding across the Sacramento and Northern San Joaquin Valleys and nearby foothills. Localized flooding affected areas of Amador County. Hundreds of traffic accidents also occurred on the highways and city streets throughout the region.

February 1998, DR1203 – (El Nino year) Major flooding occurred below Dam on JVID property and on the JVID creek towards the western end of District. Damage to infrastructure included the following: Oxidation Basin Levee - $7,274; Lake Amador Sacrificial road - $13,551; Jackson Creek Pumping Station Dam - $42,691; and Dry Creek repair - $13,156. Total damages and disaster relief funding to JVID estimated at $76,672. Heavy rains also caused Sutter Creek to swell and exceed its banks causing low-level flooding to adjacent structures located on Main Street (Highway 49), Eureka Street, Badger Street, and Spanish Street. Damage to property occurred; amounts are unknown. Damages were also reported throughout the county, in Amador city, the City of Ione, and to the Amador County Unified School District.

February 9, 1999 – Flash flooding affected areas of Amador County. The NCDC reported that Jackson Creek left its banks and flooded areas of downtown Jackson. The California Department of Forestry aided in sandbagging and saved downtown businesses from damage. Sutter Creek left its banks and flooded isolated areas of the City of Sutter Creek. Sandbagging was not necessary. An unnamed tributary off of Gopher Gulch in the town of Sutter Creek rose quickly and topped the Badger Street Bridge.

January 22, 2000 - Rainfall totaling 6.32 inches accumulated in just over 48 hours near Pine Grove.

December 2005/January 2006, Winter Storms of 2005/2006, DR1628 – Amador County sustained extensive damages to the public road system due to severe storms, flooding, mudslides, and landslides from the period December 17, 2005 to January 3, 2006. Damages were estimated at approximately $1.5 million dollars. There were some minor damages to private property reported. In addition, the Amador Regional Sanitation Authority sustained some damages to their pipeline. The most severe problem associated with this storm was the high winds and downed trees and power lines. A tree fell on a house causing moderate damage and another tree fell on a vehicle causing major damage.

March 2006, Spring Storms of 2006, DR1646 – The spring of 2006 was an unusually wet spring. There were constant reports of mudslides throughout the county. On April 8, 2006, the Amador Water Agency sustained major damages to an earthen canal that transports water from Lake Tabeaud to the Tanner Water Treatment Facility in Sutter Creek. A 200-foot section of the canal slid down the hillside cutting off the water supply to the Tanner facility. This outage affected approximately 10,000 raw and treated water customers in Jackson, Sutter Creek, Amador City, Drytown and Ione. Estimates for emergency work and repairs exceed $1.5 million dollars. The county road system sustained major damages and estimates for repairs exceed $1 million dollars. The Amador Region Sanitation Authority, the cities of Plymouth, Ione and Jackson sustained minor damages. There was little damage to private property reported.

January and February 2017 DR-4308, DR-4301 – Flood occurred in the County. AWA almost lost water pump station in Ione. Sutter Creek was at flood stage. A pump station along the creek was damaged due to flooding and soil erosion. A disaster declaration was issued for this flood. In addition to damages to roads, landslides in Pioneer Creek Road occurred as a result. Repair costs were $375,961. Shake Ridge Road also suffered erosion and landslides that is being dealt with as of the writing of this Plan. Multiple locations had damages. This can be seen in Table 4-103.

Table 4-103 2017 Amador County Winter Storm Damages

Address	City	Problem	Cause	Damages
Freemont Mine Road	Sutter Creek	Debris Removal/road clean-up	Winter Storm	$9,000
Lower Jackson Valley Road	Ione	Debris Removal/road clean-up	Winter Storm	$6,437
Stony Creek Road	Jackson	Debris Removal/road clean-up	Winter Storm	$7,000
Buena Vista Road	Ione	Debris Removal/road clean-up	Winter Storm	$4,466
Defender Grade	Pioneer	Debris Removal/road clean-up	Winter Storm	$5,292
Lower Tonzi Road	Plymouth	Debris Removal/road clean-up	Winter Storm	$2,376
Sutter Creek Road	Ione	Debris Removal/road clean-up	Winter Storm	$5,755
Old Sacramento Road	Plymouth	Debris Removal/road clean-up	Winter Storm	$4,822
Silver Drive South	Pioneer	Debris Removal/road clean-up	Winter Storm	$1,026
Sugar Pine Drive	Pioneer	Debris Removal/road clean-up	Winter Storm	$2,250
Alpine Drive	Pioneer	Debris Removal/road clean-up	Winter Storm	$6,084
6500 Buena Vista Road	Ione	Emergency Pumping and Hauling for line leachate pond	Winter Storm	$85,800

Address	City	Problem	Cause	Damages
New Chicago Road	Sutter Creek	Shoulder Danage/Gravel Road Damage	Winter Storm	$31,000
Freemont Mine Road	Sutter Creek	Road construction	Winter Storm	$5,000
Defender Grade	Pioneer	Slope Failure	Winter Storm	$10,000
Lower Tonzi Road	Plymouth	Culvert Failure	Winter Storm	$8,000
Shake Ridge Road	Pioneer	Road Failure	Winter Storm	$3,000,000
Pioneer Creek Road	Pioneer	Culvert Failure/Riprap Damage	Winter Storm	$7,500

Source: Amador County

Figure 4-97 Amador County 2017 Flooding

Source: Jackson Valley Irrigation District

Figure 4-98 Amador County 2017 Flooding

Source: Jackson Valley Irrigation District

2019 – Flooding occurred in the County. Sutter Creek was at flood stage. $20,000 in FEMA disaster money was received to repair debris locations.

December 2021 – After multiple atmospheric river storms starting in October of 2021 (which received a state emergency proclamation), an extreme winter storm (with rain in the lower elevations and snow in the upper elevations of the County) occurred. A local emergency proclamation (Resolution 22-048) was tendered. The Pioneer Park area saw heavy rains down multiple trees. Debris was generated, and the woody debris was removed by a local contractor.

December 2022 to March 2023 – Atmospheric river storm events affected the County multiple times in the winter of 2022/2023. Two state emergency proclamations were issued for these events. Amador County also issued an emergency proclamation (Resolution 23-001) for these events. In the lower elevations, heavy rains caused flooding. In the upper elevations, heavy snows were seen.

Figure 4-99 Damages in Amador County from 2022/2023 Storms

Source: Amador County

Likelihood of Future Occurrence

1% Annual Chance Flood

Occasional— The 1% annual chance flood (100-year) is the flood that has a 1 percent chance of being equaled or exceeded in any given year. This, by definition, makes the likelihood of future occurrence occasional. However, the 100-year flood could occur more than once in a relatively short period of time.

0.2% Annual Chance Flood

Unlikely—The 0.2% annual chance flood (500-year) is the flood that has a 0.2 percent chance of being equaled or exceeded in any given year. This, by definition, makes the likelihood of future occurrence unlikely.

It is likely that climate change will increase the chance of future occurrence as well as future impacts. More information on climate change and flood can be found in the next section. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate Change and Flood

Climate change and its effect on flooding is discussed using three sources:

- 2021 CAS (as well as the 2024 Draft CAS)
- Cal-Adapt
- National Center for Atmospheric Research

California Climate Adaptation Strategy

According to the 2021 CAS (as well as the 2024 Draft CAS), climate change may affect flooding in California and the Planning Area. While average annual rainfall may increase or decrease slightly, the

intensity of individual rainfall events is likely to increase during the 21st century. It is possible that average soil moisture and runoff could decline, however, due to increasing temperatures, evapotranspiration rates, and spacing between rainfall events. Reduced snowpack and increased number of intense rainfall events are likely to put additional pressure on water infrastructure which could increase the chance of flooding associated with breaches or failures of flood control structures such as levees and dams.

Cal Adapt

Cal Adapt future precipitation projections were shown in Figure 4-56 in the Severe Weather Heavy Rains and Storms in Section 4.3.4. These could affect flooding in the Amador County Planning Area.

National Center for Atmospheric Research

Also, according to the National Center for Atmospheric Research in Boulder, Colorado, atmospheric rivers are likely to grow more intense in coming decades, as climate changes warms the atmosphere enabling it to hold more water.

Vulnerability Assessment

Vulnerability—High

Historically, the Amador County Planning Area has always been at risk to flooding during the rainy season from November through April. The Amador County FIS noted that floods result from prolonged heavy rainfall and are characterized by high peak flows of moderate duration and by a large volume of runoff. Flooding is more severe when antecedent rainfall has resulted in saturated ground conditions. Several areas of the Planning Area are subject to flooding by the overtopping of rivers and creeks, levee failures, and the failure of urban drainage systems that cannot accommodate large volumes of water during severe rainstorms. In addition to the major rivers, there are many streams, channels, canals, and creeks that serve the drainage needs of the Planning Area and communities surrounding it. There is significant threat of flooding in areas of the Planning Area from several of these streams. These streams can be prone to rapid flooding with little notice.

An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to unincorporated Amador County. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect both the entire Amador County Planning Area as well as the unincorporated portions of Amador County. How the hazard affects the other participating jurisdictions can be found in their respective annexes to this LHMP Update. These sections below include assets at risk, impacts, and how future development may affect the vulnerability of the County to this hazard.

Local Concerns (unincorporated Amador County)

The unincorporated County has specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce the risk and vulnerability to this hazard.

The County noted that some areas of the County are susceptible to flooding during heavy rains or rapid snowmelt. The rural infrastructure is sometimes not adequately prepared to handle these events. In some areas, homeless encampments have been established in low-lying, flood-prone areas. Amador County Public Works noted that Sutter Creek-Volcano Road runs parallel to Sutter Creek. A portion of the road and the Creek are nearly at the same elevation. In those areas, small, localized flooding is sometimes experienced.

The 2016 FIS for Amador County noted that, for the unincorporated County, there are no significant flood-protection measures in the study area. Bridges and culverts have been provided at all road crossings, both public and private. The 2016 Amador County General Plan Safety Element noted that Flood flows generally follow defined stream channels, drainages, and watersheds. Floods causing severe damage or risk have historically occurred primarily in developed portions of the county. Flooding events generally occur in areas near waterways, and have caused significant damage in the western portion of the county near population centers, such as Jackson, Ione, and Sutter Creek.

Local concerns for each of the jurisdictions can be found under the Local Concerns heading in each respective jurisdictional annex to this LHMP Update.

Assets at Risk

Assets at risk from 1% and 0.2% annual chance floods include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections for the Amador County Planning Area and unincorporated Amador County.

Additionally, for each hazard in the FEMA National Risk Index in Amador County, the relevant portions of the hazard analysis done by FEMA is presented below. This includes the Hazard Risk Index Rating, Expected Annual Loss Values, Exposure Values, and the Historic Loss Ratio Rating. These are presented for the Amador County Planning Area as a whole.

The Planning Area has mapped FEMA DFIRMs with flood hazard areas. GIS was used to determine the possible impacts of flooding within the Planning Area and how the risk varies across the Amador County Planning Area. The following methodology was utilized in determining assets at risk to the 1% annual chance flood event and 0.2% annual chance flood event.

Methodology (Parcel and Structures)

In order to analyze people and populations, structures, and critical facilities at risk in DFIRM flood zones, GIS was used to quantify those values. The 2024 Amador County Parcel/Assessor Data was provided by Amador County and was used as the basis for the inventory of assessed values for both improved and unimproved parcels within the Amador County Planning Area. Amador County has a FEMA effective DFIRM dated 1/20/2016, which was obtained from FEMA's National Flood Hazard Layer to perform the flood analysis. The DFIRM flood zones, were then overlaid on the parcel layer. In some cases, there are parcels in multiple flood zones, such as Zone A, Zone X, or Shaded X. For the purposes of this analysis, if multiple DFIRM flood zones intersected any portion of a parcel polygon, the entire parcel was assigned the highest annual chance flood zone category. The parcels were segregated and analyzed in this fashion for the entire Planning Area.

Once the DFIRM flood zones were intersected, land and improved (structure) values from the Assessor data were included for each parcel and estimated content replacement values were added to the analysis. Improved parcels include those with improved structure values identified in the Amador County Assessor's database.

Methodology (Loss Estimate)

The loss estimate for flood is based on the total of improved and contents value. Only improved parcels and the value of their structure improvements were included in the flood loss analysis. The value of land is not included in the loss estimates as generally the land is not at loss to floods, just the value of improvements and structure contents. The land value is represented in the detailed flood tables but is primarily present to show the value of the land associated with each flood zone.

Once the potential value of affected parcels was calculated, a damage factor was applied to obtain loss estimates by flood zone. When a flood occurs, seldom does the event cause total loss of an area or building. Potential losses from flooding are related to a variety of factors including flood depth, flood velocity, building type, and construction. The percentage of damage is primarily related to the flood depth. FEMA's flood benefit/cost module uses a simplified approach to model flood damage based on building type and flood depth. The values at risk in the flood analysis tables were refined by applying an average damage estimation of 20% of the total building value. The 20% damage estimate utilized FEMA's Flood Building Loss Table based on an assumed average flood depth of 2 feet. The end result of this more refined flood hazard loss estimate analysis is an inventory of the numbers, types, and values of parcels subject to the flood hazard.

People and Populations

All people and populations located in the 1% and 0.2% annual chance floodplains are at some risk to flooding. Certain vulnerable populations located within areas prone to flooding may be at increased risk to this hazard, especially during a large event with minimal advance notice. These vulnerable populations include: the unhoused, those with limited mobility, and those that lack the resources to leave the area.

Amador County Planning Area residents that live in the 1% and 0.2% annual chance floodplains are often the most vulnerable. Not only are the residents at risk, but their homes and contents are all at risk, compounding the impacts associated with significant hazard events. To further evaluate the impact to the Planning Area's residential population residing within these hazard areas, the DFIRM flood zones were overlayed on the parcel layer and linked to the Assessor Data. Those residential parcels that were assigned the highest annual chance flood zones as detailed in the above methodology, were counted and multiplied by the 2020 Census Bureau average household factors for each jurisdiction. This is shown in Table 4-104.

Table 4-104 Amador County Planning Area – Improved Residential Parcels and Populations in FEMA DFIRM Flood Zones by Jurisdiction

Jurisdiction	1% Annual Chance		0.2% Annual Chance	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Amador City	0	0	0	0
Ione	322	737	155	355
Jackson	151	332	13	29
Plymouth	4	12	0	0
Sutter Creek	64	132	16	33
Unincorporated County	261	613	2	5

Source: FEMA DFIRM 1/20/2016, 2024 Amador County Parcel/Assessor Data, 2020 US Census Bureau Average Household Size – City of Amador City (2.07); City of Ione (2.29); City of Jackson (2.20); City of Plymouth (2.80); City of Sutter Creek (2.07): Unincorporated Amador County (2.35).

Structures

Results are presented here first for the Amador County Planning Area and secondly for unincorporated Amador County.

Amador County Planning Area

Certain structures in the Amador County Planning Area are at risk of DFIRM flooding and primarily include those structures located within the 1% and 0.2% annual chance floodplains. GIS was used to determine the possible impacts of flooding on parcels and structures within the Planning Area. Table 4-105 shows parcel counts, land and improved values (i.e., those with a structure improvement on the parcel), estimated content replacement values, and total values in the Planning Area. This is shown for the 1% and 0.2% annual chance flood zones, as well as for those properties that fall outside of the mapped FEMA DFIRM flood zones.

Table 4-105 Amador County Planning Area – Count and Value of Parcels and Structures in FEMA DFIRM 1% and 0.2% Annual Chance Flood Zones by Jurisdiction

Jurisdiction / Flood Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Amador City						
1% Annual Chance Flood Hazard	0	0	$0	$0	$0	$0
0.2% Annual Chance Flood Hazard	0	0	$0	$0	$0	$0
Other Areas	180	111	$19,124,377	$21,078,306	$12,365,357	$52,568,040

Jurisdiction / Flood Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Amador City Total	**180**	**111**	**$19,124,377**	**$21,078,306**	**$12,365,357**	**$52,568,040**
Ione						
1% Annual Chance Flood Hazard	452	371	$40,923,840	$87,983,517	$51,122,765	$180,030,122
0.2% Annual Chance Flood Hazard	169	159	$15,370,985	$34,728,985	$20,000,009	$70,099,979
Other Areas	1,584	1,446	$167,447,004	$373,754,655	$186,962,206	$728,163,865
Ione Total	**2,205**	**1,976**	**$223,741,829**	**$496,467,157**	**$258,084,980**	**$978,293,966**
Jackson						
1% Annual Chance Flood Hazard	291	207	$38,297,775	$145,588,113	$122,294,239	$306,180,127
0.2% Annual Chance Flood Hazard	29	24	$3,525,241	$10,794,147	$9,553,139	$23,872,527
Other Areas	1,804	1,525	$160,028,972	$411,492,479	$248,465,038	$819,986,489
Jackson Total	**2,124**	**1,756**	**$201,851,988**	**$567,874,739**	**$380,312,415**	**$1,150,039,142**
Plymouth						
1% Annual Chance Flood Hazard	25	7	$8,477,615	$9,727,971	$9,582,027	$27,787,613
0.2% Annual Chance Flood Hazard	0	0	$0	$0	$0	$0
Other Areas	600	481	$76,665,748	$108,639,435	$59,680,115	$244,985,298
Plymouth Total	**625**	**488**	**$85,143,363**	**$118,367,406**	**$69,262,141**	**$272,772,910**
Sutter Creek						
1% Annual Chance Flood Hazard	102	73	$9,234,981	$19,000,793	$11,174,927	$39,410,701
0.2% Annual Chance Flood Hazard	24	19	$2,546,520	$8,018,401	$5,844,780	$16,409,701
Other Areas	1,308	1,068	$121,893,704	$304,320,667	$180,599,958	$606,814,329
Sutter Creek Total	**1,434**	**1,160**	**$133,675,205**	**$331,339,861**	**$197,619,665**	**$662,634,731**

Jurisdiction / Flood Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Unincorporated Amador County						
1% Annual Chance Flood Hazard	956	534	$145,444,914	$225,859,512	$189,924,665	$561,229,091
0.2% Annual Chance Flood Hazard	3	2	$517,124	$951,800	$475,900	$1,944,824
Other Areas	16,869	11,898	$1,541,444,469	$2,799,942,229	$1,574,323,556	$5,915,710,254
Unincorporated Amador County Total	**17,828**	**12,434**	**$1,687,406,507**	**$3,026,753,541**	**$1,764,724,121**	**$6,478,884,169**
Grand Total	**24,396**	**17,925**	**$2,350,943,269**	**$4,561,881,010**	**$2,682,368,677**	**$9,595,192,956**

Source: FEMA DFIRM 1/20/2016 2024 Amador County Parcel/Assessor Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Table 4-106 shows Planning Area loss estimates and improved values at risk by FEMA 1% and 0.2% annual chance flood zones. More detailed tables and discussions can be found in each jurisdiction's respective annex to this Base Plan.

Table 4-106 Amador County Planning Area – FEMA DFIRM Flood Loss Estimates

Flood Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value	Loss Estimate	Loss Ratio
1% Annual Chance Flood Hazard	1,826	1,192	$242,379,125	$488,159,906	$384,098,622	$872,258,528	$174,451,706	2.52%
0.2% Annual Chance Flood Hazard	225	204	$21,959,870	$54,493,333	$35,873,827	$90,367,160	$18,073,432	0.26%
Total	**2,051**	**1,396**	**$264,338,995**	**$542,653,239**	**$419,972,449**	**$962,625,688**	**$192,525,138**	**2.78%**

Source: FEMA DFIRM 1/20/2016 2024 Amador County Parcel/Assessor Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

According to the information in Table 4-105 and Table 4-106, the Amador County Planning Area has 1,826 improved parcels and roughly $872.3 million of structure and contents value in the 1% annual chance floodplain. There are an additional 225 improved parcels and roughly $18.1 million of structure and contents value in the 0.2% annual chance flood event. A loss ratio of 2.52% and 0.26% indicates that while the Amador County Planning Area does have structural assets at risk to flood, the County should be able to effectively recover from a major flood event.

Unincorporated Amador County

Numerous structures in unincorporated Amador County are at risk of DFIRM flooding and primarily include those structures located within the 1% and 0.2% annual chance floodplains. GIS was used to determine the possible impacts of flooding on parcels and structures within the unincorporated County. Table 4-107 shows parcel counts, land and improved values (i.e., those with a structure improvement on the parcel), estimated content replacement values, and total values in the unincorporated County. This is shown for the detailed flood zones by the 1% and 0.2% annual chance flood zones, as well as for those properties that fall outside of the mapped FEMA DFIRM flood zones.

Table 4-107 Unincorporated Amador County – Count and Value of Parcels and Structures in Detailed FEMA DFIRM 1% and 0.2% Annual Chance Flood Zones by Property Use

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
1% Annual Chance Flood Hazard						
Zone A						
Agricultural	292	214	$73,137,287	$42,882,073	$42,882,073	$158,901,433
Commercial	35	27	$6,005,532	$113,098,050	$113,098,050	$232,201,632
Industrial	9	8	$2,698,528	$2,066,396	$3,099,594	$7,864,518
Miscellaneous	158	5	$2,132,767	$5,626,324	$0	$7,759,091
Residential	355	218	$34,988,113	$46,836,792	$23,418,396	$105,243,301
Unknown	25	9	$17,692,072	$2,098,345	$0	$19,790,417
Zone A Total	**874**	**481**	**$136,654,299**	**$212,607,980**	**$182,498,113**	**$531,760,392**
Zone AE						
Agricultural	3	2	$1,279,416	$628,269	$628,269	$2,535,954
Commercial	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	1	1	$873,843	$5,381	$0	$879,224
Residential	8	4	$573,244	$1,255,746	$627,873	$2,456,863
Unknown	0	0	$0	$0	$0	$0
Zone AE Total	**12**	**7**	**$2,726,503**	**$1,889,396**	**$1,256,142**	**$5,872,041**
Zone AE: Regulatory Floodway						

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	10	7	$759,370	$978,684	$978,684	$2,716,738
Commercial	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	59	39	$5,304,742	$10,383,452	$5,191,726	$20,879,920
Unknown	1	0	$0	$0	$0	$0
Zone AE: Regulatory Floodway Total	**70**	**46**	**$6,064,112**	**$11,362,136**	**$6,170,410**	**$23,596,658**
1% Annual Chance Flood Hazard Total	**956**	**534**	**$145,444,914**	**$225,859,512**	**$189,924,665**	**$561,229,091**
0.2% Annual Chance Flood Hazard						
Zone X (shaded)						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	3	2	$517,124	$951,800	$475,900	$1,944,824
Unknown	0	0	$0	$0	$0	$0
Zone X (shaded) Total	**3**	**2**	**$517,124**	**$951,800**	**$475,900**	**$1,944,824**
0.2% Annual Chance Flood Hazard Total	**3**	**2**	**$517,124**	**$951,800**	**$475,900**	**$1,944,824**
Other Areas						
Zone X (unshaded)						
Agricultural	1,484	938	$207,847,367	$172,573,057	$172,573,057	$552,993,481
Commercial	401	277	$90,796,324	$177,463,456	$177,463,456	$445,723,236
Industrial	43	22	$32,334,460	$11,409,198	$17,113,797	$60,857,455
Miscellaneous	662	69	$17,957,156	$8,181,313	$0	$26,138,469
Residential	14,130	10,515	$1,172,411,560	$2,414,346,492	$1,207,173,246	$4,793,931,298
Unknown	149	77	$20,097,602	$15,968,713	$0	$36,066,315
Zone X (unshaded) Total	**16,869**	**11,898**	**$1,541,444,469**	**$2,799,942,229**	**$1,574,323,556**	**$5,915,710,254**
Other Areas Total	**16,869**	**11,898**	**$1,541,444,469**	**$2,799,942,229**	**$1,574,323,556**	**$5,915,710,254**

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Unincorporated Amador County Total	**17,828**	**12,434**	**$1,687,406,507**	**$3,026,753,541**	**$1,764,724,121**	**$6,478,884,169**

Source: FEMA DFIRM 1/20/2016 2024 Amador County Parcel/Assessor Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Table 4-108 shows unincorporated Amador County loss estimates and improved values at risk by FEMA 1% and 0.2% annual chance flood zones.

Table 4-108 Unincorporated Amador County – FEMA DFIRM Flood Loss Estimates

Flood Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value	Loss Estimate	Loss Ratio
1% Annual Chance Flood Hazard	956	534	$145,444,914	$225,859,512	$189,924,665	$415,784,177	$83,156,835	1.20%
0.2% Annual Chance Flood Hazard	3	2	$517,124	$951,800	$475,900	$1,427,700	$285,540	0.004%
Unincorporated Amador County Total	**959**	**536**	**$145,962,038**	**$226,811,312**	**$190,400,565**	**$417,211,877**	**$83,442,375**	**1.204%**

Source: FEMA DFIRM 1/20/2016 2024 Amador County Parcel/Assessor Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

According to the information in Table 4-107 and Table 4-108, the unincorporated Amador County has 534 improved parcels and roughly $415.8 million of structure and contents value in the 1% annual chance floodplain. There are an additional 2 improved parcels and roughly $1.4 million of structure and contents value in the 0.2% annual chance flood event. A loss ratio of 1.204% and 0.004% indicates that while the County does have structural assets at risk to flood, the County should be able to effectively recover from a major flood event.

Insurance Coverage, Claims Paid, and Repetitive Losses

Standard property insurance does not include flood coverage because of the relatively high risk. The National Flood Insurance Program (NFIP) provides flood insurance to residents in those communities that participate in the NFIP. Federal financial assistance requires the purchase of flood for structures located within a 1% annual chance floodplain – a requirement that affects nearly all mortgages financed through

commercial lending institutions. Flood insurance is also recommended for all structures protected by levees, even if not mapped within a floodplain. However, there are no certified levees in the Planning Area. Flood insurance promotion and outreach will be important moving forward to ensure vulnerable structures are adequately insured and protected.

Unincorporated Amador County joined as an Emergency Entry on 10/29/1980, and then as a Regular NFIP Entry on 9/24/1984. The County does not participate in the CRS program. NFIP insurance data indicates that as of December 2, 2024, there were 23 policies in force in the unincorporated County, resulting in $4,709,000 of insurance in force and $23,560 in annual premiums paid. Of these, 19 are for residential properties and 4 are nonresidential. 14 of these are in A zones; and 9 policies are for parcels in the B, C, & X zones.

There have been 17 closed paid losses totaling $365,920.56. 16 of these were for residential properties and 1 was for nonresidential. Of these 17 paid losses, 10 were parcels in A zones, 5 parcels were in B, C, & X zones, and 2 had no zone data attached to them. Of the 17 claims, 12 claims were associated with pre-FIRM structures and 3 with post-FIRM structures, and 2 had no data attached to them. There have been 2 substantial damage claims since 1978. There have been 0 Increased Cost of Compliance (ICC) losses. According to FEMA's Community Information System data, there are 2 repetitive loss (RL) and 0 Post-FIRM Severe Repetitive Loss (SRL) buildings.

Based on the flood analysis, the Amador County Planning Area and unincorporated Amador County have significant values at risk to the 1% and 0.2% annual chance and greater floods. In many instances, the impact to the community from those structures falling within the special flood hazard zone (i.e., the 1% annual chance flood zone) can be lessened by those individuals that maintain flood insurance. Within the Planning Area, of the 1,468 improved parcels within the 1% annual chance flood zone, only 110 (or 7.5 percent) of those parcels maintain flood insurance. For the unincorporated County, of the 534 parcels within the 1% annual chance flood zone, only 23 (or 4.3 percent) of these parcels maintain flood insurance. his can be seen on Table 4-109, along with insurance information from the incorporated communities in the County.

Table 4-109 Amador County Planning Area – Percentage of Policy Holders to Improved Parcels in the 1% Annual Chance Floodplain by Jurisdiction

Jurisdiction	Improved Parcels in SFHA (1% Annual Chance) Floodplain*	Insurance Policies in the SFHA (1% Annual Chance) Floodplain	Percentage of 1% Annual Chance Floodplain Parcels Currently Insured
Amador City	0	0	–
Ione	371	51	13.7%
Jackson	207	24	11.6%
Plymouth	7	0	0.0%
Sutter Creek	73	7	9.6%
Unincorporated Amador County	534	23	4.3%

Source: FEMA DFIRM 1/20/2016, FEMA CIS 2024, 2024 Amador County Parcel/Assessor's Data

FEMA also supplied data from their PIVOT database, which provides property use information specific to the RL and SRL properties. However, according to FEMA, there is a discrepancy between CIS and the PIVOT databased on numbers of RL and SRL properties based on how information is transferred between systems. According to the PIVOT database, there are 0 RL properties and 0 SRL properties in the unincorporated County. This can be seen for all communities on Table 4-110. FEMA's CIS data does not include searchable information on property use for RL and SRL properties.

Table 4-110 Amador County Planning Area – RL and SRL Properties and their Status

Jurisdiction	RL Properties	SRL Properties
City of Amador City	0	0
City of Ione	0	0
City of Jackson		
Single-family dwelling	2	0
2-4 family dwelling	1	0
Non-residential building	1	0
Jackson Total	**4**	**0**
City of Plymouth	0	0
City of Sutter Creek		
Single-family dwelling	1	0
Sutter Creek Total	**1**	**0**
Unincorporated Amador County	0	0

Source: FEMA, PIVOT, 3/24/2025

Critical Facilities and Infrastructure

Flooding presents a threat to critical facilities and infrastructure, and community lifelines. Critical facilities and infrastructure plays an immensely important role in our communities. As previously noted, communities rely on roads, rail corridors, and related biking and pedestrian routes for transportation, and on critical infrastructure for drinking water, wastewater service, and draining streets of rainwater. Other utilities play an important role in providing critical services to area residents. Fire, police and other emergency response facilities and functions are also critical to the well being of the community and the ability to respond and recover from hazard events, such as floods. Damage to any one of these systems can threaten public safety, wreak havoc on daily life, impact properties far from flood zones, and result in economic impacts that cascade throughout California. The following GIS analysis identifies critical facilities and infrastructure at risk to 1% and 0.2% annual chance flooding, followed by a discussion on vulnerability of community lifelines.

A separate analysis was performed on the critical facility inventory in the Amador County Planning Area to determine critical facilities in the 1% and 0.2 annual chance flood zones. Using GIS, the DFIRM flood zones were overlayed on the critical facility GIS layer. Figure 4-100 shows critical facilities and the detailed DFIRM flood zones. Table 4-111 details critical facilities in detailed DFIRM flood zones by facility type

and count for the Amador County Planning Area broken out by jurisdiction. Details of critical facilities by type, name, and address by flood zone are listed in Appendix F.

Figure 4-100 Amador County Planning Area – Critical Facilities in DFIRM Flood Zones

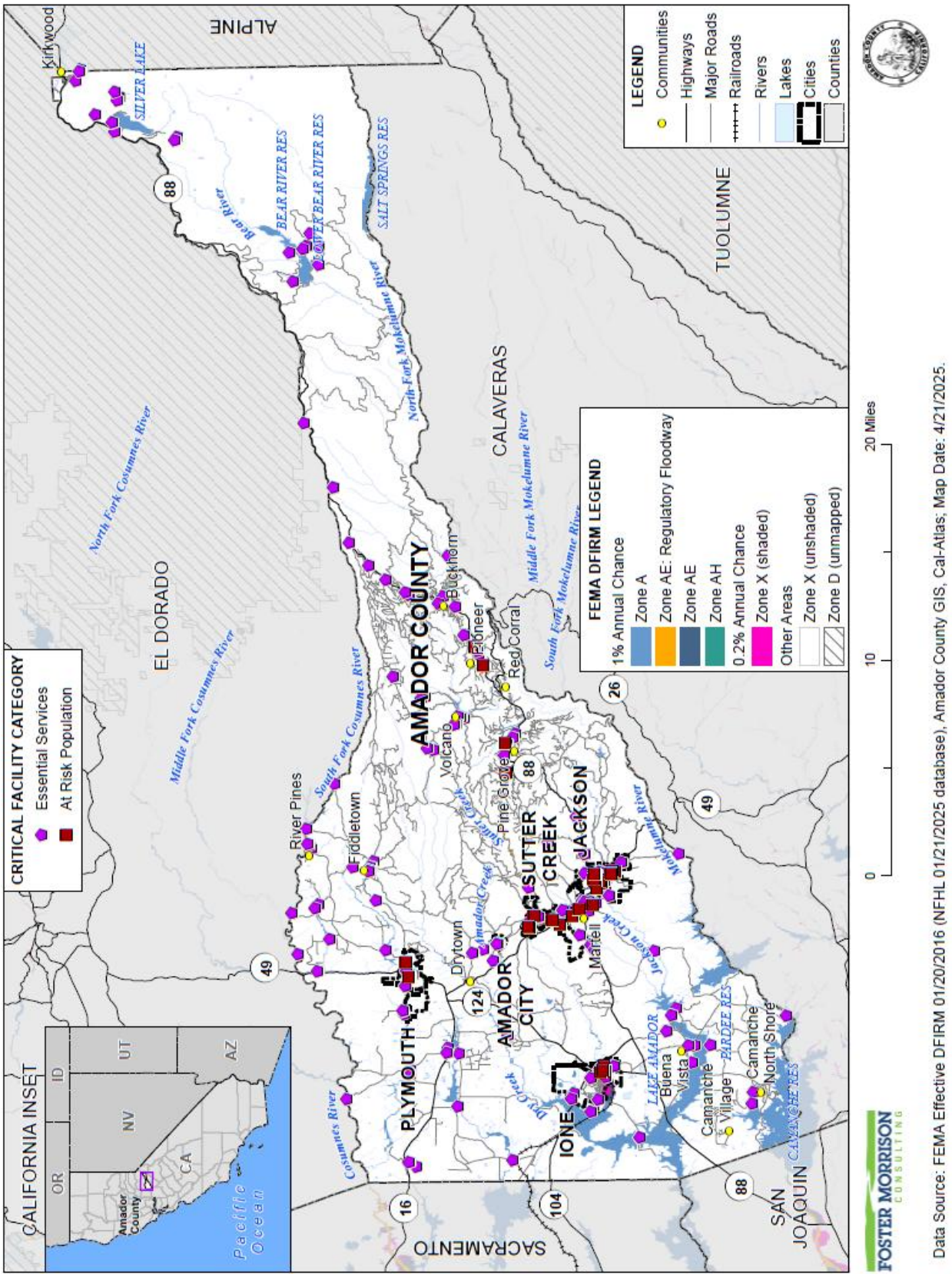


Table 4-111 Amador County Planning Area – Critical Facilities in Detailed DFIRM Flood Zones by Jurisdiction and Category

Jurisdiction / Critical Facility Category / Flood Zone	Facility Count
Amador City	
Essential Services	
1% Annual Chance Flood Hazard	0
0.2% Annual Chance Flood Hazard	0
Other Areas	3
Amador City Total	**3**
Ione	
Essential Services	
1% Annual Chance Flood Hazard	8
0.2% Annual Chance Flood Hazard	0
Other Areas	5
At Risk Population	
1% Annual Chance Flood Hazard	2
0.2% Annual Chance Flood Hazard	1
Other Areas	2
Ione Total	**18**
Jackson	
Essential Services	
1% Annual Chance Flood Hazard	4
0.2% Annual Chance Flood Hazard	1
Other Areas	30
At Risk Population	
1% Annual Chance Flood Hazard	0
0.2% Annual Chance Flood Hazard	0
Other Areas	13
Jackson Total	**48**
Plymouth	
Essential Services	
1% Annual Chance Flood Hazard	0
0.2% Annual Chance Flood Hazard	0
Other Areas	8
At Risk Population	
1% Annual Chance Flood Hazard	0
0.2% Annual Chance Flood Hazard	0
Other Areas	1

Jurisdiction / Critical Facility Category / Flood Zone	Facility Count
Plymouth Total	**9**
Sutter Creek	
Essential Services	
1% Annual Chance Flood Hazard	2
0.2% Annual Chance Flood Hazard	1
Other Areas	4
At Risk Population	
1% Annual Chance Flood Hazard	
0.2% Annual Chance Flood Hazard	
Other Areas	6
Sutter Creek Total	**13**
Unincorporated Amador County	
Essential Services	
1% Annual Chance Flood Hazard	28
0.2% Annual Chance Flood Hazard	0
Other Areas	110
At Risk Population	
1% Annual Chance Flood Hazard	0
0.2% Annual Chance Flood Hazard	0
Other Areas	7
Unincorporated Amador County Total	**145**
Unincorporated Alpine County	
Essential Services	
1% Annual Chance Flood Hazard	0
0.2% Annual Chance Flood Hazard	0
Other Areas	1
Unincorporated Alpine County Total	**1**
Grand Total	**237**

Source: FEMA 1/20/2016 DFIRM, Amador County GIS

Natural, Historic, and Cultural Resources

Large flood events can affect natural, historic, and cultural resources. There are a number of ways floodwaters can impact natural resources and the environment: Wildlife habitats can be destroyed by floodwaters. Contaminated floodwater can pollute rivers and habitats. Silt and sediment can destroy natural areas. Riverbanks and natural levees can be eliminated as rivers reach bankfull capacity. Rivers can be widened, and deposition can increase downstream. Trees can be uprooted by high-velocity water flow. Plants that survive the initial flood may die due to being inundated with water. Historic and cultural

resources may also be affected. Generally, the impacts are associated with damage to structures within the flooded areas, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged and lost during extreme flood events. Any of these resources that fall in the flood zones would be vulnerable.

FEMA NRI Hazard Vulnerability Assessment

The FEMA NRI was queried for additional specific data on Amador County's vulnerability to Flood: 1%/0.2% annual chance and Flood: Localized Flooding. The NRI contains data and analysis for 18 separate natural hazards. The NRI hazard related to Amador County's Flood: 1%/0.2% annual chance and Flood: Localized Flooding is riverine flooding. As shown in Table 4-112, riverine flooding could cause a total of $535,814 in expected annual losses, with a historic loss rating of relatively low. Riverine flooding has a relatively low rating for both social vulnerability and community resilience, with a risk index score of 54.1 out of 100. According to the NRI, there have been 16 riverine flooding events between the years 1996-2019 with an average of 0.7 events per year.

Table 4-112 Amador County Planning Area – Riverine Flooding Vulnerability Ratings from FEMA NRI

NRI Hazard	Hazard Risk Index Rating*	Expected Annual Loss Values (total)**	Exposure Value (total)***	Historic Loss Ratio Rating
Riverine Flooding	54.1	$535,814	$14,920,746,533	Relatively Low

Source: FEMA NRI Report, retrieved 4/1/2025.

*Hazard Risk Index is calculated using data for only a single hazard type, and reflect a communities expected annual loss value, community risk factors, and the adjustment factor used to calculate the risk value.

**Expected annual loss represents the average economic loss in dollars resulting from natural hazards each year.

***Exposure is a natural hazard consequence factor that is the representative value of buildings, populations, or agriculture potentially exposed to a natural hazard occurrence.

Additional information on the FEMA NRI can be found in Section 4.2 and Appendix G.

Impacts from Flood: 1% and 0.2% Annual Chance Flood

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Large flood events, including those associated with 1% and 0.2% annual chance floods, can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. People may be swept away in floodwaters, causing injuries or deaths. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Structures can be damaged directly from floodwaters and can also be damaged from trees falling as a result of water-saturated soils. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services causing power outages. The interruption of power causes major problems and can result in the closure of governmental offices and community businesses. Public schools may also be required to

close or be placed on a delayed start schedule. Roads can be damaged and closed, causing safety and evacuation issues.

Standing water can cause damage to crops, roads, foundations, and electrical circuits. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, loss of environmental resources, and economic impacts.

Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values

Health Hazards from Flooding

Certain health hazards are also common to flood events. While such problems are often not reported, three general types of health hazards accompany floods. The first comes from the water itself. Floodwaters carry anything that was on the ground that the upstream runoff picked up, including dirt, oil, animal waste, and lawn, farm and industrial chemicals. Pastures and areas where cattle and hogs are kept or their wastes are stored can contribute polluted waters to the receiving streams.

Floodwaters also saturate the ground, which leads to infiltration into sanitary sewer lines. When wastewater treatment plants are flooded, there is nowhere for the sewage to flow. Infiltration and lack of treatment can lead to overloaded sewer lines that can back up into low-lying areas and homes. Even when it is diluted by flood waters, raw sewage can be a breeding ground for bacteria such as e. coli and other disease-causing agents.

The second type of health problems arise after most of the water has gone. Stagnant pools can become breeding grounds for mosquitoes, and wet areas of a building that have not been properly cleaned breed mold and mildew. A building that is not thoroughly cleaned becomes a health hazard, especially for small children and the elderly.

Another health hazard occurs when heating ducts in a forced air system are not properly cleaned after inundation. When the furnace or air conditioner is turned on, the sediments left in the ducts are circulated throughout the building and breathed in by the occupants. If a city or county water system loses pressure, a boil order may be issued to protect people and animals from contaminated water.

The third problem is the long-term psychological impact of having been through a flood and seeing one's home damaged and irreplaceable keepsakes destroyed. The cost and labor needed to repair a flood-damaged home puts a severe strain on people, especially the unprepared and uninsured. There is also a long-term problem for those who know that their homes can be flooded again. The resulting stress on floodplain residents takes its toll in the form of aggravated physical and mental health problems.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future hazard conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for Amador County include the following:

- Climate change is likely to exacerbate future flood conditions and associated impacts and vulnerability of the County to 1% and 0.2% annual chance flooding.
- Population growth in Amador County is expected to slowly continue. Additional growth within the DFIRM flood zones in the County would place additional populations at risk to flooding. Additional population growth would likely bring continued diversity to the County. Vulnerable population groups could face disproportionate effects from a flood and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the County to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. Locating new development, structures and critical facilities and infrastructure within or near areas of flood risk may put additional development at risk. However, County building codes and the County's floodplain ordinance are in effect to reduce this risk and should be updated as necessary to continue to address future flood conditions. Depending on the location of new development and adherence to protective building codes and the floodplain ordinance, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the County to this hazard.

Future Development

This section provides an analysis of the flood hazard and proposed future development within the County based on FEMA floodplains and also discusses considerations in evaluating future flooding conditions.

Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements, such as building codes, are followed, and varying needs for different demographic groups with intersecting identities that reside within the County are considered can help to make for a more resilient community.

Future Development: General Considerations

Communities that participate in the NFIP adopt regulations and codes that govern development in special flood hazard areas (SFHAs) and enforce those requirements through their local floodplain management

ordinances through the issuance of permits. Amador County's floodplain management ordinance provides standards for development, subdivision of land, construction of buildings, and improvements and repairs to buildings that generally meet the minimum requirements of the NFIP.

The International Residential Code (IRC) and International Building Code (IBC), by reference to ASCE 24, include requirements that govern the design and construction of buildings and structures in flood hazard areas. FEMA has determined that the flood provisions of the I-Codes are consistent with the requirements of the NFIP (the I-Code requirements shown either meet or exceed NFIP requirements). ASCE 24, a design standard developed by the American Society of Civil Engineers, expands on the minimum NFIP requirements with more specificity, additional requirements, and some limitations.

With the adoption of the International Codes, communities will be moving towards a more stringent approach to regulatory floodplain management, beyond the minimum requirements of the NFIP. The adoption and enforcement of disaster-resistant building codes is a core community action to promote effective mitigation. When communities ensure that new buildings and infrastructure are designed and constructed in accordance with national building codes and construction standards, they significantly increase local resilience now and in the future. With continued advancements in building codes, local ordinances should be reviewed and updated to meet and exceed standards as practicable to protect new development from future flood events and to further promote disaster resiliency.

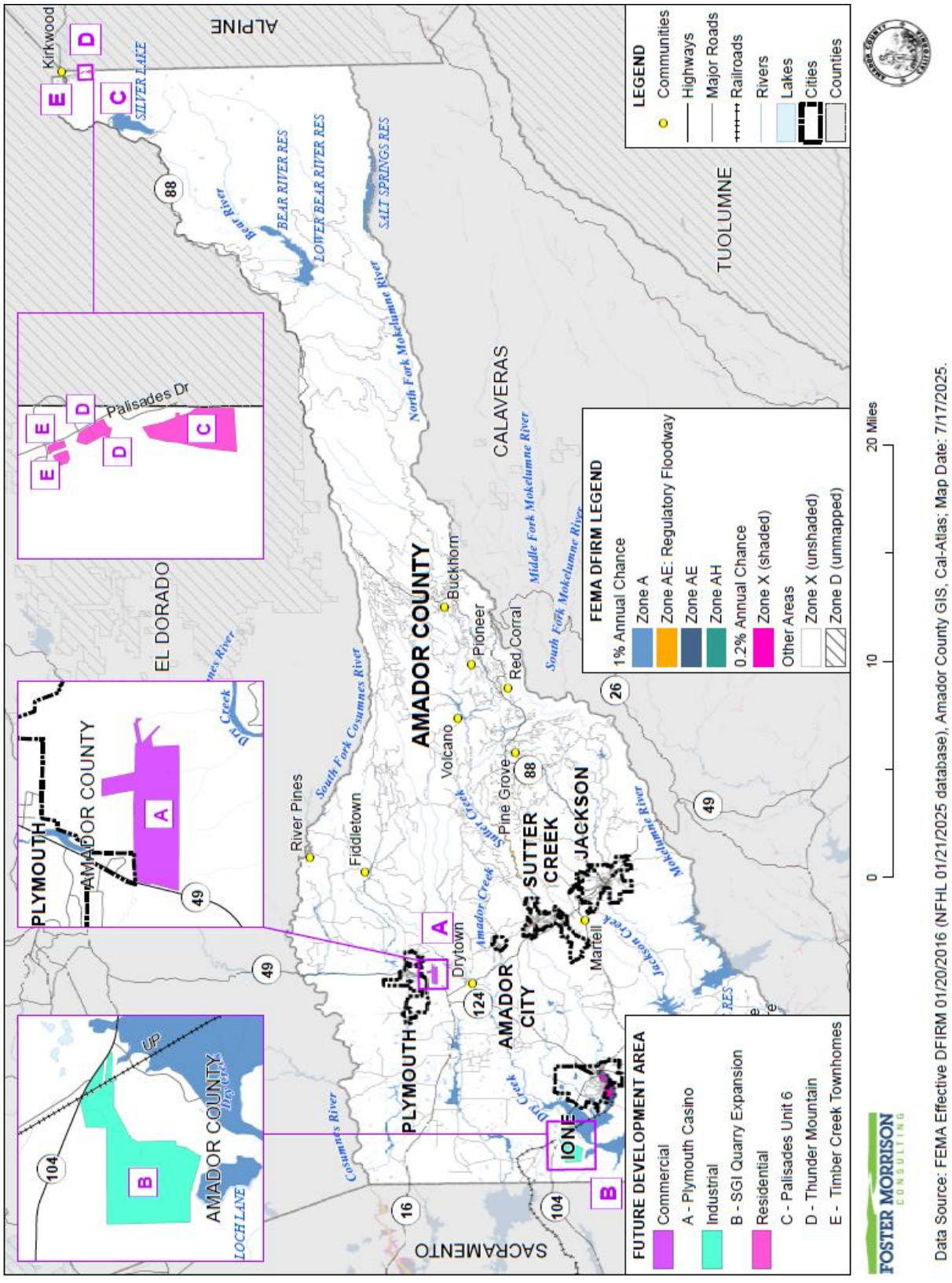
One of the most effective ways to reduce vulnerability to potential flood damage is through careful land use planning that fully considers applicable flood management information and practices. Master planning will also be necessary to assure that open channel flood flow conveyances serving the smaller internal streams and drainage areas are adequately prepared to accommodate the flows. Preservation and maintenance of natural and riparian areas should also be an ongoing priority to realize the flood control benefits of the natural and beneficial functions of these areas.

Future development in the County may be built in the floodplain, in conformance to the standards of the floodplain ordinance. The County enforces the floodplain ordinance on new development in unincorporated Amador County. Future development areas and their vulnerability to DFIRM flooding is discussed further in the below GIS analysis.

Future Development: GIS Analysis

Amador County provided five future development areas which were used as the basis for the inventory of future development for the unincorporated County. These were mapped in GIS. Where multiple parcels are listed, the parcels are merged to form one polygon, and the hazards are assigned to the highest annual chance flood zone category. Figure 4-101 show the locations of the future development areas and FEMA DFIRM flood zones. As shown, all of these areas fall outside of the 1% and 0.2% annual chance flood zones; as such, no tabular analysis is presented.

Figure 4-101 Unincorporated Amador County – Future Development in FEMA DFIRM Flood Zones



4.3.13. Flood: Localized Flooding

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Amador County Planning Area. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; likelihood of future occurrence; and how climate change can affect or influence this hazard.

Hazard/Problem Description

Flooding occurs in areas other than the FEMA mapped floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the Amador County Planning Area during the rainy season from November through April. Prolonged heavy rainfall contributes to a large volume of runoff resulting in high peak flows of moderate duration. Flooding is more severe when previous rainfall has created saturated ground conditions. Urban storm drainpipes and pump stations have a finite capacity. When rainfall exceeds this capacity, or the system is clogged, water accumulates in the street until it reaches a level of overland release. This type of flooding may occur when intense storms occur over areas of development.

Location and Extent

There is no established scientific scale or measurement system for localized flooding. Localized flooding is generally measured by depth of flooding and the area affected. Localized flooding often happens quickly and has a short speed of onset. In the County this happens more often during the winter months, as was shown on Figure 4-47 above. Localized flooding often has a short duration. Specific locations in the County can be seen in the Local Concerns section below in Table 4-113.

Past Occurrences

Disaster Declarations

There are no identified state or federal disaster declarations for localized flooding, as shown in Table 4-4. However, localized flooding was likely an issue during previous declarations for severe storms, heavy rains and floods.

NCDC Events

The past occurrences of localized flooding are included in the 1% and 0.2% annual chance flood hazard profile in Section 4.3.12.

Hazard Mitigation Planning Committee Events

The HMPC noted the following events:

2017 – Heavy rains in 2017 caused flooding in many areas. Localized flooding occurred throughout the County. This was brought on by atmospheric rivers bringing heavy rains to large portions of the County. In addition to flooding, damage to these areas included pavement deterioration, washouts, and areas of erosion, The following areas have had localized flooding: Old Sacramento Road, Tonzi Road, Carbondale Road, Paine Road, Sutter Ione Road, Climax Road and others.

Figure 4-102 Old Sacramento Road

Source: Amador County

Figure 4-103 Tonzi Road

Source: Amador County

Figure 4-104 Carbondale Road

Source: Amador County

Figure 4-105 Paine Road

Source: Amador County

Figure 4-106 Sutter Ione Road #1

Source: Amador County

Figure 4-107 Sutter Ione Road #2

Source: Amador County

Figure 4-108 Climax Road

Source: Amador County

In 2023, Amador County Public Works noted that localized flooding occurred. It was contained to just a few low-lying areas, such as the Sutter Creek-Volcano Road and the creek crossing on Amador Road and Turner Road.

Likelihood of Future Occurrence

Highly Likely—Natural drainage systems located throughout the Amador County Planning Area have a finite capacity to convey water. Likewise, storm drainage systems have a finite capacity generally based on the design criteria. When rainfall exceeds the capacity of natural and storm drainage systems or systems clog, water accumulates until it reaches a level of overland release. Due to aging and often undersized infrastructure, this type of flooding will continue to occur annually during heavy rains.

It is likely that climate change will increase the chance of future occurrence as well as future impacts. More information on climate change and localized flood can be found in the next section. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate Change and Localized Flood

Even if average annual rainfall may decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century, increasing the likelihood of overwhelming stormwater systems built to historical rainfall averages. This makes localized flooding more likely.

Vulnerability Assessment

Vulnerability—Medium

Flood vulnerability and their impacts vary by location and severity of any given flood event and will likely only affect certain areas of the Amador County Planning Area during specific times. Based on the risk assessment, it is evident that floods will continue to have potentially significant economic impacts to certain areas of the Amador Planning Area. However, while flooding can cause significant impacts depending on the duration and volume of precipitation and the drainage in any given area, many of the floods in the Planning Area are minor, localized flood events that are more of a nuisance than a disaster.

Many areas of the Planning Area are at some measure of vulnerability to localized flooding. An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to unincorporated Amador County. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect both the entire Amador County Planning Area as well as the unincorporated portions of Amador County. How the hazard affects the other participating jurisdictions can be found in their respective annexes to this LHMP Update. These sections below include assets at risk, impacts, and how future development may affect the vulnerability of the County to this hazard.

Local Concerns (unincorporated Amador County)

The unincorporated County has specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce vulnerabilities to this hazard.

According to Amador County, numerous parcels and roads throughout the County not included in the FEMA 1% and 0.2% annual chance floodplains are subject to flooding in heavy rains. In addition to flooding, damage to these areas during heavy storms includes pavement deterioration, washouts, mudslides, debris areas, and downed trees. The frequency and type of damage or flooding that occurs varies from year to year, depending on the quantity of runoff.

The primary areas of localized flooding and the types of damage are shown on Figure 4-109 and presented in Table 4-113.

Figure 4-109 Amador County – Localized Flooding Areas

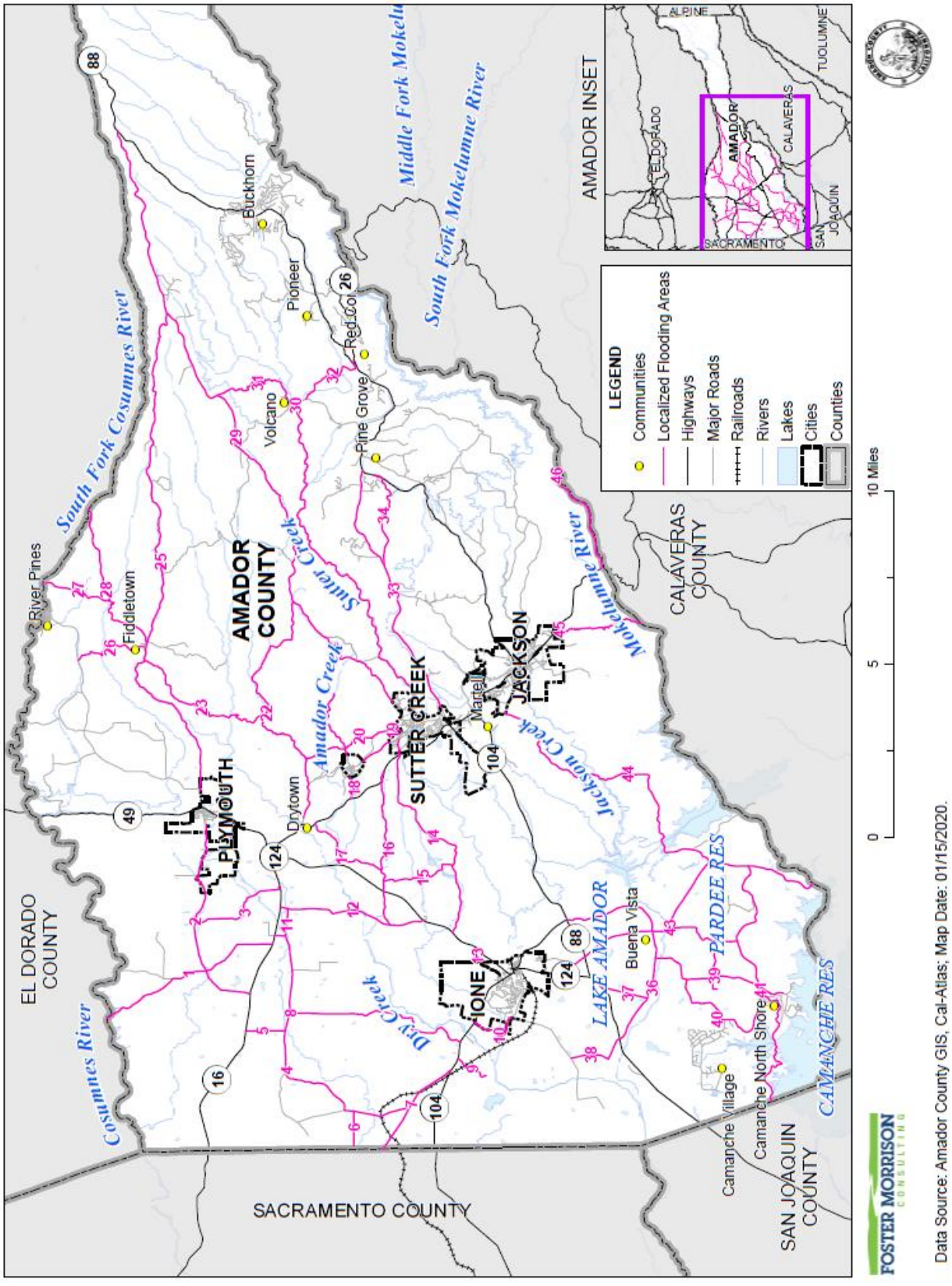


Table 4-113 Amador County Localized Flooding Areas

No.	Road Name	Flooding	Pavement Deterioration	Washouts	High Water/ Creek Crossing	Landslides/ Mudslides	Debris	Downed Trees
1	Labtrobe Rd	X				X		
2	Old Sacramento Rd	X	X				X	
3	Greilich Rd	X	X	X	X		X	
4	Carbondale Rd	X			X		X	
5	Forest Home Rd	X					X	
6	Maxwell Rd	X	X					
7	Michigan Bar Rd						X	
8	Irish Hill Rd	X	X					X
9	Dutschke Rd	X						
10	Five Mile Dr						X	
11	Huot Rd	X			X			
12	Willow Creek Rd	X						
13	Waterman Rd	X	X				X	
14	Sutter Ione Rd	X				X	X	X
15	Paine Rd	X	X		X	X	X	
16	Tonzi Rd	X	X		X	X	X	
17	Vaira Ranch Rd	X	X		X	X	X	
18	Old Hwy 49					X		
19	Amador Rd				X			
20	Turner Rd		X		X			
21	Amador Creek Rd	X	X	X	X			X
22	New Chicago Rd	X					X	
23	Quartz Mountain Rd N	X			X		X	
24	Quartz Mountain Rd E	X			X	X		
25	Fiddletown Rd	X	X				X	X
26	Ostrom Rd	X					X	
27	Lawrence Rd							X
28	Tyler Rd		X			X		X
29	Shakeridge Rd	X	X	X		X	X	
30	Sutter Creek Rd	X	X	X		X	X	X
31	Rams Horn Grade	X					X	
32	Pioneer Volcano Rd	X	X	X	X	X	X	X

No.	Road Name	Flooding	Pavement Deterioration	Washouts	High Water/ Creek Crossing	Landslides/ Mudslides	Debris	Downed Trees
33	Ridge Rd					X		X
34	Climax Rd					X	X	X
35	Buena Vista Rd	X	X			X	X	
36	Jackson Valley Rd	X	X				X	
37	Martin Ln	X	X				X	
38	Dave Brubeck Rd	X	X				X	
39	Camanche Rd	X	X			X	X	
40	Curran Rd	X	X				X	
41	Camanche Parkway N	X				X		
42	Reservation Rd	X						
43	Coal Mine Rd	X	X			X	X	
44	Stony Creek Rd	X	X	X		X	X	X
45	Middle Bar Rd		X			X	X	X
46	Electra Rd	X	X	X	X	X	X	X

Source: Amador County

Local concerns for each of the participating jurisdictions can be found under the Local Concerns heading in each respective jurisdictional annex to this LHMP Update.

Assets at Risk

Assets at risk from localized flood include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections for the Amador County Planning Area and unincorporated Amador County.

Additionally, for each hazard in the FEMA National Risk Index in Amador County, the relevant portions of the hazard analysis done by FEMA is presented below. This includes the Hazard Risk Index Rating, Expected Annual Loss Values, Exposure Values, and the Historic Loss Ratio Rating. These are presented for the Amador County Planning Area as a whole.

People and Populations

People and populations are traditionally not highly vulnerable to localized flooding, but their structures and contents can be at risk. Localized flooding may also cause transportation issues as roads and lanes are impacted or closed and affect the ability for people to travel throughout the Planning Area.

Structures

Structures in areas with localized flooding can be affected if floodwaters intrude into the structure. Structures in low lying areas, or those with basements can be at greater risk. Buildings with older

foundations that are prone to water intrusion are also at greater risk. Once water finds its way into a structure, it tends to continue to do so until the path that brings water into a structure is mitigated. Ground saturation can result in instability, collapse, or other damage to structures. Trees can also be compromised and uprooted falling on structures causing damage.

Critical Facilities and Infrastructure

Localized flooding, while often more of a nuisance, can cause damage to critical facilities and infrastructure during a heavy rain and storm event. Any facility that experiences localized flooding can be impacted. Utilities and other critical infrastructure can all be affected, causing interruptions in service until repairs can be made. For example, water and wastewater systems can be vulnerable to heavy rains and flood events. Rainfall creates a high water table, surging streams and creeks, and saturates soil. Infiltration of stormwater into water and wastewater systems may occur and presents a threat to public health and safety, when the infrastructure is no longer able to meet operational needs and local demands.

Natural, Historic, and Cultural Resources

Natural resource assets may have some vulnerabilities to localized flood during major storm events, but can benefit from floodwaters, often by design. Many parks and green spaces are designed to take overflow water and release it into the underlying soils and natural areas. Wetlands areas in the Planning Area actually help reduce the risk of flooding, as they can absorb excess rainfall that would have to be drained away from impervious surfaces. Flooding can provide many benefits to the natural environment, including recharging wetlands and groundwater, increasing fish production, creating wildlife habitat, and rejuvenating soil fertility. These smaller localized flooding events often provide more benefits to the environment in comparison to negative impacts associated with large flood events. Historic and cultural resources may be at some measure of vulnerability if they are located in areas subject to repeated localized flooding.

Impacts from Localized Flood

Primary concerns associated with stormwater flooding include impacts to infrastructure that provides a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services. Standing water can cause damage to crops, roads, and foundations. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Life safety issues from localized flooding would be more limited. The amount and type of damage or flooding that occurs varies from year to year and from storm to storm, depending on the quantity of precipitation and runoff.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future hazard conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for Amador County include the following:

- Climate change is likely to exacerbate future heavy rain conditions and associated impacts and vulnerability of the County to localized flood.
- Future population growth should be considered, as having more or less people in a community affects the overall hazard vulnerability to the County. Population growth in Amador County is expected to continue (though slowly). Additional population growth would likely bring continued diversity to the County. Vulnerable population groups such as low-income individuals and households living in floodprone areas could face disproportionate effects from localized flood and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the County to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. While limited, much of the growth in Amador County is occurring through expansion of the more urbanized areas, causing an increase in peak flow and stormwater runoff. Such growth will consume previously undeveloped acres, and the impacts may overwhelm existing drainage and flood control facilities. Locating new development, structures and critical facilities and infrastructure within or near areas of localized flooding risk may put additional development at risk. County building codes are in effect to reduce this risk and should be updated as necessary to continue to address future localized flood conditions. Depending on the location of new development and adherence to protective building codes, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the County to this hazard.

The potential for flooding may increase as stormwater is channeled due to land development. Such changes can create localized flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. Mitigating the root causes of the localized stormwater flooding or choosing not to develop in areas that often are subject to localized flooding will reduce future risks of losses due to stormwater/localized flooding. Floodplain modeling and master planning should be based on built out property conditions to ensure that all new development remains safe from future flooding.

Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements, such as building codes, are followed, and varying needs for different demographic groups with intersecting identities that reside within the County are considered can help to make for a more resilient community.

4.3.14. Landslides, Mudslides, and Debris Flows

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Amador County Planning Area. These sections include a hazard/problem description; description of location and extent;

past occurrences of this hazard; the likelihood of future occurrence; and how climate change can affect or influence this hazard.

Hazard/Problem Description

Like its earthquake-generating faults, California's mountainous terrain is a consequence of dynamic geologic processes in operation as the North American Plate grinds past the Pacific Plate. According to the CGS, a landslide is a general term for a variety of mass-movement processes that generate a down-slope movement of mud, soil, rock, and/or vegetation. Landslides are classified into many different types based on form and type of movement. They range from slow-moving rotational slumps and earth flows, which can slowly distress structures but are less threatening to personal safety, to fast-moving rock avalanches and debris flows that are a serious threat to structures and have been responsible for most fatalities during landslide events. For the purposes of this LHMP Update, the term landslide includes mudslides, debris flows, and rockfalls that tend to occur suddenly; as well as hillside erosion, which is a similar process that tends to occur on smaller scales and more gradually but can exacerbate landslide events.

Landslides, debris flows and mudslides are closely related to flooding, as both processes are related to precipitation, runoff, and the saturation of ground by water. In addition, landslides, mud flows, and debris flows can occur on small, steep stream channels and are often mistaken for floods. However, landslide events may be much more destructive than floods because of their higher densities, high debris loads, and high velocities.

Soil erosion is another common form of soil instability. Erosion is a function of soil type, slope, rainfall intensity, and groundcover. It accounts for a loss in many dollars of valuable soil, is aesthetically displeasing, and often induces even greater rates of erosion and sedimentation. Sedimentation is simply the accumulation of soil as a result of erosion. Construction activities often contribute greatly to erosion and sedimentation. Besides being a pollutant in its own right, sediment acts as a transport medium for other pollutants, especially nutrients, pesticides, and heavy metals, which adhere to the eroded soil particles. As the sediment drains into watercourses, the combination of these pollutants adversely affects water quality and can eventually impact stream flows and contribute to flooding potential. Conditions that contribute to landslide, mudslides, debris flows, hillside and streambank erosion include the following:

- Degree of slope
- Water (heavy rain, river flows, or wave action)
- Unconsolidated soil or soft rock and sediments
- Lack of vegetation (no stabilizing root structure)
- Previous wildfires and other forest disturbances (discussed in Section 4.3.15)
- Road building, excavation, and grading
- Earthquake

The 2023 State of California Hazard Mitigation Plan noted that more than one third of California is mountainous terrain that generally trends parallel to the coast, forming a barrier that captures moisture from offshore storms originating in the Gulf of Alaska and Mexico. Steep topography, weak rocks, heavy winter rains, and occasional earthquakes all lead to slope failures more frequently than would otherwise occur

under gravity alone. This is true in the mountainous, sloped areas within the Planning Area where the topography is characterized by rolling hills elevation changes.

Location and Extent

Landslides can be expected in areas with steep slopes and weak soils. It can also occur in areas where erosion has previously occurred. Both winter storms (precipitation-induced) and earthquake triggered landslides tend to occur in or near places that have experienced previous landslides. However, landslides may also occur in other locations over time.

Figure 4-110 shows the CGS areas at susceptible to deep seated landslides. The legend on Figure 4-110 shows the susceptibility scale (from 0-X with 0 being the least and X being the most susceptible) that the CGS uses to show the susceptibility of landslides. It is a primarily a combination of slope class and rock strength. Geographic extents of these classes for the unincorporated Amador County are shown on Table 4-114. Details on each participating jurisdiction's CGS deep-seated landslide extents can be found in their respective annexes to this LHMP Update.

According to the 2023 State Hazard Mitigation Plan, the susceptibility classes were further categorized into Very High (susceptibility class X) and High (susceptibility classes VII, VIII, & IX) for exposure analysis. The rest of the classes were not categorized. CGS mapping indicates that the eastern portions of the County Planning Area and surrounding area have areas at high to very high susceptibility areas for landslides. The western portion of the County, while much more limited, also includes some areas at high to very high landslide susceptibility. This can be seen in the darker orange and red colors. The speed of onset of landslide is often short, especially in post-wildfire burn scar areas, but it can also take years for a slope to fail. Landslide duration is usually short, though digging out and repairing landslide areas can take some time. In Amador County, landslides generally occur where there is very little population or infrastructure.

Figure 4-110 Amador County Planning Area – Susceptibility to Deep Seated Landslides

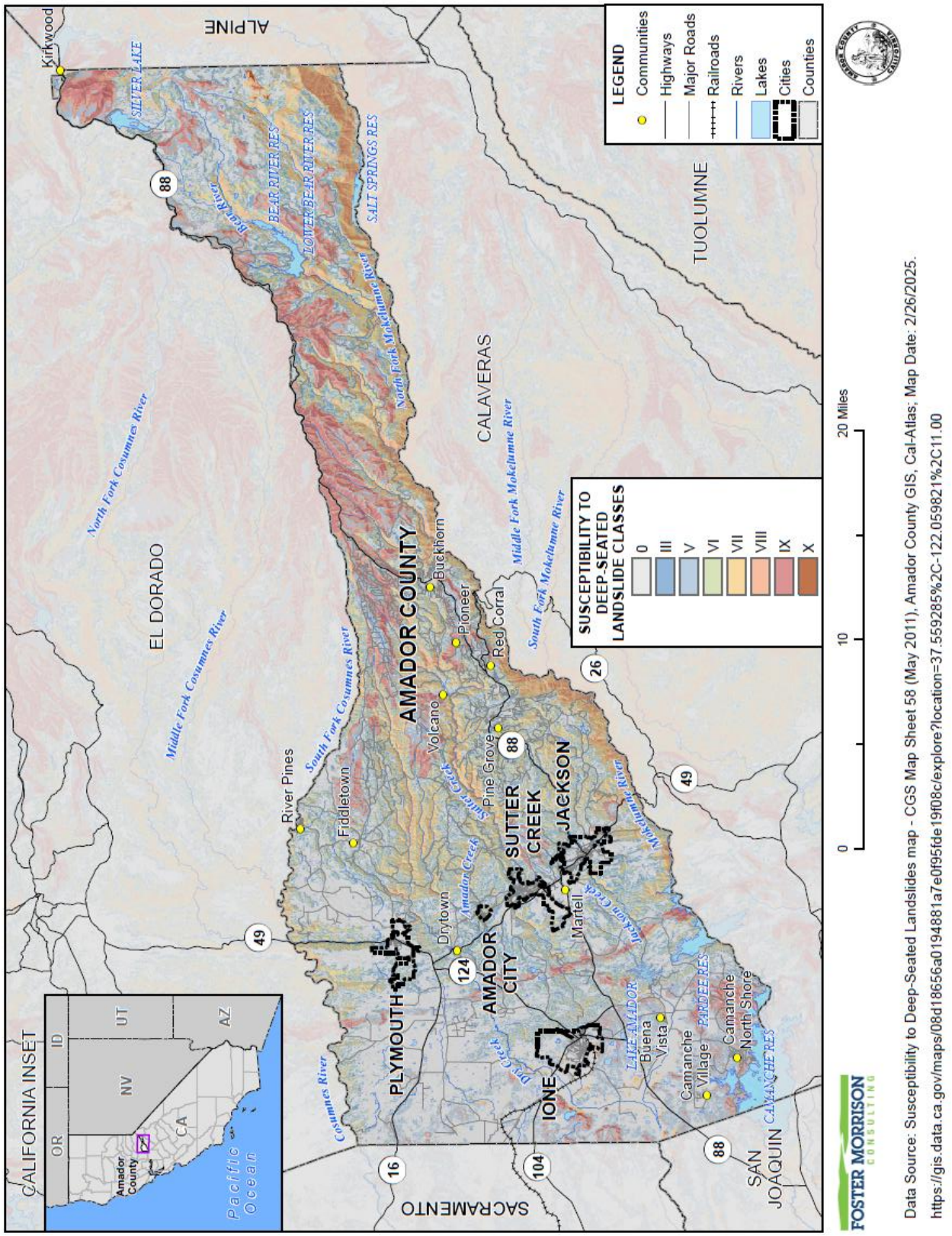


Table 4-114 Amador County Planning Area – Geographical Deep Seated Landslide Classes Extent

Jurisdiction / Susceptibility to Deep-Seated Landslide Class	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Amador City						
0	34	0.009%	13	0.008%	21	0.009%
III	57	0.01%	21	0.01%	36	0.02%
V	0	0.0%	0	0.0%	0	0.0%
VI	59	0.02%	16	0.009%	43	0.02%
VII	43	0.01%	9	0.005%	34	0.02%
VIII	5	0.001%	2	0.001%	3	0.001%
IX	0	0.0%	0	0.0%	0	0.0%
X	0	0.0%	0	0.0%	0	0.0%
Amador City Total	**198**	**0.05%**	**61**	**0.04%**	**137**	**0.06%**
Ione						
0	2,023	0.52%	507	0.30%	1,516	0.69%
III	134	0.03%	0	0.00002%	134	0.06%
V	570	0.15%	126	0.07%	444	0.20%
VI	60	0.02%	0	0.0%	60	0.03%
VII	102	0.03%	35	0.02%	68	0.03%
VIII	59	0.02%	16	0.009%	44	0.02%
IX	25	0.006%	6	0.004%	18	0.008%
X	0	0.0%	0	0.0%	0	0.0%
Ione Total	**2,973**	**0.77%**	**690**	**0.41%**	**2,283**	**1.04%**
Jackson						
0	1,569	0.40%	561	0.33%	1,009	0.46%
III	419	0.11%	132	0.08%	287	0.13%
V	61	0.02%	30	0.02%	31	0.01%
VI	145	0.04%	38	0.02%	107	0.05%
VII	70	0.02%	12	0.01%	57	0.03%
VIII	33	0.01%	8	0.00%	25	0.01%
IX	3	0.001%	1	0.0005%	3	0.00%
X	0	0.0%	0	0.0%	0	0.0%
Jackson Total	**2,302**	**0.59%**	**782**	**0.47%**	**1,520**	**0.69%**
Plymouth						
0	1,271	0.33%	572	0.34%	698	0.32%

Jurisdiction / Susceptibility to Deep-Seated Landslide Class	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
III	267	0.07%	26	0.02%	240	0.11%
V	0	0.0%	0	0.0%	0	0.0%
VI	124	0.03%	1	0.001%	124	0.06%
VII	34	0.009%	0	0.0%	34	0.02%
VIII	1	0.0004%	0	0.0%	1	0.001%
IX	0	0.0%	0	0.0%	0	0.0%
X	0	0.0%	0	0.0%	0	0.0%
Plymouth Total	**1,698**	**0.44%**	**600**	**0.36%**	**1,098**	**0.50%**
Sutter Creek						
0	1,164	0.30%	546	0.33%	618	0.28%
III	315	0.08%	134	0.08%	181	0.08%
V	33	0.008%	9	0.006%	23	0.01%
VI	137	0.04%	57	0.03%	80	0.04%
VII	48	0.01%	14	0.008%	34	0.02%
VIII	10	0.00%	2	0.001%	8	0.004%
IX	2	0.0005%	0	0.0001%	2	0.001%
X	0	0.0%	0	0.0%	0	0.0%
Sutter Creek Total	**1,709**	**0.44%**	**762**	**0.45%**	**947**	**0.43%**
Unincorporated Amador County						
0	140,569	36%	77,398	46%	63,170	29%
III	54,223	14%	25,575	15%	28,647	13%
V	35,424	9%	14,510	9%	20,914	10%
VI	42,155	11%	17,541	10%	24,614	11%
VII	47,138	12%	15,997	10%	31,141	14%
VIII	36,230	9%	8,611	5%	27,619	13%
IX	23,505	6%	5,578	3%	17,927	8%
X	137	0.04%	21	0.01%	116	0.1%
Unincorporated Amador County Total	**379,381**	**98%**	**165,231**	**98%**	**214,150**	**97%**
Grand Total	**388,260**	**100%**	**168,125**	**100%**	**220,134**	**100%**

Source: Susceptibility to Deep-Seated Landslides map – CSG Map Sheet 58 (05/2011)

Past Occurrences

Disaster Declaration History

There have been no disaster declarations associated with solely landslides in Amador County; however, as shown in Table 4-115, there have been 9 state and 10 federal disaster declarations for flood which included landslides as a component.

Table 4-115 Amador County – Federal and State Disaster Declarations Summary 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (events that included landslide)	9	1995 (twice), 2006 (twice), 2017 (twice), 2019, 2023 (twice)	10	1995 (twice), 2006 (twice), 2017 (twice), 2019, 2023 (three)

Source: Cal OES, FEMA. Retrieved March 2025.

NCDC Events

The NCDC contains no records for landslides in Amador County. There has, however, been a damaging debris flow recorded in the County. This can be seen in Table 4-116.

*Table 4-116 NCDC Landslide and Debris Flow Events for Amador County 1950-7/31/2024**

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Debris Flows	1	0	0	0	0	$100,000	$0

Source: NCDC

Hazard Mitigation Planning Committee Events

There are certain areas within the County that are susceptible to slope failure resulting in localized landslides, mudslides, and debris flows. These areas are detailed in the Local Concern section below. Past occurrences of this hazard include the following:

In **2005 -** a landslide on the north side of Shake Ridge Road near Sutter Creek occurred. The hillside failed which, in turn, damaged 300 feet of water supply ditch. This ditch fed 6 cities/towns. The Amador Water Agency installed a pipeline to remove the risk of future issues in this area.

2023 - Amador County Public Works noted that there were small localized incidents that occurred in 2023 in some of the landslide areas Local Concerns section below. No damages were reported from these events.

Figure 4-111 Amador County Planning Area – Slip in Hillside from 2022/2023 Storm Events

Source: Amador County OES

It was also noted that Tiger Creek Road and Tiger Creek Afterbay Dam Road see ongoing issues due to severe winter weather and other issues. Erosion and slumping can occur in these areas.

Likelihood of Future Occurrence

Likely—Based on data provided by the HMPC, landslides are naturally occurring events that will inevitably happen as long as gravity itself is a controlling factor upon the landscape. Since Amador County's mountainous terrain in the eastern portion of the County challenges gravity as it rapidly rises to upper elevations, much of the high-relief topography in the County can be identified as land with the potential for

landslides. Much of that land though is in remote and undeveloped locales, which reduces the risk and vulnerability of this natural hazard. Given the nature of localized problems identified within the County, landslides will likely continue to impact the area when heavy precipitation occurs (especially in post wildfire burn areas) as they have in the past.

It is likely that climate change will increase the chance of future occurrence as well as future impacts. More information on climate change and landslide and debris flow can be found in the next section. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate Change and Landslide and Debris Flows

According to the 2021 CAS (as well as the 2024 Draft CAS), climate change may result in precipitation extremes (i.e., wetter wet periods and drier dry periods). More information on precipitation increases can be found in Section 4.3.3. While total average annual rainfall may decrease only slightly, rainfall is predicted to occur in fewer, more intense precipitation events. The combination of a generally drier climate in the future, which will increase the chance of drought and wildfires, and the occasional extreme downpour is likely to cause more mudslides, landslides, and debris flows.

Vulnerability Assessment

Vulnerability—Medium

According to historical hazard data and landslide hazard mapping, landslides can occur in the Amador County Planning Area. An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to unincorporated Amador County. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect both the entire Amador County Planning Area as well as the unincorporated portions of Amador County. How the hazard affects the other participating jurisdictions can be found in their respective annexes to this LHMP Update. These sections below include assets at risk, impacts, and how future development may affect the vulnerability of the County to this hazard.

Local Concerns (unincorporated Amador County)

The unincorporated County has specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce vulnerabilities to this hazard.

The 2016 Amador County General Plan Safety Element noted that although landslides are primarily associated with slopes greater than 15 percent, they can also occur in relatively flat areas and as cut-and-fill failures, river bluff failures, lateral spreading landslides, collapse of wine-waste piles, failures associated with quarries, and open-pit mines. Landslides in the County may be triggered by both natural- and human-caused activity.

The County noted that many areas in eastern Amador County are also rated high or very high in their susceptibility to landslide due to erosive soils, and from hydrophobic soils from past wildfire burn scars. There is very little population or improved parcels in this area.

Areas identified by the County with historic problems include those listed below.

- Landslides/Mudslides
  - ✓ Camanche Parkway No.
  - ✓ Carson Pass area
  - ✓ Charleston Road
  - ✓ Climax Road
  - ✓ Deer Trail
  - ✓ Electra Road
  - ✓ Fiddletown Road
  - ✓ Latrobe Road
  - ✓ Michigan Bar Road
  - ✓ Middle Bar Road
  - ✓ Old Highway 49
  - ✓ Pioneer – Volcano Road
  - ✓ Pioneer Creek Road
  - ✓ Rams Horn Grade
  - ✓ Shakeridge Road
  - ✓ Stony Creek Road (see Figure 4-112)
  - ✓ Sutter Creek Road
  - ✓ Trans Sierra Highway
  - ✓ Volcano Road

- Debris Flows
  - ✓ Comanche Road Bridge
  - ✓ Kit Carson Road
  - ✓ Little Bear Road (see Figure 4-113)
  - ✓ Old Sacramento Road
  - ✓ Sutter Creek Road
  - ✓ Pine Grove/Volcano Road

Figure 4-112 Stony Creek Road

Source: Amador County

Figure 4-113 Little Bear Road

Source: Amador County

Local concerns for each of the other participating jurisdictions can be found under the Local Concerns heading in each respective jurisdictional annex to this LHMP Update.

Assets at Risk

Assets at risk from landslide include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections for the Amador County Planning Area and unincorporated Amador County.

Additionally, for each hazard in the FEMA National Risk Index in Amador County, the relevant portions of the hazard analysis done by FEMA is presented below. This includes the Hazard Risk Index Rating, Expected Annual Loss Values, Exposure Values, and the Historic Loss Ratio Rating. These are presented for the Amador County Planning Area as a whole.

Methodology (Parcels and Structures)

In order to analyze people and populations, structures, and critical facilities at risk in DFIRM flood zones, GIS was used to quantify those values. The 2024 Amador County Parcel/Assessor Data was provided by Amador County and was used as the basis for the inventory of assessed values for both improved and unimproved parcels within the Amador County Planning Area. The 2011 California Geologic Survey Deep

Seated Landslide Susceptibility data was obtained for the Amador County Planning Area. The landslide hazard layer was then overlaid on the parcel layer. In some cases, there are parcels in multiple deep seated landslide classes. For the purposes of this analysis, if the deep seated landslide classes intersected any portion of a parcel polygon, the entire parcel was considered to be in the highest risk class. The parcels were segregated and analyzed in this fashion for the entire Planning Area.

Once the deep-seated landslide susceptibility classes were intersected, land and improved (structure) values from the Assessor data were included for each parcel and estimated content replacement values were added to the analysis. Improved parcels include those with improved structure values identified in the Amador County Assessor's database.

People and Populations

All populations located within areas of landslide susceptibility, especially in the High to Very High hazard areas (i.e., Classes VII to X) are at some vulnerability to landslide. This includes those people residing in these landslide potential areas as well as those that might reside or work within the landslide run out areas. People residing in these areas may also be cut off from transportation routes if roads and streets providing a means of ingress and egress are impacted. Certain vulnerable populations may be at greater risk due to the often sudden onset of a landslide event and include: the unsheltered, those with limited mobility, and those that lack the resources to leave the area.

Amador County Planning Area residents that live in the High and Very High landslide susceptibility areas are often the most vulnerable, but those who live in in the landslide run out areas (which are not mapped) are also vulnerable. Not only are the residents at risk, but their homes and contents are all at risk, compounding the impacts associated with significant hazard events. To further evaluate the impact to Planning Area's residential population residing within these hazard areas, an analysis was conducted of those who physically reside in the mapped landslide susceptibility areas. The CGS Susceptibility to Deep Seated Landslide maps were overlayed on the parcel layer and linked to the assessor data. Those residential parcel centroids that intersect the High or Very High risk areas (Class VII or higher) were counted and multiplied by the 2020 Census Bureau average household factors each jurisdiction in the Planning Area. Analysis results are shown in Table 4-117.

Table 4-117 Amador County Planning Area – Improved Residential Parcels and Population in Susceptibility to Deep Seated Landslides (Classes VII, VIII, IX, and X) by Jurisdiction

Deep Seated Landslide Class/Jurisdiction	Improved Residential Parcels	Population
VII		
Amador City	26	54
Ione	101	232
Jackson	49	108
Plymouth	0	0
Sutter Creek	62	128

Deep Seated Landslide Class/Jurisdiction	Improved Residential Parcels	Population
Unincorporated County	2,313	5,436
Total	**2,551**	**5,958**
VIII		
Amador City	4	8
Ione	72	165
Jackson	50	110
Plymouth	0	0
Sutter Creek	0	0
Unincorporated County	1,760	4,136
Total	**1,886**	**4,419**
IX		
Amador City	0	0
Ione	32	73
Jackson	17	37
Plymouth	0	0
Sutter Creek	1	2
Unincorporated County	1,412	3,318
Total	**1,463**	**3,431**
X		
Amador City	0	0
Ione	0	0
Jackson	0	0
Plymouth	0	0
Sutter Creek	0	0
Unincorporated County	4	9
Total	**4**	**9**

Source: Susceptibility to Deep-Seated Landslides map – CSG Map Sheet 58 (05/2011), 2024 Amador County Parcel/Assessor Data, 2020 US Census Bureau Average Household Size – City of Amador City (2.07); City of Ione (2.29); City of Jackson (2.20); City of Plymouth (2.80); City of Sutter Creek (2.07): Unincorporated Amador County (2.35).

Structures

Landslides can affect the built environment of the Amador County Planning Area and those structures located within the high to very high hazard areas (i.e., Classes VII to X) are especially vulnerable, as are the structures located within the landslide run out areas. The CGS Deep Seated Landslide Susceptibility layer was overlaid with the County parcel (structure) layer in GIS and linked to the assessor data. The mapped landslide areas are shown on Figure 4-110. Table 4-118 summarizes parcel counts, land and improved values (i.e., those with a structure improvement on the parcel), other values, estimated content replacement values, and total values in the Planning Area for deep seated landslide classes. Table 4-119

summarizes parcel counts, land and improved values (i.e., those with a structure improvement on the parcel), estimated content replacement values, and total values by property use for the unincorporated County for deep seated landslide classes. As shown, a limited number of improved parcels fall in Classes VII to X in the cities, while there are many improved parcels in Classes VII to X in the unincorporated County.

Table 4-118 Amador County Planning Area – Count and Value of Parcels and Structures Susceptible to Deep Seated Landslide by Class and Jurisdiction

Jurisdiction / Susceptibility to Deep-Seated Landslide Class	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Amador City						
0	17	11	$1,295,333	$1,857,930	$1,001,341	$4,154,604
III	37	25	$4,135,446	$4,500,610	$2,669,721	$11,305,777
VI	58	41	$6,930,312	$8,059,107	$4,806,698	$19,796,117
VII	52	29	$5,069,410	$6,045,394	$3,577,490	$14,692,294
VIII	16	5	$1,693,876	$615,265	$310,108	$2,619,249
Amador City Total	**180**	**111**	**$19,124,377**	**$21,078,306**	**$12,365,357**	**$52,568,040**
Ione						
0	1,317	1,230	$132,482,672	$318,679,739	$168,808,142	$619,970,553
V	585	531	$59,332,843	$125,847,002	$63,640,389	$248,820,234
VII	118	103	$11,085,532	$25,739,054	$13,201,312	$50,025,898
VIII	97	72	$8,803,927	$15,328,781	$7,664,391	$31,797,099
IX	88	40	$12,036,855	$10,872,581	$4,770,746	$27,680,182
Ione Total	**2,205**	**1,976**	**$223,741,829**	**$496,467,157**	**$258,084,980**	**$978,293,966**
Jackson						
0	1,037	922	$81,153,812	$205,409,492	$126,515,881	$413,079,185
III	540	440	$48,822,598	$138,243,500	$85,274,597	$272,340,695
V	115	100	$9,973,704	$30,412,696	$15,125,519	$55,511,919
VI	224	161	$27,645,839	$135,031,474	$110,107,041	$272,784,354
VII	99	59	$20,349,425	$32,993,251	$26,423,486	$79,766,162
VIII	79	57	$11,053,270	$20,588,206	$14,267,832	$45,909,308
IX	30	17	$2,853,340	$5,196,120	$2,598,060	$10,647,520
Jackson Total	**2,124**	**1,756**	**$201,851,988**	**$567,874,739**	**$380,312,415**	**$1,150,039,142**
Plymouth						
0	536	435	$69,207,310	$106,934,063	$62,161,134	$238,302,507
III	53	39	$9,668,168	$9,332,941	$6,048,755	$25,049,864
VI	22	14	$2,685,659	$2,100,402	$1,052,253	$5,838,314

Jurisdiction / Susceptibility to Deep-Seated Landslide Class	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
VII	12	0	$3,582,226	$0	$0	$3,582,226
Plymouth Total	**625**	**488**	**$85,143,363**	**$118,367,406**	**$69,262,141**	**$272,772,910**
Sutter Creek						
0	744	634	$72,757,839	$184,632,211	$120,864,415	$378,254,465
III	367	303	$29,373,095	$77,110,330	$39,376,477	$145,859,902
V	3	2	$575,072	$736,206	$700,166	$2,011,444
VI	199	155	$17,159,592	$47,724,542	$26,224,294	$91,108,428
VII	100	62	$10,397,559	$20,672,537	$10,336,269	$41,406,365
VIII	11	2	$1,262,463	$48,045	$48,045	$1,358,553
IX	10	2	$2,149,585	$415,990	$70,000	$2,635,575
Sutter Creek Total	**1,434**	**1,160**	**$133,675,205**	**$331,339,861**	**$197,619,665**	**$662,634,731**
Unincorporated Amador County						
0	2,052	1,575	$182,544,780	$386,612,887	$258,799,971	$827,957,638
III	1,723	1,333	$139,945,708	$306,413,278	$174,086,893	$620,445,879
V	2,267	1,537	$165,359,918	$338,599,501	$181,301,318	$685,260,737
VI	1,803	1,401	$159,986,869	$313,805,753	$171,368,366	$645,160,988
VII	3,702	2,659	$353,651,150	$677,494,509	$370,628,602	$1,401,774,261
VIII	3,486	2,175	$349,745,652	$481,480,648	$263,311,585	$1,094,537,885
IX	2,747	1,730	$296,033,771	$517,545,500	$341,495,575	$1,155,074,846
X	48	24	$40,138,659	$4,801,465	$3,731,813	$48,671,937
Unincorporated Amador County Total	**17,828**	**12,434**	**$1,687,406,507**	**$3,026,753,541**	**$1,764,724,121**	**$6,478,884,169**
Grand Total	**24,396**	**17,925**	**$2,350,943,269**	**$4,561,881,010**	**$2,682,368,677**	**$9,595,192,956**

Source: Susceptibility to Deep-Seated Landslides map – CSG Map Sheet 58 (05/2011), 2024 Amador County Parcel/Assessor Data

Table 4-119 Unincorporated Amador County – Count and Value of Parcels and Structures Susceptible to Deep Seated Landslide by Class and Property use

Susceptibility to Deep-Seated Landslide Class/Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Estimated Contents Value
0						
Agricultural	59	52	$9,331,710	$24,744,106	$24,744,106	$58,819,922
Commercial	206	141	$47,970,217	$107,004,646	$107,004,646	$261,979,509
Industrial	12	4	$1,128,162	$1,204,716	$1,807,074	$4,139,952

Susceptibility to Deep-Seated Landslide Class/Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Estimated Contents Value
Miscellaneous	89	8	$248,387	$612,121	$0	$860,508
Residential	1,671	1,360	$122,067,732	$250,488,289	$125,244,145	$497,800,166
Unknown	15	10	$1,798,572	$2,559,009	$0	$4,357,581
0 Total	**2,052**	**1,575**	**$182,544,780**	**$386,612,887**	**$258,799,971**	**$827,957,638**
III						
Agricultural	86	71	$9,525,739	$14,368,403	$14,368,403	$38,262,545
Commercial	51	37	$12,567,965	$24,663,155	$24,663,155	$61,894,275
Industrial	9	7	$3,101,167	$2,352,216	$3,528,324	$8,981,707
Miscellaneous	54	4	$390,002	$259,732	$0	$649,734
Residential	1,506	1,204	$113,520,998	$263,054,021	$131,527,011	$508,102,030
Unknown	17	10	$839,837	$1,715,751	$0	$2,555,588
III Total	**1,723**	**1,333**	**$139,945,708**	**$306,413,278**	**$174,086,893**	**$620,445,879**
V						
Agricultural	24	19	$3,391,498	$2,834,644	$2,834,644	$9,060,786
Commercial	43	32	$7,720,871	$15,343,765	$15,343,765	$38,408,401
Industrial	6	4	$2,252,733	$4,457,151	$6,685,727	$13,395,611
Miscellaneous	52	8	$575,342	$784,414	$0	$1,359,756
Residential	2,126	1,465	$150,366,452	$312,874,365	$156,437,183	$619,678,000
Unknown	16	9	$1,053,022	$2,305,162	$0	$3,358,184
V Total	**2,267**	**1,537**	**$165,359,918**	**$338,599,501**	**$181,301,318**	**$685,260,737**
VI						
Agricultural	121	96	$22,354,969	$14,485,416	$14,485,416	$51,325,801
Commercial	34	27	$11,986,585	$13,120,970	$13,120,970	$38,228,525
Industrial	6	5	$2,688,982	$1,499,248	$2,248,872	$6,437,102
Miscellaneous	46	9	$861,989	$423,103	$0	$1,285,092
Residential	1,585	1,260	$121,289,580	$283,026,215	$141,513,108	$545,828,903
Unknown	11	4	$804,764	$1,250,801	$0	$2,055,565
VI Total	**1,803**	**1,401**	**$159,986,869**	**$313,805,753**	**$171,368,366**	**$645,160,988**
VII						
Agricultural	397	285	$55,690,415	$59,178,152	$59,178,152	$174,046,719
Commercial	32	18	$4,692,847	$8,271,178	$8,271,178	$21,235,203
Industrial	2	2	$298,760	$2,302,323	$3,453,485	$6,054,568
Miscellaneous	110	16	$1,693,168	$2,507,382	$0	$4,200,550
Residential	3,114	2,313	$284,275,299	$599,451,575	$299,725,788	$1,183,452,662
Unknown	47	25	$7,000,661	$5,783,899	$0	$12,784,560
VII Total	**3,702**	**2,659**	**$353,651,150**	**$677,494,509**	**$370,628,602**	**$1,401,774,261**

Susceptibility to Deep-Seated Landslide Class/Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Estimated Contents Value
VIII						
Agricultural	598	356	$76,852,461	$46,501,816	$46,501,816	$169,856,093
Commercial	35	25	$4,344,234	$5,448,103	$5,448,103	$15,240,440
Industrial	7	3	$8,192,873	$345,125	$517,688	$9,055,686
Miscellaneous	241	11	$9,043,358	$4,350,738	$0	$13,394,096
Residential	2,562	1,760	$238,461,268	$421,687,957	$210,843,979	$870,993,204
Unknown	43	20	$12,851,458	$3,146,909	$0	$15,998,367
VIII Total	**3,486**	**2,175**	**$349,745,652**	**$481,480,648**	**$263,311,585**	**$1,094,537,885**
IX						
Agricultural	479	267	$75,607,422	$51,633,728	$51,633,728	$178,874,878
Commercial	34	23	$7,453,210	$116,691,220	$116,691,220	$240,835,650
Industrial	9	4	$17,010,083	$1,311,958	$1,967,937	$20,289,978
Miscellaneous	220	18	$7,277,677	$4,870,147	$0	$12,147,824
Residential	1,986	1,412	$183,030,550	$342,405,379	$171,202,690	$696,638,619
Unknown	19	6	$5,654,829	$633,068	$0	$6,287,897
IX Total	**2,747**	**1,730**	**$296,033,771**	**$517,545,500**	**$341,495,575**	**$1,155,074,846**
Unincorporated Amador County Total	**17,828**	**12,434**	**$1,687,406,507**	**$3,026,753,541**	**$1,764,724,121**	**$6,478,884,169**

Source: Susceptibility to Deep-Seated Landslides map – CSG Map Sheet 58 (05/2011), 2024 Amador County Parcel/Assessor Data

Critical Facilities and Infrastructure

Landslides present a threat to critical facilities and infrastructure. The following analysis discusses critical facilities and infrastructure. A separate analysis was performed on the critical facility inventory in the Amador County Planning Area to determine critical facilities by deep-seated landslide class. Using GIS, the landslide classes were overlayed on the critical facility GIS layer. Figure 4-114 shows critical facilities, as well as the deep-seated landslide classes. Table 4-120 details critical facilities by deep seated landslide class by facility type and count for the Planning Area. Details of critical facility category, type, name and address by deep-seated landslide classes are listed in Appendix F. As shown, 13 critical facilities fall in Classes VII to X all of which are in the unincorporated County.

Figure 4-114 Amador County Planning Area – Critical Facilities in Deep-Seated Landslide Class

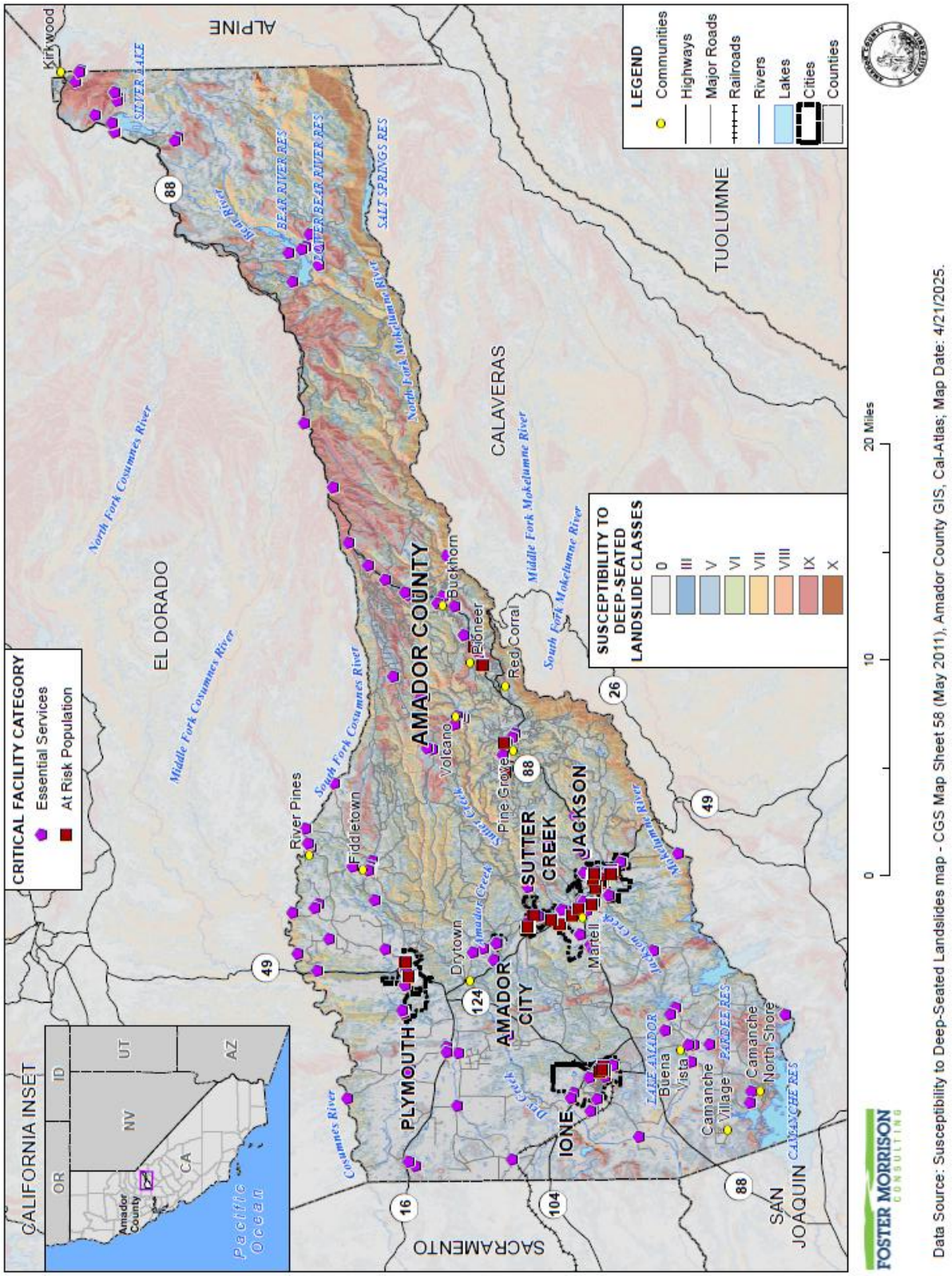


Table 4-120 Amador County Planning Area – Critical Facilities in Deep-Seated Landslide Class by Jurisdiction and Category

Jurisdiction / Susceptibility to Deep-Seated Landslide Class / Critical Facility Category	Facility Count
Amador City	
0	
Essential Services	2
At Risk Population	0
0 Total	**2**
III	
Essential Services	1
At Risk Population	0
III Total	**1**
Amador City Total	**3**
Ione	
0	
Essential Services	11
At Risk Population	5
0 Total	**16**
V	
Essential Services	2
At Risk Population	0
V Total	**2**
Ione Total	**18**
Jackson	
0	
Essential Services	30
At Risk Population	9
0 Total	**39**
III	
Essential Services	3
At Risk Population	2
III Total	**5**
VI	
Essential Services	2
At Risk Population	1
VI Total	**3**
VII	
Essential Services	0

Jurisdiction / Susceptibility to Deep-Seated Landslide Class / Critical Facility Category	Facility Count
At Risk Population	1
VII Total	**1**
Jackson Total	**48**
Plymouth	
0	
Essential Services	8
At Risk Population	1
0 Total	**9**
Plymouth Total	**9**
Sutter Creek	
0	
Essential Services	6
At Risk Population	6
0 Total	**12**
III	
Essential Services	1
At Risk Population	0
III Total	**1**
Sutter Creek Total	**13**
Unincorporated Amador County	
0	
Essential Services	91
At Risk Population	5
0 Total	**96**
III	
Essential Services	8
At Risk Population	1
III Total	**9**
V	
Essential Services	19
At Risk Population	1
V Total	**20**
VI	
Essential Services	7
At Risk Population	0
VI Total	**7**
VII	

Jurisdiction / Susceptibility to Deep-Seated Landslide Class / Critical Facility Category	Facility Count
Essential Services	3
At Risk Population	0
VII Total	**3**
VIII	
Essential Services	7
At Risk Population	0
VIII Total	**7**
IX	
Essential Services	3
At Risk Population	0
IX Total	**3**
Unincorporated Amador County Total	**145**
Unincorporated Alpine County	
VII	
Essential Services	1
At Risk Population	0
VIII Total	7
Unincorporated Amador County Total	**8**
Grand Total	**237**

Source: Susceptibility to Deep-Seated Landslides map – CSG Map Sheet 58 (05/2011), Amador County GIS

Natural, Historic, and Cultural Resources

Landslides can affect natural, historic, and cultural resources that lie in the landslide area, or the landslide run out area. Landslides can destroy large tracts of forest and open space areas, destroy wildlife habitat, and remove productive soils and vegetation from slopes. It can also fill in waterways, impact water quality, and potentially affect flooding potential. Natural resources that fall in the High or Very High susceptibility classes shown on Figure 4-110 would be most vulnerable, as well as those in the run out areas. As shown on the map, this would include a relatively small area of the developed area, since most of the higher risk areas occur in the undeveloped areas of the Planning Area.

FEMA NRI Hazard Vulnerability Assessment

The FEMA NRI was queried for additional specific data on Amador County's vulnerability to Landslides, Mudslides, and Debris Flow. The NRI contains data and analysis for 18 separate natural hazards. The NRI hazard related to Amador County's Landslides, Mudslides, and Debris Flow is only landslide. As shown in Table 4-121, landslides could cause a total of $21,900 in expected annual losses, with a historic loss rating of very low. Landslide has a relatively moderate rating for both social vulnerability and community resilience, with a risk index score of 44 out of 100. According to the NRI, there have been 0 landslide events between the years 2010-2021 with an average of 0 events per year.

Table 4-121 Amador County Planning Area – Landslide Vulnerability Ratings from FEMA NRI

NRI Hazard	Hazard Risk Index Rating*	Expected Annual Loss Values (total)**	Exposure Value (total)***	Historic Loss Ratio Rating
Landslide	44	$21,900	$181,116,409,942	Very Low

Source: FEMA NRI Report, retrieved 4/1/2025.

*Hazard Risk Index is calculated using data for only a single hazard type, and reflect a communities expected annual loss value, community risk factors, and the adjustment factor used to calculate the risk value.

**Expected annual loss represents the average economic loss in dollars resulting from natural hazards each year.

***Exposure is a natural hazard consequence factor that is the representative value of buildings, populations, or agriculture potentially exposed to a natural hazard occurrence.

Additional information on the FEMA NRI can be found in Section 4.2 and Appendix G.

Impacts from Landslide

Any type of landslide may result in damages or complete destruction of buildings in their path, as well as deaths and injuries. Landslides can cause road blockages by depositing debris on road surfaces or road damage if the road surface itself slides downhill. Utility lines and pipes are also prone to breakage in slide areas.

Landslides can collapse into water bodies, causing tsunamis or seiches. In 1958, a magnitude 8 earthquake collapsed a hillside into Lituya Bay, Alaska, causing a water splash wave that reached 1,720 feet up a mountain slope, stripping all vegetation. A massive landslide into the Vaoint Reservoir in Italy in 1963 caused a water splash wave that swept 800 feet over the top of a dam, causing a major flood that killed an estimated 2,600 people below. Landslides can relocate river channels, as occurred during the Oso mudslide in Washington State in March 2014. This occurred in an area not considered landslide prone on local maps. Landslides and debris flows can relocate river channels, impact water quality and the storage capacity of surface water reservoirs used to store potable water.

Landslides, debris flows, and mud flows impacts vary by location and severity of any given event and will likely only affect certain areas of the Planning Area susceptible to landslide. Based on the risk assessment, there is limited potential for significant landslides to occur in the Planning Area in the more developed areas. Most, but not all, of the historic landslides in the Amador County Planning Area have been minor, localized events that are more of a nuisance than a disaster. Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future hazard conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for Amador County include the following:

- Climate change is likely to exacerbate future landslide conditions and associated impacts and vulnerability of the County to landslides. This is especially true in burn scar areas that are at greater risk to landslides.
- Future population growth should be considered, as having more or less people in a community affects the overall hazard vulnerability to the County. Population growth in Amador County is expected to continue slowly. Additional population growth would likely bring continued diversity to the County. Vulnerable population groups could face disproportionate effects from a landslide, though it would be unlikely for these or any populations to build in the landslide risk areas. Changes in population and population patterns may or may not increase the impacts and vulnerability of the County to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. Locating new development, structures and critical facilities and infrastructure within or near areas of landslide risk may put additional development at risk. However, County building codes are in effect to reduce this risk and should be updated as necessary to continue to address future landslide conditions. It should be noted that most of the growth in the County is occurring in areas outside the landslide risk areas. Thus, depending on the location of new development and adherence to protective building codes, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the County to this hazard.

Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements are followed, and varying needs for different demographic groups with intersecting identities that reside within the County are considered can help to make for a more resilient community. Although new growth and development corridors would fall in the area affected by moderate risk of landslide, given the small chance of a major landslide and the building codes and erosion ordinance in effect, development in the landslide areas will continue to occur.

GIS Analysis

Amador County provided five future development areas which were used as the basis for the inventory of future development for the unincorporated County. These were mapped in GIS. Figure 4-115 show the locations of the future development areas and deep-seated landslide classes. Table 4-122 shows the details of the future development areas that are located in each deep-seated landslide class.

Figure 4-115 Unincorporated Amador County – Future Development in Deep-Seated Landslide Classes

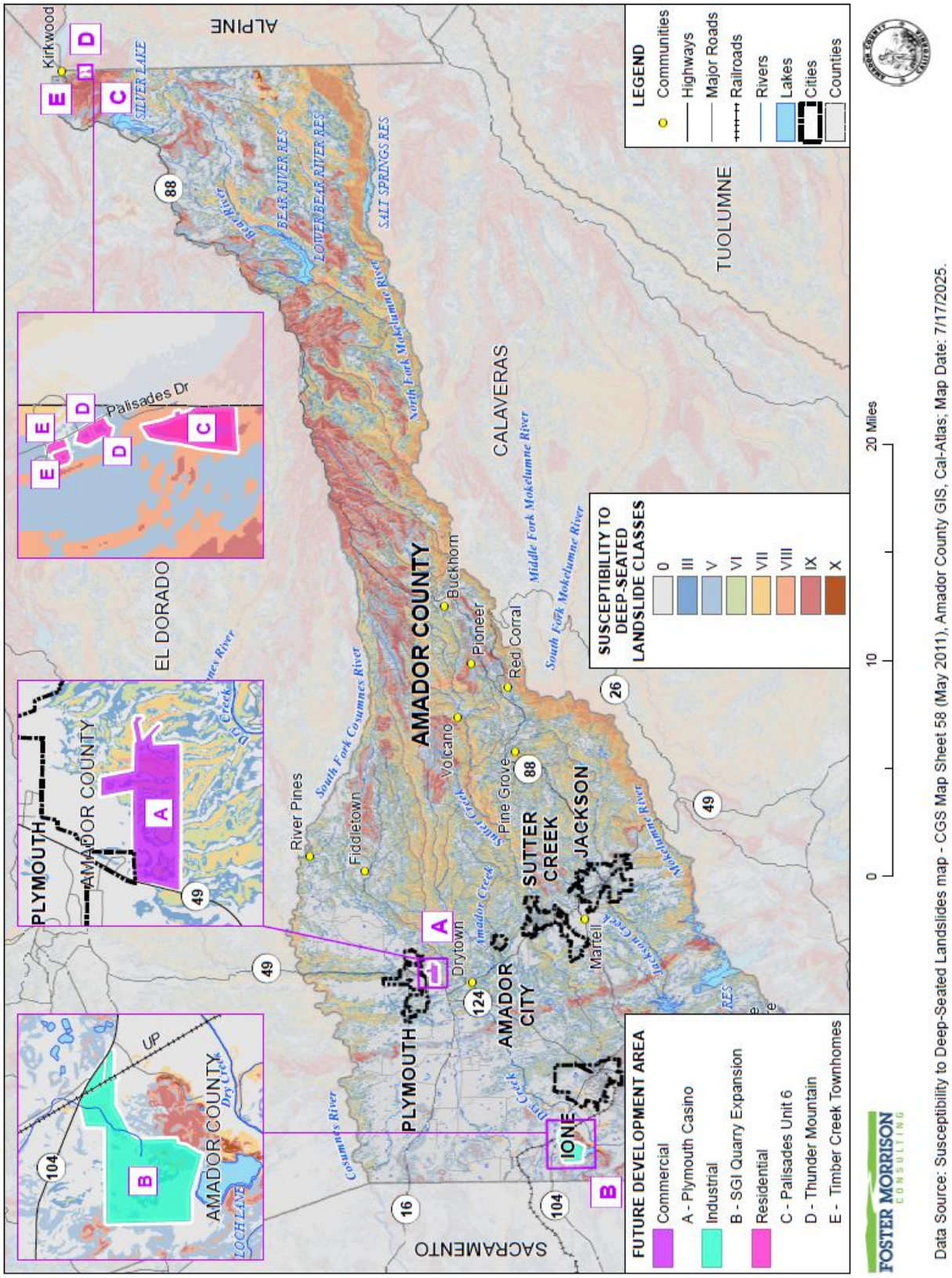


Table 4-122 Unincorporated Amador County – Future Development in Deep-Seated Landslide Classes with Parcel Counts and Acreages

Susceptibility to Deep-Seated Landslide Class /Site/Map ID - Future Development	Unimproved Parcel Count	Total Unimproved Acres
VI		
D - Thunder Mountain	2	2.5
E - Timber Creek Townhomes	2	2
VI Total	**4**	**4.5**
VIII		
A - Plymouth Casino	1	130
VIII Total	**1**	**130**
IX		
B - SGI Quarry Expansion	1	50
C - Palisades Unit 6	1	13
IX Total	**2**	**63**
Grand Total	**7**	**197.5**

Source: CGS Maps Sheet 58, Amador County GIS

4.3.15. Wildfire (w/Smoke and Air Quality)

Hazard Profile

This hazard profile contains multiple sections that detail how this hazard can affect the Amador County Planning Area. These sections include a hazard/problem description; description of location and extent; past occurrences of this hazard; likelihood of future occurrence; and how climate change can affect or influence this hazard.

Hazard/Problem Description

California is recognized as one of the most fire-prone and consequently fire-adapted landscapes in the world. The combination of complex terrain, Mediterranean climate, and productive natural plant communities, along with ample natural and aboriginal ignition sources, has created conditions for extensive wildfires. Wildland fire is an ongoing concern for the Amador County Planning Area. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months. However, in recent years, wildfire season is more of a year around event. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, an accumulation of vegetation, and high winds.

Potential losses from wildfire include human life, structures and other improvements, natural and cultural resources, quality and quantity of water supplies, cropland, timber, and recreational opportunities. Economic losses could also result. Smoke and air pollution from wildfires can be a severe health hazard.

In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides and mudflows, and erosion during the rainy season. Additional losses could occur if PG&E initiates a power shutdown during extreme fire weather conditions. This is discussed in greater detail at the beginning of Section 4.3.

Wildfire Smoke and Air Quality

Smoke from wildfires is made up of gas and particulate matter, which can be easily observed in the air. Air quality standards have been established to protect human health with the pollutant referred to as PM2.5 which consists of particles 2.5 microns or less in diameter. These smaller sizes of particles are responsible for adverse health effects because of their ability to reach the lower regions of the respiratory tract.

Wildfire smoke can have negative effects to those who live in or near a fire burn area. Smoke and air pollution from wildfires can be a severe health hazard. Significant wildfires occurring in nearby northern California communities since the 2020 LHMP Update have created significant air pollution affecting area residents. County residents have been affected by wildfire smoke and poor air quality, from fires both within the Planning Area and from those much further away. The County has seen air quality impacts from smoke from wildfires since the 2020 LHMP. During these times, air sensors in the County showed periods of very poor air quality in Amador County. This was especially a concern during Covid. A document titled Smoke Impacts CA: 2020 Lessons – 2021 Actions that was published by the US Forest Service noted that wildfire smoke exposure could result in greater susceptibility to COVID-19 and other viruses/bacteria (decrease in local and systemic immune function).

The Amador Resource Conservation District noted that there is not much information pertaining to smoke and air quality concerns specific to Amador County but given information from various sources (CDC, EPA, and various clinical studies) it is known that prolonged exposure to wildfire smoke can have effects ranging from minor to extreme, especially for high-risk individuals (people with preexisting lung problems, elderly), leading to heart failure and premature death in the worst case scenario. An EPA database of Air Quality Index was queried for the last 5 years for AQI in Amador County. Results are shown in Table 4-123.

Table 4-123 Amador County Planning Area – Air Quality Index 2020-2025

Year	# Days with AQI	Good	Moderate	Unhealthy for Sensitive Groups	Unhealthy	Very Unhealthy	Hazardous	AQI Maximum	AQI 90th Percentile	AQI Median
2020	359	327	29	2	1	.	.	156	50	37
2021	365	307	54	4	.	.	.	133	67	37
2022	364	333	30	1	.	.	.	112	50	36
2023	360	341	19	.	.	.	.	80	48	36
2024	329	251	72	6	.	.	.	143	74	41

Source: Amador County Air Quality District
AQI from 0-50 is considered good and anything below 100 is Moderate.

According to FirstStreet.org, a climate risk data organization, elderly individuals are at an adversely high risk of experiencing negative health impacts from poor air quality, like worsening of heart disease and stroke, reduced lung capacity, and increase in lung disease.

The paper "Wildland fire management and air quality in the southern Sierra Nevada: Using the Lion Fire as a case study with a multi-year perspective on PM2.5 impacts and fire policy" by D. Schweizer and R. Cisneros explores the impacts of smoke from high-intensity, stand replacing fires versus lower intensity fires in the Sierra Nevada and explains that while smoke and fire mitigation is important with any fire, the extreme effects of smoke from large wildfires can be prevented by managing forests and allowing low intensity fires to burn.

Location and Extent

This section is broken down into two parts: a discussion on the wildland urban interface in Amador, and the Amador County wildfire setting.

Wildland Urban Interface

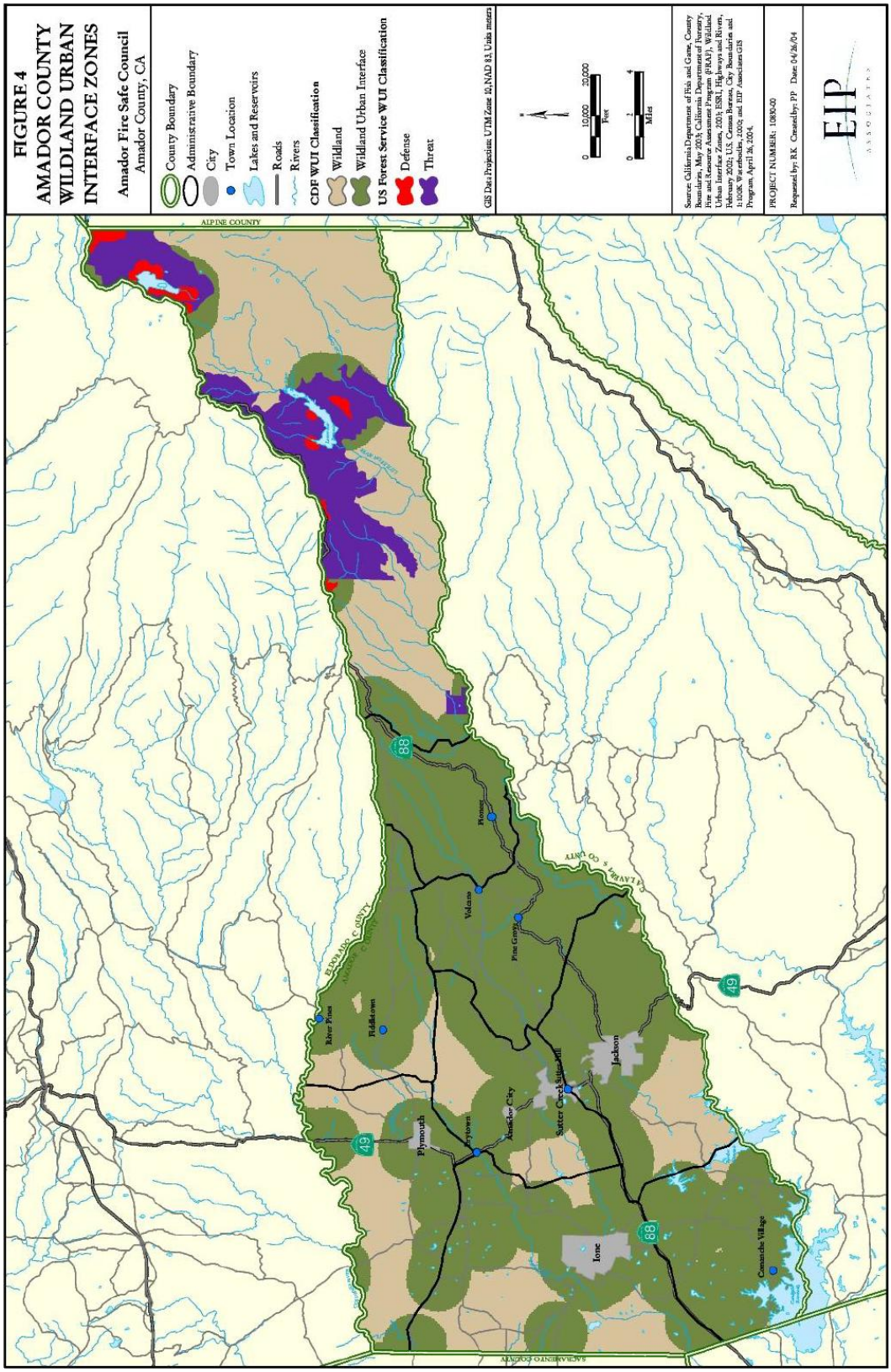
Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of the ecosystem. While wildfire risk is predominantly associated with wildland urban interface (WUI) areas, significant wildfires can also occur in heavily populated areas. The wildland urban interface is a general term that applies to development adjacent to landscapes that support wildland fire. The WUI defines the community development into the foothills and mountainous areas of California. The WUI describes those communities that are mixed in with grass, brush and timbered covered lands (wildland). These are areas where wildland fire once burned only vegetation but now burns homes as well. The WUI for Amador County consists of communities at risk (shown in the Local Concerns section below) as well as the area around the communities that pose a fire threat.

There are two types of WUI environments. The first is the true urban interface where development abruptly meets wildland. The second WUI environment is referred to as the wildland urban intermix. Wildland urban intermix communities are rural, low density communities where homes are intermixed in wildland areas. Wildland urban intermix communities are difficult to defend because they are sprawling communities over a large geographical area with wild fuels throughout. This profile makes access, structure protection, and fire control difficult as fire can freely run through the community.

WUI fires are often the most damaging. WUI fires occur where the natural forested landscape and urban-built environment meet or intersect. Even relatively small acreage fires may result in disastrous damages. WUI fires occur where the natural forested landscape and urban-built environment meet or intermix. The damages are primarily reported as damage to infrastructure, built environment, loss of socio-economic values and injuries to people.

Figure 4-116 shows these WUI areas in red with Amador County in the center of the frame. This intermingling of wildland and manmade fuel has made the control of wildland fires more difficult and costly. It has also dramatically increased the danger and potential destruction caused by wildfire.

Figure 4-116 Amador County – WUI Areas



Source: Amador County Fire Hazard Protection Plan Addendum, 2010

Amador County Wildfire Setting

As previously stated, there are areas in the County that are prone to wildfire. Wildland fires affect grass, forest, and brushlands, as well as any structures located within them. Where there is human access to wildland areas, the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Generally, there are four major factors that contribute to and sustain wildfires and allow for predictions of a given area's potential to burn. These factors include fuel, topography, weather, and human actions.

- **Fuel** – Fuel is the material that feeds a fire and is a key factor in wildfire behavior. Fuel is generally classified by type and by volume. Fuel sources are diverse and include everything from dead tree needles and leaves, twigs, and branches to dead standing trees, live trees, brush, and cured grasses. Also to be considered as a fuel source, are man-made structures and other associated combustibles. The type of prevalent fuel directly influences the behavior of wildfire. Light fuels such as grasses burn quickly and serve as a catalyst for fire spread. The volume of available fuel is described in terms of Fuel Loading. Fuels are generally Sierra Mixed Conifer which is made up of heavy timber and significant loads of accumulated dead fuels. Certain areas in and surrounding Amador County are extremely vulnerable to fires as a result of overgrown fuels combined with a growing number of structures being built near and within rural lands. Fuel is the only factor that is under human control.
- **Topography** – An area's terrain and land slopes affect its susceptibility to wildfire spread. Fire intensities and rates of spread increase as slope increases due to the tendency of heat from a fire to rise via convection. The natural arrangement of vegetation throughout a hillside can also contribute to increased fire activity on slopes. Topography in Amador County is flat near the valley bottom and increasingly steep as the County reaches higher elevations. More importantly is the relationship of vegetation change with that of topography. Fuel loads tend to increase significantly as the topography becomes more rugged. The area near the Central Valley, which is characterized by rolling hills and flat valley bottoms, is generally dominated by grass lands or savannah. The fire behavior is generally wind driven short duration fires, typically lasting no more than one burning period. (A burn period comprises 10:00 a.m. of Day 1 to 10:00 a.m. of Day 2, a full 24-hour period). As the terrain approaches the upper foothills the vegetation changes dramatically to brush and tree dominated fuel types. These areas are generally steeper and longer sloped which will tend to cause more fuel and topography dominated fire behavior. Heavier fuels over steeper slopes cause marked increases in fire intensity and fire size; this combination makes firefighting efforts increasingly more difficult. This is primarily due to the demands that heavier fuels on steeper terrain can have on resources during active suppression and mop up operations. Higher elevation areas of the County are typically steeper than that of the upper foothill region. Fire spread is typically fuel and slope driven but winds can cause long range spotting. A major topographic feature that can lead to increased fire spread and intensity is the canyon alignment of the major river systems within the County. All of the major river systems are generally aligned in an east/west direction which coincides with the general prevailing westerly wind patterns over the County. This alignment can have the effect of "channeling" which can increase the wind speed and turbulence along these river systems. This alignment can often cause fire to spread farther and with greater intensity.
- **Weather** – Weather components such as temperature, relative humidity, wind, and lightning also affect the potential for wildfire. High temperatures and low relative humidity dry out the fuels that feed the wildfire creating a situation where fuel will more readily ignite and burn more intensely. Wind is the most treacherous weather factor. The greater a wind, the faster a fire will spread, and the more intense

it will be. Winds can be significant at times in Amador County. The western portion of the County often experiences surface winds blowing from the north and west. The dryer north winds combined with light flashy fuels create conditions for large grass fires, which while menacing generally do little long-term damage. The resulting west winds are brisk and push fires in a west to east direction. The major canyons in Amador County are also orientated west to east, which tends to channel wind into canyons in a way that increases its upslope velocity. In addition to high winds, wind shifts can occur suddenly due to temperature changes or the interaction of wind with topographical features such as slopes or steep hillsides. Burn patterns of almost all historic large wildfires indicate they occurred during a relatively rare weather event called a foehn wind (discussed in the wind profile in Section 4.3.5). An example of a fire in Amador County affected by a foehn wind event was the Power Fire in 2004. This fire was started during the normal summer weather pattern and was declared contained two days later. Four days after the Power Fire started, a foehn wind event developed producing downslope winds in excess of 30 mile per hour, which spread the fire much more rapidly. Lightning also ignites wildfires, often in difficult-to reach terrain for firefighters. Related to weather is the issue of recent drought conditions contributing to concerns about wildfire vulnerability. During periods of drought, the threat of wildfire increases.

- **Human Actions** – Most wildfires are ignited by human action, the result of direct acts of arson, carelessness, or accidents. Many fires originate in populated areas along roads and around homes, and are often the result of arson or careless acts such as the disposal of cigarettes, use of equipment or debris burning. Recreation areas that are located in high fire hazard areas also result in increased human activity that can increase the potential for wildfires to occur.

Fires can have a quick speed of onset, especially during periods of drought. Fires can burn for a short period of time, or may have durations lasting for a week or more. Wildfire can affect any area of the Planning Area; however, CAL FIRE has mapped areas in California that are at risk to wildfire. Methodologies for this analysis and maps showing the various Fire Hazard Severity Zones, which range from Urban-Unzoned to Very High, can be found in the Vulnerability Assessment below. Cal Fire Fire Hazard Severity Zones have been developed based on Fire Responsibility Areas located in the County which details the responsible fire agency for each area of the County; specifically, federal, state, and local areas. Figure 4-117 shows the Fire Responsibility Area mapping for Amador County. Geographic extents of wildfire in the State Responsibility Area (SRA) and Federal Responsibility Area (FRA) for the unincorporated Amador County be seen on Figure 4-118 and is detailed in Table 4-124. Geographic extents of wildfire in the Local Responsibility Area (LRA) for the unincorporated Amador County be seen on Figure 4-119 and is detailed in Table 4-125. Details on each jurisdiction's Fire Hazard Severity Zone extents (for both SRA/FRA and LRA) can be found in their respective annexes to this LHMP Update.

Figure 4-117 Amador County Planning Area – Fire Responsibility Areas

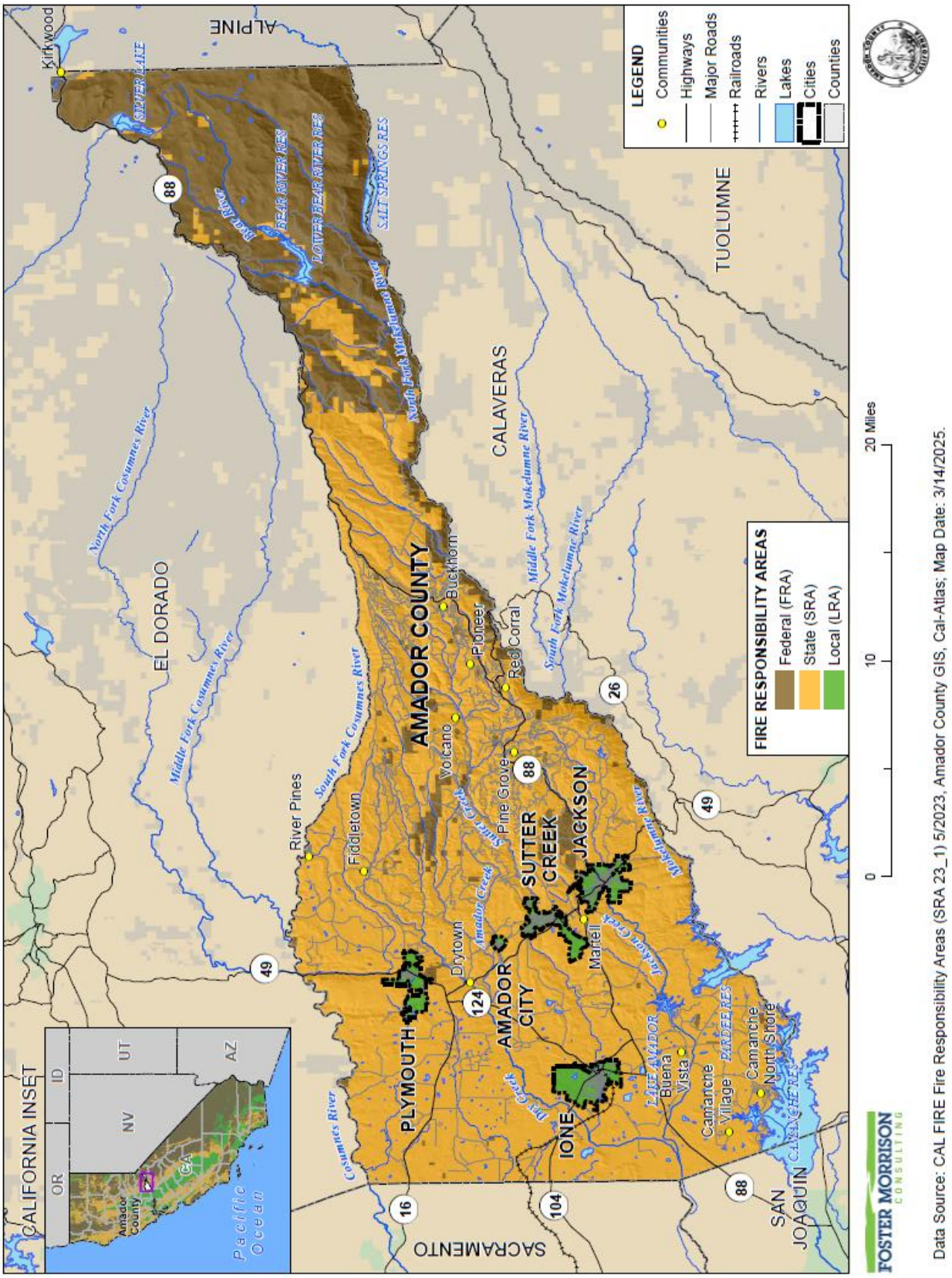


Figure 4-118 Amador County Planning Area – CAL FIRE SRA/FRA Fire Hazard Severity Zones

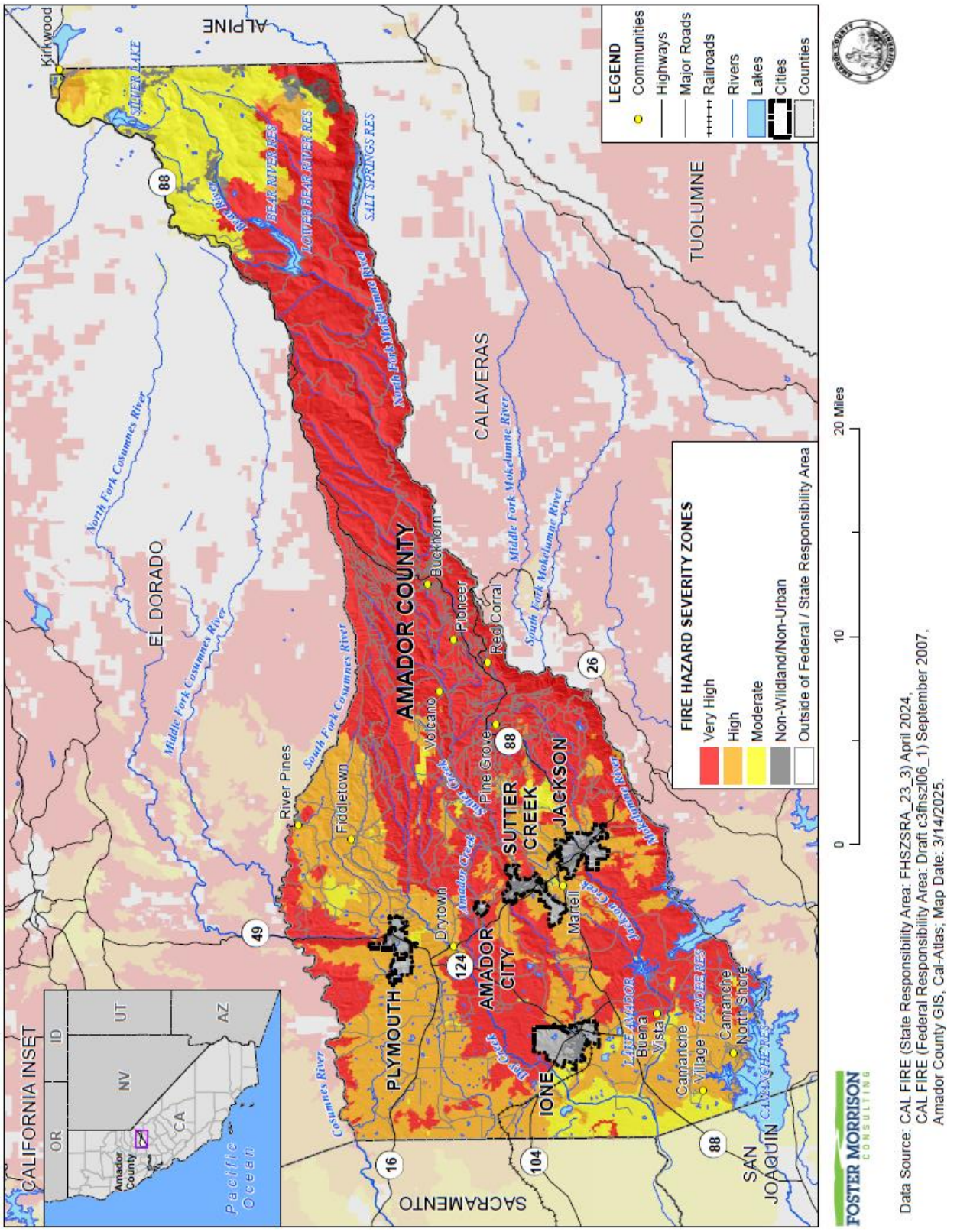


Table 4-124 Amador County Planning Area – CAL FIRE SRA/FRA Fire Hazard Severity Zones Geographical Extents

Jurisdiction / Fire Responsibility/ Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Amador City						
FRA						
High	0.0003	0.0000001%	0.0003	0.0000002%	–	–
Moderate	0.002	0.000001%	0.002	0.000001%	–	–
FRA Total	**0.003**	**0.000001%**	**0.003**	**0.000002%**	**–**	**–**
SRA						
Very High	0.8	0.0002%	0.419	0.0003%	0.4	0.0002%
SRA Total	0.8	0.0002%	0.419	0.0003%	0.4	0.0002%
Amador City Total	**0.8**	**0.0002%**	**0.422**	**0.0003%**	**0.4**	**0.0002%**
Ione						
SRA						
Very High	0.8	0.0002%	0.003	0.000002%	0.8	0.0004%
High	2.8	0.001%	0.08	0.0001%	2.7	0.001%
Moderate	0.9	0.0002%	0.6	0.0004%	0.3	0.0001%
SRA Total	**4.5**	**0.001%**	**0.7**	**0.0004%**	**3.8**	**0.002%**
Ione Total	**4.5**	**0.001%**	**0.7**	**0.0004%**	**3.8**	**0.002%**
Jackson						
SRA						
Very High	0.6	0.0002%	0.1	0.0001%	0.5	0.0002%
High	12.2	0.003%	3.1	0.0019%	9.1	0.004%
SRA Total	12.8	0.003%	3.2	0.0020%	9.6	0.004%
Jackson Total	**12.8**	**0.003%**	**3.2**	**0.0020%**	**9.6**	**0.004%**
Plymouth						
SRA						
Very High	0.3	0.0001%	0.02	0.00001%	0.3	0.0001%
High	8.8	0.002%	1.7	0.0010%	7.1	0.003%
SRA Total	**9.1**	**0.002%**	**1.7**	**0.0010%**	**7.4**	**0.003%**
Plymouth Total	**9.1**	**0.002%**	**1.7**	**0.0010%**	**7.4**	**0.003%**
Sutter Creek						
SRA						
Very High	5.3	0.001%	1.8	0.0011%	3.5	0.002%

Jurisdiction / Fire Responsibility/ Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
High	2.5	0.001%	0.6	0.0004%	1.9	0.001%
Moderate	0.4	0.0001%	0.3	0.0002%	0.1	0.0001%
SRA Total	**8.2**	**0.002%**	**2.7**	**0.0017%**	**5.5**	**0.003%**
Sutter Creek Total	**8.2**	**0.002%**	**2.7**	**0.0017%**	**5.5**	**0.003%**
Unincorporated Amador County						
FRA						
Very High	48,472	13%	60	0.04%	48,412	23%
High	5,010	1%	4	0.003%	5,006	2%
Moderate	32,604	9%	141	0.09%	32,463	15%
Non-Wildland/Non-Urban	5,003	1%	4	0.002%	4,999	2%
FRA Total	**91,089**	**24%**	**210**	**0.13%**	**90,879**	**42%**
SRA						
Very High	168,213	44%	86,479	52%	81,735	38%
High	103,688	27%	71,036	43%	32,653	15%
Moderate	16,337	4%	7,487	5%	8,851	4%
SRA Total	288,239	76%	165,001	100%	123,238	58%
Unincorporated Amador County Total	**379,328**	**100%**	**165,211**	**100%**	**214,117**	**100%**
Grand Total	**379,363**	**100%**	**165,219**	**100%**	**214,144**	**100%**

Source: CAL FIRE (FHSZ SRA 2024, FHSZ FRA 2007)

Figure 4-119 Amador County Planning Area – CAL FIRE LRA Fire Hazard Severity Zones

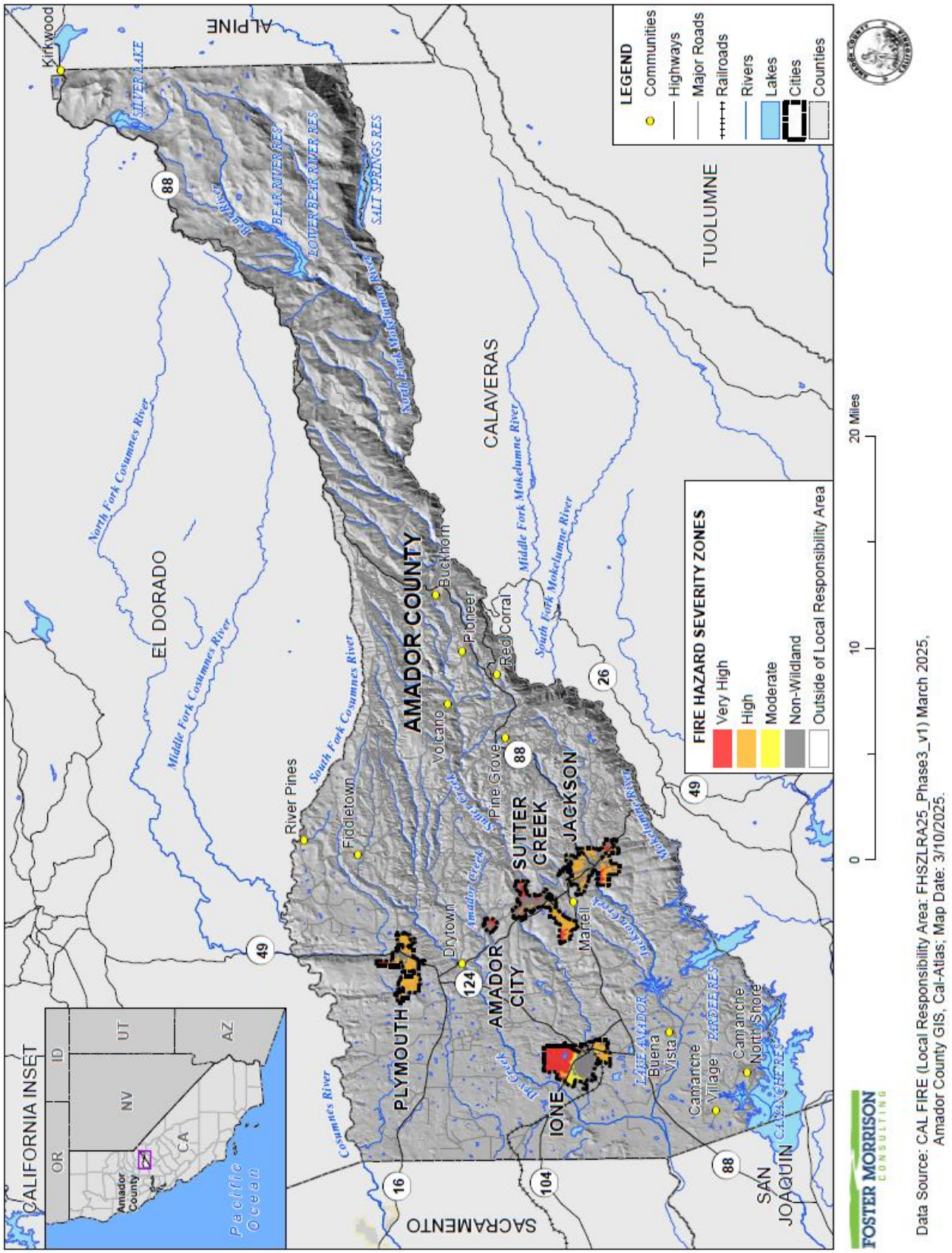


Table 4-125 Amador County Planning Area– CAL FIRE LRA Fire Hazard Severity Zones Geographical Extents

Jurisdiction / Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Amador City						
Very High	197	0.1%	60	0.04%	137	0.1%
Outside of LRA Responsibility Area	0.4	0.0001%	0.1	0.0001%	0.2	0.0001%
Amador City Total	**198**	**0.1%**	**61**	**0.0%**	**137**	**0.1%**
Ione						
Very High	1,114	0.3%	3	0.002%	1,111	0.5%
High	918	0.2%	198	0.1%	720	0.3%
Moderate	398	0.1%	218	0.1%	181	0.1%
Non-Wildland	526	0.1%	271	0.2%	255	0.1%
Outside of LRA Responsibility Area	17	0.004%	1	0.0005%	16	0.01%
Ione Total	**2,973**	**0.8%**	**690**	**0.4%**	**2,283**	**1.0%**
Jackson						
Very High	253	0.1%	65	0.04%	188	0.1%
High	1,810	0.5%	590	0.4%	1,220	0.6%
Moderate	126	0.03%	73	0.04%	52	0.02%
Non-Wildland	109	0.03%	53	0.03%	56	0.03%
Outside of LRA Responsibility Area	6	0.001%	2	0.001%	3	0.002%
Jackson Total	**2,302**	**0.6%**	**782**	**0.5%**	**1,520**	**0.7%**
Plymouth						
Very High	105	0.03%	8	0.005%	98	0.04%
High	1,519	0.4%	558	0.3%	961	0.4%
Moderate	46	0.01%	24	0.01%	22	0.01%
Non-Wildland	22	0.01%	9	0.01%	13	0.01%
Outside of LRA Responsibility Area	6	0.001%	1	0.001%	5	0.002%
Plymouth Total	**1,698**	**0.4%**	**600**	**0.4%**	**1,098**	**0.5%**
Sutter Creek						
Very High	780	0.2%	357	0.2%	423	0.2%

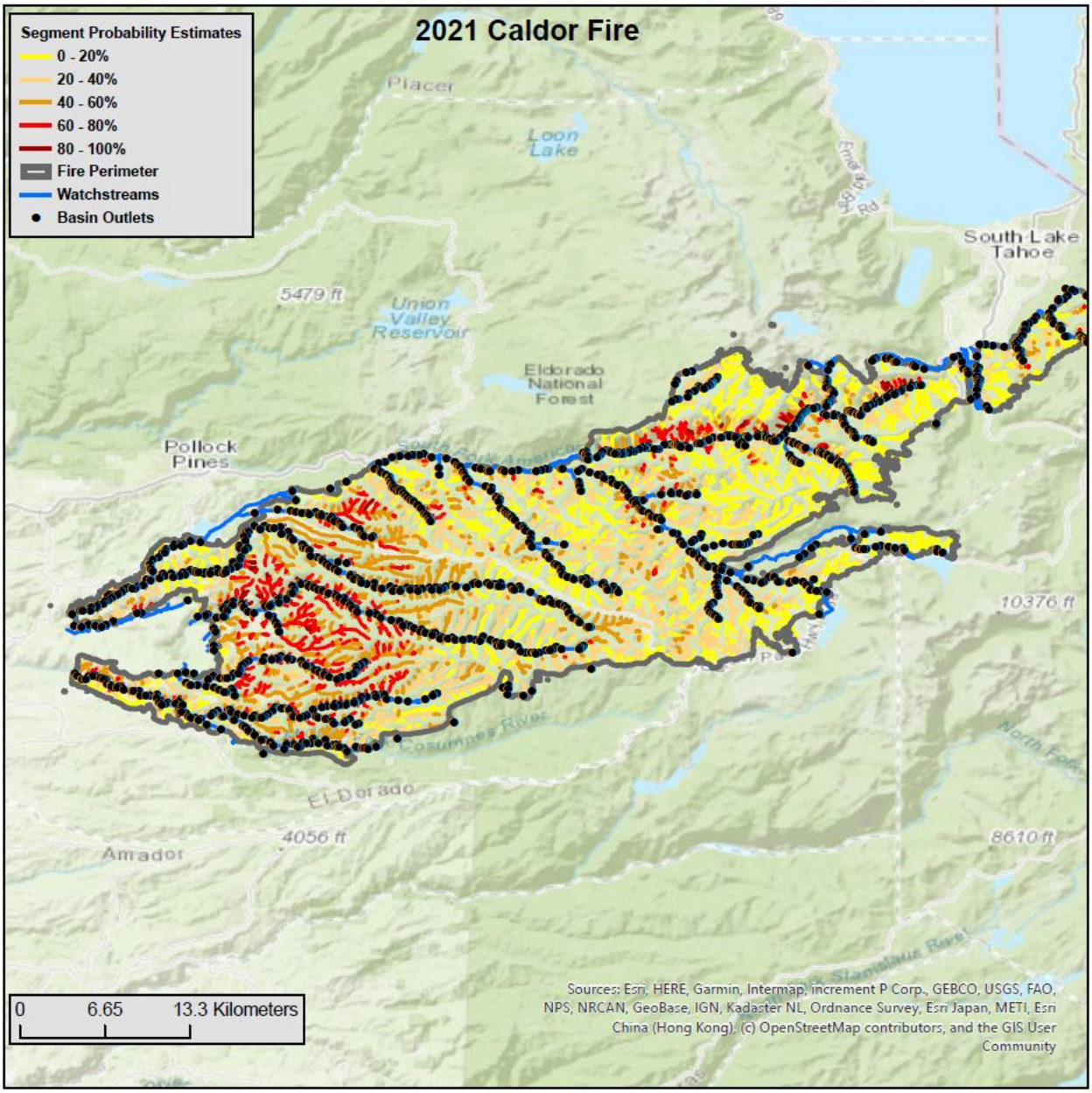
Jurisdiction / Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
High	857	0.2%	368	0.2%	489	0.2%
Moderate	34	0.01%	15	0.01%	19	0.01%
Non-Wildland	34	0.01%	21	0.01%	13	0.01%
Outside of LRA Responsibility Area	4	0.001%	1	0.001%	3	0.001%
Sutter Creek Total	**1,709**	**0.4%**	**762**	**0.5%**	**947**	**0.4%**
Unincorporated Amador County						
Outside of LRA Responsibility Area	378,848	97.7%	165,178	98.3%	213,670	97.3%
Unincorporated Amador County Total	**378,848**	**97.7%**	**165,178**	**98.3%**	**213,670**	**97.3%**
Grand Total	**387,727**	**100.0%**	**168,072**	**100.0%**	**219,654**	**100.0%**

Source: CAL FIRE (LRA 2025)

Post-Wildfire Landslides and Debris Flows

Post-wildfire landslides and debris flows are a concern in Amador County, though the fires and associated post fire landslides often occur in areas that are less populated. Fires that burn in hilly areas, which comprise the eastern portion of Amador County, remove vegetation that holds hillsides together during rainstorms. Once that vegetation is removed, the hillside may be compromised, resulting in landslides and debris flows. Mapping of these areas has been ongoing on a case-by-case basis since 2012. A search of the USGS Emergency Assessment of Post-Fire Debris Flow Hazards showed only one event in Amador County – the 2021 Caldor Fire. This can be seen on Figure 4-120. The orange, red, and dark red colors on the map indicate areas where risk is greater.

Figure 4-120 Amador County – Post-Wildfire Debris Flow Areas



Source: USGS. Retrieved 3/20/2025

Past Occurrences

Disaster Declaration History

A search of FEMA and Cal OES disaster declarations shows three state and two federal disaster declarations. These are shown in Table 4-126.

Table 4-126 Amador County – Federal and State Disaster Declaration from Wildfire 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	3	1961 (Rancheria Creek Fire), 2015 (Summer 2015 Fires), 2021 (Caldor Fire)	2	2016 (Butte Fire), 2021 (Caldor Fire)

Source: Cal OES, FEMA

NCDC Events

The NCDC has tracked wildfire events in the County dating back to 1993. The 50 events in Amador County in the database are shown in Table 4-127.

*Table 4-127 NCDC Wildfire Events in Amador County 1993 to 7/31/2024**

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Dense Smoke	2	0	0	0	0	$0	$0
Wildfire	48	5	0	32	32	$1,225,000	$0
Total	**50**	**5**	**0**	**32**	**32**	**$1,225,000**	**$ 0**

Source: NCDC

*Deaths, injuries, and damages are for the entire event, and may not be exclusive to the County.

CAL FIRE Events

CAL FIRE, USDA Forest Service Region 5, Bureau of Land Management (BLM), the National Park Service (NPS), Contract Counties and other agencies jointly maintain a comprehensive fire perimeter GIS layer for public and private lands throughout the state. The data covers fires back to 1878 (though the first recorded incident for the County was in 1917). For the National Park Service, Bureau of Land Management, and US Forest Service, fires of 10 acres and greater are reported. For CAL FIRE, timber fires greater than 10 acres, brush fires greater than 50 acres, grass fires greater than 300 acres, and fires that destroy three or more residential dwellings or commercial structures are reported. CAL FIRE recognizes the various federal, state, and local agencies that have contributed to this dataset, including USDA Forest Service Region 5, BLM, National Park Service, and numerous local agencies.

Fires may be missing altogether or have missing or incorrect attribute data. Some fires may be missing because historical records were lost or damaged, fires were too small for the minimum cutoffs, documentation was inadequate, or fire perimeters have not yet been incorporated into the database. Also, agencies are at different stages of participation. For these reasons, the data should not be used for statistical or analytical purposes.

The data provides a reasonable view of the spatial distribution of past large fires in California. Using GIS, fire perimeters that intersect Amador County were extracted and are listed in Table 4-128. There are 111 fires recorded in this database for Amador County. Each of them was tracked by CAL FIRE. Many more small fires likely have occurred, but were not included in the analysis.

Figure 4-121 shows fire history for the Amador County Planning Area, colored by the size of the acreage burned. This map contains fires from 1950 to 2024, while the detailed tables of wildfire shown in Table 4-128 contain fires from 1910 to 2024, with the first recorded wildfire in this database in Amador County is from 1917.

Figure 4-121 Amador County Wildfire History – CAL FIRE 1910 to 2024

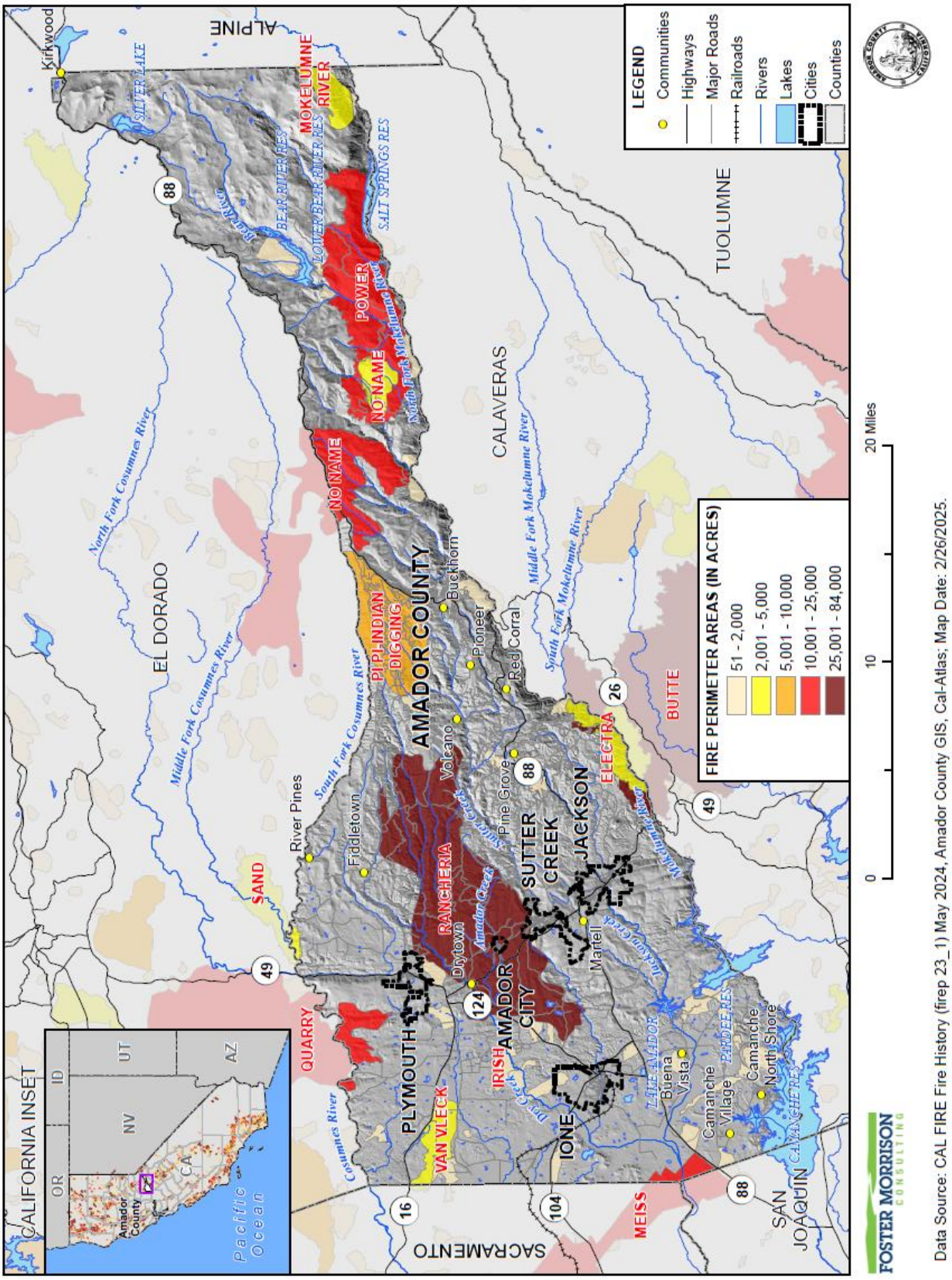


Table 4-128 Amador County – CAL FIRE Wildfire History Summary 1910-2024 by Acres Burned

Wildfire Name	Year	Date	Cause Description	Total Wildfire Acres	Wildfire Acres Within County
RANCHERIA	1961	9/2/1961	Unknown/Unidentified	34,104	34,103
POWER	2004	10/6/2004	Equipment Use	16,983	16,981
PI PI-INDIAN DIGGING	1924	8/18/1924	Miscellaneous	8,948	8,886
(blank)			Unknown/Unidentified	10,058	7,152
BUTTE	2015	9/10/2015	Unknown/Unidentified	70,847	3,559
QUARRY	1976	6/23/1976	Unknown/Unidentified	20,870	2,620
ELECTRA	2022	7/4/2022	Unknown/Unidentified	4,466	2,577
VAN VLECK	1968	6/22/1968	Unknown/Unidentified	2,665	2,520
MOKELUMNE RIVER	1924	8/1/1924	Miscellaneous	2,449	2,244
(blank)	1917	(blank)	Lightning	2,051	2,051
BEAR RIVER FIRE	1918	6/12/1918	Lightning	1,748	1,747
JACKSON	2001	6/13/2001	Equipment Use	1,671	1,671
(blank)	1959	(blank)	Unknown/Unidentified	1,378	1,377
P.G. & E.CO MOKELUME	1927	4/30/1927	Miscellaneous	1,131	1,131
MEISS	1981	6/14/1981	Miscellaneous	14,126	1,130
CALDOR	2021	8/15/2021	Unknown/Unidentified	221,786	1,115
(blank)	1919	(blank)	Unknown/Unidentified	1,107	1,107
SUTTER CREEK	1961	9/2/1961	Unknown/Unidentified	966	966
P.G. & E. #3	1965	9/17/1965	Unknown/Unidentified	1,570	916
PACIFIC MINE	1951	7/18/1951	Unknown/Unidentified	902	902
IRISH	2018	7/6/2018	Equipment Use	825	825
HIGHWAY 88 SERIES	1980	10/5/1980	Unknown/Unidentified	1,080	744
IRISH HILL	1961	10/8/1961	Unknown/Unidentified	732	732
DUFRENE ESCAPE	1954	7/29/1954	Unknown/Unidentified	726	726
BUTTE PG&E #24	1990	6/11/1990	Unknown/Unidentified	692	692
MICHIGAN BAR	1980	7/29/1980	Unknown/Unidentified	848	691
WEST SHERMAN CK	1919	9/15/1919	Unknown/Unidentified	681	681
JOSES SERIES	1964	7/5/1964	Unknown/Unidentified	680	680

Wildfire Name	Year	Date	Cause Description	Total Wildfire Acres	Wildfire Acres Within County
CLINTON TRAIL	1957	8/15/1957	Unknown/Unidentified	666	662
PONY	2002	6/12/2002	Powerline	702	644
AMADOR	1985	7/9/1985	Equipment Use	588	588
HIGHWAY-16	2001	7/6/2001	Equipment Use	547	547
COLD CK FIRE	1917	8/24/1917	Lightning	992	468
ARROYO SECO NO. 6	1958	7/29/1958	Unknown/Unidentified	436	436
SCULLY ROAD	1950	7/3/1950	Unknown/Unidentified	416	416
DAFFODIL HILL	1959	8/11/1959	Unknown/Unidentified	408	408
GOLD BUG	1923	3/22/1923	Unknown/Unidentified	510	386
SAND	2014	7/26/2014	Vehicle	4,239	386
DELL ORTO ESCAPE	1954	8/17/1954	Unknown/Unidentified	380	373
MOKE	2004	6/17/2004	Campfire	354	354
RANCHO	2016	6/28/2016	Vehicle	372	353
SALT	2011	12/1/2011	Miscellaneous	343	343
HIGHWAY 88 NO.1	1961	7/22/1961	Unknown/Unidentified	336	336
AMADOR	1988	7/18/1988	Arson	329	329
KLOTZ	1962	9/27/1962	Unknown/Unidentified	326	326
PETERSON	1951	8/19/1951	Unknown/Unidentified	312	312
(blank)			Unknown/Unidentified	308	308
(blank)	1922	(blank)	Miscellaneous	274	274
ELECTRA	2008	6/13/2008	Powerline	251	251
SUNNYBROOK	1994	6/26/1994	Unknown/Unidentified	230	230
SALT	2003	7/18/2003	Campfire	216	216
CAMANCHE	2016	6/17/2016	Unknown/Unidentified	210	210
DEADMAN'S FLAT	1925	7/18/1925	Lightning	189	189
(blank)	1956	(blank)	Unknown/Unidentified	160	160
(blank)	1991	4/19/1991	Lightning	154	154
(blank)	1978	3/27/1978	Debris	130	130
ROAD	1993	5/10/1993	Debris	127	127
ELLIS 2	2002	11/15/2002	Debris	113	113
POWERHOUSE	2004	9/5/2004	Powerline	113	113
JACKSON	2006	7/20/2006	Unknown/Unidentified	104	104
TONZI	2003	8/18/2003	Vehicle	99	99

Wildfire Name	Year	Date	Cause Description	Total Wildfire Acres	Wildfire Acres Within County
CABLE #2	1924	5/19/1924	Miscellaneous	89	89
BUSI	1961	1/14/1961	Unknown/Unidentified	84	84
CAMANCHE	2006	7/10/2006	Structure	79	79
SALT	2016	10/3/2016	Lightning	78	78
LIBERTY	2023	7/11/2023	Unknown/Unidentified	71	71
STONY	2002	7/3/2002	Equipment Use	68	68
GOOSE	2021	6/13/2021	Equipment Use	66	66
CARBON	2023	7/11/2023	Miscellaneous	59	59
SALT	1992	2/3/1992	Miscellaneous	53	53
BULL CK	1918	6/12/1918	Lightning	51	51
BEAR 2	2002	11/24/2002	Debris	49	49
COPPER FIRE	2020	9/30/2020	Smoking	47	47
BELL	2016	(blank)	Unknown/Unidentified	46	46
LAWRENCE	2021	9/5/2021	Unknown/Unidentified	46	46
UPPER	1996	8/12/1996	Miscellaneous	40	40
DOAK'S RIDGE FIRE	1937	5/16/1937	Miscellaneous	38	38
(blank)	1918	(blank)	Unknown/Unidentified	37	37
JACKSON	2023	7/1/2023	Equipment Use	28	28
HOYA	2016	8/15/2016	Equipment Use	23	23
(blank)	1927	(blank)	Miscellaneous	23	23
LAMBERT FIRE	2020	10/4/2020	Miscellaneous	22	22
TONZI	2017	6/17/2017	Unknown/Unidentified	22	22
BUENA	2002	8/15/2002	Unknown/Unidentified	21	21
JACKSON	2005	7/26/2005	Vehicle	21	21
CEDAR	1994	1/2/1994	Miscellaneous	20	20
DAVIS	1925	5/3/1925	Lightning	20	20
BELL	2021	5/20/2021	Equipment Use	19	19
MUD SPRINGS	1929	5/21/1929	Unknown/Unidentified	19	19
(blank)	1994	1/1/1994	Debris	19	19
VOLCANO	1993	8/16/1993	Powerline	18	18
WILLOW	2016	8/30/2016	Vehicle	18	18
(blank)	1989	11/20/1989	Debris	18	18
COAL	2022	8/7/2022	Arson	17	17
TIGER	2013	8/18/2013	Lightning	16	16
HIGHWAY-88	2001	8/24/2001	Arson	15	15

Wildfire Name	Year	Date	Cause Description	Total Wildfire Acres	Wildfire Acres Within County
STONY	2016	7/2/2016	Miscellaneous	15	15
MIDDLE	2016	7/11/2016	Unknown/Unidentified	13	13
(blank)	1931	(blank)	Unknown/Unidentified	261	13
PLYMOUTH	2023	11/2/2023	Debris	11	11
STONY	2017	6/24/2017	Powerline	11	11
(blank)	1938	(blank)	Lightning	11	11
(blank)	1934	(blank)	Lightning	11	11
ELECTRA	2019	9/25/2019	Arson	10	10
SALT	1969	9/9/1969	Lightning	10	10
(blank)	1937	(blank)	Miscellaneous	10	10
(blank)		9/3/1989	Smoking	8	8
DRESSLER	1952	8/8/1952	Unknown/Unidentified	1,555	4
STEVENS	1950	8/27/1950	Unknown/Unidentified	313	2
WINTON	2017	8/28/2017	Arson	0	0
(blank)	(blank)	(blank)	(blank)	-	-

Source: CAL FIRE (May 2024)

Hazard Mitigation Planning Committee Events

It is important to note that in addition to the Amador County fire history detailed above, there are numerous smaller fires that occur in the area year after year. These smaller fires have the ability to quickly get out of hand and become significant fires. Also, depending on the area, small fires in acreage can result in large losses. The HMPC provided the following details on fire history in Amador County.

1855 – City of Jackson: Although not considered a wildland fire, a fire destroyed a portion of the town.

1862 – City of Jackson: A fire (i.e., also not a wildland fire) destroyed most of Jackson, which was later rebuilt.

1920 – The Amador County Fire Safe Council indicated a fire known as the Indian Diggings fire affected the County.

August 5, 1926 – A fire which started between Ione and Buena Vista burned an area of between 30–40,000 acres. The fire was stopped short of entering the City of Jackson.

1961 – Rancheria Creek Fire: This was the worst fire in the County in over 50 years. In September of 1961, a fire started a mile and half west of Sutter Creek. Twenty-five minutes later, a second fire broke out on Dry Creek north of the Old Rancheria store. Whipped by a fierce wind, the latter fire moved past Plymouth, swept through the New Chicago and Fremont Mine country, moved to Bunker Hill, and by dusk, Amador City was surrounded by flames. The fire left one house remaining in historic "Stringbean Alley" and in Sutter Creek destroyed the Amador High School gym. Overall, the fire burned over 30,000 acres,

destroyed over 30 buildings, and did about $1,243,400 worth of damage. (See Figure 4-122 and Figure 4-123)

Figure 4-122 Rancheria Creek Fire Damages

Source: Amador County Archives

Figure 4-123 Rancheria Creek Fire Damages

Source: Amador County Archives

1964 – City of Sutter Creek: Wildland fire with structures involved occurred during the summer in the northwestern area of Sutter Creek from the City limits up to Amador High School area.

1992 – Farnum Ridge Fire burned over 800 acres near River Pines. It was caused by faulty equipment.

Summer 2003 – A forest fire near Panther Creek burned 250 acres of land.

July 2003 – A wildfire between Ione and Martell closed a section of Highway 88 for about five hours. The fire began as five smaller roadside fires that merged into three larger fires. Approximately 45 acres were scorched in the blaze.

October 2004 – The Power Fire: The Power Fire burned a total of just under 17,000 acres near the Salt Springs and Bear River reservoir areas. 13,611 acres were on USFS land within the Amador District of the Eldorado National Forest and about 3,000 acres were on private land. The exact cause is unknown; although it is confirmed to be human caused. Foehn wind gusts of up to 50 mph caused the fire to escape original containment. No structures were lost, and no injuries or fatalities were reported. Firefighting costs were

estimated at $6.8 million. Known damages include over $80,000 to repair fences and $33,707,115 in potential damages to crops, if not harvested. Other impacts included loss of grazing, hunting, and fishing lands.

2013 Roadrunner Fire – A fire broke out near Roadrunner Drive south of Ione in Amador County. The fire was started on June 12 and was extinguished the same day. 96 acres were burned.

2014 Sand Fire – The Sand Fire broke out east of Highway 49 5 miles north of Plymouth in Amador County. The fire broke out on the afternoon of July 25th. 4,240 acres were consumed by the fire. The fire was extinguished on August 2nd. Officials reported the fire had burned ten homes, seven outbuildings, and threatened 515 homes.

2015 Butte Fire – The Butte Fire broke out to the east of Jackson in Amador County on September 9 in the early afternoon. The fire burned 70,868 acres in total. The fire was not extinguished until October 15th. 44 structures were damaged, and 877 were destroyed. One injury was sustained, and two fatalities occurred due to the fire. On June 22, 2017, Sacramento Judge Allen Sumner ruled that because "...the Butte Fire was caused by a public improvement as deliberately designed and constructed by Pacific Gas and Electric Company," the company is liable for all property damages caused by the fire. On December 7, 2019, PG&E proposed to settle all the claims for a total of $13.5 billion, which would cover liability for its responsibility originating from the Camp Fire, Tubbs Fire, Butte Fire and Ghost Ship warehouse fire, combined. The offer was tendered as a method of avoiding bankruptcy.

2018 Irish Fire – A fire broke out off Irish Ridge Road and Carbondale road south of Plymouth in Amador County. The fire broke out on the afternoon of July 6. The fire consumed 825 acres and was extinguished on January 4 of 2019.

In **2020**, The Copper Fire was a vegetation fire that started September 30th and burned 48 acres at Copper Hill Rd. off Hwy 16, east of Rancho Murieta. Impacts include evacuations and road closures; no deaths and no property destroyed

Also in **2020**, the Lambert Fire, started October 4th, was a 21-acre vegetation fire at Lambert Road and Carbondale Road, North of Carbondale. Impacts include evacuations and road closures; no death nor properties destroyed.

In **2021**, the Goose Fire began on June 13th and burned 67 acres near Red Valley Road and Jackson Valley Road; this fire resulted in evacuations and road closures though no property was destroyed, and no injuries were reported.

Also in **2021**, the Caldor Fire began on August 14th and burned 221,835 acres, primarily in El Dorado County, though parts of the fire dropped into upcountry Amador County. This fire was absolutely devasting, destroying 1,005 structures, damaging 81 others, and injuring a total of 21 people, though luckily no deaths are reported.

The final larger wildfire of **2021** was the Lawrence Fire began on September 5th and burned 46 acres just North of Fiddletown; It threatened homes and a school and resulted in evacuations and road closures but was extinguished before any buildings were destroyed.

In **2022**, the Electra Fire broke out on July 4th and burned 4,470 acres in the scar of the Butte Fire (2015), northeast of Mokelumne Hill in Amador and Calaveras counties. An emergency declaration was proclaimed (Resolution 22-179). It did not become a state or federal proclamation. This fire threatened the lives of people celebrating the holiday at the river as well as the lives and homes of those nearby, this fire resulted in evacuation and shelter in place orders, road closures, and the injury of 1 firefighter.

In **2023**, the Liberty Fire started on July 11th, near Lake Camanche, on the boarder of San Joaquin and Amador counties and burned 71 acres. No structures were destroyed and no injuries or fatalities.

Also in **2023**, the Carbon Fire started on July 11th off Carbondale Road near Ione burned 58 acres. No loss of life or destruction of structures resulted.

In **2024**, the Wicklow Fire ignited September 9th and burned 63 acres in Martell. No loss of life or destruction of structures was reported.

Later in **2024**, the Tiger Fire began on September 30th and burned 4 acres near Pioneer. This fire resulted in evacuation orders but there are no reports of destroyed structures or deaths/injuries. The EOC was stood up during this event for approximately 6 hours. It was noted in and After Action Report that the early and well-coordinated evacuation efforts resulted in zero casualties. Transportation assistance for those without the means to evacuate was made available. The human shelter was fully operational within about an hour and provided essential services to evacuees and their pets. Animal rescue groups were quick to respond and set up shelters.

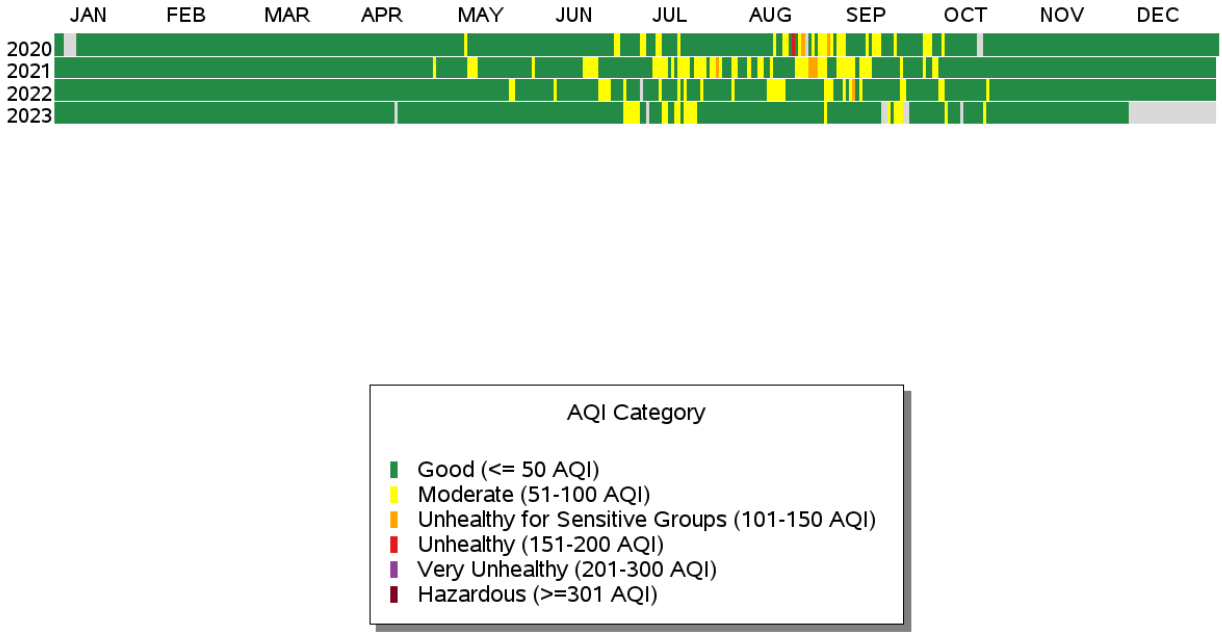
The last large fire in **2024** was the Michigan Fire. It ignited on November 21st near Ione and burned 24 acres, no reports of destruction of structures or death/injuries.

Figure 4-124 Michigan Fire Burn Area

Source: Amador County

For those wildfire events from 2020 to 2023, air quality data for smoke was reviewed and presented. This coincides with some of the wildfire events above. This can be seen in Figure 4-125.

Figure 4-125 Amador County Planning Area – Daily Air Quality from 2020-2023



Source: U.S. EPA AirData <https://www.epa.gov/air-data>
Generated: December 5, 2023

Likelihood of Future Occurrence

Highly Likely —Amador County faces a serious wildland fire threat every year. While generally limited to the sparsely populated, forested areas in the western portion of the County, fires will continue to occur on an annual basis throughout the Amador County Planning Area. The threat of wildfire and potential losses are constantly increasing as human development and population increase and the wildland urban interface areas expand. Due to its high fuel load and long, dry summers, portions of Amador County continue to be at risk from wildfire.

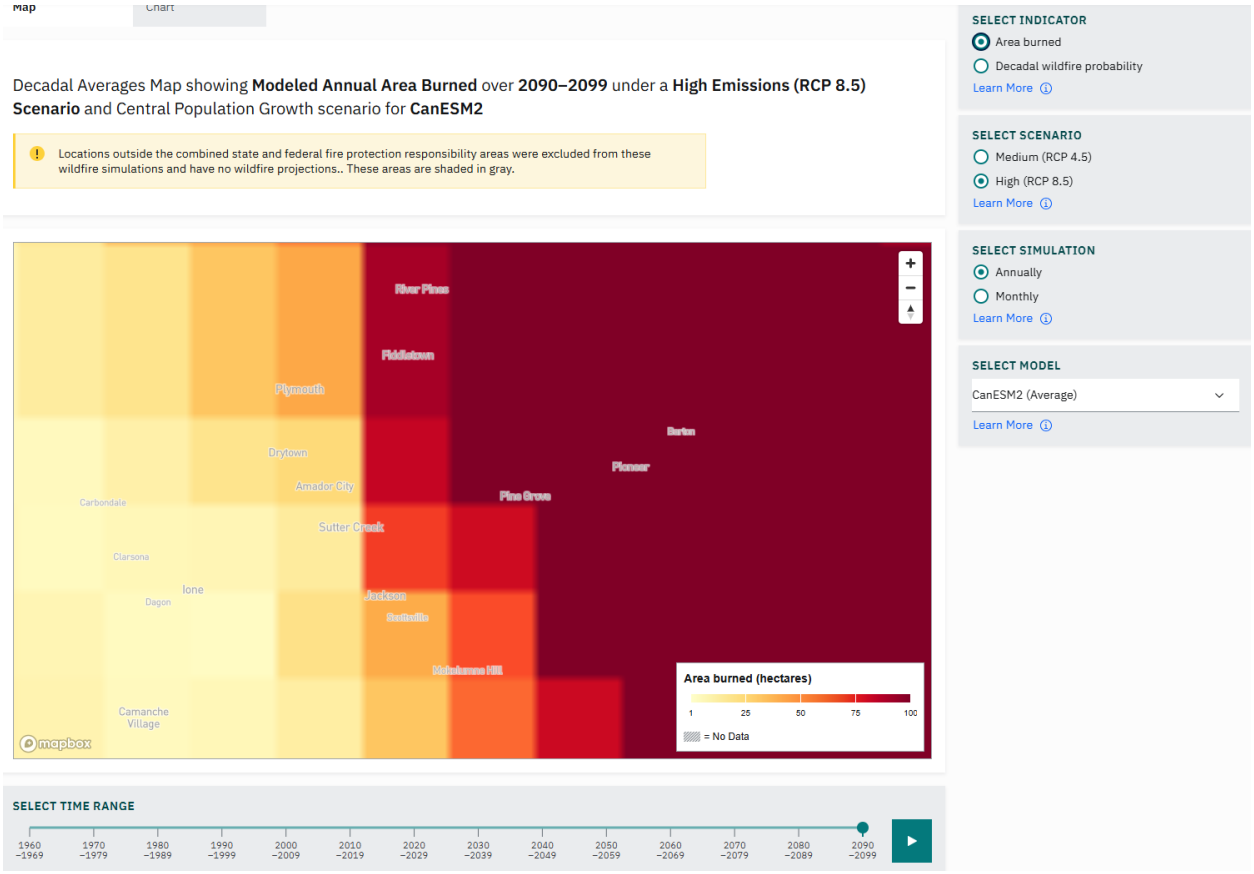
It is likely that climate change will increase the chance of future occurrence as well as future impacts. More information on climate change and wildfire can be found in the next section. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate Change and Wildfire

Warmer temperatures can exacerbate drought conditions. Drought often kills plants and trees, which serve as fuel for wildfires. Warmer temperatures could increase the number of wildfires and pest outbreaks, such as the western pine beetle. Cal-Adapt's wildfire tool predicts the potential increase in the amount of burned areas for the year 2090-2099, as compared to recent (2010) conditions. This is shown in Figure 4-126. Based on this model, Cal-Adapt predicts that wildfire risk in Amador County will increase moderately by the end of the century. However, wildfire models can vary depending on the parameters used. Cal-Adapt does not take landscape and fuel sources into account in their model. In all likelihood, in the Amador

County Planning Area, precipitation patterns, high levels of heat, topography, and fuel load will determine the frequency and intensity of future wildfire.

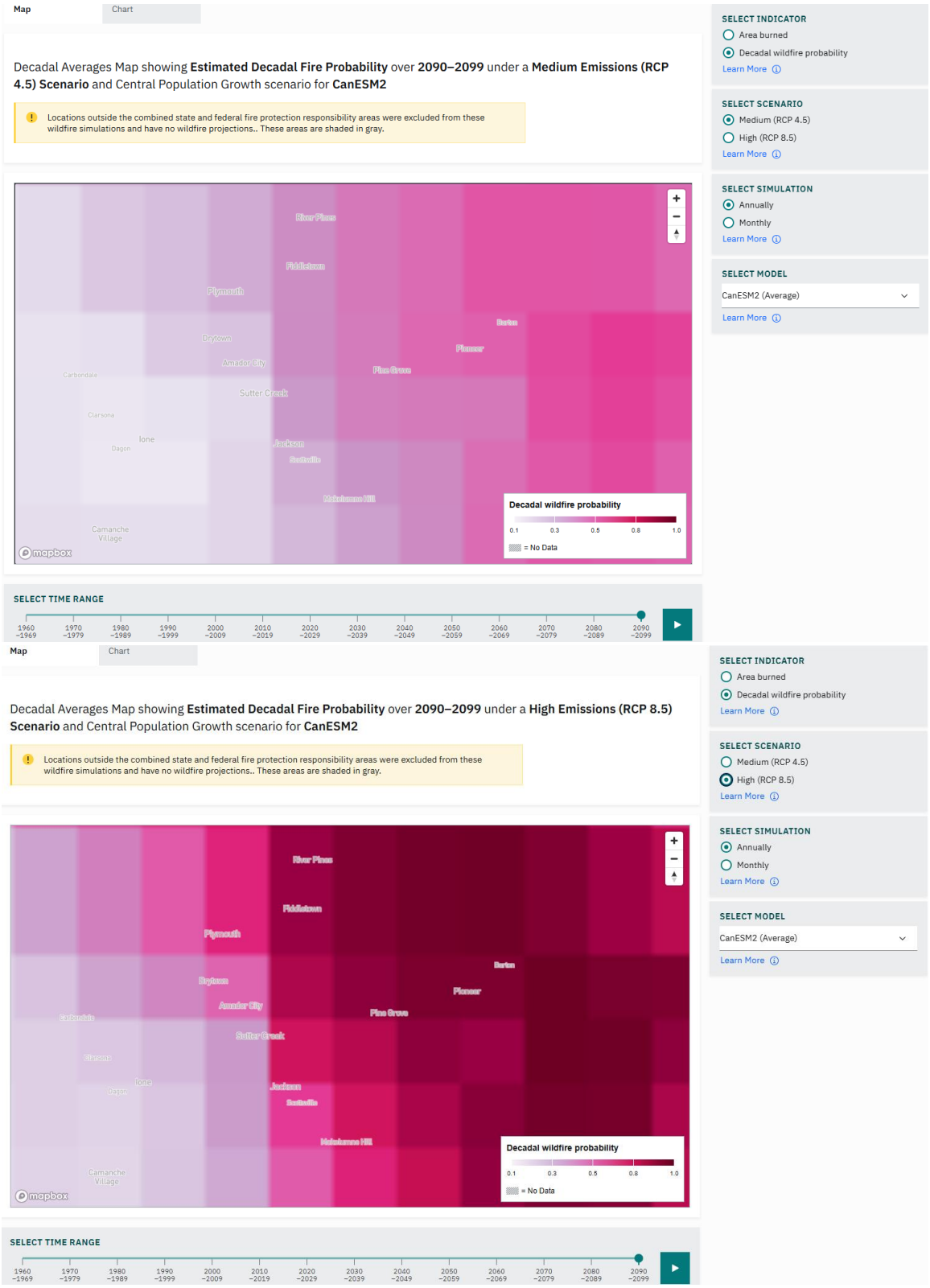
Figure 4-126 Amador County Planning Area – Projected Increase in Wildfire Burn Areas



Source: Cal-Adapt. Retrieved 2/6/2025.

Wildfire scenario projections were done by Cal-Adapt, based on statistical modeling from historical data of climate, vegetation, population density, and fire history. The fire modeling ran simulations on five variables on a monthly time step - Large fire presence/absence, Number of fires given presence, Area burned in a grid cell given a fire, High severity burned area given a fire and emissions. These are shown on Figure 4-127. The upper chart shows modeled annual averages of area burned for the Planning Area under the RCP 4.5 scenario, while the lower chart shows modeled annual averages of area burned for the Planning Area under the RCP 8.5 scenario.

Figure 4-127 Amador County Planning area – Future Annual Averages of Acres Burned under RCP 4.5 and 8.5 Scenarios



Source: Cal-Adapt. Retrieved 2/6/2025.

Vulnerability Assessment

Vulnerability—Extremely High

Risk and vulnerability to the County from wildfire is of significant concern. Wildfires that occur in the County occur from a variety of both natural and manmade causes. The County can be affected both by fires that start on or near County lands as well as those that start elsewhere and move into the County. In addition to burning large areas of land, air quality can be affected in the County by fires occurring inside the County as well as those from many miles away. As growth continues and populations increase in the County, the potential for catastrophic wildfires will also increase.

An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to unincorporated Amador County. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect both the entire Amador County Planning Area as well as the unincorporated portions of Amador County. How the hazard affects the other participating jurisdictions can be found in their respective annexes to this LHMP Update. These sections below include assets at risk, impacts, and how future development may affect the vulnerability of the County to this hazard.

Local Concerns (unincorporated Amador County)

The unincorporated County has specific concerns regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce the risk and vulnerability to this hazard.

County Concerns

The County noted that increasingly frequent and severe wildfires throughout California pose a major threat. Limited road networks and dispersed rural communities mean that the vulnerable populations mentioned below may struggle to evacuate quickly and safely. Wildland fires that burn in natural settings with little or no development are part of a natural ecological cycle and may actually be beneficial to the landscape. Century old policies of fire exclusion and aggressive suppression have given way to better understanding of the importance fire plays in the natural cycle of certain forest types.

Communities at Risk

The National Fire Plan is a cooperative, long-term effort between various government agency partners with the intent of actively responding to severe wildland fires and their impacts to communities while ensuring sufficient firefighting capacity for the future. For purposes of the National Fire Plan, CAL FIRE generated a list of California communities at risk for wildfire. The intent of this assessment was to evaluate the risk to a given area from fire escaping off federal lands. Thus, there may be many more communities that are considered at risk to wildfire within the Amador County Planning Area, but might not meet these specific requirements for determining communities at risk from wildfire escaping off federal lands. Three main factors were used to determine the wildfire threat in the wildland-urban interface areas of California: fuel hazards, probability of fire, and areas of suitable housing density that could create wildland urban interface fire protection strategy situations. The preliminary criteria and methodology for evaluating wildfire risk to

communities is published in the Federal Register, January 4, 2001. The National Fire Plan identifies 10 "Communities at Risk" in Amador County.

- Amador City
- Fiddletown
- Ione
- Jackson
- Pine Grove
- Pioneer
- Plymouth
- River Pines
- Sutter Creek
- Volcano

Concerns from CAL FIRE

CAL FIRE noted that wildfires pose several significant public health concerns. Here are some of the chief local concerns:

- Respiratory Issues: Wildfire smoke contains fine particulate matter (PM2.5) that can penetrate deep into the lungs and even enter the bloodstream, exacerbating conditions like asthma, bronchitis, and chronic obstructive pulmonary disease (COPD).
- Cardiovascular Problems: Exposure to wildfire smoke can increase the risk of heart attacks, arrhythmias, and other cardiovascular issues.
- Vulnerable Populations: Certain groups, such as children, the unhoused, the elderly, pregnant women, and those with pre-existing health conditions, are more susceptible to the health impacts of wildfire smoke.
- Mental Health: The stress and trauma from experiencing wildfires and displacement can lead to mental health issues like anxiety, depression, and post-traumatic stress disorder (PTSD).
- Long-term Health Effects: Prolonged exposure to wildfire smoke can have lasting health impacts, including increased rates of respiratory infections and other chronic conditions.
- Emergency Room Visits and Hospitalizations: Increased air pollution from wildfires can lead to a rise in emergency room visits and hospitalizations for respiratory and cardiovascular issues which could overcome our small rural hospital's ability to care for patients.

Wildfire risk in Amador County varies by location. Factors contributing to the wildfire risk in Amador County include:

- Overstocked forests, severely overgrown vegetation, and lack of defensible space around structures;
- Large percentage of high hazard fuels;
- Conditions such as drought and overstocked forests contribute to increased beetle kill in weakened and stressed trees. In Amador County beetle kill is most established in the true firs within the upper elevations of the Eldorado National Forest (i.e., in the 5,000 to 7,000 elevation range). While the infestation is not exceptionally heavy, the mortality is noticeable along the Highway 88 corridor and is more prevalent in the heavily stocked stands of the Foster Meadow to Mormon Emigrant Trail area;
- The County contains steep rugged river canyons that limit accessibility except on foot;
- Increasing population density and increasing development within the WUI areas; and

- The area east of Highway 49 which contains the largest population also contains the most hazardous fuels and most difficult terrain.

Land Ownership Concerns

Sierra Pacific Industries (SPI) currently owns approximately 26,000 acres in Amador County. This land is defined as industrial timberland and is zoned as Timber Production Zone. Much of this land lies between the forest/urban interface within the Eldorado National Forest, and is critical to effective fire management activities. SPI and predecessor companies have been aggressive in planning and implementing fire control strategies on the property including the development of shaded fuel breaks. Wildfires in the Timber Production Zones would negatively affect SPI, its subsidiaries, and its employees.

Insurance Concerns

The HMPC noted that in the WUI areas, there has been increased difficulty in obtaining home insurance and the cost of insurance premiums. Some residents have experienced cancellations of their policies due to catastrophic and recent wildfires occurring throughout California which has reduced the risk tolerance of many insurance companies. This increases costs to those who live in the WUI, and in some circumstances limits where people choose to live.

Amador County Resource Conservation District Concerns

In addition to the above, the Amador County Resource Conservation District noted the following:

- Nearly 30% of the population in Amador County is elderly (ages 65+) [census info], they may have difficulty evacuating or need assistance to evacuate
- Wildfires pose a threat to life and property
- Road capabilities during evacuation to handle evacuees leaving and emergency response entering (Ingress/Egress)
- Ability of fire response teams to effectively fight wildfire
- Dense vegetation that serves as ladder fuels and leads to higher intensity fires that are harder to contain
- Need for establishment and maintenance of strategic fuel breaks to project infrastructure and communities.
- Insurance cost, Amador County residents live in the Wildland Urban Interface (WUI). The growth of rural communities increases the risk to life, property, and infrastructure during a wildlife. Many homeowners are unable to afford the cost of home hardening and land management that would reduce the risk to their homes. Insurance costs have skyrocketed in recent years and many people are left with the CA fair plan as their only option.
- Watershed impacts, high intensity wildlife pose a significant risk to upper watershed resources that much of the state depends on and provide ecological value. Amador Counties upcountry landscape is the headwaters of the Mokelumne and Cosumnes rivers. A wildfire threat to either of these rivers could have critical water resource and ecological impacts beyond Amador County, such as the downstream farming communities, CA delta, and East Bay MUD.

Local concerns for each of the participating jurisdictions can be found under the Local Concerns heading in each respective jurisdictional annex to this LHMP Update.

Assets at Risk

Assets at risk from wildfire include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections for the Amador County Planning Area and unincorporated Amador County.

Additionally, for each hazard in the FEMA National Risk Index in Amador County, the relevant portions of the hazard analysis done by FEMA is presented below. This includes the Hazard Risk Index Rating, Expected Annual Loss Values, Exposure Values, and the Historic Loss Ratio Rating. These are presented for the Amador County Planning Area as a whole.

Methodology (Parcels and Structures)

As part of the Fire and Resource Assessment Program (FRAP), the State Fire Marshall was mandated to map areas of significant fire hazards based on fuels, terrain, weather, and other relevant factors, including areas where winds have been identified as a major cause of wildfire spread. These zones, referred to as Fire Hazard Severity Zones (FHSZs), include non-wildland/non-urban, moderate, high, and very high FHSZs. The FHSZ map evaluates hazard, not risk. Hazard is based on the physical conditions that create a likelihood and expected fire behavior over a 30-50 year period without considering mitigation measures such as home hardening, recent wildfire, or fuel reduction efforts. Risk is the potential damage a fire can do to an area under existing conditions, accounting for any modification such as fuel reduction projects, defensible space, and ignition resistant building construction.

Effective April 1, 2024, CAL FIRE updated its Fire Hazard Severity Zone (FHSZ) maps for the State Responsibility Area (SRA) to provide updated map zones based on new science in local climate data and improved fire assessment modeling. The FHSZ model for wildland fire has two key elements: probability of an area burning and expected fire behavior under extreme fuel and weather conditions. The factors considered in determining fire hazard within wildland areas are fire history, flame length, terrain, local weather, and the potential fuel over a 50-year period. Outside of wildlands, the model considers factors that might lead to buildings being threatened, including terrain, weather, urban vegetation cover, blowing embers, proximity to wildland, fire history and fire hazard in nearby wildlands. FHSZs are not a structure loss model, as key information regarding structure ignition (such as roof type, etc.) is not included.

The new FHSZ mapping will create more accurate zone designations that can direct the implementation of mitigation strategies in areas where hazards warrant these investments. The FHSZ mapping program is still ongoing with new mapping in the LRA completed in March of 2025. Note: the FHSZ data for the Federal Responsibility Area has not been updated since 2007.

For the Amador County Planning Area, two separate analyses were performed: one for the combined SRA/FRA datasets and one for the LRA dataset. Specifically, the following datasets were utilized for the SRA/FRA analysis and contained all FHSZ hazard classes from Very High to non-wildland/non-urban: CAL FIRE State Responsibility Area (FHSZSRA_23_3) April 2024 and CAL FIRE Federal/ Areas: (Adopted SRA FHSZ 11/2007 - fhszs06_3_6). The following LRA dataset was used for the LRA FHSZ analysis: CAL FIRE Local Responsibility Area (FHSZLRA25_Phase3_v1) released in March 2025.

Since it is possible for any given parcel to intersect with multiple categories for purposes of this analysis, the parcel centroid was used to determine which FHSZ to assign to each parcel. In some cases, there are parcels in multiple fire hazard severity zones. For the purposes of this analysis, if multiple fire hazard zone intersected any portion of a parcel polygon, the entire parcel was considered to be in the highest fire risk category. The parcels were segregated and analyzed in this fashion for the entire Planning Area.

Once the CAL FIRE fire hazard severity zones were intersected, land and improved (structure) values from the Assessor data were included for each parcel and estimated content replacement values were added to the analysis. Improved parcels include those with improved structure values identified in the Amador County Assessor's database.

This methodology is used below for the FHSZ analysis of people and populations, structures, and critical facilities at risk as well as with respect to future development areas.

People and Populations

All populations are at some vulnerability to wildfire. Certain vulnerable populations are at greater risk to the effects of wildfire as well as smoke and air quality issues that wildfires bring. Vulnerable populations include:

- Unhoused
- Infants and children under age five and their caregivers
- Elderly (65 and older)
- Individuals with disabilities
- Individuals' dependent on medical equipment
- Individuals who exercise or recreate outdoors
- Individuals who work outdoors
- Individuals with impaired mobility

Amador County Planning Area residents that live in CAL FIRE FHSZs are often the most vulnerable. Not only are the residents at risk, but their homes and contents are all at risk, compounding the impacts associated with significant hazard events. To further evaluate the impact to the residential population within the Planning Area, CAL FIRE's wildfire hazard layers were overlayed on the parcel layer and linked to the Assessor data. Those residential parcel centroids that intersect the mapped FRA and SRA layers were counted and multiplied by the 2020 Census Bureau average household factors for each jurisdiction. These are shown by jurisdiction in Table 4-129. Those residential parcel centroids that intersect the mapped LRA layers were counted and multiplied by the 2020 Census Bureau average household factors for each jurisdiction. These are shown by jurisdiction in Table 4-130.

Table 4-129 Amador County Planning Area – Improved Residential Parcels and Population by CAL FIRE SRA/FRA Fire Hazard Severity Zone by Jurisdiction

Jurisdiction	Very High		High		Moderate	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Amador City	1	2	0	0	0	0
Ione	0	0	0	0	0	0
Jackson	0	0	0	0	0	0
Plymouth	0	0	0	0	0	0
Sutter Creek	0	0	0	0	0	0
Unincorporated County	8,462	19,886	2,080	4,888	242	569

Source: CAL FIRE, 2024 Amador County Parcel/Assessor's Data, 2020 US Census Bureau Average Household Size – City of Amador City (2.07); City of Ione (2.29); City of Jackson (2.20); City of Plymouth (2.80); City of Sutter Creek (2.07): Unincorporated Amador County (2.35).

Table 4-130 Amador County Planning Area – Improved Residential Parcels and Population by CAL FIRE LRA Fire Hazard Severity Zone by Jurisdiction

Jurisdiction	Very High		High		Moderate	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Amador City	95	197	0	0	0	0
Ione	1	2	560	1,282	242	554
Jackson	144	317	1,054	2,319	177	389
Plymouth	40	112	331	927	47	132
Sutter Creek	773	1,600	263	544	6	12
Unincorporated County	0	0	0	0	0	0

Source: CAL FIRE, 2024 Amador County Parcel/Assessor's Data, 2020 US Census Bureau Average Household Size – City of Amador City (2.07); City of Ione (2.29); City of Jackson (2.20); City of Plymouth (2.80); City of Sutter Creek (2.07): Unincorporated Amador County (2.35).

Structures

This section is presented in two sections: SRA/FRA Fire Hazard Severity Zone Analysis and LRA Fire Hazard Severity Zone Analysis.

For the following analysis, the SRA/FRA and LRA fire responsibility area layers were overlaid with the parcel data as described above and further broken out by property use and included information on both land and improved values. It should be noted that fire does not just affect structural values, fire can also affect land values. As such the Assessor's land values and all parcels were accounted for in this analysis to represent total County values at risk. However, it is highly unlikely the whole County will ever be on fire at once.

SRA/FRA Fire Hazard Severity Zone Analysis

All structures in the Amador County Planning Area have some risk to wildfire. The Amador County Planning Area parcel inventory and associated values by FRA and SRA are provided in Table 4-131. This is broken down further for the unincorporated County in Table 4-131. Table 4-131 shows FRA and SRA parcel counts, land and improved values (i.e., those with a structure improvement on the parcel), estimated content replacement values, and total values in the unincorporated County. ***Note***: while most SRA/FRA mapped areas fall within the unincorporated County areas, due to differing boundaries in mapped datasets, a few SRA/FRA mapped areas are found in the incorporated communities as shown below. Details on each jurisdiction's SRA/FRA Fire Hazard Severity Zones and property use types can be found in their respective annexes to this LHMP Update.

Table 4-131 Amador County Planning Area – Count and Value of Parcels and Structures by CAL FIRE SRA/FRA Fire Hazard Severity Zones by Jurisdiction

Jurisdiction / Fire Responsibility Area/ Fire Hazard Severity Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Values	Total Value
Amador City						
SRA						
Very High	1	1	$39,032	$116,158	$58,079	$213,269
SRA Total	**1**	**1**	**$39,032**	**$116,158**	$58,079	$213,269
Amador City Total	**1**	**1**	**$39,032**	**$116,158**	**$58,079**	**$213,269**
Jackson						
SRA						
High	3	0	$8,575	$0	$0	$8,575
SRA Total	**3**	0	**$8,575**	$0	$0	**$8,575**
Jackson Total	**3**	0	**$8,575**	$0	$0	**$8,575**
Plymouth						
SRA						
High	2	0	$106,120	$0	$0	$106,120
SRA Total	**2**	**0**	**$106,120**	**$0**	$0	**$106,120**
Plymouth Total	**2**	**0**	**$106,120**	**$0**	$0	**$106,120**
Unincorporated Amador County						
FRA						
Very High	133	45	$3,484,714	$4,218,497	$2,109,249	$9,812,460
High	17	13	$295,716	$1,006,722	$359,999	$1,662,437
Moderate	142	102	$8,120,599	$10,442,127	$5,250,207	$23,812,933

Jurisdiction / Fire Responsibility Area/ Fire Hazard Severity Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Values	Total Value
Non-Wildland/Non-Urban	4	3	$296,137	$492,306	$246,153	$1,034,596
FRA Total	**296**	**163**	**$12,197,166**	**$16,159,652**	**$7,965,608**	**$36,322,426**
SRA						
Very High	13,034	9,427	$1,125,553,747	$2,227,048,958	$1,247,474,536	$4,600,077,241
High	4,023	2,659	$505,375,316	$708,274,763	$450,070,234	$1,663,720,313
Moderate	472	184	$43,888,598	$74,645,928	$58,901,625	$177,436,151
SRA Total	**17,529**	**12,270**	**$1,674,817,661**	**$3,009,969,649**	$1,756,446,394	$6,441,233,704
Unincorporated Amador County Total	**17,825**	**12,433**	**$1,687,014,827**	**$3,026,129,301**	**$1,764,412,001**	**$6,477,556,129**
Grand Total	**17,831**	**12,434**	**$1,687,168,554**	**$3,026,245,459**	**$1,764,470,080**	**$6,477,884,093**

Source: CAL FIRE (FHSZ SRA 2024, FRA 2007), 2024 Amador County Parcel/Assessor's Data

Table 4-132 Unincorporated Amador County – Count and Value of Parcels and Structures by CAL FIRE SRA/FRA Fire Hazard Severity Zones by Property Use

Fire Responsibility Area / Fire Hazard Severity Zone/Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Values	Total Value
FRA						
Very High						
Agricultural	6	0	$2,036,833	$0	$0	$2,036,833
Commercial	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	81	0	$313,570	$0	$0	$313,570
Residential	46	45	$1,134,311	$4,218,497	$2,109,249	$7,462,057
Unknown	0	0	$0	$0	$0	$0
Very High Total	**133**	**45**	**$3,484,714**	**$4,218,497**	**$2,109,249**	**$9,812,460**
High						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0

Fire Responsibility Area / Fire Hazard Severity Zone/Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Values	Total Value
Miscellaneous	3	0	$0	$0	$0	$0
Residential	11	11	$241,620	$719,998	$359,999	$1,321,617
Unknown	3	2	$54,096	$286,724		$340,820
High Total	**17**	**13**	**$295,716**	**$1,006,722**	**$359,999**	**$1,662,437**
Moderate						
Agricultural	1	0	$162,302	$0	$0	$162,302
Commercial	1	1	$176,804	$58,287	$58,287	$293,378
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	35	0	$1,472,540	$0	$0	$1,472,540
Residential	105	101	$6,308,953	$10,383,840	$5,191,920	$21,884,713
Unknown	0	0	$0	$0	$0	$0
Moderate Total	**142**	**102**	**$8,120,599**	**$10,442,127**	**$5,250,207**	**$23,812,933**
Non-Wildland/Non-Urban						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	1	0	$0	$0	$0	$0
Residential	3	3	$296,137	$492,306	$246,153	$1,034,596
Unknown	0	0	$0	$0	$0	$0
Non-Wildland/Non-Urban Total	**4**	**3**	**$296,137**	**$492,306**	**$246,153**	**$1,034,596**
FRA Total	**296**	**163**	**$12,197,166**	**$16,159,652**	**$7,965,608**	**$36,322,426**
SRA						
Very High						
Agricultural	1,188	704	$161,097,114	$109,583,478	$109,583,478	$380,264,070
Commercial	209	161	$31,646,275	$165,117,421	$165,117,421	$361,881,117
Industrial	25	18	$10,243,882	$6,289,273	$9,433,910	$25,967,065
Miscellaneous	522	67	$6,181,688	$8,184,549	$0	$14,366,237
Residential	10,965	8,417	$883,454,372	$1,926,679,454	$963,339,727	$3,773,473,553
Unknown	125	60	$32,930,416	$11,194,783	$0	$44,125,199
Very High Total	**13,034**	**9,427**	**$1,125,553,747**	**$2,227,048,958**	**$1,247,474,536**	**$4,600,077,241**
High						
Agricultural	564	437	$115,304,332	$101,734,096	$101,734,096	$318,772,524

Fire Responsibility Area / Fire Hazard Severity Zone/Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Values	Total Value
Commercial	187	110	$52,084,232	$87,536,850	$87,536,850	$227,157,932
Industrial	27	12	$24,789,106	$7,186,321	$10,779,482	$42,754,909
Miscellaneous	158	8	$12,570,152	$5,628,469	$0	$18,198,621
Residential	3,043	2,069	$295,958,186	$500,039,612	$250,019,806	$1,046,017,604
Unknown	44	23	$4,669,308	$6,149,415	$0	$10,818,723
High Total	**4,023**	**2,659**	**$505,375,316**	**$708,274,763**	**$450,070,234**	**$1,663,720,313**
Moderate						
Agricultural	30	20	$4,422,859	$5,744,509	$5,744,509	$15,911,877
Commercial	39	32	$12,894,545	$37,848,948	$37,848,948	$88,592,441
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	20	0	$425,816	$0	$0	$425,816
Residential	380	131	$26,009,524	$30,616,335	$15,308,168	$71,934,027
Unknown	3	1	$135,854	$436,136	$0	$571,990
Moderate Total	**472**	**184**	**$43,888,598**	**$74,645,928**	$58,901,625	$177,436,151
SRA Total	**17,529**	**12,270**	**$1,674,817,661**	**$3,009,969,649**	$1,756,446,394	$6,441,233,704
Unincorporated Amador County Total	**17,825**	**12,433**	**$1,687,014,827**	**$3,026,129,301**	**$1,764,412,001**	**$6,477,556,129**

Source: CAL FIRE (FHSZ SRA 2024, FRA 2007), 2024 Amador County Parcel/Assessor's Data

LRA Fire Hazard Severity Zone Analysis

All structures in the Amador County Planning Area have some risk to wildfire. The Amador County Planning Area parcel inventory and associated values by LRA are provided in Table 4-133. As shown, there are no LRA areas for the unincorporated County. As such, no tabular analysis of property use is presented for unincorporated Amador County. Details on each jurisdiction's LRA Fire Hazard Severity Zones and property use types can be found in their respective annexes to this LHMP Update.

Table 4-133 Amador County Planning Area – Count and Value of Parcels and Structures by CAL FIRE LRA Fire Hazard Severity Zone by Jurisdiction

Jurisdiction/Fire Hazard Severity Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Values	Total Value
Amador City						
Very High	180	111	$19,124,377	$21,078,306	$12,365,357	$52,568,040

Jurisdiction/Fire Hazard Severity Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Values	Total Value
Amador City Total	**180**	**111**	**$19,124,377**	**$21,078,306**	**$12,365,357**	**$52,568,040**
Ione						
Very High	23	3	$4,044,274	$205,961	$93,636	$4,343,871
High	705	587	$73,730,102	$144,835,562	$74,739,206	$293,304,870
Moderate	294	267	$28,946,094	$71,387,728	$40,987,786	$141,321,608
Non-Wildland	1,183	1,119	$117,021,359	$280,037,906	$142,264,353	$539,323,618
Ione Total	**2,205**	**1,976**	**$223,741,829**	**$496,467,157**	**$258,084,980**	**$978,293,966**
Jackson						
Very High	213	168	$23,192,037	$54,995,054	$33,185,946	$111,373,037
High	1,421	1,164	$139,012,347	$416,400,057	$280,110,623	$835,523,027
Moderate	276	243	$25,221,616	$63,857,922	$47,288,279	$136,367,817
Non-Wildland	213	181	$14,353,404	$32,621,706	$19,727,567	$66,702,677
Outside of LRA Responsibility Area	1	0	$72,584	$0	$0	$72,584
Jackson Total	**2,124**	**1,756**	**$201,851,988**	**$567,874,739**	**$380,312,415**	**$1,150,039,142**
Plymouth						
Very High	46	40	$5,939,568	$6,628,450	$3,314,225	$15,882,243
High	482	372	$73,102,242	$102,067,788	$59,725,032	$234,895,062
Moderate	77	58	$4,502,157	$6,969,088	$4,632,529	$16,103,774
Non-Wildland	20	18	$1,599,396	$2,702,080	$1,590,355	$5,891,831
Plymouth Total	**625**	**488**	**$85,143,363**	**$118,367,406**	**$69,262,141**	**$272,772,910**
Sutter Creek						
Very High	991	815	$83,708,244	$216,257,857	$114,172,572	$414,138,673
High	414	331	$45,809,571	$106,185,022	$74,684,120	$226,678,713
Moderate	24	14	$3,607,044	$8,896,982	$8,762,973	$21,266,999
Non-Wildland	5	0	$550,346	$0	$0	$550,346
Sutter Creek Total	**1,434**	**1,160**	**$133,675,205**	**$331,339,861**	**$197,619,665**	**$662,634,731**
Grand Total	**6,568**	**5,491**	**$663,536,762**	**$1,535,127,469**	$917,644,556	$3,116,308,787

Source: CAL FIRE (FHSZ LRA 2025), 2024 Amador County Parcel/Assessor Data

Critical Facilities and Infrastructure

Wildfire present a threat to critical facilities and infrastructure. The following analysis discusses critical facilities and infrastructure. A separate analysis was performed on the critical facility inventory in the

Amador County Planning Area to determine critical facilities in fire hazard severity zones. This was done for both SRA/FRA and LRA fire hazard severity zones. Using GIS, the SRA/FRA and LRA fire hazard severity zones were overlayed on the critical facility GIS layer. Figure 4-128 shows critical facilities, as well as the SRA/FRA fire hazard severity zones. Table 4-134 details critical facilities by SRA/FRA fire hazard severity zone by facility type and count for the Planning Area. Figure 4-129 shows critical facilities, as well as the LRA fire hazard severity zones. Table 4-135 details critical facilities by LRA fire hazard severity zone by facility type and count for the Planning Area. Details of critical facility category, type, name and address by SRA/FRA and LRA fire hazard severity zones are listed in Appendix F.

Figure 4-128 Amador County Planning Area – Critical Facilities in SRA/FRA Fire Hazard Severity Zones

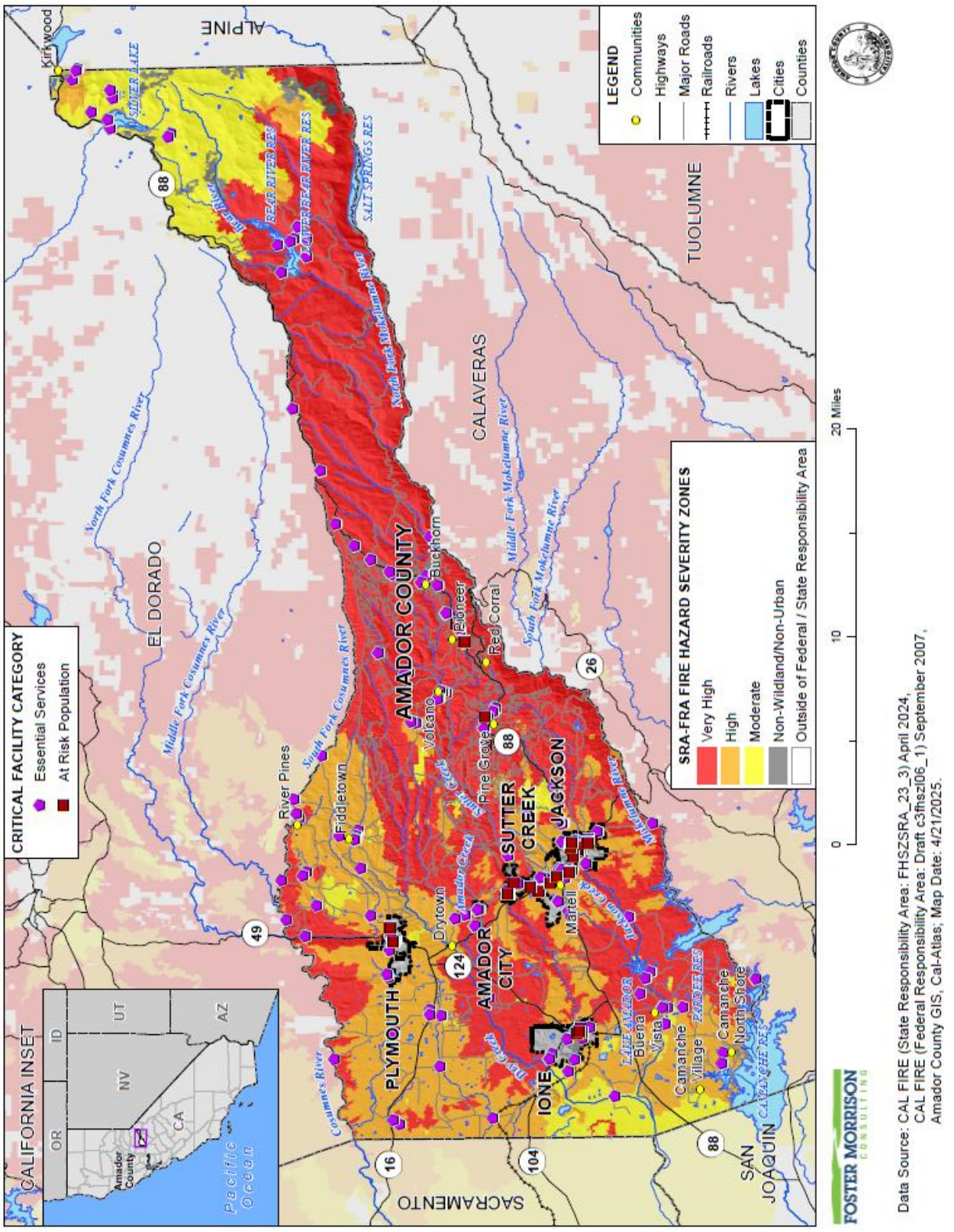


Table 4-134 Amador County Planning Area – Critical Facilities in SRA/FRA Fire Hazard Severity Zones by Jurisdiction and Category

Jurisdiction/Fire Hazard Severity Zones/Critical Facility Category	Facility Count
Plymouth	
High	
Essential Services	1
At Risk Population	0
High Total	**1**
Plymouth Total	**1**
Unincorporated Amador County	
Very High	
Essential Services	79
At Risk Population	4
Very High Total	**83**
High	
Essential Services	36
At Risk Population	2
High Total	**38**
Moderate	
Essential Services	23
At Risk Population	1
Moderate Total	**24**
Unincorporated Amador County Total	**145**
Unincorporated Alpine County	
High	
Essential Services	1
At Risk Population	0
High Total	**1**
Unincorporated Alpine County Total	**1**
Grand Total	**147**

Source: CAL FIRE, Amador County GIS

Figure 4-129 Amador County Planning Area – Critical Facilities in LRA Fire Hazard Severity Zones

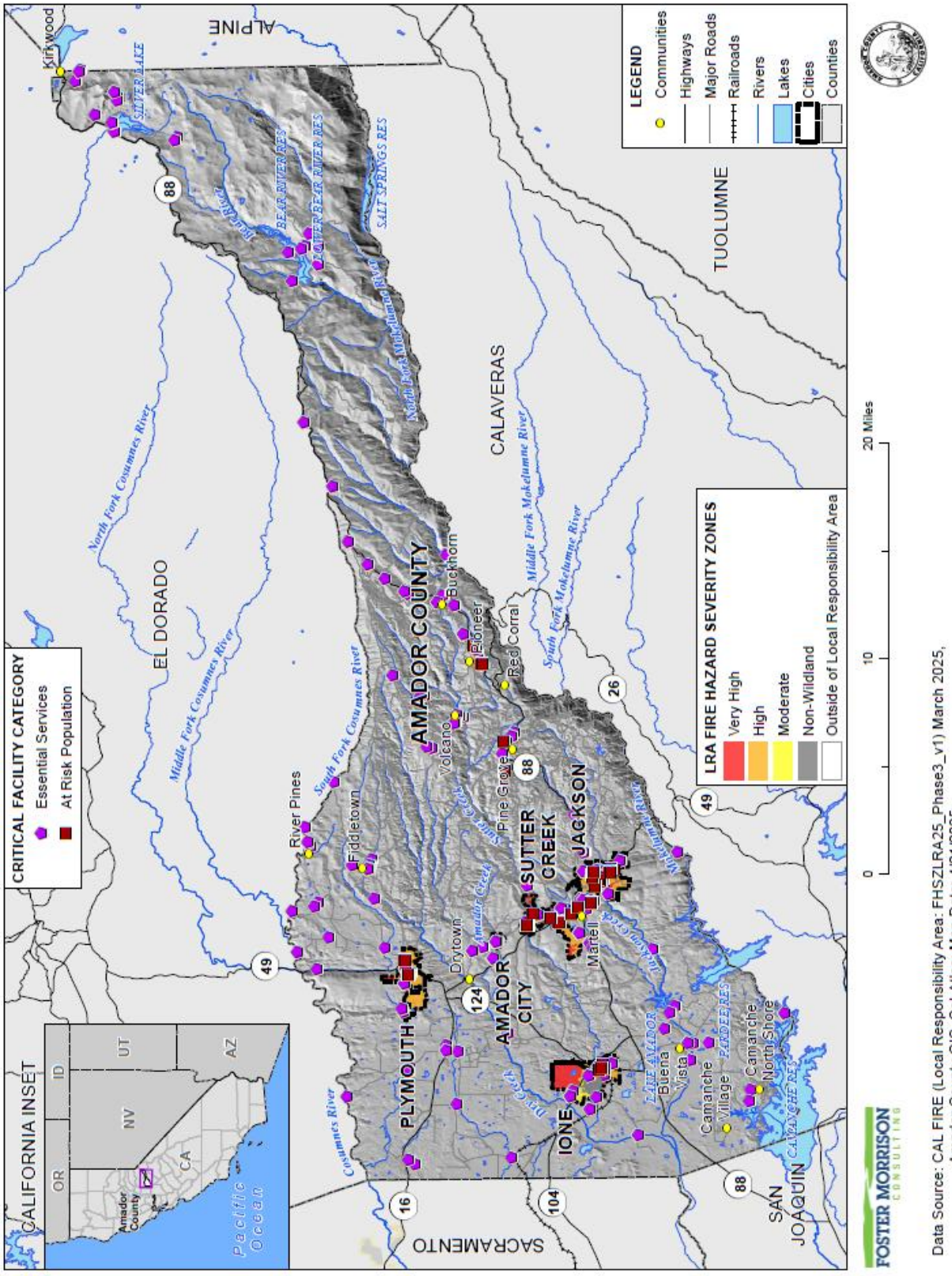


Table 4-135 Amador County Planning Area – Critical Facilities in LRA Fire Hazard Severity Zones by Jurisdiction, Category, and Type

Jurisdiction/Fire Hazard Severity Zone/Critical Facility Category	Facility Count
Amador City	
Very High	
Essential Services	3
At Risk Population	0
Very High Total	**3**
Amador City Total	**3**
Ione	
Very High	
Essential Services	1
At Risk Population	0
Very High Total	**1**
High	
Essential Services	4
At Risk Population	1
High Total	**5**
Moderate	
Essential Services	3
At Risk Population	2
Moderate Total	**5**
Non-Wildland	
Essential Services	5
At Risk Population	2
Non-Wildland Total	**7**
Ione Total	**18**
Jackson	
Very High	
Essential Services	1
At Risk Population	0
Very High Total	**1**
High	
Essential Services	17
At Risk Population	8
High Total	**25**
Moderate	
Essential Services	8

Jurisdiction/Fire Hazard Severity Zone/Critical Facility Category	Facility Count
At Risk Population	3
Moderate Total	**11**
Non-Wildland	
Essential Services	8
At Risk Population	2
Non-Wildland Total	**10**
Jackson Total	**47**
Plymouth	
High	
Essential Services	2
At Risk Population	0
High Total	**2**
Moderate	
Essential Services	2
At Risk Population	1
Moderate Total	**3**
Non-Wildland	
Essential Services	4
At Risk Population	**0**
Non-Wildland Total	**4**
Plymouth Total	**9**
Sutter Creek	
Very High	
Essential Services	2
At Risk Population	3
Very High Total	**5**
High	
Essential Services	5
At Risk Population	3
High Total	**8**
Sutter Creek Total	**13**
Grand Total	**90**

Source: CAL FIRE, Amador County GIS

Natural, Historic, and Cultural Resources

Natural, historic, and cultural resources located within areas at risk to wildfire would be vulnerable. Should a wildfire occur in the Planning Area, the impacts to natural, historic, and cultural resources could be extensive and include air pollution, contamination from water runoff containing toxic products, and other environmental discharges or releases from burned materials affecting soils, habitat areas, wildlife, and aquatic resources. Historic and cultural resources can be affected and are often more vulnerable due to their older age, construction type, and lack of fire prevention infrastructure such as sprinklers.

FEMA NRI Hazard Vulnerability Assessment

The FEMA NRI was queried for additional specific data on Amador County's vulnerability to Wildfire. The NRI contains data and analysis for 18 separate natural hazards, including wildfire. As shown in Table 4-136, wildfires could cause a total of $7,534,156 in expected annual losses, with a historic loss rating of relatively moderate. Wildfire has a relatively moderate rating for both social vulnerability and community resilience, with a risk index score of 97.4 out of 100. According to the NRI, there have been 0 wildfire events during the 2021 data set with 0.59% annual chance per year.

Table 4-136 Amador County Planning Area – Wildfire Vulnerability Ratings from FEMA NRI

NRI Hazard	Hazard Risk Index Rating*	Expected Annual Loss Values (total)**	Exposure Value (total)***	Historic Loss Ratio Rating
Wildfire	97.4	$7,534,156	$209,068,882,831	Relatively Moderate

Source: FEMA NRI Report, retrieved 4/1/2025.

*Hazard Risk Index is calculated using data for only a single hazard type, and reflect a communities expected annual loss value, community risk factors, and the adjustment factor used to calculate the risk value.

**Expected annual loss represents the average economic loss in dollars resulting from natural hazards each year.

***Exposure is a natural hazard consequence factor that is the representative value of buildings, populations, or agriculture potentially exposed to a natural hazard occurrence.

Additional information on the FEMA NRI can be found in Section 4.2 and Appendix G.

Impacts from Wildfire

Potential impacts from wildfire include loss of life and injuries; damage to structures (commercial, industrial, and residential) and other improvements, natural and cultural resources, croplands, and timber; and loss of recreational opportunities. Wildfires can cause short-term and long-term disruption to the Amador County Planning Area. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the Planning Area by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the Planning Area; smoke and air pollution from wildfires can be a severe health hazard. Smoke impacts may come from wildfires outside the Planning Area, as well as from within.

Although the physical damages and casualties arising from wildland-urban interface fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include

traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate a PSPS which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

The impacts of a fire are felt long after the fire is extinguished. In addition to the loss of property in fires, the loss in vegetation and changes in surface soils alters the environment. When supporting vegetation is burned, hillsides become destabilized and prone to erosion. The burnt surface soils are harder and absorb less water. When winter rains come, this leads to increased runoff, erosion, and landslides in hilly areas.

Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values

Wildfire smoke can also have negative effects to those who live in or near a fire burn area. Smoke and air pollution from wildfires can be a severe health hazard. Significant wildfires occurring in nearby northern California communities since the previous LHMP Update have created significant air pollution affecting area residents. Planning Area residents have been affected by wildfire smoke and poor air quality, from fires both within the County and from those much further away.

The Amador County Air District noted that wildfire smoke impacts populations for days and weeks at a time. The County has no control on what wildfires burn or for how long. Poor air quality poses a health risk to all individuals. However, children, adolescents, pregnant women, the elderly, the immunocompromised and those with pre-existing chronic diseases and lung conditions are especially vulnerable to the compounding detrimental health impacts of poor air quality events. Wildfire smoke creates and often exacerbates poor air quality situations. Of the many harmful components that exist in wildfire smoke, one of the most dangerous is particulate matter (PM), specifically fine PM (PM2.5). The microscopic particles of PM2.5 are so fine that they are inhaled deep into the lungs and cross the blood-air barrier to enter the bloodstream. Short-term exposure over hours or days can lead to increased asthma attacks, acute bronchitis, increased susceptibility to respiratory infections and can lead to an increased risk of heart attack for individuals with lung disease.

Ground-level ozone is another air pollutant of concern because it is a strong irritant that can cause constriction of the airways, forcing the respiratory system to work harder to provide oxygen. It can also cause other health problems including aggravated respiratory disease such as emphysema, bronchitis and asthma, lung damage, wheezing, chest pain, dry throat, headache, nausea, reduced resistance to infection, increased fatigue and weakened athletic performance. While ozone is typically seen at its highest levels

during the summer, wildfire plumes can increase ozone formation. With an increased number of prolonged wildfire smoke events impacting populations near and far from fire epicenters, it has become imperative to understand the health impact from acute and extended exposure to wildfire smoke.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future hazard conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for Amador County include the following:

- Climate change is likely to exacerbate future wildfire conditions and associated impacts and vulnerability of the County to wildfire.
- Future population growth should be considered, as having more or less people in a community affects the overall hazard vulnerability to the County. Population growth in Amador County is expected to slowly continue. Additional growth within the WUI and other high fire hazard severity areas of the County would place additional populations at risk to wildfire. Additional population growth would likely bring continued diversity to the County. Vulnerable population groups could face disproportionate effects from wildfire and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the County to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. Locating new development, structures and critical facilities and infrastructure within or near areas of wildfire risk may put additional development at risk. However, County building codes are in effect to reduce this risk and should be updated as necessary to continue to address future wildfire conditions. It should be noted that most of the growth in the County is occurring in areas outside the moderate or higher fire hazard severity zones. Thus, depending on the location of new development and adherence to protective building codes, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the County to this hazard.

Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements, such as building codes, are followed, and varying needs for different demographic groups with intersecting identities that reside within the County are considered can help to make for a more resilient community.

GIS Analysis

Amador County provided five future development areas which were used as the basis for the inventory of future development for the unincorporated County. These were mapped in GIS. Figure 4-130 show the locations of the future development areas and SRA/FRA FHSZs. Table 4-137 shows the details of the future development areas that are located in each SRA/FRA FHSZ. Figure 4-131 shows the locations of

the future development areas in the LRA FHSZ. As shown, all of these future development areas fall outside the LRA FHSZs, so no tabular analysis of LRA FHSZs is presented.

Figure 4-130 Unincorporated Amador County – Future Development in CAL FIRE SRA/FRA Fire Hazard Severity Zones

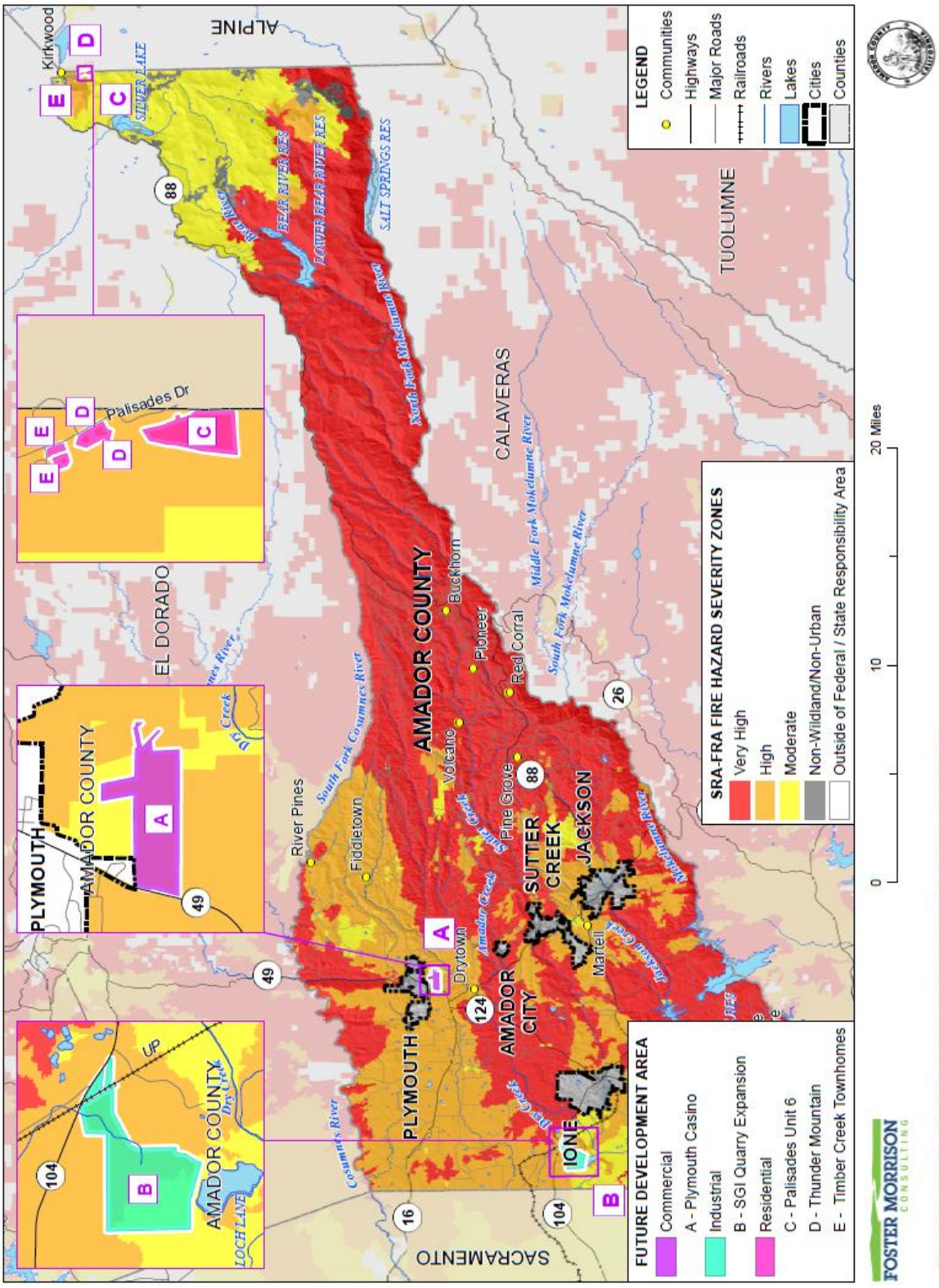
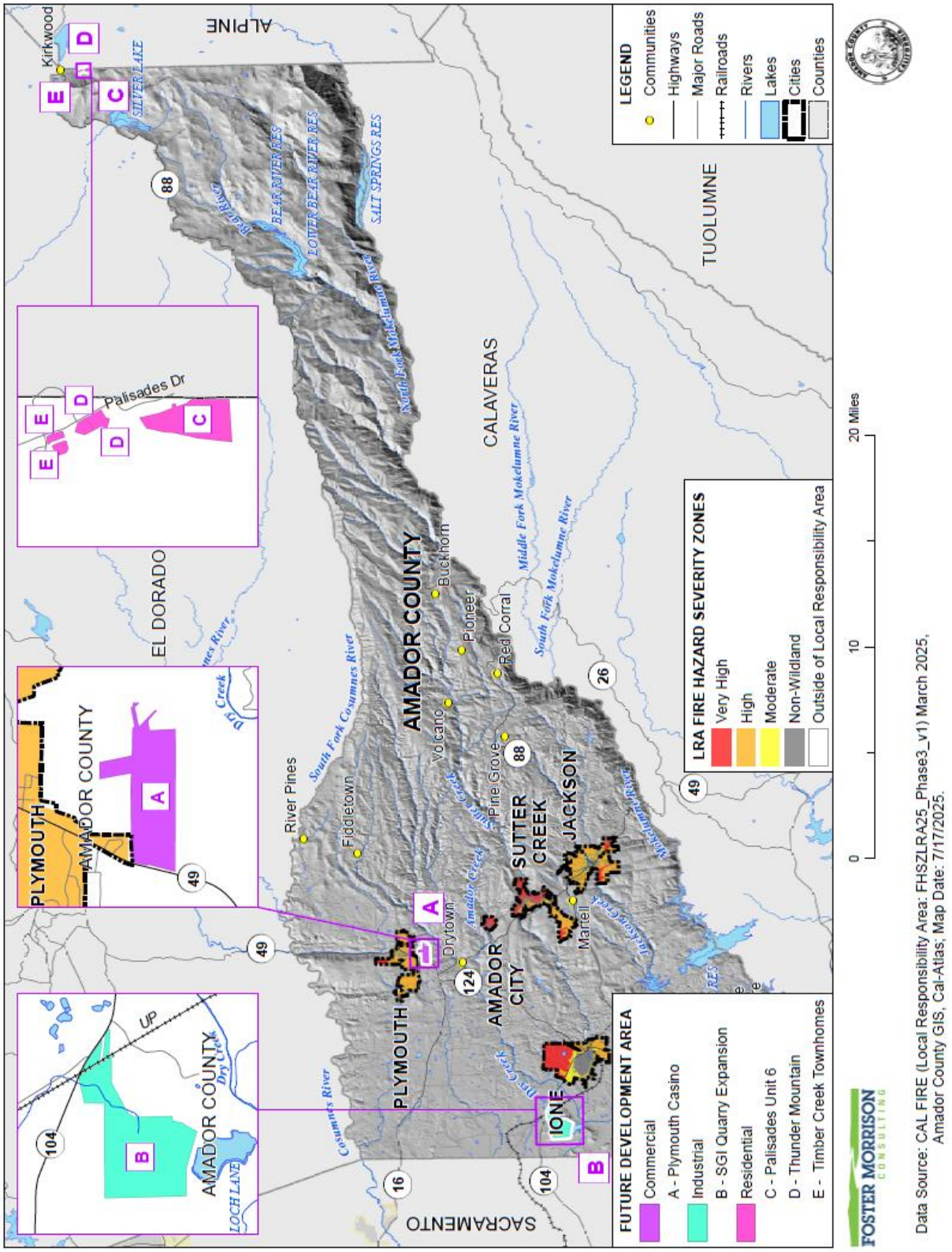


Table 4-137 Unincorporated Amador County – Future Development in SRA/FRA FHSZs with Parcel Counts and Acreages

Fire Hazard Severity Zone / Site/Map ID - Future Development	Unimproved Parcel Count	Total Unimproved Acres
High		
B - SGI Quarry Expansion	1	50
C - Palisades Unit 6	1	13
D - Thunder Mountain	2	2.5
E - Timber Creek Townhomes	2	2
High Total	**6**	**67.5**
Moderate		
A - Plymouth Casino	1	130
Moderate Total	**1**	**130**
Grand Total	**7**	**197.5**

Source: CAL FIRE, Amador County GIS

Figure 4-131 Unincorporated Amador County – Future Development in CAL FIRE LRA Fire Hazard Severity Zones



4.4 Capability Assessment

Thus far, the planning process has identified the natural hazards posing a threat to the Amador County Planning Area and described, in general, the vulnerability of the County to these risks. The next step is to assess what loss prevention mechanisms are already in place. This part of the planning process is the capability assessment. Combining the risk assessment with the capability assessment provides an overview of the County's net vulnerability to disasters, and more accurately focuses the goals, objectives, and proposed actions of this Plan.

A two-step approach is used to conduct the Capability Assessment for each participating jurisdiction to this LHMP Update. First, an inventory of common mitigation activities was made through the use of matrixes. The purpose of this effort was to identify policies and programs that were either in place, needed improvement, or could be undertaken if deemed appropriate. Second, an inventory and review of existing policies, regulations, plans, and programs was conducted to determine if they contributed to reducing hazard-related losses or if they inadvertently contributed to increasing such losses.

This section presents the County's mitigation capabilities that are applicable to the unincorporated County. These are in addition to, and supplement, the many plans, reports, and technical information reviewed and used for this LHMP Update as identified in Chapter 3 and in Chapter 4.

This assessment is divided into four sections: regulatory mitigation capabilities are discussed in Section 4.4.1; administrative and technical mitigation capabilities are discussed in Section 4.4.2; fiscal mitigation capabilities are discussed in Section 4.4.3; and mitigation education, outreach, and partnerships are discussed in Section 4.4.4.

4.4.1. Amador County's Regulatory Mitigation Capabilities

Table 4-138 lists planning and land management tools typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in unincorporated Amador County. Excerpts from applicable policies, regulations, and plans and program descriptions follow to provide more detail on existing mitigation capabilities.

Table 4-138 Amador County Regulatory Mitigation Capabilities

Plans	In Place Y/N	Does the plan address hazards? Can the plan be used to carry out mitigation actions? When was it last updated??
Capital Improvements Plan	Y	Plan is not hazard specific. 2011
Climate Change Adaptation Plan	N	
Community Wildfire Protection Plan	Y	Multiple plans exist for portions of the County. These are held by the Amador Fire Safe Council and updated when needed.
Comprehensive/Master Plan	Y	Plan addresses hazards and mitigation. Plan can be used to implement mitigation plans. 2016
Continuity of Operations Plan	N	
Economic Development Plan	Y	

Land Use Plan		Included within the County's General Plan
Local Emergency Operations Plan	Y	The County just updated it's EOP, which was finalized in 2024
Stormwater Management Plan	Y	
Transportation Plan	Y	2019
Other		
Land Use Planning and Ordinances	**Y/N**	**Is the ordinance an effective way to reduce hazard impacts? Is the ordinance adequately administered and enforced?**
Acquisition of land for open space and public recreation use	Y	
Building code	Y	Codes are enforced
Flood insurance rate maps	Y	Ordinance is effective and enforced.
Floodplain ordinance	Y	No. Needs update to reflect current standards
Natural hazard-specific ordinance (stormwater, steep slope, wildfire)	Y	Fire and other ordinances are effective and enforced.
Subdivision ordinance	Y	Ordinance is effective and enforced.
Zoning ordinance	Y	Ordinance is effective and enforced.
Other		
How can these capabilities be expanded and improved to reduce risk?		
The Floodplain Ordinance still needs to be updated, but the changes are minimal in that new construction is required to be a foot above the 100-year floodplain. We require the extra foot of building elevation as a matter of practice, but it should be noted that we issue permits for structures in the floodplain once every two or three years.		

As indicated in the tables above, Amador County has several plans and programs that guide the County's mitigation of development of hazard-prone areas. Starting with the Amador County General Plan, which is the most comprehensive of the County's plans when it comes to mitigation, some of these are described in more detail below.

Amador County General Plan (2016)

A general plan is a legal document, required by state law, that serves as a community's "constitution" for land use and development. The plan must be a comprehensive, long-term document, detailing proposals for the "physical development of the county or city, and of any land outside its boundaries which in the planning agency's judgment bears relation to its planning" (Government Code §65300 et seq.). Time horizons vary, but the typical general plan looks 10 to 20 years into the future. The law specifically requires that the general plan address seven topics or "elements." These are land use, circulation (transportation), housing, conservation, open space, noise, and safety. The plan must analyze issues of importance to the community, set forth policies in text and diagrams for conservation and development, and outline specific programs for implementing these policies.

Goals and policies related to mitigation from the General Plan include the following:

Land Use Element

Goal LU-3	Ensure the provision of effective law enforcement, fire, emergency medical services, and animal control throughout the county.
Policy LU-3.2	Coordinate with fire districts to maintain and improve fire service levels in the county.
Policy LU-3.3	Increase community awareness regarding public safety, fire, and emergency response issues.

Goal LU-4	Ensure adequate wastewater treatment, storage, and disposal capacity exists to serve the county's current and future demand.
Policy LU-4.2:	Consider infrastructure availability and expansion in the evaluation of individual projects.
Policy LU-4.3	Support efforts by water purveyors to educate the public on how to reduce water use, and utilize reclaimed water.
Policy LU-4.4	Encourage countywide regional coordination and organizational structures to fully implement maximum recycled water reuse opportunities throughout the county
Policy LU-4.5:	Encourage and promote water conservation and reuse to reduce new effluent disposal needs.

Goal LU-6	Ensure that adequate water supply, wastewater disposal, and public services are available prior to development.
Policy LU-6.1	Ensure that new development is able to meet water supply, wastewater disposal, and public service standards.

Goal LU-12	Reduce fire risks to existing and future structures.
Policy LU-12.1	Ensure that appropriate levels of emergency services, including fire protection, can be demonstrated for new development.
Policy LU-12.2	Ensure that new roadways meet County standards for firefighting access. These standards include minimum width, surface, grade, radius, turnaround, turnout, and bridge standards, as well as limitations on one-way roads, dead-end roads, driveways, and gate entrances.
Policy LU-12.3	Continue to ensure that the County's development code addresses evacuation and emergency vehicle access, water supplies and fire flow, fuel modification for defensible space, and home addressing and signing.
Policy LU-12.4	Ensure that new development or redevelopment in the Wildland-Urban Interface meets building and development standards to ensure adequate defensible space.

Conservation Element

Goal C-1	Ensure that all future development permitted in the county can be provided adequate amounts of water.
Policy C-1.1	Coordinate with the county's water suppliers to ensure that water is available to serve both current and planned future residential, commercial, industrial, and agricultural needs. Include upland areas in future water management plans.
Policy C-1.2	Guide future development to areas of the county where adequate water supplies can be ensured.

Goal C-1	Ensure that all future development permitted in the county can be provided adequate amounts of water.
Policy C-1.3	Limit reliance on groundwater wells as sources for community water systems. Where possible, encourage connection of developments to existing water supply systems.
Policy C-1.4	Encourage new development, renovation, landscape, and agricultural projects to include water conservation measures, including use of graywater, reclaimed, or recycled water for irrigation, water-

Goal C-2	Maintain and improve water supply planning and infrastructure.
Policy C-2.1:	Encourage integrated management of surface water and groundwater resources, wastewater, stormwater treatment and use, and the development of reclaimed water.
Policy C-2.2:	Encourage conjunctive use of groundwater and surface water by water agencies to improve water supply reliability.
Policy C-2.3	Support the county's water suppliers, including public agencies and private entities within Amador County, in their efforts to protect water rights and water supply contracts.
Policy C-2.4	Pursue management strategies that develop upstream/ downstream interregional conjunctive use/water transfer programs to meet future water needs in Amador County.
Policy C-2.5	Support efforts by water and wastewater agencies to respond to state mandates addressing the future challenges posed by climate change.
Policy C-2.6	Reduce erosion and sediment loads which might limit the lifespan of existing water storage facilities.
Policy C-2.7	Promote development patterns and practices which permit the continued use and future development of water storage and power generation facilities on the county's streams and rivers.
Policy C-2.8	Federal, state, and/or local designations of surface waters in or adjacent to the County (e.g., Federal Wild and Scenic River, National Recreation Area) are considered incompatible with the long-term water needs of Amador County.

Goal C-10	Reduce GHG emissions associated with automobile travel, electrical power generation and energy use.
Policy C-10.1	Evaluate the potential effects of climate change on the county's human and natural systems and prepare strategies that allow the County to appropriately respond and adapt.
Policy C-10.2	Develop and adopt a comprehensive strategy to reduce GHGs within Amador County by at least 15 percent from current levels by 2020.
Policy C-10.3	Guide new development to areas where pedestrian and bicycle/NEV access to existing activity centers is possible, in order to reduce the need for automobile travel and VMT.
Policy C-10.4	Work with service providers to ensure that transit offerings in the county are stable or expanding, and that transit is tailored to meet residents' needs.
Policy C-10.5	Require new development projects to incorporate building placement and design features to increase energy efficiency in new structures.
Policy C-10.6	Support green building through incentives for Leadership in Energy and Environmental Design (LEED) certification of new commercial, industrial, public, and multi-family residential buildings. Promote incentives for compliance with this standard as a way to increase the energy efficiency of new structures. Promote increased energy efficiency and green building practices through the County's use of these practices.
Policy C-10.7	Support parcel-scale energy generation, including addition of solar panels for residential structures and cogeneration for larger commercial or industrial uses.

Goal C-10	Reduce GHG emissions associated with automobile travel, electrical power generation and energy use.
Policy C-10.8	Expand recycling and waste minimization efforts, including recycling of construction and demolition materials.

Safety Element

Goal S-1	Prevent loss of life or property from flooding.
Policy S-1.1	Direct future development (as defined in "Floodplain Management Regulations" set forth in the Amador County Code) to areas outside the floodway portion of the 100-year floodplain.
Policy S-1.2	Limit development in other areas prone to flooding, including the floodway fringe, other portions of floodplains and inundation areas. Require structures in these areas to incorporate floodproofing measures, including elevation above the 100-year floodplain profile.
Policy S-1.3	Reduce urban runoff and maintain the carrying capacity of floodplains or flood channels. Require provision of on-site retention and detention basins in new development applications as needed to reduce downstream flooding hazards.
Policy S-1.4	Designate agriculture, passive parks, open space, and other low intensity uses within floodplain areas.
Policy S-1.5	Provide for construction of dams and water retention facilities on agricultural lands to support agricultural land uses, consistent with state and federal law.

Goal S-2	Reduce fire risks to current and future structures.
Policy S-2.1	Consistent with state regulations and local code requirements, require new buildings to be constructed to provide fire-defensible spaces, separated from property lines and other buildings on the same or adjacent properties by adequate building setbacks clear of brush and fuel. Require new buildings in areas of moderate to high fire risk to be constructed using building materials and designs that increase fire resistance.
Policy S-2.2	Guide new development to areas where adequate fire protection, roads, and water service are available to support fire response.
Policy S-2.3	Incorporate fire safety site planning techniques within new development applications in high- or very-high fire risk areas. Encourage building envelope or cluster development techniques to increase defensible areas.
Policy S-2.4	Work with fire districts or other agencies and property owners to coordinate efforts to prevent wildfires and grassfires including consolidation of fuel buildup abatement efforts, firefighting equipment access, and water service provision.
Policy S-2.5	Work with fire districts and other agencies to educate the public regarding fire risks and periods of elevated or extreme risk due to drought or other factors.

Goal S-3	Maintain or improve fire response times.
Policy S-3.1	Support efforts by fire districts to obtain adequate funding to provide fire protection at desired levels. Implement impact fees if needed to provide adequate fire service.
Policy S-3.2	Encourage cooperation and regional agreements among fire districts and state and federal fire agencies

Goal S-4	Protect people and property from seismic hazards.
Policy S-4.1	Enforce site-specific seismic design category requirements per the California Building Code (CBC) to minimize earthquake damage.
Policy S-4.2	Require minimum setbacks for habitable construction along streams between the stream bank and structure, based upon the susceptibility of the bank to seismic shaking-induced lurching.
Policy S-4.3	Discourage new construction of structures or improvements in or near a seismic risk area or geologic hazard area unless these projects meet design standards to minimize or eliminate seismic risk.

Goal S-5	Protect people and property from landslides, mudslides, and avalanches.
Policy S-5.1	Use the development review process to lessen the potential for erosion and landslides. Restrict site grading which steepens unstable slopes.
Policy S-5.2	Limit development in areas with high landslide, mudslide, or avalanche susceptibility.

Goal S-7	Respond appropriately and efficiently to natural or human-caused emergencies.
Policy S-7.1	Maintain a disaster response plan to coordinate response actions.
Policy S-7.2	Continue to coordinate with other local public safety and law enforcement agencies to ensure effective emergency response.
Policy S-7.3	Work with other agencies to designate evacuation routes for various natural or human-caused emergencies.
Policy S-7.4	Maintain the operational integrity of essential public

Other Amador County Plans/Studies/Programs

Amador County Emergency Operations Plan (2024)

The Amador County Office of Emergency Services coordinates planning, preparedness, response, and recovery efforts for disasters in unincorporated Amador County. The Amador County Emergency Operations Plan addresses the County's planned response to extraordinary emergency situations associated with natural disasters, technological incidents, and national security emergencies in or affecting Amador County.

Amador County Evacuation Procedures/Plan

The Amador County Sheriff's Office of Emergency Services would like the public to be prepared for evacuations and to be familiar with the evacuation terminology used by our Office. There is also a form that is designed to be distributed when time allows in an area to be evacuated. The front of the form will tell you what type of an emergency or disaster is occurring and what level of evacuation order is being issued. The back of the form gives instructions on evacuation and sheltering in place.

An Emergency Evacuation means that citizens MUST leave the area IMMEDIATELY; their life is in danger. An Emergency Evacuation notice is issued when a hazard is moving towards an area and there is an immediate threat to life and property.

A Voluntary Evacuation means that the area is likely going to be impacted and it is encouraged that those residents willing and able to leave the area do so. The medically fragile or those with livestock or large pets may want to begin making transportation arrangements. Under this evacuation order citizens do not have to leave the area. It is, however, recommended that citizens begin making arrangements to leave.

Sheltering in your home or place of business means that citizens should NOT leave the safety of the building they are currently in to leave the area. In a number of instances residents are safer staying indoors, closing the windows, shutting off the heating and air systems and staying inside the building than they would be traveling through the disaster area.

Auxiliary Communications Service Plan

The County of Amador created this Auxiliary Communication Service plan as an emergency communications unit, designed to support emergency tactical, administrative, and logistical communications. Created in 2007, the program serves many functions such as skilled personnel, resources essential to public safety communications, and doesn't require the declaration of an emergency to be utilized.

Amador County Warming and Cooling Centers Operations Guide (2024)

The purpose of the Operations Guide is to identify actions to be taken during extreme weather events in Amador County by the Amador County Sheriff's Office of Emergency Services (OES) and the Amador County Department of Social Services. Through pre-planning and resource sharing, the goal is to mitigate and minimize extreme weather health impacts within the county. This guide should also be considered during prolonged utility outages that may result during extreme weather emergencies and the potential health-related issues that may arise. This guide is maintained by the Amador County Sheriff's OES.

In addition to the use of the Centers addressed in this guide, the County may consider opening local buildings and public facilities or extending hours of operation, such as community centers, senior centers, and libraries, to provide refuge from the weather. This guide does not address the operation of these sites, nor would they be operated by Social Services staff.

Sutter Amador Hospital Plans

Though not owned or operated by Amador County, due to its importance during hazard events, capabilities of the Sutter Amador Hospital are discussed here. The Sutter Amador Hospital has the following plans, policies, and capabilities for hazard preparedness and response:

- Code Orange Hazardous Response
- Code Red Fire Response
- Earthquake Response Plan
- Emergency Management Communication Plan

- Emergency Operations Plan
- Flooding Plan
- Hazard Communication Program
- Hazardous Materials Resource Team
- Hospital Surge Response Policy
- Mass Notification Policy
- Multi-Mass Casualty Incident Plan
- Pandemic Influenzas Response Plan

Amador County Long Term Care Facility Evacuation Plan (2008)

This plan is intended for all Long-Term Care Facilities in Amador County, including facilities which are licensed by the State of California and operating under Title 22 CCR. The objective of this plan is to ensure the orderly and timely movement of patients/residents from single or multiple facilities which need to be evacuated to a safe location.

Amador County Hazardous Materials Area Plan (2014)

Amador County is home to many businesses that manufacture, store, sell, use, and dispose of hazardous materials. Additionally, large volumes of hazardous materials are transported through the county on various transportation corridors such as highways and railway. It is essential that a response plan be developed and maintained to protect the public, environment and property from an accidental release involving chemicals. This plan is known as the Amador County Hazardous Materials Area Plan, also referred to as the Area Plan. It is an Annex to the County's Emergency Operations Plan.

This Area Plan fulfills the Certified Unified Program Agency (CUPA) regulatory program requirements per Health and Safety Code 25503(c). Copies of the Area Plan are on file in the Emergency Operations Center (Cal EOC). The Area Plan can be used as a resource document in conjunction with the Amador County Emergency Operations Plan, and other local and state plans.

The Area Plan describes the County's pre-incident planning and preparedness for hazardous materials releases. It clarifies the roles and responsibilities of federal, state, and local agencies during a hazardous materials incident. It describes the County's hazardous materials incident response program, training, communications, and post-incident recovery procedures.

Amador County & Calaveras County Regional Watershed Plan (2007)

In 2006, in partnership with local governments and organizations in Amador County and Calaveras County, the LGC received additional funding to conduct this watershed planning project with communities in the two counties. The goal of the watershed planning process has been to support integration of local planning, stormwater management, watershed planning efforts. The process has also guided development of this regional watershed plan, which provides regionally appropriate solutions to challenges at the nexus of water and land use planning.

Strategic Fire Plan Amador-El Dorado Unit (2024)

The goal of the Amador – El Dorado Unit of CAL FIRE is to reduce the loss of life, property, watershed values, and other assets at risk from wildfire through a focused pre-fire management program and increased initial attack success. The roadmap to accomplish this involves collaboration between stakeholders and communities who have different complexities as it relates to project implementation and priorities regarding the threat of a wildland fire. The purpose of this Strategic Fire Plan is to provide adequate direction to departmental staff and communities within the Administrative Unit to direct resources and personnel commitments towards the implementation of this Strategic Fire Plan. The Amador - El Dorado Unit Pre-Fire Management Plan has been prepared with the following objectives in priority order.

- Support project work and planning efforts that encourage the development of safe ingress and egress routes for emergency incidents.
- Continue to provide operational training that will support safe and successful suppression operations.
- Utilize CAL FIRE and community resources to mitigate large and damaging wildfires with defensible fuel zone/fuels reduction projects at critical operational locations.
- Continue to support the implementation of fire safe clearance around structures.
- Support implementation of the 2008 WUI Building standards through cooperation with local government planning departments.
- Conduct incident analysis to evaluate Unit success in achieving the 95% threshold of keeping fires less than 10 acres in size.
- Educate the community on their role in the wildlands and support Fire Safe Council activities.
- Utilize prevention operations to reduce ignitions within the Unit.
- Nurture and build relationships with local public and private industries to develop cooperative project plans.
- Continually reassess local mitigation projects and update this Fire Plan

Amador County Climate Change and Health Profile Report (2017)

The Climate Change and Health Profile Report seeks to provide a county-level summary of information on current and projected risks from climate change and potential health impacts. This report represents a synthesis of information on climate change and health for California communities based on recently published reports of state agencies and other public data.

The content of this report was guided by a cooperative agreement between CDPH and the CDC Climate-Ready States and Cities Initiative's program Building Resilience Against Climate Effects. The goals of BRACE are to assist state health departments to build capacity for climate and health adaptation planning. This includes using the best available climate science to project likely climate impacts, identifying climate-related health risks and populations vulnerable to these impacts, assessing the added burden of disease and injury that climate change may cause, identifying appropriate interventions, planning more resilient communities, and evaluating to improve the planning effort. Communities with economic, environmental, and social disadvantages are likely to bear disproportionate health impacts of climate change.

This Climate Change and Health Profile Report is intended to inform, empower, and nurture collaboration that seeks to protect and enhance the health and well-being of all California residents. This report is part of a suite of tools that is being developed by the California Department of Public Health to support local,

regional, and statewide efforts of the public health sector to build healthy, equitable, resilient, and adaptive communities ready to meet the challenges of climate change. Along with a county-level climate change and health vulnerability assessment and state guidance documents, such as Preparing California for Extreme Heat: Guidance and Recommendations, the profile provides a knowledge base for taking informed action to address climate change.

Mokelumne/Amador/Calaveras (Integrated Regional Water Management Plan (2018)

In November 2006, the Mokelumne/Amador/Calaveras (MAC) regional partners completed the MAC Integrated Regional Water Management Plan (IRWMP or Plan). The 2006 version of the MAC IRWMP (MAC Plan) was based on guidelines and standards included in Proposition 50 as interpreted by the California Department of Water Resources (DWR) and the State Water Resources Control Board (SWRCB). In September 2008, Governor Schwarzenegger signed SB X2 1, which contains appropriations for the IRWM program from Propositions 84 and 1E (Prop 84/1E) along with criteria that DWR must apply in updating statewide standards for IRWMPs. These revised State standards for IRWMPs were released in August of 2010 and provided the guidelines by which the MAC Plan Update will be prepared. The MAC Plan Update was developed to comply with the 2012 Guidelines that were finalized by DWR in December 2012.

The 2008 MAC IRWMP update began with a reconstituted stakeholder committee (called the Regional Participants Committee or RPC), the development of Governing Procedures to guide the RPC's work, and the preparation of a Community Outreach Plan. The 2008 Update was conducted under a governance structure different than that developed for the original plan development. Specifically, the Upper Mokelumne River Watershed Authority (UMRWA), a regional water management group as defined by the California Water Code (CWC), assumed lead agency responsibility for the preparation and adoption of the updated IRWMP and established two subcommittees to oversee the document update. A Regional Participants Committee (or RPC) was formed to directly oversee the Plan update. The Board Advisory Committee was also established (replacing the earlier Steering Committee) with Board representatives from three UMRWA member agencies. This committee was charged with reconciling conflicts that may occur at the RPC, providing guidance to the Executive Officer and consultants, and ultimately recommending the updated plan for adoption by the UMRWA governing board. In addition to the updating of selected Plan sections in 2008, UMRWA also completed the Region Acceptance Process (RAP), as required by DWR, in order to become an approved IRWM region. Furthermore, because IRWM Plans are not required to follow the exact outline of the IRWM Plan Standards, the 2013 Plan Update applied a revised organization that provides a more logical progression of topics and information, hopefully making the Plan a more useful tool for the region's water managers.

This 2018 MAC Plan Update was initiated to capture updated regional information since the 2013 MAC Plan was developed and respond to updated state requirements. All required Plan elements as identified in the 2016 IRWM Plan Standards are met by this MAC Plan 2018 Update, as summarized in the following table.

Amador and Calaveras Counties Needs Assessment for Extreme Weather and Natural Disaster Prevention and Response Strategies (2022)

ACTC has developed an Extreme Weather and Natural Disaster Prevention and Response Strategies Needs Assessment Program with funding provided by Caltrans's Adaptation Planning Grant program. The Assessment Program is developing response strategies to mitigate potential natural disaster risks (primarily wildfire) within Amador and Calaveras counties.

Landforms, land cover types, and an uncertain but changing future climate put large portions of the Planning Area at risk of catastrophic wildfire and localized flooding damage. Results from predictive modeling completed by CAL FIRE's Fire and Resource Assessment Program (FRAP) show that expansive regions within Amador and Calaveras counties are located within high and very high Fire Hazard Severity Zones (FHSZ). Utility transmission corridors located within foothill elevations also contribute to elevated wildfire risk. Hundreds of miles of Amador County and Calaveras County roads are located within high and very high FHSZs.

A Community Vulnerability Model has been developed by ACTC to identify the relative risks to Amador County communities in preparation for and response to wildfire. This report evaluates important evacuation routes serving several high-risk communities and identifies potential ingress/egress impairments that may impact use of these routes during emergencies. These impairments include unmaintained defensible space, narrow roadway widths, and poor pavement condition This report also identifies additional information needed to further characterize and assess the potential performance of evacuation routes. These include locating, describing, and quantifying unmaintained defensible space (including encroaching vegetation) along roadsides, documenting roadway and shoulder widths and roadway turnouts, identifying and describing roadside drainage ditches, and locating and describing drainage under-crossings (culverts, bridges). Of these, the most critical need is the maintenance of defensible space along roadway evacuation routes.

Amador County Regional Transportation Plan (2024)

State law requires that the RTP be updated and submitted to the California Transportation Commission (CTC) every five years. Though updates are required every 5 years, in 2018, the ACTC elected to adopt a 4-year schedule to better coordinate with the 8-year Housing Element cycle required of local jurisdictions. The purpose of the RTP is to identify the Region’s short-term and long-range transportation needs and to establish policies, programs, and projects designed to meet those needs. Regional transportation improvement projects that are included in the RTP and are prioritized for funding through the Regional Transportation Improvement Program (RTIP) are then submitted to the CTC for programming every two years as part of the State Transportation Improvement Program (STIP). Projects that are proposed for funding through other sources, such as state or federal competitive grant programs are submitted according to the requirements of individual programs. In either case, improvement projects proposed for funding must typically be identified through either a local or regional transportation planning process, such as the RTP.

Community Wildfire Protection Plans

Many Community Wildfire Protection Plans have been put forward for various areas of the County. These are tracked and housed by the Amador Fire Safe Council. Existing CWPPs include:

- Amador County 2004 CWPP
- Pioneer/Volcano 2013 CWPP
- Greater Pine Grove 2013 CWPP
- High Country 2016 CWPP

Amador County Ordinances

The Amador County General Plan provides policy direction for land use, development, open space protection, and environmental quality; however, this policy direction must be carried out through numerous ordinances, programs, and agreements. The following ordinances are among the most important tools for implementing the General Plan and/or are critical to the mitigation of hazards identified in this plan.

Disaster Council (Amador County Code Title 2, Chapter 2.64)

Chapter 2.64 of the Amador County Code provides for the preparation and execution of plans for the protection of persons and property within Amador County in the event of an emergency; to ensure the continuity of local government; to guarantee the direction of the emergency management organization; and to coordinate the emergency functions of this county with all other public agencies, corporations and affected private persons. The Sheriff is designated as the Director of Emergency Services.

Chapter 2.64 further creates the Disaster Council consisting of the following: The Sheriff/Director of Emergency Services or their designee who shall be Chairman; the Chairman of the Board of Supervisors or their designee who shall be Vice-Chairman; one representative from each city appointed by City Councils; one Fire representative appointed by the Fire Chief's Association; one Law representative appointed by the Chief of Police; one representative from the School District; one representative of each of the Special Districts/Tribes; Director/Agency heads of county departments having disaster responsibility or their designee; such representative of other organizations, either civic, business, labor, veterans, professional or other organizations having an official organization having disaster responsibility; and, the Emergency Services Coordinator. The Disaster Council is empowered to develop and recommend for adoption by the Board of Supervisors emergency operations plans or practices and such policies, ordinances, or resolutions necessary to implement such plans and practices. The Disaster Council meets on a quarterly basis.

Mitigations for New Development Projects in the Rock Creek Drainage Basin (Amador County Code Title 7, Chapter 7.88)

Whenever a development project within the Rock Creek drainage basin is approved by any agency, the public works agency shall impose on said development project mitigation measures sufficient to mitigate the development project's potential to flood Amador Plaza in the event of a one-hundred-year flood event. (Ord. 1567(part), 2003).

Burning Permit and Regulations (Amador County Code Title 7, Chapter 7.32)

It is unlawful for any person to set fire to or burn any brush, logs, stumps, fallen timber, fallows, slash or grass, brush, or forest covered land or any other inflammable material; and it is unlawful for any person to burn inflammable material in any incinerator, barbeque pit or outdoor cooking stove or other such device within any portion of the unincorporated area of the county between May 1st and the date the director of the department of forestry declares, by proclamation, that the hazardous fire conditions have abated for that year, or at any other time during any year when the director of the department of forestry has declared, by proclamation, that unusual fire hazard conditions exist in the area, unless such person first obtains a written permit to do so from the constituted fire control authority within the area wherein the fire is to be set, which permit shall be issued in writing and shall state the times at which and the terms and conditions subject to which said fire shall be permitted or said burning shall be done. (Ord. 1049 §2, 1985).

Every person owning, leasing, controlling or operating any cabin, house, hotel, apiary, or other building or structure in the county, and every person leasing or controlling any such land shall at all times do all the following: maintain upon said land, around or adjacent to said cabin, house, hotel, apiary or other building or structure for a distance of not less than fifteen feet from the exterior walls or surfaces thereof; or to his or its property line, whichever is the lesser distance; provided, however, that this section shall not apply to trees, except where dead, or where the foliage of said trees shall be within ten feet of a chimney, nor shall it apply to evergreen vegetation where growing and preserved for decorative effect. (Ord. 1049 §5, 1984).

Weeds and Shrubs (Amador County Code Title 7, Chapter 7.28)

It is unlawful for any person or persons owning or possessing land in the county to permit the Scotch or Canada thistle to mature and disseminate its seed on land so owned or possessed by such person. The agricultural commissioner of Amador County, whenever he deems it necessary, may enter upon and make an inspection of any area of land located in the unincorporated territory of the county for the purpose of detecting the presence thereon of broom, and if any of said broom is found to be growing upon said area or any part of the same, he may notify in writing the record owner or person in charge or in possession of said premises of the presence and approximate location of such broom and require such person to eradicate and destroy the same, to the satisfaction of said agricultural commissioner, within a period of thirty days after such notice, or within the further extension thereof in writing signed by said commissioner, or within said period of time or such extension thereof to give his consent in writing to said agricultural commissioner authorizing said commissioner or his duly authorized representative to enter upon said premises for the purpose of removing or treating such broom at public expense.

Well Drilling Permits and Standards (Chapter 14.06)

Where the well is a water supply to serve a new single-family dwelling, no storage shall be required if and when rated well yield, based on a minimum thirty-minute air lift test, is five gallons per minute or greater. If the rated yield is from one-half to less than five gallons per minute, a minimum of two thousand gallons storage shall be provided in addition to any storage required by applicable fire regulation requirements. If the rated yield is less than one-half gallon per minute, the well shall not be considered adequate to support a single-family dwelling unless a proposal by a licensed well drilling contractor, licensed pump contractor or registered professional engineer has been submitted for review and approved by the department

proposing storage or other design features that must be implemented as a condition of well permit final approval.

Where the well is a water supply to serve two, three or four dwellings, the minimum required yield shall be ten, fifteen or twenty gpm, respectively. If the rated yield does not meet this standard, a proposal by a registered professional engineer shall be submitted for review and approval by the department proposing storage or other design features that must be implemented as a condition of well permit final approval.

Where the well is a water supply to serve nonresidential or mixed uses, the applicant shall retain a registered professional engineer to submit a proposal for review and approval by the department describing water demand and proposing storage or other design features that must be implemented as a condition of well permit final approval.

This section shall not apply to wells intended solely for nondomestic use. (Ord. 1730 §2(part), 2013).

BUILDINGS AND CONSTRUCTION - (Amador County Code Title 15)

15.04 Adoption of Uniform Building and Related Codes.

Except as hereinafter provided, the following building codes are adopted by reference as the rules and regulations governing the construction, alteration, moving, demolition, repair, use, change of use and occupancy of any building or structure within the county (except work located primarily in a public way, public utility towers and poles, mechanical equipment not specifically regulated in said codes, and hydraulic flood control structures):

- California Administrative Code, 2019 Edition, as adopted and amended by the California Building Standards Commission in the California Building Standards Code, Title 24, Part 1, of the California Code of Regulations.
- California Building Standards Code, 2019 Edition, as published by the International Code Council and amended by the California Building Standards Commission, the State Department of Housing and Community Development, the Division of State Architect, the Office of the State Fire Marshal, the Office of Statewide Health Planning and Development, the California Energy Commission, and the Building Standards Commission, Title 24, Part 2, Volumes 1 and 2, of the California Code of Regulations, together with the following appendices: Appendix A (Employee Qualifications), Appendix B (Board of Appeals), Appendix C (Group U-Agricultural Buildings), Appendix D (Fire Districts), Appendix F (Rodent Proofing), Appendix G (Flood-Resistant Construction), Appendix H (Signs), Appendix I (Patio Covers), Appendix J (Grading), Appendix K (Group R-3 and R3.1 Occupancies Protected by the Facilities of the Central Valley Flood Protection Program), and Appendix L (Earthquake Recording Instrumentation).
- California Residential Code, 2019 Edition, as adopted and amended by the California Building Standards Commission in the California Building Standards Code, Title 24, Part 2.5, of the California Code of Regulations together with the following appendices: Appendix A (Sizing and Capacities of Gas Piping), Appendix B (Sizing of Venting Systems Serving Appliances Equipped with Draft Hoods, Category I Appliances, and Appliances Listed for use with Type B Vents), Appendix C (Exit Terminals of Mechanical Draft and Direct-Vent Venting Systems), Appendix D (Recommended Procedure for Safety Inspection of an Existing Appliance Installation), Appendix E (Manufactured Housing Used as Dwellings), Appendix F (Passive Radon Gas Controls), Appendix G (Piping Standards for Various Applications), Appendix H (Patio Covers), Appendix J (Existing Buildings and Structures), Appendix

K (Sound Transmission), Appendix M (Home Day Care R-3 Occupancy), Appendix N (Venting Methods), Appendix O (Automatic Vehicular Gates), Appendix P (Sizing of Water Piping Systems, Appendix R (Light Straw-Clay Construction), Appendix S (Straw Bale Construction), Appendix T (Recommended Procedure for Worst-Case Testing of Atmospheric Venting Systems Under N1102.4 or N1105 Conditions ≤ 5ACH50, Appendix U (Solar-Ready Provisions--Detached One- and Two-Family Dwellings, Multiple Single-Family Dwellings (Townhouses)), Appendix V (Swimming Pool Safety Act), Appendix W (Areas Protected by the Facilities of the Central Valley Flood Protection Plan).

- California Electrical Code, 2019 Edition, based on the 2017 Edition National Electric Code, as published by the National Fire Protection Association, and as adopted and amended by the California Building Standards Commission in Title 24, Part 3, of the California Code of Regulations.
- California Mechanical Code, 2019 Edition, based on the 2018 Uniform Mechanical Code as published by the International Association of Plumbing and Mechanical Officials, and as adopted and amended by the California Building Standards Commission in Title 24, Part 4, of the California Code of Regulations.
- California Plumbing Code, 2019 Edition, based on the 2018 Uniform Plumbing Code as published by the International Association of Plumbing and Mechanical Officials, and as adopted and amended by the California Building Standards Commission in Title 24, Part 5, of the California Code of Regulations.
- California Energy Code, 2019 Edition, as published by the International Code Council (ICC) and as adopted and amended by the California Building Standards Commission in Title 24, Part 6, of the California Code of Regulations.
- California Historical Building Code, 2019 Edition, as published by the International Code Council (ICC) and as adopted and amended by the California Building Standards Commission in Title 24, Part 8, of the California Code of Regulations.
- California Fire Code, 2019 Edition, as published by the International Code Council (ICC) and as adopted and amended by the California Building Standards Commission in Title 24, Part 9, of the California Code of Regulations.
- California Existing Building Code, 2019 Edition, as published by the International Code Council (ICC) and as adopted and amended by the California Building Standards Commission in Title 24, Part 10, of the California Code of Regulations.
- California Green Building Standards Code, 2019 Edition, as published by the International Code Council (ICC) and as adopted and amended by the California Building Standards Commission in Title 24, Part 11, of the California Code of Regulations.
- California Referenced Standards Code, 2019 Edition, as published by the International Code Council (ICC) and as adopted and amended by the California Building Standards Commission in Title 24, Part 12, of the California Code of Regulations.
- International Property Maintenance Code, 2018 Edition (2018 is the most current edition), as published by the International Code Council (ICC). (Ord. 1791 §2(part), 2019).

Floodplain Management Regulations (Amador County Title 15, Chapter 15.16)

15.16.030 Statement of purpose.

It is the purpose of this chapter to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:

- Protect human life and health;
- Minimize expenditure of public money for costly flood-control projects;

- Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- Minimize prolonged business interruptions;
- Minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in areas of special flood hazard;
- Help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future blighted areas caused by flood damage;
- Ensure that potential buyers are notified that property is in an area of special flood hazard; and
- Ensure that those who occupy the areas of special flood hazard assume responsibility for their actions. (Ord. 1503(part), 2000).

15.16.040 Methods of reducing flood losses.

In order to accomplish its purposes, this chapter includes methods and provisions for:

- Restricting or prohibiting uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or flood heights or velocities;
- Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
- Controlling the alteration of natural floodplains, stream channels, and natural protective barriers, which help accommodate or channel floodwaters;
- Controlling filling, grading, dredging and other development which may increase flood damage; and
- Preventing or regulating the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards in other areas. (Ord. 1503(part), 2000).

Fire and Life Safety Regulations (Amador County Title 15, Chapter 15.30)

15.30.440 Fire management plans.

A fire management plan may be required for any project if the project will have a significant effect on the provisions of fire protection services or when such a plan is necessary to achieve the same practical effect as the requirements of this chapter.

A fire management plan shall address the following:

- Impact on the pertinent fire protection agency's ability to provide service;
- Availability of fire protection water to the site;
- Ingress/egress and circulation, ability for vehicles to access two-lane roadways;
- Fire hazards existing within the project, including a fuel modification plan prepared by a registered professional forester when deemed necessary by the director;
- Requirements of this chapter that cannot be met due to project design or other constraints;
- Fire protection measures that are consistent with the provisions of this chapter or recognized fire protection standards; and
- Provisions for annual maintenance, which shall be included in development plans and road maintenance agreements, or as a condition of the permit of map approval. (Ord. 1778 §2 (part), 2018).

15.30.400 Setback of structures for defensible space.

All parcels one acre and larger shall provide a minimum thirty-foot setback for buildings and accessory buildings from all property lines and/or the center of a road. In order to demonstrate the same overall practical effect, a request for deviation must be accompanied by an easement or similar documentation of an irrevocable right to access the adjoining property to maintain a firebreak by removing and clearing away all flammable vegetation and other combustible growth within thirty feet of the building**.**

For parcels less than one acre, provide for the same practical effect. (Ord. 1799 §5, 2020; Ord. 1778 §2 (part), 2018).

15.30.430 Maintenance of defensible space.

The intent of this regulation is to provide guidance for implementation of Public Resources Code Section 4291(a) and (b), and minimize the spread of fire within a one-hundred-foot zone around a building or structure.

- A person that owns, leases, controls, operates, or maintains a building or structure in, upon, or adjoining any mountainous area, forest-covered lands, brush-covered lands, grass-covered lands, or any land that is covered with flammable material, and is within state responsibility area, shall do the following:
  - ✓ Within thirty feet from each building or structure, maintain a firebreak by removing and clearing away all flammable vegetation and other combustible growth pursuant to Public Resources Code Section 4291(a). Single specimens of trees or other vegetation may be retained, provided they are well spaced, well pruned, and create a condition that avoids spread of fire to other vegetation or to a building or structure.
  - ✓ Within the thirty-foot to one-hundred-foot zone (reduced fuel zone) from each building or structure (or to the property line, whichever is nearer to the structure), provide a fuel break by disrupting the vertical and/or horizontal continuity of flammable and combustible vegetation with the goal of reducing fire intensity, inhibiting fire in the crowns of trees, reducing the rate of fire spread, and providing a safer environment for fire fighters to suppress wildfire pursuant to Public Resources Code Section 4291(b).
- Any vegetative fuels identified as a fire hazard by the fire inspection official of the authority having jurisdiction shall be removed or modified, provided it is required by subsections (A)(1) and (2) of this section.
- Within the intent of the regulations, the fire inspection official of the authority having jurisdiction may approve alternative practices which provide for the same practical effects as the stated guidelines.
- Guidance for implementation of this regulation is contained in the publication "General Guidelines for Creating Defensible Space" as published by the Board of Forestry and Fire Protection by resolution adopted on February 8, 2006.
- Fuel modification shall be required to a width of ten feet on each side of a road by reducing ground fuels to less than eighteen inches in height and by maintaining tree and shrub separations necessary to reduce fuel loading. (Ord. 1778 §2 (part), 2018).

Erosion Control Ordinance (Amador County Code Title 15, Chapter 15.40)

This chapter sets forth rules and regulations by which excavation, grading, and earthwork construction, including fills and cuts, embankments, and impoundment structures (collectively "excavation") are to be

reviewed and permitted by the county. It establishes an administrative procedure for the issuance of required permits involving excavation, the approval of plans and inspection of all permitted excavation, and the establishment of measures to control erosion and other adverse impacts of excavation ("erosion control measures"). (Ord. 1619 §2(part), 2020).

All permits issued by the county causing land disturbance shall include erosion control measures except for permits and reclamation plans which are separately reviewed and permitted. Those permits covered by this chapter include but are not limited to conditional use permits, on-site septic system permits, county road encroachment permits, well permits and grading permits. All building permits shall include erosion control measures as part of the building permit. (Ord. 1619 §2(part), 2020).

Amador County Board of Supervisors Resolution No. 99-273

This resolution adopts the policy pursuant to Division 12, Part 5 of the California Health and Safety Code that vacant parcels in subdivisions, that are ten acres or smaller, will be declared a public nuisance and owner will be noticed to destroy weeds if the CAL FIRE or other authorized fire official verifies that the weeds constitute a fire hazard.

Zoning and Subdivision Ordinance (Amador County Code Title 19)

The Amador County Zoning Code has been adopted by the County and is used:

- To assist in providing a definite plan of development for the county, and to guide, control and regulate the future growth of the county, in accordance with said plan;
- To protect the character and the social and economic stability of agricultural, residential, commercial, industrial, and other areas within the county and to assure the orderly and beneficial development of such areas;
- To obviate the menace of the public safety resulting from the location of buildings and the uses thereof, and of land adjacent to highways which are a part of the streets and highways plan of the county, or which are important thoroughfares, in such manner as to cause interference with existing or prospective traffic movements on said highways.
- To encourage the most appropriate use of land; to conserve, protect and stabilize the value of property; to provide adequate open space for light and air; to prevent undue concentration of population; to lessen congestion on the streets; to facilitate adequate provisions for community utilities such as transportation, water, sewer, schools, parks and other publicly owned facilities; and to promote the public health, safety and general welfare.

No building or structure shall be erected, reconstructed or structurally altered in any manner, nor shall any building or land be used for any purpose, other than as permitted by and in conformance with this title and all ordinances, laws and maps referred to in this Chapter.

Subdivision Ordinance (Amador County Code Title 17)

Amador County's subdivision ordinance regulates the design and improvement of land divisions and the dedication of public improvements needed in connection with land divisions. It is the purpose of this title to encourage new concepts and innovations in the arrangement of building sites within subdivisions.

Deviations from the traditional mechanical approach to the subdivision of land are encouraged in order to facilitate the ultimate development of the land in a manner that will be commensurate with contemporary living patterns and technological progress.

4.4.2. Amador County's Administrative/Technical Mitigation Capabilities

Table 4-139 identifies the County personnel responsible for activities related to mitigation and loss prevention in the County.

Table 4-139 Amador County Administrative/Technical Mitigation Capabilities

Administration	In Place Y/N	Describe capability Is coordination effective?
Staff		**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official	Y	Staffing is adequate and staff is trained on hazards and mitigation. There is sufficient coordination between agencies and staff.
Civil Engineer, including dam and levee safety	Y	Staffing is adequate and staff is trained on hazards and mitigation. There is sufficient coordination between agencies and staff.
Community Planner	Y	Staffing is adequate and staff is trained on hazards and mitigation. There is sufficient coordination between agencies and staff.
Emergency Manager	Y	Staffing is adequate and staff is trained on hazards and mitigation. There is sufficient coordination between agencies and staff.
Floodplain Administrator	Y	Staffing is adequate and staff is trained on hazards and mitigation. There is sufficient coordination between agencies and staff.
GIS Coordinator	N	
Planning Commission	Y	Staffing is adequate and staff is trained on hazards and mitigation. There is sufficient coordination between agencies and staff.
Other		
Technical	**Y/N**	**Has capability been used to assess/mitigate risk in the past?**
Grant writing	Y	Yes – grant writers have helped write hazard mitigation grants for Cal OES and FEMA grants.

Hazard data and information	Y	The impact fees collected for new development (traffic, fire, parks, school, and county facilities) aren't direct funding resources for hazard prevention or mitigation, although fees collected by the fire districts might be indirectly used toward fire prevention. The County could establish a capital improvement plan for hazard mitigation, but the actual source and amount of funding are uncertain.
GIS analysis	Y	
Mutual aid agreements	Y	Amador Transit
Other		
How can these capabilities be expanded and improved to reduce risk?		
GIS files of hazard layers could be used by staff to better identify various risks and development constraints when preparing project CEQA analyses. A GIS coordinator may need to be hired.		

4.4.3. Amador County's Fiscal Mitigation Capabilities

Table 4-140 identifies financial tools or resources that the County could potentially use to help fund mitigation activities.

Table 4-140 Amador County Fiscal Mitigation Capabilities

Funding Resource	In Place Y/N	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	
Community Development Block Grant	Y	Mostly used for AWA infrastructure improvements.
Federal funding programs (non-FEMA)	N	
Fees for water, sewer, gas, or electric services	N	
Impact fees for new development	Y	Current fees –no; future fees - yes
State funding programs	Y	Cal OES, Cal EPA, CA DWR grants.
Stormwater utility fee	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Impact fees for new development are being implemented slowly. Board approval is needed for many of these items. Budgets and avenues for generating revenue are always being considered.		

4.4.4. Amador County Mitigation Education, Outreach, and Partnerships

Table 4-141 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table 4-141 Amador County Mitigation Education, Outreach, and Partnerships

Program/Organization	In Place Y/N	How widespread are each of these in your community?
Community newsletters	Y	Limited to only some Districts and Communities
Hazard awareness campaigns (such as Firewise, Storm Ready, Severe Weather Awareness Week, school programs, public events)	Y	Amador Fire Safe Council
Local news	Y	Amador Ledger Newspaper, KVGC Radio
Organizations that interact with underserved and vulnerable communities	Y	Operation Care (Domestic Violence victims), Sheriff's Office HART (Homeless Amador React Team), Amador County Homeless Task Force/Outreach (I'm not familiar w/them), Victory Village (for Veterans)
Social media	Y	Sheriff's Office mobile app and Facebook
How can these capabilities be expanded and improved to reduce risk?		
Amador County can expand its current outreach by adding quarterly emergency alert recruitment pushes, reminding residents to sign up and stay connected. Social media efforts can be broadened to Instagram, Nextdoor, and X, reaching more demographics. Firewise Community expansion will increase neighborhood-level wildfire resilience. A local Preparedness Guide, available in print and online, will provide consistent, accessible information for all hazards. Seasonal severe weather campaigns will deliver timely preparedness messages through schools, organizations, and media. Together, these actions will strengthen public engagement, broaden partnerships, and reduce overall disaster risk		

4.4.5. Other Mitigation Efforts

In addition to the tables above, the County noted the following mitigation efforts.

Amador County Public Health has put together a Public Health Preparedness App. It is dedicated to coordinating efforts to limit the health impact of emergencies within Amador County. The program facilitates partnerships with public health departments, local governments, educational institutions, community organizations, and healthcare providers. By working together, it strengthen the ability to coordinate emergency preparedness activities and respond swiftly to emerging threats.

Amador County Public Works has multiple projects currently underway related to mitigation. This includes:

- Carbondale Bridge over Willow Creek at Forest Home: Beginning in June 2024, Amador County Transportation and Public Works began replacing the Carbondale Road bridge over Willow Creek near Forest Home Road. The project includes the removal of the existing bridge structure and replacing it with a new bridge structure with a wider deck and improved railings. The roadway alignment will remain unchanged; however, the new roadway profile will be raised approximately four feet.
- Bridge Replacement Projects - 3 Bridges:

- ✓ Fiddletown Road Bridge: The Fiddletown Road Bridge, constructed in 1923, is a 32.8-foot long, 2-lane concrete arch bridge that spans over North Fork Dry Creek. The project is to remove the existing structure and reconstruct with a bridge to provide pedestrian and vehicle access. Currently, the County is completing right-of-way and permitting.
- ✓ Old Amador Road Bridge: The Old Amador Road Bridge, constructed in 1925, is a 65-foot long, 2-span bridge that spans over Rancheria Creek. The project is to remove the existing structure and reconstruct with a bridge to provide pedestrian and vehicle access. Currently, the County is completing the environmental review and design.
- ✓ Bell Road Bridge: The project will replace the existing structurally deficient bridge, constructed in 1925. The roadway at the bridge will conform to the existing roadway at approximately 400-feet from each side of the bridge. The new bridge would accommodate one 12-foot wide travel lane and two 2-foot wide shoulders. Currently, the County is completing environmental review and design.

- Upper Ridge Road Improvements Project: Amador County has secured funds in the amount of $2,300,000 for repairs and safety improvements along Upper Ridge Road, a 3.04-mile section of road from Climax Road to Highway 88 in Pine Grove. This funding is through the Priority Legislative Budget Project administered by the California Department of Transportation. Engineering design has been completed with construction of the improvements to occur in Fall 2025.

Wildfire guidance and resources are provided through County website. This includes:

- Fuel breaks implemented by ARCD/AFSC
- I/E assistance provided by AFSC
- CWPP by AFSC from 2016 High Country Community Wildfire Protection Plan - Amador Fire Safe Council

4.5 Natural Hazards Summary

As detailed in the hazard identification section, those hazards identified as a high or medium significance in Table 4-142 are considered priority hazards for mitigation planning. Those hazards that occur infrequently or have little or no impact in the Amador County Planning Area were determined to be of low significance and not considered a priority hazard. Significance was determined based on the hazard profile, focusing on key criteria such as frequency, extent, and resulting damage, including deaths/injuries and property, natural and cultural resources, and economic damage. The ability of a jurisdiction to reduce losses through implementation of existing and new mitigation measures was also considered as to the significance of a hazard. This assessment was used to prioritize those hazards of greatest significance in the Amador County Planning Area, enabling the County and participating jurisdictions to focus resources where they are most needed.

Table 4-142 Hazard Identification and Initial Determination of Priority Hazards

Hazard	Likelihood of Future Occurrence	Vulnerability	Priority Hazard
Agricultural Hazards (severe weather/pests/invasive species)	Highly Likely	High	Y

Hazard	Likelihood of Future Occurrence	Vulnerability	Priority Hazard
Avalanche	Likely	Medium	N
Climate Change	Likely	Medium	Y
Dam Failure	Unlikely	High	Y
Drought & Water shortage (w/tree mortality)	Likely	High	Y
Earthquake (w/subhazards)	Unlikely	Extremely High	Y
Floods: 1%/0.2% annual chance (w/ levee failure)	Occasional/Unlikely	High	Y
Floods: Localized Stormwater	Highly Likely	Medium	Y
Landslide, Mudslide, Debris Flow	Likely	Medium	Y
Severe Weather: Extreme Cold, Freeze, and Snow	Highly Likely	Medium	Y
Severe Weather: Extreme Heat	Highly Likely	Medium	Y
Severe Weather: Heavy Rains and Storms (Hail, Lightning)	Highly Likely	Medium	Y
Severe Weather: High Winds and Tornadoes	Highly Likely	Medium	Y
Wildfire (w/smoke and air quality)	Highly Likely	Extremely High	Y

Chapter 5 Mitigation Strategy

44 CFR §201.6(c)(3) and §201.7(c)(3): [The plan shall include] a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

This section describes the mitigation strategy process and mitigation action plan for this 2025 Amador County LHMP Update. It describes how all the participating jurisdictions met the following requirements from the 10-step planning process:

- Planning Step 6: Set Goals
- Planning Step 7: Review Possible Activities
- Planning Step 8: Draft an Action Plan

5.1 Mitigation Strategy: Overview

The results of the planning process, the risk assessment, the goal setting, the identification of mitigation actions, and the hard work of the HMPC led to the mitigation strategy and mitigation action plan for this LHMP Update. As part of the LHMP Update process, a comprehensive review and update of the mitigation strategy portion of the 2020 Amador County LHMP was conducted. Some of the initial goals and objectives from the previous LHMP were refined and reaffirmed, some goals were deleted, and others were added. The end result was a new set of goals, to reflect the completion of, or progress towards the 2020 mitigation actions, the updated risk assessment, and the new priorities of participating jurisdictions and this 2025 LHMP Update.

To support the updated mitigation strategy including updated goals, the mitigation actions from the 2020 LHMP were reviewed and assessed for their value in reducing risk and vulnerability to the Amador County Planning Area from identified hazards and further evaluated for their inclusion in this LHMP Update (See Chapter 2 What's New). Section 5.2 below identifies the new goals and objectives of this 2025 LHMP Update and Section 5.4 details the new mitigation action plan.

Taking all of the above into consideration, the participating jurisdictions and HMPC developed the following umbrella mitigation strategy for this LHMP Update:

- Communicate the hazard information collected and analyzed through this planning process as well as mitigation success stories so that the community better understands what can happen where and what they themselves can do to be better prepared.
- Implement the mitigation action plan recommendations of this Plan.
- Use existing rules, regulations, policies, and procedures already in place.
- Monitor multi-objective management opportunities so that funding opportunities may be shared and packaged, and broader constituent support may be garnered.

5.1.1. Continued Compliance with NFIP

Given the nature and extent of the flood hazard in the Amador County Planning Area, an emphasis will be placed on continued compliance with the National Flood Insurance Program (NFIP) by all communities. This Chapter 5 of the Base Plan for the County and the jurisdictional annexes for the five cities, as the six eligible NFIP communities, provides an overview of their flood management programs and continued compliance with the NFIP. Although the participating districts to this LHMP Update are not eligible NFIP communities, many of their mitigation actions and projects contain measures to promote effective floodplain management throughout the Amador County Planning Area.

To participate in the NFIP a community must adopt and enforce floodplain management regulations that meet or exceed the minimum requirements of the Program. These requirements are intended to prevent loss of life and property and to reduce taxpayer's costs for disaster relief as well as minimize economic and social hardships that result from flooding. Participation in the NFIP provides a community with access to flood insurance.

Detailed below is a description of the County's flood management program to ensure continued compliance with the NFIP. Also to be considered are the flood mitigation actions contained in this LHMP that support the ongoing efforts by the County to minimize the risk and vulnerability of the community to the flood hazard and to enhance their overall floodplain management program.

Amador County's Flood Management Program

Amador County has participated in the Regular Phase of the NFIP since September 24, 1984. Since then, the County has administered floodplain management regulations that meet the minimum requirements of the NFIP. Under that arrangement, residents and businesses paid the same flood insurance premium rates as most other communities in the country.

The Community Rating System (CRS), a voluntary program under the NFIP, was created in 1990. It is designed to recognize floodplain management activities that go above and beyond the NFIP's minimum requirements. If a community implements public information, mapping, regulatory, loss reduction and/or flood preparedness activities and submits the appropriate documentation to FEMA, then its residents can qualify for a flood insurance premium rate reduction. The County does not currently participate in the CRS program.

Presently, the County manages its floodplains in compliance with NFIP requirements and implements a floodplain management program designed to protect the people and property of the County. Floodplain regulations are a critical element in local floodplain management and are a primary component in the County's participation in the NFIP.

The County will continue to manage their floodplains in continued compliance with the NFIP. An overview of the County's NFIP status and floodplain management program is discussed on Table 5-1.

Table 5-1 Amador County NFIP Status

NFIP Topic	Comments
Staff Resources	
Who is responsible for floodplain management in your community? Provide Department/Title. Do they serve any roles other than Community Floodplain Administrator (FPA)?	Planning Director. They serve in other roles as well.
Is the Community FPA or NFIP Coordinator a Certified Floodplain Manager?	No
Is floodplain management an auxiliary function?	Auxiliary
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	Permit review, GIS, Inspections, and (minimal) education. (No outreach, No engineering)
What are the barriers to running an effective NFIP program in the community, if any?	Staffing & associated expenses.
Insurance Summary	
How many NFIP policies are in the community? What is the total premium and coverage?	23 policies $23,560 in annual premiums $4,709,000 of insurance in force
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	17 paid losses $365,920.56in paid claims. 2 substantial damage claims
How many structures (residential and non-residential) are exposed to flood risk within the community?	534 in 1% annual chance flood zone 2 in 0.2% annual chance flood zone
Are there Repetitive Loss (RL) and Severe Repetitive Loss Properties (SRL) structures in the community?	2 RL 0 SRL
Describe any areas of flood risk with limited NFIP policy coverage	No known places of limited coverage
How does the community teach property owners or other stakeholders about the importance of flood insurance?	N/A. Banks will determine if homes are in the floodplain, then require flood insurance. (Rely on external sources).
What digital sources (like the FEMA Map Service Center, National Flood Hazard Layer) or non-regulatory tools does the community use?	FEMA Map Service Center, National Flood Hazard Layer.
Compliance History	
Is the community in good standing with the NFIP?	Y
Are there any outstanding compliance issues (i.e., current violations)?	N
Who is responsible (Department, Title) for making substantial damage/improvement determinations? How does the community identify substantially damaged/improved structures? What is the process to make sure these structures are brought into compliance?	Planning Director Chuck Beatty and Chief Building Official, Todd Barr. In the past, they've used an estimate for repair from a Contractor, then compared that number to the assessed value. What process: Building Codes, Permits, Inspections, and an Elevation Survey.
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	9/22/2017 CAV

NFIP Topic	Comments
Is a CAV or CAC scheduled or needed?	No
Regulation	
When did the community enter the NFIP?	9/24/1984
Are the FIRMs digital or paper?	Digital
Has the community adopted the NFIP minimum floodplain management criteria via local regulation? Date of current local regulation?	No, the current Floodplain Development Ordinance was adopted in 2000. However, the County applies the required 2-foot clearance above floodplain elevation for new construction.
Has the community adopted the latest effective FIRM? Date adopted?	Yes, the latest FIRMs have an effective date of May 20, 2010.
How does the community enforce local floodplain regulations and monitor compliance?	Projects are evaluated during the building permit plan-check review process. If a floodplain permit is needed, an Elevation Certificate is required for lowest floor level.
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	Meet minimum requirements.
How are Letters of Map Change (LOMCs) tracked and compiled?	New DFIRMs are downloaded regularly which include the latest LOMCs, LOMRs, and CLOMRs
Provide an explanation of the permitting process.	Site plans are reviewed to ensure projects are outside SFHAs or Elevation Certificates are provided for projects within SFHAs
Community Rating System	
Does the community participate in CRS? If so, what is the community's CRS Class Ranking?	No
What categories and activities provide CRS points and how can the class be improved?	N/A
Does the plan include CRS planning requirements?	N/A

Source: FEMA CIS, FEMA PIVOT, Amador County

*FEMA CIS and PIVOT databases record this data differently; thus results utilized differ depending on the source.

5.1.2. Integration of Mitigation with Post Disaster Recovery and Mitigation Strategy Funding Opportunities

Hazard mitigation actions are essential to weaving long-term resiliency into all community recovery efforts so that at-risk infrastructure, development, and other community assets are stronger and more resilient for the next severe storm or hazard event. Mitigation measures to reduce the risk and vulnerability of a community to future disaster losses can be implemented in advance of a disaster event and also as part of post-disaster recovery efforts.

Mitigation applied to recovery helps communities become more resilient and sustainable. It is often most efficient to fund eligible infrastructure mitigation through FEMA's Public Assistance mitigation program if the asset was damaged in a storm event. Mitigation work can be added to project worksheets if they can be proven to be cost-beneficial.

Integration of mitigation into post disaster recovery efforts should be considered by all communities as part of their post disaster redevelopment and mitigation policies and procedures. Post-disaster redevelopment and mitigation policies and procedures are evaluated and updated as part of the Emergency Operations Plan (EOP) updates and other emergency management plans for each community.

These EOP's and other emergency management documents, through its policies and procedures, seek to mitigate the effects of hazards, prepare for measures to be taken which will preserve life and minimize damage, enhance response during emergencies and provide necessary assistance, and establish a recovery system in order to return the community to their normal state of affairs. Mitigation is emphasized as a major component of recovery efforts.

Mitigation Strategy Funding Opportunities

An understanding of the various funding streams and opportunities enable the communities to match identified mitigation projects with the grant programs that are most likely to fund them. Additionally, some of the funding opportunities can be utilized together. Mitigation grant funding opportunities available pre- and post- disaster include the following.

FEMA HMA Grants

Cal OES administers four main types of HMA grants: (1) Hazard Mitigation Grant Program, (2) Pre-Disaster Mitigation Program, (3) Flood Mitigation Assistance Program, and (4) Building Resilient Infrastructure and Communities. Eligible applicants for the HMA include state and local governments, certain private non-profits, and federally recognized Indian tribal governments. While private citizens cannot apply directly for the grant programs, they can benefit from the programs if they are included in an application sponsored by an eligible applicant.

FEMA Public Assistance Section 406 Mitigation

The Robert T. Stafford Disaster Relief and Emergency Assistance Act provides FEMA the authority to fund the restoration of eligible facilities that have sustained damage due to a presidentially declared disaster. The regulations contain a provision for the consideration of funding additional measures that will enhance a facility's ability to resist similar damage in future events.

Community Development Block Grants

The California Department of Housing and Community Development administers the State's Community Development Block Grant (CDBG) program with funding provided by the U.S. Department of Housing and Urban Development. The program is available to all non-entitlement communities that meet applicable threshold requirements. All projects must meet one of the national objectives of the program – projects must benefit 51 percent low- and moderate-income people, aid in the prevention or clearance of slum and blight, or meet an urgent need. Grant funds can generally be used in federally declared disaster areas for CDBG eligible activities including the replacement or repair of infrastructure and housing damaged during, or as a result of, the declared disaster.

Small Business Loans

SBA offers low-interest, fixed-rate loans to disaster victims, enabling them to repair or replace property damaged or destroyed in declared disasters. It also offers such loans to affected small businesses to help them recover from economic injury caused by such disasters. Loans may also be increased up to 20 percent of the total amount of disaster damage to real estate and/or leasehold improvements to make improvements that lessen the risk of property damage by possible future disasters of the same kind.

Increased Cost of Compliance

Increased Cost of Compliance (ICC) coverage is one of several resources for flood insurance policyholders who need additional help rebuilding after a flood. It provides up to $30,000 to help cover the cost of mitigation measures that will reduce flood risk. ICC coverage is a part of most standard flood insurance policies available under NFIP.

5.2 Goals and Objectives

44 CFR §201.6(c)(3)(i) and §201.7(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

Up to this point in the planning process, the participating jurisdictions, along with the HMPC, have organized resources, assessed hazards and risks, and documented mitigation capabilities. The resulting goals, objectives, and mitigation actions were developed based on these tasks. The HMPC held a series of meetings and exercises designed to achieve a collaborative mitigation strategy as described further throughout this section. Appendix C documents the information covered in these mitigation strategy meetings, including information on the goals development and the identification and prioritization of mitigation alternatives by the HMPC and participating jurisdictions.

During the initial goal-setting meeting, the HMPC reviewed the results of the hazard identification, vulnerability assessment, and capability assessment. This analysis of the risk assessment identified areas where improvements could be made and provided the framework for the HMPC to formulate planning goals and objectives and to develop the mitigation strategy for the Amador County Planning Area.

Goals were defined for the purpose of this mitigation plan as broad-based public policy statements that:

- Represent basic desires of the community;
- Encompass all aspects of community, public and private;
- Are nonspecific, in that they refer to the quality (not the quantity) of the outcome;
- Are future-oriented, in that they are achievable in the future; and
- Are time-independent, in that they are not scheduled events.

Goals are stated without regard to implementation. Implementation cost, schedule, and means are not considered. Goals are defined before considering how to accomplish them so that they are not dependent on the means of achievement. Goal statements form the basis for objectives and actions that will be used as means to achieve the goals. Objectives define strategies to attain the goals and are more specific and measurable.

HMPC members were provided with the list of goals from the 2020 LHMP as well as a list of other sample goals to consider. The team was told that they could use, combine, or revise the statements provided or develop new ones, keeping the risk assessment in mind. Each member was asked to provide three goal statements. Goal statements were collected and grouped into similar themes and provided to the HMPC. Some of the statements were determined to be better suited as objectives or actual mitigation actions and were set aside for later use. Next, the HMPC developed objectives that summarized strategies to achieve each goal. Edits and refinements to these new goals and resulting objectives were provided by the HMPC until the team came to consensus on the final goals and objectives for this 2025 LHMP Update.

Based on the risk assessment review and goal setting process, the HMPC identified the following goals, which provide the direction for reducing future hazard-related losses within the Amador County Planning Area.

Goal #1: Provide protection for people's lives, property, public health, and the environment and reduce risk and losses from natural hazards

- Minimize impact to existing development
- Minimize impact to future development
- Minimize economic and resource impact
- Promote resiliency strategies
- Consider and prioritize the use of prevention measures such as land use controls and code enhancements

Goal #2: Provide protection for critical facilities, infrastructure, utilities and services from hazard impacts

- Protect and improve resiliency of critical facilities, services, and community lifelines from hazard impacts to protect life and reduce loss of property
- Implement critical facility upgrades, retrofits, and mitigation measures to ensure reliability of services
- Update and maintain GIS list of critical facilities: Essential Services, At-Risk Populations, Hazardous Materials Facilities

Goal #3: Improve community (public and stakeholder) awareness, education, and preparedness to natural hazard events

- Enhance public/stakeholder outreach, education and preparedness planning for all hazards of concern and for all populations, including underserved and vulnerable populations
- Reinforce emergency response systems
- Foster household preparedness and self-responsibility for hazard mitigation
- Increase public and stakeholder knowledge and awareness about the risk and vulnerability to identified hazards and how to take responsibility for and mitigate these risks with a focus on high priority hazards such as wildfire and flood
- Leverage existing public outreach and education mechanisms such as community coalitions and other existing forums; expand social media presence and local community boards
- Increase use of technology to communicate hazard information (e.g., GIS)
- Provide education and outreach on evacuation routes, signage, roles and responsibilities, as well as on various emergency communication modes

Goal #4: Build community resilience and increase communities' ability to be prepared for, respond to, and recover from a disaster event

- Improve community capabilities to mitigate hazards, reduce losses, and to better recover from disasters
- Integrate mitigation into planning and decision making by embedding mitigation strategies into everyday county policies, capital projects, and other similar mechanisms
- Improve interagency (local, state, federal) emergency coordination, communication, and operational capacity to ensure effective community preparedness, response and recovery
- Maintain current service levels and continue internal and operational training
- Enhance alert and warning systems and ensure effective system redundancies
- Improve emergency communication systems with reliable backup (e.g., cell phones, radios, sirens, reverse 911, multi-media, etc.)
- Improve identification, education, and emergency notifications of vulnerable and underserved populations
- Enhance the use of shared resources/Develop a strong mutual aid support system
- Improve and make better use of technology (e.g., GIS)
- Establish and expand GIS technologies to map hazards and community assets for mitigation planning and to support hazard response and community recovery
- Maintain coordination of disaster plans, data, and information with changing DHS/FEMA and State requirements
- Support and build upon evacuation planning and sheltering efforts in the County
- Mitigate future hazard losses through adequate land use/facilities planning

Goal #5: Reduce fire severity and intensity in Amador County and surrounding lands

- Reduce life safety issues, property loss, natural resource impacts, and damages associated with wildfires
- Prevent and reduce wildfire ignitions
- Increase agency and jurisdictional coordination to reduce wildfire risk, severity and intensity
- Increase vegetation management countywide to reduce wildfire losses
- Be proactive in identifying and prioritizing mitigation funding to minimize risk and vulnerability to wildfire
- Prioritize wildfire mitigation around critical facilities and infrastructure
- Support efforts to gain access to affordable insurance for all communities including underserved and vulnerable populations

Goal #6: Maintain FEMA Eligibility/Position the communities for Grant funding

- Improve community ability to be competitive/successful with grant funding opportunities from application development to project delivery
- Establish and share best practices among agencies for development of grant applications, project permits, etc.
- Educate (and advocate) local officials to support local access to funding.

5.3 Identification and Analysis of Mitigation Actions

44 CFR §201.6(c)(3)(ii) and §201.6(c)(3)(ii): [The mitigation strategy shall include a] section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

In order to identify and select mitigation actions to support the mitigation goals, each hazard identified in Section 4.1 was evaluated at the completion of the risk assessment as part of the second prioritization process to determine which hazards were priorities for mitigation strategy planning. Only those hazards that were determined to be a priority hazard for each participating jurisdiction were considered further in the development of hazard-specific mitigation actions. Those hazards not considered a priority for mitigation strategy development were eliminated from further consideration because the risk of a hazard event to the participating jurisdiction is unlikely, the vulnerability of the participating jurisdiction is low, or capabilities are already in place to mitigate adverse impacts. Further, the resulting mitigation strategy presented in this Chapter focuses on those mitigation actions that each jurisdiction has the authority, resources, and capacity to consider for implementation over the next 5-years covered by this LHMP Update. Table 5-2 and Table 5-3 provide a listing of priority hazards by jurisdiction to be addressed in the mitigation strategy portion of this Plan.

Table 5-2 Amador County Planning Area: Mitigation Action Priority Hazards by Jurisdiction

Hazard	Amador County	City of Amador City	City of Jackson	City of Ione	City of Plymouth	City of Sutter Creek
Agricultural Hazards (severe weather/pests/invasive species)	X					
Avalanche*						
Climate Change	X	X	X	X	X	X
Dam Failure	X			X		X
Drought & Water shortage (w/ tree mortality)	X	X	X	X	X	X
Earthquake (w/subhazards)	X			X		X
Floods: 1%/0.2% annual chance (w/ levee failure)	X		X	X	X	X
Floods: Localized Stormwater	X	X	X	X	X	X
Landslide, Mudslide, Debris Flow	X	X		X		X
Severe Weather: Extreme Cold, Freeze, and Snow	X			X		
Severe Weather: Extreme Heat	X	X	X	X	X	X
Severe Weather: Heavy Rains and Storms (Hail, Lightning)	X	X		X	X	X
Severe Weather: High Winds and Tornadoes	X	X	X	X		
Wildfire (w/smoke and air quality)	X	X	X	X	X	X

*while initially a priority hazard for the County Planning Area, after completion of the risk assessment, it was determined that avalanche is a low priority hazard for mitigation planning purposes.

Table 5-3 Amador County Planning Area: Mitigation Action Priority Hazards by Jurisdiction

Hazard	Amador Water Agency	Jackson Valley Irrigation District
Agricultural Hazards (severe weather/pests/invasive species)	X	X
Avalanche*		
Climate Change	X	X
Dam Failure	X	X
Drought & Water shortage (w/ tree mortality)	X	X
Earthquake (w/subhazards)	X	X
Floods: 1%/0.2% annual chance (w/ levee failure)	X	X
Floods: Localized Stormwater	X	
Landslide, Mudslide, Debris Flow	X	
Severe Weather: Extreme Cold, Freeze, and Snow	X	X
Severe Weather: Extreme Heat	X	
Severe Weather: Heavy Rains and Storms (Hail, Lightning)	X	
Severe Weather: High Winds and Tornadoes	X	
Wildfire (w/smoke and air quality)	X	X

*while initially a priority hazard for the County Planning Area, after completion of the risk assessment, it was determined that avalanche is a low priority hazard for mitigation planning purposes.

It is important to note, however, that all the Hazards addressed in this LHMP are included in the multi-hazard public awareness mitigation actions as well as in other multi-hazard, emergency management actions, and other hazard-specific actions, providing benefits to all participating jurisdictions to this 2025 LHMP Update.

Once it was determined which hazards warranted the development of specific mitigation actions, the participating jurisdictions and HMPC analyzed viable mitigation options that supported the identified goals and objectives. The HMPC was provided with the following list of categories of mitigation actions, which originate from the Community Rating System:

- Prevention
- Property protection
- Structural projects
- Natural resource protection
- Emergency services
- Public information

The HMPC was provided with examples of potential mitigation actions for each of the above categories. The HMPC was also instructed to consider both future and existing buildings in considering possible mitigation actions. A facilitated discussion then took place to examine and analyze the options. Appendix C provides a detailed review and discussion of the six mitigation categories to assist in the review and identification of possible mitigation activities or projects. Also utilized in the review of possible mitigation measures is FEMA's publication on Mitigation Ideas, by hazard type. Prevention type mitigation

alternatives were discussed for each of the priority hazards. This was followed by a brainstorming session that generated a list of preferred mitigation actions by hazard.

5.3.1. Prioritization Process

Once the mitigation actions were identified, the HMPC was provided with several decision-making tools, including FEMA's recommended prioritization criteria, STAPLEE sustainable disaster recovery criteria; Smart Growth principles; and others, to assist in deciding why one recommended action might be more important, more effective, or more likely to be implemented than another. STAPLEE stands for the following:

- Social: Does the measure treat people fairly? (e.g., different groups, different generations)
- Technical: Is the action technically feasible? Does it solve the problem?
- Administrative: Are there adequate staffing, funding, and other capabilities to implement the project?
- Political: Who are the stakeholders? Will there be adequate political and public support for the project?
- Legal: Does the jurisdiction have the legal authority to implement the action? Is it legal?
- Economic: Is the action cost-beneficial? Is there funding available? Will the action contribute to the local economy?
- Environmental: Does the action comply with environmental regulations? Will there be negative environmental consequences from the action?

In accordance with the DMA requirements, an emphasis was placed on the importance of a benefit-cost analysis in determining action priority. Other criteria used to assist in evaluating the benefit-cost of a mitigation action includes:

- Contribution of the action to save life or property
- Availability of funding and perceived cost-effectiveness
- Available resources for implementation
- Ability of the action to address the problem

The initial list of mitigation actions carried forward from the 2020 LHMP and new actions identified during this planning process were reviewed and prioritized using the criteria (alternatives and selection criteria) in Appendix C.

With these criteria in mind, the HMPC were each given a set of 9 colored dots, three each of red, blue, and green. The dots were assigned red for high priority (worth five points), blue for medium priority (worth three points), and green for low priority (worth one point). The HMPC was asked to use the dots to prioritize actions with the above criteria in mind. The point score for each action was totaled. Appendix C contains the total score given to each identified mitigation action.

The process of identification and analysis of mitigation alternatives allowed the HMPC to come to consensus and to prioritize recommended mitigation actions. During the voting process, emphasis was placed on the importance of a benefit-cost review in determining project priority; however, this was not a quantitative analysis. The team agreed that prioritizing the actions collectively enabled the actions to be ranked in order of relative importance and helped steer the development of additional actions that meet the more important objectives while eliminating some of the actions which did not garner much support.

Benefit-cost was also considered in greater detail in the development of the Mitigation Action Plan detailed below in Section 5.4 The cost-effectiveness of any mitigation alternative will be further considered in greater detail through performing benefit-cost project analyses when seeking FEMA mitigation grant funding for eligible actions associated with this 2025 LHMP Update.

Recognizing the limitations in prioritizing actions from multiple jurisdictions and departments and the regulatory requirement to prioritize by benefit-cost to ensure cost-effectiveness, the participating jurisdictions and HMPC decided to pursue actions that contributed to saving lives and property as first and foremost, with additional consideration given to the benefit-cost aspect of a project. This process drove the development of a determination of a high, medium, or low priority for each mitigation action, and a comprehensive prioritized mitigation action plan for the Amador County Planning Area.

5.4 Mitigation Action Plan

44 CFR §201.6(c)(3)(iii) and §201.7(c)(3)(iii): [The mitigation strategy section shall include] an action plan describing how the actions identified in section (c)(3)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefit review of the proposed projects and their associated costs.

This mitigation action plan was developed to present the recommendations developed by the HMPC for how the Amador County Planning Area can reduce the risk and vulnerability of people, property, critical facilities and infrastructure, natural and cultural resources, and the economy to future disaster losses. Emphasis was placed on both the existing built environment and future development. This mitigation action plan summarizes who is responsible for implementing each of the prioritized actions as well as when and how the actions will be implemented. Each action summary also includes a discussion of the benefit-cost review conducted to meet the regulatory requirements of the Disaster Mitigation Act.

Table 5-4 identifies all mitigation actions for participating jurisdictions to this LHMP Update. For each mitigation action item included in Table 5-4, a detailed mitigation implementation strategy has been developed. The detailed descriptions for each mitigation action are included in each respective jurisdictional annex to this LHMP.

The mitigation action plan summarized below contains both new action items developed for this 2025 LHMP Update as well as old actions being carried forward from the 2020 LHMP. Table 5-4 indicates whether the action is new or from the 2020 LHMP and Chapter 2 contains the details for each 2020 mitigation action item indicating whether a given action item has been completed, deleted, or deferred.

As described throughout this 2025 LHMP Update, the Amador County Planning Area has many risks and vulnerabilities to identified hazards. Although many possible mitigation actions, as detailed in Appendix C, were brainstormed and prioritized during the mitigation strategy meetings, the resulting mitigation strategy presented in this Chapter 5 of this LHMP focuses only on those mitigation actions that are both reasonable and realistic for the communities to consider for implementation over the next 5-years covered by this 2025 Update. Thus, only a portion of the actions identified in Appendix C have been carried forward into the mitigation strategy presented in Table 5-4. Although many good ideas were developed during the mitigation action brainstorming process, the reality of determining which priority actions to develop and include in this LHMP Update came down to the actual priorities of communities, individuals and departments based in part on department direction, staffing, and available funding. The overall value of the mitigation action table in Appendix C is that it represents a wide-range of mitigation actions that can be consulted and developed for this LHMP Update during annual plan reviews and the formal 5-year update process.

It is also important to note that the participating jurisdictions have numerous existing, detailed action descriptions, which include benefit-cost estimates, in other planning documents, such as stormwater and drainage plans, flood and water management plans, fire plans, climate plans, and capital improvement budgets and reports. These actions are considered to be part of this LHMP, and the details, to avoid duplication, should be referenced in their original source document. The HMPC also realizes that new

needs and priorities may arise as a result of a disaster or other circumstances and reserves the right to support new actions, as necessary, as long as they conform to the overall goals of this LHMP Update.

Further, it should be clarified that the actions included in this mitigation strategy are subject to further review and refinement; alternatives analyses; and reprioritization due to funding availability and/or other criteria. The participating jurisdictions are not obligated by this document to implement any or all of these projects. Rather this mitigation strategy represents the desires of the jurisdictions to mitigate the risks and vulnerabilities from identified hazards. The actual selection, prioritization, and implementation of these actions will also be further evaluated in accordance with the mitigation categories and criteria contained in Appendix C.

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the public outreach actions, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this 2025 LHMP Update.

Table 5-4 Amador County Planning Area Mitigation Actions

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Amador County					
Multi-Hazard Actions					
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Previous Action	X	X		Prevention
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	Previous Action	X	X	X	Prevention Public Education
Action 3. Backup Power Projects for Critical Facilities & Infrastructure	Previous Action	X	X		Prevention Property Protection Natural Resource Protection
Action 4. Establish and Fund a Full-Time Geographic Information Systems (GIS) position for Hazard Mitigation and Emergency Planning	Previous Action	X	X		Prevention Emergency Services
Action 5. Enhance and Harden Cellular and Repeater Communications Infrastructure Countywide	Previous Action	X	X		Property Protection Structural
Action 6. Upgrade and Replace Countywide Emergency Radio Communications Infrastructure	Previous Action	X	X		Prevention Emergency Services

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 7. Emergency Water Storage & Hauling Infrastructure Project	Previous Action	X	X		Prevention Emergency Services
Action 8. Launch of PHapp Mobile Preparedness Public Health Application	New Action	X	X		Prevention Property Protection Natural Resource Protection
Agricultural Hazard Actions					
Action 9. Invasive Pests (Insect)	Previous Action	X	X		Property Protection Natural Resource Protection
Action 10. Invasive Pests (Weeds)	Previous Action	X	X		Property Protection Natural Resource Protection
Climate Change Actions					
Action 11. Climate Resilience through Multi-Hazard Mitigation	New Action	X	X		Prevention Property Protection Natural Resource Protection
Dam Failure, Flood, Localized Flood, and Heavy Rains and Storm Actions					
Action 12. Flood & Dam Failure Resilience Plan	New Action	X	X	X	Prevention Property Protection Natural Resource Protection
Earthquake Actions					
Action 13. Amador County Earthquake Preparedness & Seismic Resilience Plan	New Action	X	X		Prevention Property Protection Natural Resource Protection
Landslide Actions					
Action 14. Landslide Hazard Mitigation & Slope Stability Plan	New Action	X	X		Prevention Property Protection Natural Resource Protection
Severe Weather: Extreme Cold, Freeze, and Snow Actions					
Action 15. Severe Winter Weather Resilience Plan	New Action	X	X		Prevention Property Protection Natural Resource Protection
Severe Weather: Extreme Heat Actions					
Action 16. Extreme Heat Resilience Plan	New Action	X	X		Prevention Property Protection Natural Resource Protection
Wildfire, Drought, and Extreme Heat Actions					

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 17. Tree Mortality Program Coordinator	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 18. Countywide wildfire resiliency coordination GIS mapping project to support fuels reduction efforts	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 19. Forest Health Projects	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 20. Ingress/Egress Phases I and II: Public Education and Fuels Reduction	Previous Action	X	X		Prevention Property Protection Natural Resource Protection
Action 21. Community Fuel Break Network	Previous Action	X	X		Prevention Property Protection Natural Resource Protection
Action 22. Defensible Space Assistance	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 23. Defensible Space Public Education	New Action	X	X		Public Education
Action 24. Develop Amador County CWPP and Implementation of Identified Projects	Previous Action	X	X		Prevention Property Protection Public Education Natural Resource Protection
Action 25. Vegetation Management projects – Monitoring and Maintenance	Previous Action	X	X		Property Protection Natural Resource Protection
City of Amador City					
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Previous Action	X	X		Prevention
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	Previous Action	X	X	X	Prevention Public Education
Action 3. Old Hwy 49/Main Street Slope and Road Stabilization	Previous Action	X	X	X	Property Protection Natural Resource Protection
Action 4. Cooling Center/Severe Weather Center	New Action	X	X		Structural

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 5. Amador Creek Annual Cleaning projects	New Action	X	X	X	Property Protection Natural Resource Protection
Action 6. Stormwater Masterplan Development and Implementation	Previous Action	X	X	X	Property Protection Natural Resource Protection
Action 7. Vegetation Management and Perimeter Wildfire Protection Fuel Break	Previous Action	X	X		Property Protection Natural Resource Protection
City of Ione					
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Previous Action	X	X		Prevention
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	Previous Action	X	X	X	Prevention Public Education
Action 3. Develop a Climate Adaptation Plan	New Action	X	X	X	Prevention Public Education
Action 4. Implement Water Conservation and Drought Preparedness Program	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 5. Update Floodplain Ordinance and Join Community Rating System (CRS)	Previous Action	X	X	X	Prevention Property Protection Natural Resource Protection
Action 6. Develop a Storm Water Master Plan	Previous Action	X	X	X	Prevention Public Education
Action 7. Establish a Cooling Center Network and Shelter Upgrades	Previous Action	X	X		Emergency Services Prevention Property Protection Natural Resource Protection
Action 8. Implement Urban Forestry and Debris Management Program	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 9. Enhance Wildfire Preparedness and Defensible Space	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 10. Develop a Sustainable Sutter Creek Maintenance Program	New Action	X	X		Prevention Property Protection Natural Resource Protection

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
City of Jackson					
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Previous Action	X	X		Prevention
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	Previous Action	X	X	X	Prevention Public Education
Action 3. Creation of Drone Program	New Action	X	X		Property Protection Natural Resource Protection
Action 4. Backup Power Projects for Critical Facilities and Infrastructure (e.g. Generators, Batteries, Solar, Etc.)	New Action	X	X		Property Protection Structural
Action 5. Creek Excavation and Annual Clearing Projects	Previous Action	X	X	X	Property Protection Natural Resource Protection
Action 6. Pitt Street Bridge Replacement	New Action	X	X	X	Structural
Action 7. Mattley Street Erosion Project	New Action	X	X	X	Prevention Property Protection Natural Resource Protection
Action 8. Home Hardening Education Program/Go Bags, ARC	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 9. Defensible Space Public Education	Previous Action	X	X		Public Education
Action 10. Fuel Break Projects	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 11. Jackson Fire Station 131 Replacement Project	New Action	X	X		Structural
City of Plymouth					
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Previous Action	X	X		Prevention
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	Previous Action	X	X	X	Prevention Public Education
Action 3. Develop a Community Wildfire Prevention Plan	New Action	X	X		Prevention Public Education

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 4. Repairs of Old Sacramento Road to Reduce Flooding and Road Blockage	New Action	X	X	X	Prevention Property Protection Natural Resource Protection
Action 5. Additional Water Tank Storage	Previous Action	X	X		Structural
City of Sutter Creek					
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Previous Action	X	X		Prevention
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	Previous Action	X	X	X	Prevention Public Education
Action 3. Auditorium, Community Center, and WWTP Backup Power Generators	New Action	X	X	X	Structural
Action 4. Development of Walking Paths, Native Tree Protection, and Native Tree Species Planting	Previous Action	X	X		Prevention Property Protection Natural Resource Protection
Action 5. Henderson Underdrain	New Action	X	X	X	Structural
Action 6. Recycled Water System for New Development	New Action	X	X		Structural
Action 7. Early EQ Warning Program	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 8. Sutter Creek Excavation/Annual Cleaning Projects	Previous Action	X	X	X	Prevention Property Protection Natural Resource Protection
Action 9. Stormwater Masterplan Development and Implementation	Previous Action	X	X	X	Prevention Property Protection Natural Resource Protection
Action 10. Culvert Cleaning Projects	Previous Action	X	X	X	Prevention Property Protection Natural Resource Protection
Action 11. Karsan Drive Tributary Slope and Road Stabilization	New Action	X	X		Structural Property Protection Natural Resource Protection

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 12. Cooling Center/Severe Weather Center	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 13. Vegetation Management Enforcement and Perimeter Wildfire Protection Fuel break	Previous Action	X	X		Prevention Property Protection Natural Resource Protection
Amador Water Agency					
Action 1. AWA Tank Flexibility Connectors	New Action	X	X		Structural
Action 2. Camanche WWTP Treatment, Disposal, and Effluent Storage Upgrades	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 3. CAWP Transmission Main Improvements and Tank D Replacement	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 4. CAWP Tiger Creek Afterbay Alternate Supply	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 5. Ione WTP Backwash Handling Improvements	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 6. Tanner Clearwell Replacement	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 7. Tanner WTP Backwash Drying Beds	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 8. Tank Replacement/ Tank Repair	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 9. Amador and Ione Water Systems Taste and Odor Mitigation	Previous Action	X	X		Structural Property Protection Natural Resource Protection
Action 10. Replacement of Two Hypalon Lined and Covered Tanks with New Tanks	Previous Action	X	X		Structural Property Protection Natural Resource Protection

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 11. Mt. Crossman Main Area Tank for Upper CAWP System	Previous Action	X	X		Structural Property Protection Natural Resource Protection
Action 12. Martell Regional Lift Station and Collection System Improvements	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 13. Mace Meadows Pump Station Flooding	New Action	X	X	X	Structural Property Protection Natural Resource Protection
Action 14. Water Treatment Plant Raw Water Bypasses	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 15. Upgrade Fire Pumps	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 16. Tanner WTP Flow Control and Reliability Improvements	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 17. Ione Reliability Capacity Expansion and Site Security	New Action	X	X		Structural Property Protection Natural Resource Protection
Jackson Valley Irrigation District					
Action 1. Aquatic Invasive Species Monitoring Plan and Decontamination Station	Previous Action	X	X		Natural Resource Protection
Action 2. Long Term Water Solutions Analysis Due to Climate Change	Previous Action	X	X		Property Protection Natural Resource Protection
Action 3. Jackson Creek Dam Spillway Apron Extension Project	Previous Action	X	X	X	Structural Property Protection Natural Resource Protection
Action 4. Lake Amador Spillway Rubber Dam Project	Previous Action	X	X	X	Structural Property Protection Natural Resource Protection
Action 5. JVID Water Procurement and Additional Water Storage Study	Previous Action	X	X		Property Protection Natural Resource Protection

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 6. Jackson Creek Streambank and Levee Maintenance Project	Previous Action	X	X	X	Structural Property Protection Natural Resource Protection
Action 7. Lake Amador Drive Box Culvert Expansion Project	Previous Action	X	X	X	Structural Property Protection Natural Resource Protection

Amador County Mitigation Actions

Multi-Hazard Actions

Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Hazards Addressed: Multi-hazard (Agricultural Hazards (severe weather/pests/invasive species), Avalanche, Climate Change, Dam Failure, Drought & Water shortage (w/ tree mortality), Earthquake (w/subhazards), Floods: 1%/0.2% annual chance (w/ levee failure), Floods: Localized Stormwater, Landslide, Mudslide, Debris Flow, Severe Weather: Extreme Cold, Freeze, and Snow, Severe Weather: Extreme Heat, Severe Weather: Heavy Rains and Storms (Hail, Lightning), Severe Weather: High Winds and Tornadoes, Wildfire (w/smoke and air quality))

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): Local jurisdictional reimbursement for mitigation projects and cost recovery after a disaster is guided by Government Code Section 8685.9 (Assembly Bill (AB) 2140).

Project Description: Specifically, this section requires that each applicable jurisdiction adopt a local hazard mitigation plan (LHMP) in accordance with the federal Disaster Mitigation Act of 2000 as part of the Safety Element of its General Plan. Adoption of the LHMP into the Safety Element of the General Plan may be by reference or incorporation.

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Safety Element of General Plan

Responsible Office/Partners: Amador County Planning Department

Benefits (Losses Avoided): Incorporation of an adopted LHMP into the Safety Element of the General Plan will help jurisdictions maximize the cost recovery potential following a disaster.

Potential Funding (Local Budgets, Grant Funds, etc.): Local budgets: General Fund, Staff Time

Timeline: Within year 1 as part of LHMP adoption

Priority (H, M, L): High

Action 2. Comprehensive Public Education and Outreach Enhancement for All-Hazards Preparedness

Hazards Addressed: Multi-hazard (Agricultural Hazards (severe weather/pests/invasive species), Avalanche, Climate Change, Dam Failure, Drought & Water shortage (w/ tree mortality), Earthquake (w/subhazards), Floods: 1%/0.2% annual chance (w/ levee failure), Floods: Localized Stormwater, Landslide, Mudslide, Debris Flow, Severe Weather: Extreme Cold, Freeze, and Snow, Severe Weather:

Extreme Heat, Severe Weather: Heavy Rains and Storms (Hail, Lightning), Severe Weather: High Winds and Tornadoes, Wildfire (w/smoke and air quality))

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): Amador County residents and visitors face a wide range of natural and human-caused hazards. The 2020 Amador County LHMP identified a need for improved public understanding of risk and individual preparedness, especially in rural or high-risk areas. Public education efforts have been limited by staff capacity, funding, and coordination among local partners. Many residents lack basic preparedness items (e.g., Go Bags), do not understand evacuation protocols, or are unaware of available resources like ARC shelters or emergency alerts. Enhanced, accessible, and ongoing outreach is necessary to ensure the public is informed and empowered before, during, and after emergencies.

Project Description: Develop and implement a comprehensive, year-round public education and outreach program focused on multi-hazard preparedness across all communities within Amador County. This program will include:

- Regular in-person and virtual workshops on Go Bag preparation, family communication plans, evacuation planning, and shelter-in-place procedures.
- Partnership with schools, community groups, and businesses to distribute preparedness information.
- Quarterly public safety campaigns via social media, local radio, and print media.
- Bilingual outreach materials (English & Spanish) tailored to vulnerable populations.
- Distribution of American Red Cross materials and integration of ARC support services in outreach events.
- Creation and promotion of an "Amador Ready" webpage and/or integration with existing Amador County Sheriff's Office mobile application with hazard information, evacuation maps, emergency kit checklists, and alert registration links.
- Community drills and outreach booths at local events.

Other Alternatives:

- Status Quo: Continue limited outreach through existing channels (e.g., occasional Facebook posts)
- Digital-Only Strategy: Focus solely on online outreach and alert system, omitting in-person events and direct engagement.
- Emergency-Only Messaging: Limit outreach to periods immediately before/during active disasters.

These alternatives lack the consistency, equity, and multi-platform engagement needed to reach the entire population effectively.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Existing Public Outreach Programs, County website,

Responsible Office/Partners: Amador County Sheriff's Office of Emergency Services, American Red Cross, Amador County Public Health

Benefits (Losses Avoided):

- Increased personal and household preparedness reduces reliance on emergency services during disasters.
- Faster and more orderly evacuations.
- Greater community resilience and recovery capacity.
- Reduced injury and loss of life during emergencies.
- Reduced costs associated with unprepared populations during disaster response.
- Improved public trust and cooperation with emergency officials.

Potential Funding (Local Budgets, Grant Funds, etc.):

- FEMA Hazard Mitigation Grant Program (HMGP)
- Building Resilient Infrastructure and Communities Grant (BRIC)
- Emergency Management Performance Grant (EMPG)
- Public Health Emergency Preparedness Funds
- PG&E
- Cal-OES Grants
- County General Fund

Timeline:

- 0-2 years
  - ✓ Establish stakeholder working group
  - ✓ Develop education materials and outreach schedule
  - ✓ Launch first outreach campaign and public workshops
  - ✓ Coordinate w/ARC

- 3-5 years
  - ✓ Expand program to underserved and high-risk communities
  - ✓ Evaluate effectiveness via public surveys
  - ✓ Update materials and incorporate new hazards or best practices
  - ✓ Launch website and incorporate resources into existing mobile application

Project Priority (High, Medium, Low): High

Action 3. Backup Power Projects for Critical Facilities & Infrastructure

Hazards Addressed: Multi-hazard (Agricultural Hazards (severe weather/pests/invasive species), Avalanche, Climate Change, Dam Failure, Drought & Water shortage (w/ tree mortality), Earthquake (w/subhazards), Floods: 1%/0.2% annual chance (w/ levee failure), Floods: Localized Stormwater, Landslide, Mudslide, Debris Flow, Severe Weather: Extreme Cold, Freeze, and Snow, Severe Weather: Extreme Heat, Severe Weather: Heavy Rains and Storms (Hail, Lightning), Severe Weather: High Winds and Tornadoes, Wildfire (w/smoke and air quality))

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): Amador County is frequently impacted by power outages caused by Public Safety Power Shutoffs (PSPS), wildfire threats, and other extreme weather events. The 2020 LHMP identified that many of the County's critical facilities, including Emergency Operations

Centers (EOCs), fire stations, law enforcement offices, water/sewer systems, shelters, and communication towers, lack reliable, long-term backup power systems.

Although some progress has been made in this area, the lack of redundancy at many facilities poses a serious threat to emergency response, medical care, public safety, and essential infrastructure continuity during disasters. Some facilities rely on outdated or undersized generators, while others have no backup system at all. Investing in diversified back power solutions such as generators, battery storage, and solar power with storage will significantly increase the County's resilience.

Project Description: This mitigation project will include:

- Conducting a countywide assessment of existing backup power capabilities and gaps at critical facilities and infrastructure nodes (e.g., EOCs, fire stations, law enforcement offices, water/wastewater treatment plants, shelters, communication towers.)
- Prioritizing Upgrades based on vulnerability, service population, and hazard exposure.
- Procuring and installing diesel, propane, or natural gas generators where appropriate.
- Implementing solar-plus-storage microgrids for high-use public buildings or community shelters to reduce reliance on fuel.
- Ensuring all backup systems are maintained and regularly tested, and that staff are trained in proper use.

Other Alternatives:

- Do Nothing: Continue relying on aging or absent backup system, risking loss of function during outages
- Mobile Generators Only: Deploy trailer-mounted generators when outages occur. However, this option is limited by fuel supply, logistics, and deployment delays.
- Only Solar Installations: Focus solely on solar energy without storage. This does not address nighttime outages or cloudy-day failures.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Emergency Plans

Responsible Office/Partners: Amador County Sheriff's Office of Emergency Services, Amador County General Services Administration, Amador County Public Works, PG&E, Local law enforcement agencies and fire stations, and Special Districts

Benefits (Losses Avoided):

- Continuity of essential government functions during disasters
- Maintenance of communications and coordination in emergency response
- Protection of vulnerable populations who depend on shelter and medical facilities
- Avoidance of water/wastewater system failure and association environmental & public health risks
- Reduced economic and service disruption during PSPS or natural hazard events
- Increased confidence in local government preparedness

Potential Funding (Local Budgets, Grant Funds, etc.):

- FEMA Hazard Mitigation Grant Program (HMGP)
- FEMA Building Resilient Infrastructure & Communities Program (BRIC)

- Cal-OES Grants
- California Energy Commission Resilient Communities program
- PG&E Grant Program

Timeline:

- Short Term:
  - ✓ Facility power needs assessment
  - ✓ Project scoping and grant application
  - ✓ Procurement for priority sites

- Medium Term:
  - ✓ Full deployment at prioritized sites
  - ✓ Development of testing/maintenance schedule
  - ✓ Training

- Long Term:
  - ✓ Expansion to secondary facilities
  - ✓ Solar microgrid installation at designated resilience hubs or shelters
  - ✓ Ongoing system maintenance and lifecycle replacement

Project Priority (High, Medium, Low): High

Action 4. Establish and Fund a Full-Time Geographic Information Systems (GIS) position for Hazard Mitigation and Emergency Planning

Hazards Addressed: Multi-Hazard

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): The 2020 Amador County LHMP highlights the need for improved hazard mapping, risk analysis, evacuation route modeling, and real-time data sharing to support emergency response and mitigation. Geographic Information Systems (GIS) are essential tools in identifying hazard exposure, modeling impact areas, planning evacuations, coordinating resources, and informing the public.

Currently, Amador County lacks a dedicated, full-time GIS professional to support countywide hazard mitigation and emergency management functions. A permanent GIS position would greatly enhance the County's ability to plan for, respond to, and recover from disasters.

Project Description: Hire and fund a full-time County GIS Specialist under the Department of Information Technology or the Planning Department, responsible for the following activities:

- Maintain and update hazard layers (e.g., wildfire zones, floodplains, evacuation zones, infrastructure maps)
- Support hazard mitigation planning with risk assessments and vulnerability analysis
- Develop GIS tools and dashboards for decision-makers and first responders

- Assist in creating and maintaining evacuation maps, emergency shelter data, and situational awareness platforms
- Generate public-facing tools and maps for community preparedness
- Integrate GIS into Continuity of Operations Plans (COOP), Emergency Operations Plans (EOP), and LHMP updates
- Partner with state agencies (e.g., Cal OES, CalFire) and local jurisdictions for GIS data exchange and coordination

Other Alternatives:

- Status Quo: Continue without a GIS Specialist
- Contract GIS: Outsourcing may work temporarily but lacks the institutional knowledge, continuity, and cost-effectiveness of a full-time role.
- Regional Shared GIS Resource: Explore partnership with nearby counties. While potentially cost-saving, this limits the responsiveness needed for Amador-specific needs.

Existing Planning Mechanism(s) through which Action Will Be Implemented: County budgets and staffing plans

Responsible Office/Partners: Amador County Planning Department, Amador County Information Technology Department

Benefits (Losses Avoided):

- Improved identification of hazard-prone areas and vulnerable populations
- Faster, data-driven emergency response and evacuation coordination
- Enhanced public information during disasters (e.g., interactive evacuation maps)
- More competitive grant applications with data-backed risk assessments
- Improved planning for infrastructure investments and resource deployment
- Increased operational efficiency and interagency coordination
- Better compliance with FEMA and Cal OES hazard mitigation and emergency management standards

Potential Funding (Local Budgets, Grant Funds, etc.): FEMA Hazard Mitigation Grant Program (HMPG), Building Resilient Infrastructure & Communities Grant (BRIC), State Homeland Security Program (SHSP), County General Fund

Timeline:

- Short Term: (0-1 year)
  - ✓ Identify funding source(s)
  - ✓ Update job description and classification
  - ✓ Hire GIS Specialist

- Medium Term: (1-3 years)
  - ✓ Develop and integrate GIS systems across departments
  - ✓ Complete first phase of hazard mapping and public dashboards

- Long Term: (Ongoing)
  - ✓ Maintain, update, and expand GIS capabilities

- ✓ Integrate GIS into all County hazard and resilience planning

Project Priority (High, Medium, Low): High

Action 5. Enhance and Harden Cellular and Repeater Communications Infrastructure Countywide

Hazards Addressed: Multi-Hazard

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): Amador County's mountainous terrain, rural population, and dependence on above-ground infrastructure make it particularly vulnerable to communications failures during disasters. The 2020 Amador County LHMP identifies communication outages as a recurring vulnerability, especially during PSPS events and wildfires when towers often lose power or become damaged. Several areas of the county also suffer from limited or no cellular coverage under normal conditions, complicating emergency response and public alerting.

Inadequate cell service undermines public warning systems (e.g., Wireless Emergency Alerts), responder coordination, and public ability to call for help. A hardened, redundant cellular and repeater infrastructure is essential for life safety and effective disaster response.

Project Description:

- Cell Coverage Assessment & Planning:
  - ✓ Conduct a countywide assessment of cell coverage gaps and tower vulnerabilities.
  - ✓ Identify critical areas lacking service (e.g., evacuation routes, shelters, fire-prone zones).
- Infrastructure Enhancements:
  - ✓ Construct new permanent cell towers and repeaters in underserved and high-risk zones.
  - ✓ Install backup generators, solar panels, and/or battery storage at existing tower sites.
  - ✓ Partner with cellular providers to harden critical sites against wildfire and power loss.
- Deployable Assets:
  - ✓ Acquire or pre-position mobile cellular repeaters (e.g., COWs – Cells on Wheels) for rapid deployment during outages.
  - ✓ Integrate mobile units into emergency operations planning and exercises.
- Public-Private Coordination:
  - ✓ Work with Verizon, AT&T, FirstNet, and other carriers to upgrade existing assets, share infrastructure data, and co-fund new installations.
  - ✓ Ensure interoperability with county radio and dispatch systems.

Other Alternatives:

- Status Quo: Rely on existing cellular networks and hope for carrier-driven upgrades. This leaves many areas exposed to prolonged outages and slow recovery
- Satellite Phones Only: Provide satellite phones to key personnel. Helpful for redundancy, but impractical for widespread public communication and limited bandwidth.

- Fixed Wireless Mesh Network: Establish a proprietary emergency communication network. Expensive and redundant where cell improvements are more scalable.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Emergency plans: EOP and Annexes

Responsible Office/Partners: Amador County Sheriff's Office of Emergency Services, Local Fire Departments, Local Police Departments, American Legion Ambulance, and/or Cell Providers

Benefits (Losses Avoided):

- Improved public access to emergency alerts and warnings
- Greater responder coordination and situational awareness
- Reduced response times and faster resource deployment
- Increased survivability of communication infrastructure during PSPS and natural disasters
- Continuity of public safety services in remote and rural areas
- Reduced loss of life and property due to faster emergency response
- Greater equity in access to emergency services across all parts of the county

Potential Funding (Local Budgets, Grant Funds, etc.): FEMA Hazard Mitigation Grant Program (HMGP), FEMA Building Resilient Infrastructure and Communities (BRIC), California Public Utilities Commission (CPUC) PSPS Mitigation Funds, California Office of Emergency Services (Cal OES) Infrastructure Grants, or State Homeland Security Program (SHSP)

Timeline:

- Short-Term (0–1 year):
  - ✓ Conduct coverage assessment and planning
  - ✓ Identify funding sources and partnerships
  - ✓ Procure mobile repeaters for initial deployment

- Medium-Term (1–3 years):
  - ✓ Construct new towers/repeaters in prioritized zones
  - ✓ Install backup power and hardening features
  - ✓ Conduct community outreach and integration with EOP

- Long-Term (3–5+ years):
  - ✓ Maintain and upgrade infrastructure as technology evolves
  - ✓ Expand coverage to remaining underserved areas
  - ✓ Conduct periodic testing and disaster communication exercises

Action 6. Upgrade and Replace Countywide Emergency Radio Communications Infrastructure

Hazards Addressed: Multi-Hazard

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): Reliable emergency communications are critical for coordinated response and life safety during disasters. The 2020 Amador County LHMP identifies aging and fragmented radio infrastructure as a major vulnerability for first responders, particularly law enforcement, fire, EMS, and emergency management personnel. Key issues include:

- Inadequate coverage in mountainous and rural areas
- Limited interoperability between jurisdictions
- Increasing equipment failure due to age and deferred maintenance
- Power and connectivity vulnerabilities at key repeater sites.

Without a modern and resilient communications network, Amador County's response capacity is significantly reduced in fast-moving or multi-agency events.

Project Description: Modernize and expand the County's emergency communications network through phased replacement of radios, repeaters, towers, and supporting infrastructure. The project will include:

- Assessment and mapping of current coverage gaps and equipment condition
- Replacement of aging repeaters, antennas, and associated hardware
- Transition to P25 Phase II digital trunked radio systems (where appropriate)
- Installation of redundant power (generators, batteries, solar) at repeater sites
- Development of radio interoperability plans with CalFire, CHP, neighboring counties, and local fire/law enforcement agencies
- Standardization and bulk procurement of portable and mobile radios for field staff
- Integration with GIS and dispatch systems for improved situational awareness
- Installation of equipment in priority locations.

Other Alternatives:

- Status Quo: Continue using legacy systems until failure. This increases the risk of communications breakdown during emergencies.
- Partial Upgrade: Replace only mobile or portable radios. This improves user equipment but does not guarantee improved coverage, repeaters, or interoperability gaps.
- Leased Network Services: Contract with private carriers of regional networks. While supplemental, this does not provide the resilience of a dedicated county system.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Amador County Emergency Operations Plan

Responsible Office/Partners: Amador County Sheriff's Office, Local Fire Departments, Local Police Departments, American Legion Ambulance, Amador County Public Works

Benefits (Losses Avoided):

- Reliable, 24/7 emergency communications in all hazard scenarios
- Faster response and coordination in mutual aid/multi-agency incidents
- Enhanced responder safety and situational awareness
- Reduced delays and errors in dispatch and field operations
- Increased coverage in rural and high-risk areas
- Avoidance of system failure during PSPS and natural disasters

Potential Funding (Local Budgets, Grant Funds, etc.): FEMA Hazard Mitigation Grant Program (HMGP), FEMA Homeland Security Grant Program (HSGP), Cal-OES Grants, Partner Agencies, County General Fund

Timeline:

- Short Term: (0-1 year)
  - ✓ Conduct full system audit
  - ✓ Identify funding sources and develop engineering specifications
  - ✓ Apply for grants and secure budget

- Medium Term: (1-3 years)
  - ✓ Begin phased installation of new infrastructure
  - ✓ Deploy upgraded radios to field personnel
  - ✓ Train users on systems and interoperability protocols

- Long Term: (3-5 years)
  - ✓ Full system modernization
  - ✓ Integrate with GIS, Dispatch, and Mutual Aid systems
  - ✓ Maintain and test backup power and resilience measures

Project Priority (High, Medium, Low): High

Action 7. Emergency Water Storage & Hauling Infrastructure Project

Hazards Addressed: Multi-Hazard

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): Amador County relies on a limited number of surface water and groundwater sources to supply drinking water, agriculture, fire suppression, and emergency shelter needs. The 2020 LHMP recognizes drought, wildfire, and infrastructure failure as major threats to water supply, particularly for vulnerable rural communities, critical facilities, and fire protection services.

Many small water systems and private wells are vulnerable to prolonged outages during emergencies. In particular, wildfires and PSPS events can disrupt pumping stations and storage tank operations. There is also a growing need for mobile water hauling and emergency storage systems for use during system outages, contamination incidents, or when traditional delivery methods fail.

A coordinated emergency water storage and hauling system will enhance community resilience, reduce reliance on bottled water during crises, and support firefighting operations during peak wildfire seasons.

Project Description: This project involves the development and deployment of a countywide emergency water storage and hauling capability, in partnership with the State of California. Key components include:

- Fixed Emergency Storage Tanks
  - ✓ Install large-capacity water storage tanks in strategic locations (fire stations, public works yards, rural community centers, schools, shelters, etc.,)

- Water Hauling Equipment
  - ✓ Procure water tenders and tanker trailers capable of delivering water to remote or disconnected areas.
- Water Fill Stations
  - ✓ Develop or expand public and emergency-use water fill stations accessible to mutual aid partners and residents.
  - ✓ Ensure capability for gravity or pump-powered access during power failures.
- Mobile Treatment Units
  - ✓ Explore inclusion of mobile water purification of chlorination systems to treat hauled water as needed.
- Integration with State Emergency Water Program
  - ✓ Coordinate with State resources and planning efforts for pre-positioning assets and technical support.

Other Alternatives:

- Status Quo: Continue relying on ad hoc bottle water distribution or private contracts during emergencies. This is inefficient, slow, and costly during large-scale disasters.
- Facility-by-Facility Resilience: Have each critical facility develop its own water backup. This leads to inconsistent standards and lacks centralized coordination.
- Reservoir Expansion Only: Long-term solution but does not address short-term water transport and emergency needs.

Existing Planning Mechanism(s) through which Action Will Be Implemented: SB552 Drought plan and other Drought and water supply plans; Emergency Operations Plans

Responsible Office/Partners: Amador County Sheriff's Office of Emergency Services, Amador Water Agency, Amador County Environmental Health, Amador County Public Works, Local Fire Departments & Schools, California Department of Water Resources, and Amador County and California Department of Public Health

Benefits (Losses Avoided):

- Rapid deployment of water for fire suppression and public health emergencies.
- Reduced public exposure to contaminated or unavailable water supplies
- Continuity of operations at emergency shelters and critical facilities
- Lower costs and delays from emergency bottle water procurement
- Increased capacity to serve remote and underserved populations.
- Support for agricultural continuity during prolonged droughts or outages
- Enhanced interagency coordination and mutual aid readiness

Potential Funding (Local Budgets, Grant Funds, etc.): FEMA Hazard Mitigation Grant Program (HMPG), FEMA Building Resilient Infrastructure & Communities (BRIC), California Department of Water Resources Grants, California Climate Resilience Program, State Water Resources Control Board Emergency Drinking Water Funds, USDA Rural Development Programs

Timeline:

- Short Term: (0-1 year)
  - ✓ Conduct needs assessment and stakeholder engagement
  - ✓ Identify priority sites for tanks and hauling support
  - ✓ Secure design specs, environmental compliance, and funding applications.

- Medium Term: (1-3 years)
  - ✓ Procure and install emergency storage systems
  - ✓ Purchase and train staff on hauling equipment
  - ✓ Establish fill stations and storage rotation schedules

- Long Term: (3-5 years)
  - ✓ Integrate water logistics into emergency exercises
  - ✓ Maintain, inspect, and rotate emergency water stocks
  - ✓ Expand program to new sites and incorporate mobile treatment

Project Priority (High, Medium, Low): High

Action 8. Launch of PHapp Mobile Preparedness Public Health Application

Hazards Addressed: Public Health Emergencies, Disease Outbreaks, Extreme Weather Events, Wildfire Smoke/Power Outages, Hazardous Material Events

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): Amador County is a rural jurisdiction with geographically dispersed and vulnerable populations, including seniors, individuals with limited mobility, and those with limited access to technology or communication systems. Ensuring timely, trusted communication during a public health emergency has historically been a challenge, particularly in areas with limited infrastructure or unreliable cell service.

Project Description: Amador County Public Health has partnered with Wehealth and its Public Health Preparedness Platform, PHapp. This app was created to provide a free, county-specific mobile application that delivers real-time public health alerts and information to residents. The app enables Public Health to send notifications during emergencies, disease outbreaks, extreme weather events, or other threats. Key features include local event alerts, customizable notification settings, and an easy-to-use design that increases community access to credible information and supports emergency preparedness.

Other Alternatives:

- Use of social media or county website only (less direct and time-sensitive)
- Reverse 911 system (limited flexibility and scope)
- Printed materials (not viable for real-time alerts)

Existing Planning Mechanism(s) through which Action Will Be Implemented:

- Public Health Emergency Preparedness Plans
- Mass Communication Plan

- Local Hazard Mitigation Plan

Responsible Office/Partners: Amador County Public Health Emergency Preparedness Program, Amador County Public Health Communications Team, PHapp (Wehealth), National Weather Service-Sacramento station-NWS, Amador Air District-AAD, Food and Drug Administration-FDA, Center for Disease Control-CDC

Benefits (Losses Avoided):

- Faster, more equitable communication with all community members
- Increased emergency readiness across vulnerable populations
- Reduced misinformation and confusion during crises
- Improved coordination with response partners

Potential Funding (Local Budgets, Grant Funds, etc.):

- HPP/PHEP Grants-(Though these programs and their budgets have been reduced again for the FY 25-26, so we're unsure of future sustainability)
- In-kind support through PHapp partnership
- Other potential funding opportunities?

Timeline: Initial App Launch: Late Spring, 2025; Ongoing Engagement and Integration: FY 2025-2027

Project Priority (High, Medium, Low): Medium

Agricultural Hazard Actions

Action 9. Invasive Pests (Insect)

Hazards Addressed: Invasive Pests (Insect)

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background (Problem Statement): Invasive insects can decimate local agricultural crops such as grapes, walnuts, and timber. They also are known to vector disease and pathogens such as Pierces' disease.

Project Description: Monitoring invasive insects through urban and crop specific insect traps to located and delimitate the introduction and spread of these insects.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: California Department of Food & Agriculture (CDFA) annual Pest Detection agreements with Amador County to deploy and service traps each season. Treatments to control infestations may be possible if found.

Responsible Office/Partners: Amador County Department of Agriculture / California Department of Food & Agriculture (CDFA)

Benefits (Losses Avoided): If insects that make there way into Amador County are trapped/found and eliminated before they establish an infestations in the commercial agricultural areas. This will reduce the possible losses to production Agriculture in Amador County.

Potential Funding (Local Budgets, Grant Funds, etc.): State funding through CDFA and Amador County general fund support through the Amador County Department of Agriculture

Timeline: Seasonal and ongoing for the 5 years covered by this LHMP

Project Priority (High, Medium, Low): Medium

Action 10. Invasive Pests (Weeds)

Hazards Addressed: Invasive Pests (Weeds)

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background (Problem Statement): Invasive insects can decimate local agricultural crops such as grapes, walnuts, and timber. They also are known to vector disease and pathogens such as Pierces' disease.

Project Description: Monitoring invasive insects through urban and crop specific insect traps to located and delimitate the introduction and spread of these insects.

Other Alternatives: No action

Existing Planning Mechanism(s) through which Action Will Be Implemented: California Department of Food & Agriculture (CDFA) annual Pest Detection agreements with Amador County to deploy and service traps each season. Treatments to control infestations may be possible if found.

Responsible Office/Partners: Amador County Department of Agriculture / California Department of Food & Agriculture (CDFA)

Benefits (Losses Avoided): If insects that make there way into Amador County are trapped/found and eliminated before they establish an infestations in the commercial agricultural areas. This will reduce the possible losses to production Agriculture in Amador County.

Potential Funding (Local Budgets, Grant Funds, etc.): State funding through CDFA and Amador County general fund support through the Amador County Department of Agriculture

Timeline: Seasonal and ongoing for the 5 years covered by this LHMP

Project Priority (High, Medium, Low): Medium

Climate Change Actions

Action 11. Climate Resilience through Multi-Hazard Mitigation

Hazards Addressed: Climate Change, Wildfire and wildfire smoke, Extreme heat/heat waves, Drought & Water Scarcity, Flooding associated w/intense storms

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): Climate projections indicate increasing frequency and severity of heat waves, drought, wildfire, and associated air quality issues within Amador County. Such shifts exacerbate threats to public health—especially for vulnerable groups including older adults, children, and people with chronic conditions—as noted in the County's health profile report CDPH. Infrastructure, agriculture, and water systems face growing strain under these conditions. Without proactive mitigation and adaptation strategies, cumulative impacts will degrade community resilience and critical services.

Project Description:

- Wildland Fuel Reduction + Community Defensible Space Program
  - ✓ Fire Districts + Public Works + Planning + ARCD + OES
  - ✓ Expand fuel-break maintenance, educational outreach for property owners, seek grants for defensible space & home hardening.
- Heat-Wave Response Infrastructure
  - ✓ Public Health + OES + Environmental Health
  - ✓ Grow Cooling Center location options (libraries, community centers, etc.)
  - ✓ Establish Community Outreach registration programs for vulnerable individuals.
- Drought Resilience
  - ✓ Amador Water Agency + Ag Dept + Planning + OES
  - ✓ Promote water conversation, incentives for drought-resistant landscaping, monitoring for groundwater and surface water readiness.
- Flood Mitigation Enhancements
  - ✓ Public Works + Planning + OES
  - ✓ Update mapping for extreme storm/flood zones, implement natural stormwater retention projects, improve infrastructure drainage in high-risk areas

Other Alternatives:

- Status Quo: Continue current hazard programs without targeted climate focus.
  - ✓ Pros: minimal new resource needs.
  - ✓ Cons: Vulnerabilities deepen as climate intensifies; uncoordinated responses.
- Narrow Hazard-Specific Approach: Tackle each hazard separately (e.g. wildfire fuels reduction, heat shelters, flood control).
  - ✓ Pros: focused interventions.
  - ✓ Cons: Misses synergies; resource duplication; limited cross hazard preparedness.
- Integrated Climate-Hazard Action Plan (Preferred): A coordinated package of mitigation, adaptation, public health, and infrastructure actions that addresses multiple climate enhanced hazards and target vulnerable populations for greatest benefit.

Existing Planning Mechanism(s) through which Action Will Be Implemented: General Plan Elements, Related hazard plans: Drought, Flood, Extreme Weather, Wildfire, others

Responsible Office/Partners: Fire Districts, Public Works, Planning, ARCD, Environmental Health, Ag Dept, OES

Benefits (Losses Avoided): Reduced property damage, Lower firefighting costs, improved public health, fewer heat-related deaths/hospitalizations, protection for vulnerable groups, sustained water supply, protection of agricultural.

Potential Funding (Local Budgets, Grant Funds, etc.): HMGP, BRIC, FMA, Cal-Fire

Timeline: Within 5 years

Project Priority (High, Medium, Low): Medium

Dam Failure, Flood, Localized Flood, and Heavy Rains and Storm Actions

Action 12. Flood & Dam Failure Resilience Plan

Hazards Addressed: Dam Failure Inundation, Flooding, Localized Flooding, Heavy Rains & Snow

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background (Problem Statement): Amador County is downstream of several reservoirs and dams with dam-failure inundation zones. In heavy storm, snowmelt, or seismic events – even slow-release – can produce catastrophic downstream flooding. Localized floods also occur in low-lying areas and roads during intense rainfall or snowmelt. Existing maps and emergency plans are limited in community-wide reach, and residents in inundation zones map lack awareness or preparedness. The County's floodplain management and hazard vulnerability reports note widespread exposure to these risks.

Project Description:

- Dam Safety & Emergency Action Planning
  - ✓ OES + DWR
  - ✓ Map & review inundation zones; coordinate with DWR inundation mapping guidelines.
  - ✓ Update or develop EAPs for relevant dams; train first responders.
  - ✓ Conduct community education on dam risk and evacuation protocols
- Flood Mitigation & Infrastructure
  - ✓ Public Works + Planning + OES
  - ✓ Assess & upgrade culverts, drainage systems in flood-prone areas
  - ✓ Retrofit critical infrastructure (roads, bridges) to withstand high-flow scenarios.
  - ✓ Establish or expand retention basins, bioswales, and natural stormwater features to reduce peak flows.
- Snowpack & Storm Preparedness
  - ✓ Public Works + Cal-Trans +OES
  - ✓ Monitor snowpack and melting trends; issue alerts when rapid thaw risk is high
  - ✓ Clear critical drainage channels before spring thaws; pre-position sandbags, barriers
  - ✓ Train community volunteers in flood watch and flood response support
- Community Engagement & Equity
  - ✓ Planning + OEs
  - ✓ Host outreach in communities within inundation zones; including underserved and remote residents

Other Alternatives:

- Status Quo – Rely on existing flood/dam plans.
  - ✓ Cons: Low awareness, limited mitigation, reactive responses only.
- Partial Upgrades – Improve flood infrastructure (culverts, drainage) without dam safety coordination.
  - ✓ Cons: Dam failure hazard remains unmanaged; siloed approach.
- Integrated Flood/Dam Resilience Strategy (Preferred) – Develop coordinated actions across dam safety, flood infrastructure, emergency awareness and planning to reduce both dam-related and localized flood risk.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Emergency Plans, Related hazard plans: Dam EAPs, Flood, Extreme Weather, others

Responsible Office/Partners: OES, DWR, Public Works, Planning, Cal-Trans

Benefits (Losses Avoided): Timely dam-failure warnings and evacuation systems prevent fatalities and injuries. Structural upgrades and stormwater management reduce damage to homes, roads, utilities. Proactive planning diminishes rescue efforts, road closures, and cleanup expenses. Hardening drainage and tech improves transportation resilience and minimizes closures. Educated residents respond more quickly in emergencies, reducing chaos and loss.

Potential Funding (Local Budgets, Grant Funds, etc.): FEMA grants (HMA related), Cal-OES, California/DWR

Timeline: Annually and within 5 years

Project Priority (High, Medium, Low): Medium

Earthquake Actions

Action 13. Amador County Earthquake Preparedness & Seismic Resilience Plan

Hazards Addressed: Earthquakes. Secondary hazards: landslides, utility disruption, structural failure, HAZMAT releases.

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background (Problem Statement): Amador County lies near the Foothills Fault System and is within shaking influence from larger regional faults such as the Calaveras and Hayward systems. While catastrophic earthquakes are less frequent than in coastal California, moderate events can cause significant damage due to:

- Older unreinforced masonry (URM) buildings in historic towns (Sutter Creek, Jackson, Ione).
- Critical infrastructure (bridges, utilities, emergency facilities) built prior to modern seismic standards.
- Limited public preparedness for earthquake response.

Damage from a moderate earthquake could disrupt transportation, emergency response, water and power supply, and historic/cultural preservation.

Project Description:

- Seismic Risk Assessment & Mapping
  - ✓ Update seismic hazard mapping for faults, liquefaction zones, and landslide-prone slopes.
  - ✓ Identify critical facilities and lifeline infrastructure at greatest seismic risk.
- Structural Mitigation & Retrofits
  - ✓ Prioritize retrofits of County-owned critical facilities
  - ✓ Support grant-funded retrofits for schools and private, critical businesses (grocery, fuel, medical)
  - ✓ Assess bridges, overpasses and water/wastewater systems for seismic safety upgrades.
- Nonstructural Hazard Reduction
  - ✓ Secure nonstructural hazards in government buildings (equipment, shelving, HAZMAT)
  - ✓ Promote nonstructural mitigation for businesses and homeowners through outreach.
- Public Education & Preparedness
  - ✓ Expand community earthquake preparedness programs (Great California ShakeOut)
  - ✓ Distribute preparedness kits, evacuation guidance and Drop-Cover-Hold training materials.

Other Alternatives:

- Status Quo – Maintain current preparedness activities.
  - ✓ Cons: No reduction in structural vulnerability; high recovery costs.
- Targeted Retrofits Only – Focus exclusively on high-risk URM buildings.
  - ✓ Cons: Leaves other critical infrastructure and community preparedness gaps.
- Comprehensive Seismic Resilience Program (Preferred) – Combines structural mitigation, infrastructure upgrades, and community preparedness to reduce life-safety risk and economic losses.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Capital Improvement Plans

Responsible Office/Partners: OES, Planning, Building Department, Public Works, Facilities, Public Health

Benefits (Losses Avoided): Reduced fatalities and injuries from building collapse, falling debris, and utility failure. Lower repair/reconstruction costs by retrofitting vulnerable structures before an event. Protects historic downtowns and heritage structures that contribute to tourism. Keeps government, emergency services, utilities, and businesses functional post-event.

Potential Funding (Local Budgets, Grant Funds, etc.): HMGP, BRIC, FEMA Public Assistance (post event), Cal-OES, PG&E

Timeline: Within 5 years

Project Priority (High, Medium, Low): Medium

Landslide Actions

Action 14. Landslide Hazard Mitigation & Slope Stability Plan

Hazards Addressed: Landslides, debris flow, rockfalls, secondary impacts to infrastructure, utilities, and emergency access

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background (Problem Statement): Amador County's terrain includes steep slopes, weathered rock, and soils susceptible to movement during intense rainfall, seismic shaking, or following wildfire. High-risk areas include:

- Road corridors (e.g., Hwy 88, mountain passes, rural canyon roads)
- Hillsides above residential areas
- Post-burn slopes where vegetation loss increases runoff and erosion

Landslides can block roads, isolate communities, damage structures, disrupt utilities, and require costly emergency repairs. Preventive slope stabilization and early-warning efforts can reduce these impacts.

Project Description:

- Risk Assessment & Mapping
  - ✓ Update landslide hazard maps using recent geologic surveys, post-fire assessments, and LiDAR terrain analysis.

Prioritize slopes adjacent to critical transportation routes and populated areas.

- Slope Stabilization & Infrastructure Protection
  - ✓ Install retaining walls, rockfall netting or soil nails in high-risk road cuts
  - ✓ Improve drainage systems to reduce water saturation of slopes
  - ✓ Re-vegetate burned or disturbed slopes to prevent erosion
- Monitoring & Early Warning
  - ✓ Implement slope movement monitoring (survey markers, inclinometers) in high-risk areas.
  - ✓ Coordinate with Cal-Trans and regional agencies for debris flow and slope failure alerts.
- Public Education & Preparedness
  - ✓ Provide information to residents in slide-prone areas about warning signs (soil cracks, leaning trees) and evacuation readiness.
  - ✓ Offer guidance on private slope stabilization and drainage management
- Post-Fire Landslide Risk Reduction
  - ✓ Conduct rapid risk assessments after wildfires to identify slopes at risk of post-burn debris flow.
  - ✓ Pre-position sandbags, barriers, and erosion-control materials before winter storms.

Other Alternatives:

- Status Quo – Respond to landslides as they occur.
  - ✓ Cons: High emergency repair costs; extended road closures; recurring damage.
- Reactive Engineering Approach – Stabilize only after major failures.

- ✓ Cons: Costly, disrupts transportation, does not prevent recurring damage.
- Proactive Risk Reduction & Slope Management (Preferred) – Identify high-risk areas, stabilize proactively, improve drainage, and establish early-warning and response capabilities.

Existing Planning Mechanism(s) through which Action Will Be Implemented: None

Responsible Office/Partners: Planning, OES, Public Works, Public Health, Fire Departments

Benefits (Losses Avoided): Prevents fatalities and injuries from sudden slope failure or debris flow. Keeps key roads open, avoiding isolation of communities and emergency access delays. Preventive stabilization is far less expensive than repeated emergency clearance and reconstruction. Protects power lines, pipelines and communications infrastructure from slope failures.

Potential Funding (Local Budgets, Grant Funds, etc.): HMGP, BRIC, FEMA Public Assistance (post event), Cal-OES.

Timeline: Within 5 years

Project Priority (High, Medium, Low): Medium

Severe Weather: Extreme Cold, Freeze, and Snow Actions

Action 15. Severe Winter Weather Resilience Plan

Hazards Addressed: Extreme cold temperatures, hard freezes, heavy snow accumulation, secondary impacts (power outages, transportation disruption, structural damages, agricultural losses)

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background (Problem Statement): Amador County experiences periodic extreme cold snaps, heavy snow, and prolonged freezes, especially at higher elevations along the Hwy 88 corridor and rural foothill areas. Risks include:

- Life safety hazards to vulnerable populations (elderly, medically fragile, low-income households without adequate heating).
- Infrastructure and utility impacts from ice, snow load, and downed power lines.
- Agricultural losses from freezes affecting vineyards, orchards, and livestock.
- Transportation hazards from snow/ice-covered roads impacting emergency access and commerce.

Without coordinated mitigation and preparedness, these events can cause costly disruptions and threaten health and safety.

Project Description:

- Vulnerable Population Protection
  - ✓ Develop extreme cold emergency outreach list (elderly, medically dependent)
  - ✓ Expand warming center locations (libraries, community centers) with backup power
  - ✓ Obtain and provide blankets, space heaters, and transport support to vulnerable residents.
- Infrastructure & Utility Hardening
  - ✓ Insulate exposed water line in County facilities; promote similar measures for homes.
  - ✓ Work w/PG&E and utilities to reduce tree/ice damage to power infrastructure
  - ✓ Assess structural capacity of critical facilities for snow load
- Transportation & Snow Management
  - ✓ Maintain snow removal capacity for priority roads, especially emergency access routes
  - ✓ Pre-position de-icing materials, snow plows and barricades in high-elevation areas
- Agricultural Freeze Protection
  - ✓ Promote frost prevention method for vineyards, orchards, and livestock
  - ✓ Provide grants or technical assistance for frost fans, wind machines and water systems
- Public Outreach & Education
  - ✓ Disseminate extreme cold/snow preparedness guidance (winter kits, heating safety)
  - ✓ Share road closure, storm alerts, and freeze warning through multiple channels.

Other Alternatives:

- Status Quo – Maintain current winter storm response.
  - ✓ Cons: Continues high costs from emergency heating, storm repairs, and agricultural losses.
- Focused Agricultural Support – Target frost protection for crops and livestock only.

- ✓ Cons: Does not address life safety, infrastructure, or transportation impacts.
- Comprehensive Winter Resilience Strategy (Preferred) – Integrates life safety, infrastructure protection, agricultural mitigation, and preparedness measures.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Emergency Plans,

Responsible Office/Partners: Public Health, Red Cross, OES, Public Works

Benefits (Losses Avoided):

- Life Safety: Prevents hypothermia, frostbite, and cold-related deaths.
- Property Protection: Reduces burst pipes, roof damage from snow loads, and utility failures.
- Agricultural Stability: Limits crop and livestock losses, preserving agricultural economy.
- Economic Continuity: Maintains transportation access for commerce and emergency services.
- Lower Emergency Costs: Reduces spending on emergency shelter, storm repairs, and power restoration.

Potential Funding (Local Budgets, Grant Funds, etc.): HMGP, BRIC, FEMA Public Assistance (post event), Cal-OES

Timeline: Within 5 years

Project Priority (High, Medium, Low): Medium

Severe Weather: Extreme Heat Actions

Action 16. Extreme Heat Resilience Plan

Hazards Addressed: Extreme Heat Waves, Prolonged high temperature periods. Secondary impacts: Power outages, wildfires, drought intensification, health emergencies

Issue/Background (Problem Statement): Amador County experiences periodic heat waves that can last several days or longer. Risks include:

- Life safety hazards for vulnerable populations (elderly, children, medically fragile, outdoor workers).
- Health emergencies from heat stroke, dehydration, and exacerbation of existing illnesses.
- Power reliability risks from increased energy demand for cooling.
- Economic impacts to agriculture, livestock, and outdoor industries.

Extreme heat events are projected to increase in frequency and intensity, making proactive mitigation essential.

Project Description:

- Vulnerable Population Protection
  - ✓ Identify high-risk individuals and maintain an emergency contact registry (elderly, medically dependent)
  - ✓ Expand cooling center locations (libraries, community centers, with backup power
  - ✓ Transportation support for vulnerable residents
- Energy Reliability & Resilience
  - ✓ Coordinate w/PG&E to minimize planned outages during extreme heat events
  - ✓ Install backup generators or solar battery systems at designated cooling centers and critical facilities
- Community Preparedness & Outreach
  - ✓ Disseminate heat safety guidance (hydration, cooling, recognizing heat illness symptoms)
  - ✓ Partner w/employers, schools, and outdoor recreation programs to promote safe heat practices
- Agricultural & Outdoor Workforce Protection
  - ✓ Provide technical guidance & support for livestock cooling systems, irrigation timing, and worker safety compliance.

Other Alternatives: No Action

- Status Quo – Continue current response-based approach.
  - ✓ Cons: Reactive only, does not reduce vulnerability or prevent health impacts.
- Targeted Cooling Centers Only – Establish limited cooling facilities during extreme heat.
  - ✓ Cons: Addresses immediate safety but not infrastructure or community-wide resilience.
- Comprehensive Heat Resilience Strategy (Preferred) – Combines life safety measures, infrastructure improvements, community outreach, and energy resilience.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Emergency Management Plans

Responsible Office/Partners: Public Health, OES, Public Works, PG&E, Ag Dept

Benefits (Losses Avoided):

- Life Safety: Prevents heat-related deaths and medical emergencies.
- Health System Relief: Reduces ER visits and hospitalizations during heat events.
- Economic Stability: Protects agricultural output, outdoor work productivity, and tourism.
- Infrastructure Resilience: Reduces strain on power systems and prolongs facility service life.
- Community Confidence: Demonstrates proactive protection for vulnerable residents.

Potential Funding (Local Budgets, Grant Funds, etc.): HMGP, BRIC, Cal-OES

Timeline: Within 5 years

Project Priority (High, Medium, Low): Medium

Wildfire, Drought, and Extreme Heat Actions

Action 17. Tree Mortality Program Coordinator

Hazards Addressed: Wildfire, Drought and Water Shortage, Severe Weather: Extreme Heat, Severe Weather: High Winds and Tornadoes (any natural hazard that affects dead and dying trees along County roads.

Goals Addressed: 1, 2, 4, 5, 6

Issue/Background (Problem Statement): Due to drought and insect infestation, trees within Amador County have been dying. The Tree Mortality Program was set up to mitigation hazard trees along County roads, thus addressing risk to the public from falling trees, while removing excess wood fuel from key roadways that would be utilized as ingress and egress during wildfire events.

Project Description: Commencing January 2017 Amador County implemented the TMP. TSS Consultants was retained as Coordinator to facilitate dead/dying tree mitigation.

Other Alternatives: No Action

Existing Planning Mechanism(s) through which Action Will Be Implemented: The County has existing contracts to identify and remove infected and dead trees throughout the County.

Responsible Office/Partners: County GSA

Benefits (Losses Avoided): Public safety

Potential Funding (Local Budgets, Grant Funds, etc.): US Forest Service match funding.

Timeline: Commencement date: Jan 2017. Project is ongoing

Project Priority (High, Medium, Low): Medium

Action 18. Countywide Wildfire Resiliency Coordination GIS Mapping Project to Support Fuels Reduction Efforts

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 4, 5, 6

Issue/Background (Problem Statement): Fuels reduction efforts are carried out by public agencies and private landowners across the county. Most are planned and implemented by the agency or landowner within their jurisdiction according to their own strategy and priorities. Some cooperative agreements exist for coordinated landscape-scale wildfire protection, but it is a challenge to share, store and update geographic information across entities, which is essential for project management and planning.

Project Description: Geographic data from wildfire mitigation projects planned and implemented by any land management agency or private landowner, if appropriate, will be shared with Amador County Planning Department: GIS and Mapping. The information will be added to the existing GIS viewer (ArcGIS Experience platform), in a publicly viewable and downloadable format. Additional layers essential for fuels reduction project planning such as roads, watercourses, parcels, will also be updated regularly in the platform.

Other Alternatives: Sharing of paper or digital maps. Sharing of individual files when multi-agency/landowner maps are required.

Existing Planning Mechanism(s) through which Action Will Be Implemented: The Amador County Community Wildfire Protection Plan (CWPP) will be rewritten in 2025-2026. It will include geographically specific risk and hazard analyses and identify past, present and future wildfire mitigation actions. County-wide coordinated GIS mapping will build off this work with regular updates.

Responsible Office/Partners: Amador County Planning Department, CALFIRE Amador-El Dorado Unit, Amador Fire Safe Council, Amador Resource Conservation District, Amador Fire Protection District, Bureau of Land Management – Mother Lode Field Office, El Dorado National Forest, Sierra Pacific Industries

Benefits (Losses Avoided): The cost of personnel time required for inter-agency collaboration will be significantly reduced if there is one accessible source which contain updated geographic information associated with wildfire mitigation projects.

Potential Funding (Local Budgets, Grant Funds, etc.): Local budgets will be required to maintain the database and existing GIS viewer. Grant-funded work will supplement the program, for example the rewriting of the CWPP in 2025-2026 and the associated geographic information that will be compiled and analyzed.

Timeline: 2025 - no end date

Project Priority (High, Medium, Low): High

Action 19. Forest Health Projects

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 4, 5, 6

Issue/Background (Problem Statement): Historic wildfire suppression, the expansion of residences within the Wildland Urban Interface (WUI), and climate change have resulted in extreme risk and vulnerability to wildfire within and beyond the County. Forested areas within the WUI are typically overcrowded with vegetation. Non-industrial private landowners and public land management agencies have limited financial means for fuels reduction treatments.

Project Description: Forest Health projects refer to landscape-scale vegetation management to improve ecosystem functions including the reduction of potential wildfire severity through fuels reduction. The Jackson Creek Forest Health Project was the first of its kind and scale in the County. The Project assisted non-industrial forest landowners in the WUI to thin overcrowded forests across over one thousand acres through mechanical mastication, hand treatment and targeted grazing. The Amador Resource Conservation District intends to implement similar projects in other areas of the County.

Other Alternatives: California Forest Improvement Program (Natural Resource Conservation Service). Assists individual landowners.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Amador County CWPP. Firewise Communities may propose Forest Health project ideas to the Amador Resource Conservation District, who will evaluate their feasibility and seek funding opportunities for planning and implementation.

Responsible Office/Partners: Firewise Communities, Amador Resource Conservation District, CALFIRE Amador-El Dorado Unit, Bureau of Land Management – Mother Lode Field Office

Benefits (Losses Avoided): Vegetative fuels reduction will reduce the intensity of future wildfires in treated areas.

Potential Funding (Local Budgets, Grant Funds, etc.): CALFIRE Forest Health grants

Timeline: Ongoing and within 1-5 years covered by this LHMP

Project Priority (High, Medium, Low): Medium

Action 20. Ingress/Egress Phases I and II: Public Education and Fuels Reduction

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 4, 5, 6

Issue/Background (Problem Statement): Vegetative growth adjacent to roads presents a danger to residents on their evacuation routes and to emergency services en route towards their destination in a wildfire situation. This is a continual maintenance issue along County- and private- maintained roads which serve as evacuation routes. Many residents in the WUI depend on a single evacuation route.

Project Description: Through the Community Ingress/Egress Project Phases I & II which concluded in 2025:

- Evacuation routes were identified, mapped and prioritized.
- Public outreach was conducted
- 113 miles of fuels reduction treatment was implemented along 113 miles of road, within 20 feet of the road edge.

The program will continue in the future pending additional grant funding.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: The Amador Fire Safe Council is seeking additional funding opportunities to resume the program.

Responsible Office/Partners: Amador County Public Works, Amador Fire Safe Council, CALFIRE Amador-El Dorado Unit, and Amador Fire Protection District

Benefits (Losses Avoided): The avoided loss of life and damage to property that can result if emergency access routes are blocked is invaluable.

Potential Funding (Local Budgets, Grant Funds, etc.): CALFIRE Fire Prevention grants, Sierra Nevada Conservancy grants

Timeline: Ongoing. Intent to obtain funding and resume program in late 2025

Project Priority (High, Medium, Low): High

Action 21. Community Fuel Break Network

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 4, 5, 6

Issue/Background (Problem Statement): Historic wildfire suppression, the expansion of residences within the Wildland Urban Interface (WUI), and climate change have resulted in extreme risk and vulnerability to wildfire within and beyond the County. Forested areas within the WUI are typically overcrowded with vegetation. Non-industrial private landowners and public land management agencies have limited financial means for fuels reduction treatments.

Project Description: Shaded fuel breaks facilitate wildfire suppression activities in strategic locations along ridgetops and main access routes. They are forested areas that are thinned to significantly reduce understory vegetation, ladder fuels, and crown connectivity of remaining overstory trees. Since the Amador Fire Safe Council (AFSC) was formed in 2002, the following fuel breaks have been implemented in the County:

- Mitchell Mine
- Pine Acres
- River Pines
- Tiger Creek
- Upper Rancheria

Community-based project proposals drive the expansion of the fuel break network to new project areas. The AFSC evaluates, plans and implements projects on a rolling basis.

Several fuel breaks are in planning including:

- Butte Mountain
- Mount Crossman
- Pine Grove Corridor
- Rendic (Amador City)
- Thompson Ridge
- Volcano Hills

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: Firewise Communities may propose Fuel Break project ideas to the Amador Fire Safe Council, who will evaluate their feasibility and seek funding opportunities for planning and implementation. The Community Wildfire Protection Plan rewrite of 2025-2026 will identify and prioritize areas for new fuel breaks.

Responsible Office/Partners: Amador Fire Safe Council, Firewise Communities, CALFIRE Amador-El Dorado Unit, Amador Fire Protection District, Bureau of Land Management – Mother Lode Field Office

Benefits (Losses Avoided): A network of shaded fuel breaks aid firefighters to contain wildfires, reducing the extent of damage done to land and property.

Potential Funding (Local Budgets, Grant Funds, etc.): CALFIRE Wildfire Prevention grants, Sierra Nevada Conservancy grants, and Bureau of Land Management grants

Timeline: Ongoing and annually within the next 5 years and beyond, depending on funding

Project Priority (High, Medium, Low): High

Action 22. Defensible Space Assistance

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 4, 5, 6

Issue/Background (Problem Statement): A significant portion of the County's residents who live within the Wildland Urban Interface (WUI) are seniors, veterans, disabled, and/or earn a low income. Defensible Space can be a challenge for any homeowner or resident to maintain, especially for the above listed vulnerable sectors of the population.

Project Description: A Defensible Space Assistance Pilot Program is in development to aid disadvantaged residents of the County to treat vegetation within 100 feet of their homes. The Pilot Program will assist at least 75 households, after which additional funding will be required.

Other Alternatives: Defensible Space Education

Existing Planning Mechanism(s) through which Action Will Be Implemented: Amador Resource Conservation District is developing the pilot program through a CALFIRE Wildfire Prevention grant.

Responsible Office/Partners: Amador Resource Conservation District, Amador Fire Protection District, and CAL FIRE Amador-El Dorado Unit

Benefits (Losses Avoided): Properly maintained Defensible Space reduces risk of damage to homes during wildfire and reduces risk of fire spreading beyond a home where a fire ignites.

Potential Funding (Local Budgets, Grant Funds, etc.): CALFIRE Wildfire Prevention grants, Sierra Nevada Conservancy grants

Timeline: Program to begin accepting applications Fall 2025. Ongoing and annually within the next 5 years and beyond, depending on funding

Project Priority (High, Medium, Low): High

Action 23. Defensible Space Public Education

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 4, 5, 6

Issue/Background (Problem Statement): Of Amador County's 41,259 residents, 23,500 live within the State Responsibility Area and the Wildland Urban Interface (2020 U.S. Census). Maintaining Defensible Space 100 feet around homes is the responsibility of the homeowner and mandated by the state of California, but compliance is challenging to achieve.

Project Description: Public education is necessary to inform residents of Defensible Space standards and requirements, which are complex and require close attention to understand and apply to one's personal property. Several organizations within the County provide education and outreach through community events and print and online resources.

Amador Fire Protection District consistently hosts public outreach events and makes home visits for Defensible Space Assessments upon request free of charge.

A Defensible Space and Firewise Landscaping demonstration site is being developed at Pioneer Veterans Hall to serve as a publicly accessible full-scale example for residents to educate themselves.

University of California Cooperative Extension: Master Gardeners hosts a Defensible Space, Home Hardening and Firewise Landscaping workshop once per year.

Red Cross provides Defensible Space, Home Hardening and Wildfire Preparedness education and outreach, emergency go-bags, and smoke detectors.

Other Alternatives: Enforcement of Public Resources Code 4291 of Government Code 51182

Existing Planning Mechanism(s) through which Action Will Be Implemented: Amador Fire Protection District: Public Information Officer, Firewise Communities, ARCD Defensible Space Assistance Program

Responsible Office/Partners: Amador Fire Protection District, Amador Fire Safe Council, Amador Resource Conservation District, CALFIRE Amador-El Dorado Unit, Red Cross, Amador County Board of Supervisors, and University of California Cooperative Extension: Master Gardeners

Benefits (Losses Avoided): Properly maintained Defensible Space reduces risk of damage to homes during wildfire and reduces risk of fire spreading beyond a home where a fire ignites.

Potential Funding (Local Budgets, Grant Funds, etc.): County budget: Amador Fire Protection District, CALFIRE Wildfire Prevention Grants

Timeline: Ongoing and annually within the next 5 years and beyond, depending on funding

Project Priority (High, Medium, Low): High

Action 24. Develop Amador County CWPP and Implementation of Identified Projects

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 4, 5, 6

Issue/Background (Problem Statement): The Community Wildfire Protection Plan (CWPP) for all of Amador County was written in 2004. Since then, several CWPP's were written for planning units within the county, but most have passed their 10-year planning horizon.

Project Description: The Amador County CWPP will be rewritten in 2025-2026.

Other Alternatives: Do not update the CWPP, remain ineligible for some wildfire mitigation funding sources.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Amador Fire Safe Council is facilitating the CWPP development process using BLM grant funding.

Responsible Office/Partners: Amador Fire Safe Council, Amador County Office of Emergency Services, CALFIRE Amador-El Dorado Unit, Amador Fire Protection District, Bureau of Land Management – Mother Lode Field Office, El Dorado National Forest, Cities of Amador City, Ione, Jackson, Plymouth, Sutter Creek, Firewise Communities

Benefits (Losses Avoided): Establish a coordinated strategy among stakeholders in the County for wildfire mitigation, especially fuels reduction project prioritization and reduction of structural ignitability. Become eligible for additional wildfire mitigation funding sources.

Potential Funding (Local Budgets, Grant Funds, etc.): Bureau of Land Management Fuels Management and Community Fire Assistance Program

Timeline: 2025-2026. Rewrite every 10 years.

Project Priority (High, Medium, Low): High

Action 25. Vegetation Management projects – Monitoring and Maintenance

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 4, 5, 6

Issue/Background (Problem Statement): Fuels reduction projects in the Wildland Urban Interface on private nonindustrial forest lands and public lands are typically implemented using grant funds. After the initial treatment and conclusion of the grant, vegetation quickly grows back and fuel loads return, but historically funding has not been secured for follow-up treatments.

Project Description: A Monitoring and Maintenance program will be established to track and manage the following types of fuels reduction projects (Mitigation Actions described in previous Worksheets):

- Forest Health
- Community Fuel Break Network
- Ingress/Egress

Information obtained through monitoring will allow for the prioritization of maintenance treatments to retain the benefits of fuels reduction projects beyond the initial treatment period. Maintenance plans will be informed by the Community Wildfire Protection Plan (CWPP).

In 2025, Amador Fire Safe Council began planning a monitoring program, and intends to fully develop it by 2026. Maintenance treatments will require continuous grant solicitations and awards.

Other Alternatives: CALFIRE Vegetation Management Program (VMP). For some project areas within the Community Fuel Break Network, a VMP may be established to enable CALFIRE contribution to fuels management through prescribed fire and mechanical treatments.

Existing Planning Mechanism(s) through which Action Will Be Implemented: No standardized system yet exists. Some follow-up treatment has been implemented within the grant period intended for the initial treatment on one Community Fuel Break: Mitchell Mine.

Responsible Office/Partners: Amador Fire Safe Council, Firewise Communities, CALFIRE Amador-El Dorado Unit, Amador Fire Protection District, Bureau of Land Management – Mother Lode Field Office, Amador County Public Works

Benefits (Losses Avoided): Consistent monitoring and maintenance of fuels reduction projects would extend the wildfire mitigation benefits of initial treatments beyond just 2-3 years.

Potential Funding (Local Budgets, Grant Funds, etc.): CALFIRE Wildfire Prevention grants, CALFIRE Forest Health grants, Sierra Nevada Conservancy grants, Bureau of Land Management grants

Timeline: Ongoing and annually within the next 5 years and beyond, depending on funding

Project Priority (High, Medium, Low): High

Chapter 6 Plan Adoption

44 CFR §201.6(c)(5): [The local hazard mitigation plan shall include] documentation that the plan has been formally approved by the governing body of the jurisdiction requesting approval of the plan (e.g., City Council, county commissioner, Tribal Council).

The purpose of formally adopting this 2025 Amador County LHMP Update is to secure buy-in from each participating jurisdiction, raise awareness of the Plan, and formalize the Plan's approval and implementation. The adoption of this LHMP Update completes Planning Step 9 of the 10-step planning process: Adopt the Plan, in accordance with the requirements of DMA 2000. For the unincorporated County and the two incorporated communities, this adoption resolution also addresses AB 2140 requiring adoption by reference or incorporation into the Safety Element of the General Plan. Two resolutions were created – one for the County and incorporated communities and one for the special districts.

The governing board for each jurisdiction has adopted this 2025 Amador County LHMP Update by passing a resolution. A copy of the generic resolutions is included in Appendix D: Adoption Resolution.

Chapter 7 Plan Implementation and Maintenance

44 CFR §201.6(c)(4): [The plan maintenance process shall include a] section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

Implementation and maintenance of this 2025 Amador County LHMP Update is critical to the success of hazard mitigation in the Amador County Planning Area. Plan implementation and maintenance is Planning Step 10 of the 10-step planning process. Accordingly, this chapter provides an overview of the overall strategy for Plan implementation and maintenance and outlines the method and schedule for monitoring, updating, and evaluating the Plan. The chapter also discusses incorporating the Plan into existing planning mechanisms and how to address continued public involvement in local hazard mitigation planning.

Chapter 3, Planning Process, includes information on the implementation and maintenance process since the adoption of the 2020 LHMP Update. This chapter includes information on the implementation and maintenance process for the development of this Plan, the 2025 Amador County LHMP Update.

7.1 Implementation

Once adopted, this 2025 Amador County LHMP Update faces the truest test of its worth: implementation. While the Plan contains many worthwhile actions, the County and all participating jurisdictions will need to decide which action(s) to undertake first. Two factors should be considered when making that decision: the priority assigned to the mitigation actions in the Plan and funding availability. Low or no-cost actions most easily demonstrate progress toward successful Plan implementation.

An important implementation mechanism that is highly effective and low-cost is incorporation of the hazard mitigation plan recommendations and their underlying principles into other plans and mechanisms such as local general plans, stormwater plans, Emergency Operations Plans (EOPs), evacuation plans, and other hazard and emergency management planning efforts by the participating jurisdictions. These jurisdictions already implement policies and programs to reduce losses to life and property from hazards. This 2025 LHMP Update builds upon the momentum developed through prior, related planning and mitigation programs and recommends implementing actions, where possible, through other programs.

Mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development. Implementation can be accomplished by adhering to the schedules identified for each action through sustained collaborative efforts, highlighting the mutual benefits of proposed mitigation actions, and the Amador County jurisdictions, its stakeholders, and the public. This is achieved through the routine actions of monitoring agendas, attending meetings, and promoting mitigation initiatives to enhance the safety and sustainability of the community. Additional mitigation strategies may include consistent and ongoing enforcement of existing policies and the vigilant review of programs for coordination and multi-objective opportunities to enhance mitigation.

Simultaneously, it is important to continuously monitor potential funding opportunities to finance mitigation actions. This may include identifying funding sources to meet local matching funds requirements under FEMA pre- and post-disaster mitigation grant programs, and other sources. When funding does become available, the participating jurisdictions will be better positioned to capitalize on the opportunity.

Responsibility for Implementation of Goals and Activities

The elected officials, executive leadership teams, responsible staff and departments, and emergency management offices of the participating jurisdictions are charged with implementation of various activities in the 2025 LHMP Update. During annual reviews as described later in this section, each participating jurisdiction should conduct an assessment of progress toward meeting the goals and activities of the LHMP Update. At that time, recommendations may be made to modify timeframes for the completion of identified mitigation actions, identify funding sources, and work with responsible entities to implement the actions. On an annual basis, the priority of various mitigation actions may be adjusted. Some activities that are found not to be feasible may be removed from the Plan entirely, while other mitigation actions unforeseen during the Plan development process may be added.

7.1.1. Role of the LHMP Update Planning Committee in Implementation and Maintenance

With adoption of this Plan, each participating jurisdiction will be responsible for LHMP implementation and maintenance. The HMPC identified in Chapter 3 (or a similar committee) will reconvene annually to ensure mitigation strategies are being implemented, and the County and Cities continue to maintain compliance with the NFIP. The Amador County, Office of Emergency Services (County OES), will continue in its role as project lead for LHMP implementation and maintenance. As such, County OES, as LHMP project lead, and all participating jurisdictions will continue their relationship, and will plan to convene the same or similar HMPC when preparing the subsequent LHMP Update. The County OES project lead, with support from participating jurisdictions and the LHMP Update HMPC will:

- Act as a forum for hazard mitigation issues;
- Disseminate hazard mitigation ideas and activities to all participants;
- Pursue the implementation of high-priority, low/no-cost recommended actions;
- Ensure hazard mitigation remains a consideration for community decision makers;
- Maintain a vigilant monitoring of multi-objective cost-share opportunities to help the community implement the Plan's recommended actions for which no current funding exists;
- Monitor and assist in the implementation and update of this Plan;
- Report on Plan progress and recommended changes to the governing boards for all participating jurisdictions; and
- Inform and solicit input from the public.

The primary duty of the County and all participating jurisdictions and the HMPC is to see the LHMP Update successfully carried out and to report to their governing boards and the public on the status of LHMP implementation and mitigation opportunities. Other duties include reviewing and promoting mitigation

proposals, considering stakeholder concerns about hazard mitigation, passing concerns on to appropriate entities, and posting relevant information about the LHMP on the websites of participating jurisdictions.

7.2 Maintenance

Plan maintenance implies an ongoing effort to monitor and evaluate LHMP implementation and to update the Plan as progress, roadblocks, or changing circumstances are encountered.

7.2.1. Maintenance Schedule

Amador County OES, as project lead, in conjunction with the LHMP leads for all participating jurisdictions, is responsible for initiating Plan reviews. In order to monitor progress and update the mitigation strategies identified in the mitigation action plan, County OES, LHMP leads from other participating jurisdictions, and the HMPC will revisit this Plan annually each year and following a hazard event to review and document progress on Plan implementation. Amador County OES will also submit a five-year written update to the State and FEMA Region IX, unless disaster or other circumstances (e.g., changing regulations) require a change to this schedule. With this 2025 LHMP Update anticipated to be fully approved and adopted in early 2026, the next required written update of the Plan must be completed by early 2031. Amador County OES will initiate the Plan Update – which may include applying for grant funding to hire professional services to assist in preparing the 2031 LHMP Update. The 2031 LHMP Update development process should be initiated in 2028 to ensure the 2031 LHMP Update can be funded and completed by this 2025 Amador County LHMP's expiration date.

7.2.2. Maintenance Evaluation Process

Evaluation of progress can be achieved by monitoring changes in vulnerabilities identified in the Plan. Changes in vulnerability can be identified by noting:

- Decreased vulnerability as a result of implementing recommended actions;
- Increased vulnerability as a result of failed or ineffective mitigation actions;
- Increased vulnerability as a result of new development (and/or annexation); and/or
- Increased vulnerability resulting from unforeseen or new circumstances.

Updates to this Plan will:

- Consider changes in vulnerability due to action implementation;
- Document success stories where mitigation efforts have proven effective;
- Document areas where mitigation actions were not effective;
- Document any new hazards that may arise or were previously overlooked;
- Incorporate new data or studies on hazards and risks;
- Incorporate new capabilities or changes in capabilities;
- Incorporate growth and development-related changes to infrastructure inventories; and
- Incorporate new action recommendations or changes in action prioritization.

Changes will be made to this Plan to accommodate for actions that have failed or are not considered feasible after a review of their consistency with established criteria, time frame, community priorities, and/or

funding resources. All mitigation actions will be reviewed during the monitoring and update of this Plan to determine feasibility of future implementation. Updating of this LHMP will be by written changes and submissions, as the participating jurisdictions and HMPC deem appropriate and necessary, and as approved by the governing boards of each participating jurisdiction. In keeping with the five-year update process, the HMPC will convene public meetings to solicit public input on this LHMP Update and its routine maintenance, and the final product will be again adopted by the governing boards of each participating jurisdiction.

Annual Plan Review Process

For the LHMP Update review process, the County OES lead, and the LHMP leads for each of the participating jurisdictions, will be responsible for facilitating, coordinating, and scheduling reviews and maintenance of the LHMP. ***The LHMP is intended to be a living document.*** The review of the 2025 LHMP Update will normally occur on an annual basis each year and will be conducted by the HMPC as follows:

- County OES will place an advertisement in the local newspaper and will utilize other public outreach mechanisms, such as e-newsletters, social media blasts, and others, advising the public of the date, time, and place for each annual review of the LHMP Update and will be responsible for leading the meeting to review the Plan.
- Notices will be mailed to the members of the HMPC, federal, state, and local agencies, non-profit groups, local planning agencies, representatives of business interests, neighboring communities, and others advising them of the date, time, and place for the review.
- County/City/District/Tribal officials will be noticed by email and telephone or personal visit and urged to participate.
- Members of any participating jurisdiction's planning commissions and other appointed commissions and groups will also be noticed by email and either by telephone or personal visit.
- Prior to the review, department heads and others tasked with implementation of the various activities will be queried concerning progress on each activity in their area of responsibility and asked to present a report at the review meeting.
- The local news media will be contacted, and a copy of the current LHMP will be available for public comment at Amador County OES as project lead.
- After the review meeting, minutes of the meeting and an annual report will be prepared by the participating jurisdictions and the HMPC and posted on the Amador County LHMP webpage for the public.
- A copy of the 2025 LHMP Update will be continually posted on the LHMP website for the participating jurisdictions.

Criteria for Annual Reviews

The criteria recommended in 44 CFR 201 and 206 will be utilized in reviewing and updating the 2025 LHMP Update. More specifically, the reviews should include the following information:

- Community growth or change in the past year.
- The number of substantially damaged or substantially improved structures by flood zone.

- The renovations to public infrastructure including water, sewer, drainage, roads, bridges, gas lines, and buildings.
- Natural hazard occurrences that required activation of the Emergency Operations Center(s) (EOC) and whether or not the event resulted in a federal disaster declaration.
- Natural hazard occurrences that were not of a magnitude to warrant activation of the EOC or a federal disaster declaration but were severe enough to cause damage in the community or closure of businesses, schools, or public services.
- The dates of hazard events and descriptions.
- Documented damages due to the events.
- Closures of places of employment or schools and the number of days closed.
- Road or bridge closures due to the hazard and the length of time closed.
- Assessment of the number of private and public buildings damaged and whether the damage was minor, substantial, major, or if buildings were destroyed. The assessment will include residences, mobile homes, commercial structures, industrial structures, and public buildings, such as schools and public safety buildings.
- Review of the status of implementation of projects (mitigation strategies) including projects completed will be noted. Projects behind schedule will include a reason for delay of implementation.
- Review of any changes in federal, state, and local policies to determine the impact of these policies on the community and how and if the policy changes can or should be incorporated into the next LHMP Update.

7.2.3. Incorporation into Existing Planning Mechanisms

Another important implementation mechanism that is highly effective and low-cost is incorporation of the 2025 LHMP Update recommendations and their underlying principles into other jurisdictional plans and mechanisms. Where possible, Plan participants will use existing plans and/or programs to implement hazard mitigation actions. As previously stated in Section 7.1 of this Plan, mitigation is most successful when it is incorporated into the day-to-day functions and priorities of government and development. The point is re-emphasized here. As described in this LHMP's capability assessment, the participating jurisdictions already implement policies and programs to reduce losses to life and property from hazards. This Plan builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing actions, where possible, through these other program mechanisms. These existing mechanisms include:

- General and master plans
- Emergency Operations Plans and other emergency management efforts
- Jurisdictional ordinances
- Flood/stormwater management/master plans
- Climate Plans
- Capital Improvement Plans and budgets
- Other plans and policies outlined in the capability assessment
- Other plans, regulations, and practices with a mitigation focus

Participating jurisdictions and HMPC members involved in these other planning and program mechanisms will be responsible for integrating the findings and recommendations of this LHMP with these other plans,

programs, etc., as appropriate. As described in Section 7.1 Implementation, incorporation into existing planning mechanisms will be done through the routine actions of:

- monitoring other planning/program agendas;
- attending other planning/program meetings;
- participating in other planning processes; and
- monitoring community budget meetings for other community program opportunities.

The successful implementation of this mitigation strategy will require constant and vigilant review of existing plans and programs for coordination and multi-objective opportunities that promote a safe, sustainable community.

Examples of incorporation of the 2025 LHMP Update into existing planning mechanisms include:

1. As recommended by Assembly Bill 2140, the County and Cities should adopt (by reference or incorporation) this LHMP into the Safety Element of their General Plans. Evidence of such adoption (by formal, certified resolution and text within the body of the Safety Element) shall be provided to CAL OES and FEMA.
2. Integration of wildfire actions identified in this mitigation strategy with the actions and implementation priorities established in existing and new Community Wildfire Protection Plans and other fire plans. Key people responsible for development and implementation of these plans participated on the HMPC. Key projects were identified and integrated specifically into this LHMP, while others currently of lessor priority should be referenced in their source document. Actual implementation of these projects will likely occur through the CWPP's processes through the efforts of each responsible jurisdiction and department.
3. Integration of many of the infrastructure, roads, and facility improvement projects with the jurisdictional Capital Improvement Programs.
4. Use of risk assessment information to inform future updates of the hazard analysis in the Emergency Operations Plans and related emergency management efforts for all participating jurisdictions.

Each jurisdiction will consider incorporation of the LHMP into planning mechanisms listed on Table 7-1.

Table 7-1 LHMP Incorporation into other Planning Mechanisms

Jurisdiction	General Plans / Master Plans/ Strategic Plans	EOP / Emergency Plans	CWPP / Fire Plans	CIP	Flood / Stormwater / Watershed Plans	Other Plans: Drought/ Water Management/ Climate Plans/ Other
Amador County	X	X	X	X	X	X
City of Amador City	X	X			X	X
City of Ione	X	X				X
City of Jackson	X	X			X	X
City of Plymouth	X	X			X	X
City of Sutter Creek	X	X				X

Jurisdiction	General Plans / Master Plans/ Strategic Plans	EOP / Emergency Plans	CWPP / Fire Plans	CIP	Flood / Stormwater / Watershed Plans	Other Plans: Drought/ Water Management/ Climate Plans/ Other
Amador Water Agency	X	X		X		X
Jackson Valley Irrigation District	X	X		X		X

In addition, the mitigation actions included within each jurisdictions' mitigation strategy contain a category identifying "Existing Planning Mechanism(s) through which Action will be Implemented" that contains how each mitigation action is related to other planning mechanisms and jurisdictional programs. Those can be found in Chapter 5 of the Base Plan for the County and within each jurisdictions' annex to this Base Plan.

Efforts should continuously be made to monitor the progress of mitigation actions implemented through these other planning mechanisms and, where appropriate, their priority actions should be incorporated into updates of this LHMP.

7.2.4. Continued Public Involvement

Continued public involvement is a crucial element of successful Plan implementation. The update process provides an opportunity to solicit participation from new and existing stakeholders and to publicize success stories from the 2025 LHMP implementation and seek additional public comment. The Plan maintenance and update process will include continued public and stakeholder involvement and input through attendance at designated committee meetings, web postings, press releases to local media, and through public hearings.

Public Involvement Process for Annual Reviews

The public will be noticed by placing an advertisement in the newspaper and will utilize other public outreach mechanisms, such as e-newsletters, social media blasts, and others specifying the date and time for the review and inviting public participation. The HMPC, local, state, and regional agencies will be notified and invited to attend and participate.

Public Involvement for Five-year Update

When the participating jurisdictions and HMPC reconvenes for the next LHMP Update, they will coordinate with all stakeholders participating in the planning process—including those that joined the committee since the planning process began—to update and revise the Plan. In reconvening, the HMPC will identify a public outreach subcommittee, which will be responsible for coordinating the activities necessary to involve the greater public. The subcommittee will develop a plan for public involvement and will be responsible for disseminating information through a variety of media channels detailing the LHMP update process. As part of this effort, public meetings will be held, and public comments will be solicited on the LHMP Update draft. In addition, continued public involvement and outreach efforts will place an emphasis on identifying and inviting representatives from underserved and vulnerable populations to be part of the next, 2031

Amador County LHMP Update. As a starting point the underserved and vulnerable population groups identified for this 2025 LHMP Update will be contacted to invite them to the 2031 LHMP Update process with additional groups identified and added to meet the ongoing goal of mitigation planning for the whole community.

Prelude to Jurisdictional Annexes

For this 2025 Amador County LHMP Update, the **Jurisdictional Annexes**, working in conjunction with the Base Plan, detail the hazard mitigation planning elements specific to participating jurisdictions, beyond the unincorporated County which is covered in the Base Plan. Each Annex is not intended to be a standalone document, but appends to, supplements, and incorporates by reference the information contained in the Base Plan, as the umbrella document for this planning effort. As such, all Chapters 1-7 of the Base Plan and associated appendices, including the planning process and other procedural requirements and planning elements apply to and were met by each participating jurisdiction.

These Jurisdictional Annexes provide additional information specific to each participating jurisdiction, with a focus on providing additional details on the risk assessment and mitigation strategy beyond that provided in the Base Plan.

CITY OF AMADOR CITY
INCORPORATED JUNE 2, 1915
California

Annex A City of Amador City

A.1 Introduction

This Annex details the hazard mitigation planning elements specific to the City of Amador City, a previously participating jurisdiction to the 2020 Amador County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the City. This Annex provides additional information specific to the City of Amador City, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this jurisdiction.

A.2 Planning Process

As described above, the City of Amador City followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Amador County Hazard Mitigation Planning Committee (HMPC), the City formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table A-1. Additional details on Plan participation and City representatives are included in Appendix A.

*Table A-1 City of Amador City – Planning Team**

Name	Position/Title	How Participated
Sandy Staples	Mayor	Attended planning meetings. Provided past events and local concerns. Provided hazard ID table.
David Groth	City Administrator	Attended planning meetings. Provided past events and local concerns.

*The City noted that much help was provided by Tom DuBois, City Manager, City of Sutter Creek, and Dan LaFontaine, Public Works Director, City of Sutter Creek in the completion of this annex.

Coordination with other community planning efforts is paramount to the successful implementation of this LHMP Update. This section provides information on how the City integrated the previously approved 2020 LHMP into existing planning mechanisms and programs. Specifically, the City incorporated into or implemented the 2020 LHMP through other plans and programs shown in Table A-2.

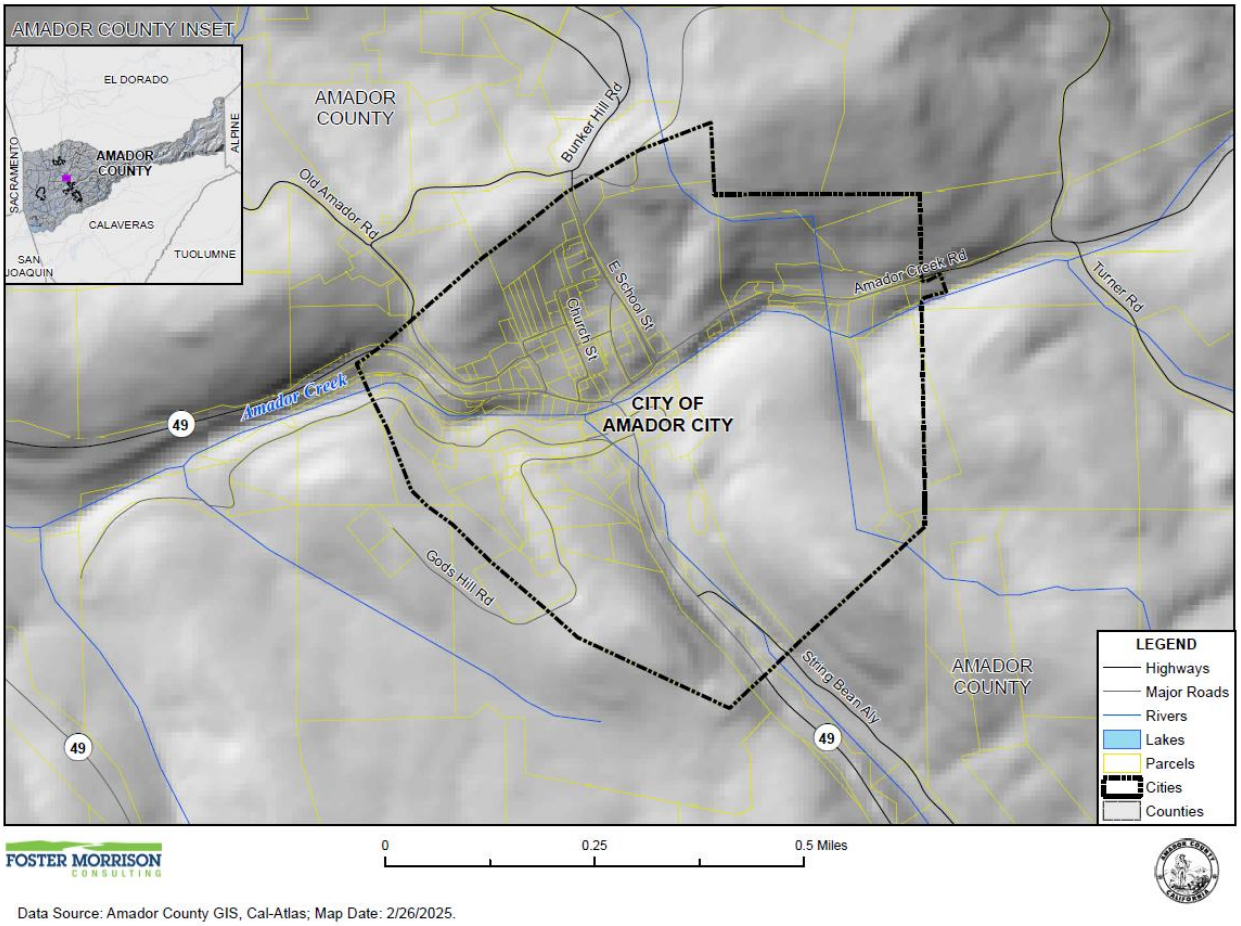
Table A-2 2020 LHMP Incorporation

Planning Mechanism 2020 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
N/A	There were no planning mechanisms since 2020 to incorporate the Plan into.

A.3 Community Profile

The community profile for the City of Amador City is detailed in the following sections. Figure A-1 displays a City map and the location of City of Amador City within Amador County.

Figure A-1 City of Amador City



A.3.1. Geography and Climate

Amador City is located on Highway 49 in California's Gold Country. The benchmark elevation for the City is 954 feet above sea level. However, elevations range from as low as 900 feet to about 1,320 feet in the southeast portion of the City. The terrain is common for the foothills area of the Sierra Nevada, variable and dominated by grasslands. The main part of the City is located in an east-west trending Canyon created by Amador Creek, which serves as the primary drainage basin. Slopes vary, with a large part of the City in the 15-30% and 30%+ categories. Climate is similar to the County, as described in the Base Plan.

A.3.2. History

Amador City, like the County, is named for Jose Maria Amador, a wealthy California rancher who mined along the creek in 1848. Amador City was settled in the summer of 1851, after gold outcroppings had been

prospected on both sides of Amador's Creek. The "Original" or "Little" Amador Mine (north) and the Spring Hill (south) were probably Amador County's first gold mines. The City's most famous and productive mine, the Keystone, was organized in 1853 and, before it closed for good in 1942, produced about $24 million in gold. Today Amador City offers a wide range of tourist activities, including nearby access to area wineries and local shops and eateries.

A.3.3. Economy and Tax Base

US Census estimates show economic characteristics for the City of Amador City. These are shown in Table A-3 and Table A-4. Mean household income in the City was $107,129. Median household income in the City was $69,844.

Table A-3 City of Amador City – Civilian Employed Population 16 years and Over

Industry	Estimated Employment	Percent
Agriculture, forestry, fishing and hunting, and mining	3	2.3%
Construction	5	3.8%
Manufacturing	0	0.0%
Wholesale trade	0	0.0%
Retail trade	0	0.0%
Transportation and warehousing, and utilities	0	0.0%
Information	11	8.4%
Finance and insurance, and real estate and rental and leasing	13	9.9%
Professional, scientific, and management, and administrative and waste management services	27	20.6%
Educational services, and health care and social assistance	10	7.6%
Arts, entertainment, and recreation, and accommodation and food services	27	20.6%
Other services, except public administration	4	3.1%
Public administration	31	23.7%

Source: US Census Bureau American Community Survey 2023 Estimates

Table A-4 City of Amador City – Income and Benefits

Income Bracket	Percent
<$10,000	6.5%
$10,000 – $14,999	3.7%
$15,000 - $24,9999	7.5%
$25,000 – $34,999	6.5%
$35,000 – $49,999	13.1%
$50,000 – $74,999	13.1%
$75,000 – $99,999	8.4%
$100,000 – $149,999	16.8%

Income Bracket	Percent
$150,000 – $199,999	7.5%
$200,000 or more	16.8%

Source: US Census Bureau American Community Survey 2023 Estimates

A.4 Risk Assessment

As defined by FEMA, risk is a combination of hazard, vulnerability, and exposure. "It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage."

The City of Amador City risk assessment identifies and profiles relevant hazards and assesses the exposure of lives, property, infrastructure, and the environment to these hazards. The process allows for a better understanding of the City's potential risk and vulnerability to hazards and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

Building on the Community Profile above, a risk assessment was performed for the City. This includes the following sections:

- A.4.1 Assets Inventory and Growth and Development Trends
- A.4.2 Hazard Identification
- A.4.3 Hazard Profiles and Vulnerability to Specific Hazards

A.4.1. Assets Inventory and Growth and Development Trends

This section provides an inventory of the City of Amador City's total assets potentially at risk to hazards and an overview of growth and development trends. This section is broken into two parts:

- **Asset Inventory** – The assets inventory identifies the City of Amador City's total assets, including the people and populations; structures; critical facilities and infrastructure; community lifelines; natural, historic, and cultural resources; and economic assets and community activities of value. This data is not hazard specific, but is representative of total assets within the City, potentially at risk to identified hazards as discussed in Section A.4.3 Hazard Profiles and Vulnerability to Specific Hazards.
- **Growth and Development Trends** – A discussion of growth and development trends in the City, both current and future, is presented.

Assets Inventory

The City's asset inventory is detailed in the following sections:

- People and Populations
- Structures
- Critical Facilities and Infrastructure
- Community Lifelines
- Natural, Historic, and Cultural Resources
- Economic Assets and Community Activities of Value

A discussion of each of these assets follows and serves as the template for the asset discussion for each hazard in Section A.4.3.

People and Populations

The most important asset within any community are the people and populations that reside in the community. This section includes an inventory of past and current populations of the City and also discusses vulnerable populations and underserved communities as a subsection of people and populations located within the City and potentially at risk to hazards. Information from the City, US Census Bureau, California Department of Finance, and other sources as detailed below form the basis of this discussion.

Historic Population Trends and Current Population

Population growth can increase the number of people living in hazard prone areas. The City of Amador City has 197 residents, as of January 1, 2025. The City of Amador City has seen growth rates as shown in Table A-5.

Table A-5 City of Amador City– Population Changes Since 1950

Year	Population	% Change
1950	151	–
1960	202	33.8%
1970	156	-22.8%
1980	136	-12.8%
1990	196	44.1%
2000	196	0.0%
2010	185	-5.6%
2020	200	8.1%
2025	197	-1.5%

Source: US Census Bureau, California Department of Finance (2025)

Data from the County noted that almost half of the homes in the City are owned by non-residents. Many of these are secondary homes. It was noted by City that during the last census in 2020, Covid was at its height. Many people who normally do not reside in the City had come to their second homes to flee the pandemic. This changed the demographics of the City (both in terms of overall population numbers, as well as in what the average incomes were in the City.

Underserved and Vulnerable Populations and Disadvantaged Communities

The City has a socially and economically diverse community, and many residents that are socially or economically disadvantaged or vulnerable due to varying reasons reside within the City. The City and surrounding County are no strangers to large natural disasters which have had a direct impact on the populations of the area. Thus, it is important to consider the potential effects of hazard events and disasters on these more vulnerable populations. Socially vulnerable and disadvantaged communities in the City are discussed by the following sources:

- CDC Social Vulnerability Index
- California Department of Water Resources (CA DWR) Special Populations and Disadvantaged Community Mapping
- FEMA Community Disaster Resilience Zones
- City Planning Team Input

CDC Social Vulnerability Index

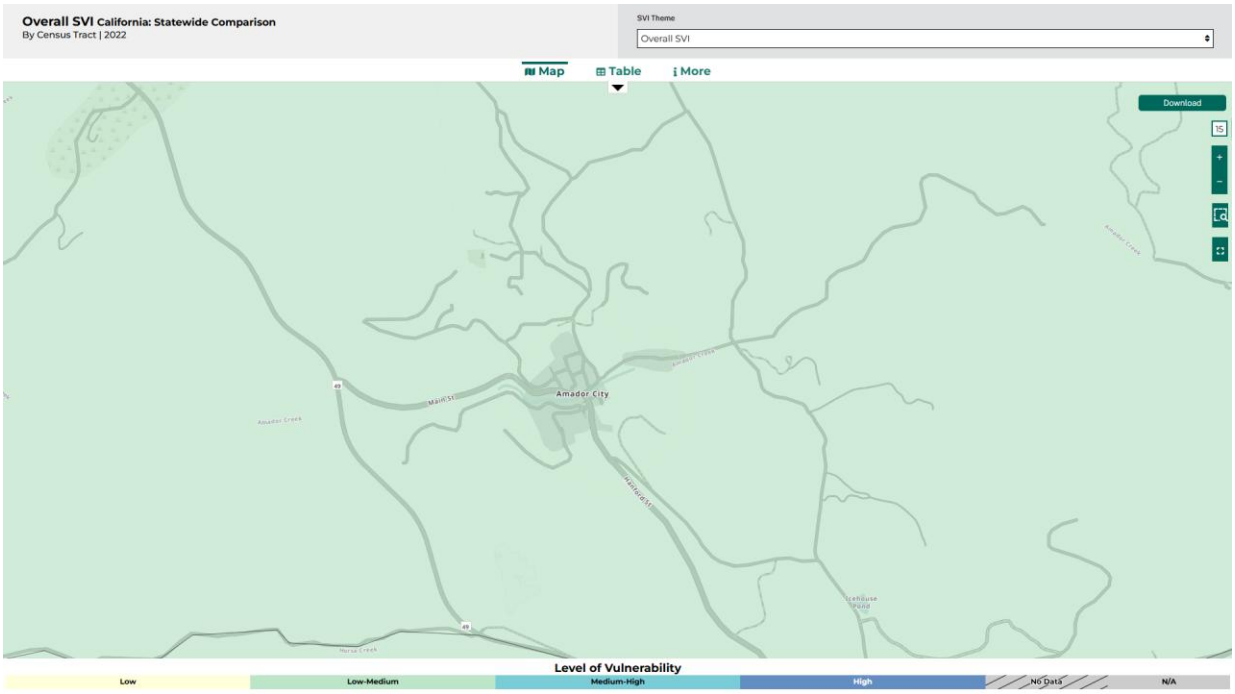
Every community must prepare for and respond to a hazard event, including the range of natural hazards addressed in this Plan, from severe weather extremes to large potentially catastrophic events such as wildfires or earthquakes. A number of factors, including poverty, lack of access to transportation, and crowded housing may weaken a community's ability to prevent human suffering and financial loss in a disaster. These factors are known as social vulnerability.

Social vulnerability refers to the potential negative effects on communities caused by external stresses on human health. Such stresses include natural or human-caused disasters, or disease outbreaks. Reducing social vulnerability can decrease both human suffering and economic loss. The Agency for Toxic Substances and Disease Registry (ATSDR) Geospatial Research, Analysis & Services Program (GRASP) created databases to help emergency response planners and public health officials identify and map communities that will most likely need support before, during, and after a hazardous event. The CDC used these databases to create the CDC Social Vulnerability Index (CDC SVI), which uses 15 U.S. census variables to help local officials identify communities that may need additional support before, during, or after disasters.

CDC SVI uses U.S. Census data to determine the social vulnerability of every census tract. Census tracts are subdivisions of counties for which the Census collects statistical data. The CDC SVI ranks each tract on 15 social factors, including poverty, lack of vehicle access, and crowded housing, and groups them into four related themes. Each tract receives a separate ranking for each of the four themes, as well as an overall ranking. Maps of the four themes for the City are shown in the figures below.

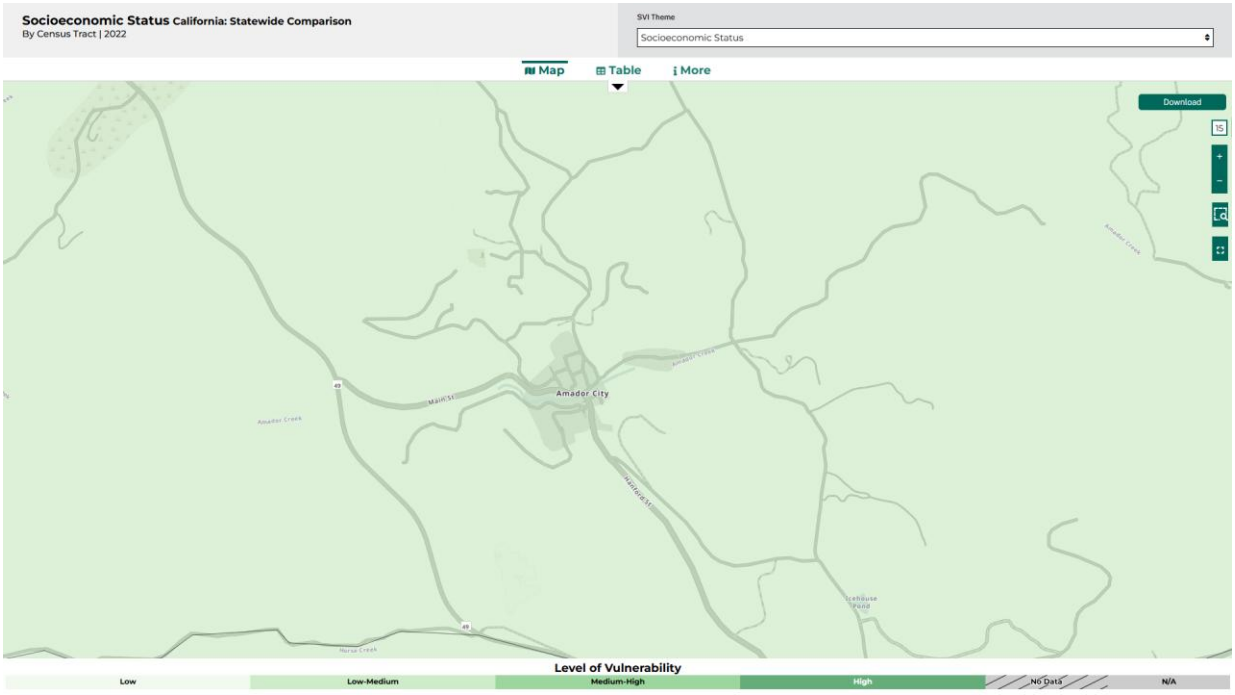
The overall SVI map is shown in Figure A-2; the socioeconomic SVI for the census tracts in and around the City are shown in Figure A-3; the household composition SVI is shown in Figure A-4; the minority and language SVI is shown in Figure A-5; and the housing and transportation SVI is shown in Figure A-6. Overall, the maps indicate that, in general, the City sees little change in social vulnerability regardless of location. As shown, there is very minimal change in each SVI across the City.

Figure A-2 City of Amador City – Overall Social Vulnerability



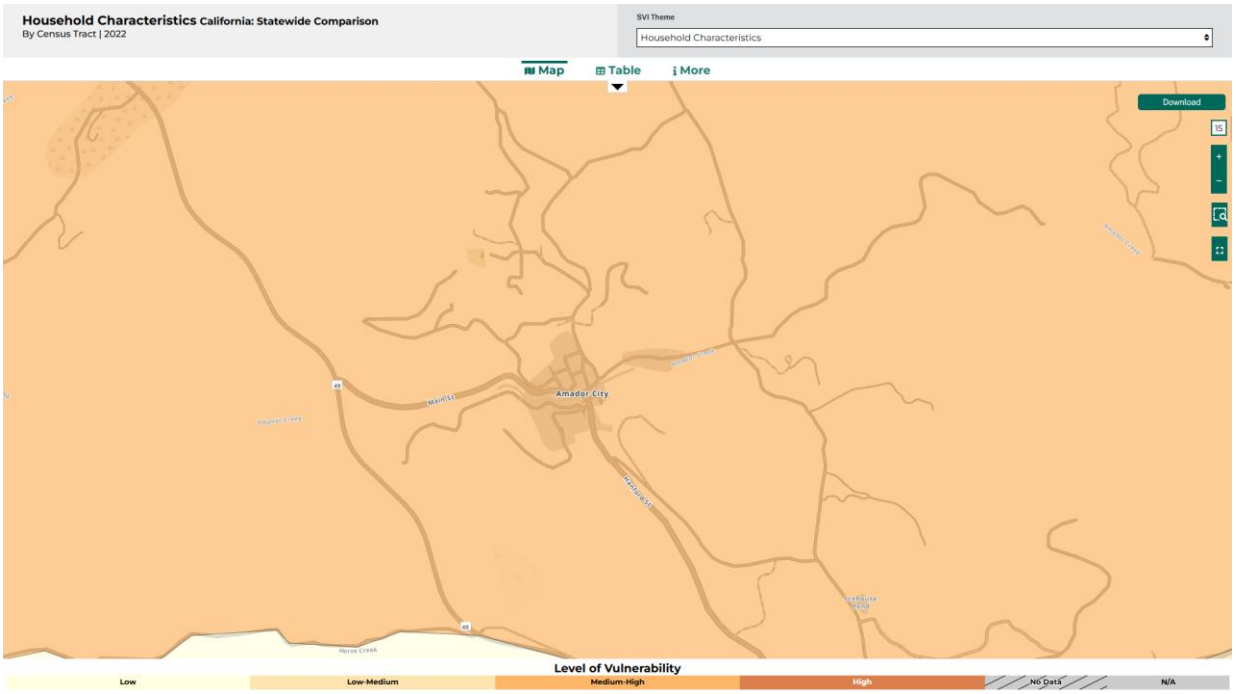
Source: CDC Social Vulnerability Index – map retrieved 12/16/2024
Level of Vulnerability Rating: **Yellow** – Low; **Green** – Low/Medium; **Aqua** – Medium/High; **Blue** – High; **Grey Hatched** – No Data; **Grey** – Not Available

Figure A-3 City of Amador City – Socioeconomic Status Vulnerability



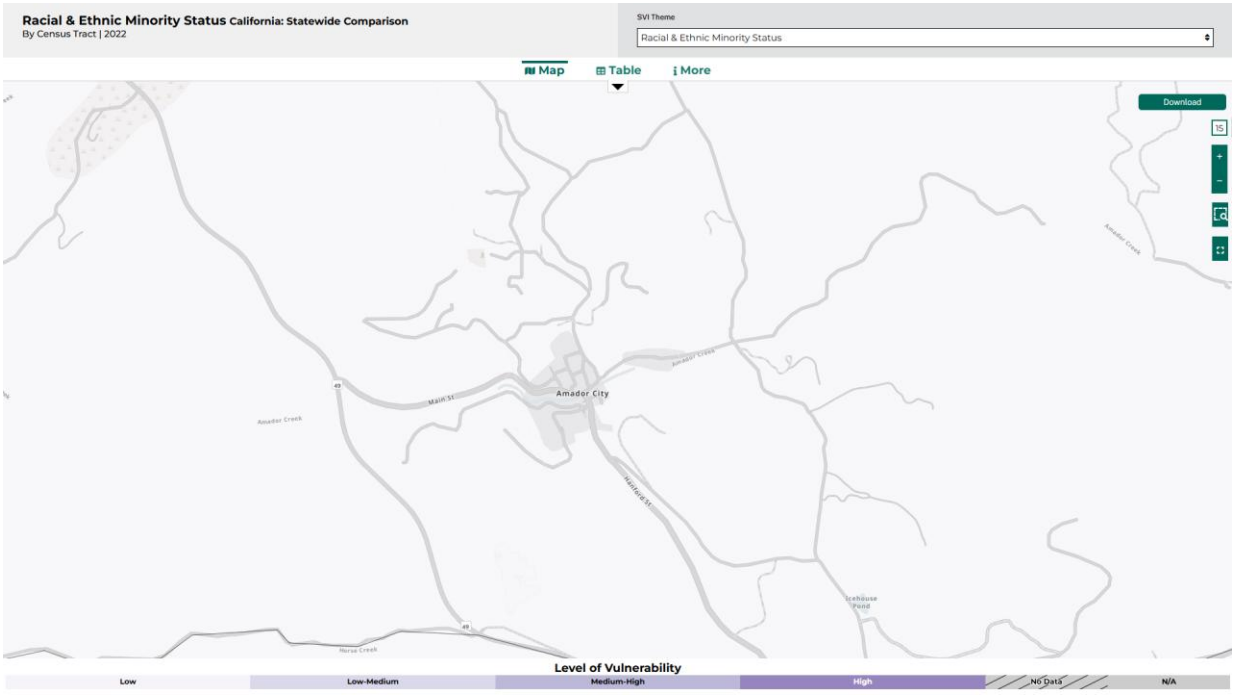
Source: CDC Social Vulnerability Index – map retrieved 12/16/2024
Level of Vulnerability Rating: **Faint Green** – Low; **Light Green** – Low/Medium; **Green** – Medium/High; **Dark Green** – High; **Grey Hatched** – No Data; **Grey** – Not Available

Figure A-4 City of Amador City – Household Characteristics



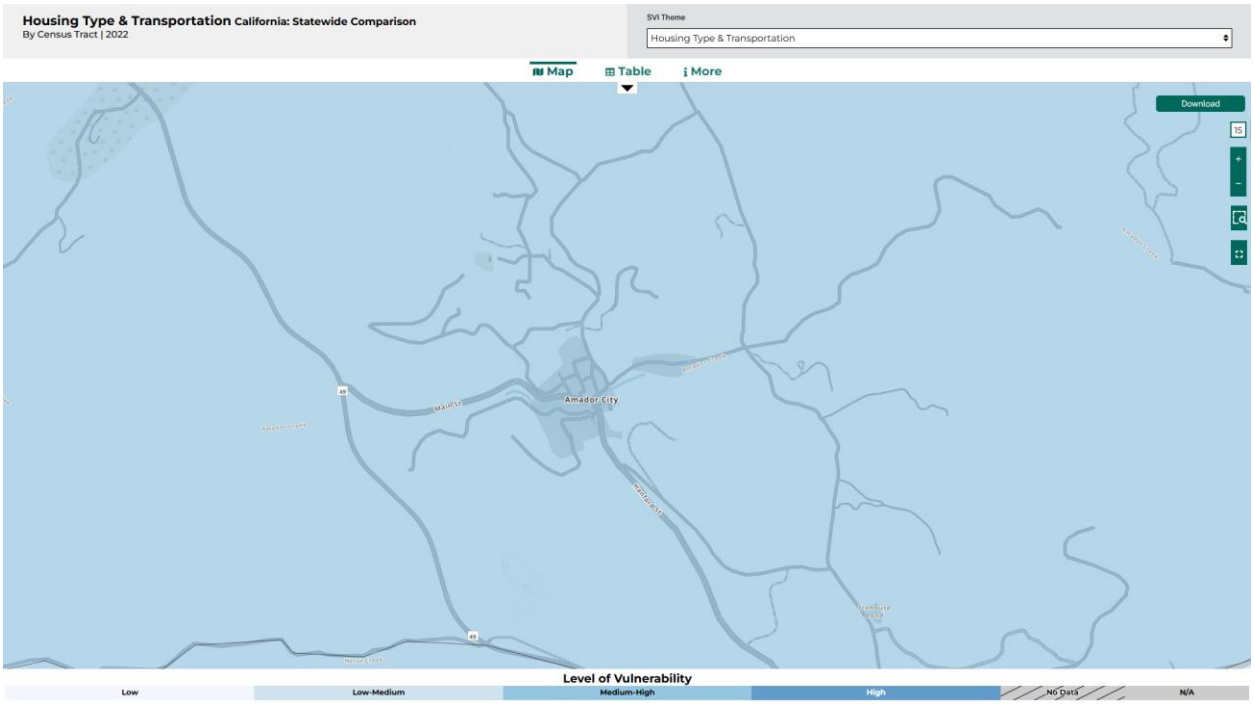
Source: CDC Social Vulnerability Index – map retrieved 12/16/2024
Level of Vulnerability Rating: **Faint Orange** – Low; **Light Orange**– Low/Medium; **Orange** – Medium/High; **Dark Orange** – High; **Grey Hatched** – No Data; **Grey** – Not Available

Figure A-5 City of Amador City – Racial and Ethnic Minority Status



Source: CDC Social Vulnerability Index – map retrieved 12/16/2024
Level of Vulnerability Rating: **Faint Purple** – Low; **Light Purple** – Low/Medium; **Purple** – Medium/High; **Dark Purple** – High; **Grey Hatched** – No Data; **Grey** – Not Available

Figure A-6 City of Amador City – Housing Type and Transportation

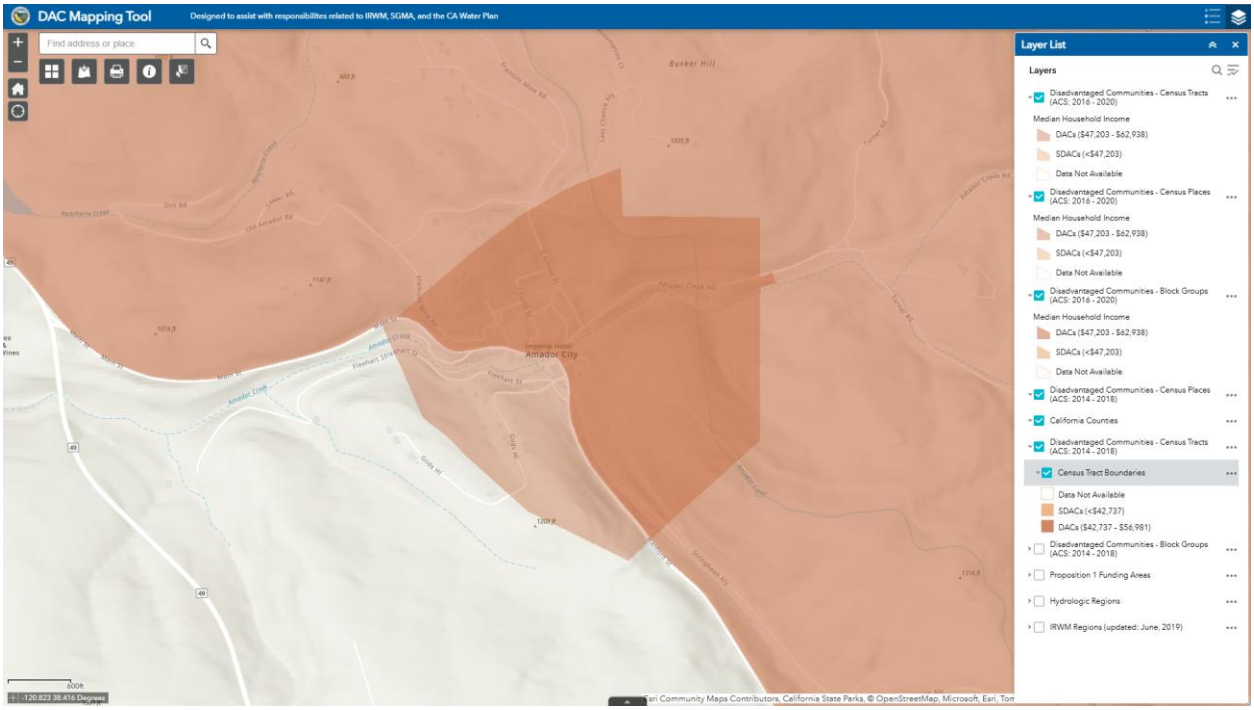


Source: CDC Social Vulnerability Index – map retrieved 12/16/2024
Level of Vulnerability Rating: **Faint Blue** – Low; **Light Blue** – Low/Medium; **Blue** – Medium/High; **Dark Blue** – High; **Grey Hatched** – No Data; **Grey** – Not Available

California DWR Disadvantaged Community Mapping Tool

The State of California's Proposition 1 Disadvantaged Community (DAC) Involvement Program is designated to ensure the involvement of DACs as well as Economically Distressed Areas and Underrepresented Communities, which DWR collectively refers to as DACs. The Cal DWR definition for a Disadvantaged Community is a community with an annual median household income (MHI) that is less than 80% of the Statewide annual MHI (PRC Section 75005(g)), and those census geographies with an annual MHI less than 60% of the Statewide annual MHI are considered "Severely Disadvantaged Communities". Those areas in the City considered disadvantaged are shown in Figure A-7. As shown, much of the City falls in these DAC areas.

Figure A-7 City of Amador City – Disadvantaged Areas



Source: Cal DWR DAC Mapping Tool – retrieved 12/16/2024

FEMA Community Disaster Resilience Zones

Community Disaster Resilience Zones aim to build and strengthen community resilience across the nation by driving federal, public, and private resources to the most at-risk and in-need communities. The Community Disaster Resilience Zones Act uses FEMA's National Risk Index to identify the most at-risk and in-need communities to identify resilience zones. Designated zones will be prioritized for targeted federal support, such as increased cost-share for resilience and mitigation projects, lessening the financial burden on communities to perform resilience-related activities. On September 6, 2023, FEMA announced the initial 483 designations in all 50 states and the District of Columbia. Figure A-8 shows these zones in teal green. As shown, there are no areas inside of the City limits.

Figure A-8 City of Amador City – FEMA Community Disaster Resilience Zones

Source: FEMA. Map retrieved 12/16/2024

City Planning Team Input

The HMPC noted that there are many elderly residents in the City. These residents pose a special challenge in times of emergency.

City of Amador City Items from the Amador County 2021-2029 Housing Element

The City Planning Team noted that the Amador County 2021-2029 Housing Element discusses special populations in the City. While the Housing Element information can be found in the base plan, there are unique elements to the City that are included here. Discussions for seniors, those with disabilities, developmental disabilities, people experiencing homelessness, large households, female headed households, extremely low-income households, and farmworkers were included. These are discussed below.

Seniors

The total population of seniors in Amador City is 13.2%, with none of the population renting only owned homes or residing in an elderly home.

Disabled Citizens

The total population of disabled citizens in Amador City is 11.1% of the population.

People with Developmental Disabilities

Due to the small size of Amador City, along with the method of gathering data using zip codes, there is shown a total of 0 individuals with developmental disabilities with a chance of <11 individuals residing in the City.

People Experiencing Homelessness

The Amador Tuolumne Community Action Agency was contacted for homeless data, but there is no collection of data at the individual jurisdiction level.

Large Households

Large households are defined as 5 or more persons residing in the same home, which only makes up 6.9% of the total households countywide. In Amador City, there are no records of owned homes with 5 or more people, however, the number of households with 5 or more people is 5 of rented homes (6.8% total county and 10.9% total city).

Single Parent and Female Headed Households

Female headed households make up 20.5% of the City's population. While this group is a vulnerable population, there are no families within this category that are below the poverty line.

Farmworkers

Nothing was included for Amador City.

Households in Poverty

The level of poverty in a jurisdiction often influences the need for housing to accommodate those persons and families in the Very Low and Low-income categories. The U.S. Census Bureau measures poverty by using a set of money income thresholds that vary by family size and composition of who is in poverty. If a family's total income is less than the family's threshold, then that family and every individual in it is considered in poverty. While the overall County experiences a poverty rate of 9.9%, Amador City has the lowest percentage of individuals and households likely to be living in poverty. In 2019, 6.6% of individuals and families living in the City were living below the poverty level.

Structures

This section inventories the parcels (and associated structures) that make up the built environment of the City. The 2024 Amador County Assessor's data and the associated parcel layer was used as the basis of this inventory. The methodology used to derive the number of total and improved parcels (i.e., those with an improved structure value) and land and improved property values (as well as content replacement values)

follows the same methodology detailed in Section 4.2.1 of the Base Plan. This data should only be used as a guideline to overall values in the City, as the information has some limitations. The most significant limitations are created by Proposition 13. With respect to Proposition 13, instead of adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result, overall value information is most likely low and does not reflect current market value of properties within the City. It is also important to note, in the event of a disaster, it is often the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a loss. However, depending on the type of hazard and impact of any given hazard event, land values may be adversely affected; thus, land values are included as appropriate. Table A-6 shows the Amador County Parcel/Assessor Data land and structure values and content replacement values (e.g., the values at risk) broken down by property use for the City.

Table A-6 City of Amador City – Total Value of Parcels and Structures by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	7	2	$1,234,719	$606,345	$606,345	$2,447,409
Commercial	15	12	$2,570,473	$3,052,716	$3,052,716	$8,675,905
Industrial	2	1	$10,716	$2,475	$3,713	$16,904
Miscellaneous	11	1	$20,377	$11,604	$0	$31,981
Residential	144	95	$15,288,092	$17,405,166	$8,702,583	$41,395,841
Unknown	1	0	$0	$0	$0	$0
Amador City Total	**180**	**111**	**$19,124,377**	**$21,078,306**	**$12,365,357**	**$52,568,040**

Source: 2024 Amador County Parcel/Assessor Data

Critical Facilities and Infrastructure

Beyond just the buildings and structures that comprise the built environment, it is important to identify the critical facilities and infrastructure that are critical for life safety and property protection. This is done for the City of Amador City below.

For purposes of this plan, a critical facility is defined as:

> ***Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.***

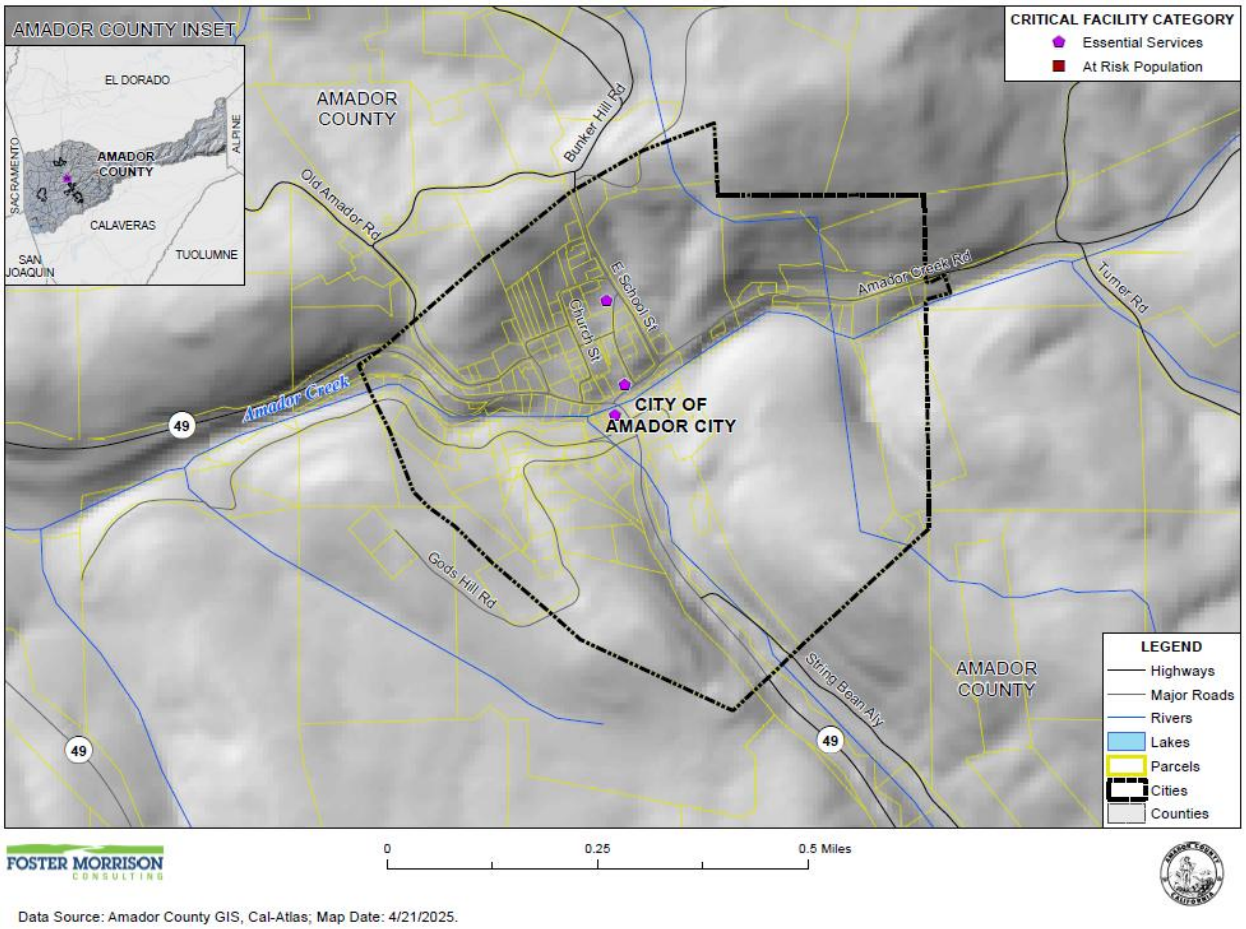
A critical facility is classified by the following categories: (1) Essential Services Facilities, (2) At-Risk Populations Facilities, and (3) Hazardous Materials Facilities, as discussed in Section 4.3.1 of the Base Plan.

Note: The Hazardous Materials Facilities, while considered critical facilities for purposes of this Plan Update, are not mapped in this Plan due to the lack of an available GIS layer. In addition to the mapped

critical facilities, it should further be noted that additional critical facilities, including infrastructure, utilities, and others have been identified for the City of Amador City and the larger Amador County Planning Area but are not included in the mapping and inventory due to privacy and security concerns.

An inventory of critical facilities in the City of Amador City from Amador County GIS is shown on Figure A-9. Table A-7 gives summary information about the critical facilities in the City. Table A-8 details the facility categories and breaks them down by facility type. Details of critical facility definition, type, name, address, and jurisdiction by hazard zone are listed in Appendix F.

Figure A-9 City of Amador City – Critical Facilities



Data Source: Amador County GIS, Cal-Atlas; Map Date: 4/21/2025.

Table A-7 City of Amador City – Critical Facilities by Category

Critical Facility Category	Facility Count
Essential Services Facilities	3
At Risk Population Facilities	0
City of Amador City Total	**3**

Source: Amador County GIS

Table A-8 City of Amador City – Critical Facilities by Category and Type

Critical Facility Category	Critical Facility Type	Facility Count
Essential Services	Fire Station	1
	Post Office	1
	Public Administration Building	1
	Total	**3**
Amador City Total		**3**

Source: Amador County GIS

Community Lifelines

Assessing the vulnerability of the City of Amador City to natural hazards and disasters also involves reviewing and inventorying the community lifelines in place that could be affected. It is important to include these items in hazard discussions as the continuous operation of critical government and business functions is essential to human health and safety, property protection, and economic security. The importance of community lifelines is discussed below:

- Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function.
- FEMA has developed a method for objectives-based response that prioritizes the rapid stabilization of Community Lifelines after a disaster.
- The integrated network of assets, services, and capabilities that provide lifeline services are used day-to-day to support the recurring needs of the community and enable all other aspects of society to function.
- When disrupted, decisive intervention (e.g., rapid re-establishment or employment of contingency response solutions) is required to stabilize the incident.

Community lifelines, as defined by FEMA, include the following:

- **Safety and Security** – Law Enforcement/Security, Fire Service, Search and Rescue, Government Service, Community Safety
- **Food, Hydration, Shelter** – Food, Water, Shelter, Agriculture
- **Health and Medical –** Medical Care, Public Health, Patient Movement, Medical Supply Chain, Fatality Management
- **Energy –** Power Grid, Fuel
- **Communications** – Infrastructure, Responder Communications, Alerts Warnings and Messages, Finance, 911 and Dispatch
- **Transportation** – Highway/Roadway/Motor Vehicle, Mass Transit, Railway, Aviation, Maritime
- **Hazardous Material –** Facilities, HAZMAT, Pollutants, Contaminants
- **Water Systems** – Potable Water Infrastructure, Wastewater Management

It should be noted that these community lifelines are all in place and functional as part of regular government operations in the Amador County Planning Area serving as a partnership between the cities, local special districts and agencies, and Amador County. Due to its more rural nature, there is an interplay in community lifelines between all jurisdictions in the County. Most all of the City's community lifelines

overlap with the Planning Area's s. It should also be noted that these lifelines collectively include many of the critical facilities and infrastructure assets inventoried for this LHMP As such, specific information on these community lifelines in the City and how they may be affected by a hazard event or disaster are discussed collectively for all jurisdictions in the Base Plan

Natural, Historic, and Cultural Resources

Assessing the vulnerability of the City of Amador City to natural hazards and disasters also involves inventorying the natural, historic, and cultural assets of the area. This step is important for the following reasons:

- Environmental and natural resources add to a community's identity and quality of life. They also help the local economy through agriculture, tourism, and recreation. They support ecosystem services, such as clean air and water.
- Conserving the environment may help people mitigate risk. It can also protect sensitive habitats, develop parks and trails, and build the economy.
- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- If these resources are impacted by a disaster, knowing so ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts are higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.

Natural Resources

The City contains a variety of natural resources. Natural resources are unique to each area, often provide an important function, and are difficult to replace. Should a natural disaster occur, these species, resources, and locations are at risk.

Within the largely unimproved areas of the City, there are four major plant communities which serve as open space lands and provide key wildlife habitat. These plant communities include oak woodland/chaparral, grassland, riparian drainage, and stream side riparian.

According to the City's Open Space Element of the General Plan, none of the endangered and/or rare plant species listed by the California Native Plant Society's publication "*Inventory of Rare and Endangered Vascular Plants of California*" or listed by the Department of Fish and Game's "*List of Designated Endangered or Rare Plants of California*" are known to exist in the City.

The potential for animal diversity in the City is significant because the plant communities offer a broad range of food, cover, roosting and nesting sites, and water. According to the City's Open Space Element of the General Plan, none of the endangered and/or rare species and fauna are listed in the "*Federal Register of Endangered and Threatened Wildlife and Plants*", and the California Department of Fish and Game's "*Endangered, Rare, and Threatened Animals of California*" are known to inhabit the City.

Wetlands and their Natural and Beneficial Functions

Wetlands are habitats in which soils are intermittently or permanently saturated or inundated. Wetland habitats vary from rivers to seasonal ponding of alkaline flats and include swamps, bogs, marshes, vernal pools, and riparian woodlands. Wetlands are considered to be waters of the United States and are subject to the jurisdiction of the U.S. Army Corps of Engineers as well as the California Department of Fish and Wildlife (CDFW). Where the waters provide habitat for federally endangered species, the U.S. Fish and Wildlife Service may also have authority.

Wetlands are a valuable natural resource for communities providing beneficial impact to water quality, wildlife protection, recreation, and education, and play an important role in hazard mitigation. Wetlands provide drought relief in water-scarce areas where the relationship between water storage and streamflow regulation is vital and reduce flood peaks and slowly release floodwaters to downstream areas. When surface runoff is dampened, the erosive powers of the water are greatly diminished. Furthermore, the reduction in the velocity of inflowing water as it passes through a wetland helps remove sediment being transported by the water.

Wetlands are often found in floodplains and depressional areas of a watershed. Many wetlands receive and store floodwaters, thus slowing and reducing downstream flow. Wetlands perform a variety of ecosystem functions including food web support, habitat for insects and other invertebrates, fish and wildlife habitat, filtering of waterborne and dry-deposited anthropogenic pollutants, carbon storage, water flow regulation (e.g., flood abatement), groundwater recharge, and other human and economic benefits.

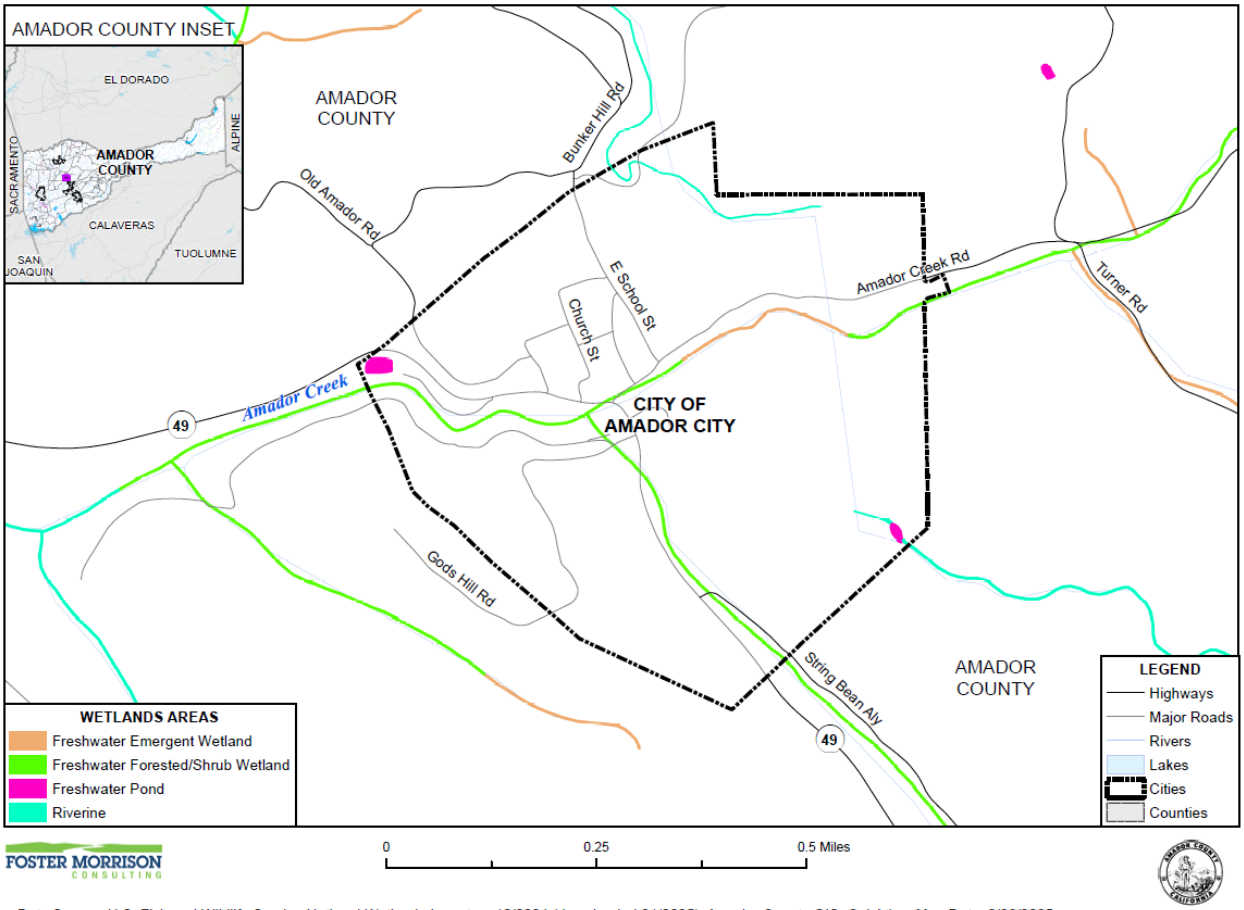
Wetlands, and other riparian and sensitive areas, provide habitat for insects and other invertebrates that are critical food sources to a variety of wildlife species, particularly birds. There are species that depend on these areas during all parts of their lifecycle for food, overwintering, and reproductive habitat. Other species use wetlands and riparian areas for one or two specific functions or parts of the lifecycle, most commonly for food resources. In addition, these areas produce substantial plant growth that serves as a food source to herbivores (wild and domesticated) and a secondary food source to carnivores.

Wetlands slow the flow of water through the vegetation and soil, and pollutants are often held in the soil. In addition, because the water is slowed, sediments tend to fall out, thus improving water quality and reducing turbidity downstream.

These natural floodplain functions associated with the natural or relatively undisturbed floodplain that moderates flooding, such as wetland areas, are critical for maintaining water quality, recharging groundwater, reducing erosion, redistributing sand and sediment, and providing fish and wildlife habitat. Preserving and protecting these areas and associated functions are a vital component of sound floodplain management practices for the City.

Wetlands in the City are shown in Figure A-10 and detailed in Table A-9.

Figure A-10 City of Amador City – Wetlands Areas



Data Source: U.S. Fish and Wildlife Service National Wetlands Inventory 10/2024 (downloaded 01/2025), Amador County GIS, Cal-Atlas; Map Date: 2/26/2025.

Table A-9 City of Amador City – Wetland Types and Acreages

Wetlands Area Type	Wetlands Count	Wetlands Area (in Acres)
Freshwater Emergent Wetland	1	0.53
Freshwater Forested/Shrub Wetland	2	2.17
Freshwater Pond*	2	0.52
Lake	0	0.00
Riverine	4	0.58
Amador City Total	**9**	**3.81**

Source: US Fish and Wildlife Service

*This pond is actually the wastewater treatment holding pond for the City.

Historic and Cultural Resources

Historic and cultural resources are difficult to replace. Should a natural disaster occur, these properties and locations can be at risk. The City of Amador City has a stock of historically significant homes, public buildings, and landmarks. The California Department of Parks and Recreation Office of Historic Preservation (OHP) was the primary source of information. OHP administers the National Register of

Historic Places, the California Register of Historical Resources, California Historical Landmarks, and the California Points of Historical Interest programs. Each program has different eligibility criteria and procedural requirements. These requirements are detailed in Section 4.2.1 of the Base Plan. Table A-10 shows 1 historic building in the City in the OHP Database.

Table A-10 City of Amador City – Historic Resources

Resource Name (Plaque Number)	National Register	State Landmark	Point of Interest	Date Listed	City/ Community
Amador City (P498)			X	5/5/1977	Amador City

Source: California Department of Parks and Recreation Office of Historic Preservation. Retrieved 12/3/2024.

It should be noted that these lists may not be complete, as they may not include those currently in the nomination process and not yet listed. Additionally, as defined by the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA), any property over 50 years of age is considered a historic resource and is potentially eligible for the National Register. Thus, in the event that the property is to be altered, or has been altered, as the result of a major federal action, the property must be evaluated under the guidelines set forth by CEQA and NEPA. Structural mitigation projects are considered alterations for the purpose of this regulation.

The following historical sites have been locally designated by the Amador County Historical Society and/ or the Amador Historical Landmarks Advisory Committee, and included in the California History Plan Inventory of Historic Features (1973).

- Amador Hotel
- Keystone Mine and Mine House Inn
- Imperial Hotel
- False Front Buildings

Economic Assets and Community Activities of Value

Assessing the vulnerability of the City of Amador City to natural hazards and disasters also involves inventorying the economic assets and community activities of value in the City.

Economic Assets

After a disaster, economic resiliency is one of the major drivers of a speedy recovery. Each community has specific economic drivers. These include:

- Primary Economic Sectors
- Major employers
- Commercial Centers

In the City of Amador City, this includes hospitality and tourism (many wine tasting areas in and near the City).

Note: This inventory of economic assets is only included in this overall asset inventory for the City. To limit redundancy, it is not discussed further in the hazard profiles and vulnerability assessments in Section A.4.3 below. However, depending on the type, location, magnitude and extent of future hazard events and disasters, these City's economic assets may be vulnerable

Community Activities of Value

Inventorying economic assets in the City and their vulnerability to natural hazards and disasters also involves inventorying activities that have value to the community. This includes activities that are important to a community, like long-standing traditions such as a festival or fair. Some areas rely on seasonal industries to sustain them throughout the year. Many of these activities also provide economic benefits to the City. A hazard event that cancels or shortens these can affect a community's livelihood and can make disaster recovery more difficult or prolonged. This includes activities such as:

- Festivals and Fairs
- Sporting Events
- Tourism
- Local Pools
- Local Splash Pools

The City noted the following community activities of value:

- Dancing in the Streets Festivals (3 times per year)
- Dia de los Muertos
- Holiday Tree Lighting
- Long Table Meal on Main St. for community and visitors.
- Holiday Fairs

Note: This inventory of community activities of value only occurs in this overall asset inventory for the City. To limit redundancy, it is not discussed further in the hazard profiles and vulnerability assessments in Section A.4.3 below. However, depending on the type, location, magnitude and extent of future hazard events and disasters, the City's community activities of value may be vulnerable.

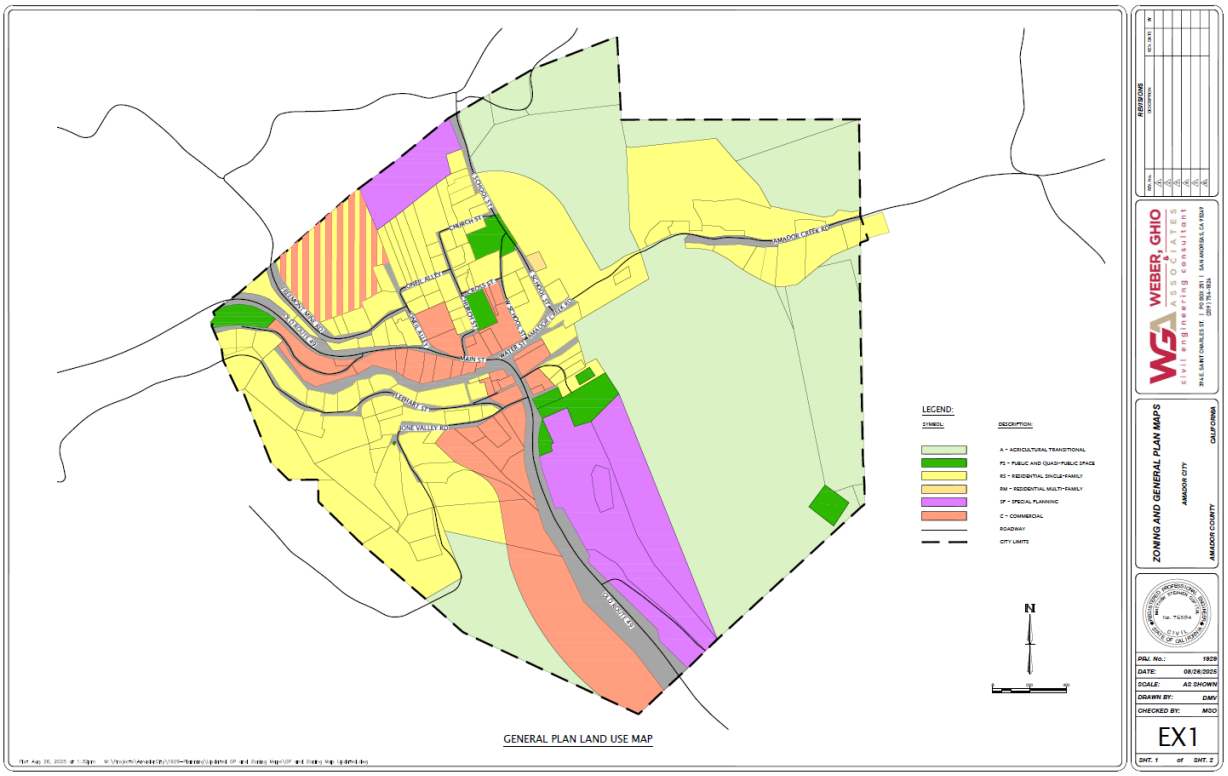
Growth and Development Trends

As part of the planning process, the City looked at changes in growth and development, both current and future, and examined these changes in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability over time.

Land Use

State planning law requires that the land use element of a general plan include a statement of the standard population density, building intensity, and allowed uses for the various land use designations in the plan (Government Code Section 65302(a)). The Amador City Municipal Code provides detailed land use and development standards for development. The Land Use Map for the City of Amador City is shown on Figure A-11.

Figure A-11 City of Amador City – Land Use



Source: City of Amador City

Population Trends and Projections

There are no future City population projections. Amador County as a whole is expected to slowly continue to increase in population. As such, it is assumed that the City may see slow population growth as well.

Development since 2020 Plan

Development has occurred in the City since the last plan. Some of this has occurred in hazard prone areas. The City Planning Department tracked total building permits issued since 2020 for the City. These are tracked by total development, property use type, and hazard risk area. These are shown in Table A-11 and Table A-12.

Table A-11 City of Amador City – Total Development Since 2020

Property Use	2020	2021	2022	2023	2024
Residential	0	0	0	0	1
Commercial	0	0	0	0	0
Industrial	0	0	0	0	0
Other	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**

Source: City of Amador City Planning Department

Table A-12 City of Amador City – Development in Hazard Areas since 2020

Property Use	1% Annual Chance Flood	Levee Protected Area	Wildfire Risk Area[1]	Other
Total	**0**	**0**	**1**	**0**

Source: City of Amador City Planning Department
[1]Moderate or higher wildfire risk area

Only one new development occurred in the City since the 2020 LHMP, This development occurred in the high wildfire risk areas. It was completed in accordance with all current and applicable development codes, including wildfire codes and other applicable standards and should be adequately protected. Thus, with the exception of more people living in the area potentially exposed to natural hazards, this growth does not increase the vulnerability of the City to identified priority hazards.

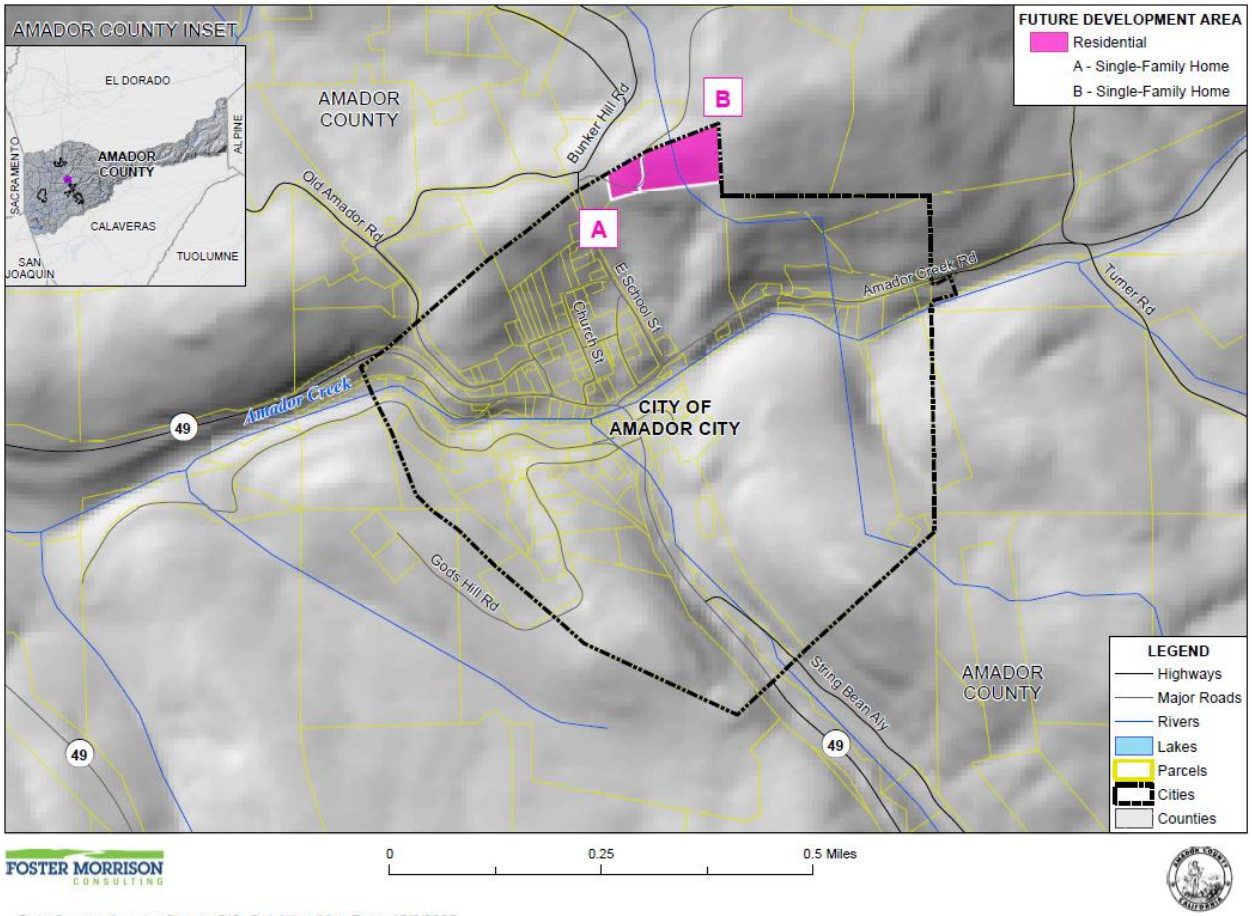
Future Development Areas

It is important to review future development plans for the City. Future development should be sited in areas that are away from known hazard risks. If this is not possible, mitigation should be done to ensure that future development is protected against future hazards.

GIS Analysis

The City noted that there is limited development in the City planned. Two locations were provided by the City where residential single-family homes are likely to be built in the next five years. These are shown on Figure A-12 and detailed in Table A-13.

Figure A-12 City of Amador City – Future Development Areas



Data Source: Amador County GIS, Cal-Atlas; Map Date: 10/6/2025.

Table A-13 City of Amador City – Parcels and Acres in Future Development Areas

Property Use / Future Development	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
Residential Single-Family Home						
A	1	0	1	0.99	0	0.99
B	1	1	0	3.44	3.44	0
Grand Total	**2**	**1**	**1**	**4.43**	**3.44**	**0.99**

Source: City of Amador City

A.4.2. Hazard Identification

The City of Amador City identified the hazards that affect the City and summarized their location, extent, likelihood of future occurrence, potential magnitude, and significance specific to the City (see Table A-14). Those hazards identified as a high or medium significance in Table A-14 are considered priority hazards for mitigation planning. Those hazards that occur infrequently or have little or no impact in the City were determined to be of low significance and not considered a priority hazard. Significance was determined based on the hazard profile, focusing on key criteria such as frequency, extent, and resulting damage,

including deaths/injuries and property, natural and cultural resources, and economic damage. The ability of a jurisdiction to reduce losses through implementation of existing and new mitigation measures was also considered as to the significance of a hazard. This assessment was used to prioritize those hazards of greatest significance, enabling the City to focus resources where they are most needed.

Table A-14 City of Amador City—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Agricultural Hazards (severe weather/pests/invasive species)	Extensive (Bark Beetles)	Highly Likely	Critical	Low	Medium
Avalanche	Limited	Unlikely	Negligible	Low	Medium
Climate Change	Extensive	Likely	Critical	Low	--
Dam Failure	Limited	Unlikely	Negligible	Low	Medium
Drought & Water shortage (w/ tree mortality)	Extensive	Likely	Critical	Low	High
Earthquake (w/subhazards)	Extensive	Unlikely	Negligible	Low	Low
Floods: 1%/0.2% annual chance (w/ levee failure)	Limited	Unlikely	Limited	Low	Medium
Floods: Localized Stormwater	Extensive	Likely	Limited	Medium	Medium
Landslide, Mudslide, Debris Flow	Significant	Occasional	Limited	Medium	Medium
Severe Weather: Extreme Cold, Freeze, and Snow	Limited	Likely	Negligible	Low	Medium
Severe Weather: Extreme Heat	Extensive	Highly	Limited	Medium	High
Severe Weather: Heavy Rains and Storms (Hail, Lightning)	Extensive	Highly Likely	Limited	Medium	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Highly Likely	Limited	Medium	Medium
Wildfire (w/smoke and air quality)	Extensive	Highly Likely	Catastrophic	High	Medium

Geographic Extent
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Likelihood of Future Occurrences
Highly Likely: Near 100% chance of occurrence in next year, or happens every year.
Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.
Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.
Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Magnitude/Severity
Catastrophic: More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths
Critical: 25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability
Limited: 10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability
Negligible: Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance
Low: Minimal potential impact
Medium: Moderate potential impact
High: Widespread potential impact

Climate Change Influence
Low: Minimal potential impact
Medium: Moderate potential impact
High: Widespread potential impact

A.4.3. Hazard Profiles and Vulnerability to Specific Hazards

This section includes the hazard profiles and vulnerability assessment for hazards ranked of medium or high significance specific to the City of Amador City (as identified in the Significance column of Table A-14) and also includes a hazard profile and vulnerability assessment to the four primary hazards to the State of California: dam failure, earthquake, flood, and wildfire, regardless of the significance ranking by the City. Chapter 4 of the Base Plan provides more detailed information about these hazards and their impacts on the Amador County Planning Area. Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.2 of the Base Plan.

Hazard Profiles and Vulnerability Assessment

Each hazard is profiled in the following format:

- **Hazard Profile** – A hazard profile is included for each hazard. This includes information on:
  - ✓ **Hazard Overview –** A general discussion of the hazard and related issues is detailed here.
  - ✓ **Location** and **Extent** – Location is the geographic area within the City that is affected by the hazard. Extent is the expected range of intensity for each hazard. These are discussed in specific detail for mapped hazards, and in more general detail for those hazards that do not have discrete mapped hazard areas.
  - ✓ **Past Occurrences** – Past occurrences are discussed for each hazard. A discussion of disaster declarations is included in each hazard section. NCDC events are also discussed. Other past occurrences data specific to the City follow the disaster declarations and NCDC events for each hazard.
  - ✓ **Climate Change** – This section contains the effects of climate change (as applicable). The possible influence of climate change on the hazard is discussed.

After the hazard profile, a vulnerability assessment is presented. As part of the vulnerability assessment, an estimate of the vulnerability of the City to each identified hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

After this classification, a general discussion of hazard vulnerabilities occurs. This is done in the following format:

- **Local Concerns** – This includes City provided information on how the City is uniquely affected by or vulnerable to each hazard.
- **Assets at Risk** – A discussion of the assets at risk follows, presented in the same order as in Section A.4.1 above, with a few exceptions. This includes sections on: People and Populations; Structures; Critical Facilities and Infrastructure, and Natural, Historic, and Cultural Resources. These are discussed in specific terms for mapped hazards, and in more general terms for those hazards that are unmapped. Sections on Community Lifelines and Economic Assets and Community Activities of Value are not included in the Sections below, as they are fully covered in Section A.4.1 above and in chapter 4 of the Base Plan.
- **Impacts** – A discussion on hazard impacts follows. Impacts describe how each hazard can affect the City and its assets. The type and severity of impacts reflect both the potential magnitude of the hazard and the vulnerability of the asset.
- **Future Conditions/Future Development** – A discussion of how future conditions and future development may affect the hazard is also included. This is addressed specifically for mapped hazards, and in more general terms for those hazards that are unmapped.

Power Interruption/Power Failure: A Common Vulnerability of all Hazards

An impact of almost all hazards evaluated as part of this LHMP Update relates to power shortage and/or power failures. The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the U.S. Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power disruptions can be found in Section 4.3 of the Base Plan.

Public Safety Power Shutoff (PSPS)

An intentional disruption type of power shortage/failure event has been recently implemented in California as a result of wildfires starting as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are preparing all Californians for the threat of wildfires and power outages during times of extreme (fire) weather. To help protect customers and communities during extreme fire weather events, electric power may be shut off for public safety in an effort to proactively prevent wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3 of the Base Plan.

In addition to PSPSs, to help prevent wildfires, electric utilities have begun to evolve safety efforts. This includes installing safety settings on powerlines in and around high fire-risk areas. These are known as

Enhanced Powerline Safety Settings (EPSS), and they help prevent falling tree branches, animals and other hazards from starting a wildfire. By stopping ignitions, it helps prevent wildfires from starting and spreading. According to PG&E, if ignitions occur, the size of fires are much smaller due to EPSS. In 2022, there was a 99% decrease in acres impacted by ignitions (as measured by fire size from electric distribution equipment (compared to the 2018-2020 average). This decrease occurred despite dry conditions.

Local Concerns

The City noted that there was one PSPS events during the Caldor Fire that affected the City. The City also had three power outages in 2024. There were warnings of PSPS events in 2025, but they did not ultimately materialize.

Dam Failure

Note: though a low significance hazard in the City, due to its importance in the County and in the State of California, this hazard is profiled here. It is not considered a priority for mitigation planning purposes.

Likelihood of Future Occurrence–Unlikely
Vulnerability–Low

Hazard Profile

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any given year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped or fail. Overtopping is the primary cause of earthen dam failure in the United States.

Dam failure is a natural disaster from two perspectives. First, the inundation from released waters resulting from dam failure is related to naturally occurring floodwaters. Second, a total dam failure would most probably happen as a consequence of the natural disaster triggering the event, such as an earthquake.

Location and Extent

An inventory map of dams located within Amador County was shown in Section 4.3.9 in the Base Plan. Dams with an inundation area within the City of Amador City are not shown in this annex, as there are no inundation areas that intersect the City.

There is no scale with which to measure dam failure. However, FEMA and CA DWR Division of Safety of Dams (DSOD) assign hazard potential classifications to dams within the State that provides information on the potential impact should a dam fail. The following two factors are considered when assigning hazard ratings: existing land use and land use controls (zoning) downstream of the dam. FEMA categorizes the downstream hazard potential into three categories in increasing severity: Low, Significant, and High. DSOD adds a fourth category of Extremely High. Dams are classified in these four categories that identify

the potential hazard to life and property. These were discussed in more detail in Section 4.3.9 of the Base Plan.

While a dam may fill slowly with runoff from winter storms, a dam break has a very quick speed of onset. The duration of dam failure is generally not long – only as long as it takes to empty the reservoir of water the dam held back. For dam overtopping, the speed of onset is somewhat slower than that of a dam break, and the duration is longer (as evidenced in the 2017 Oroville Dam spillway event). The City would be affected for as long as the flood waters from the dam failure took to drain downstream.

Geographic flood extent are not shown, as there are no mapped dam inundation areas in the City. As such, the City does not consider dam failure a priority hazard for mitigation planning purposes. Significance and priority of a hazard was determined based on frequency, extent, and resulting damage, including deaths/injuries and property, natural and cultural resources, and economic damage. The ability of a jurisdiction to reduce losses through implementation of existing and new mitigation measures was also considered as to the significance and priority of a hazard. This assessment was used by the City to prioritize those hazards of greatest significance, enabling the City to focus resources where they are most needed. As such, no additional analysis is presented for this hazard, due to its low significance in the City. Further, as a non-priority hazard, it will not be carried forward into the mitigation strategy for the City.

Earthquake

Likelihood of Future Occurrence–Unlikely
Vulnerability–Low

Note: though a low significance hazard in the City, due to its importance in the County and in the State of California, this hazard is profiled here. It is not considered a priority for mitigation planning purposes.

Hazard Profile

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction.

Location and Extent

Since earthquakes are regional events, the whole of the City is at risk to earthquake. The City of Amador City, Amador County, and surrounding areas have some level of risk from seismic and geologic hazards. Faults in and around the City were shown in Section 4.3.11 of the Base Plan. These include the Carson

Range, Great Valley, and Rogers-Hayward Creek faults. A significant seismic event on any of these major faults could cause damage in the City of Amador City.

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales, as discussed in Section 4.3.11 of the Base Plan.

Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. The City is located in an area where earthquakes of some magnitude occur, so both magnitude and intensity of earthquakes are expected to remain moderate. Seismic shaking maps for the area in Section 4.3.11 of the Base Plan show Amador County and the City fall within a low to moderate shake risk.

As such, the City does not consider earthquake a priority hazard for mitigation planning purposes. Significance and priority of a hazard was determined based on frequency, extent, and resulting damage, including deaths/injuries and property, natural and cultural resources, and economic damage. The ability of a jurisdiction to reduce losses through implementation of existing and new mitigation measures was also considered as to the significance and priority of a hazard. This assessment was used by the City to prioritize those hazards of greatest significance, enabling the City to focus resources where they are most needed. As such, no additional analysis is presented for this hazard, due to its low significance in the City. Further, as a non-priority hazard, it will not be carried forward into the mitigation strategy for the City.

Flood: 1%/0.2% Annual Chance

Likelihood of Future Occurrence–Occasional (1%)/Unlikely (0.2%)
Vulnerability–Low

Note: though a low significance hazard in the City, due to its importance in the County and in the State of California, this hazard is profiled here. It is not considered a priority for mitigation planning purposes.

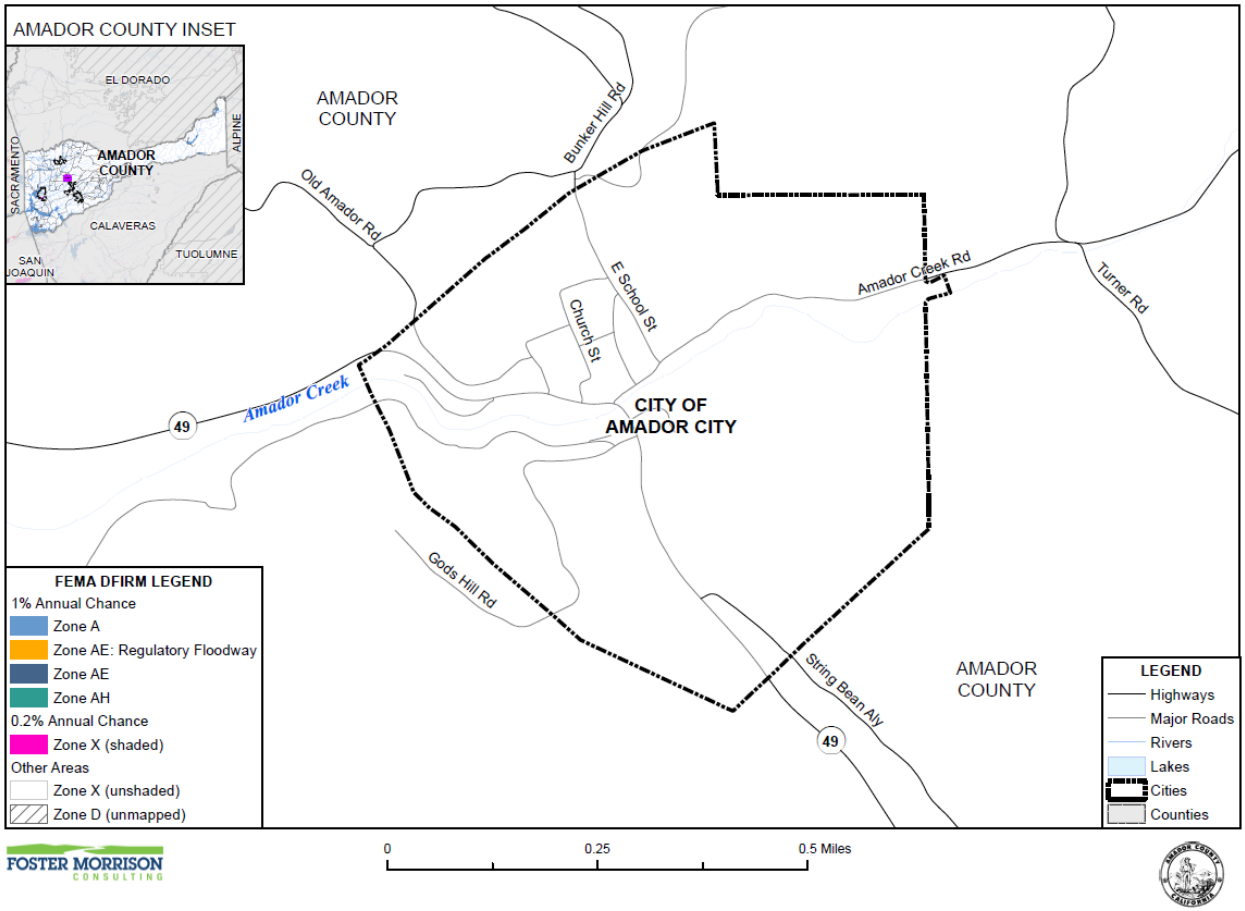
Hazard Profile

This hazard analyzes the FEMA DFIRM 1% and 0.2% annual chance floods. These tend to be the larger floods that can occur in the City and have caused damage in the past. Flooding is a minor problem in the City. Historically, the City has been at some risk to flooding primarily during the winter and spring months when river systems in the City swell with heavy rainfall and snowmelt runoff. The City has also been at risk during atmospheric river flood events. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures located throughout the Amador County Planning Area and the City of Amador City.

Location and Extent

The City of Amador City is located outside of the FEMA DFIRM 1% and 0.2% annual chance flood zones. This is seen in Figure A-13.

Figure A-13 City of Amador City – FEMA DFIRM Flood Zones



Data Source: FEMA Effective DFIRM 01/20/2016 (NFHL 01/21/2025 database), Amador County GIS, Cal-Atlas; Map Date: 2/26/2025.

Table A-15 details the DFIRM mapped flood zones located within the City.

Table A-15 City of Amador City– DFIRM Flood Hazard Zones

Flood Zone	Description	Present in City of Amador City
A	1% annual chance flooding: No base flood elevations provided	
AE	1% annual chance flooding: Base flood elevations provided	
AE Regulatory Floodway	1% annual chance flood: Regulatory floodway; Base flood elevations provided	
AH	1% annual chance flood areas of shallow flooding between one to three feet deep. Regulatory floodway; Base flood elevations provided	
Shaded X	0.2% annual chance flooding: The areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood	
X (unshaded)	No flood hazard	X

Source: FEMA DFIRM 1/20/2016

Additionally, flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the City vary, depending on the nature and extent of a flood event; specific depths are unknown but are thought to be low. Flood durations in the City tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Flooding in the City tends to have a shorter speed of onset, due to the amount of water that flows through the City.

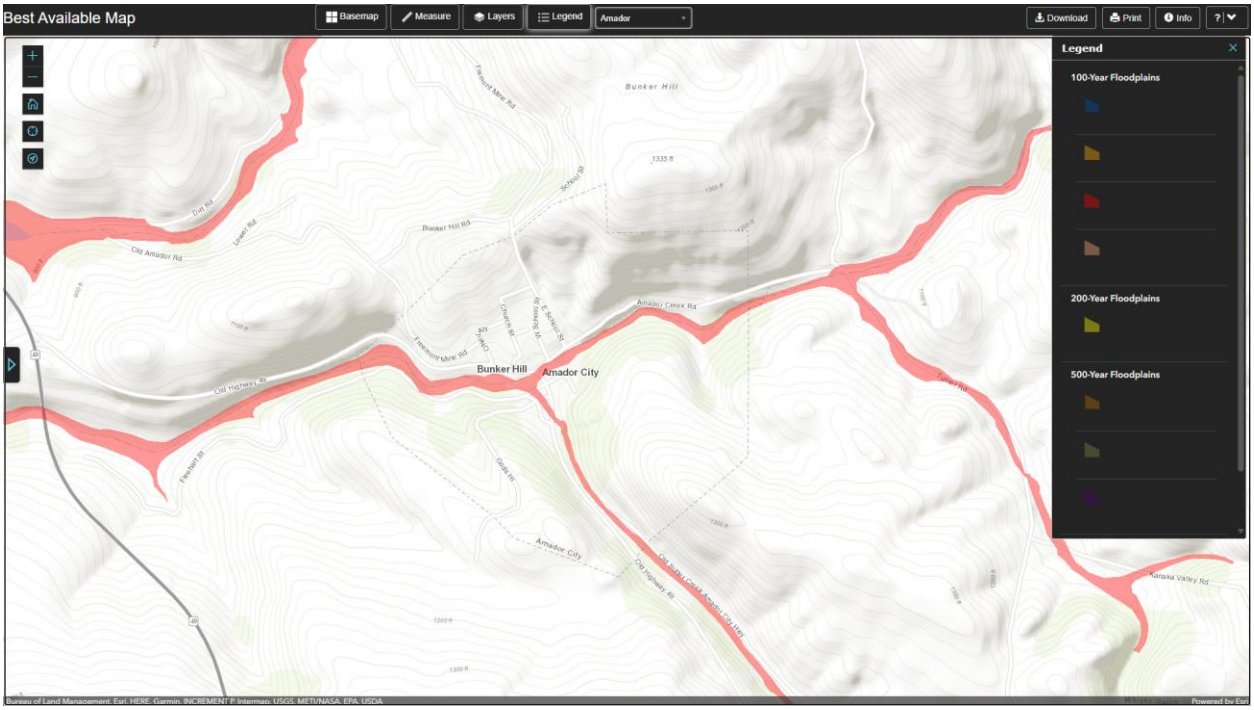
Geographical flood extents for the City from the FEMA DFIRMs are not tabulated, as the entire City is outside of the 1% and 0.2% annual chance floodplains.

California Department of Water Resources Best Available Maps (BAM)

The FEMA regulatory maps provide just one perspective on flood risks in the City. Senate Bill 5 (SB 5), enacted in 2007, authorized the California DWR to develop the Best Available Maps (BAM) displaying 100- and 200-year floodplains for areas located within the Nevada-San Joaquin (SAC-SJ) Valley watershed. This effort was completed by DWR in 2008. DWR has expanded the BAM to cover all counties in the State and to include 500-year floodplains.

Different than the FEMA DFIRMs which have been prepared to support the NFIP and reflect only the 100-year event risk, the BAMs are provided for informational purposes and are intended to reflect current 100-, 200-(as applicable), and 500-year event risks using the best available data. The 100-year floodplain limits on the BAM are a composite of multiple 100-year floodplain mapping sources. It is intended to show all currently identified areas at risk for a 100-year flood event, including FEMA's 100-year floodplains. The BAM are comprised of different engineering studies performed by FEMA, Corps, and DWR for assessment of potential 100-, 200-, and 500-year floodplain areas. These studies are used for different planning and/or regulatory applications, and for each flood frequency may use varied analytical and quality control criteria depending on the study type requirements. The value in the BAMs is that they provide a bigger picture view of potential flood risk to the City than that provided in the FEMA DFIRMs. The BAM map for the City of Amador City is shown in Figure A-14.

Figure A-14 City of Amador City – Best Available Map



Source: California DWR

Legend explanation: **Blue** - FEMA 100-Year, **Orange** – Local 100-Year (developed from local agencies), **Red** – DWR 100-year (Awareness floodplains identify the 100-year flood hazard areas using approximate assessment procedures.), **Pink** – USACE 100-Year (2002 Sac and San Joaquin River Basins Comp Study), **Yellow** – USACE 200-Year (2002 Sac and San Joaquin River Basins Comp Study), **Tan** – FEMA 500-Year, Grey – Local 500-Year (developed from local agencies), **Purple** – USACE 500-Year (2002 Sac and San Joaquin River Basins Comp Study).

The City does not consider 1% and 0.2% annual chance flooding to be a priority hazard for mitigation planning purposes. Significance and priority of a hazard was determined based on frequency, extent, and resulting damage, including deaths/injuries and property, natural and cultural resources, and economic damage. The ability of a jurisdiction to reduce losses through implementation of existing and new mitigation measures was also considered as to the significance and priority of a hazard. This assessment was used by the City to prioritize those hazards of greatest significance, enabling the City to focus resources where they are most needed. As such, no additional analysis is presented for this hazard, due to its low significance in the City. Further, as a non-priority hazard, it will not be carried forward into the mitigation strategy for the City.

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the City during the rainy season from

November through April. Prolonged heavy rainfall (including that from atmospheric river events) contributes to a large volume of runoff resulting in high peak flows of moderate duration.

Location and Extent

The City of Amador City is subject to localized flooding throughout the City. Areas prone to localized flooding are included in Table A-16 below. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the City vary by location. Flood durations in the City tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the City tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

Past Occurrences

Disaster Declaration History

There have been no state or federal disaster declarations from localized floods. There would most likely have been localized flood events during the disaster declarations from flood as shown in the previous 1%/0.2% annual chance flood section.

NCDC Events

The NCDC occurrences of localized flooding are included in the 1% and 0.2% annual chance flood hazard profile above where past flood events were noted.

City of Amador City Events

The City noted that localized flooding occurs throughout portions of the City annually. Historical data indicates that flooding of Amador Creek is a concern. Peak flows have not remained within normal creek limits. Flooding along Amador Creek can occur during heavy or prolonged rains and generally affects houses, some businesses, and the sewer plant and pipelines. The City noted the following specific flood events:

- In both 1995 and 1997 there were retaining wall collapses and sewer lines were washed out. The City received FEMA assistance. Repairs to the retaining wall were estimated at $150,000.
- 2017 landslides were caused by heavy rains and flooding in three different areas: Fleehart, Water Street and God's Hill. The City received FEMA assistance for the God's Hill area of approximately $5,000. No FEMA assistance was provided for the other two areas as damages were limited to private property.
- In 2017, Amador Creek flood walls washed out. There was no FEMA assistance given for this event as the impacted area was determined to be on private property.

Since 2020, flooding in Sierra-fed creeks and rivers in Jackson and Sutter Creek has similarly affected local travel, city businesses, and school closures-- peripheral impacts. The City noted that during periods of atmospheric river flooding, the City has seen localized floods. This occurred in 2023 in the City.

Climate Change and Localized Flood

It is likely that climate change will increase the chance of future occurrence as well as future impacts from localized flood. More information on future impacts to the City can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Even if average annual rainfall may decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century, increasing the likelihood of overwhelming stormwater systems built to historical rainfall averages. This makes localized flooding more likely.

Vulnerability to Localized Flood

Flood vulnerability and their impacts vary by location and severity of any given flood event and will likely only affect certain areas of the City during specific times. Based on the risk assessment, it is evident that floods will continue to have potentially significant impacts to certain areas of the City. However, while flooding can cause significant impacts, depending on the duration and volume of precipitation and the drainage in any given area, many of the floods in the City are minor, localized flood events that are more of a nuisance than a disaster.

Many areas of the City are at some measure of vulnerability to localized flooding. An assessment of a community's vulnerability to localized flooding begins with an understanding of local exposure to localized flooding. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Historically, the City has been affected by flooding of streams and creeks occurring during heavy rain and storm (including atmospheric river) events. Additional development in the City and in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff and contributes to localized flooding occurring in areas throughout the City. The lack of or inadequate drainage infrastructure in the City contributes to localized flooding issues. The City noted that many of their drains and manholes are old and are at risk to infiltration and inflow from excess rains. Vegetation management and debris cleaning efforts are constantly underway along Amador Creek but are always needed. The City is pursuing a stormwater master plan in the near future.

The City tracks localized flooding areas. Affected localized flood areas identified by the City of Amador City are summarized in Table A-16.

Table A-16 City of Amador City – List of Localized Flooding Problem Areas

Area Name	Flooding	Pavement Deterioration	Washout	High Water	Landslide/ Mudslide	Debris	Downed Trees
Along Amador Creek	X		X	X	X	X	

Source: City of Amador City

Assets at Risk

Assets at risk from localized flood include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

People and populations (including vulnerable populations) are traditionally not highly vulnerable to localized flooding, but their structures and contents can be at risk. Localized flooding may also cause transportation issues as roads and lanes are impacted or closed and affect the ability for people to travel throughout the City.

Structures

Structures in areas with localized flooding can be affected if floodwaters intrude into the structure. Structures in low lying areas, or those with basements can be at greater risk. Buildings with older foundations that are prone to water intrusion are also at greater risk. Once water finds its way into a structure, it tends to continue to do so until the path that brings water into a structure is mitigated. Structures can also be damaged by trees that have become uprooted and fall during rain and storm events. Large trees falling onto structures can cause significant damage.

Critical Facilities and Infrastructure

Localized flooding, while often more of a nuisance, can cause damage to critical facilities and infrastructure during a heavy rain and storm event. Any facility that experiences localized flooding can be impacted. Utilities and other critical infrastructure can all be affected, causing interruptions in service until repairs can be made. For example, water and wastewater systems can be vulnerable to heavy rains and flood events. Rainfall creates a high water table, surging streams and creeks, and saturates soil. Infiltration of stormwater into water and wastewater systems may occur and presents a threat to public health and safety, when the infrastructure is no longer able to meet operational needs and local demands. Other critical facilities such as roads, bridges and other transportation facilities can also experience localized flooding causing road closures and other impacts until storm waters recede. This can result in extended road closures requiring alternate routes.

Natural, Historic, and Cultural Resources

Natural resource assets may have some vulnerabilities to localized flood during major storm events, but can benefit from floodwaters, often by design. Many parks and green spaces are designed to take overflow water and release it into the underlying soils and natural areas. Wetlands areas in the City actually help reduce the risk of flooding, as they can absorb excess rainfall that would have to be drained away from

impervious surfaces. Flooding can provide many benefits to the natural environment, including recharging wetlands and groundwater, increasing fish production, creating wildlife habitat, and rejuvenating soil fertility. These smaller localized flooding events often provide more benefits to the environment in comparison to negative impacts associated with large flood events. Historic and cultural resources may be at some measure of vulnerability if they are located in areas subject to repeated localized flooding.

Impacts from Localized Flood

Primary concerns associated with stormwater flooding include impacts to infrastructure that provide a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services. Standing water can cause damage to crops, roads, and foundations. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Life safety issues from localized flooding would be more limited. The amount and type of damage or flooding that occurs varies from year to year and from storm to storm, depending on the quantity of precipitation and runoff.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City of Amador City include the following:

- Climate change is likely to exacerbate future heavy rain conditions and associated impacts and vulnerability of the City to localized flood.
- Population growth in the City of Amador City has recently slowed, but future populations are expected to be slightly larger. This can also increase the vulnerable populations, like low-income individuals and households living in areas that are typically more hazardous. Vulnerable population groups such as low-income individuals and households living in flood prone areas could face disproportionate effects from localized flood and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions and the location of future hazard events.
- Land use planning should be proactive to address future hazard conditions. Development in more urban areas causes an increase in peak flow and stormwater runoff. Such growth will consume previously undeveloped acres, and the impacts may overwhelm existing drainage and flood control facilities. Locating new development, structures and critical facilities and infrastructure within or near areas of localized flooding risk may put additional development at risk. However, City building codes are in

effect to reduce this risk and should be updated as necessary to continue to address future localized flood conditions. In addition, there are only two parcels in possible development in the next five years. Depending on the location of new development and adherence to protective building codes, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the City to this hazard.

Future development in the City will add more impervious surfaces causing an increase in stormwater runoff and the continued need to drain these waters. The City will need to be proactive to ensure that increased development has proper siting and drainage for stormwaters. Currently, the City requires a 50' setback from the creek for all new development. The risk of localized flooding to future development can also be minimized by accurate recordkeeping of repetitive localized storm activity. Mitigating the root causes of the localized stormwater flooding will reduce future risks of losses.

Landslide, Mudslide, and Debris Flow

Likelihood of Future Occurrence–Occasional
Vulnerability–Medium

Hazard Profile

Like its earthquake-generating faults, California's mountainous terrain is a consequence of dynamic geologic processes in operation as the North American Plate grinds past the Pacific Plate. According to the CGS, a landslide is a general term for a variety of mass-movement processes that generate a down-slope movement of mud, soil, rock, and/or vegetation. Landslides are classified into many different types based on form and type of movement. They range from slow-moving rotational slumps and earth flows, which can slowly distress structures but are less threatening to personal safety, to fast-moving rock avalanches and debris flows that are a serious threat to structures and have been responsible for most fatalities during landslide events. For the purposes of this LHMP Update, the term landslide includes mudslides, debris flows, and rockfalls that tend to occur suddenly; as well as hillside erosion, which is a similar process that tends to occur on smaller scales and more gradually but can exacerbate landslide events.

Landslides, debris flows and mudslides are closely related to flooding, as both processes are related to precipitation, runoff, and the saturation of ground by water. In addition, landslides, mud flows, and debris flows can occur on small, steep stream channels and are often mistaken for floods. However, landslide events may be much more destructive than floods because of their higher densities, high debris loads, and high velocities.

Soil erosion is another common form of soil instability. Erosion is a function of soil type, slope, rainfall intensity, and groundcover. It accounts for a loss in many dollars of valuable soil, is aesthetically displeasing, and often induces even greater rates of erosion and sedimentation. Sedimentation is simply the accumulation of soil as a result of erosion. Construction activities often contribute greatly to erosion and sedimentation. Besides being a pollutant in its own right, sediment acts as a transport medium for other pollutants, especially nutrients, pesticides, and heavy metals, which adhere to the eroded soil particles. As the sediment drains into watercourses, the combination of these pollutants adversely affects water quality.

Natural conditions that contribute to landslide, mudslides, debris flows, hillside and streambank erosion, include the following:

- Degree of slope
- Water (heavy rain, river flows, or wave action)
- Unconsolidated soil or soft rock and sediments
- Lack of vegetation (no stabilizing root structure)
- Previous wildfires and other forest disturbances (discussed in the Wildfire section below)
- Road building, excavation, and grading
- Earthquake

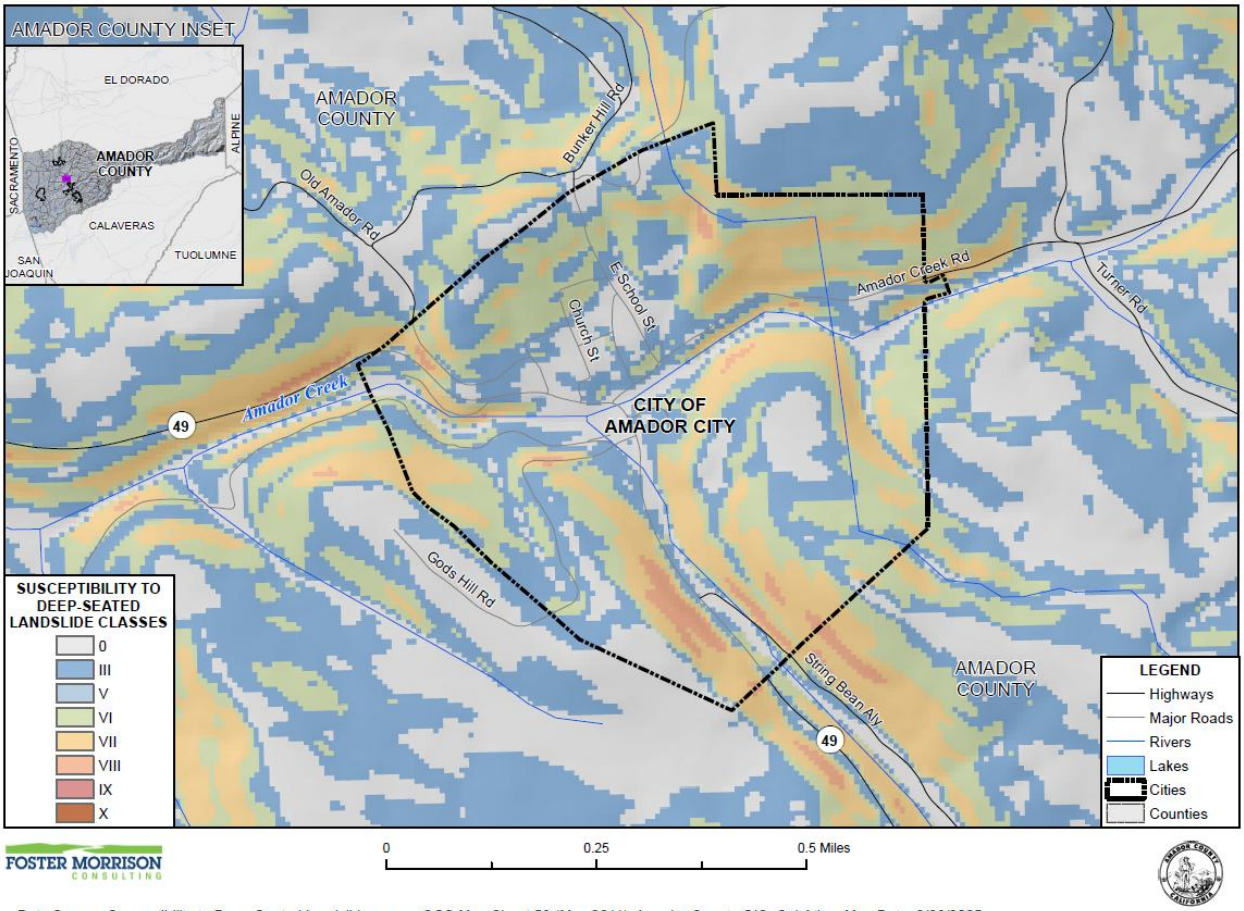
The 2023 California State Hazard Mitigation Plan noted that more than one third of California is mountainous terrain that generally trends parallel to the coast, forming a barrier that captures moisture from offshore storms originating in the Gulf of Alaska and Mexico. Steep topography, weak rocks, heavy winter rains, and occasional earthquakes all lead to slope failures more frequently than would otherwise occur under gravity alone. This is true in the sloped areas in the City where the topography is characterized by rolling hills.

Location and Extent

Landslides can occur in areas with steep slopes and weak soils. It can also occur in areas where erosion has previously occurred. Both winter storms (precipitation-induced) and earthquake triggered landslides tend to occur in or near places that have experienced previous landslides. However, landslides may also occur in other locations over time. Landslides may also occur in fire burn scar areas.

Figure A-15 shows the CGS areas at susceptible to deep-seated landslides. The legend on Figure A-15 shows the susceptibility scale (from 0-X with 0 being the least and X being the most susceptible) that the CGS uses to show the susceptibility of landslides. It is a primarily a combination of slope class and rock strength. Geographic extents of these classes are shown on Table A-17. According to the 2023 State Hazard Mitigation Plan, the susceptibility classes were further categorized into Very High (susceptibility class X) and High (susceptibility classes VII, VIII, & IX) for exposure analysis. The rest of the classes were not categorized. CGS mapping indicates that many portions of the City and surrounding area are at moderate to high susceptibility areas for landslides. This can be seen in the darker orange and red colors. The speed of onset of landslide is often short, especially in past landslide areas as well as in post-wildfire burn scar areas, but it can also take years for a slope to fail. Landslide duration is usually short, though digging out and repairing landslide areas can take some time.

Figure A-15 City of Amador City – Susceptibility to Deep-Seated Landslides Classes



Data Source: Susceptibility to Deep-Seated Landslides map - CGS Map Sheet 58 (May 2011), Amador County GIS, Cal-Atlas; Map Date: 2/26/2025.
https://gis.data.ca.gov/maps/08d18656a0194881a7e0f95fde19f08c/explore?location=37.559285%2C-122.059821%2C11.00

Table A-17 City of Amador City – Susceptibility to Deep-Seated Landslide Geographical Extents by Class

Susceptibility to Deep-Seated Landslide Class	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
0	34	17%	13	22%	21	15%
III	57	29%	21	35%	36	26%
V	0	0.0%	0	0.0%	-	0.0%
VI	59	30%	16	26%	43	31%
VII	43	22%	9	14%	34	25%
VIII	5	2%	2	3%	3	2%
IX	0	0.0%	0	0.0%	0	0.0%
X	0	0.0%	0	0.0%	0	0.0%
Amador City Total	**198**	**100%**	**61**	**100%**	**137**	**100%**

Source: CGS Susceptibility to Deep-Seated Landslides – CGS Map Sheet 58

Past Occurrences

Disaster Declarations

There have been no disaster declarations associated with solely landslides in Amador County; however, as shown in Table A-18, there have been 9 state and 10 federal disaster declarations for flood which included landslides as a component.

Table A-18 Amador County – Federal and State Disaster Declarations Summary 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (events that included landslide)	9	1995 (twice), 2006 (twice), 2017 (twice), 2019, 2023 (twice)	10	1995 (twice), 2006 (twice), 2017 (twice), 2019, 2023 (three)

Source: Cal OES, FEMA. Retrieved March 2025.

NCDC Events

The NCDC contains no records for landslides in Amador County, but there was one record for debris flow. This was not known to affect the City.

City of Amador City Past Occurrences

The City Planning Team noted a landslide in 2017 after heavy rains. These 2017 landslides were caused by heavy rains and flooding in three different areas: Fleehart, Water Street and God's Hill. The City received FEMA assistance for the God's Hill area of approximately $5,000. No FEMA assistance was provided for the other two areas as damages were limited to private property.

In addition to the above landslides, a minor landslide also occurred as a result of the heavy 2017 rains on Amador Creek Road. The City noted no other landslides since the 2020 LHMP.

Climate Change and Landslide and Debris Flows

According to the 2021 CAS (as well as the 2024 Draft CAS), climate change may result in precipitation extremes (i.e., wetter wet periods and drier dry periods). More information on precipitation increases can be found in Section 4.3.4 of the Base Plan. While total average annual rainfall may decrease only slightly, rainfall is predicted to occur in fewer, more intense precipitation events. The combination of a generally drier climate in the future, which will increase the chance of drought and wildfires, and the occasional extreme downpour is likely to cause more mudslides, landslides, and debris flows.

Vulnerability from Landslide

Portions of the City are at some measure of vulnerability to landslide. This is true when atmospheric river or heavy rain and storm events occur. An assessment of a community's vulnerability to landslide begins with an understanding of local exposure to landslide. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Amador City is located in an area of hills and steep slopes creating a potential for washouts and landslides during periods of heavy rains. Specific areas of concern include God's Hill Road, Fleehart, and Water Street and other sloped areas throughout the City. The City also noted there is an area just above (in elevation) the wastewater treatment plan that is at risk to landslide. A portion of this is on City land, while a portion is on private land. The City is looking to build a retaining wall on City owned land to keep slippage from happening at the base of the hill in order to protect the wastewater treatment plant.

Assets at Risk

Assets at risk from landslide include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations located within areas of landslide susceptibility, especially in the High to Very High hazard areas (i.e., Classes VII to X) are at some vulnerability to landslide. This includes those people residing in these landslide potential areas as well as those that might reside or work within the landslide run out areas. People residing in these areas may also be cut off from transportation routes if roads and streets providing a means of ingress and egress are impacted. Certain vulnerable populations may be at greater risk due to the often sudden onset of a landslide event and include: the unsheltered, those with limited mobility, and those that lack the resources to leave the area.

City residents that live in the High and Very High landslide susceptibility areas are often the most vulnerable, but those who live in in the landslide run out areas (which are not mapped) are also vulnerable. Not only are the residents at risk, but their homes and contents are all at risk, compounding the impacts associated with significant hazard events. To further evaluate the impact to the City's residential population residing within these hazard areas, an analysis was conducted of those who physically reside in the mapped landslide susceptibility areas. The CGS Susceptibility to Deep-Seated Landslide maps were overlayed on the parcel layer and linked to the assessor data. Those residential parcel polygons that intersect the High or Very High risk areas (Class VII or higher) were counted and multiplied by the 2023 Census Bureau average household factors for Amador City – 2.07. Analysis results are shown in Table A-19. According to this analysis, there is a total population of 54 residents of the City at high or very high risk to landslides.

Table A-19 City of Amador City – Improved Residential Parcels and Population in Susceptibility to Deep-Seated Landslides - Classes VII, VIII, IX, and X

Deep Seated Landslide Class/Jurisdiction	Improved Residential Parcels	Population
VII		
Amador City	26	54

Deep Seated Landslide Class/Jurisdiction	Improved Residential Parcels	Population
VIII		
Amador City	4	8
IX		
Amador City	0	0
X		
Amador City	0	0

Source: CGS, Amador County 2024 Parcel/Assessor Data, US Census Bureau American Community Survey 2023 Household Size Estimates.

The City noted that the Critical Facilities and Infrastructure section below includes the facilities used by At-Risk populations that are threatened by this hazard. While this is not specific to what special populations reside in the City, it does speak to facilities that area used to serve (portions) of this population.

Structures

Landslides can affect the built environment of the City and those structures located within the High to Very High hazard areas (i.e., Classes VII to X) are especially vulnerable, as are the structures located within the landslide run out areas. The CGS Deep-Seated Landslide layer was overlaid with the City parcel (structure) layer in GIS and linked to the assessor data. The mapped landslide susceptibility areas are shown on Figure A-15. Table A-20 summarizes parcel counts, land and improved values (i.e., those with a structure improvement on the parcel), estimated content replacement values, and total values in the City for landslide susceptibility areas. Table A-21 shows the same analysis further broken out by property use.

Table A-20 City of Amador City – Count and Value of Parcels and Structures Susceptible to Deep-Seated Landslide Classes

Susceptibility to Deep-Seated Landslide Class	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
0	17	11	$1,295,333	$1,857,930	$1,001,341	$4,154,604
III	37	25	$4,135,446	$4,500,610	$2,669,721	$11,305,777
VI	58	41	$6,930,312	$8,059,107	$4,806,698	$19,796,117
VII	52	29	$5,069,410	$6,045,394	$3,577,490	$14,692,294
VIII	16	5	$1,693,876	$615,265	$310,108	$2,619,249
Amador City Total	**180**	**111**	**$19,124,377**	**$21,078,306**	**$12,365,357**	**$52,568,040**

Source: CGS, Amador County 2024 Parcel/Assessor Data

Table A-21 City of Amador City – Count and Value of Parcels and Structures in Deep-Seated Landslide Classes by Property Use

Susceptibility to Deep-Seated Landslide Class/Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Estimated Contents Value
III						
Agricultural	2	1	$417,023	$266,879	$266,879	$950,781
Commercial	13	10	$2,131,953	$2,282,596	$2,282,596	$6,697,145
Miscellaneous	5	1	$17,407	$11,604	$0	$29,011
Residential	72	49	$7,473,658	$9,226,621	$4,613,311	$21,313,590
III Total	**92**	**61**	**$10,040,041**	**$11,787,700**	**$7,162,786**	**$28,990,527**
VI						
Residential	1	0	$1,020	$0	$0	$1,020
VI Total	**1**	0	**$1,020**	$0	$0	**$1,020**
VII						
Agricultural	3	1	$401,680	$339,466	$339,466	$1,080,612
Commercial	2	2	$438,520	$770,120	$770,120	$1,978,760
Industrial	1	0	$6,880	$0	$0	$6,880
Miscellaneous	5	0	$577	$0	$0	$577
Residential	41	26	$4,221,753	$4,935,808	$2,467,904	$11,625,465
VII Total	**52**	**29**	**$5,069,410**	**$6,045,394**	**$3,577,490**	**$14,692,294**
VIII						
Agricultural	2	0	$416,016	$0	$0	$416,016
Industrial	1	1	$3,836	$2,475	$3,713	$10,024
Miscellaneous	1	0	$2,393	$0	$0	$2,393
Residential	11	4	$1,271,631	$612,790	$306,395	$2,190,816
Unknown	1	0	$0	$0	$0	$0
VIII Total	**16**	**5**	**$1,693,876**	**$615,265**	**$310,108**	**$2,619,249**
X						
Residential	19	16	$2,320,030	$2,629,947	$1,314,974	$6,264,951
X Total	**19**	**16**	**$2,320,030**	**$2,629,947**	**$1,314,974**	**$6,264,951**
Amador City Total	**180**	**111**	**$19,124,377**	**$21,078,306**	**$12,365,357**	**$52,568,040**

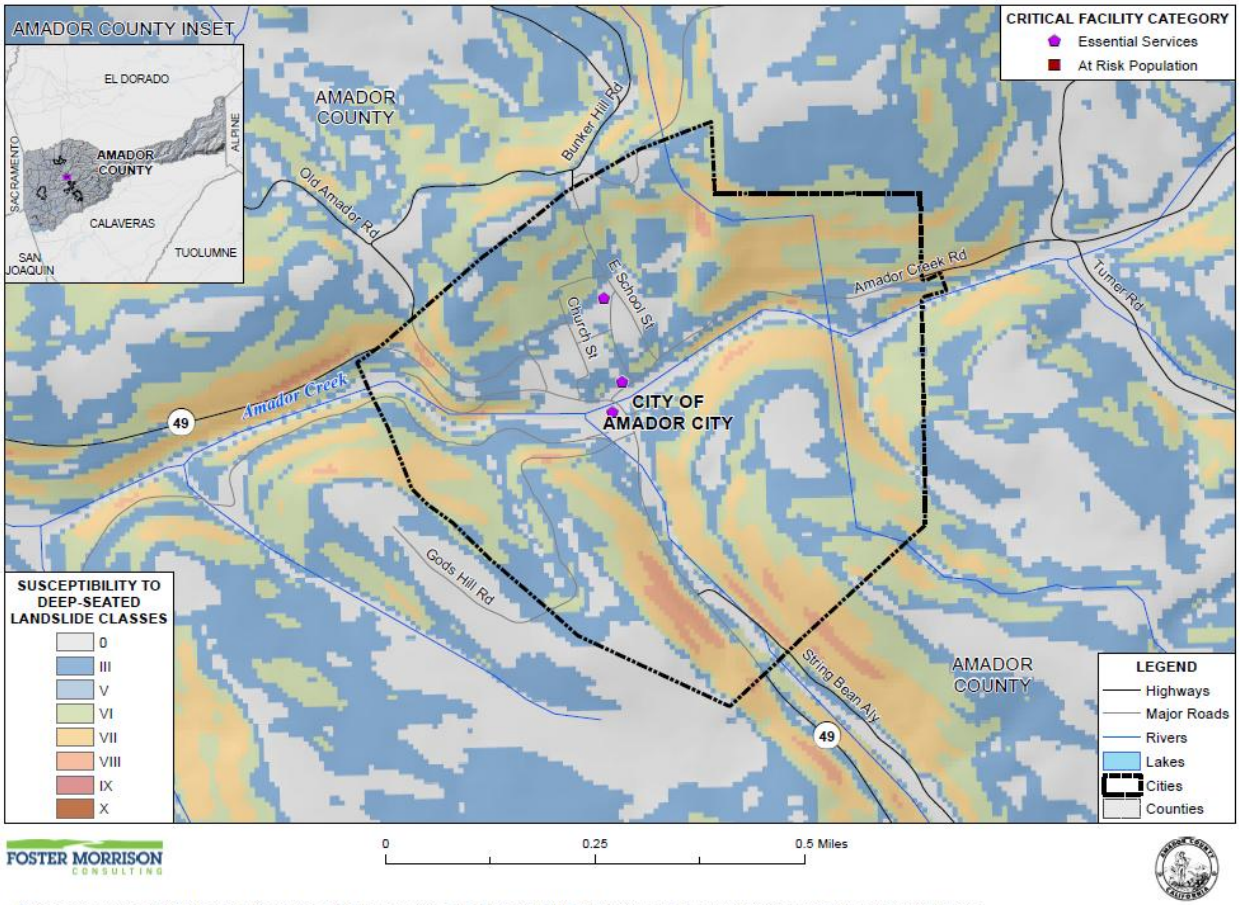
Source: CGS, Amador County 2024 Parcel/Assessor Data

Critical Facilities and Infrastructure

Landslides present a threat to both critical facilities and infrastructure. The following analysis discusses critical facilities and infrastructure. A separate analysis was performed on the critical facility inventory in the City to determine which critical facilities fall into each deep-seated landslide classes. Using GIS, the

deep-seated landslide classes were overlayed on the critical facility GIS layer. This is shown on Figure A-16 for the deep-seated landslide classes. Table A-22 summarizes Table A-23 details which critical facilities fall in which landslide class. Details of critical facility categories, type, name, and address by deep-seated landslide class are listed in Appendix F.

Figure A-16 City of Amador City – Critical Facilities in Deep-Seated Landslide Classes



Data Source: Susceptibility to Deep-Seated Landslides map - CGS Map Sheet 58 (May 2011), Amador County GIS, Cal-Atlas; Map Date: 4/21/2025.
https://gis.data.ca.gov/maps/08d18656a0194881a7e0f95fde19f08c/explore?location=37.559285%2C-122.059821%2C11.00

Table A-22 City of Amador City– Critical Facilities by Category in Deep-Seated Landslide Classes

Susceptibility to Deep-Seated Landslide Class / Critical Facility Category	Facility Count
0	
Essential Services	2
At Risk Population	0
0 Total	**2**
III	
Essential Services	1
At Risk Population	0

Susceptibility to Deep-Seated Landslide Class / Critical Facility Category	Facility Count
III Total	**1**
Amador City Total	**3**

Source: CGS, City of Amador City

Table A-23 City of Amador City – Critical Facilities by Category and Type in Deep-Seated Landslide Classes

Susceptibility to Deep-Seated Landslide Class	Critical Facility Category	Facility Type	Facility Count
0	Essential Services Facilities	Fire Station	1
		Public Administration Building	1
	0 Total		**2**
III	Essential Services Facilities	Post office	1
	III Total		**1**
City of Amador City Total			**3**

Source: CGS, City of Amador City

Natural, Historic, and Cultural Resources

Landslides can affect natural, historic, and cultural resources that lie in the landslide area, or the landslide run out area. Landslides can destroy large tracts of forest and open space areas, destroy wildlife habitat, and remove productive soils and vegetation from slopes. It can also fill in waterways, impact water quality, and potentially affect flooding potential. Natural resources that fall in the High or Very High susceptibility areas shown on Figure A-15 would be most vulnerable, as well as those in the run-out areas. As shown on the map, this would include a relatively small area of the developed area City, since most of this occurs in the undeveloped areas of the City.

Impacts from Landslide

Any type of landslide may result in damages or complete destruction of buildings in their path, as well as deaths and injuries. Landslides can cause road blockages by depositing debris on road surfaces or road damage if the road surface itself slides downhill. Utility lines and pipes are also prone to breakage in slide areas. Large landslides can collapse into water bodies, causing seiches. Landslides can relocate river channels. Landslides and debris flows can also impact water quality and the storage capacity of surface water reservoirs used to store potable water.

Landslides, debris flows, and mud flows impacts vary by location and severity of any given event and will likely only affect certain areas of the City susceptible to landslide. Based on the risk assessment, there is limited potential for significant landslides to occur in the City. Most, but not all, of the historic landslides in the City have been minor, localized events that are more of a nuisance than a disaster. Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;

- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the hazard profile above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City include the following:

- Climate change is likely to exacerbate future landslide, mudslide, and debris flow conditions and associated impacts and vulnerability of the City to landslide.
- Population growth in the City has recently slowed; however, additional growth within the areas at risk to deep-seated landslides in the City would place additional populations at risk. Additional population growth would likely bring continued diversity to the City. Vulnerable population groups could face disproportionate effects from a landslide and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions and the location of future landslide events.
- Land use planning should be proactive to address future hazard conditions. Locating new development, structures and critical facilities and infrastructure within or near areas of landslide risk may put additional development at risk. However, there are only two parcels thought to be developed over the next five years. City building codes are in effect to reduce this risk and should be updated as necessary to continue to address future landslide conditions. Thus, depending on the location of new development and adherence to protective building codes, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the City to this hazard.

Future Development

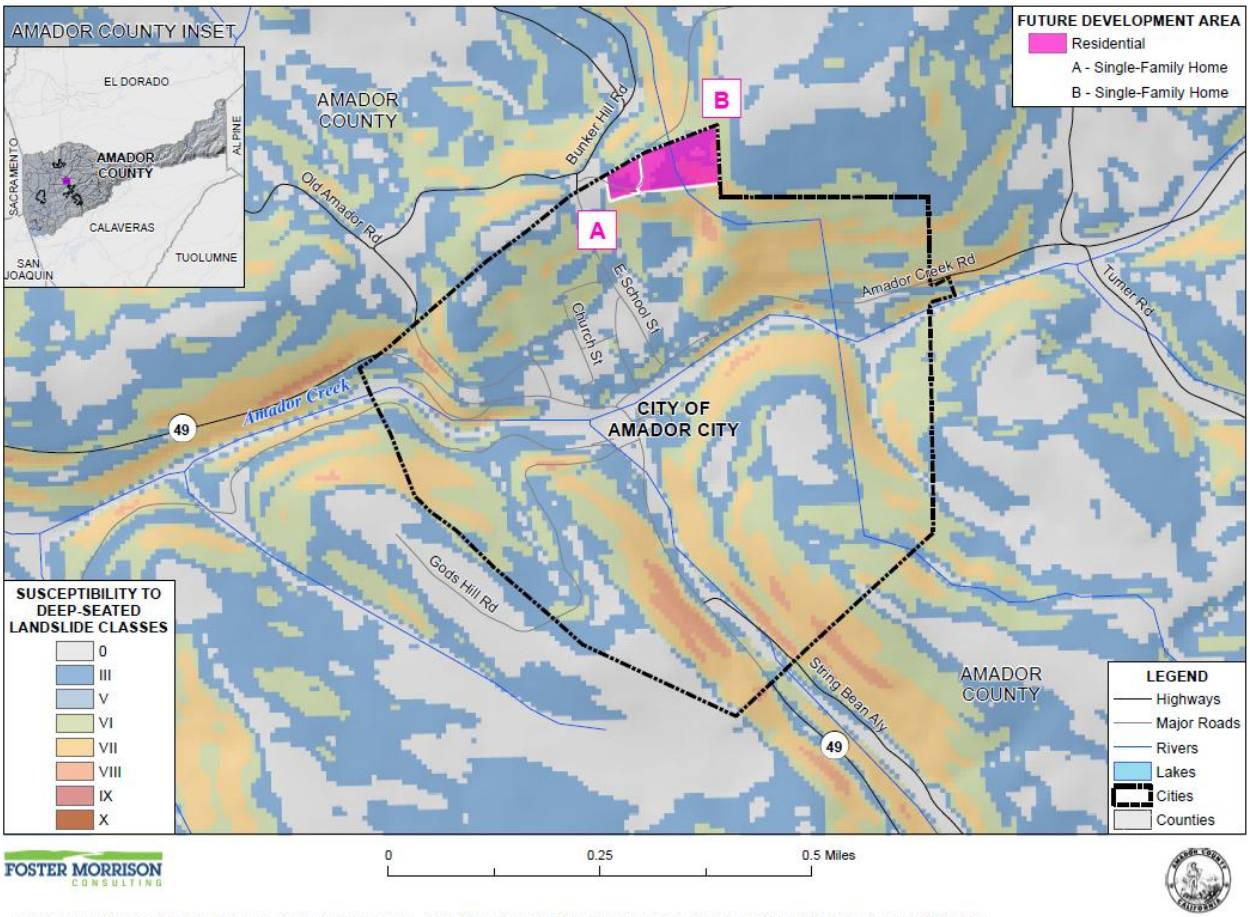
Additional growth and development within moderate or higher deep-seated landslide susceptibility classes in the City would place additional values at risk to landslide. More vulnerable populations may experience a disproportionate impact from landslide, and this should be considered as development continues.

Future development areas and their vulnerability to landslides are discussed further in the below GIS analysis.

GIS Analysis

The City provided two future development areas which were used as the basis for the inventory of future development for the City. This area were mapped in GIS. Utilizing the future development area spatial layer, the parcel polygon data was intersected to determine the future development areas within each deep-seated landslide class. Figure A-17 shows the locations of the future development area overlayed on the deep-seated landslide classes. These lie outside in the III and VII deep-seated landslide classes, as shown in Table A-24.

Figure A-17 City of Amador City – Future Development in Deep-Seated Landslide Classes



Data Source: Susceptibility to Deep-Seated Landslides map - CGS Map Sheet 58 (May 2011), Amador County GIS, Cal-Atlas; Map Date: 10/6/2025.

Table A-24 City of Amador City – Future Development Parcels and Acres in Deep Seated Landslide Classes

Susceptibility to Deep-Seated Landslide Class / Property Use / Future Development	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
III						
Residential Single-Family Home						
A	1	0	1	0.99	0	0.99

Susceptibility to Deep-Seated Landslide Class / Property Use / Future Development	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
III Total	**1**	**0**	**1**	**0.99**	**0**	**0.99**
VII						
Residential Single-Family Home						
B	1	1	0	3.44	3.44	0
VII Total	**1**	**1**	**0**	**3.44**	**3.44**	**0**
Grand Total	**2**	**1**	**1**	**4.43**	**3.44**	**0.99**

Source: CGS Map Sheet 58, City of Amador City

Severe Weather: Extreme Heat

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

According to FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and lasts for several weeks. Heat kills by taxing the human body beyond its abilities. In extreme heat and high humidity, evaporation is slowed, and the body must work extra hard to maintain a normal temperature." Most heat disorders occur because the victim has been overexposed to heat or has over-exercised for his or her age and physical condition. Older adults, young children, those who are sick or overweight, and those that work or recreate outdoors are more likely to experience heat exhaustion or succumb to extreme heat.

In addition to the risks faced by citizens of the City, there are risks to the built environment from extreme heat. While extreme heat on its own does not usually affect structures, extreme heat during times of drought can cause wildfire risk to heighten. Extreme heat can lead to interruptions in power, power outages, and when combined with high winds, to Public Safety Power Shutdown (PSPS) events, creating significant issues in the City.

Location and Extent

Heat is a regional phenomenon and affects the whole of the City. Heat emergencies are often slower to develop, taking several days of continuous, oppressive heat before a significant or quantifiable impact is seen. Heat waves do not strike victims immediately, but rather their cumulative effects slowly affect general and vulnerable populations and communities. Heat waves do not generally cause damage or elicit the immediate response of floods, fires, earthquakes, or other more "typical" disaster scenarios. The City experiences temperatures in excess of 100°F during the summer and fall months. The temperature moves to 105-110°F in rather extreme situations.

The NWS has in place a system to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected severity of the heat determines whether

advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color (green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Section 4.3.3 of the Base Plan.

Past Occurrences

Disaster Declaration History

There have been no federal or state disaster declarations from extreme heat.

NCDC Events

The NCDC data shows 124 extreme heat incidents for Amador County since 1993, some of which likely affected the City.

City of Amador City Events

The City noted that extreme heat occurs every year, but could recall no specific events of damage, injury, or death.

Climate Change and Extreme Heat

The 2021 CAS (as well as the 2024 Draft CAS), citing a California Energy Commission study, states that "over the past 15 years, heat waves have claimed more lives in California than all other declared disaster events combined." This study shows that California is getting warmer, leading to an increased frequency, magnitude, and duration of heat waves. These factors may lead to increased mortality from excessive heat.

As temperatures increase, California and Amador County will face increased risk of death from dehydration, heat stroke, heat exhaustion, heart attack, stroke and respiratory distress caused by extreme heat. According to the 2021 CAS (as well as the 2024 Draft CAS) report and the 2023 State of California Hazard Mitigation Plan, by 2100, hotter temperatures are expected throughout the state, with projected increases of 3-5.5°F (under a lower emissions scenario) to 8-10.5°F (under a higher emissions scenario). These changes could lead to an increase in deaths related to extreme heat in Amador County.

Vulnerability to Severe Weather: Extreme Heat

Extreme heat is becoming more frequent, intense, longer lasting and geographically widespread. Extreme heat occurs on an annual basis in the County and the City. In recent years, compounded by climate change conditions, summer months continue to get a bit hotter. The whole of the City is at some measure of vulnerability to extreme heat. An assessment of a community's vulnerability to extreme heat begins with an understanding of local exposure to extreme heat. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The City is concerned that only a fraction of the residents of the City have air conditioning. Many of the residents without air conditioning are elderly or disabled. A former grammar school is being restored and converted to being a cooling center. There are plans for a backup generator at this site. There is currently no public transport to this cooling center. The City is looking for ways to address this. In addition, the City is concerned that heat will stress trees weakened by drought or bark beetle, causing increased wildfire risk in the City.

Assets at Risk

Assets at risk from extreme heat include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations within the City are vulnerable to extreme heat, but it generally affects people spending large amounts of time outside or without means of cooling indoor structures. During extended periods of high temperatures, extreme heat may overload the demands for electricity to run air conditioners and can present health concerns to individuals. When interruptions in power occur during extreme heat, the risk of heat related illnesses and deaths increases. Extreme heat is a significant concern to vulnerable populations. The unhoused; individuals who exercise or train outdoors; outdoor workers; individuals that lack the resources to afford heat; and the young, old, or medically fragile individuals that are more susceptible to heat related impacts. In addition to vulnerable populations, pets and livestock are at risk to extreme heat conditions.

Structures

Extreme heat normally does not generally impact structures, but individuals working in structures may be affected during periods of extended heat, especially in structures that might not be equipped with air conditioning or other means of cooling. The City noted that extreme heat has caused interruptions to power in the past. Also depending on the structure, sensitive contents such as IT equipment can be impacted, especially if a power outage occurs.

Critical Facilities and Infrastructure

Depending on their type and function, critical facilities and infrastructure can also be affected by extreme heat. Interruptions in power caused by extreme heat can lead to system failures. Schools without air conditioning may have to close or operate on a reduced schedule.

Natural, Historic, and Cultural Resources

Natural resource assets, including those located in City park areas, may be vulnerable during periods of extreme heat. These include turfed areas; landscapes, City trees, wildlife and habitat areas, and wetlands and marsh lands. In the past 20 years, trees were lost in areas of the City that were weakened by drought and extreme heat. Extreme heat may also cause drought-like conditions, contributing to other issues. For example, several weeks of extreme heat increases evapotranspiration and reduces moisture content in vegetation, leading to higher wildfire vulnerability in the region for that time period, even if the rest of the season is relatively moist. Historic and cultural resources are not expected to be affected by extreme heat.

Impacts from Severe Weather: Extreme Heat

The City experiences temperatures in excess of 100°F during the summer and fall months. The temperature moves to 105-110°F in rather extreme situations. During these times, drought conditions may worsen, and the City may see an increase in dry fuels. Also, power outage and PSPS events may occur during these times as well. Health issues are a primary concern with this hazard, especially to vulnerable populations, although economic impacts can also be an issue.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for City include the following:

- Climate change is likely to exacerbate future extreme heat conditions and associated impacts and vulnerability of the City.
- Future population growth should be considered, as having more or less people in a community affects the overall hazard vulnerability to the City. Population is expected to slowly increase for the City and, as such, the vulnerability to this hazard may increase, specifically affecting growing vulnerable populations as the senior citizen population continues to reside in and age within the communities of the City. Along with this, low income and the unhoused population are at risk to extreme heat which can put strain on emergency services and shelters. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions and the location of future hazard events.
- Land use planning should be proactive to address future hazard conditions. City building codes are in effect to reduce this risk and should be updated as necessary to continue to address future extreme heat conditions. Due to adherence to protective building codes, changes in land use and development will likely not increase the impacts and associated vulnerabilities of the City to this hazard.

Future development of new buildings in the City will likely not be affected by extreme heat. Extreme heat is more likely to affect vulnerable populations. Vulnerability to extreme heat will increase as the average age of the population shifts. It is encouraged that nursing homes and elder care facilities have emergency plans or backup power to address power failure during times of extreme heat and in the event of a PSPS. Low-income residents and unhoused populations are also more vulnerable and should be considered in future growth plans for the City.

Severe Weather: Heavy Rains and Storms

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

Storms in the City occur annually and are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the City falls mainly in the fall, winter, and spring months. Wind often accompanies these storms; hail and lightning are rare in the City.

Location and Extent

Heavy rain events occur on a regional basis. Rains and storms can occur in any location of the City. All portions of the City are at risk to heavy rains and storms. Most of the severe rains occur during the fall, winter, and spring months in the City as discussed below (with problem flooding areas associated with heavy rains and storms shown in Table A-16 in the Flood: Localized Stormwater section). There is no scale by which heavy rains and severe storms are measured. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Hail and lightning are rarer in the City and Amador County. Duration of severe storms in the City can range from minutes to hours to days. Information on precipitation extremes can be found in Section 4.3.4 of the Base Plan.

Past Occurrences

Disaster Declaration History

According to historical hazard data, severe weather, including heavy rains and storms, is an annual occurrence in the City. This contributes to many of the federal disaster declarations related to flooding. Disaster declarations from flooding are shown on Table A-25.

Table A-25 Amador County – State and Federal Disaster Declarations from Flood (Heavy Rain and Storms) 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	22	1950, 1955, 1958 (twice), 1959, 1963, 1964, 1969, 1980, 1982, 1986, 1995 (twice), 1997, 2006 (twice), 2017 (twice), 2019, 2021, 2023 (twice)	20	1950, 1955, 1958, 1962, 1963, 1964, 1969, 1986, 1995 (twice), 1997, 1998, 2006 (twice), 2017 (twice), 2019, 2023 (three)

Source: Cal OES, FEMA

NCDC Events

The NCDC data recorded 114 hail, heavy rain, and winter weather incidents for Amador County since 1950. Winter weather events tend to be rain in the lower elevations of the County, while snow falls in the upper elevations.

City of Amador City Events

According to historical hazard data, severe weather, including heavy rains and storms, is an annual occurrence in the City. This is the cause of many of the state and federal disaster declarations related to flooding. Also as detailed in the flood sections of this Annex, significant events occurring since the 2014 LHMP include those associated with the heavy rains and storms during the winter of 2017. These storms caused flooding of Amador Creek and other areas with minimal drainage infrastructure throughout the City and also resulted in landslides in several areas. One of these landslide areas on God's Hill was repaired utilizing FEMA Public Assistance (PA) funds. It was also noted, that while heavy storms occurred in 2019, no PA claims were made by the City. No other events have occurred since the 2020 LHMP causing notable damage in the City.

Climate Change and Heavy Rains and Storms

It is likely that climate change will increase the chance of future occurrence as well as future impacts from heavy rains and storms. More information on future impacts to the City can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

According to the 2021 CAS (as well as the 2024 Draft CAS), while average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is unlikely that hail will become more common in Amador County and the City of Amador City. The amount of lightning is not projected to change.

Cal-Adapt noted that, on average, the projections show little change in total annual precipitation in California. Furthermore, among several models, precipitation projections do not show a consistent trend during the next century. Cal-Adapt modeled scenarios are shown in Section 4.3.4 of the Base Plan.

Vulnerability to Heavy Rain and Storms

Heavy rain and severe storms are the most frequent type of severe weather occurrences in the City. These events can cause both significant and localized flooding. Flooding can be worse during times where the ground is already saturated. Wind often accompanies these storms and has caused damage in the past. Hail and lightning are rare in the City, but also can cause damage, with lightning occasionally igniting wildfires.

The whole of the City is at some measure of vulnerability to heavy rain and storms. An assessment of a community's vulnerability to heavy rains and storms begins with an understanding of local exposure to heavy rain and storms. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The City is concerned about inflow and infiltration of both the sewer and storm drains in the City. The City is also concerned that heavy rains can cause erosion and slippage, which may exacerbate landslide (especially above the wastewater treatment plant). The City also noted that heavy rains and storms cause localized flooding in the City. The problem areas are shown on Table A-16 above.

Assets at Risk

Assets at risk from heavy rain and storms include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations (including vulnerable populations) in the City have some measure of risk to heavy rains and storms. Those populations that work or recreate outside and unhoused individuals are more vulnerable to impacts from heavy storm events. Heavy rains and storms occur every year and do not generally cause significant adverse impacts to individuals; it is the secondary hazard, flooding, which poses the biggest impact to people. Populations at risk to flooding resulting from heavy rains and storm events include those who live in floodplains (discussed in further detail in the Flood: 1%/0.2% Annual Chance section above) and those who live in and near localized flooding areas (discussed in further detail in the Flood: Localized Stormwater Flooding section above).

Structures

Structures in the City have some risk to heavy rains and storms. Structures built to modern building codes are built to withstand heavy rains and storms (including high winds and lightning). During a heavy storm, localized flooding may cause water intrusion into buildings from the outside. Trees can be downed causing impacts to structures. Older homes and buildings may be at increased risk to heavy rains and storms. Power outages during severe storm events can occur, impacting the use of structures until the power is back online.

Critical Facilities and Infrastructure,

Heavy rain and storms can affect critical facilities and infrastructure during large events. Power outages may occur taking facilities offline. High winds can down power lines and trees impacting facilities. Water intrusion into facilities and infrastructure can impact operations. City roads, streets, and bridges can be impacted resulting in closures restricting traffic flow in the City. In certain areas, large storms can cause erosion and localized landslides which can impact facilities. Many critical facilities are built to modern design standards that take heavy rains and storms into account when siting and building these structures, and others may need to be retrofitted to better withstand these events.

Natural, Historic, and Cultural Resources

Large rain and storm events and associated flooding can affect natural, historic, and cultural resources. Silt and sediment can damage natural areas. Trees can be uprooted and downed by high winds. Extended periods of rainfall can erode natural banks along waterways and degrade soil stability for terrestrial species. While some natural systems can be adversely impacted during these large storms, heavy rain events can also provide benefits. Groundwater and wetland areas can be recharged and water supplies replenished. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to structures affected by large storm events, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged, and lost during extreme rain and storm and events.

Impacts from Heavy Rain and Storms

Impacts from heavy rains and storms include damage to property, critical facilities and infrastructure, and the natural landscape. This includes: erosion; downed trees; damaged utility structures and infrastructure; power outages; road damage and blockages; and even lightning strikes to critical infrastructure and people. Lightning can also cause wildfires and urban fires to occur. Landsliding and erosion occur when the soil on slopes becomes oversaturated and fails. Climate change may cause these impacts to worsen.

Actual damage associated with the primary effects of severe storms and heavy rains has been somewhat limited. It is the secondary hazards caused by these severe weather events, such as floods and erosion that would likely have the greatest impact.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City include the following:

- Climate change is likely to exacerbate future heavy rain and storm conditions and associated impacts and vulnerability of the City to flooding.
- Population is expected to slowly increase for the City of Amador City. The vulnerability may change depending on changes to the makeup of more vulnerable populations. Certain vulnerable populations, such as the unhoused, could experience disproportional effects from this hazard. and should be addressed as the City continues to grow. Thus, changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions and the nature and intensity of future storm events.
- Land use planning should be proactive to address future hazard conditions. Changes in land use may also amplify the impacts of heavy rains and storms, as additional impervious surfaces can cause additional runoff and localized flooding throughout the City. However, only two parcels and expected to be developed in the next five years. As such, very little impervious surfaces will be added. Thus, future land use and development planned in the City is unlikely to change the vulnerability of the City to this hazard.

Building codes in the City ensure that new development is built to current building standards, which should reduce the risk to future development in the City from heavy rains and storms. New critical facilities such as communications towers and others should be built to withstand hail damage, lightning, and thunderstorm winds. With adherence to development standards, future losses to new development should be minimal. Future changes in land use, if significant, may also amplify the impacts of heavy rains and storms, as additional impervious surfaces can cause additional runoff and localized flooding throughout the City.

Severe Weather: High Winds and Tornado

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

High winds, as defined by the NWS glossary, are sustained wind speeds of 40 mph or greater lasting for 1 hour or longer, or winds of 58 mph or greater for any duration. High winds can cause significant property damage, threaten public safety, and have adverse economic impacts from business closures and power loss. High winds, when combined with high temperatures and low humidity can also lead to PSPS events. Winds can also drive fires in and near the City.

Portions of the City are also located in or near a special wind hazard region, which is a result of foehn winds. A foehn wind is a type of dry down-slope wind that occurs in the lee (downwind side) of a mountain range. Winds of this type are called "snow-eaters" for their ability to make snow melt or sublimate rapidly. These types of winds are also associated with the rapid spread of wildfires, making some regions which experience these winds particularly fire prone.

Tornadoes are rotating columns of air marked by a funnel-shaped downward extension of a cumulonimbus cloud whirling at destructive speeds of up to 300 mph, usually accompanying a thunderstorm. Tornadoes form when cool, dry air sits on top of warm, moist air. Tornadoes are the most powerful storms that exist.

Tornadoes, though rare, can affect areas of the City, primarily during the rainy season in the late fall, winter, and early spring.

Location and Extent

The entire City is subject to significant, non-tornadic (straight-line), winds. Each area of the City is at risk to high winds. Magnitude of winds is measured often in speed and damages. These events are often part of a heavy rain and storm event but can occur outside of storms. The speed of onset of winds can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of winds in California is often short, ranging from minutes to hours. The Beaufort scale is an empirical 12 category scale that relates wind speed to observed conditions at sea or on land. Its full name is the Beaufort Wind Force Scale. The Beaufort Scale was shown in Section 4.3.5 of the Base Plan.

Tornadoes, while rare, can occur at any location in the City. Prior to February 1, 2007, tornado intensity was measured by the Fujita (F) scale. This scale was revised and is now the Enhanced Fujita scale. Both scales are sets of wind estimates (not measurements) based on damage. The new scale (EF) provides more damage indicators (28) and associated degrees of damage, allowing for more detailed analysis and better correlation between damage and wind speed. It is also more precise because it considers the materials affected and the construction of structures damaged by a tornado. The F Scale and EF Scale are shown in Section 4.3.5 of the Base Plan.

Past Occurrences

Disaster Declarations

There have been no federal or state disaster declarations in the County for winds and tornadoes.

NCDC Events

The NCDC data recorded 160 high wind, 3 funnel cloud, and 0 tornado incidents for Amador County since 1950. Many of these wind events likely affected the City.

City of Amador City Past Occurrences

The City noted that high winds are an annual occurrence, but could recall no events since 2020 where damages occurred as a result of winds. No tornadoes could be recalled.

Climate Change and High Winds and Tornado

According to the 2021 CAS (as well as the 2024 Draft CAS), while average annual rainfall may increase or decrease slightly, the intensity of individual thunderstorm events is likely to increase during the 21st century. This may bring stronger thunderstorm winds. The CAS does not discuss non-thunderstorm winds or tornadoes.

Vulnerability to Severe Weather: High Wind and Tornadoes

The City is subject to potentially destructive high winds and tornadoes. High winds are common throughout the area and can happen during most times of the entire year and outside of a severe storm event. Tornadoes are rare. High winds and tornadoes can be a significant public safety and economic concern. The whole of the City is at some measure of vulnerability to wind and tornadoes.

An assessment of a community's vulnerability to high winds begins with an understanding of local exposure to wind and tornadoes. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The City is in or adjacent to a special wind hazard region, which is a result of foehn winds. A foehn wind is a type of dry down-slope wind that occurs in the lee (downwind side) of a mountain range. Winds of this type are called "snow-eaters" for their ability to make snow melt or sublimate rapidly. This snow-removing ability is caused not only by warmer temperatures, but also the low relative humidity of the air mass coming over the mountain(s). High winds are also associated with the rapid spread of wildfires, making some regions which experience these winds particularly fire prone. Burn patterns of almost all historic large wildfires in the larger County indicate they occurred during foehn winds. In addition, high winds can cause power outages (including PSPS events) to occur in the City. High winds also contribute to downed trees, especially those trees that are previously compromised from recent drought conditions.

Assets at Risk

Assets at risk from winds and tornadoes include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations are at some vulnerability to high winds and tornadoes. Certain vulnerable populations are at the greatest risk to the effects of high winds and tornadoes. These include:

- The unsheltered.
- Citizens who reside in mobile homes.
- Citizens in buildings with no tornado shelter or below ground floors.
- Those with access and functional needs.
- The medically fragile experiencing power outages as a result of wind events.
- Those working or caught outdoors during a wind or tornado event.

Structures

All structures in the City have some measure of risk from high wind and tornadoes. Though rare, a tornado could cause damage to virtually all facilities in the tornado touchdown path. This would affect homes, businesses, commercial property, as well as government and critical facilities. During a wind or tornado event, power lines in the City can be damaged by falling trees caused by wind. High winds are a cause for PSPS events to be declared, causing power outages to occur. High winds and tornadoes could cause sparks from electric wires and other sources, which could lead to wildfire ignition. Once ignited, high winds can also cause wildfires to rapidly spread and become out of control. High wind conditions can cause wildfires to move into more urban areas destroying structures and whole subdivisions, as seen in recent wildfire events in the West.

Critical Facilities and Infrastructure

Though most critical facilities are built to withstand winds, high wind speeds can still cause damage to critical facilities and infrastructure in the City. Though rare, a tornado could cause damage to virtually all facilities in the tornado touchdown path. Winds can cause power outages affecting system operations. Winds can also contribute to PSPS events, and lead to out of control wildfires, which can damage critical facilities and impact their abilities to perform their critical roles in the community.

Natural, Historic, and Cultural Resources

Natural resources, such as trees, are vulnerable to winds. Increased levee and streambank erosion can occur during periods of high water and high winds. High wave action during significant wind events can impact marsh lands and habitat areas. Soil erosion can also occur during high winds. Most all natural, historic, or cultural resources are at risk to tornadoes. Tornadoes can tear apart habitats, causing fragmentation across ecosystems and can damage and destroy historic structures and cultural resources.

Impacts from Severe Weather: High Wind and Tornado

Wind and tornadoes can cause damage to property and loss of life. While most tornado damage is caused by violent winds, the majority of injuries and deaths generally result from flying debris. Property damage can include damage to buildings, fallen trees, and power lines. Local industries may also be damaged or destroyed. Access roads and streets may be blocked by debris, delaying necessary emergency response. Winds can push automobiles off roads, damage roofs and structures, cause power outages, and cause secondary damage due to flying debris and hazardous trees. High winds can also contribute to the spread and intensity of wildfires. High winds during periods of high water can cause impacts to levees and streambanks from accelerated erosion. Climate change may affect this hazard and cause winds to increase in velocity and more tornadoes to affect the City.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City include the following:

- Climate change is likely to exacerbate future wind conditions and associated impacts and vulnerability of the City. Climate change is not likely to affect future tornado conditions.
- Future population growth should be considered as having more or less people in a community affects the overall hazard vulnerability to the City. Population growth in the City is expected to continue slowly. Vulnerable populations could experience disproportional effects from this hazard and should be planned for as development of the City continues. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions and the location of future hazard events.
- Land use planning should be proactive to address future hazard conditions. Only two parcels are expected to be completed in the next five years. Building codes in the City ensure that new development is built to current building standards to withstand high winds, which should reduce the risk to future development in the City from high winds and tornadoes. With adherence to development standards, future losses to new development should be minimal. Changes in land use and increased development may amplify the impacts of high winds and tornadoes, as additional structures in the County increase the number of buildings at risk to high winds and tornadoes.

Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements, such as building codes, are followed, and varying needs for different demographic groups with intersecting identities that reside within the County are considered can help make for a more resilient community. The City enforces the state building codes which includes standards for new development to minimize damage from windstorms. New and existing critical facilities and infrastructure should also consider adding backup power systems to limit impacts associated with power outages.

Wildfire (with smoke and air quality)

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Extremely High

Hazard Profile

Wildland fire and the risk of a conflagration is an ongoing concern for the City of Amador City. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of fire regimes. Wildland fires affect grass, forest, and brushlands, as well as structures. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern.

Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. These weather conditions can result in red flag (e.g., fire weather) days and can result in PSPS events in the City. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas. There is also the concern of wildfires occurring in these more remote, forested areas that, under certain weather conditions, can extend into areas not generally considered at a high risk to wildfire. Smoke and air quality also become an issue, both from fires occurring inside and outside of the Amador County Planning Area and the City.

Wildfire Smoke and Air Quality

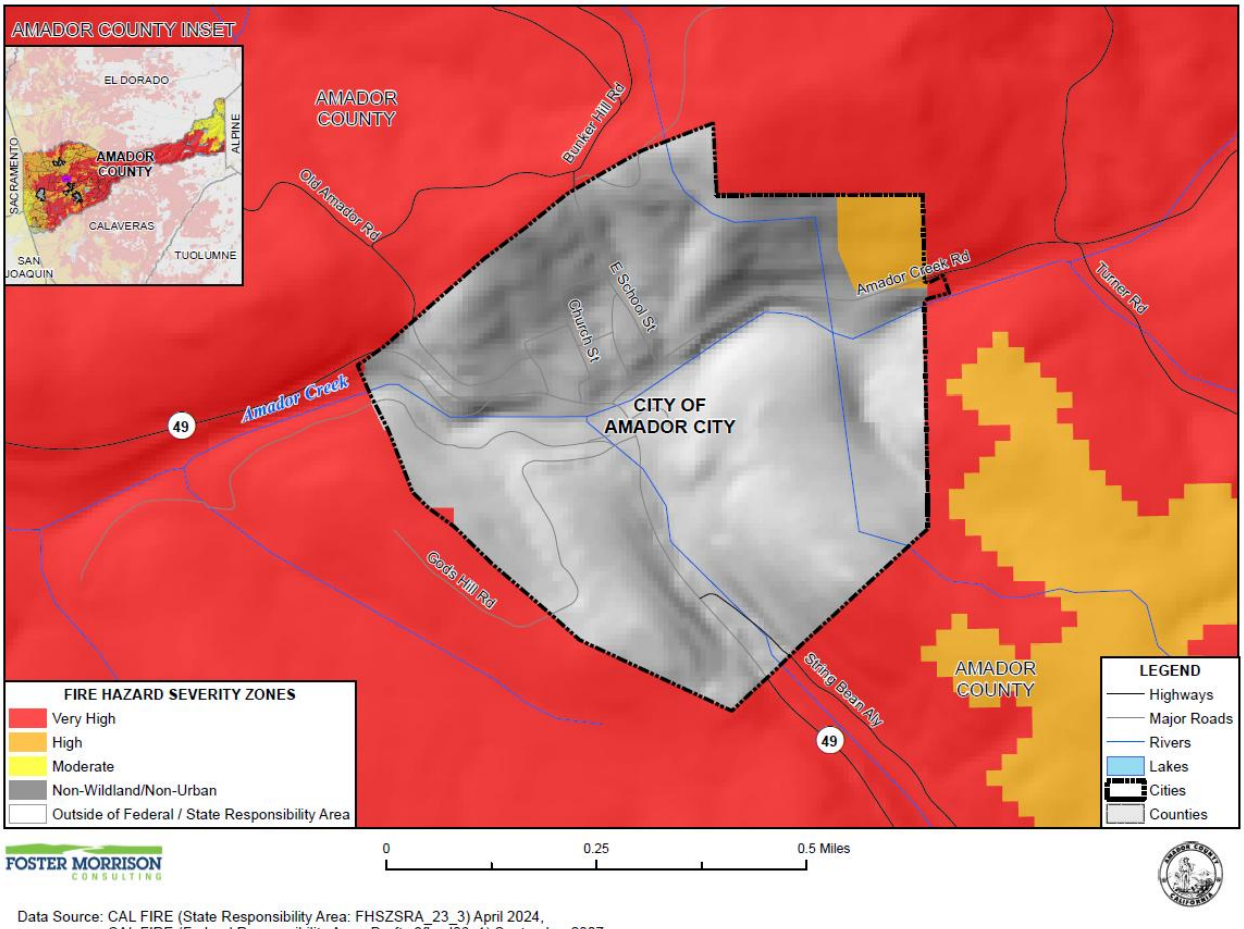
Smoke from wildfires is made up of gas and particulate matter, which can be easily observed in the air. Air quality standards have been established to protect human health with the pollutant referred to as PM2.5 which consists of particles 2.5 microns or less in diameter. These smaller sizes of particles are responsible for adverse health effects because of their ability to reach the lower regions of the respiratory tract.

Wildfire smoke can have negative effects to those who live in or near a fire burn area. Smoke and air pollution from wildfires can be a severe health hazard. Significant wildfires occurring in both Amador County and nearby northern California communities since the 2020 LHMP Update have created significant air pollution affecting area residents. This was the case during the 2021 Caldor Fire, as well as others that affected the nearby areas.

Location and Extent

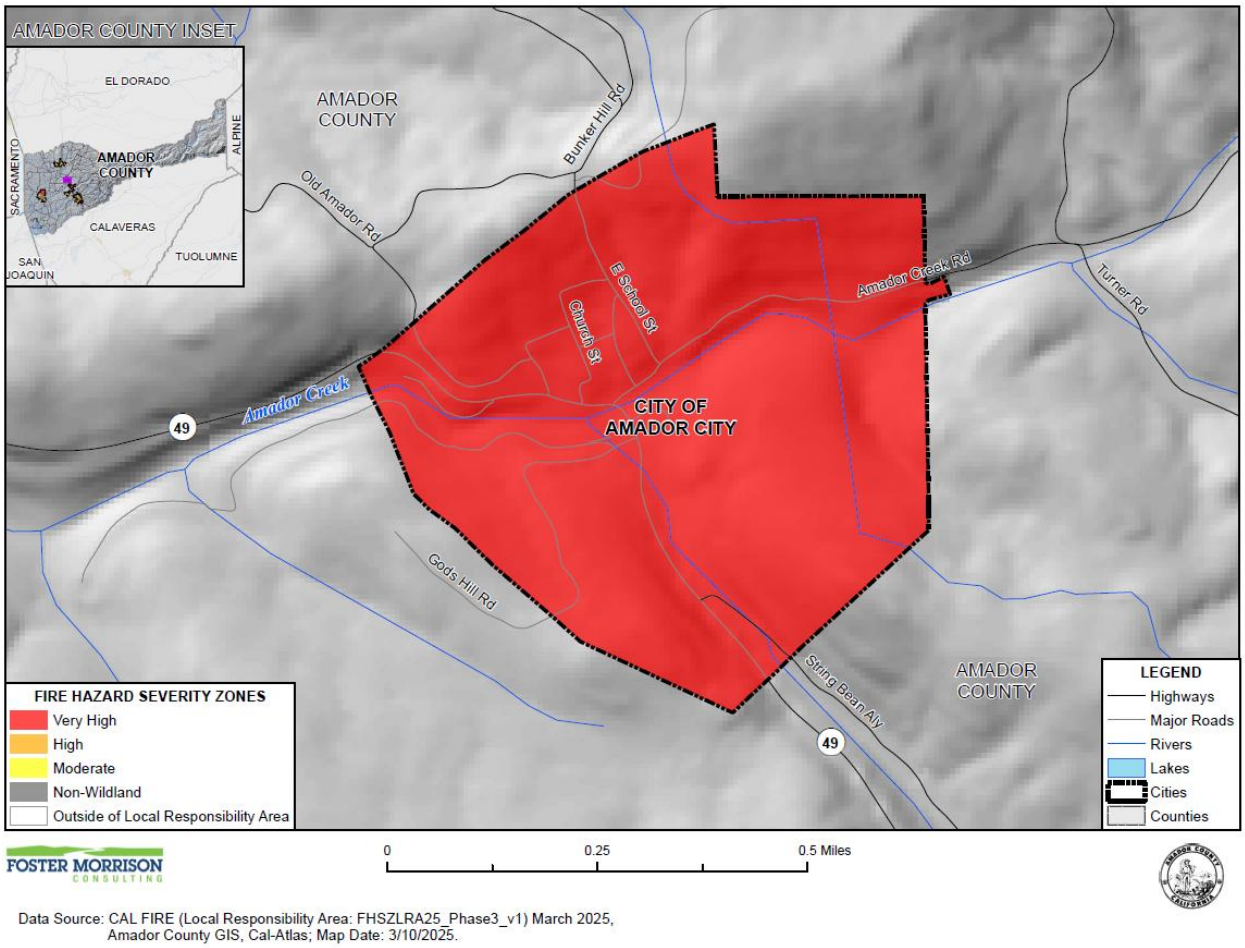
Wildfire can affect all areas of the City. CAL FIRE has estimated that the risk varies across the City and has created maps showing risk variance. Following the methodology described in Section 4.3.15 of the Base Plan, wildfire maps for the City of Amador City were created. Figure A-18 shows the CAL FIRE Federal Responsibility Areas (FRA) and State Responsibility Areas (SRA) and their associated Fire Hazard Severity Zones (FHSZ) in the City. As shown, the City falls in the LRA. Figure A-19 shows the CAL FIRE Local Responsibility Areas (LRA) and their associated Fire Hazard Severity Zones (FHSZ) in the City. As shown on the maps, FHSZs within the City are Very High.

Figure A-18 City of Amador City – CAL FIRE SRA/FRA Fire Hazard Severity Zones



Data Source: CAL FIRE (State Responsibility Area: FHSZSRA_23_3) April 2024,
CAL FIRE (Federal Responsibility Area: Draft c3fhszl06_1) September 2007,
Amador County GIS, Cal-Atlas; Map Date: 3/12/2025.

Figure A-19 City of Amador City – CAL FIRE LRA Fire Hazard Severity Zones



Data Source: CAL FIRE (Local Responsibility Area: FHSZLRA25_Phase3_v1) March 2025, Amador County GIS, Cal-Atlas; Map Date: 3/10/2025.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time or may have durations lasting for a week or more. As previously stated, there are no SRA/FRA FHSZs in the City; as such, no tabular analysis is performed. Geographical FHSZ extents in the LRA are shown on Table A-26.

Table A-26 City of Amador City – CAL FIRE LRA Fire Hazard Severity Zone Geographical Extents

Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Very High	197	99.8%	60	99.8%	137	99.8%
High	0	0.0%	0	0.0%	0	0.0%
Moderate	0	0.0%	0	0.0%	0	0.0%
Non-Wildland	0	0.0%	0	0.0%	0	0.0%

Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Outside of LRA Responsibility Area	0.4	0.2%	0.1	0.2%	0.2	0.2%
Amador City Total	**198**	**100%**	**61**	**100%**	**137**	**100%**

Source: CAL FIRE

Past Occurrences

Disaster Declaration History

There has been three state and two federal disaster declarations due to fire, as shown in Table A-27.

Table A-27 Amador County – State and Federal Wildfire Disaster Declarations 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	3	1961 (unnamed), 2015 (Summer 2015 Fires), 2021 (Caldor Fire)	2	2016 (Butte Fire), 2021 (Caldor Fire)

Source: Cal OES, FEMA

NCDC Events

The NCDC has tracked 50 wildfire events in the County dating back to 1993.

City of Amador City Events

The most significant fire that affected the City was in 1961, where several structures were impacted. Other recent fires, the Butte, Irish, and Caldor fires did not impact the City. The City did note, while past impacts to the City from wildfire have been limited, wildfire is the most significant hazard of concern to the City and has the potential for catastrophic impacts. Wildfires in Amador County and upcountry (for example, Butte, Electra, and Caldor Fires), have resulted in smoke and poor air quality, economic impact, as well as evacuation warnings.

The Tiger Fire started along Tiger Creek Road, just west of the Tiger Creek Power House, in Amador County, approximately 5–7 miles from Amador City. CAL FIRE reported the fire burning in grass and brush, with mandatory evacuations ordered due to rapid spread. The fire was close enough to warrant evacuation orders in nearby areas, with a Red Cross shelter established at the Senior Center in Jackson (229 New York Ranch Road, ~5 miles from Amador City) and a large animal shelter at Laughton Ranch (90 Clinton Road, Jackson).

Climate Change and Wildfire

It is likely that climate change will increase the chance of future occurrence as well as future impacts from wildfire. More information on future impacts to the City can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Warmer temperatures can exacerbate drought conditions. Drought often kills plants and trees, which serve as fuel for wildfires. Warmer temperatures could increase the number of wildfires and pest outbreaks, such as the western pine beetle. Cal-Adapt's wildfire tool predicts the potential increase in the amount of burned areas for the year 2090-2099, as compared to recent (2010) conditions. This is shown in Section 4.3.15 of the Base Plan. Based on this model, Cal-Adapt predicts that wildfire risk in Amador County will increase moderately at the end of the century. However, wildfire models can vary depending on the parameters used. Cal-Adapt does not take landscape and fuel sources into account in their model. In all likelihood, in the Amador County Planning Area, precipitation patterns, high levels of heat, topography, and fuel load will determine the frequency and intensity of future wildfire.

Vulnerability to Wildfire

Risk and vulnerability to the City from wildfire is of significant concern. Wildfires that occur in the City occur from a variety of both natural and manmade causes. The City can be affected both by fires that start on or near City lands as well as those that start elsewhere and move into the City. In addition to burning large areas of land and structures located throughout the City, air quality can be affected in the City by smoke from fires occurring inside the City as well as those from many miles away. As growth continues and populations increase in the City, the potential for wildfires will also increase.

The whole of the City is at some measure of vulnerability to wildfire. An assessment of a community's vulnerability to wildfire begins with an understanding of local exposure to wildfire. This is included in the Local Concerns section below. After that section, assets at risk are discussed.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The City noted that it is quite small physically. Any wildfire that hit the City would be overwhelming. Many of the homes in the City are older homes (many built before 1900). Many of these have no insulation and would burn quickly if a large fire came through. This was the case in fires in the City in 1886 and 1906. In addition, it was noted that many of the homes in the City are second homes. Data from the County noted that almost half of the homes in the City are owned by non-residents. These second homes are often more vulnerable to wildfire due to the lack of or more limited maintenance and vegetation management work on these properties.

The City is also concerned that wildfire smoke from wildfires both in the County and from those outside the County cause air quality issues in the City. The cooling center being built (see the discussion in the

Local Concern in the Severe Weather: Extreme Heat section) will have cooling and air filtration for smoky days.

The City noted it was also concerned with limited evacuation routes. The City partners with both Sutter Creek Fire Protection District and County OES during times of wildfire response. Sutter Creek Fire Protection District also helps with vegetation clearing in and near the City.

Assets at Risk

Assets at risk from wildfire include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations are vulnerable to wildfire. Certain vulnerable populations are at greater risk to the effects of wildfire as well as smoke and air quality issues that wildfires bring. Vulnerable populations include:

- Unhoused
- Infants and children under age five and their caregivers
- Elderly (65 and older)
- Individuals with disabilities
- Individuals' dependent on medical equipment
- Individuals who exercise, recreate, or work outdoors
- Individuals with impaired mobility

To further evaluate the impact to the residential population within the City, the CAL FIRE FHSZ dataset was overlayed on the parcel layer. Those residential parcels that intersect the FHSZs were counted and multiplied by the 2023 Census Bureau average household factors for the City of Amador City – 2.07. The entire City falls in the LRA; as such, only LRA tabular analysis was performed. According to this analysis, there is a total population of 197 residents of the City of Amador City falling within the very high LRA FHSZ, as shown on Table A-28.

Table A-28 City of Amador City – Improved Residential Parcels and Population by CAL FIRE LRA Fire Hazard Severity Zone

Jurisdiction	Very High		High		Moderate	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Amador City	95	197	0	0	0	0

Source: CAL FIRE, 2024 Amador County Parcel/Assessor's Data, US Census Bureau American Community Survey 2023 Household Size Estimates.

The City noted that the Critical Facilities and Infrastructure section below includes the facilities used by At-Risk populations that are threatened by this hazard. While this is not specific to what special populations reside in the City, it does speak to facilities that area used to serve (portions) of this population.

Structures

All structures in the City have some risk to wildfire. GIS was used to determine the possible impacts of wildfire within the City of Amador City. The methodology described in Section 4.3.15 of the Base Plan was followed in determining structures and values at risk in both the CAL FIRE's SRA/FRA and LRA Fire Hazard Severity Zone layer. The entire City falls in the LRA; as such, only LRA tabular analysis was performed. Analysis results for the LRA in the City of Amador City are shown in Table A-29, which summarizes total parcel counts, improved parcel counts and their structure values by LRA FHSZs. It should be noted that the entire City is located within the LRA very high FHSZ, thus, all structures in the City are located in the very high FHSZ and are vulnerable to future wildfire events.

Table A-29 City of Amador City – Count and Value of Parcels and Structures by CAL FIRE LRA Fire Hazard Severity Zone

Fire Hazard Severity Zone/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Values	Total Value
Very High						
Agricultural	7	2	$1,234,719	$606,345	$606,345	$2,447,409
Commercial	15	12	$2,570,473	$3,052,716	$3,052,716	$8,675,905
Industrial	2	1	$10,716	$2,475	$3,713	$16,904
Miscellaneous	11	1	$20,377	$11,604	$0	$31,981
Residential	144	95	$15,288,092	$17,405,166	$8,702,583	$41,395,841
Unknown	1	0	$0	$0	$0	$0
Very High Total	**180**	**111**	**$19,124,377**	**$21,078,306**	**$12,365,357**	**$52,568,040**
Amador City Total	**180**	**111**	**$19,124,377**	**$21,078,306**	**$12,365,357**	**$52,568,040**

Source: CAL FIRE, Amador County 2024 Parcel/Assessor Data

Critical Facilities and Infrastructure

Wildfire presents a threat to critical facilities and infrastructure. The following analysis discusses critical facilities and infrastructure. A separate analysis was performed on the critical facility inventory in the City to determine which critical facilities fall into each fire hazard severity zone. Using GIS, the SRA/FRA and LRA fire hazard severity zones were overlayed on the critical facility GIS layer. Only LRA fire hazard severity zones intersect the City; as such no SRA/FRA analysis is presented here. Only LRA analysis is presented. This is shown on Figure A-16 for the LRA fire hazard severity zones. Table A-30 details which critical facilities fall in which LRA fire hazard severity zone. Table A-31 summarizes Table A-30 details which critical facilities fall in which landslide class. Details of critical facility categories, type, name, and address by LRA fire hazard severity zone are listed in Appendix F.

Figure A-20 City of Amador City – Critical Facilities in LRA Fire Hazard Severity Zones

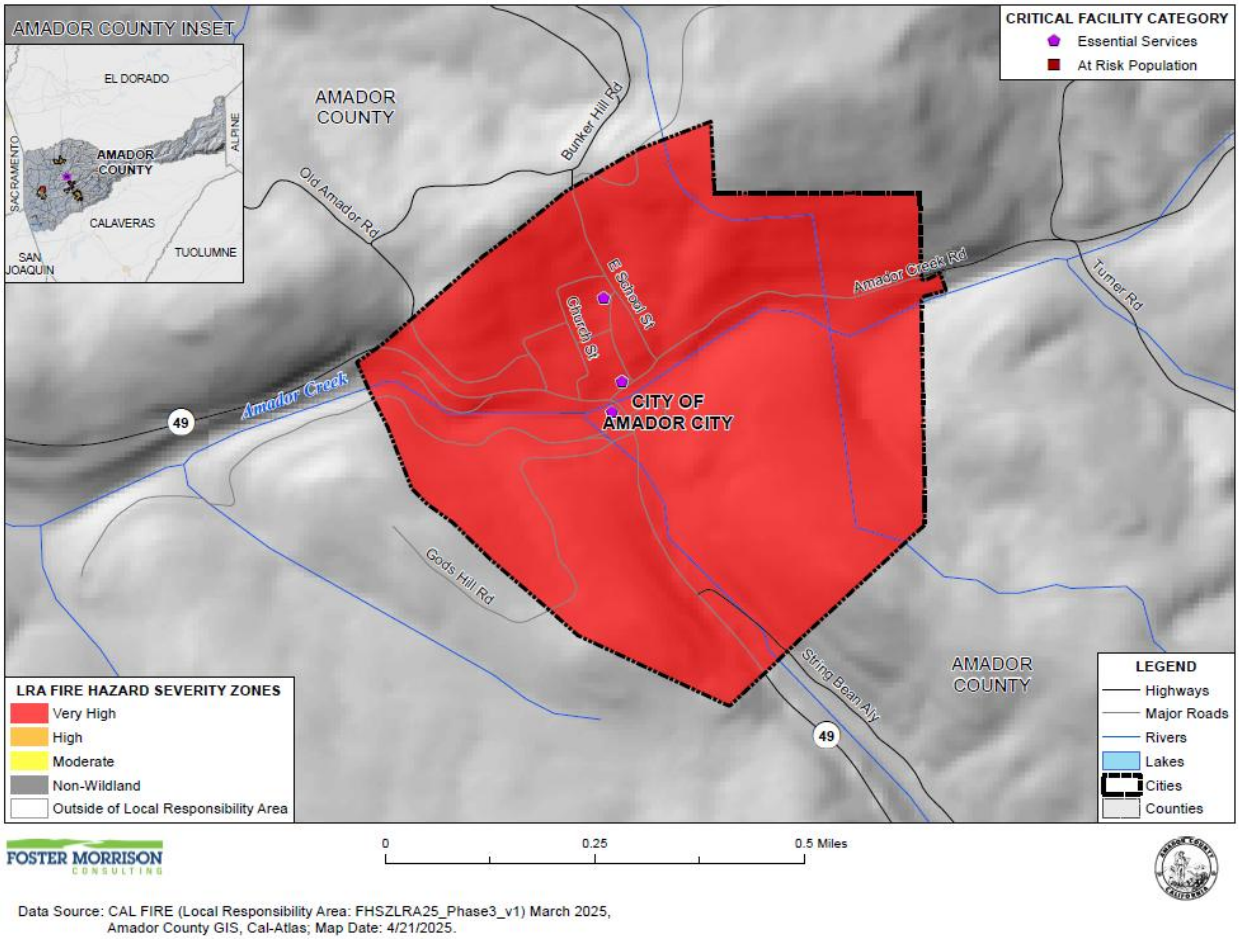


Table A-30 City of Amador City – Critical Facilities by Category in LRA Fire Hazard Severity Zones

Fire Hazard Severity Zone/Critical Facility Category	Facility Count
Very High	
Essential Services	3
At Risk Population	0
Very High Total	**3**
Amador City Total	**3**

Source: CGS, City of Amador City

Table A-31 City of Amador City – Critical Facilities by Category and Type in LRA Fire Hazard Severity Zones

Fire Hazard Severity Zone	Critical Facility Category	Facility Type	Facility Count
Very High	Essential Services Facilities	Fire Station	1
		Post Office	1

Fire Hazard Severity Zone	Critical Facility Category	Facility Type	Facility Count
		Public Administration Building	1
		Essential Services Total	**3**
	Very High Total		**3**
City of Amador City Total			**3**

Source: CGS, City of Amador City

Natural, Historic, and Cultural Resources

Natural, historic, and cultural resources located within areas at risk to wildfire would be vulnerable. Should a wildfire occur in the City, the impacts to natural, historic and cultural resources could be extensive and include air pollution, contamination from water runoff containing toxic products, and other environmental discharges or releases from burned materials affecting soils, habitat areas, wildlife, and aquatic resources. Historic and cultural resources can be damaged or destroyed and are often more vulnerable due to their older age, construction type, and lack of fire prevention infrastructure such as sprinklers.

Impacts from Wildfire

Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and timber; and loss of recreational opportunities. Out of control wildfires can have catastrophic impacts. Wildfires can cause short-term and long-term disruption to the City. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the City by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the City; smoke and air pollution from wildfires can be a severe health hazard. Smoke impacts may come from wildfires outside the City, as well as from within.

Although the physical damages and casualties arising from wildland-urban interface or conflagration fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate a PSPS which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

The impacts of a fire are felt long after the fire is extinguished. In addition to the loss of property in fires, the loss in vegetation and changes in surface soils alters the environment. When supporting vegetation is burned, hillsides become destabilized and prone to erosion. The burnt surface soils are harder and absorb less water. When winter rains come, this leads to increased runoff, erosion, and landslides in hilly areas.

Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the hazard profile above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City of Amador City include the following:

- Climate change is likely to exacerbate future wildfire conditions and associated impacts and vulnerability of the City to wildfire.
- Population growth in the City of Amador City is expected to continue slowly over time. Additional population growth would likely bring continued diversity to the City. Vulnerable population groups could face disproportionate effects from wildfire and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions and the location of future hazard events.
- Land use planning should be proactive to address future hazard conditions. Locating new development, structures and critical facilities and infrastructure within or near areas of wildfire risk may put additional development at risk. However, only two parcels and expected to be developed in the next five years. City building codes are in effect to reduce this risk and should be updated as necessary to continue to address future wildfire conditions. Specifically, with the release of the new 2025 LRA mapping for Amador County, wildfire building codes should be updated as required to include enhanced measures to reduce wildfire impacts on new construction, and should include the formal adoption of the new LRA maps. With the entire City mapped as in the LRA very high FHSZ, all future growth and development in the City will fall in this very high hazard zone. Thus, future development in the City will likely increase the impacts and associated vulnerabilities of the City to this hazard. It should also be noted, however, that once new building codes are adopted for the LRA, this should reduce or mitigate the vulnerability associated with new construction.

Future Development

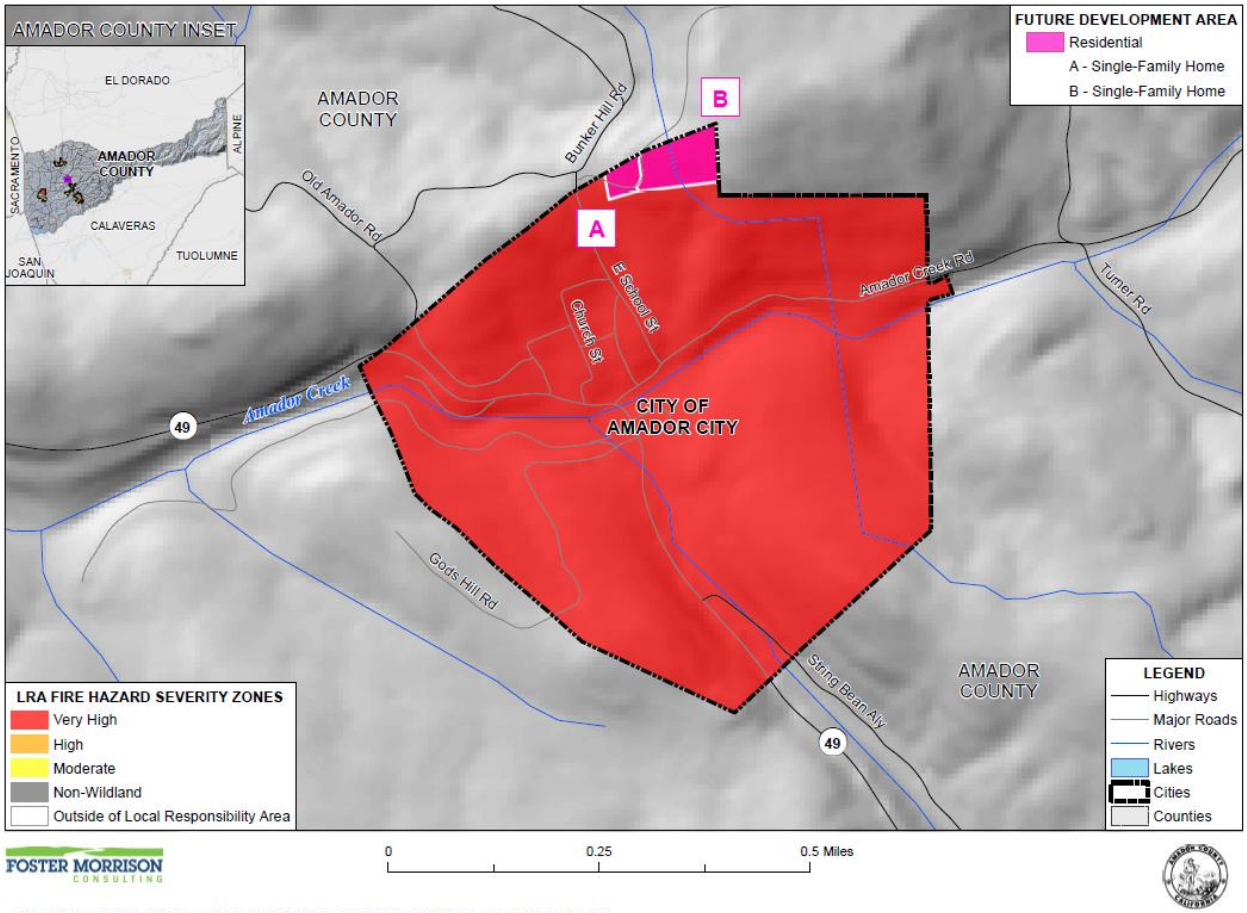
Additional growth and development in the City would place additional values at risk to wildfire, as the entirety of the City sits in the very high fire hazard severity zone. More vulnerable populations may experience a disproportionate impact from wildfire, and this should be considered as development continues. However, City building codes are in effect and should continue to be updated as appropriate to reduce future impacts.

Future development areas and their vulnerability to wildfire are discussed further in the below GIS analysis.

GIS Analysis

The City provided a future development area which were used as the basis for the inventory of future development for the City. This area were mapped in GIS. Utilizing the future development area spatial layer, the parcel polygon data was intersected to determine the future development areas within each SRA/FRA and LRA fire hazard severity zone. No facilities fell in the SRA/FRA fire hazard severity zones. Figure A-21 shows the locations of the future development area overlayed on the LRA fire hazard severity zones. As shown in Table A-32, the future development area falls in the Very High fire hazard severity zone.

Figure A-21 City of Amador City – Future Development in LRA FHSZs



Data Source: CAL FIRE (Local Responsibility Area: FHSZLRA25_Phase3_v1) March 2025, Amador County GIS, Cal-Atlas; Map Date: 10/6/2025.

Table A-32 City of Amador City - Future Development Parcels and Acres in LRA Fire Hazard Severity Zones

Fire Hazard Severity Zone / Property Use / Future Development	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
Very High						
Residential Single-Family Home						
A	1	0	1	0.99	0	0.99
B	1	1	0	3.44	3.44	0
Very High Total	**2**	**1**	**1**	**4.43**	**3.44**	**0.99**
Grand Total	**2**	**1**	**1**	**4.43**	**3.44**	**0.99**

Source: CAL FIRE, City of Amador City

A.5 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

A.5.1. Regulatory Mitigation Capabilities

Table A-33 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the City of Amador City.

Table A-33 City of Amador City's Regulatory Mitigation Capabilities

Plans	In Place Y/N	Does the plan address hazards? Can the plan be used to carry out mitigation actions? When was it last updated??
Capital Improvements Plan	N	CIP projects are identified annually
Climate Change Adaptation Plan	N	
Community Wildfire Protection Plan	N	
Comprehensive/Master Plan	Y	Safety element addresses hazards, identifies mitigation actions, and strategies. Safety Element is from 2008. The General Plan elements are updated at different times.
Continuity of Operations Plan	N	
Economic Development Plan	N	
Land Use Plan	N	
Local Emergency Operations Plan	N	In coordination with Amador County OES.
Stormwater Management Plan	N	
Transportation Plan	N	
Other		
Land Use Planning and Ordinances	**Y/N**	**Is the ordinance an effective way to reduce hazard impacts? Is the ordinance adequately administered and enforced?**
Acquisition of land for open space and public recreation use	N	
Building code	Y	
Flood insurance rate maps	N	
Floodplain ordinance	N	
Natural hazard-specific ordinance (stormwater, steep slope, wildfire)	N	
Subdivision ordinance	Y	Ordinance is effective, administered, and enforced.
Zoning ordinance	Y	Ordinance is effective, administered, and enforced.

Other
How can these capabilities be expanded and improved to reduce risk?
Development of a stormwater drainage plan or ordinance would also help manage stormwater runoff in the City.

Source: City of Amador City

City of Amador City General Plan (dates vary by Element)

The General Plan is a document that guides the future development within the City. It contains broad community values and goals, giving a picture of the desired character and quality of development in the County and policies which outline the steps to accomplish those goals. Of primary concern to this planning document is the Conservation and Open Space Elements of the General Plan. This Element, first adopted in 1983, has been updated to reflect changes within the community. Specifically, the Conservation and Open Space Elements is more specific, and implementation oriented with respect to protecting open space and natural resources.

Goals, Policies, and Implementation Measures related to hazard mitigation include the following:

- Goal #1: To assure the wise use, development and protection of the City's natural and cultural resources and open space lands.

Policies:

- Maintain the current flow characteristics and biotic quality of Amador Creek by minimizing increased flow from impermeable surfaces and controlling encroachment into the stream zone.
- Protect riparian and wetland habitats from unnecessary disturbance with the goal of no net loss.
- Encourage development appropriate to the terrain to limit visual and grading impacts.
- Designate particularly valuable, sensitive, or hazardous areas relative to visual; cultural; historic; recreation; wildlife, fish, or plant habitat; public trails; and publicly owned corridors as Open Space or related protected designation.
- Encourage the use of conservation easements and open space dedications in the City and its surroundings.
- All aspects of new growth and redevelopment shall preserve the sense of a compact, 19th century community in architecture, scale, and other design elements and be compatible with both the overall community and the surrounding neighborhood.
- The Historic Commercial District structures, features, public facilities, and layout shall be preserved to the greatest extent possible in Gold Rush era authenticity.
- Preserve the natural beauty of the City and its surroundings.
- Encourage linking of open space corridors.
- Protect the city's existing trees and woodlands.

Mitigation Related Ordinances

Health and Safety (Amador City Code Title 8, Chapters 8.12)

8.12.010 Definitions. As used in this chapter: "Nuisance" includes anything which is injurious to human health, is indecent, or is offensive to the senses. A nuisance interferes with the comfortable enjoyment of life or property. A nuisance affects at the same time an entire community, neighborhood, or a considerable number of persons although the extent of annoyance or damage inflicted upon the individual may be

unequal. A nuisance includes all conditions of property including but not limited to, that condition which occurs as a result of the storage, removal, transport, processing, or disposal of solid waste. A nuisance includes dry grasses, weeds, dead shrubs, dead trees, rubbish, and waste matter that constitute a fire hazard in the R-1, R-2, R-3, R-4, C-l, and C-2 zones.

Buildings and Construction (Amador City Code Title 15, Chapters 15.04.010)

Adoption of Uniform Codes

The following uniform codes are adopted by reference as the rules and regulations governing the construction, alteration, moving, demolition, repair and use of any building or structure within the city, and additions:

- The Uniform Building Code (UBC) and Uniform Building Code Standards (UBCS, 1991 Edition, as published by the International Conference of Building Officials (ICBO), including, but not limited to, Parts I through XI and the Appendix; excluding Appendix Chapters 1, 12, 23, 38, 51 and 53;
- The Uniform Plumbing Code, (UPC) 1991 Edition, as published by the International Association of Plumbing and Mechanical Officials including but not limited to Part I: Chapters 1 through 13; Appendices A through I, and the Installation Standards;
- The Uniform Mechanical Code, (UMC) 1991 Edition, as promulgated by the International Conference of Building Officials and the International Conference of Plumbing and Mechanical officials including but not limited to Parts I through IV; and Appendices A through D;
- The National Electric Code, (NEC) 1991 Edition, as published by the National Fire Protection Association and the International Conference of Building Officials, including the Uniform Administrative Code provisions, and Chapters 1 through 9; 5. The Uniform Housing Code, (HC) 1991 Edition as published by the International Conference of Building Officials, including only Chapters 1, 4, 5, 6 and Section 701 (b) and (c); 6. The Uniform Swimming Pool, Spa and Hot Tub Code, 1991 Edition, as published by the International Allocation of Plumbing and Mechanical officials, including, but not limited to, Chapters 1 through 5; excluding Part 1 Administration (Part I Administration of the UBC shall apply;
- The Uniform Administrative Code (UAC) 1988 Edition, as published by the International Conference of Building Officials, including Chapters 1, 2, and 3.

B. The following codes are adopted by reference as standards in conjunction with subsection A of this section:

- Uniform Fire Code, 1991 Edition as published by the International Conference of Building Officials and Western Fire Chiefs Association;
- National Fire Codes, 1991 Edition and Supplement as published by the National Fire Protection Association;

Zoning (Amador City Code Title 17)

An official land use zoning ordinance for the City is adopted and established to serve the public health, safety, comfort, convenience and general welfare and to provide the economic and social advantages resulting from an orderly planned use for the future growth and development of the city. (Ord. 55 § 1.00, 1980)

In order to classify, regulate, restrict, and segregate the uses of land and building to regulate and restrict the height and bulk of buildings; and to regulate the area of yards and other open spaces about buildings; and to regulate the density of population, six classes of land use zones are established.

The zones aforesaid and the boundaries of such zones are shown upon the map attached hereto and made a part of the ordinance codified in this title, being designated as the "zoning map," and such map and all the notations, references, and other information shown thereon shall be as much a part of this title as if the matters and information set forth by such map were all fully described in this chapter. (Ord. 55 § 3.01, 1980)

Subdivisions (Amador City Code Title 16)

Soils and/or hazardous materials report.

A. A preliminary soils report and/or a hazardous materials report prepared by a civil engineer or engineering geologist registered in California, and based upon adequate test boring and/or other testing or analysis, may be required by the city engineer for any subdivision for which a final map is required by this title.

B. When the city engineer determines that a preliminary soils report is necessary, the planning commission may include the preparation of such report as a condition of approval of the tentative map.

C. When the preliminary soils report indicates the presence of critically expansive soils or other hazardous soils problems which, if not corrected or adequately addressed, would lead to structural defects, a soils investigation of each lot in the subdivision may be required.

D. Soils investigation shall be done by a professional engineer or engineering geologist of proper registration in California, who shall recommend the corrective actions necessary to prevent structural damage to structures proposed to be constructed in the area where such soils problems exist. (Ord. 159 (part), 2005)

16.16.170 Storm drainage.

The subdivider shall dedicate right-of-way for storm drainage purposes conforming substantially with the lines of any natural water course or channel, stream, or creek that traverses the subdivision. All storm drain improvements shall be in accordance with city improvement standards. The planning commission may require adequate fencing or other protection of all ditches and streams. Where drainage facilities are necessary on an area-wide basis to permit safe, healthful, and convenient development of the area, the subdivider may be required to pay a pro rata share of such facilities' cost, as determined by the city council. (Ord. 159 (part), 2005)

16.16.180 Grading and erosion control.

All grading and erosion control shall be in accordance with applicable provisions of the Uniform Building Code and an approved erosion control plan. Erosion control plan shall implement "best management practices" that will prevent construction pollutants from contacting storm water. All products of erosion shall be prevented from moving off-site into receiving waters. Construction practices shall be in accordance

with an approved erosion control plan and methods contained in "Volume 3 of California Storm Water Best Management Practice Handbook." (Ord. 159 (part), 2005)

A.5.2. Administrative/Technical Mitigation Capabilities

Table A-34 identifies the City department(s) responsible for activities related to mitigation and loss prevention in the City of Amador City.

Table A-34 City of Amador City's Administrative and Technical Mitigation Capabilities

Administration	In Place Y/N	Describe capability Is coordination effective?
Staff		**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official	Y	Contract City Engineer. Engineer is trained on mitigation related items.
Civil Engineer, including dam and levee safety	Y	Contract City Engineer. Engineer is trained on mitigation related items.
Community Planner	Y	Contract Planner.
Emergency Manager	N	
Floodplain Administrator	N	
GIS Coordinator	Y	Contract City Engineer. Engineer is trained on mitigation related items.
Planning Commission		
Other		
Technical	**Y/N**	**Has capability been used to assess/mitigate risk in the past?**
Grant writing	N	
Hazard data and information	N	
GIS analysis		
Mutual aid agreements	Y	Sutter Creek Fire, County Sheriff, Amador Water Agency, Amador Regional Sanitary Agency (ARSA)
Other		
How can these capabilities be expanded and improved to reduce risk?		
A grant writer would add value to the City in pursuing project funding. This may occur on a case-by-case basis depending on grants pursued.		

Source: City of Amador City

A.5.3. Fiscal Mitigation Capabilities

Table A-35 identifies financial tools or resources that the City could potentially use to help fund mitigation activities.

Table A-35 City of Amador City's Fiscal Mitigation Capabilities

Funding Resource	In Place Y/N	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	
Community Development Block Grant	Y	But have not used this program in years.
Federal funding programs (non-FEMA)	N	
Fees for water, sewer, gas, or electric services	Y	
Impact fees for new development	Y	
State funding programs	N	
Stormwater utility fee	N	
Other	Y	Cal Trans grants have been awarded to the City. Portions of the grant encompass backup power sources for the City.
How can these capabilities be expanded and improved to reduce risk?		
Sewer funds are limited. There is currently a rate change in effect now. The Cal Trans grant will be used for reduced risk to people and property in the City once fully funded.		

Source: City of Amador City

A.5.4. Mitigation Education, Outreach, and Partnerships

Table A-36 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table A-36 City of Amador City's Mitigation Education, Outreach, and Partnerships

Program/Organization	In Place Y/N	How widespread are each of these in your community?
Community newsletters	Y	Posted on City government webpage and is accessible for all residents.
Hazard awareness campaigns (such as Firewise, Storm Ready, Severe Weather Awareness Week, school programs, public events)	Y	District school program, participation with County OES campaigns. County has social media program that the City feeds up to on an as needed basis.
Local news	Y	Radio and newspaper are used.

Program/Organization	In Place Y/N	How widespread are each of these in your community?
Organizations that interact with underserved and vulnerable communities	Y	There are local representatives who work with the County food bank and who serve those inside the City. There are unhoused in the City and there are local organizations and individuals who are seeking to serve those populations.
Social media	Y	There is an Infolink that allows residents to sign up and have City information emailed directly to them.
How can these capabilities be expanded and improved to reduce risk?		
This is limited by size and budgetary issues. It would be beneficial to establish a disaster group or committee of City Council and citizens. The City is always looking to strengthen relationships with other organizations in and around the City to expand hazard reduction capabilities.		

Source: City of Amador City

A.5.5. Other Mitigation Efforts

The City has many other completed or ongoing mitigation projects/efforts that include the following:

- City only has primary wastewater treatment. The City pumps primary effluent to Sutter Creek. An entirely new system is being proposed.
- Flooding - Highway bridge replacement project at Main Street over Amador Creek was completed in 2014.
- Bridge maintenance projects are being completed in 2025/2026. This was funded by the City Capital Improvement budget.
- Creek clearing occurs annually along Amador Creek.
- The City works with Sutter Creek Fire to inspect and work with property owners to conduct vegetation management throughout the City.

A.6 Mitigation Strategy

A.6.1. Mitigation Goals and Objectives

The City of Amador City adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

A.6.2. NFIP Mitigation Strategy

Amador City does not currently participate in the NFIP as it has no mapped FEMA floodplains. The City continues to evaluate the benefits of participation in the program. However, in light of the lack of good data to support valid mapping efforts, the City currently is adopting a wait and see approach. The City Engineer has valid data on flood levels and city staff cooperates to keep construction out of flood areas.

A.6.3. Mitigation Actions

The Planning Team for the City of Amador City identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Floods: Localized Stormwater
- Landslide, Mudslide, and Debris Flow
- Severe Weather: Heavy Rain and Storms (Hail, Lightning)
- Severe Weather: Extreme Heat
- Severe Weather: High Winds and Tornados
- Wildfire (w/smoke and air quality)

Low priority hazards for mitigation planning include:

- Agricultural Hazards (severe weather/pests/invasive species)
- Avalanche
- Climate Change
- Dam Failure
- Drought & Water Shortage (w/ tree mortality)
- Earthquake (w/subhazards)
- Floods: 1%/0.2% annual chance (w/levee failure)
- Severe Weather: Extreme Cold, Freeze, and Snow

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Mitigation Actions

The City has put forward the actions as shown in Table A-37. Details of the actions can be found below the table.

Table A-37 City of Amador City Mitigation Actions

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
City of Amador City					
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Previous Action	X	X		Prevention
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	Previous Action	X	X	X	Prevention Public Education
Action 3. Old Hwy 49/Main Street Slope and Road Stabilization	Previous Action	X	X		Property Protection Natural Resource Protection
Action 4. Cooling Center/Severe Weather Center	New Action	X	X		Structural
Action 5. Amador Creek Annual Cleaning projects	New Action	X	X	X	Property Protection Natural Resource Protection
Action 6. Stormwater Masterplan Development and Implementation	Previous Action	X	X	X	Property Protection Natural Resource Protection
Action 7. Vegetation Management and Perimeter Wildfire Protection Fuel Break	Previous Action	X	X		Property Protection Natural Resource Protection

Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Hazards Addressed: Multi-hazard (Floods: Localized Stormwater, Landslide, Mudslide, and Debris Flow, Severe Weather: Heavy Rain and Storms (Wind, Hail, Lightning), Severe Weather: Extreme Heat, Severe Weather: High Winds and Tornados, Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): Local jurisdictional reimbursement for mitigation projects and cost recovery after a disaster is guided by Government Code Section 8685.9 (AB 2140). Specifically, this section requires that each jurisdiction adopt a local hazard mitigation plan (LHMP) in accordance with the federal Disaster Mitigation Act of 2000 as part of the Safety Element of its General Plan. Adoption of the LHMP into the Safety Element of the General Plan may be by reference or incorporation.

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Safety Element of General Plan

Responsible Office/Partners: City of Amador City Planning Department

Benefits (Losses Avoided): Incorporation of an adopted LHMP into the Safety Element of the General Plan will help jurisdictions maximize the cost recovery potential following a disaster.

Potential Funding (Local Budgets, Grant Funds, etc.): City General Fund

Timeline: Within 5 years

Priority (H, M, L): High

Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness

Hazards Addressed: Multi-hazard (Floods: Localized Stormwater, Landslide, Mudslide, and Debris Flow, Severe Weather: Heavy Rain and Storms (Wind, Hail, Lightning), Severe Weather: Extreme Heat, Severe Weather: High Winds and Tornados, Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): The City and County play a key role in public outreach/education efforts to communicate the potential risk and vulnerability of their community to the effects of natural hazards. A comprehensive multi-hazard public education program will better inform the community of natural hazards of concern and actions the public can take to be better prepared for the next natural disaster event.

Project Description: A comprehensive multi-hazard outreach program will ascertain both broad and targeted educational needs throughout the community. The City will work with the County and other agencies as appropriate to develop timely and consistent annual outreach messages in order to communicate the risk and vulnerability of natural hazards of concern to the community. This includes measures the public can take to be better prepared and to reduce the damages and other impacts from a hazard event. The public outreach effort will leverage and build upon existing mechanisms, and will consider:

- Using a variety of information outlets, including websites, local radio stations, news media, schools, and local, public sponsored events;
- Creating and distributing (where applicable) brochures, leaflets, water bill inserts, websites, and public service announcements;
- Displaying public outreach information in County office buildings, libraries, and other public places and events;
- Developing public-private partnerships and incentives to support public education activities.

Other Alternatives: Continue public information activities currently in place.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Existing City and County outreach programs will be reviewed for effectiveness and leveraged and expanded upon to reach the broader region.

Responsible Office/Partners: City of Amador City Mayor' Office in partnership with the County

Benefits (Losses Avoided): Increase residents' knowledge of potential hazards and activities required to mitigate hazards and be better prepared. Protect lives and reduce damages, relatively low cost to implement.

Potential Funding (Local Budgets, Grant Funds, etc.): City General Fund, grant funds (like CA DWR, Cal OESPDM, HMGP, FMA, BRIC, or other sources).

Timeline: Ongoing/Annual public awareness campaign

Project Priority (High, Medium, Low): High

Action 3. Old Hwy 49/Main Street Slope and Road Stabilization

Hazards Addressed: Landslide, Mudslide, Slope Slippage, Debris Flow, Severe Weather: Heavy Rains and Storms

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): The slope crossing Old Hwy 49/Main Street on the north approach to Amador City has been identified by city engineers and sewer engineers as an extreme hazard to the road but more importantly to the City's Wastewater Treatment pond.

Project Description: The downward slope from the road to the sewer pond needs to be stabilized; the slope on the north side of the road is private property; protecting the road from landslide/and blockage of an emergency egress for residents can be mitigated with a retaining wall. The road needs to be repaired once a stable surface has been created and protection from landslide from the north slowed.

Other Alternatives: none

Existing Planning Mechanism(s) through which Action Will Be Implemented: Voters approved Measure K, a grant program through California Department of Transportation/CalTrans, for road repair and maintenance; funding can include building retaining walls and stabilizing slopes to mitigate erosion and protect the road. Planning Phase of Project is underway.

Responsible Office/Partners: City of Amador City Mayor' Office

Benefits (Losses Avoided): Protect the existing roadway and emergency egress; protect the Wastewater treatment pond from debris flow.

Potential Funding (Local Budgets, Grant Funds, etc.): Measure K grant funds; local budget as needed.

Timeline: over 5 years

Project Priority (High, Medium, Low): high

Action 4. Cooling Center/Severe Weather Center

Hazards Addressed: Severe Weather hazards (Extreme Heat, Rains and Storms, Winds and Tornado)

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): The City of Amador City is a small, disadvantaged rural community. Proportionally, it has a large, vulnerable and aging population that without an extreme weather center is susceptible to a host of negative impacts from extreme heat, including increased health risks and mortality, increased heat-related illnesses.

Project Description: The City has identified the Community Center as critical infrastructure that could be used as a cooling/extreme weather center. It is currently under restoration and soon to have electric heating and air conditioning. The Community Center does not currently have a backup generator.

Other Alternatives: none

Existing Planning Mechanism(s) through which Action Will Be Implemented: The City has identified critical infrastructure and the need for backup power during extreme weather events.

Responsible Office/Partners: City of Amador City Mayor' Office

Benefits (Losses Avoided): Improves resilience of City services when power outages or public safety power shut events are implemented by PG&E.

Potential Funding (Local Budgets, Grant Funds, etc.): City General Fund

Timeline: next 5 years

Project Priority (High, Medium, Low): High

Action 5. Amador Creek Annual Cleaning projects

Hazards Addressed: Localized Flood, Severe Weather: Heavy Rains and Storms, Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): During times of heavy rain, Amador Creek becomes clogged from organic debris, vegetation, and "volunteer" trees. Clogged creeks contribute to obstructed water flow and causing localized flooding, damage to property and roads. Additionally, during dry months with periods of high dry wind and extreme heat, the dry creek bed is filled with dried vegetation and debris that serves as fuel to any wildfire originating in the County and being drawn into the creek bed, now serving as a chimney. The hazard is not only to the creek, but also to the Wastewater Treatment facility and to private property.

Project Description: The City will clean Amador Creek of vegetation, debris, and small saplings under three-feet in height, as mitigation efforts for both flood hazards and fire hazard.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: The City at least annually cleans Amador Creek of vegetation, debris and small saplings under three-feet in height, as mitigation efforts for both flood hazards and fire hazard.

Responsible Office/Partners: City of Amador City Mayor' Office

Benefits (Losses Avoided): Mitigate the chances of localized flooding in one season and fire in another, both resulting in infrastructure destruction, threats to life and livelihood of residents.

Potential Funding (Local Budgets, Grant Funds, etc.): City General Fund; incentive grants from the City's insurer

Timeline: 5 years

Project Priority (High, Medium, Low): High

Action 6. Stormwater Masterplan Development and Implementation

Hazards Addressed: Localized flood, Severe Weather: Heavy Rains and Storms, Flood: 1%/0.2% Annual Chance

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): The City of Amador City does not have a Storm Water Master Plan to address storm water issues and improve drainage to reduce localized flooding on the creek that runs through town.

Project Description: A Storm Water Mater Plan will be developed to improve the storm water collection system.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: Currently none

Responsible Office/Partners: City of Amador City Mayor' Office

Benefits (Losses Avoided): A Storm Water Master Plan will identify improvements to the current storm water collection system.

Potential Funding (Local Budgets, Grant Funds, etc.): FEMA FMA, HMGP, PDM, or other grant source

Timeline: Dependent on funding

Project Priority (High, Medium, Low): High

Action 7. Vegetation Management and Perimeter Wildfire Protection Fuel Break

Hazards Addressed: Wildfire, Severe Weather: High Winds and Tornado

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): The City of Amador City lacks a Safety Element in its General Plan. It is surrounded by open dry grassland making the City vulnerable to the threat of wildfire. Internally there are areas of the City that are overgrown with dead and fallen trees, and organic material that all need to be removed to mitigate the hazards of wildfire spreading throughout the City.

Project Description: A Safety Element to the General Plan will establish policies and programs to reduce risks and protect people, property, and the environment. A formal Safety Element will provide a mechanism for identifying and mitigating fire hazards internally and at the City's borders.

Other Alternatives: none

Existing Planning Mechanism(s) through which Action Will Be Implemented: Currently, Sutter Creek Fire Protection District identifies properties in town that require vegetation management, and provides crews to reduce vegetation on specific City properties and roadways.

Responsible Office/Partners: City of Amador Mayor' Office in coordination with SCFPD

Benefits (Losses Avoided): Minimizing threats of fire to livelihood and life of residents.

Potential Funding (Local Budgets, Grant Funds, etc.): FEMA HMA grants, local City budgets

Timeline: 5 years

Project Priority (High, Medium, Low): High

Annex B City of Ione

B.1 Introduction

This Annex details the hazard mitigation planning elements specific to the City of Ione, a previously participating jurisdiction to the 2020 Amador County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the City. This Annex provides additional information specific to the City of Ione, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this jurisdiction.

B.2 Planning Process

As described above, the City of Ione followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Amador County Hazard Mitigation Planning Committee (HMPC), the City formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table B-1. Additional details on Plan participation and City representatives are included in Appendix A.

Table B-1 City of Ione – Planning Team

Name	Position/Title	How Participated
Stacey Rhoades	Mayor	Attended meetings, added input on charts, and provided an updated Hazard Identification table.
George Lee	City Manager	Attended meetings, added input on charts, and provided an updated Hazard Identification table.
Ken Mackey	Fire Chief	Provided/updated information/data
Zach Finch	Public Works Superintendent	Provided/updated information/data
Jordan Doerksen	Admin Assistant	Provided/updated information/data
Janice Traverso	City Clerk	Provided/updated information/data
Justin Granados	Wastewater Facility Manager	Provided/updated information/data
Deborah Mackey	Grant Administrator	Provided/updated information/data

Coordination with other community planning efforts is paramount to the successful implementation of this LHMP Update. This section provides information on how the City integrated the previously approved 2020

LHMP into existing planning mechanisms and programs. Specifically, the City incorporated into or implemented the 2020 LHMP through other plans and programs shown in Table B-2.

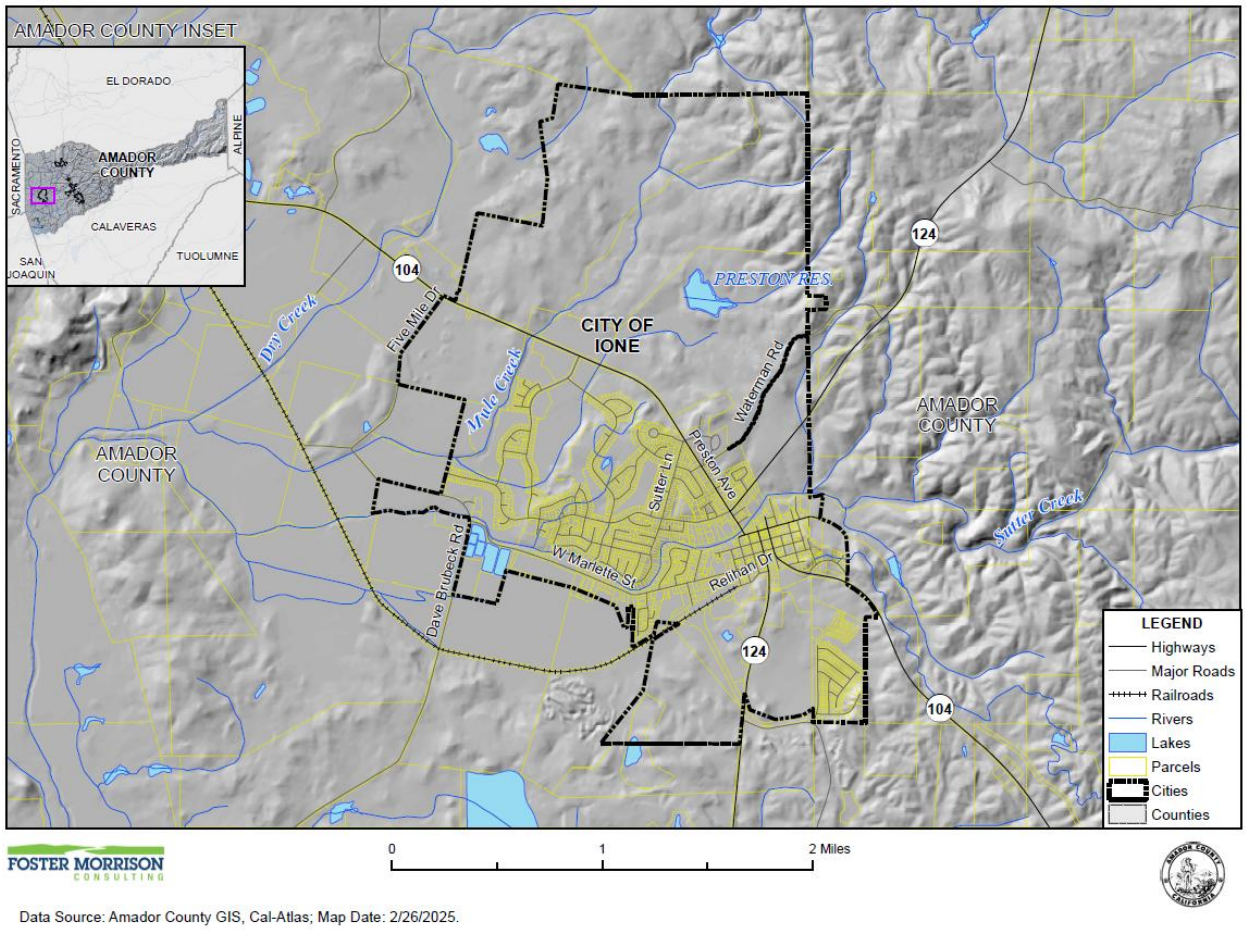
Table B-2 2020 LHMP Incorporation

Planning Mechanism 2020 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
City of Ione General Plan	The 2020 LHMP was incorporated into the Safety Element, building on Resolution 2015-16, to guide policies on hazard mitigation, including restrictions on development in floodplains, wildfire-prone areas, and drought resilience.
Ione Municipal Code (Title 17 – Zoning)	The 2020 LHMP informed updates to zoning regulations to restrict development in floodplains and require fire-resistant standards in wildfire-prone areas
Ione Municipal Code (Title 16 – Subdivisions)	The 2020 LHMP guided subdivision regulations to ensure infrastructure (e.g., drainage systems, fire access roads) supports flood and wildfire mitigation, and (defensible space).
Ione Floodplain Ordinance	The 2020 LHMP informed updates to the floodplain ordinance to meet National Flood Insurance Program (NFIP) requirements, restricting development in flood-prone areas (e.g., near Sutter Creek, Mule Creek) and requiring elevation certificates
Ione Local Emergency Operations Plan (EOP)	The 2020 LHMP provided hazard data and mitigation strategies to enhance the EOP's response protocols for floods, wildfires, and severe weather.
Ione Transportation Plan	The 2020 LHMP informed transportation planning to improve evacuation routes and infrastructure resilience.

B.3 Community Profile

The community profile for the City of Ione is detailed in the following sections. Figure B-1 displays a City map and the location of City of Ione within Amador County.

Figure B-1 City of Ione



Data Source: Amador County GIS, Cal-Atlas; Map Date: 2/26/2025.

B.3.1. Geography and Climate

The City is located in the western boundary of the County, adjacent to Sacramento County. Elevation is approximately 298 feet above sea level. The terrain is relatively gentle and is dominated by grasslands.

The climate is generally moderate, with mild winters and hot, dry summers. Temperatures range from the low 40s F to the high 90s F, with an average daily maximum temperature of 74.7 F. The average annual rainfall is 20.5 inches, most of which occurs from November to April.

B.3.2. History

Ione is located in the Ione Valley in the "Gold Country" and is believed to be named by Thomas Brown around 1849 after one of the heroines in Edward Bulwer Lytton's drama "The Last Days of Pompeii." During the days of the Gold Rush, the miners knew the town by the names of "Bedbug" and "Freezeout." Unlike other communities in Amador County, which were founded on gold mining, Ione was a supply center, stage and rail stop and agricultural hub.

The Town of Ione continued to grow and prosper after its gold rush founding. The first school was built in 1853. The historic Methodist Church was organized in 1853 and the structure was completed in 1862. The first flour mill was built in 1855. The first brick building was built by Daniel Stewart in 1855 for his general merchandise store.

In 1876, Ione had a population of about 600 which included about 100 Chinese who lived in Ione's Chinatown. The town included one public school, 4 churches, 4 general stores, one meat market, one laundry, one brewery, a restaurant, millinery shop, an art gallery, six saloons, a drug store and barber shop, and many other business establishments. 1876 also marked the celebration of the completion of the railroad to the town of Ione.

The City of Ione was incorporated as a General Law City in 1953. The City currently houses many restaurants, businesses, and retail establishments. Also located within the incorporated limits of the City of Ione, the future Howard Park Industrial Park includes the potential for approximately 140 acres of office, industrial, and commercial lands that front State Route 124. Tourism is still a big part of the City; Ione has many interesting landmarks and historical points of interest.

B.3.3. Economy and Tax Base

US Census estimates show economic characteristics for the City of Ione. These are shown in Table B-3 and Table B-4. Mean household income in the City was $97,912. Median household income in the City was $78,661.

Table B-3 City of Ione – Civilian Employed Population 16 years and Over

Industry	Estimated Employment	Percent
Agriculture, forestry, fishing and hunting, and mining	75	3.4%
Construction	231	10.6%
Manufacturing	78	3.6%
Wholesale trade	26	1.2%
Retail trade	216	9.9%
Transportation and warehousing, and utilities	160	7.3%
Information	71	3.2%
Finance and insurance, and real estate and rental and leasing	144	6.6%
Professional, scientific, and management, and administrative and waste management services	177	8.1%
Educational services, and health care and social assistance	395	18.1%
Arts, entertainment, and recreation, and accommodation and food services	186	8.5%
Other services, except public administration	154	7.0%
Public administration	274	12.5%

Source: US Census Bureau American Community Survey 2023 Estimates

Table B-4 City of Ione – Income and Benefits

Income Bracket	Percent
<$10,000	11.6%
$10,000 – $14,999	3.2%
$15,000 - $24,9999	4.7%
$25,000 – $34,999	0.7%
$35,000 – $49,999	6.1%
$50,000 – $74,999	21.4%
$75,000 – $99,999	10.4%
$100,000 – $149,999	22.8%
$150,000 – $199,999	13.3%
$200,000 or more	5.8%

Source: US Census Bureau American Community Survey 2023 Estimates

In 2010, the State of California announced the closure of the Preston Youth Correctional Facility. The resulting lob loss had a huge negative impact on the local economy. In 2013, the State of California announced the expansion of Mule Creek State prison. Almost 1,400 jobs were added to the local economy, but that did not mean the City of Ione received all the benefit of those jobs. Many of the new Mule Creek prison employees live in other communities and commute to Ione. In 2016, the CalFire Training Facility in Ione started an expansion project to create more dorm rooms for cadets. This expansion also has a limited impact on the City's economy.

Ione's commercial area is small and primarily limited to the historic downtown area. In 2018/2019, the City began receiving more and more inquiries from owners of commercial properties regarding their desire to build in Ione. The City anticipates that those who have expressed interest in developing their commercial property will do so in the next year or two.

B.4 Risk Assessment

As defined by FEMA, risk is a combination of hazard, vulnerability, and exposure. "It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage."

The City of Ione risk assessment identifies and profiles relevant hazards and assesses the exposure of lives, property, infrastructure, and the environment to these hazards. The process allows for a better understanding of the City's potential risk and vulnerability to hazards and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

Building on the Community Profile above, a risk assessment was performed for the City. This includes the following sections:

- B.4.1 Assets Inventory and Growth and Development Trends
- B.4.2 Hazard Identification

- B.4.3 Hazard Profiles and Vulnerability to Specific Hazards

B.4.1. Assets Inventory and Growth and Development Trends

This section provides an inventory of the City of Ione's total assets potentially at risk to hazards and an overview of growth and development trends. This section is broken into two parts:

- **Asset Inventory** – The assets inventory identifies the City of Ione's total assets, including the people and populations; structures; critical facilities and infrastructure; community lifelines; natural, historic, and cultural resources; and economic assets and community activities of value. This data is not hazard specific, but is representative of total assets within the City, potentially at risk to identified hazards as discussed in Section B.4.3 Hazard Profiles and Vulnerability to Specific Hazards.
- **Growth and Development Trends** – A discussion of growth and development trends in the City, both current and future, is presented.

Assets Inventory

The City's asset inventory is detailed in the following sections:

- People and Populations
- Structures
- Critical Facilities and Infrastructure
- Community Lifelines
- Natural, Historic, and Cultural Resources
- Economic Assets and Community Activities of Value

A discussion of each of these assets follows and serves as the template for the asset discussion for each hazard in Section B.4.3.

People and Populations

The most important asset within any community are the people and populations that reside in the community. This section includes an inventory of past and current populations of the City and also discusses vulnerable populations and underserved communities as a subsection of people and populations located within the City and potentially at risk to hazards. Information from the City, US Census Bureau, California Department of Finance, and other sources as detailed below form the basis of this discussion.

Historic Population Trends and Current Population

Population growth can increase the number of people living in hazard prone areas. The City of Ione has 9,037 residents, as of January 1, 2025. The City of Ione has seen growth rates as shown in Table B-5. As shown, the City has grown consistently since 1960, with a few periods of time where the population has dipped. However, because of a high prison population incarcerated in a state correctional facilities in the City (Mule Creek State Prison) this is not a true representation of the City's growth.

Table B-5 City of Ione– Population Changes Since 1960

Year	Population	% Change
1960	1,118	-
1970	2,369	111.9%
1980	2,207	-6.8%
1990	6,516	195.2%
2000	7,129	9.4%
2010	7,918	11.1%
2020	8,326*	5.2%
2025	9,037	8.5%

Source: US Census Bureau, California Department of Finance (2025)

* US Census Bureau has this at 5,141, but the City noted that this did not include those in Mule Creek State Prison.

Underserved and Vulnerable Populations and Disadvantaged Communities

The City has a socially and economically diverse community, and many residents that are socially or economically disadvantaged or vulnerable due to varying reasons reside within the City. The City and surrounding County are no strangers to large natural disasters which have had a direct impact on the populations of the area. Thus, it is important to consider the potential effects of hazard events and disasters on these more vulnerable populations. Socially vulnerable and disadvantaged communities in the City are discussed by the following sources:

- CDC Social Vulnerability Index
- California Department of Water Resources (CA DWR) Special Populations and Disadvantaged Community Mapping
- FEMA Community Disaster Resilience Zones
- City Planning Team Input

CDC Social Vulnerability Index

Every community must prepare for and respond to a hazard event, including the range of natural hazards addressed in this Plan, from severe weather extremes to large potentially catastrophic events such as wildfires or earthquakes. A number of factors, including poverty, lack of access to transportation, and crowded housing may weaken a community's ability to prevent human suffering and financial loss in a disaster. These factors are known as social vulnerability.

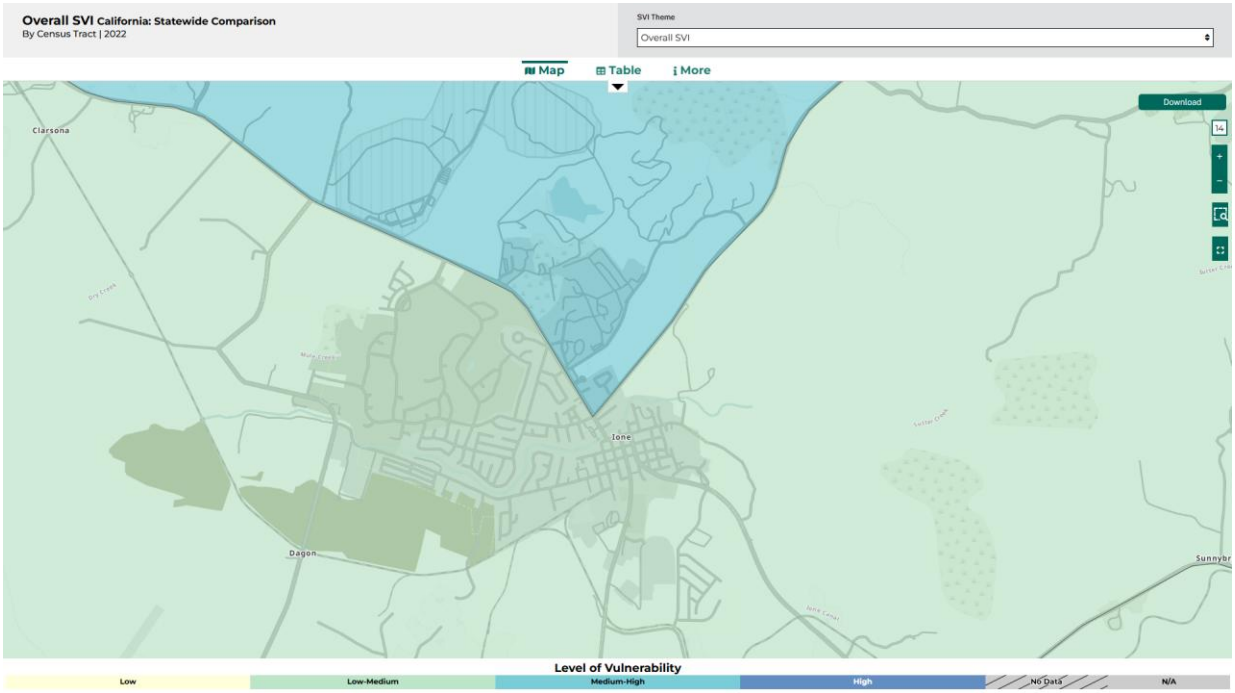
Social vulnerability refers to the potential negative effects on communities caused by external stresses on human health. Such stresses include natural or human-caused disasters, or disease outbreaks. Reducing social vulnerability can decrease both human suffering and economic loss. The Agency for Toxic Substances and Disease Registry (ATSDR) Geospatial Research, Analysis & Services Program (GRASP) created databases to help emergency response planners and public health officials identify and map communities that will most likely need support before, during, and after a hazardous event. The CDC used these databases to create the CDC Social Vulnerability Index (CDC SVI), which uses 15 U.S. census

variables to help local officials identify communities that may need additional support before, during, or after disasters.

CDC SVI uses U.S. Census data to determine the social vulnerability of every census tract. Census tracts are subdivisions of counties for which the Census collects statistical data. The CDC SVI ranks each tract on 15 social factors, including poverty, lack of vehicle access, and crowded housing, and groups them into four related themes. Each tract receives a separate ranking for each of the four themes, as well as an overall ranking. Maps of the four themes for the City are shown in the figures below.

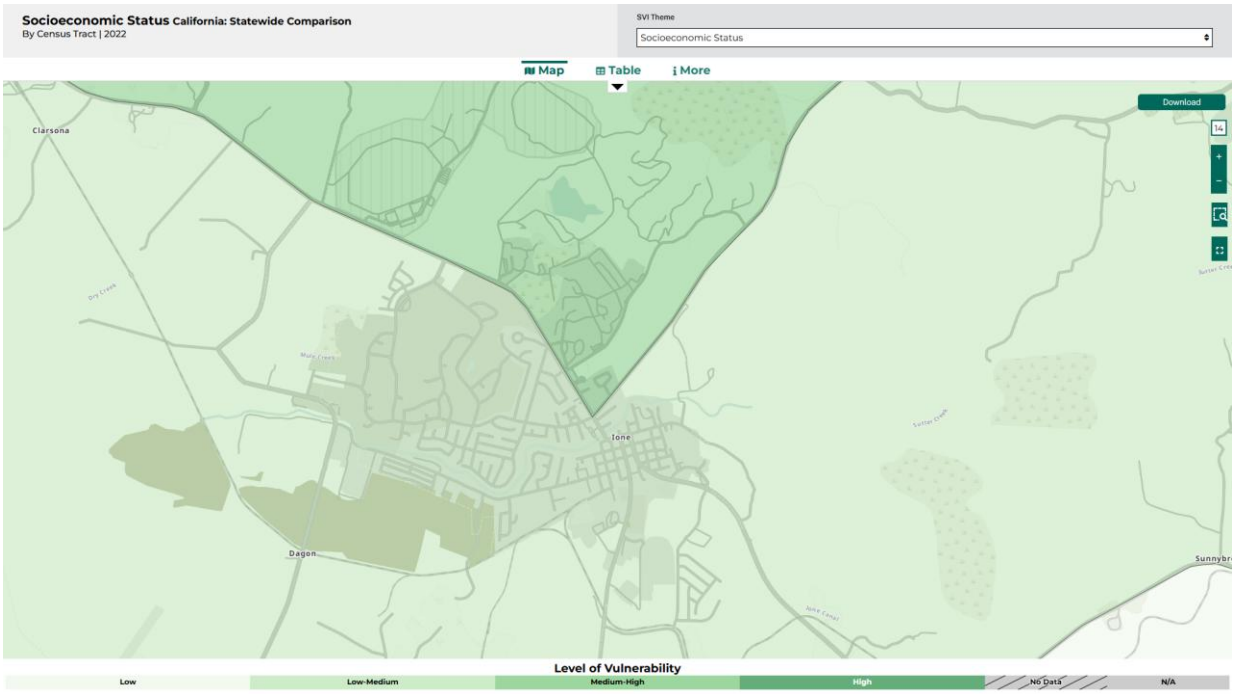
The overall SVI map is shown in Figure B-2; the socioeconomic SVI for the census tracts in and around the City are shown in Figure B-3; the household composition SVI is shown in Figure B-4; the minority and language SVI is shown in Figure B-5; and the housing and transportation SVI is shown in Figure B-6. Overall, the maps indicate that, in general, there is little differentiations with the areas on the north portion of the City. As shown, there is very minimal change in each SVI across the City.

Figure B-2 City of Ione – Overall Social Vulnerability



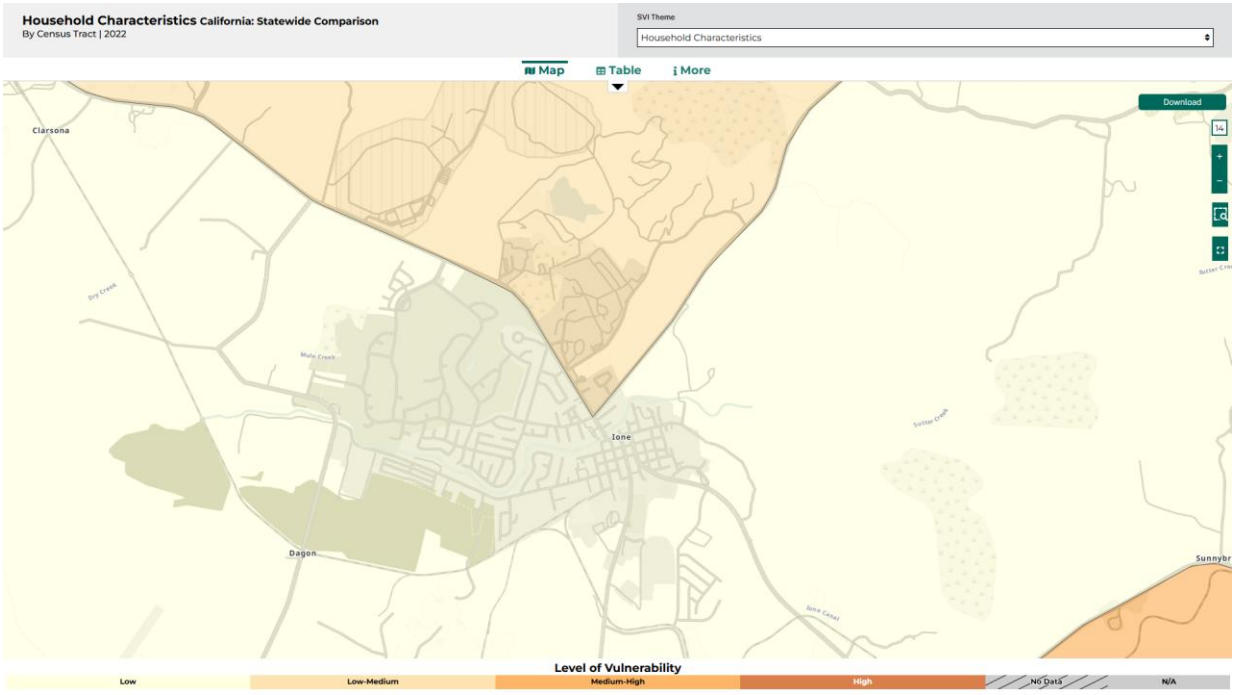
Source: CDC Social Vulnerability Index – map retrieved 12/16/2024
Level of Vulnerability Rating: **Yellow** – Low; **Green** – Low/Medium; **Aqua** – Medium/High; **Blue** – High; **Grey Hatched** – No Data; **Grey** – Not Available

Figure B-3 City of Ione – Socioeconomic Status Vulnerability



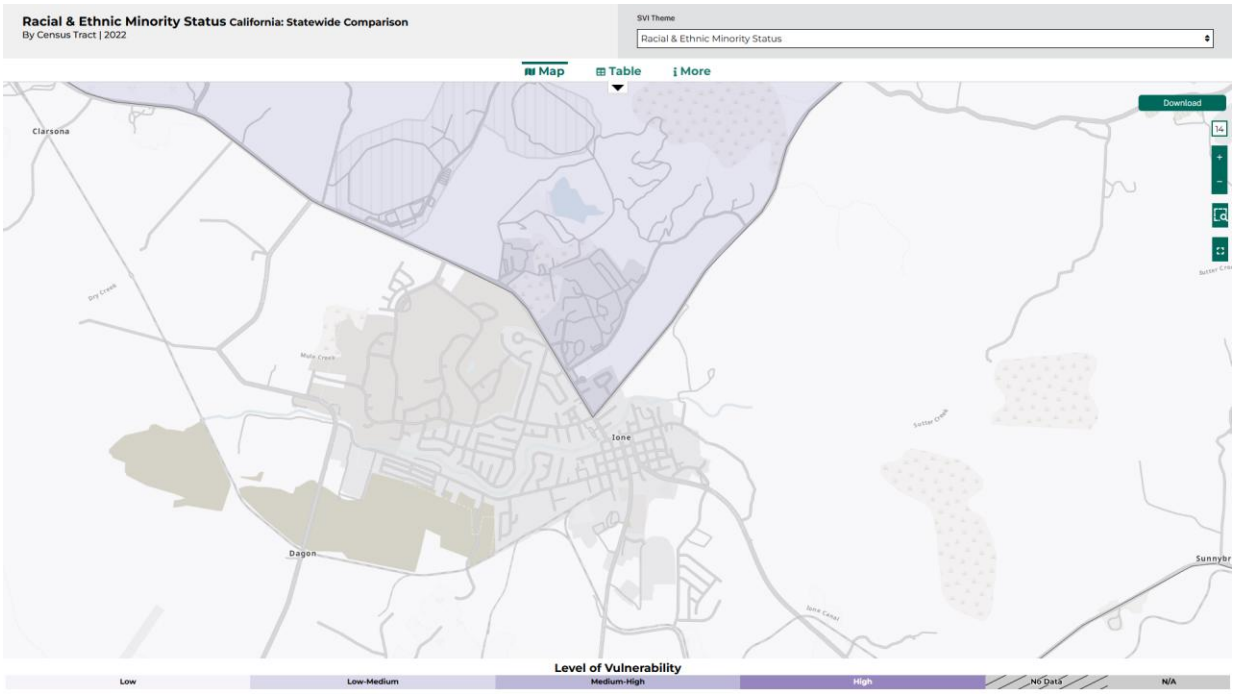
Source: CDC Social Vulnerability Index – map retrieved 12/16/2024
Level of Vulnerability Rating: **Faint Green** – Low; **Light Green** – Low/Medium; **Green** – Medium/High; **Dark Green** – High; **Grey Hatched** – No Data; **Grey** – Not Available

Figure B-4 City of Ione – Household Characteristics



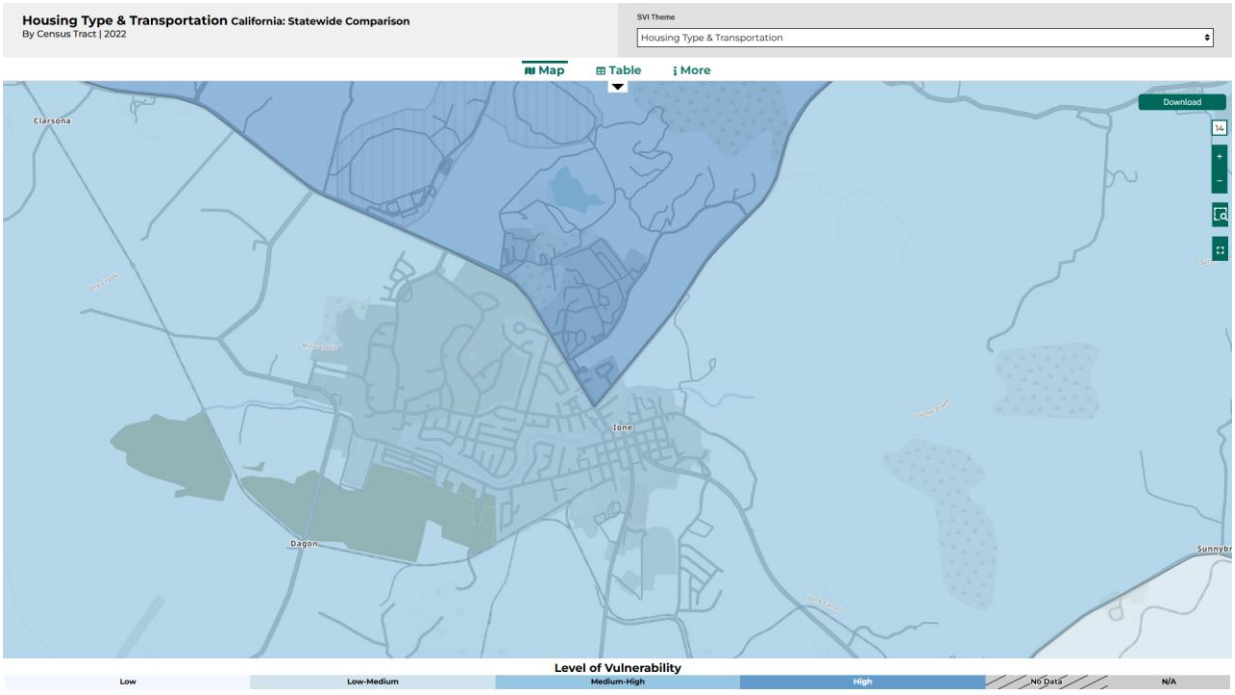
Source: CDC Social Vulnerability Index – map retrieved 12/16/2024
Level of Vulnerability Rating: **Faint Orange** – Low; **Light Orange**– Low/Medium; **Orange** – Medium/High; **Dark Orange** – High; **Grey Hatched** – No Data; **Grey** – Not Available

Figure B-5 City of Ione – Racial and Ethnic Minority Status



Source: CDC Social Vulnerability Index – map retrieved 12/16/2024
Level of Vulnerability Rating: **Faint Purple** – Low; **Light Purple** – Low/Medium; **Purple** – Medium/High; **Dark Purple** – High; **Grey Hatched** – No Data; **Grey** – Not Available

Figure B-6 City of Ione – Housing Type and Transportation

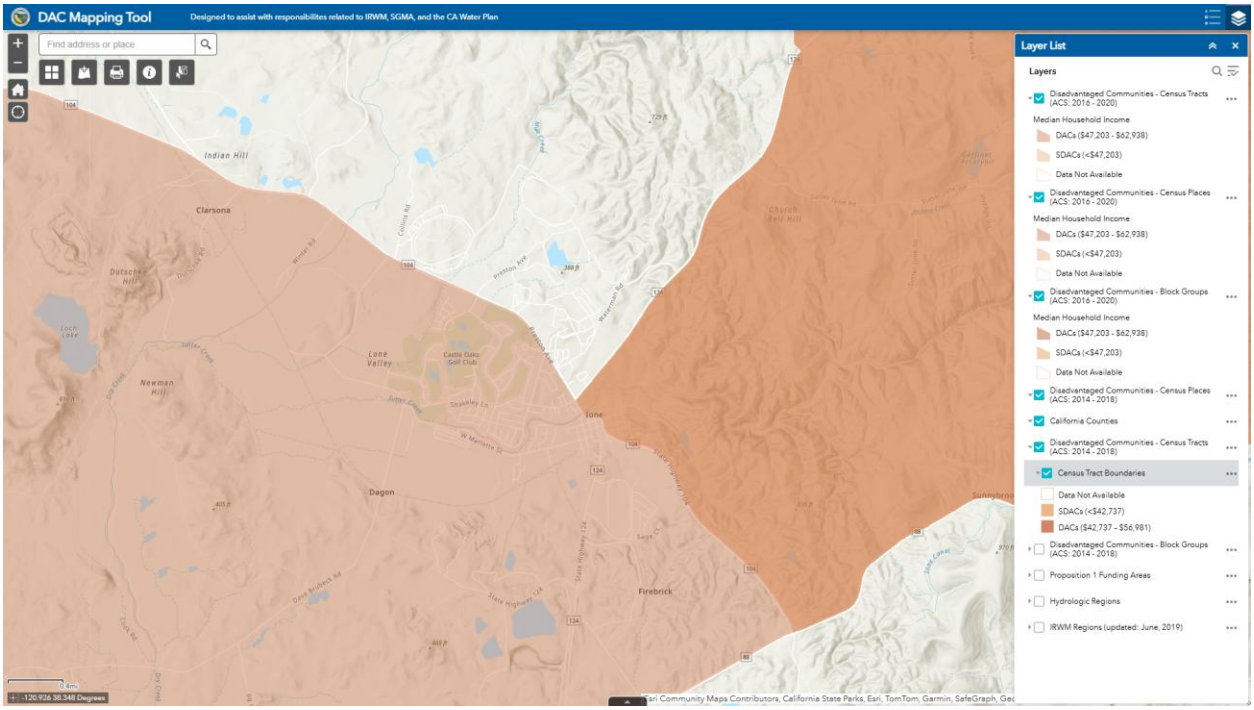


Source: CDC Social Vulnerability Index – map retrieved 12/16/2024
Level of Vulnerability Rating: **Faint Blue** – Low; **Light Blue** – Low/Medium; **Blue** – Medium/High; **Dark Blue** – High; **Grey Hatched** – No Data; **Grey** – Not Available

California DWR Disadvantaged Community Mapping Tool

The State of California's Proposition 1 Disadvantaged Community (DAC) Involvement Program is designated to ensure the involvement of DACs as well as Economically Distressed Areas and Underrepresented Communities, which DWR collectively refers to as DACs. The Cal DWR definition for a Disadvantaged Community is a community with an annual median household income (MHI) that is less than 80% of the Statewide annual MHI (PRC Section 75005(g)), and those census geographies with an annual MHI less than 60% of the Statewide annual MHI are considered "Severely Disadvantaged Communities". Those areas in the City considered disadvantaged are shown in Figure B-7. As shown, portions of the City fall into various DAC areas.

Figure B-7 City of Ione – Disadvantaged Areas

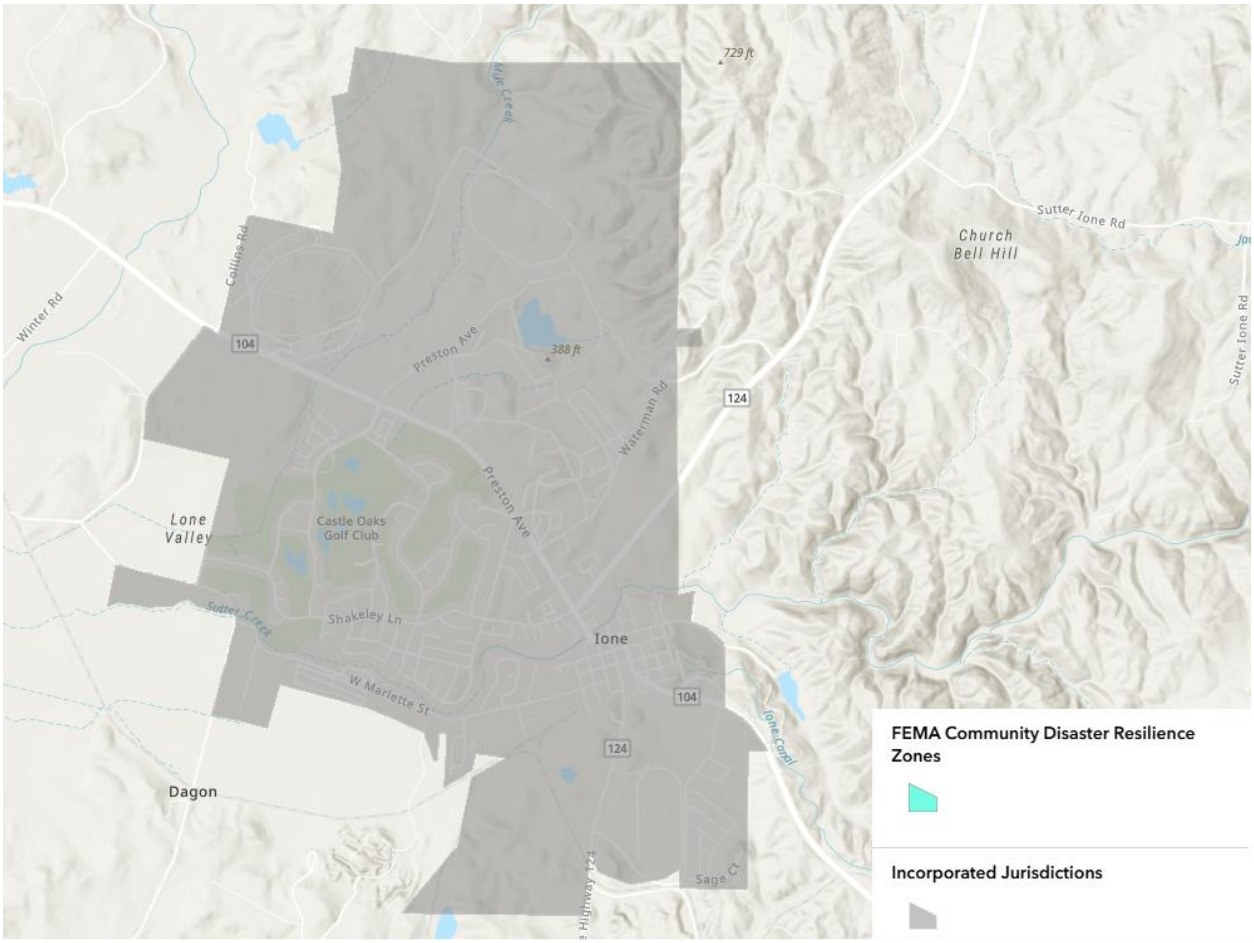


Source: Cal DWR DAC Mapping Tool – retrieved 12/16/2024

FEMA Community Disaster Resilience Zones

Community Disaster Resilience Zones aim to build and strengthen community resilience across the nation by driving federal, public, and private resources to the most at-risk and in-need communities. The Community Disaster Resilience Zones Act uses FEMA's National Risk Index to identify the most at-risk and in-need communities to identify resilience zones. Designated zones will be prioritized for targeted federal support, such as increased cost-share for resilience and mitigation projects, lessening the financial burden on communities to perform resilience-related activities. On September 6, 2023, FEMA announced the initial 483 designations in all 50 states and the District of Columbia. Figure B-8 shows these zones in teal green. As shown, there are no zones near or within the City limits.

Figure B-8 City of Ione – FEMA Community Disaster Resilience Zones



Source: FEMA. Map retrieved 12/16/2024

City Planning Team Input

There are certain populations in the City that are at greater risk to hazards, due to circumstances beyond their control. These populations in the City present a unique challenge when natural hazards arise.

Vulnerable populations in the City of Ione are primarily located in the Jose's Apartment Complex located off of North Arroyo Seco. This property is located next to Sutter Creek, but the 2016 FIRM map shows the vast majority of the property is located outside the 100-year floodplain. The Ione Apartments, located on South Church Street, also has vulnerable residents living in the facility. So do Foothill Apartments on 426 Foothill Dr, 116 Clay St Apartments, Ione Mobile Home Park at 1311 W. Marlette and Castle Park at 1400 W. Marlette.

Also to note is the prison population incarcerated in the Mule Creek State Prison. Current populations are estimated around 3,000. Should a significant hazard event occur impacting the Mule Creek Prison, incarcerated populations and staff could be at risk creating unique challenges associated with evacuations if needed.

City of Ione Items from the Amador County 2021-2029 Housing Element

The City Planning Team noted that the Amador County 2021-2029 Housing Element discusses special populations in the City. While the Housing Element information can be found in the Base Plan, there are unique elements to the City that are included here. Discussions for seniors, those with disabilities, developmental disabilities, people experiencing homelessness, large households, female headed households, extremely low-income households, and farmworkers were included. These are discussed below.

Seniors

The total population of seniors in the City is 1,363 (17.6%) persons. 34.6% of this population are owners while 24.6% rent their residence.

Disabled Citizens

The total population of disabled citizens in the City is 17.7% of the population.

People with Developmental Disabilities

Due to the method of gathering data using zip codes, there is shown a total of 79 individuals with developmental disabilities residing in the City.

People Experiencing Homelessness

The Amador Tuolumne Community Action Agency was contacted for homeless data, but there is no collection of data at the individual jurisdiction level. The estimation for the City is 21 individuals (14%).

Large Households

Large households are defined as 5 or more persons residing in the same home, which only makes up 6.9% of the total households countywide. In the City, 4% of this population owned homes with 5 or more people, with none renting.

Female Headed Households

Female headed households make up 9.1% of the City's population. Of this percentage, 23.7% live below the poverty line.

Farmworkers

The City data shows that 146 persons (6.6%) of 2,221 employed residents work in the agriculture, (also including forestry, fishing, hunting, and mining) industry.

Extremely Low Income

The level of poverty in a jurisdiction often influences the need for housing to accommodate those persons and families in the Very Low and Low-income categories. The U.S. Census Bureau measures poverty by

using a set of money income thresholds that vary by family size and composition of who is in poverty. If a family's total income is less than the family's threshold, then that family and every individual in it is considered in poverty. While the overall County experiences a poverty rate of 9.9%, the City has a percentage of individuals and households likely to be living in poverty. In 2019, 7.2% of individuals and families living in the City were living below the poverty level.

Structures

This section inventories the parcels (and associated structures) that make up the built environment of the City. The 2024 Amador County Assessor's data and the associated parcel layer was used as the basis of this inventory. The methodology used to derive the number of total and improved parcels (i.e., those with an improved structure value) and land and improved property values (as well as content replacement values) follows the same methodology detailed in Section 4.2.1 of the Base Plan. This data should only be used as a guideline to overall values in the City, as the information has some limitations. The most significant limitations are created by Proposition 13. With respect to Proposition 13, instead of adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result, overall value information is most likely low and does not reflect current market value of properties within the City. It is also important to note, in the event of a disaster, it is often the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a loss. However, depending on the type of hazard and impact of any given hazard event, land values may be adversely affected; thus, land values are included as appropriate. Table B-6 shows the Amador County Parcel/Assessor Data land and structure values and content replacement values (e.g., the values at risk) broken down by property use for the City.

Table B-6 City of Ione – Total Value of Parcels and Structures by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	11	3	$5,080,923	$32,232	$32,232	$5,145,387
Commercial	65	60	$10,119,481	$22,622,895	$22,622,895	$55,365,271
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	61	6	$2,034,148	$2,952,325	$0	$4,986,473
Residential	2,057	1,907	$199,498,752	$470,859,705	$235,429,853	$905,788,310
Unknown	11	0	$7,008,525	$0	$0	$7,008,525
Ione Total	**2,205**	**1,976**	**$223,741,829**	**$496,467,157**	**$258,084,980**	**$978,293,966**

Source: 2024 Amador County Parcel/Assessor Data

Critical Facilities and Infrastructure

Beyond just the buildings and structures that comprise the built environment, it is important to identify the critical facilities and infrastructure that are critical for life safety and property protection. This is done for the City of Ione below.

For purposes of this plan, a critical facility is defined as:

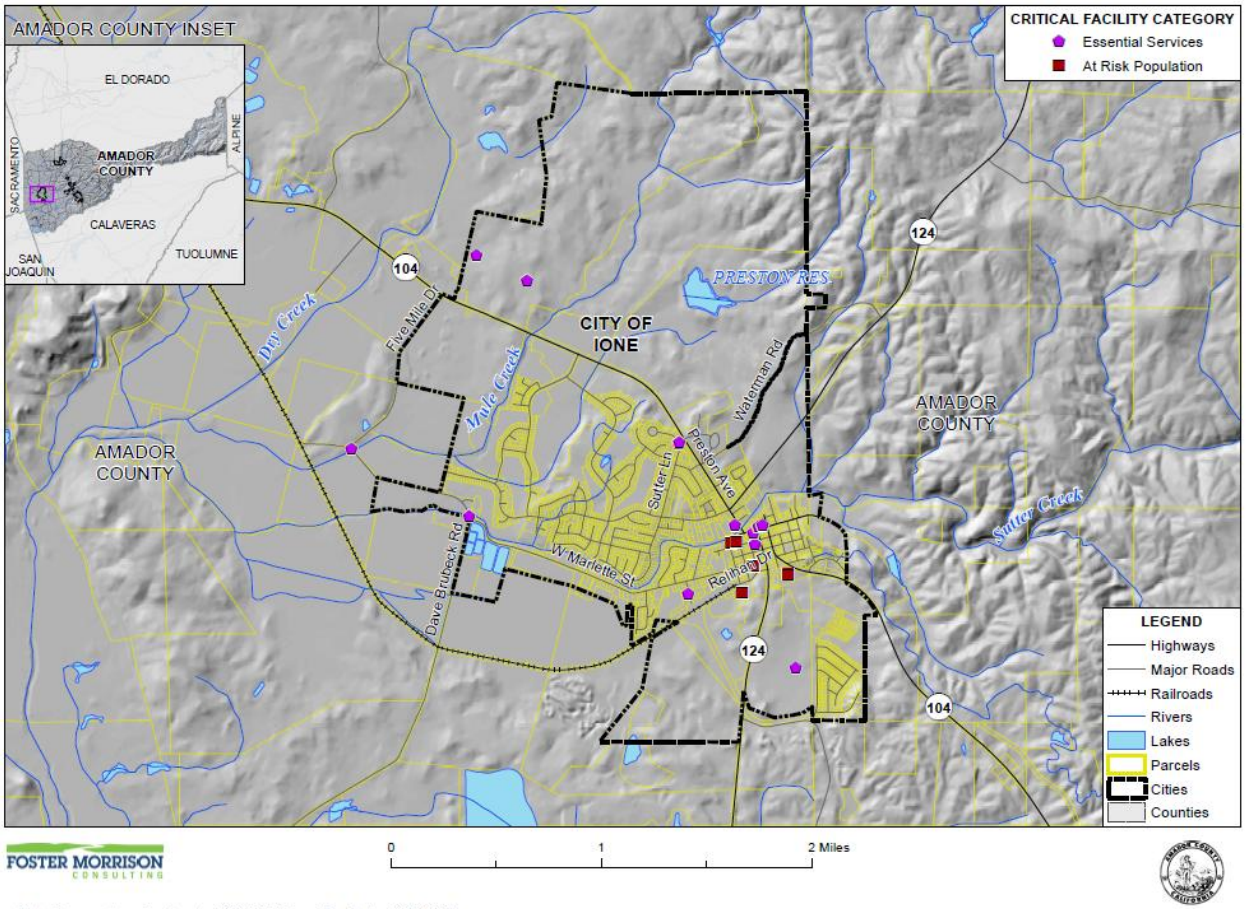
Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

A critical facility is classified by the following categories: (1) Essential Services Facilities, (2) At-Risk Populations Facilities, and (3) Hazardous Materials Facilities, as discussed in Section 4.3.1 of the Base Plan.

Note: The Hazardous Materials Facilities, while considered critical facilities for purposes of this Plan Update, are not mapped in this Plan due to the lack of an available GIS layer. In addition to the mapped critical facilities, it should further be noted that additional critical facilities, including infrastructure, utilities, and others have been identified for the City of Ione and the larger Amador County Planning Area but are not included in the mapping and inventory due to privacy and security concerns.

An inventory of critical facilities in the City of Ione from Amador County GIS is shown on Figure B-9. Table B-7 gives summary information about the critical facilities in the City. Table B-8 details the facility categories and breaks them down by facility type. Details of critical facility definition, type, name, address, and jurisdiction by hazard zone are listed in Appendix F.

Figure B-9 City of Ione – Critical Facilities



Data Source: Amador County GIS, Cal-Atlas; Map Date: 4/21/2025.

Table B-7 City of Ione – Critical Facilities by Category

Critical Facility Category	Facility Count
Essential Services Facilities	13
At Risk Population Facilities	5
City of Ione Total	**18**

Source: Amador County GIS

Table B-8 City of Ione – Critical Facilities by Category and Type

Critical Facility Category	Critical Facility Type	Facility Count
Essential Services	Bridge	1
	Clinic	1
	EMS Station	2
	Evacuation Shelter	1
	Fire Station	2
	Library	1

Critical Facility Category	Critical Facility Type	Facility Count
	Other	1
	Police Station	1
	Post Office	1
	Prison	1
	Public Administration Building	1
	Essential Services Total	**13**
At Risk Population	School	5
	At Risk Population Total	**5**
Ione Total		**18**

Source: Amador County GIS

Community Lifelines

Assessing the vulnerability of the City of Ione to natural hazards and disasters also involves reviewing and inventorying the community lifelines in place that could be affected. It is important to include these items in hazard discussions as the continuous operation of critical government and business functions is essential to human health and safety, property protection, and economic security. The importance of community lifelines is discussed below:

- Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function.
- FEMA has developed a method for objectives-based response that prioritizes the rapid stabilization of Community Lifelines after a disaster.
- The integrated network of assets, services, and capabilities that provide lifeline services are used day-to-day to support the recurring needs of the community and enable all other aspects of society to function.
- When disrupted, decisive intervention (e.g., rapid re-establishment or employment of contingency response solutions) is required to stabilize the incident.

Community lifelines, as defined by FEMA, include the following:

- **Safety and Security** – Law Enforcement/Security, Fire Service, Search and Rescue, Government Service, Community Safety
- **Food, Hydration, Shelter** – Food, Water, Shelter, Agriculture
- **Health and Medical –** Medical Care, Public Health, Patient Movement, Medical Supply Chain, Fatality Management
- **Energy –** Power Grid, Fuel
- **Communications** – Infrastructure, Responder Communications, Alerts Warnings and Messages, Finance, 911 and Dispatch
- **Transportation** – Highway/Roadway/Motor Vehicle, Mass Transit, Railway, Aviation, Maritime
- **Hazardous Material –** Facilities, HAZMAT, Pollutants, Contaminants
- **Water Systems** – Potable Water Infrastructure, Wastewater Management

It should be noted that these community lifelines are all in place and functional as part of regular government operations in the Amador County Planning Area serving as a partnership between the cities, local special districts and agencies, and Amador County. Due to its more rural nature, there is an interplay in community lifelines between all jurisdictions in the County. Most all of the City's community lifelines overlap with the Planning Area's s. It should also be noted that these lifelines collectively include many of the critical facilities and infrastructure assets inventoried for this LHMP. As such, specific information on these community lifelines in the City and how they may be affected by a hazard event or disaster are discussed collectively for all jurisdictions in the Base Plan.

Natural, Historic, and Cultural Resources

Assessing the vulnerability of the City of Ione to natural hazards and disasters also involves inventorying the natural, historic, and cultural assets of the area. This step is important for the following reasons:

- Environmental and natural resources add to a community's identity and quality of life. They also help the local economy through agriculture, tourism, and recreation. They support ecosystem services, such as clean air and water.
- Conserving the environment may help people mitigate risk. It can also protect sensitive habitats, develop parks and trails, and build the economy.
- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- If these resources are impacted by a disaster, knowing so ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts are higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.

Natural Resources

The City contains a variety of natural resources. Natural resources are unique to each area, often provide an important function, and are difficult to replace. Should a natural disaster occur, these species, resources, and locations are at risk.

Ione is located at the juncture of two major California vegetation zones: the Lower Sonoran Zone and the Upper Sonoran Zone. According to the California Natural Diversity Database (CNDDB) and the U.S. Fish and Wildlife Service (USFWS), 37 special-status species have the potential to occur within Amador County. Of these, five have been recorded within the Ione, California, quadrangle.

Ione manzanita (*Arctostaphylos myrtifolia*), Ione buckwheat (*Erigonum apricum var. apricum*), Bisbee Peak rush rose (*Heliantehmum suffrutescens*), and Parry's horkelia (*Horkelia parryi*) have all been identified in the Ione, California, quadrangle. Ione manzanita (federally threatened), Bisbee Peak rush-rose (CNPS List 3), and Parry's horkelia (federal species of concern) have been found within the Planning Area. Ione buckwheat and Irish Hill buckwheat (*Erigonum apricum var prostratum*), also known to occur in Amador County, are both federally proposed endangered species and are listed as endangered by the state

of California. Of these species, the California Native Plant Society (CNPS) has deemed Ione manzanita, Ione buckwheat, Irish Hill buckwheat, and Parry's horkelia as rare or endangered in California and elsewhere. Bisbee Peak rush-rose is a CNPS List 3 species. More information is needed to determine whether protection of this species is warranted.

Wetlands and their Natural and Beneficial Functions

Wetlands are habitats in which soils are intermittently or permanently saturated or inundated. Wetland habitats vary from rivers to seasonal ponding of alkaline flats and include swamps, bogs, marshes, vernal pools, and riparian woodlands. Wetlands are considered to be waters of the United States and are subject to the jurisdiction of the U.S. Army Corps of Engineers as well as the California Department of Fish and Wildlife (CDFW). Where the waters provide habitat for federally endangered species, the U.S. Fish and Wildlife Service may also have authority.

Wetlands are a valuable natural resource for communities providing beneficial impact to water quality, wildlife protection, recreation, and education, and play an important role in hazard mitigation. Wetlands provide drought relief in water-scarce areas where the relationship between water storage and streamflow regulation is vital and reduce flood peaks and slowly release floodwaters to downstream areas. When surface runoff is dampened, the erosive powers of the water are greatly diminished. Furthermore, the reduction in the velocity of inflowing water as it passes through a wetland helps remove sediment being transported by the water.

Wetlands are often found in floodplains and depressional areas of a watershed. Many wetlands receive and store floodwaters, thus slowing and reducing downstream flow. Wetlands perform a variety of ecosystem functions including food web support, habitat for insects and other invertebrates, fish and wildlife habitat, filtering of waterborne and dry-deposited anthropogenic pollutants, carbon storage, water flow regulation (e.g., flood abatement), groundwater recharge, and other human and economic benefits.

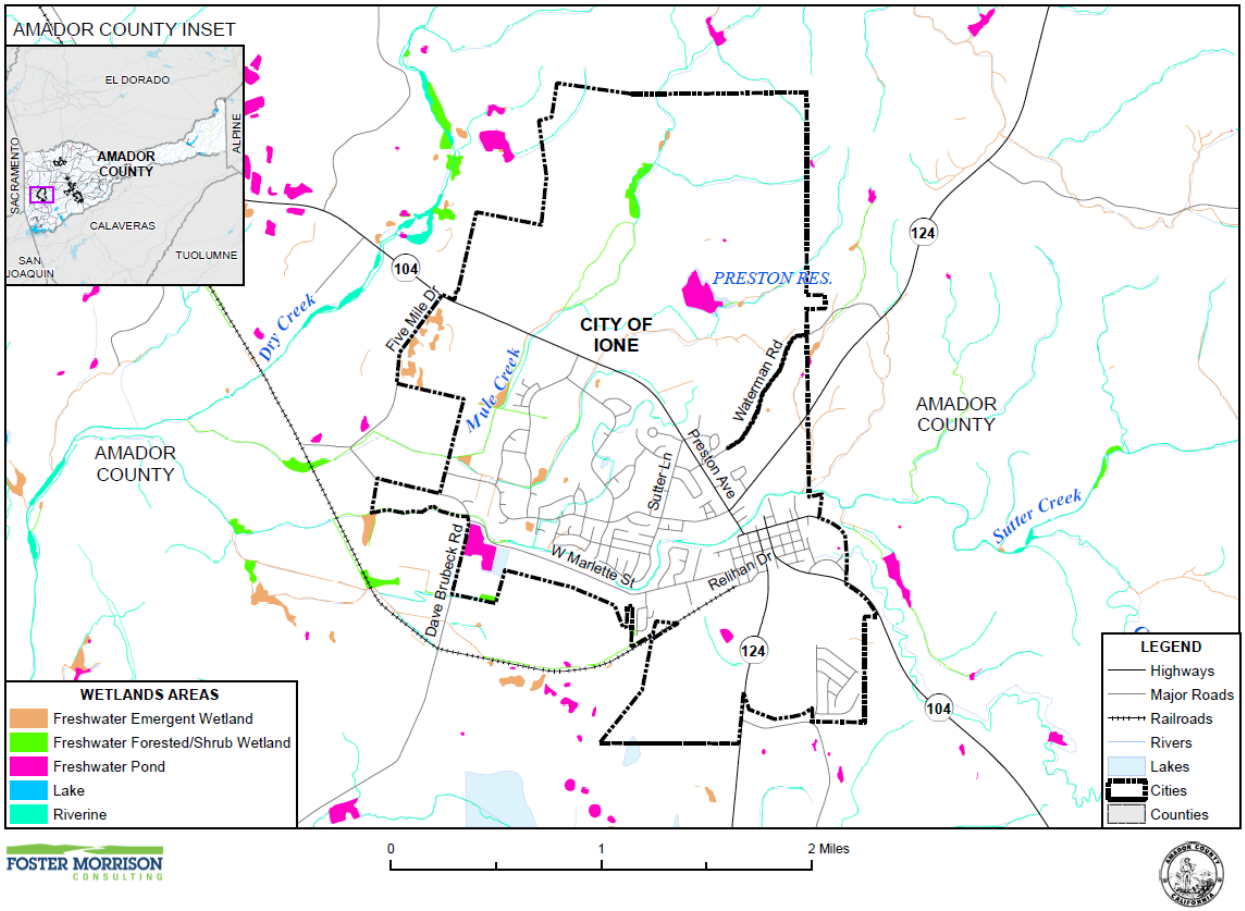
Wetlands, and other riparian and sensitive areas, provide habitat for insects and other invertebrates that are critical food sources to a variety of wildlife species, particularly birds. There are species that depend on these areas during all parts of their lifecycle for food, overwintering, and reproductive habitat. Other species use wetlands and riparian areas for one or two specific functions or parts of the lifecycle, most commonly for food resources. In addition, these areas produce substantial plant growth that serves as a food source to herbivores (wild and domesticated) and a secondary food source to carnivores.

Wetlands slow the flow of water through the vegetation and soil, and pollutants are often held in the soil. In addition, because the water is slowed, sediments tend to fall out, thus improving water quality and reducing turbidity downstream.

These natural floodplain functions associated with the natural or relatively undisturbed floodplain that moderates flooding, such as wetland areas, are critical for maintaining water quality, recharging groundwater, reducing erosion, redistributing sand and sediment, and providing fish and wildlife habitat. Preserving and protecting these areas and associated functions are a vital component of sound floodplain management practices for the City.

Wetlands in the City are shown in Figure B-10 and detailed in Table B-9.

Figure B-10 City of Ione – Wetlands Areas



Data Source: U.S. Fish and Wildlife Service National Wetlands Inventory 10/2024 (downloaded 01/2025), Amador County GIS, Cal-Atlas; Map Date: 2/26/2025.

Table B-9 City of Ione – Wetland Types and Acreages

Wetlands Area Type	Wetlands Count	Wetlands Area (in Acres)
Freshwater Emergent Wetland	30	28.90
Freshwater Forested/Shrub Wetland	15	15.73
Freshwater Pond	8	26.20
Lake	0	0.00
Riverine	18	24.00
Ione Total	**71**	**94.83**

Source: US Fish and Wildlife Service

Historic and Cultural Resources

Historic and cultural resources are difficult to replace. Should a natural disaster occur, these properties and locations can be at risk. The City of Ione has a stock of historically significant homes, public buildings, and landmarks. The California Department of Parks and Recreation Office of Historic Preservation (OHP) was the primary source of information. OHP administers the National Register of Historic Places, the California Register of Historical Resources, California Historical Landmarks, and the California Points of

Historical Interest programs. Each program has different eligibility criteria and procedural requirements. These requirements are detailed in Section 4.2.1 of the Base Plan. Table B-10 shows 6 historic buildings in the City in the OHP Database.

Table B-10 City of Ione – Historic Resources

Resource Name (Plaque Number)	National Register	State Landmark	Point of Interest	Date Listed	City/ Community
Community Methodist Church of Ione (506)		X		7/31/1953	Ione
Ione City Centenary Church (N498)	X			5/26/1977	Ione
Five Mile Drive--Sutter Creek Bridge (N1437)	X			4/11/1986	Ione
Scully Ranch (N706)	X			11/21/1978	Ione
D. Stewart Co. Store (788)		X		11/21/1963	Ione
Preston Castle (867)		X		1/11/1974	Ione

Source: California Department of Parks and Recreation Office of Historic Preservation. Retrieved 12/3/2024.

It should be noted that these lists may not be complete, as they may not include those currently in the nomination process and not yet listed. Additionally, as defined by the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA), any property over 50 years of age is considered a historic resource and is potentially eligible for the National Register. Thus, in the event that the property is to be altered, or has been altered, as the result of a major federal action, the property must be evaluated under the guidelines set forth by CEQA and NEPA. Structural mitigation projects are considered alterations for the purpose of this regulation.

Economic Assets and Community Activities of Value

Assessing the vulnerability of the City of Ione to natural hazards and disasters also involves inventorying the economic assets and community activities of value in the City.

Economic Assets

After a disaster, economic resiliency is one of the major drivers of a speedy recovery. Each community has specific economic drivers. These include:

- Primary Economic Sectors
- Major employers
- Commercial Centers

In the City of Ione, this includes the following:

- Mule Creek State Prison (MCSP):
- Cal Fire Academy
- Construction and Housing Development:
- Retail and Small Businesses
- Tourism and Recreation:
- Commuter Economy

Note: This inventory of economic assets is only included in this overall asset inventory for the City. To limit redundancy, it is not discussed further in the hazard profiles and vulnerability assessments in Section B.4.3 below. However, depending on the type, location, magnitude and extent of future hazard events and disasters, these City's economic assets may be vulnerable.

Community Activities of Value

Inventorying economic assets in the City and their vulnerability to natural hazards and disasters also involves inventorying activities that have value to the community. This includes activities that are important to a community, like long-standing traditions such as a festival or fair. Some areas rely on seasonal industries to sustain them throughout the year. Many of these activities also provide economic benefits to the City. A hazard event that cancels or shortens these can affect a community's livelihood and can make disaster recovery more difficult or prolonged. This includes activities such as:

- Festivals and Fairs
- Sporting Events
- Tourism
- Local Pools
- Local Splash Pools

The City noted the following community activities of value:

- Ione Homecoming & Parade
- Hometown Christmas
- Preston Castle Haunt
- Halloween Night Parade
- Santa Truck
- 9-11 ceremony
- Little League baseball
- Mother Lode soccer
- Ione Jr. High Swimming pool
- Howard Park Summer Camp
- Christmas Parade
- Baseball Parade
- Walk for the troops
- Party Pardee Ride

Note: This inventory of community activities of value only occurs in this overall asset inventory for the City. To limit redundancy, it is not discussed further in the hazard profiles and vulnerability assessments in Section B.4.3 below. However, depending on the type, location, magnitude and extent of future hazard events and disasters, the City's community activities of value may be vulnerable.

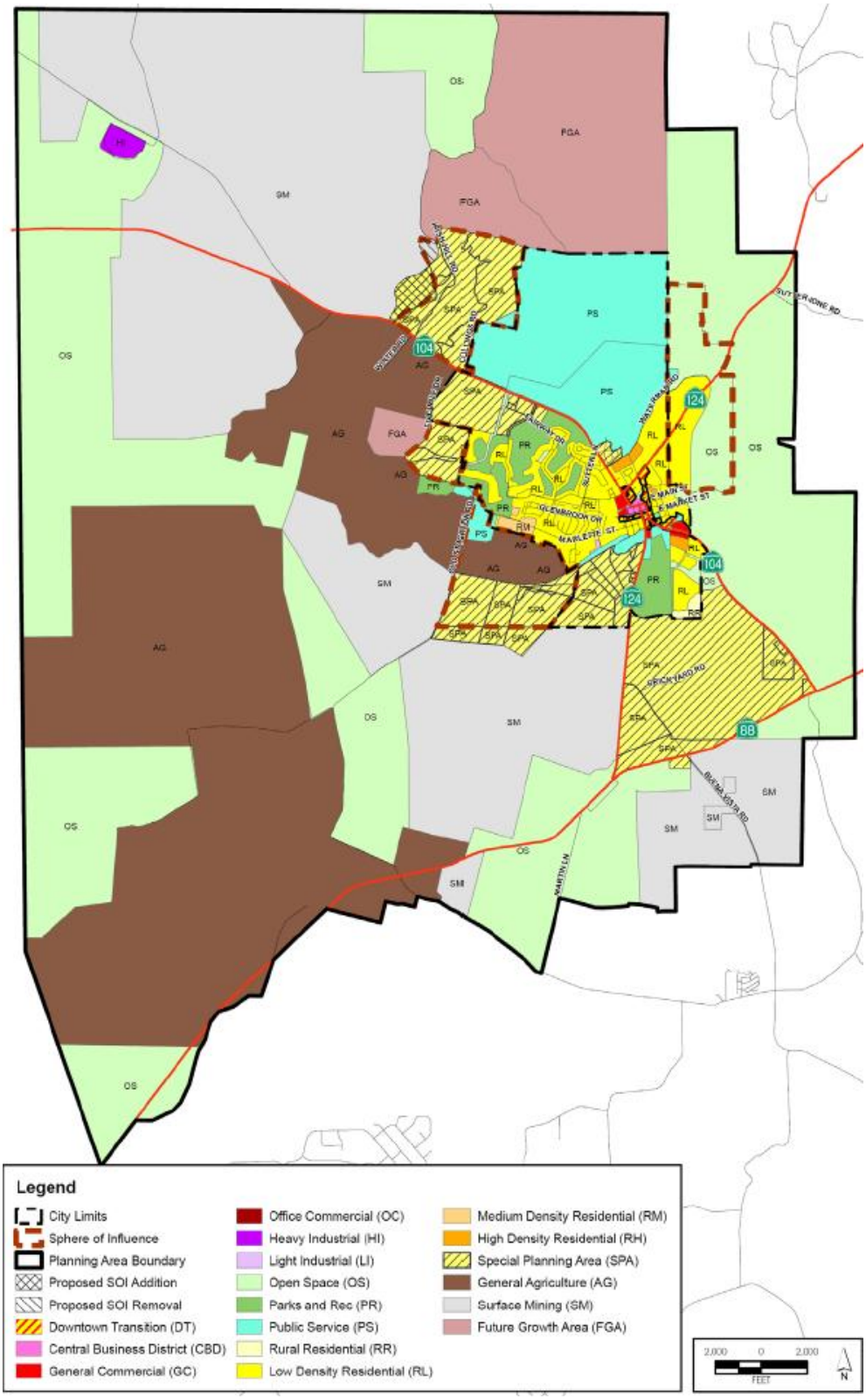
Growth and Development Trends

As part of the planning process, the City looked at changes in growth and development, both current and future, and examined these changes in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability over time.

Land Use

State planning law requires that a land use element of a general plan include a statement of the standard population density, building intensity, and allowed uses for the various land use designations in the plan (Government Code Section 65302(a)). The City's land use designations are generally described below and mapped on the Land Use Diagram (Figure B-11). The City of Ione Municipal Code provides detailed land use and development standards for development.

Figure B-11 City of Ione – Land Use Diagram



Source: City of Ione. Retrieved 6/4/2025

Population Trends and Projections

There are no future City population projections. Amador County as a whole is expected to slowly continue to increase in population. As such, it is assumed that the City may see slow population growth as well.

Development since 2020 Plan

Development has occurred in the City since the last plan. Some of this has occurred in hazard prone areas. The City Planning Department tracked total building permits issued since 2019 for the City. These are tracked by total development, property use type, and hazard risk area. These are shown in Table B-11 and Table B-12.

Table B-11 City of Ione – Total Development Since 2020

Property Use	2020	2021	2022	2023	2024
Residential	66	126	69	55	13
Commercial	0	0	0	0	0
Industrial	0	0	0	0	0
Other	0	0	0	0	0
Total	**66**	**126**	**69**	**55**	**13**

Source: City of Ione Planning Department

Table B-12 City of Ione – Development in Hazard Areas since 2020

Property Use	1% Annual Chance Flood	Levee Protected Area	Wildfire Risk Area[1]	Other
Total	**2**	**0**	**131**	**0**

Source: City of Ione Planning Department

[1]Moderate or higher wildfire risk area

Development has occurred in the identified hazard areas, including the 1% annual chance floodplains and high wildfire risk areas. It was completed in accordance with all current and applicable development codes, including floodplain ordinances, wildfire codes, and other applicable standards and should be adequately protected. Thus, with the exception of more people living in the area potentially exposed to natural hazards, this growth should not cause a significant change in vulnerability of the City to identified priority hazards.

Future Development Areas

It is important to review future development plans for the City. Future development should be sited in areas that are away from known hazard risks. If this is not possible, mitigation should be done to ensure that future development is protected against future hazards.

There are two areas in the City that are thought to see development in the next 5 years: the Ringer Ranch Subdivision and the Waterman Ranch Subdivision.

- The **Ringer Ranch Subdivision Project** proposal is for a new 585-unit detached single-family residential project of varying lot sizes located within and consistent with the existing General Plan Ringer Ranch Policy Area in the City of Ione. The site contains 135.18 +/- gross acres and is located south of State Highway 104 on the west side of Ione. The site is more specifically defined as APN 005-320-005. The property is bounded on the north by existing public facility uses, the east by existing single-family residential homes and a golf course (Castle Oaks), the south by proposed single-family development (Castle Oaks Village 10) and golf (Castle Oaks) and vacant land, and on the west by vacant lands outside the City of Ione. The project site is characterized by gently rolling hills separated dominated by annual grass lands with few valley, blue, or live oak trees. The westerly portion of the site was dredged for placer gold and now supports riparian habitat consisting of seasonal wetlands, cottonwood trees, willow, berry vines. The site is bounded on the east by Mule Creek, and an ephemeral stream, which supports valley oaks, cottonwood, and black walnut trees, willows, berry vines, and rushes. The project site is identified in the Ione General Plan as RL (Residential Low). Existing zoning is PD Planned Development.
- The **Waterman Ranch Subdivision Project** proposal is for a new 377-unit detached single-family residential project of varying lot sizes located within and consistent with the existing General Plan State Route 124 Corridor Policy Area in the City of Ione. The site contains 94.74 +/- gross acres and is located north and south of State Route 124 on the east side of Ione. The site is more specifically defined as APN 004-290-002. The property is bounded on the north by existing public facility uses, the east by vacant lands outside of the City, but within the State Route 124 Corridor Policy Area, and on the south and west by existing single-family residential uses. The project site is characterized by gently rolling hills dominated by oak savanna. The vegetation is dominated by open grass lands or a mixed overstory of gray pine and valley, blue, and live oaks, with an understory of dense annual grasses interspersed with clumps of chemise, manzanita, and poison oak. Scattered cottonwood trees, willow, berry vines, and rushes grow in association with few seasonal wetland areas. The project site is identified in the Ione General Plan as RL (Residential Low) and RH (Residential High). Existing zoning is PD Planned Development.

GIS Analysis

These two future development areas were provided by the City of Ione. Using GIS, these areas were mapped. This area is shown on Figure B-12, and detailed by parcels and acres in Table B-13.

Figure B-12 City of Ione – Future Development Areas

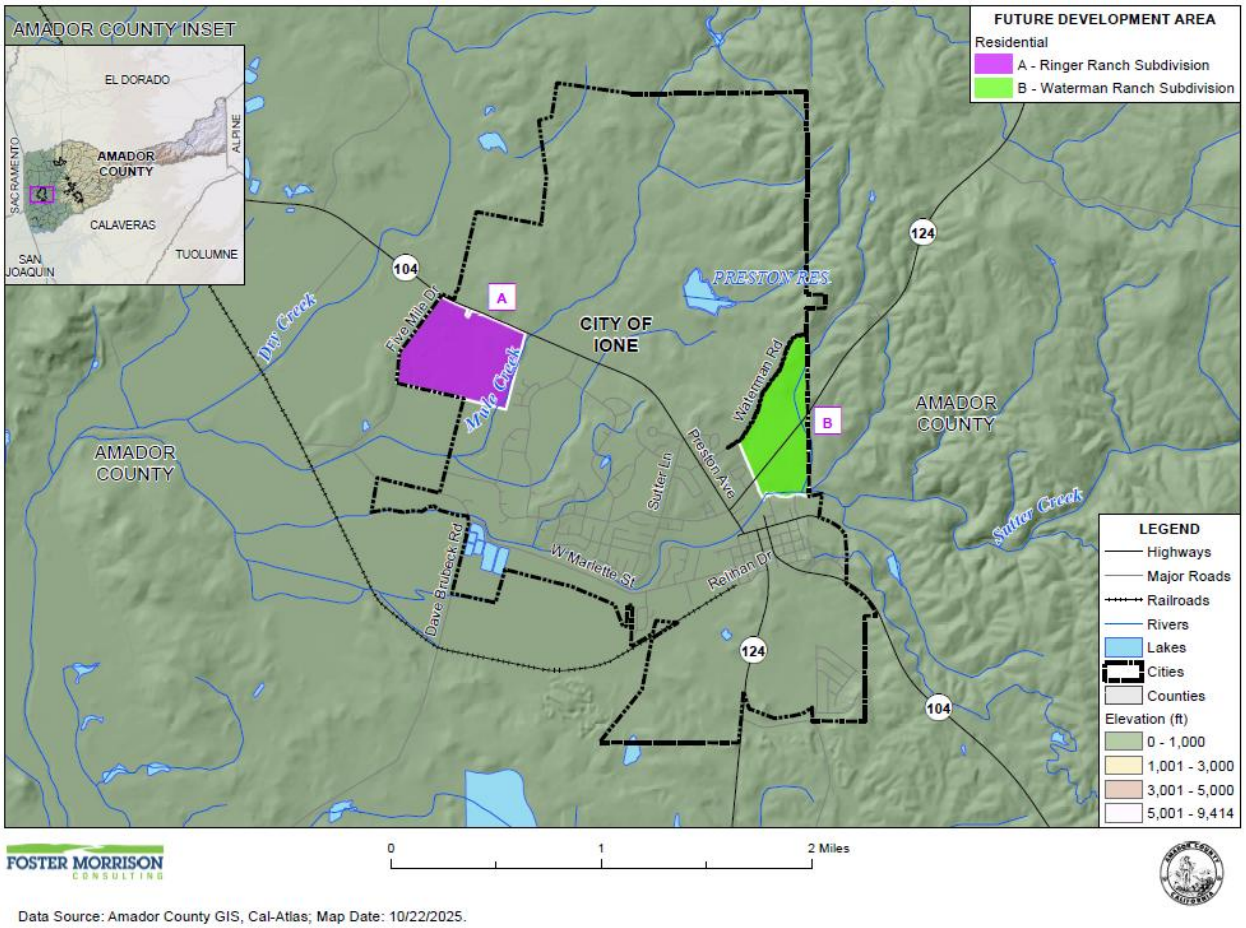


Table B-13 City of Ione– Parcels and Acres in Future Development Areas

Site/Map ID	Future Development	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
A	Ringer Ranch Subdivision	1	1	0	135.18	135.18	0
B	Waterman Ranch Subdivision	1	**0**	1	94.74	**0**	94.74
Grand Total	**–**	**2**	**1**	**1**	**229.92**	**135.18**	**94.74**

Source: City of Ione

B.4.2. Hazard Identification

The City of Ione identified the hazards that affect the City and summarized their location, extent, likelihood of future occurrence, potential magnitude, and significance specific to the City (see Table B-14). Those hazards identified as a high or medium significance in Table B-14 are considered City of Ione priority hazards for mitigation planning. Those hazards that occur infrequently or have little or no impact in the

City were determined to be of low significance and not considered a priority hazard. Significance was determined based on the hazard profile, focusing on key criteria such as frequency, extent, and resulting damage, including deaths/injuries and property, natural and cultural resources, and economic damage. The ability of a jurisdiction to reduce losses through implementation of existing and new mitigation measures was also considered as to the significance of a hazard. This assessment was used to prioritize those hazards of greatest significance, enabling the City to focus resources where they are most needed.

Table B-14 City of Ione—Hazard Identification Assessment

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Agricultural Hazards (severe weather/pests/invasive species)	Limited	Unlikely	Negligible	Low	Low
Avalanche	Limited	Unlikely	Negligible	Low	Medium
Climate Change	Extensive	Likely	Limited	Medium	--
Dam Failure	Limited	Unlikely	Negligible	Low	Medium
Drought & Water shortage	Extensive	Likely	Catastrophic	High	High
Earthquake (w/subhazards)	Extensive	Unlikely	Negligible	Low	Low
Floods: 1%/0.2% annual chance (w/ levee failure)	Significant	Occasional	Limited	High	Medium
Floods: Localized Stormwater	Limited	Highly Likely	Critical	High	Medium
Landslide, Mudslide, Debris Flow	Limited	Highly Unlikely	Negligible	Low	Medium
Severe Weather: Extreme Cold, Freeze, and Snow	Extensive	Occasional	Limited	Low	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Critical	Medium	High
Severe Weather: Heavy Rains and Storms (Hail, Lightning)	Extensive	Occasional	Limited	Low	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Highly Unlikely	Limited	Medium	Low
Wildfire (w/smoke and air quality)	Significant	Likely	Critical	High	High

Geographic Extent
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Likelihood of Future Occurrences
Highly Likely: Near 100% chance of occurrence in next year, or happens every year.
Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.
Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.
Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Magnitude/Severity
Catastrophic: More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths
Critical: 25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability
Limited: 10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability
Negligible: Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance
Low: Minimal potential impact
Medium: Moderate potential impact
High: Widespread potential impact

Climate Change Influence
Low: Minimal potential impact
Medium: Moderate potential impact
High: Widespread potential impact

B.4.3. Hazard Profiles and Vulnerability to Specific Hazards

This section includes the hazard profiles and vulnerability assessment for hazards ranked of medium or high significance specific to the City of Ione (as identified in the Significance column of Table B-14) and also includes a hazard profile and vulnerability assessment to the four primary hazards to the State of California: dam failure, earthquake, flood, and wildfire, regardless of the significance ranking by the City. Chapter 4 of the Base Plan provides more detailed information about these hazards and their impacts on the Amador County Planning Area. Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.2 of the Base Plan.

Hazard Profiles and Vulnerability Assessment

Each hazard is profiled in the following format:

- **Hazard Profile** – A hazard profile is included for each hazard. This includes information on:
  - ✓ **Hazard Overview** – A general discussion of the hazard and related issues is detailed here.
  - ✓ **Location** and **Extent** – Location is the geographic area within the City that is affected by the hazard. Extent is the expected range of intensity for each hazard. These are discussed in specific detail for mapped hazards, and in more general detail for those hazards that do not have discrete mapped hazard areas.
  - ✓ **Past Occurrences** – Past occurrences are discussed for each hazard. A discussion of disaster declarations is included in each hazard section. NCDC events are also discussed. Other past occurrences data specific to the City follow the disaster declarations and NCDC events for each hazard.
  - ✓ **Climate Change** – This section contains the effects of climate change (as applicable). The possible influence of climate change on the hazard is discussed.

After the hazard profile, a vulnerability assessment is presented. As part of the vulnerability assessment, an estimate of the vulnerability of the City to each identified hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low** – The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low** – Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium** – Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High –** Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High** – Very widespread with catastrophic impact.

After this classification, a general discussion of hazard vulnerabilities occurs. This is done in the following format:

- **Local Concerns** – This includes City provided information on how the City is uniquely affected by or vulnerable to each hazard.
- **Assets at Risk** – A discussion of the assets at risk follows, presented in the same order as in Section B.4.1 above, with a few exceptions. This includes sections on: People and Populations; Structures; Critical Facilities and Infrastructure, and Natural, Historic, and Cultural Resources. These are discussed in specific terms for mapped hazards, and in more general terms for those hazards that are unmapped. Sections on Community Lifelines and Economic Assets and Community Activities of Value are not included in the Sections below, as they are fully covered in Section B.4.1 above and in Chapter 4 of the Base Plan.
- **Impacts** – A discussion on hazard impacts follows. Impacts describe how each hazard can affect the City and its assets. The type and severity of impacts reflect both the potential magnitude of the hazard and the vulnerability of the asset.
- **Future Conditions/Future Development** – A discussion of how future conditions and future development may affect the hazard is also included. This is addressed specifically for mapped hazards, and in more general terms for those hazards that are unmapped.

Power Interruption/Power Failure: A Common Vulnerability of all Hazards

An impact of almost all hazards evaluated as part of this LHMP Update relates to power shortage and/or power failures. The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the U.S. Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power disruptions can be found in Section 4.3 of the Base Plan.

Public Safety Power Shutoff (PSPS)

An intentional disruption type of power shortage/failure event has been recently implemented in California as a result of wildfires starting as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are preparing all Californians for the threat of wildfires and power outages during times of extreme (fire) weather. To help protect customers and communities during extreme fire weather events, electric power may be shut off for public safety in an effort to proactively prevent wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3 of the Base Plan.

In addition to PSPSs, to help prevent wildfires, electric utilities have begun to evolve safety efforts. This includes installing safety settings on powerlines in and around high fire-risk areas. These are known as

Enhanced Powerline Safety Settings (EPSS), and they help prevent falling tree branches, animals and other hazards from starting a wildfire. By stopping ignitions, it helps prevent wildfires from starting and spreading. According to PG&E, if ignitions occur, the size of fires are much smaller due to EPSS. In 2022, there was a 99% decrease in acres impacted by ignitions (as measured by fire size from electric distribution equipment (compared to the 2018-2020 average). This decrease occurred despite dry conditions.

Local Concerns

The City noted that there have been no power outages or PSPS events that have affected them.

Climate Change

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

Climate change adaptation is a key priority of the State of California. The 2023 State of California Multi-Hazard Mitigation Plan noted that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the State's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

California's Adaptation Planning Guide: Understanding Regional Characteristics (from 2017) has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. The City falls in the North Sierra Region. A map and climate projections for this region are shown in Section 4.3.7 of the Base Plan and include an increase in temperatures, moderate changes in rainfall, and increased risk to wildfire.

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the City of Ione, the Amador County Planning Area, surrounding counties, and State of California. There is no scale to measure the extent of climate change. Climate change exacerbates other hazards, such as drought, extreme heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known but is feared to be tens to hundreds of years.

Past Occurrences

Disaster Declaration History

Climate change has never been directly linked to any declared disasters.

NCDC Events

NCDC does not track climate change events.

City of Ione Events

From 2020 to 2025, the City of Ione experienced several climate-driven events. The 2020-2022 drought caused water shortages, stressing residents, businesses and increasing wildfire fuel loads, with indirect costs from water management. The 2021 Caldor Fire brought smoke and air quality issues, disrupting tourism and downtown businesses. Severe winter storms in 2023 triggered localized flooding in areas like Main Street and Five Mile Drive, with debris and tree damage. Heat waves in 2023-2025 (100-106°F) strained resources. Wind events in 2021 and 2025 (40-70 mph) caused tree falls, leading to road closures and extensive cleanup. These events highlight the need for mitigation actions to address climate-driven hazards.

Vulnerability to Climate Change

The whole of the City is at some measure of vulnerability to climate change. The City Planning Team has concerns that the vulnerability of the City to climate change will continue to increase in the future. An assessment of a community's vulnerability to climate change begins with an understanding of local exposure to climate change. This is included in the Local Concerns section below followed by a discussion of the City's assets at risk, and impacts to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

From 2020 to 2025, the City of Ione faced climate-driven events intensifying vulnerabilities, including the 2020-2022 drought causing water shortages and tree mortality, the 2021 Caldor Fire with smoke impacting vulnerable populations, 2023 severe storms triggering localized flooding and debris flows, 2023-2025 heat waves (100-106°F) straining limited cooling infrastructure, and 2021/2025 wind events (40-70 mph) causing tree damage and power outages. These events highlight concerns for low-income and elderly residents, aging stormwater systems, wildfire-prone grasslands, and economic disruptions in downtown Ione. Mitigation actions, such as developing a Climate Adaptation Plan, upgrading cooling centers, and implementing stormwater and urban forestry programs, are needed to reduce risks and enhance resilience.

Assets at Risk

Assets at risk from climate change include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

Climate change affects people and populations within a community, especially those climate change issues related to increases in temperature over time. While all populations can be affected by temperature

extremes, populations particularly vulnerable include the very old and very young, medically fragile people, people without means of shelter (and air conditioning or heat) or transportation, people who are socially isolated and other vulnerable or underserved populations (as shown in the discussion in Section B.4.1). Acclimatization to extreme temperatures and other weather extremes may help reduce impacts from these extreme events, such as from heat waves, in the healthy general population but may not be sufficient to protect those with underlying medical conditions.

Structures

Climate change, on its own, does not generally impact structures. However, structures in areas of increased wildfire, flood, or other areas exacerbated by the effects of climate change would be at increased risk, as described throughout this LHMP. More information on how structures may be affected by climate change can be found in Section 4.3.7 of the Base Plan.

Critical Facilities and Infrastructure

As with structures, critical facilities and infrastructure in areas of increased wildfire, flood, or other areas due to the effects of climate change would be at increased risk. Climate change is expected to increase the vulnerability of critical facilities and infrastructure to many natural hazards.

Natural, Historic, and Cultural Resources

The rivers, streams, agricultural areas, and open space areas of the City supports rich biodiversity, including many special-status species and habitat areas. These are all at risk from the effects of climate change. In addition, if heat continues to contribute to changes in wildfire patterns, all areas (on land) of the City are at increased risk from fire – including natural, historic, and cultural resources. Furthermore, as climate change exacerbates the drought hazard, areas of wetlands in the City may be reduced or dry up temporarily, which could damage habitat areas for waterfowl and other species that depend on these areas.

Impacts from Climate Change

The California APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra Region in which the City is part of:

- Increased temperatures
- Reduced precipitation
- Public health – heat and air pollution
- Reduced agricultural productivity (e.g., wine grapes)
- Reduced tourism

In addition to these sources, the 2023 State of California Hazard Mitigation Plan noted that according to California's Fourth Climate Change Assessment, the state will experience the following climate impacts:

- Annual average daily high temperatures are expected to rise by 2.7° F by 2040, 5.8°F by 2070, and 8.8°F by 2100 compared to observed and modeled historical conditions. These changes are statewide averages.
- Heat waves are projected to become longer, more intense, and more frequent.

- Warming temperatures are expected to increase soil moisture loss and lead to drier conditions. Summer dryness may become prolonged, with soil drying beginning earlier in the spring and lasting longer into the fall and winter.
- Droughts are likely to become more frequent and persistent through 2100.
- The strength of the most intense precipitation and storm events affecting California is expected to increase.
- Snowpack levels are projected to decline significantly by 2100 due to reduced snowfall and faster snowmelt.
- Marine layer clouds are projected to decrease.
- Extreme wildfires (i.e., fires larger than 24,710 acres) would occur 50 percent more frequently. The maximum area burned statewide may increase 178 percent by the end of the century.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City include the following:

- As climate change continues to accelerate over time, climate related impacts to the City will continue to increase.
- Climate change can influence population growth in the City over time. Since the County is expected to see slow and steady growth, the City could see the same slow increase. However, population fluctuations as a result of climate impacts relative to those experienced in other regions, and these fluctuations are expected to impact demand for housing and other development. While there are currently no formal studies of specific migration patterns expected to impact the City and larger Amador County region, climate-induced migration was recognized within the UNFCCC Conference of Parties Paris Agreement of 2015 and is expected to be the focus of future studies. So while changes in population and population patterns are not expected to increase the impacts associated with this hazard, climate change may instead influence future population growth in the City which may leave more people vulnerable in the effects of climate change.
- Land use planning should be proactive to address future hazard conditions. The increasing severity and frequency of storms and other weather events and natural hazards due to the changing climate should be taken into account while considering land use planning for the City. Future development in the City consists of two large subdivision projects which will add 962 new housing units to the City's current housing stock and increase overall populations in the City. Thus, future development in the City will likely increase the impacts and associated vulnerability of the City to this hazard. It should be noted, however, that new development is subject to current building codes, which should reduce or mitigate the hazard vulnerability associated with new construction.

Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements, such as building codes, are followed, and varying needs

for different demographic groups with intersecting identities that reside within the County are considered can help to make for a more disaster resilient community.

Ione, like other communities, will need to adapt in order to comply with future state and federal mandates. This will include reducing the City's carbon footprint reducing dependence on fossil fuels. The City has currently installed a solar farm on property it owns by the Tertiary Plan/ Corp. Yard and the power that will be generated there will be used to power the Tertiary Plant, the City's Corp. Yard, and the City's wastewater treatment plant. The City anticipates significant cost saving over time. The City is also looking to adding solar panels to the roofs of City building in an effort to reduce the City's carbon footprint and to reduce the City's electric costs.

Dam Failure

Likelihood of Future Occurrence–Unlikely
Vulnerability–Low

Note: though a low significance hazard in the City, due to its importance in the County and in the State of California, this hazard is profiled here. It is not considered a priority for mitigation planning purposes.

Hazard Profile

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any given year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped or fail. Overtopping is the primary cause of earthen dam failure in the United States.

Dam failure is a natural disaster from two perspectives. First, the inundation from released waters resulting from dam failure is related to naturally occurring floodwaters. Second, a total dam failure would most probably happen as a consequence of the natural disaster triggering the event, such as an earthquake.

Location and Extent

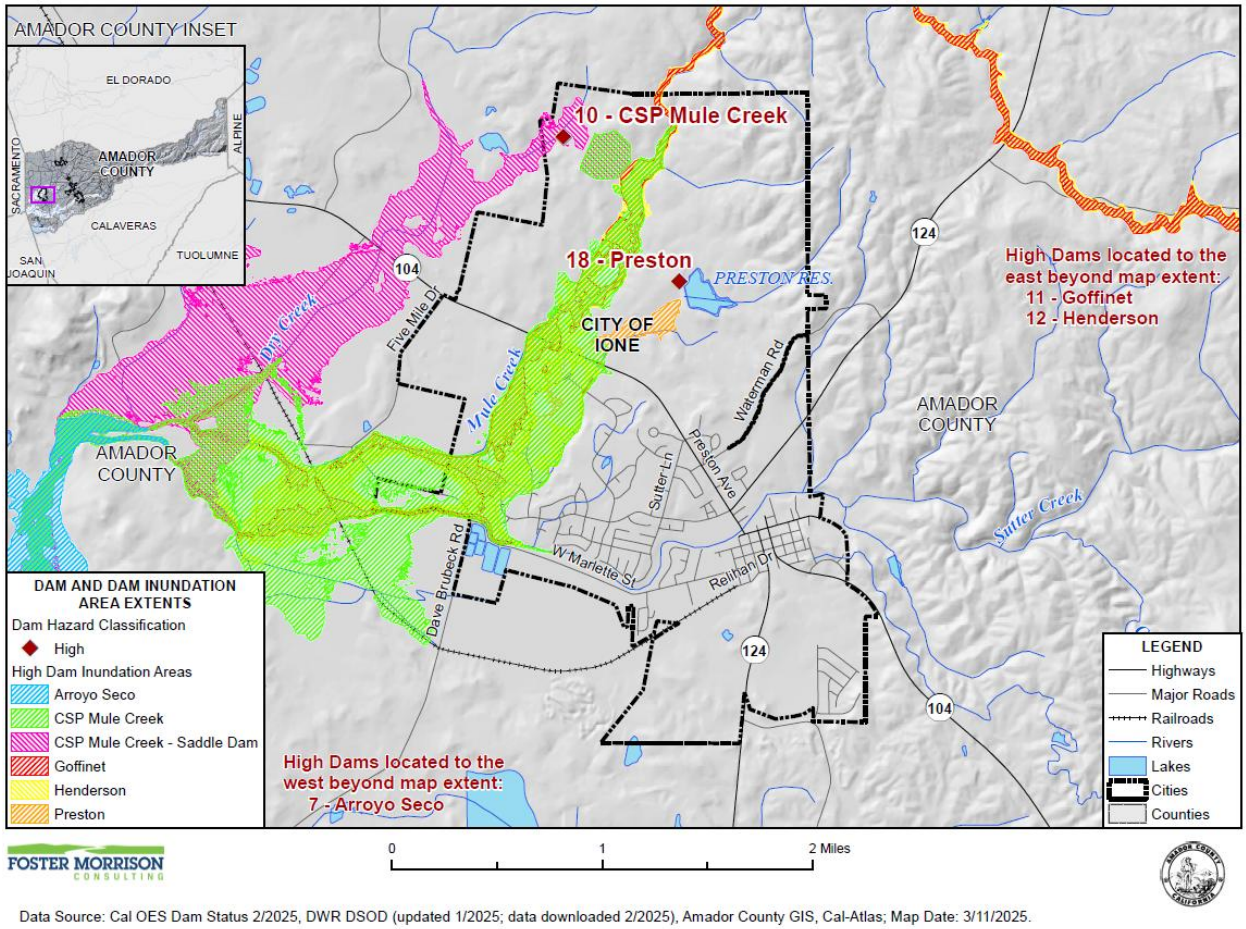
An inventory map of dams located within Amador County was shown in Section 4.3.9 in the Base Plan. No extremely high hazard dams intersect the City. High hazard dams with an inundation area within the City of Ione are shown on Figure B-13.

There is no scale with which to measure dam failure. However, FEMA and CA DWR Division of Safety of Dams (DSOD) assign hazard potential classifications to dams within the State that provides information on the potential impact should a dam fail. The following two factors are considered when assigning hazard ratings: existing land use and land use controls (zoning) downstream of the dam. FEMA categorizes the downstream hazard potential into three categories in increasing severity: Low, Significant, and High. DSOD adds a fourth category of Extremely High. Dams are classified in these four categories that identify the potential hazard to life and property. These were discussed in more detail in Section 4.3.9 of the Base Plan.

While a dam may fill slowly with runoff from winter storms, a dam break has a very quick speed of onset. The duration of dam failure is generally not long – only as long as it takes to empty the reservoir of water the dam held back. For dam overtopping, the speed of onset is somewhat slower than that of a dam break, and the duration is longer (as evidenced in the 2017 Oroville Dam spillway event). The City would be affected for as long as the flood waters from the dam failure took to drain downstream.

Geographic flood extent from the DSOD dam inundation areas is shown on Figure B-13, as well as in Table B-15.

Figure B-13 City of Ione – High Hazard Dam Inundation Areas



Data Source: Cal OES Dam Status 2/2025, DWR DSOD (updated 1/2025; data downloaded 2/2025), Amador County GIS, Cal-Atlas; Map Date: 3/11/2025.

Note: CSP Mule Creek has two scenarios originating from the same dam. Arroyo Seco mapped for locational purposes; does not affect Ione.

Table B-15 City of Ione – Dam Inundation Areas Geographical Extents

Dam Inundation Area	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
CSP Mule Creek	373	13%	65	9%	308	14%

Dam Inundation Area	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
CSP Mule Creek - Saddle Dam	44	1%	-	-	44	2%
Goffinet	123	4%	18	3%	104	5%
Henderson	239	8%	45	6%	195	9%
Preston	179	6%	35	5%	144	6%
Total	**958**	**32%**	**163**	**23%**	**795**	**36%**

Source: Cal OES, DSOD, Amador County GIS

While the City does have inundation areas associated with several high hazard dams, the City does not consider dam failure a priority hazard for mitigation planning purposes. Significance and priority of a hazard was determined based on frequency, extent, and resulting damage, including deaths/injuries and property, natural and cultural resources, and economic damage. The ability of a jurisdiction to reduce losses through implementation of existing and new mitigation measures was also considered as to the significance and priority of a hazard. This assessment was used by the City to prioritize those hazards of greatest significance, enabling the City to focus resources where they are most needed. As such, no additional analysis is presented for this hazard, due to its low significance in the City. Further, as a non-priority hazard, it will not be carried forward into the mitigation strategy for the City.

Drought & Water Shortage

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

Drought and water shortage are complex issues involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area's usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water supply is the most significant issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. Drought has also affected tree mortality in the area in the past. As the population in the area continues to grow, so will the demand for water.

Tree Mortality and Drought

One of the specific impacts of drought in the City of Ione and the Amador County Planning Area is the increased risk to trees from beetle kill and other insects, pathogens and parasites, and other tree mortality and die back issues. Drought weakens trees and makes them more susceptible to insect infestation and other pathogens. Insects, such as bark beetles and others, frequently attack trees weakened by drought,

disease, injuries, or other factors that may stress the tree. These insects and other pathogens can contribute to the decline and eventual death of trees throughout the City. The tree mortality and dieback problems are a high priority because of the issue of hazardous trees and an increased wildfire hazard. In addition to an increase in wildfire fuels, hazardous trees can fall onto structures causing damage and a result in a reduction on the tree canopy within the City that provides relief during extreme heat days.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the City and County is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme Drought
- D4 – Exceptional Drought

The Amador County Planning Area, including the City of Ione, has been in and out of drought since 2014. Over the last five years since the 2020 LHMP, drought conditions have ranged from none to exceptional. Drought conditions are expected to continue to be cyclical in nature depending on the year." Current drought conditions in the City are shown in Section 4.3.10 of the Base Plan.

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time (which does not usually affect water shortages) or for longer periods (which may challenge water supplies). Should a drought last for a long period of time, water shortage becomes a larger issue.

According to the Amador Water Agency (AWA) 2024-2025 Annual Water Supply & Demand Assessment Shortage Report, the Agency has a significant surplus of water supply above current and projected demands. The Amador Water System (AWS) water supply is a pre-1914 water right that has never been curtailed in the most severe single-year or a multiple-year drought. In addition, while the water supply associated with the Central Amador Water Project (CAWP) was temporarily curtailed during recent drought years, the significant storage volume in the Lower Bear Reservoir has allowed previous water supply demands to be met, and are expected to be met in the future, even in dry years. In addition, the total well capacity for the portion of both systems reliant on groundwater are larger than current and projected demands.

Past Occurrences

Disaster Declaration History

There have been 2 state and 1 federal disaster declarations for Amador County. This can be seen in Table B-16. Additionally, there have been 16 USDA Secretarial Disaster Declarations from drought in the County.

Table B-16 Amador County –State and Federal Drought Disaster Declarations 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	2	1976, 2015	1	1977

Source: Cal OES, FEMA

NCDC Events

There have been 249 NCDC drought events in Amador County since 1993. These most likely had some impact on the City.

City of Ione Events

Based on historical information, the occurrence of drought in California, including the City of Ione, is cyclical, driven by weather patterns. Section 4.3.10 of the Base Plan notes that five droughts have occurred in the past 86 years. Drought has occurred in the past and will occur in the future.

The City noted that recent droughts were California's second-driest three-year period on record, with 2021 being particularly severe due to low snowpack (35% of average in April 2022) and high evaporative demand. Governor Newsom declared a statewide drought emergency, and the SWP allocated only 5% of supplies in 2021, impacting water agencies like the AWA (who provide water for the City). The Amador Water Agency declared a Stage 2 Water Shortage on December 6, 2021, enacting mandatory conservation measures for Ione and other communities. These included restrictions on outdoor irrigation (e.g., no watering within 48 hours of measurable rain, fixing leaks within 72 hours) and bans on non-essential uses like washing vehicles without shut-off nozzles. Ione's reliance on the Mokelumne River, which saw reduced runoff (69% of reservoir capacity in 2021), likely strained local water supplies. Agricultural users faced reduced allocations, and rural residents with private wells may have experienced outages, as over 2,000 wells went dry statewide during this period.

Climate Change and Drought and Water Shortage

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with drought and water shortage. More information on future impacts to the City can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate scientists studying California find that drought conditions are likely to become more frequent and persistent over the 21st century due to climate change. The experiences of California during recent years underscore the need to examine more closely the state's water storage, distribution, management, conservation, and use policies. The 2021 Climate Adaptation Study (CAS) (as well as the 2024 Draft CAS) stresses the need for public policy development addressing long term climate change impacts on water supplies. The CAS notes that climate change is likely to significantly diminish California's future water supply, stating that: California must change its water management and uses because climate change will likely create greater competition for limited water supplies needed by the environment, agriculture, and cities.

A 2018 report from the Public Policy Institute of California noted that thousands of Californians – mostly in rural, small, disadvantaged communities – already face acute water scarcity, contaminated groundwater, or complete water loss. Climate change would make these effects worse.

Cal Adapt scenarios for modeled future drought scenarios were shown in Section 4.3.10 of the Base Plan.

Vulnerability to Drought and Water Shortage

Based on historical information, the occurrence of drought and water shortage in California, including the City, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. The vulnerability of the City of Ione to drought may vary and include reduction in water supply, turf losses, impacts to natural resources, and an increase in dry fuels and tree dieback.

The whole of the City is at some measure of vulnerability to drought and water shortage. An assessment of a community's vulnerability to drought and water shortage begins with an understanding of local exposure to drought. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

- Dependence on Limited Water Sources:
  - ✓ **Issue**: Ione relies on a combination of surface water from the Amador Water Agency (e.g., Mokelumne River) and local groundwater basins. The Mokelumne River, a primary water source, is vulnerable to reduced flows during droughts, as seen during the 2012–2016 California drought, which was the driest four-year period in 1,200 years. Groundwater basins in Amador County are also subject to depletion during prolonged dry periods.
  - ✓ **Concern**: Climate change is expected to intensify drought frequency and severity, with projections indicating a 10% reduction in California's water supply by 2040. Reduced snowpack in the Sierra Nevada, a critical regional water source, further threatens Ione's water availability.
  - ✓ **At-Risk Facilities**: The Ione Wastewater Treatment Plant (at West Marlette Street and Dave Brubeck Road) and water distribution infrastructure are vulnerable to reduced water availability, which could disrupt treatment capacity and increase operational costs. The plant's 2013 wastewater compliance project, addressing a Cease and Desist Order, highlights existing strain on water infrastructure.
  - ✓ **Vulnerable Populations**: Low-income households, Cal Fire Academy and Mule Creek State Prison.

- Increased Wildfire Risk Due to Drought:

- ✓ **Issue**: Ione's oak-covered foothills and proximity to wildland-urban interfaces increase wildfire risk during droughts, as dry vegetation becomes fuel.
- ✓ **Concern**: Drought exacerbates wildfire risks, threatening critical infrastructure and public safety. Smoke from wildfires degrades air quality, impacting health, and post-fire debris flows can contaminate water sources, as seen in other California regions.
- ✓ **At-Risk Facilities**: Ione Water treatment plant, Wastewater, tertiary facility, Ione Police Department, Public Works, Ione Fire Department, city hall, and power infrastructure (e.g., PG&E lines), Mule Creek State Prison, Cal Fire Academy are at risk from wildfires. Preston Castle, a historic landmark, is also vulnerable to fire damage.
- ✓ **Vulnerable Populations**: Elderly residents, children, and those with chronic conditions (e.g., respiratory issues) are particularly susceptible to poor air quality from wildfire smoke. Rural residents and farmworkers near Ione's agricultural areas face increased exposure to fire risks.

- ➢ Public Health and Heat-Related Risks:
  - ✓ **Issue**: Ione's warm-summer Mediterranean climate, features hot, arid summers and mild winters, with drought amplifying heat waves. Climate projections estimate increased heat wave frequency, with temperatures occasionally exceeding 102°F.
  - ✓ **Concern**: Drought-related heat increases health risks like heatstroke and exacerbates respiratory conditions. Water shortages also limit access to drinking water and hygiene, critical during heat events.
  - ✓ **At-Risk Facilities**: Community facilities like schools, and recreational areas (e.g., Charles Howard Park) lack adequate cooling or water distribution systems to support residents during extreme heat.
  - ✓ **Vulnerable Populations**: Elderly residents, children, people with disabilities, and those with chronic illnesses are at higher risk of heat-related illnesses. Low-income households may struggle to afford cooling or water during shortages.

- ➢ Wastewater and Water Recycling Challenges:
  - ✓ **Issue**: The Ione Wastewater Treatment Plant's 2013 compliance project aimed to improve treatment and provide recycled water for local agriculture, addressing a Cease and Desist Order from the Central Valley Regional Water Quality Control Board. Drought reduces wastewater flows, limiting recycling capacity and increasing treatment costs.
  - ✓ **Concern**: Reduced water availability strains the plant's ability to meet regulatory requirements and support agricultural irrigation, potentially increasing costs for ratepayers and farmers.
  - ✓ **At-Risk Facilities**: The wastewater treatment plant and associated pipelines are critical but vulnerable to low water flows and regulatory non-compliance.
  - ✓ **Vulnerable Populations**: Low-income ratepayers face financial burdens from potential rate hikes.

Assets at Risk

Assets at risk from drought and water shortage include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

The people and populations of the City are not directly affected by drought; although, their turfed areas, trees, and other water dependent resources can all be affected. In extreme drought conditions, however,

residents and other populations within the City may be vulnerability to drought and water shortage issues. Water quality can be impacted causing health problems, especially to vulnerable populations. Drought and water shortage can lead to an increase in wildfires threatening City residents. Water shortages can have an effect on all of the population in the City but often have a greater effect on the unhoused and other vulnerable populations that may be unable to access clean drinking water during shortages. During periods of drought as the costs of water usage may increase, especially during mandated conservation times, those who are economically disadvantaged may be unable to afford the increased costs of potable water.

Structures

Structures have a limited vulnerability to drought and water shortage. It is the secondary hazard of drought (wildfire) which causes risks to structures. Drought can also stress trees, causing die off. These trees may fall on structures adjacent to them.

Critical Facilities and Infrastructure

Most critical facilities and infrastructure have a limited vulnerability to drought and water shortage. Should drought conditions be severe enough to cause water shortage reliability issues, some facilities and infrastructure may be affected. Water and wastewater systems may be impacted during times of reduced water supply and need to employ contingencies to remain functional and fully operational. Other water dependent systems may also be adversely affected. Further, the secondary hazard of drought (increased potential for spread of urban fires and wildfire) can pose a significant risk to critical facilities and infrastructure. Sufficient water supply for firefighting can also be an issue. Drought can also stress trees, causing die off. These trees may fall on critical infrastructure adjacent to them and impact power lines and other utilities.

Natural, Historic, and Cultural Resources

Drought and water shortage can have a significant impact on natural resources. Water levels in reservoirs and lakes may be reduced and a loss of wetlands and coastal marsh areas may occur. Severe drought conditions can contribute to an increase in erosion of soils and lead to poor soil quality. Further, all of the trees in the City are at risk to drought impacts and a reduction in water supply. These trees provide a wealth of social and environmental benefits to City residents and visitors, from shade and beauty to air quality, carbon reduction and stormwater management. Drought can devastate crops and dry out pastures, dry out forests and critical habitat areas, and reduce food and water available for wildlife and livestock. Additionally, drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. It is unlikely that drought and water shortage would have a significant impact on historic and cultural resources in the City.

Impacts from Drought and Water Shortage

The vulnerability of the City to drought is City-wide, but impacts may vary and include reduction in water supply and an increase in dry fuels. The potential for a reduction in water supply during drought conditions generally leads to both mandated and voluntary conservations measures during extended droughts. During these times, the costs of water can also increase. Also of concern, the increased dry fuels, fuel loads, and tree mortality events associated with drought conditions can result in an increased fire danger. In areas of

extremely dry fuels, the intensity and speed of fires can be significant. Water supply and flows for fire suppression can also be an issue during extended droughts. Drought can also lead to turf losses and cause tree die off within the City.

Other qualitative impacts associated with drought in the City are those related to water intensive activities such as municipal usage, commerce, tourism, and recreation use. With more precipitation likely falling as rain instead of snow in the Sierra's, and warmer temperatures causing decreased snowfall to melt faster and earlier, water supply is likely to become more unreliable. In addition, drought and water shortage is predicted to become more common. This means less water available for use over the long run, and additional challenges for water supply reliability, especially during periods of extended drought.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the hazard profile discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City of Ione include the following:

- Climate change is likely to exacerbate future drought conditions and associated impacts and vulnerability of the City to drought and water shortage.
- Future population growth should be considered as having more or less people in a community affects the overall hazard vulnerability to the City. Population growth in the City is continuing. Future population growth in the City will add additional pressure to water companies during periods of drought and water shortage. Water companies will need to continue to plan for and add infrastructure capacity for population growth. As the population grows, the nature and makeup of populations will shift and change along with it. Vulnerable and underserved populations, such as those with low incomes and the unhoused that might not always have access to clean water, will need to be considered as future development continues, since they may experience a disproportionate impact from drought and water shortage. Should the City see a growth in population, it will increase the vulnerability and impacts to the County from this hazard.
- Land use planning should be proactive to address future hazard conditions. As the City continues to grow, more cropland may be taken out of production to provide housing to accommodate for population growth. As the areas adjacent to the City's agricultural lands are reduced, it seems likely that there would be less of a competing demand for water. However, more development will also require an increase in water supply and associated infrastructure. Future development in the City consists of two large subdivision projects which will add 962 new housing units to the City's current housing stock and increase overall populations in the City. Thus, future development in the City will likely increase the impacts and associated vulnerability of the City to this hazard. It should be noted, however, that new development is subject to current building codes, which should reduce or mitigate the hazard vulnerability associated with new construction.

As the population in the area continues to grow, so will the demand for water. The AWA provides water to the City through reliable surface water sources. However, population growth in the City will continue to increase the demand for water. Ongoing planning will be needed by the City and AWA to account for population growth and increased water demands.

In an effort to conserve water, the City will, at some point, need to examine implementing a requirement that all new subdivisions be constructed to allow for tertiary treated recycled effluent to be used to irrigate yards, much in the same way Castle Oaks Golf Course uses tertiary treated effluent to irrigate the golf course. Using tertiary treated water for irrigating yards is being used in larger cities in the southwestern part of the United States.

Ione is pursuing a grant opportunity to extend pipe from the tertiary plant to Howard park to use tertiary water

The City will need to work to encourage the State of California to construct more reservoirs to capture rain and snow runoff for later use. Ongoing planning activities will also need to focus on additional enclosed potable water storage tanks for consumer use and fire protection.

The City of Ione has adopted Water Efficient Landscaping Ordinances and encourages property owners to incorporate low maintenance landscaping practices. Some examples of low maintenance landscaping include removing sod and replacing it with a decorative rock lawn or installing artificial grass. Another landscaping alternative is to plants that thrive in an arid climate.

Earthquake

Likelihood of Future Occurrence–Unlikely
Vulnerability–Low

Note: though a low significance hazard in the City, due to its importance in the County and in the State of California, this hazard is profiled here. It is not considered a priority for mitigation planning purposes.

Hazard Profile

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction.

Location and Extent

Since earthquakes are regional events, the whole of the City is at risk to earthquake. The City of Ione, Amador County, and surrounding areas have some level of risk from seismic and geologic hazards. Faults in and around the City were shown in Section 4.3.11 of the Base Plan. These include the Carson Range, Great Valley, and Rogers-Hayward Creek faults. A significant seismic event on any of these major faults could cause damage in the City of Ione.

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales, as discussed in Section 4.3.11 of the Base Plan.

Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. The City is located in an area where earthquakes of some magnitude occur, so both magnitude and intensity of earthquakes are expected to remain moderate. Seismic shaking maps for the area in Section 4.3.11 of the Base Plan show Amador County and the City fall within a low to moderate shake risk.

The City does not consider earthquake a priority hazard for mitigation planning purposes. Significance and priority of a hazard was determined based on frequency, extent, and resulting damage, including deaths/injuries and property, natural and cultural resources, and economic damage. The ability of a jurisdiction to reduce losses through implementation of existing and new mitigation measures was also considered as to the significance and priority of a hazard. This assessment was used by the City to prioritize those hazards of greatest significance, enabling the City to focus resources where they are most needed. As such, no additional analysis is presented for this hazard, due to its low significance in the City. Further, as a non-priority hazard, it will not be carried forward into the mitigation strategy for the City.

Flood: 1%/0.2% Annual Chance

Likelihood of Future Occurrence–Occasional (1%)/Unlikely (0.2%)
Vulnerability–High

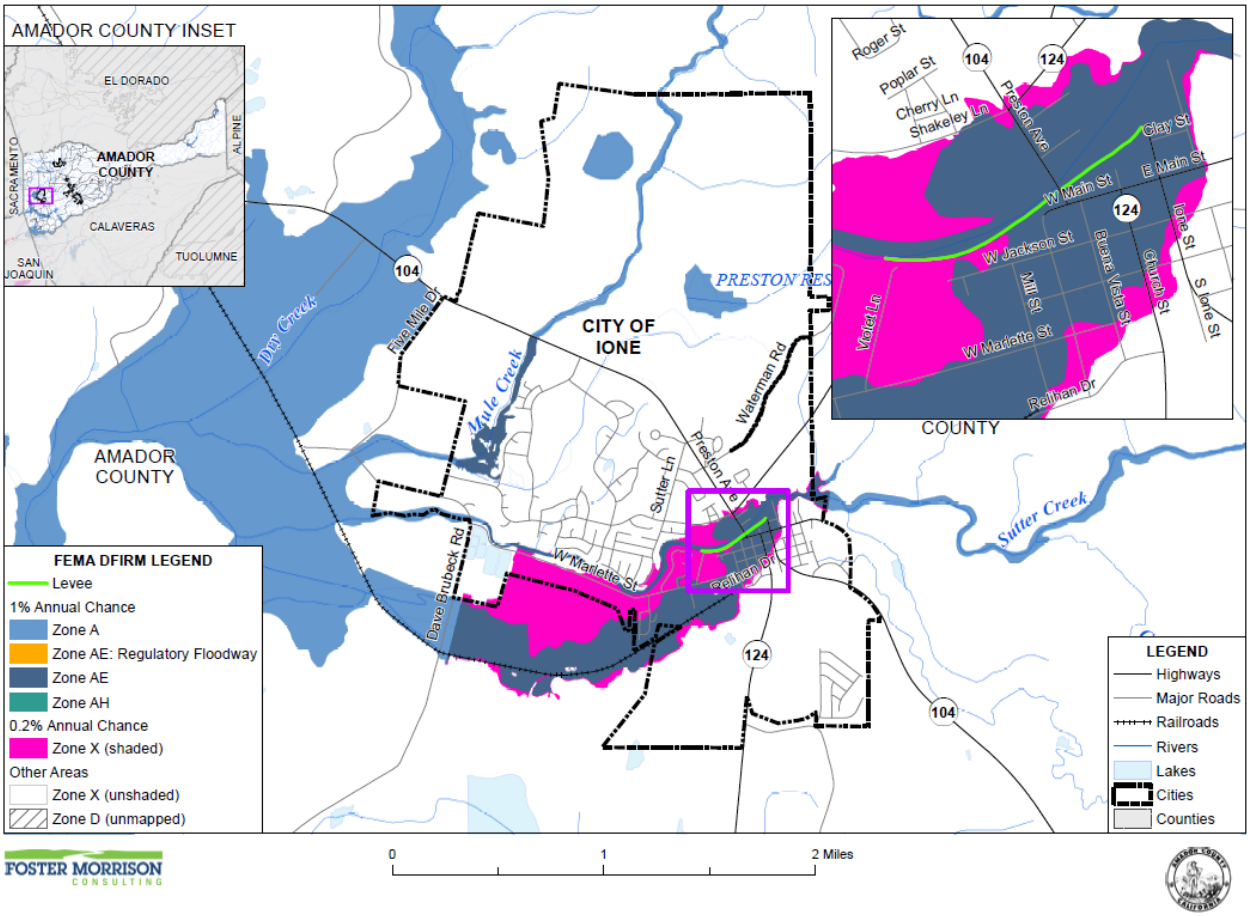
Hazard Profile

This hazard analyzes the FEMA DFIRM 1% and 0.2% annual chance floods. These tend to be the larger floods that can occur in the City and have caused damage in the past. Flooding can be a significant problem in the City. Historically, the City has been at risk to flooding primarily during the winter and spring months when river systems in the City swell with heavy rainfall and snowmelt runoff. The City has also been at risk during atmospheric river flood events. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures located throughout the Amador County Planning Area and the City of Ione. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage. Flooding has occurred both within the 1% and 0.2% annual chance floodplains and in other localized areas in the City.

Location and Extent

The City of Ione has areas located in the 1% and 0.2% annual chance flood zones. This is seen in Figure B-14.

Figure B-14 City of Ione – FEMA DFIRM Flood Zones



Data Source: FEMA Effective DFIRM 01/20/2016 (NFHL 01/21/2025 database), Amador County GIS, Cal-Atlas; Map Date: 4/7/2025.

Table B-17 details the DFIRM mapped flood zones located within the City.

Table B-17 City of Ione– DFIRM Flood Hazard Zones

Flood Zone	Description	Present in City of Ione
A	1% annual chance flooding: No base flood elevations provided	X
AE	1% annual chance flooding: Base flood elevations provided	X
AE Regulatory Floodway	1% annual chance flood: Regulatory floodway; Base flood elevations provided	
AH	1% annual chance flood areas of shallow flooding between one to three feet deep. Regulatory floodway; Base flood elevations provided	

Flood Zone	Description	Present in City of Ione
Shaded X	0.2% annual chance flooding: The areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood	X
X (unshaded)	No flood hazard	X

Source: FEMA DFIRM 1/20/2016

Additionally, flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the City vary, depending on the nature and extent of a flood event; specific depths are unknown. Flood durations in the City tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Flooding in the City tends to have a shorter speed of onset, due to the amount of water that flows through the City.

Geographical flood extents for the City from the FEMA DFIRMs are shown in Table B-18.

Table B-18 City of Ione – Geographical DFIRM Flood Zone Extents

Flood Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
1% Annual Chance Flood	251	8%	68	10%	183	8%
0.2% Annual Chance Flood	108	4%	76	11%	32	1%
Other Areas	2,613	88%	546	79%	2,068	91%
Ione Total	**2,973**	**100%**	**690**	**100%**	**2,283**	**100%**

Source: FEMA DFIRM 1/20/2016

Flood protection levees were built by the USACE along Sutter Creek in the City of Ione; however, the levees are not certified as providing protection from the 100-year flood. Flood and erosion-control retaining walls are located along Sutter Creek near the intersection of Preston and Main Streets; however, these structures also are not certified as providing protection from the 100-year flood. A more detailed description of the location of floodwalls, levees, and other flood control structures within the City of Ione is provided below:

- Levees and Floodwalls
  - ✓ A concrete floodwall on the south bank of Sutter Creek, starting at Preston Avenue Bridge and extending upstream approximately 300 feet.
  - ✓ A levee on the south bank, starting at the end of the floodwall and extending upstream approximately 400 feet.
  - ✓ A levee on the south side of Sutter Creek, from downstream of Preston Avenue and extending downstream approximately 500 feet.
  - ✓ A levee on the north bank of Sutter Creek, from downstream of Preston Avenue and extending downstream approximately 900 feet.
- Other Flood Control Structures
  - ✓ Howard Park Retention Basin

- ✓ West Marlette Storm Drain System
- ✓ Ione Oaks Drainage Ditch

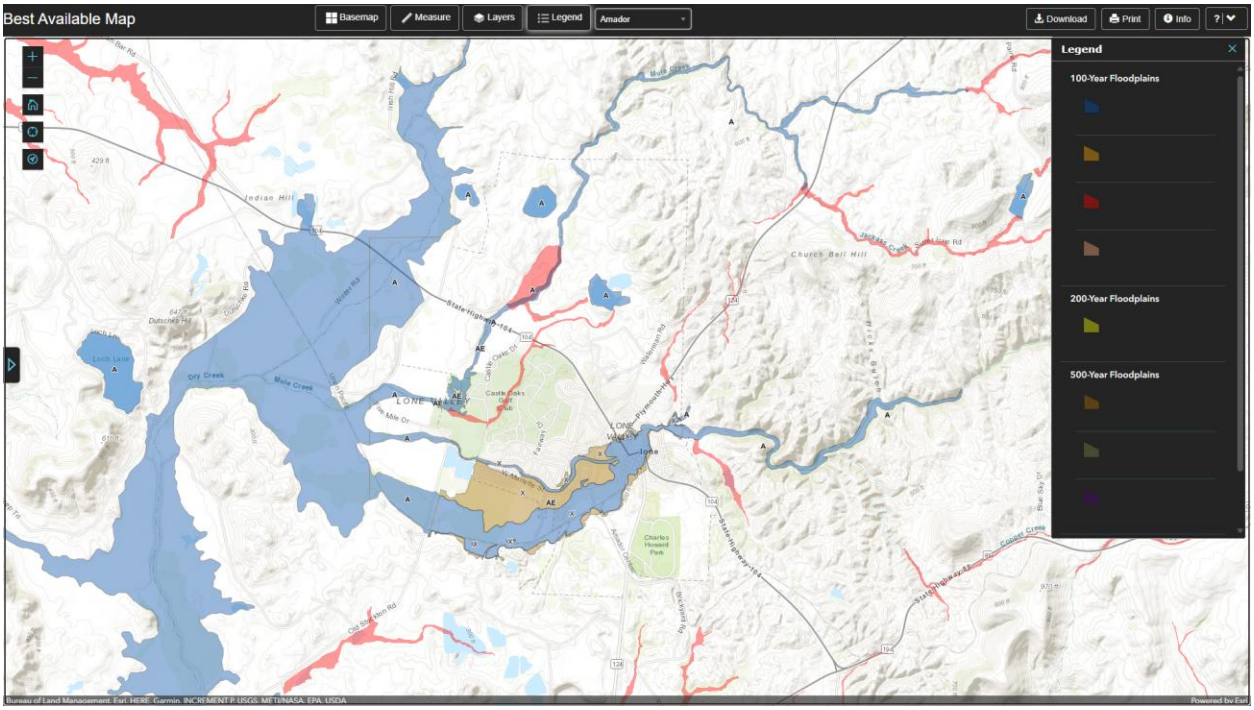
The Sutter Creek channel has been cleared and shaped at some locations, and stone slope protection has been placed at areas that were subject to erosion during the January 1995 flood event. Back-flow prevention valves have been added to the major storm drain outfall structure located downstream of Highway 104 near the channel bend.

California Department of Water Resources Best Available Maps (BAM)

The FEMA regulatory maps provide just one perspective on flood risks in the City. Senate Bill 5 (SB 5), enacted in 2007, authorized the California DWR to develop the Best Available Maps (BAM) displaying 100- and 200-year floodplains for areas located within the Nevada-San Joaquin (SAC-SJ) Valley watershed. This effort was completed by DWR in 2008. DWR has expanded the BAM to cover all counties in the State and to include 500-year floodplains.

Different than the FEMA DFIRMs which have been prepared to support the NFIP and reflect only the 100-year event risk, the BAMs are provided for informational purposes and are intended to reflect current 100-, 200-(as applicable), and 500-year event risks using the best available data. The 100-year floodplain limits on the BAM are a composite of multiple 100-year floodplain mapping sources. It is intended to show all currently identified areas at risk for a 100-year flood event, including FEMA's 100-year floodplains. The BAM are comprised of different engineering studies performed by FEMA, Corps, and DWR for assessment of potential 100-, 200-, and 500-year floodplain areas. These studies are used for different planning and/or regulatory applications, and for each flood frequency may use varied analytical and quality control criteria depending on the study type requirements. The value in the BAMs is that they provide a bigger picture view of potential flood risk to the City than that provided in the FEMA DFIRMs. The BAM map for the City of Ione is shown in Figure B-15.

Figure B-15 City of Ione – Best Available Map



Source: California DWR

Legend explanation: **Blue** - FEMA 100-Year, **Orange** – Local 100-Year (developed from local agencies), **Red** – DWR 100-year (Awareness floodplains identify the 100-year flood hazard areas using approximate assessment procedures.), **Pink** – USACE 100-Year (2002 Sac and San Joaquin River Basins Comp Study), **Yellow** – USACE 200-Year (2002 Sac and San Joaquin River Basins Comp Study), **Tan** – FEMA 500-Year, Grey – Local 500-Year (developed from local agencies), **Purple** – USACE 500-Year (2002 Sac and San Joaquin River Basins Comp Study).

Past Occurrences

Disaster Declaration History

A list of state and federal disaster declarations for Amador County from flooding is shown on Table B-19. These events also likely affected the City to some degree.

Table B-19 Amador County – State and Federal Disaster Declarations from Flood 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	22	1950, 1955, 1958 (twice), 1959, 1963, 1964, 1969, 1980, 1982, 1986, 1995 (twice), 1997, 2006 (twice), 2017 (twice), 2019, 2021, 2023 (twice)	20	1950, 1955, 1958, 1962, 1963, 1964, 1969, 1986, 1995 (twice), 1997, 1998, 2006 (twice), 2017 (twice), 2019, 2023 (three)

Source: Cal OES, FEMA

NCDC Events

The NCDC tracks flooding events for the County. Events have been tracked for flooding since 1993. Amador County has seen 43 events. These events most likely had some impact on the City.

City of Ione Events

The City noted that the following events affected or damaged the City:

Flooding has been a documented hazard in Amador County and the City since the **1860s**. The area bounded by Main Street, Highway 104, Washington Street, Highway 124, and El Dorado Street has historically experienced on-site flooding. The winter of 1984 to 1985 brought high water to Sutter Creek (see Figure B-16). Flows were generally contained within the river channel. During these times, the river was being dredged, allowing for higher flows.

Figure B-16 City of Ione – High Water in 1984/1985

Source: City of Ione

In **1997**, Sutter Creek overflowed its banks, causing evacuations in flooded areas. This was the result of not dredging the Creek Bed. The pictures in Figure B-17 were taken prior to the crest, and do not show the highest point of flooding. Sutter Creek has many vertical banks within the City limits that are eroding and at risk of ultimately collapsing. The City recently rebuilt one area of the bank in order to save a backyard from destruction.

Figure B-17 City of Ione – 1997 Flooding

Source: City of Ione

In **2016**, California received heavy rains and Sutter Creek was overflowing in the lower elevations of the City of Ione. The stream's current washed out property owner's stream banks along Sutter Creek, and an Amador Water Agency's pump station was damaged and made un-operable. Marlette Road, across from the City's wastewater treatment plant, was in danger of being undercut due to erosion of the stream bank. Areas of downtown Ione experienced localized flooding due to the storm drainage system not being able to handle all of the flow. Images of damage can be seen on Figure B-18.

Figure B-18 2016 Flooding (upper left and both lower) and Aftermath (upper right) in Ione

Source: City of Ione

Climate Change and Flood

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with flood. More information on future impacts to the City can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

According to the 2021 CAS (as well as the 2024 Draft CAS), climate change may affect flooding in California, the Amador County Planning Area, and the City of Ione. While average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is possible that average soil moisture and runoff could decline, however, due to increasing temperature, evapotranspiration rates, and spacing between rainfall events. Reduced snowpack and increased number of intense rainfall events are likely to put additional pressure on water infrastructure which could increase the chance of flooding associated with breaches or failures of flood control structures such as levees and dams. Cal Adapt future precipitation projections were shown in Section 4.3.4.

Vulnerability to Flood: 1% and 0.2% Annual Chance

Floods have been a part of the City's historical past and will continue to be so in the future. During winter months, long periods of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread structural and property damage. Predominantly, the effects of 1% and 0.2% annual chance flooding are generally confined to areas near the waterways of the City. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat.

The whole of the City is at some measure of vulnerability to floods. An assessment of a community's vulnerability to flood begins with an understanding of local exposure to flood. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

A member of the public and the HMPC noted that there are vulnerabilities to flooding in the City due to the patchwork of public agencies and private individuals who own land next to Sutter Creek. There are areas of the Creek that are overgrown with brush, trees, and other items that have fallen into the Creek that slow flows of water and compounds the flood problem during heavy storms. In periods of normal rainfall, no problems exist. During periods of high rainfall, water is not able to escape as quickly and can overflow the river channel, which can affect downtown Ione.

The City of Ione faces ongoing challenges in maintaining Sutter Creek due to recurring vegetation and debris accumulation, which exacerbates flood risks in the downtown area and near vulnerable populations, such as Jose's Apartment Complex. Clearing the channel requires permits from the California Department of Fish and Wildlife to protect special-status species and coordination with multiple private landowners whose properties extend into the creek. To address this, the City needs a sustainable plan, such as a multi-

year stream maintenance program, that streamlines permitting, establishes landowner agreements, and secures funding through FEMA or state grants to ensure regular clearing, reduce flood hazards, and comply with environmental regulations.

The City is looking at and possibly pursuing the following mitigation to address flooding

- Enhance Flood Infrastructure:
  - ✓ Upgrade storm drains and culverts near Sutter Creek to handle increased runoff.
  - ✓ Secure FEMA Hazard Mitigation Grant Program (HMGP) funding to reinforce the Ione Wastewater Treatment Plant against flooding.

- Community Preparedness:
  - ✓ Develop a flood warning system with multilingual alerts for low-income and elderly residents by 2026.
  - ✓ Establish a community flood education program to teach preparedness

- Protect Vulnerable Populations:
  - ✓ Create a special needs registry for elderly and disabled residents to ensure access to evacuation support during flood events.

- Green Infrastructure:
  - ✓ Install green infrastructure, like rain gardens, at Charles Howard Park to absorb runoff by 2028.

Assets at Risk

Assets at risk from flood include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All people and populations located in the 1% and 0.2% annual chance floodplains are at some risk to flooding. Certain vulnerable populations located within areas prone to flooding may be at increased risk to this hazard, especially during a large event with minimal advance notice. These vulnerable populations include: the unsheltered, those with limited mobility, and those that lack the resources to leave the area.

City residents that live in the 1% and 0.2% annual chance floodplains are often the most vulnerable. Not only are the residents at risk, but their homes and contents are all at risk, compounding the impacts associated with significant hazard events. To further evaluate the impact to the City of Ione's residential population residing within these hazard areas, the DFIRM flood zones were overlayed on the parcel layer. Those residential parcels that intersect the flood zones were counted and multiplied by the 2023 Census Bureau average household factors for the City of Ione – 2.29. According to this analysis, there is a total population of 737 and 355 residents of the City at risk to flooding in the 1% and 0.2% annual chance floodplains, respectively. This is shown in Table B-20.

Table B-20 City of Ione – Improved Residential Parcels and Population by Summary FEMA DFIRM Flood Zone

Jurisdiction	1% Annual Chance		0.2% Annual Chance	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Ione	322	737	155	355

Source: FEMA DFIRM 1/20/2016, Amador County 2024 Parcel/Assessor Data, US Census Bureau American Community Survey 2023 Household Size Estimates.

The City noted that the Critical Facilities and Infrastructure section below includes the facilities used by At-Risk populations that are threatened by this hazard. While this is not specific to what special populations reside in the City, it does speak to facilities that area used to serve (portions) of this population.

Structures

Certain structures in the City are at risk of DFIRM flooding and primarily include those structures located within the 1% and 0.2% annual chance floodplains. GIS was used to determine the possible impacts of flooding on parcels and structures within the City of Ione. The methodology described in Section 4.3.11 of the Base Plan was followed in determining structures and values at risk to the 1% (100-year) and 0.2% (500-year) annual chance flood event. Table B-21 is a summary table for the City of Ione. Parcel counts, land and improved values (i.e., those with a structure improvement on the parcel), estimated content replacement values, and total values in the City are shown for the 1% and 0.2% annual chance flood zones, as well as for those properties that fall outside of the mapped FEMA DFIRM flood zones. Table B-22 breaks down Table B-21 and shows the same analysis further broken out by detailed FEMA flood zone and property use.

Table B-21 City of Ione – Count and Value of Parcels and Structures in Summary DFIRM Flood Zone

Flood Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
1% Annual Chance Flood Hazard	452	371	$40,923,840	$87,983,517	$51,122,765	$180,030,122
0.2% Annual Chance Flood Hazard	169	159	$15,370,985	$34,728,985	$20,000,009	$70,099,979
Other Areas	1,584	1,446	$167,447,004	$373,754,655	$186,962,206	$728,163,865
Ione Total	**2,205**	**1,976**	**$223,741,829**	**$496,467,157**	**$258,084,980**	**$978,293,966**

Source: FEMA DFIRM 1/20/2016, Amador County 2024 Parcel/Assessor Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Table B-22 City of Ione – Count and Values of Parcels and Structures by Detailed DFIRM Flood Zone and Property Use

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
1% Annual Chance Flood Hazard						
Agricultural	3	1	$1,015,548	$20,808	$20,808	$1,057,164
Commercial	51	46	$6,687,272	$14,308,328	$14,308,328	$35,303,928
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	28	2	$1,495,169	$67,123	$0	$1,562,292
Residential	365	322	$29,799,600	$73,587,258	$36,793,629	$140,180,487
Unknown	5	0	$1,926,251	$0	$0	$1,926,251
1% Annual Chance Flood Hazard Total	**452**	**371**	**$40,923,840**	**$87,983,517**	**$51,122,765**	**$180,030,122**
0.2% Annual Chance Flood Hazard						
Agricultural	0	0	$0	$0	$0	$0
Commercial	2	2	$2,549,824	$5,428,521	$5,428,521	$13,406,866
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	4	2	$33,622	$157,489	$0	$191,111
Residential	163	155	$12,787,539	$29,142,975	$14,571,488	$56,502,002
Unknown	0	0	$0	$0	$0	$0
0.2% Annual Chance Flood Hazard Total	**169**	**159**	**$15,370,985**	**$34,728,985**	**$20,000,009**	**$70,099,979**
Other Areas						
Agricultural	8	2	$4,065,375	$11,424	$11,424	$4,088,223
Commercial	12	12	$882,385	$2,886,046	$2,886,046	$6,654,477
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	29	2	$505,357	$2,727,713	$0	$3,233,070
Residential	1,529	1,430	$156,911,613	$368,129,472	$184,064,736	$709,105,821
Unknown	6	0	$5,082,274	$0	$0	$5,082,274
Other Areas Total	**1,584**	**1,446**	**$167,447,004**	**$373,754,655**	**$186,962,206**	**$728,163,865**
Ione Total	**2,205**	**1,976**	**$223,741,829**	**$496,467,157**	**$258,084,980**	**$978,293,966**

Source: FEMA DFIRM 1/20/2016, Amador County 2024 Parcel/Assessor Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Table B-23 summarizes Table B-22 and shows City of Ione loss estimates and improved values at risk by FEMA 1% and 0.2% annual chance flood zones. According to Table B-22 and Table B-23, the City of Ione has 371 parcels and $139.1 million of structure and contents values or values in the 1% annual chance flood zone, and 159 improved parcels and $54.7 million of structure and contents values in the 0.2% annual chance flood zone. These values can be refined a step further. Applying the 20 percent damage factor as previously described in Section 4.3.11 of the Base Plan, there is a 1% chance in any given year of a flood event causing $45 million in damage and a 0.2% chance in any given year of a flood event causing $1.4 million in damage in the City of Ione. The loss ratio of 0.402% indicates that flood losses for 1% annual chance flooding would be relatively moderate, but the City would be able recover. The loss ratio of 0.158% indicates that flood losses for 0.2% annual chance flooding would be relatively minor and the City would have little difficulty in recovering.

Table B-23 City of Ione – Flood Loss Estimates

Flood Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value	Loss Estimate	Loss Ratio
1% Annual Chance Flood Hazard	452	371	$40,923,840	$87,983,517	$51,122,765	$139,106,282	$27,821,256	0.402%
0.2% Annual Chance Flood Hazard	169	159	$15,370,985	$34,728,985	$20,000,009	$54,728,994	$10,945,799	0.158%
Total	**621**	**530**	**$56,294,825**	**$122,712,502**	**$71,122,774**	**$193,835,276**	**$38,767,055**	**0.006%**

Source: FEMA DFIRM 1/20/2016, Amador County 2024 Parcel/Assessor Data

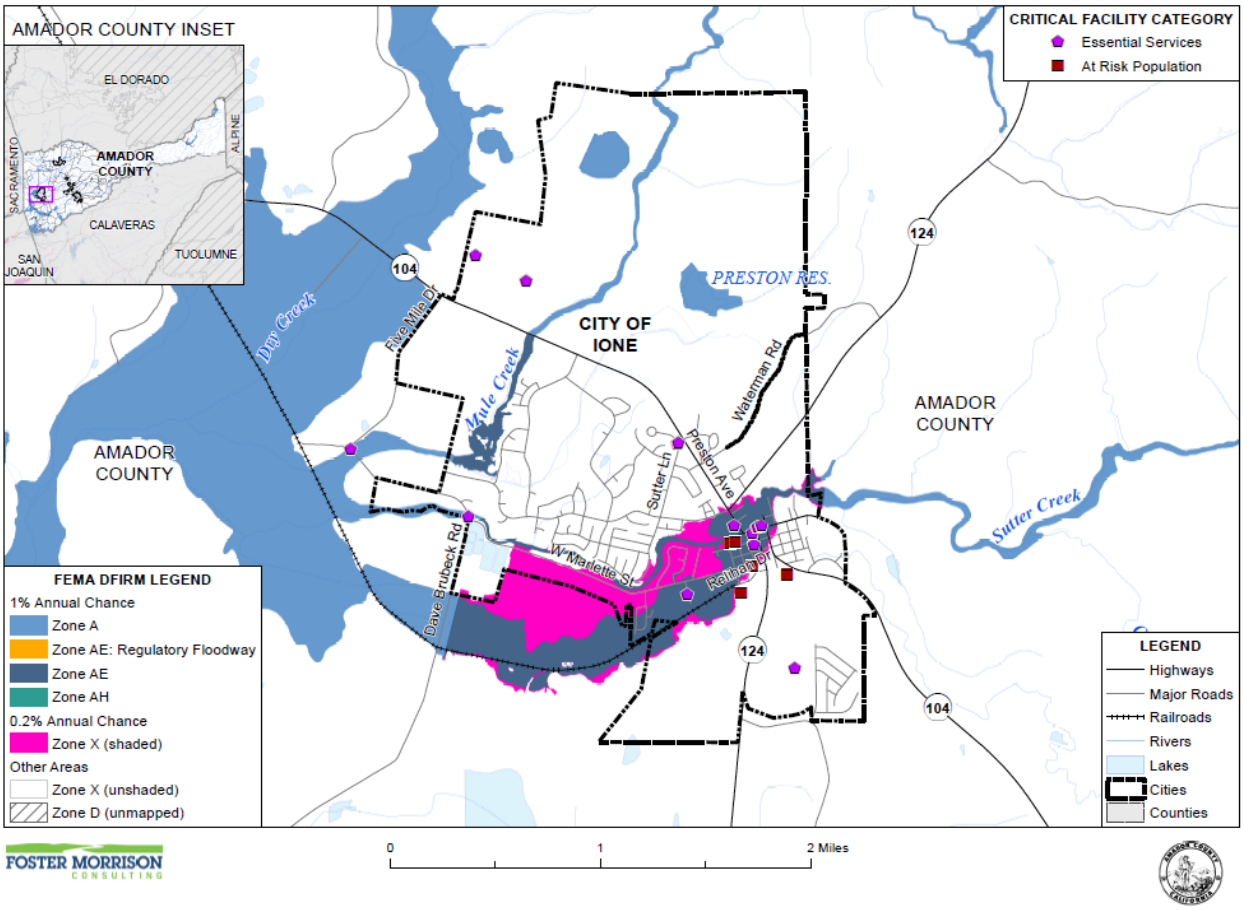
*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Critical Facilities and Infrastructure

1% and 0.2% annual chance flooding present a threat to critical facilities and infrastructure. The following analysis discusses critical facilities and infrastructure. A separate analysis was performed on the critical facility inventory in the City to determine which critical facilities fall into each FEMA DFIRM flood zone. Using GIS, the FEMA DFIRM flood zones were overlayed on the critical facility GIS layer. This is shown on Figure B-19. Table B-24 details which critical facilities fall in which FEMA DFIRM flood zones. Details of critical facility categories, type, name, and address by FEMA DFIRM flood zones are listed in Appendix F.

Figure B-19 City of Ione – Critical Facilities in FEMA DFIRM Flood Zones



Data Source: FEMA Effective DFIRM 01/20/2016 (NFHL 01/21/2025 database), Amador County GIS, Cal-Atlas; Map Date: 4/21/2025.

Table B-24 City of Ione – Critical Facilities by Category in FEMA DFIRM Flood Zones

Flood Zone	Critical Facility Category / Critical Facility Type	Facility Count
1% Annual Chance Flood Hazard		
Zone A	**Essential Services**	
	Bridge	1
	Essential Services Total	1
	Zone A Total	**1**
Zone AE	**Essential Services**	
	Clinic	1
	Fire Station	1
	Library	1
	Other	1
	Police Station	1
	Post Office	1
	Public Administration Building	1

Flood Zone	Critical Facility Category / Critical Facility Type	Facility Count
	Essential Services Total	**7**
	At Risk Population	
	School	2
	At Risk Population Total	**2**
	Zone AE Total	**9**
1% Annual Chance Flood Hazard Total		**10**
0.2% Annual Chance Flood Hazard		
Zone X (shaded)	**At Risk Population**	
	School	1
	At Risk Population Total	**1**
	Zone X (shaded) Total	**1**
0.2% Annual Chance Flood Hazard Total		**1**
Other Areas		
Zone X (unshaded)	**Essential Services**	
	EMS Station	2
	Evacuation Shelter	1
	Fire Station	1
	Prison	1
	Essential Services Total	**5**
	At Risk Population	
	School	2
	At Risk Population Total	**2**
	Zone X (unshaded) Total	**7**
Other Areas Total		**7**
Ione Total		**18**

Source: FEMA DFIRM 1/20/2016, City of Ione

Natural, Historic, and Cultural Resources

Large flood events can affect natural, historic, and cultural resources. There are a number of ways floodwaters can impact natural resources and the environment. Wildlife habitats can be destroyed by floodwaters. Contaminated floodwater can pollute rivers and habitats. Silt and sediment can destroy natural areas. Riverbanks and natural levees can be eliminated as rivers reach bankfull capacity. Rivers can be widened, and deposition can increase downstream. Trees can be uprooted by high-velocity water flow. Plants that survive the initial flood may die due to being inundated with water. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to structures within the flooded areas, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged and lost during extreme flood events. Any of these that fall in the flood zones shown on Figure B-14 would be vulnerable.

Impacts from Flood: 1% and 0.2% Annual Chance

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Large flood events, including those associated with 1% and 0.2% annual chance floods, can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. People may be swept away in floodwaters, causing injuries or deaths. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Structures can be damaged directly from floodwaters and can also be damaged from trees falling as a result of water-saturated soils. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services causing power outages. The interruption of power causes major problems and can result in the closure of governmental offices and community businesses. Public schools may also be required to close or be placed on a delayed start schedule. Roads can be damaged and closed, causing safety and evacuation issues.

Standing water can cause damage to crops, roads, foundations, and electrical circuits. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, loss of environmental resources, and economic impacts.

Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the hazard profile discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Insurance Coverage, Claims Paid, and Repetitive Losses

Standard property insurance does not include flood coverage because of the relatively high risk. The National Flood Insurance Program (NFIP) provides flood insurance to residents in those communities that participate in the NFIP. Federal financial assistance requires the purchase of flood insurance for structures located within a 100-year floodplain – a requirement that affects nearly all mortgages financed through commercial lending institutions. Flood insurance is also recommended for all structures protected by levees, even if not mapped within a floodplain.

The City of Ione joined the National Flood Insurance Program (NFIP) on July 8, 1980. The City does not participate in the CRS program. NFIP data indicates that as of December 2, 2024, there were 51 flood

insurance policies in force in the City with $14,008,000 of coverage and $46,255 in premiums. There have been 6 historical claims for flood losses totaling $3,692. 5 were for pre-FIRM structures, while 1 was for a post-FIRM structure. 3 of these losses were in the A zone, while the other 3 was in the B, C, or X zones. NFIP data further indicates that there are 0 repetitive loss (RL) and 0 severe repetitive loss buildings in the City. There have been no substantial damage claims since 1978 in the City.

Based on this analysis of insurance coverage, the City has values at risk to the 1% annual chance and greater floods. Of the 355 improved parcels within the 1% annual chance flood zone, 26 of those parcels maintain flood insurance. This can be seen on Table B-25.

Table B-25 City of Ione – Percentage of Policy Holders to Improved Parcels in the 1% Annual Chance Floodplain

Jurisdiction	Improved Parcels in SFHA (1% Annual Chance) Floodplain*	Insurance Policies in the SFHA (1% Annual Chance) Floodplain	Percentage of 1% Annual Chance Floodplain Parcels Currently Insured
City of Ione	371	26	7.0%

Source: FEMA DFIRM 1/20/2016, Amador County 2024 Parcel/Assessor Data, NFIP CIS data.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City of Ione include the following:

- Climate change is likely to exacerbate future flood conditions and associated impacts and vulnerability of the County to 1% and 0.2% annual chance flooding.
- Future population growth should be considered, as having more or less people in a community affects the overall hazard vulnerability to the City. Population growth in the City of Ione has recently slowed; however, additional growth planned within the 1% and 0.2% annual chance floodplains would place additional populations at risk to flood. Additional population growth would likely bring continued diversity to the County. Vulnerable population groups could face disproportionate effects from flooding and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions and the location of future events.
- Land use planning should be proactive to address future hazard conditions. Future development in the City consists of two large subdivision projects which will add 962 new housing units to the City's current housing stock and increase overall populations in the City. Locating new development, structures and critical facilities and infrastructure within or near areas of flood risk may put additional development at risk. However, City building codes and the City's floodplain ordinance are in effect to

reduce this risk and should be updated as necessary to continue to address future flood conditions. Based on this, future development may not increase the vulnerability of the City to flood.

Future Development

The potential for flooding may increase as floodwaters are channeled due to land development. Such changes can exacerbate flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. Floodplain modeling and master planning should be based on built out property use to ensure that all new development remains safe from future flooding. While local floodplain management, stormwater management, and water quality regulations and policies address these changes on a site-by-site basis, their cumulative effects can have a negative impact on the overall floodplain.

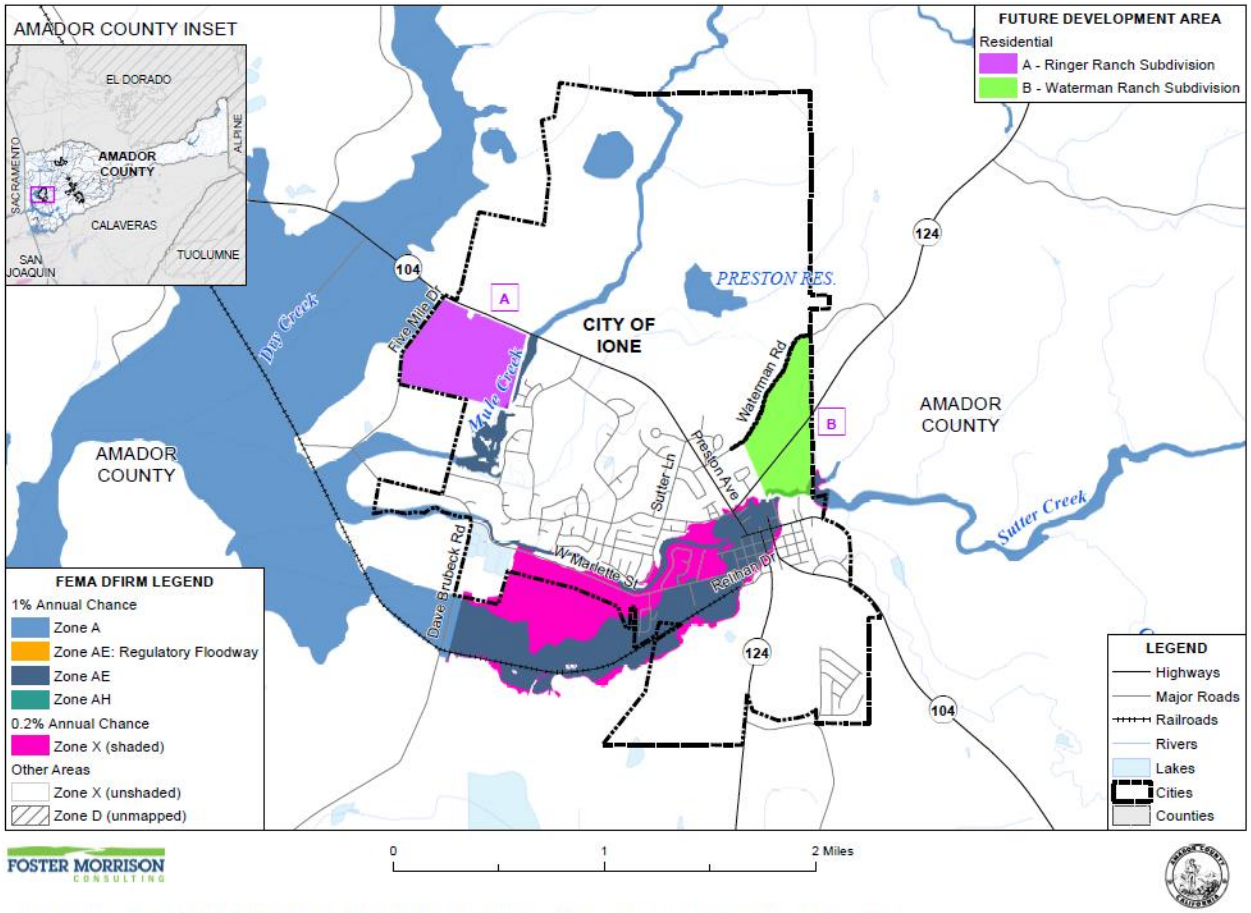
The City's floodplain ordinance prohibits development in the floodplain unless certain flood elevation and other standards are met. If new development is approved in the floodplain, it must be developed a minimum of 2 feet above base flood elevation, pursuant to City ordinance. The City enforces its floodplain management ordinance. The City's floodplain ordinance should be updated to ensure new development within floodplains is adequately protected. More detail on the specifics of the floodplain ordinance can be found in the Capability section below.

Future development areas and their vulnerability to 1% and 0.2% annual chance flood are discussed further in the below GIS analysis.

GIS Analysis

The City provided two future development areas which were used as the basis for the inventory of future development for the City. This area was mapped in GIS. Utilizing the future development area spatial layer, the parcel polygon data was intersected to determine the future development areas within each DFIRM flood zone. Figure B-20 shows the locations of the future development area overlayed on the DFIRM flood zones. Portions of these lie in the AE DFIRM flood zones; as shown in Table B-26.

Figure B-20 City of Ione – Future Development Areas in FEMA DFIRM Flood Zones



Data Source: FEMA Effective DFIRM 01/20/2016 (NFHL 01/21/2025 database), Amador County GIS, Cal-Atlas; Map Date: 10/22/2025.

Table B-26 City of Ione - Future Development Parcels and Acres in FEMA DFIRM Flood Zones

Flood Zone / Site / Map ID	Future Development	Total Parcel Count	Improved Parcel Count"	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
1% Annual Chance Flood Hazard							
Zone AE							
A	Ringer Ranch Subdivision	1	1	0	135.18	135.18	0
B	Waterman Ranch Subdivision	1	0	1	94.74	0	94.74
Grand Total		**2**	**1**	**1**	**229.92**	**135.18**	**94.74**

Source: FEMA DFIRM 1/20/2016, City of Ione

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the City during the rainy season from November through April. Prolonged heavy rainfall (including that from atmospheric river events) contributes to a large volume of runoff resulting in high peak flows of moderate duration.

Location and Extent

The City of Ione is subject to localized flooding throughout the City. Areas prone to localized flooding are included in Table B-27 below. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the City vary by location. Flood durations in the City tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the City tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

Past Occurrences

Disaster Declaration History

There have been no state or federal disaster declarations from localized floods. There would most likely have been localized flood events during the disaster declarations from flood as shown in the previous 1%/0.2% annual chance flood section.

NCDC Events

The NCDC occurrences of localized flooding are included in the 1% and 0.2% annual chance flood hazard profile above where past flood events were noted.

City of Ione Events

The City noted that localized flooding occurs throughout portions of the City annually. The City noted the following specific past occurrences of localized flooding:

In **January of 1997**, Sutter Creek over-topped its banks and all drains to Sutter Creek backed up. All of downtown Ione and along Marlette was flooded with flood waters of up to three feet. Street flooding, resulting from backwater from drainage outfall, was experienced at Springcreek Drive at the bend approximately 1,000 feet north of Marlette Street and at the intersection with Marlette Street. Ponding of flood waters was also experienced on the golf course located on the north side of the creek, approximately 500 feet upstream of Five Mile Drive.

In **October and November of 2012**, the HMPC noted that there was localized flooding of downtown Ione buildings due to localized flooding. Property damage occurred due to one to two feet of stormwater in buildings. Property damage costs were not available.

2016 – Castle Oaks Golf Course had flooding issues during the heavy rains that occurred in 2016.

December 2022 – March 2023: Atmospheric River Storms – A series of atmospheric river-driven storms impacted Ione and on March 14, 2023, the Amador County Sheriff's Office issued evacuation warnings for parts of Ione and nearby unincorporated areas due to flood risks from heavy rainfall and potential snowmelt. Neighborhoods in Ione were included in voluntary evacuation warnings issued on March 14, 2023, due to flood risks in low-lying areas, particularly near Sutter Creek and other local streams. Residents were advised to prepare for immediate evacuation if conditions worsened. Low-income households and elderly residents were at higher risk due to limited resources for evacuation or recovery. Critical facilities like the Ione Fire Department, city hall, and the wastewater treatment plant were at risk of operational disruptions due to flooding near Sutter Creek or other local waterways.

Climate Change and Localized Flood

It is likely that climate change will increase the chance of future occurrence as well as future impacts from localized flood. More information on future impacts to the City can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Even if average annual rainfall may decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century, increasing the likelihood of overwhelming stormwater systems built to historical rainfall averages. This makes localized flooding more likely.

Vulnerability to Localized Flood

Flood vulnerability and their impacts vary by location and severity of any given flood event and will likely only affect certain areas of the City during specific times. Based on the risk assessment, it is evident that floods will continue to have potentially significant impacts to certain areas of the City. However, while flooding can cause significant impacts, depending on the duration and volume of precipitation and the drainage in any given area, many of the floods in the City are minor, localized flood events that are more of a nuisance than a disaster.

Many areas of the City are at some measure of vulnerability to localized flooding. An assessment of a community's vulnerability to localized flooding begins with an understanding of local exposure to localized flooding. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Historically, the City has been affected by flooding of streams and creeks occurring during heavy rain and storm (including atmospheric river) events. Additional development in the City and in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff and contributes to localized flooding occurring in areas throughout the City. The lack of or inadequate drainage infrastructure in the City contributes to localized flooding issues.

The City tracks localized flooding areas. Affected localized flood areas identified by the City of Ione are summarized in Table B-27.

Table B-27 City of Ione – List of Localized Flooding Problem Areas

Area Name	Flooding	Pavement Deterioration	Washout	High Water	Landslide/ Mudslide	Debris	Downed Trees
W. Marlette Road	Yes			Yes		Yes	Yes
Main Street	Yes			Yes			
Springcreek Drive	Yes					Yes	Yes
Five Mile Drive	Yes					Yes	Yes
Castle Oaks Golf Course	Yes			Yes			Yes
W. Jackson St	Yes					Yes	Yes
300 block of W. Jackson St.	Yes			Yes		Yes	

Source: City of Ione

Localized flooding issues occur along Sutter Creek and in other areas. A significant portion of storm water runoff affecting Ione originates from up country properties. The increased flow and velocity of the stream water coming down Sutter Creek restricts Ione's storm water system from discharging into the stream, which in turn causes localized flooding in the downtown areas of Ione. This issue is primarily associated with the older areas of Ione south of Sutter Creek. Sutter Creek also overflows its banks and floods portions of Springcreek Drive, West Marlette Road and Five Mile Drive during storm events.

Flooding is primarily due to inadequate stormwater infrastructure, including old clay pipes that are collapsed or clogged. To mitigate these issues the development a Storm Water Master Plan to prioritize infrastructure upgrades, replace collapsed clay pipes with modern, durable materials, and enhance regular maintenance is necessary. Additional measures include implementing green infrastructure (e.g., permeable surfaces, bioswales) and securing FEMA or state funding to support these improvements, reducing flood risks and protecting critical facilities and vulnerable populations.

Assets at Risk

Assets at risk from localized flood include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

People and populations (including vulnerable populations) are traditionally not highly vulnerable to localized flooding, but their structures and contents can be at risk. Localized flooding may also cause

transportation issues as roads and lanes are impacted or closed and affect the ability for people to travel throughout the City.

Structures

Structures in areas with localized flooding can be affected if floodwaters intrude into the structure. Structures in low lying areas, or those with basements can be at greater risk. Buildings with older foundations that are prone to water intrusion are also at greater risk. Once water finds its way into a structure, it tends to continue to do so until the path that brings water into a structure is mitigated. Structures can also be damaged by trees that have become uprooted and fall during rain and storm events. Large trees falling onto structures can cause significant damage.

Critical Facilities and Infrastructure

Localized flooding, while often more of a nuisance, can cause damage to critical facilities and infrastructure during a heavy rain and storm event. Any facility that experiences localized flooding can be impacted. Utilities and other critical infrastructure can all be affected, causing interruptions in service until repairs can be made. For example, water and wastewater systems can be vulnerable to heavy rains and flood events. Rainfall creates a high water table, surging streams and creeks, and saturates soil. Infiltration of stormwater into water and wastewater systems may occur and presents a threat to public health and safety, when the infrastructure is no longer able to meet operational needs and local demands. Other critical facilities such as roads, bridges and other transportation facilities can also experience localized flooding causing road closures and other impacts until storm waters recede. This can result in extended road closures requiring alternate routes.

Natural, Historic, and Cultural Resources

Natural resource assets may have some vulnerabilities to localized flood during major storm events, but can benefit from floodwaters, often by design. Many parks and green spaces are designed to take overflow water and release it into the underlying soils and natural areas. Wetlands areas in the City actually help reduce the risk of flooding, as they can absorb excess rainfall that would have to be drained away from impervious surfaces. Flooding can provide many benefits to the natural environment, including recharging wetlands and groundwater, increasing fish production, creating wildlife habitat, and rejuvenating soil fertility. These smaller localized flooding events often provide more benefits to the environment in comparison to negative impacts associated with large flood events. Historic and cultural resources may be at some measure of vulnerability if they are located in areas subject to repeated localized flooding.

Impacts from Localized Flood

Primary concerns associated with stormwater flooding include impacts to infrastructure that provide a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services. Standing water can cause damage to crops, roads, and foundations. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Life safety issues from localized flooding would be more limited. The amount and type of damage or flooding that occurs varies from year to year and from storm to storm, depending on the quantity of precipitation and runoff.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City of Ione include the following:

- Climate change is likely to exacerbate future heavy rain conditions and associated impacts and vulnerability of the City to localized flood.
- Population growth in the City of Ione has recently slowed. Additional population growth would likely bring continued diversity to the City. This can also impact the vulnerable populations, like low-income individuals and households living in areas that are typically more hazardous. Vulnerable population groups such as low-income individuals and households living in flood prone areas could face disproportionate effects from localized flood and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions and the location of future events.
- Land use planning should be proactive to address future hazard conditions. Future development in the City consists of two large subdivision projects which will add 962 new housing units to the City's current housing stock and increase overall populations in the City. Development in more urban areas causes an increase in peak flow and stormwater runoff. Such growth will consume previously undeveloped acres, and the impacts may overwhelm existing drainage and flood control facilities. Locating new development, structures and critical facilities and infrastructure within or near areas of localized flooding risk may put additional development at risk. However, City building codes are in effect to reduce this risk and should be updated as necessary to continue to address future localized flood conditions. Depending on the location of new development and adherence to protective building codes, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the City to this hazard.

The City will need to be proactive to ensure that increased development has proper siting and drainage for stormwaters. The risk of localized flooding to future development can also be minimized by accurate recordkeeping of repetitive localized storm activity. Mitigating the root causes of the localized stormwater flooding will reduce future risks of losses. Regardless of where development occurs in the City of Ione, the removal of storm water will be contingent on making sure local streams are able to flow freely and runoff flows from upcountry are reduced through proper storm water management practices and land conservation efforts.

Severe Weather: Extreme Heat

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

According to FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and lasts for several weeks. Heat kills by taxing the human body beyond its abilities. In extreme heat and high humidity, evaporation is slowed, and the body must work extra hard to maintain a normal temperature." Most heat disorders occur because the victim has been overexposed to heat or has over-exercised for his or her age and physical condition. Older adults, young children, those who are sick or overweight, and those that work or recreate outdoors are more likely to experience heat exhaustion or succumb to extreme heat.

In addition to the risks faced by citizens of the City, there are risks to the built environment from extreme heat. While extreme heat on its own does not usually affect structures, extreme heat during times of drought can cause wildfire risk to heighten. Extreme heat can lead to interruptions in power, power outages, and when combined with high winds, to Public Safety Power Shutdown (PSPS) events, creating significant issues in the City.

Location and Extent

Heat is a regional phenomenon and affects the whole of the City. Heat emergencies are often slower to develop, taking several days of continuous, oppressive heat before a significant or quantifiable impact is seen. Heat waves do not strike victims immediately, but rather their cumulative effects slowly affect general and vulnerable populations and communities. Heat waves do not generally cause damage or elicit the immediate response of floods, fires, earthquakes, or other more "typical" disaster scenarios. The City experiences temperatures in excess of 100°F during the summer and fall months. The temperature moves to 105-110°F in rather extreme situations.

The NWS has in place a system to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color (green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Section 4.3.3 of the Base Plan.

Past Occurrences

Disaster Declaration History

There have been no federal or state disaster declarations from extreme heat.

NCDC Events

The NCDC data shows 124 extreme heat incidents for Amador County since 1993, some of which likely affected the City.

City of Ione Events

The City noted that in July of 2025, a triple-digit heat wave affected much of California, including Ione, with the National Weather Service issuing heat advisories and extreme heat warnings. Ione experienced temperatures exceeding 100°F, with the CalHeatScore tool indicating moderate to severe heat conditions (scores of 2–4) in the middle of the month for the City. This event strained power grids, increased wildfire risks, and posed health risks, particularly for vulnerable populations like older adults and outdoor workers.

Climate Change and Extreme Heat

The 2021 CAS (as well as the 2024 Draft CAS), citing a California Energy Commission study, states that "over the past 15 years, heat waves have claimed more lives in California than all other declared disaster events combined." This study shows that California is getting warmer, leading to an increased frequency, magnitude, and duration of heat waves. These factors may lead to increased mortality from excessive heat.

As temperatures increase, California and Amador County will face increased risk of death from dehydration, heat stroke, heat exhaustion, heart attack, stroke and respiratory distress caused by extreme heat. According to the 2021 CAS (as well as the 2024 Draft CAS) report and the 2023 State of California Hazard Mitigation Plan, by 2100, hotter temperatures are expected throughout the state, with projected increases of 3-5.5°F (under a lower emissions scenario) to 8-10.5°F (under a higher emissions scenario). These changes could lead to an increase in deaths related to extreme heat in Amador County.

Vulnerability to Severe Weather: Extreme Heat

Extreme heat is becoming more frequent, intense, longer lasting and geographically widespread. Extreme heat occurs on an annual basis in the County and the City. In recent years, compounded by climate change conditions, summer months continue to get a bit hotter. The whole of the City is at some measure of vulnerability to extreme heat. An assessment of a community's vulnerability to extreme heat begins with an understanding of local exposure to extreme heat. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The City of Ione has faced recurring heat waves from 2020 to 2025, with significant events in September 2020 (100-105°F), July-August 2023 (102-106°F), September 2024 (98-103°F), and May-August 2025 (95-105°F). The Ione Fire Department opened a cooling station at Fire Station #2 during peak heat days and placing ice chests with free water at locations around the city to address dehydration and hazards. Due to

the extreme heat multiple tree branches broke creating hazards in parks and roadways. A sustainable cooling center network and tree maintenance program are needed to mitigate these risks.

The City is concerned about the following risks and impacts:

- Vulnerable Populations at Risk: Low-Income Residents. The City would like to develop cooling center programs, enhance shelter and implement public education campaigns to inform low-income residents about heat safety and available resources.
- Elderly and Disabled Populations: The City is seeking to upgrade Evelyn Bishop Hall to ensure power for medical devices and cooling. Expand outreach to identify and assist elderly/disabled residents during heat events.
- Limited Cooling Infrastructure and Shelter Capacity: The City is seeking to upgrade Evalyn Bishop Hall with enhanced cooling systems and increased capacity Explore partnerships with schools to establish additional cooling centers.
- Economic and Community Activity Disruptions: The City is seeking to develop heat preparedness programs for businesses and event organizers (mitigation action #2). Install backup generators at critical facilities and downtown businesses to maintain operations during heat-related power outages.
- Limited Public Awareness and Outreach: The City is seeking to expand public education campaigns via social media, newsletters, and community partnerships to promote heat safety and resource awareness. Target outreach to vulnerable populations.
- Environmental and Infrastructure Impacts: The City is seeking to implement urban greening and water conservation programs to mitigate heat impacts on the environment. Upgrade infrastructure with heat-resistant materials.

Assets at Risk

Assets at risk from extreme heat include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations within the City are vulnerable to extreme heat, but it generally affects people spending large amounts of time outside or without means of cooling indoor structures. During extended periods of high temperatures, extreme heat may overload the demands for electricity to run air conditioners and can present health concerns to individuals. When interruptions in power occur during extreme heat, the risk of heat related illnesses and deaths increases. Extreme heat is a significant concern to vulnerable populations. The unhoused; individuals who exercise or train outdoors; outdoor workers; individuals that lack the resources to afford heat; and the young, old, or medically fragile individuals that are more susceptible to heat related impacts. In addition to vulnerable populations, pets and livestock are at risk to extreme heat conditions.

Structures

Extreme heat normally does not generally impact structures, but individuals working in structures may be affected during periods of extended heat, especially in structures that might not be equipped with air conditioning or other means of cooling. The City noted that extreme heat has caused interruptions to power

in the past. Also depending on the structure, sensitive contents such as IT equipment can be impacted, especially if a power outage occurs.

Critical Facilities and Infrastructure

Depending on their type and function, critical facilities and infrastructure can also be affected by extreme heat. Interruptions in power caused by extreme heat can lead to system failures. Schools without air conditioning may have to close or operate on a reduced schedule.

Natural, Historic, and Cultural Resources

Natural resource assets, including those located in City park areas, may be vulnerable during periods of extreme heat. These include turfed areas; landscapes, City trees, wildlife and habitat areas, and wetlands and marsh lands. Recently, trees were lost in areas of the City that were weakened by drought and extreme heat. Extreme heat may also cause drought-like conditions, contributing to other issues. For example, several weeks of extreme heat increases evapotranspiration and reduces moisture content in vegetation, leading to higher wildfire vulnerability in the region for that time period, even if the rest of the season is relatively moist. Historic and cultural resources are not expected to be affected by extreme heat.

Impacts from Severe Weather: Extreme Heat

The City experiences temperatures in excess of 100°F during the summer and fall months. The temperature moves to 105-110°F in rather extreme situations. During these times, drought conditions may worsen, and the City may see an increase in dry fuels. Also, power outage and PSPS events may occur during these times as well. Health issues are a primary concern with this hazard, especially to vulnerable populations, although economic impacts can also be an issue.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for City include the following:

- Climate change is likely to exacerbate future extreme heat conditions and associated impacts and vulnerability of the City.
- Future population growth should be considered, as having more or less people in a community affects the overall hazard vulnerability to the City. Population is expected to increase for the County and thus the City and, as such, the vulnerability to this hazard may increase, specifically affecting growing vulnerable populations as the senior citizen population continues to reside in and age within the City. Along with this, low income and the unhoused population are at risk to extreme heat which can put strain on emergency services and shelters. Changes in population and population patterns may or may

not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions and the location of future events.

- Land use planning should be proactive to address future hazard conditions. Future development in the City consists of two large subdivision projects which will add 962 new housing units to the City's current housing stock and increase overall populations in the City. Thus, future development in the City will likely increase the impacts and associated vulnerability of the City to this hazard. It should be noted, however, that new development is subject to current building codes, which should reduce or mitigate the hazard vulnerability associated with new construction.

Future development of new buildings in the City will likely not be affected by extreme heat. Extreme heat is more likely to affect vulnerable populations. Vulnerability to extreme heat will increase as the average age of the population shifts. It is encouraged that nursing homes and elder care facilities have emergency plans or backup power to address power failure during times of extreme heat and in the event of a PSPS. Low-income residents and unhoused populations are also more vulnerable and should be considered in future growth plans for the City. Cooling centers for these populations should be utilized when necessary.

Severe Weather: High Winds and Tornado

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

High winds, as defined by the NWS glossary, are sustained wind speeds of 40 mph or greater lasting for 1 hour or longer, or winds of 58 mph or greater for any duration. High winds can cause significant property damage, threaten public safety, and have adverse economic impacts from business closures and power loss. High winds, when combined with high temperatures and low humidity can also lead to PSPS events. Winds can also drive fires in and near the City.

Tornadoes are rotating columns of air marked by a funnel-shaped downward extension of a cumulonimbus cloud whirling at destructive speeds of up to 300 mph, usually accompanying a thunderstorm. Tornadoes form when cool, dry air sits on top of warm, moist air. Tornadoes are the most powerful storms that exist. Tornadoes, though rare, can affect areas of the City, primarily during the rainy season in the late fall, winter, and early spring.

Location and Extent

The entire City is subject to significant, non-tornadic (straight-line), winds. Each area of the City is at risk to high winds. Magnitude of winds is measured often in speed and damages. These events are often part of a heavy rain and storm event but can occur outside of storms. The speed of onset of winds can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of winds in California is often short, ranging from minutes to hours. The Beaufort scale is an empirical 12 category scale that relates wind speed to observed conditions at sea or on land. Its full name is the Beaufort Wind Force Scale. The Beaufort Scale was shown in Section 4.3.5 of the Base Plan.

Tornadoes, while rare, can occur at any location in the City. Prior to February 1, 2007, tornado intensity was measured by the Fujita (F) scale. This scale was revised and is now the Enhanced Fujita scale. Both scales are sets of wind estimates (not measurements) based on damage. The new scale (EF) provides more damage indicators (28) and associated degrees of damage, allowing for more detailed analysis and better correlation between damage and wind speed. It is also more precise because it considers the materials affected and the construction of structures damaged by a tornado. The F Scale and EF Scale are shown in Section 4.3.5 of the Base Plan.

Past Occurrences

Disaster Declarations

There have been no federal or state disaster declarations in the County for winds and tornadoes.

NCDC Events

The NCDC data recorded 160 high wind, 3 funnel cloud, and 0 tornado incidents for Amador County since 1950. Many of these wind events likely affected the City.

City of Ione Past Occurrences

The City noted that since high winds are a regional phenomenon, events that affected the lower elevations of the County also affected the City. Notable events in Ione included:

A **December 2021** state-declared storm with gusts of 40-50 mph that caused significant tree damage and localized flooding, requiring weeks of cleanup and straining municipal resources. Additional wind events during the **2023 Severe Winter Storms** (January-March) and **February-March 2025** (gusts up to 60-70 mph) causing significant tree damage and contributing to localized flooding, in areas of W. Marlette Five Mile Drive and Howard Park. The storm resulted in substantial losses from fallen trees and debris, requiring weeks of cleanup.

A tornado warning event occurred on **March 13, 2025**. The National Weather Service (NWS) in Sacramento issued a tornado warning for southwestern Amador County, including Ione, until 5:15 PM PDT. The warning was prompted by a severe thunderstorm capable of producing a tornado, located near Rancho Calaveras (12 miles southwest of Paloma), moving northeast at 15 mph. Radar indicated rotation, suggesting potential for flying debris, damage to roofs, windows, vehicles, and trees. Locations impacted included Ione, Valley Springs, Campo Seco, and Camanche Reservoir. While no confirmed touchdown was reported in Ione itself, this event highlights the rare but possible tornado risk in the area. On the same day as the tornado warning (March 13, 2025), a severe thunderstorm produced winds exceeding 30 mph and half-inch hail in southwestern Amador County, including Ione. The storm moved northeast at 20 mph, with gusty winds capable of knocking down tree limbs and blowing around unsecured objects.

Climate Change and High Winds and Tornado

According to the 2021 CAS (as well as the 2024 Draft CAS), while average annual rainfall may increase or decrease slightly, the intensity of individual thunderstorm events is likely to increase during the 21st

century. This may bring stronger thunderstorm winds. The CAS does not discuss non-thunderstorm winds or tornadoes.

Vulnerability to Severe Weather: High Wind and Tornadoes

The City is subject to potentially destructive high winds and tornadoes. High winds are common throughout the area and can happen during most times of the entire year and outside of a severe storm event. Tornadoes are rare. High winds and tornadoes can be a significant public safety and economic concern. The whole of the City is at some measure of vulnerability to wind and tornadoes.

An assessment of a community's vulnerability to high winds begins with an understanding of local exposure to wind and tornadoes. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The City is in or adjacent to a special wind hazard region, which is a result of foehn winds. A foehn wind is a type of dry down-slope wind that occurs in the lee (downwind side) of a mountain range. Winds of this type are called "snow-eaters" for their ability to make snow melt or sublimate rapidly. This snow-removing ability is caused not only by warmer temperatures, but also the low relative humidity of the air mass coming over the mountain(s). High winds are also associated with the rapid spread of wildfires, making some regions which experience these winds particularly fire prone. Burn patterns of almost all historic large wildfires in the larger County indicate they occurred during foehn winds. In addition, high winds can cause power outages (including PSPS events) to occur in the City. High winds also contribute to downed trees, especially those trees that are previously compromised from recent drought conditions.

Assets at Risk

Assets at risk from winds and tornadoes include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations are at some vulnerability to high winds and tornadoes. Certain vulnerable populations are at the greatest risk to the effects of high winds and tornadoes. These include:

- The unsheltered.
- Citizens who reside in mobile homes.
- Citizens in buildings with no tornado shelter or below ground floors.
- Those with access and functional needs.
- The medically fragile experiencing power outages as a result of wind events.
- Those working or caught outdoors during a wind or tornado event.

Structures

All structures in the City have some measure of risk from high wind and tornadoes. Though rare, a tornado could cause damage to virtually all facilities in the tornado touchdown path. This would affect homes, businesses, commercial property, as well as government and critical facilities. During a wind or tornado event, power lines in the City can be damaged by falling trees caused by wind. High winds are a cause for PSPS events to be declared, causing power outages to occur. High winds and tornadoes could cause sparks from electric wires and other sources, which could lead to wildfire ignition. Once ignited, high winds can also cause wildfires to rapidly spread and become out of control. High wind conditions can cause wildfires to move into more urban areas destroying structures and whole subdivisions, as seen in recent wildfire events in the West.

Critical Facilities and Infrastructure

Though most critical facilities are built to withstand winds, high wind speeds can still cause damage to critical facilities and infrastructure in the City. Though rare, a tornado could cause damage to virtually all facilities in the tornado touchdown path. Winds can cause power outages affecting system operations. Winds can also contribute to PSPS events, and lead to out of control wildfires, which can damage critical facilities and impact their abilities to perform their critical roles in the community.

Natural, Historic, and Cultural Resources

Natural resources, such as trees, are vulnerable to winds. Increased levee and streambank erosion can occur during periods of high water and high winds. High wave action during significant wind events can impact marsh lands and habitat areas. Soil erosion can also occur during high winds. Most all natural, historic, or cultural resources are at risk to tornadoes. Tornadoes can tear apart habitats, causing fragmentation across ecosystems and can damage and destroy historic structures and cultural resources.

Impacts from Severe Weather: High Wind and Tornado

Wind and tornadoes can cause damage to property and loss of life. While most tornado damage is caused by violent winds, the majority of injuries and deaths generally result from flying debris. Property damage can include damage to buildings, fallen trees, and power lines. Local industries may also be damaged or destroyed. Access roads and streets may be blocked by debris, delaying necessary emergency response. Winds can push automobiles off roads, damage roofs and structures, cause power outages, and cause secondary damage due to flying debris and hazardous trees. High winds can also contribute to the spread and intensity of wildfires. High winds during periods of high water can cause impacts to levees and streambanks from accelerated erosion. Climate change may affect this hazard and cause winds to increase in velocity and more tornadoes to affect the City.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City include the following:

- Climate change is likely to exacerbate future wind conditions and associated impacts and vulnerability of the City. Climate change is not likely to affect future tornado conditions.
- Future population growth should be considered as having more or less people in a community affects the overall hazard vulnerability to the City. Population growth in the City is expected to continue slowly. Vulnerable populations could experience disproportional effects from this hazard and should be planned for as development of the City continues. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions and the location of future events.
- Land use planning should be proactive to address future hazard conditions. Future development in the City consists of two large subdivision projects which will add 962 new housing units to the City's current housing stock and increase overall populations in the City. Building codes in the City ensure that new development is built to current building standards to withstand high winds, which should reduce the risk to future development in the City from high winds and tornadoes. With adherence to development standards, future losses to new development should be minimal. Changes in land use and increased development may amplify the impacts of high winds and tornadoes, as additional structures in the City increase the number of buildings at risk to high winds and tornadoes.

Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements, such as building codes, are followed, and varying needs for different demographic groups with intersecting identities that reside within the City are considered can help make for a more resilient community. The City enforces the state building codes which includes standards for new development to minimize damage from windstorms. New and existing critical facilities and infrastructure should also consider adding backup power systems to limit impacts associated with power outages.

Wildfire (with smoke and air quality)

Likelihood of Future Occurrence–Likely
Vulnerability–Extremely High

Hazard Profile

Wildland fire and the risk of a conflagration is an ongoing concern for the City of Ione. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of fire regimes. Wildland fires affect grass, forest, and brushlands, as well as structures. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late

fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern.

Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. These weather conditions can result in red flag (e.g., fire weather) days, and can result in PSPS events in the City. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas. There is also the concern of wildfires occurring in these more remote, forested areas that under certain weather conditions, can extend into areas not generally considered at a high risk to wildfire. Smoke and air quality also become an issue, both from fires occurring inside and outside of the Amador County Planning Area and the City.

Wildfire Smoke and Air Quality

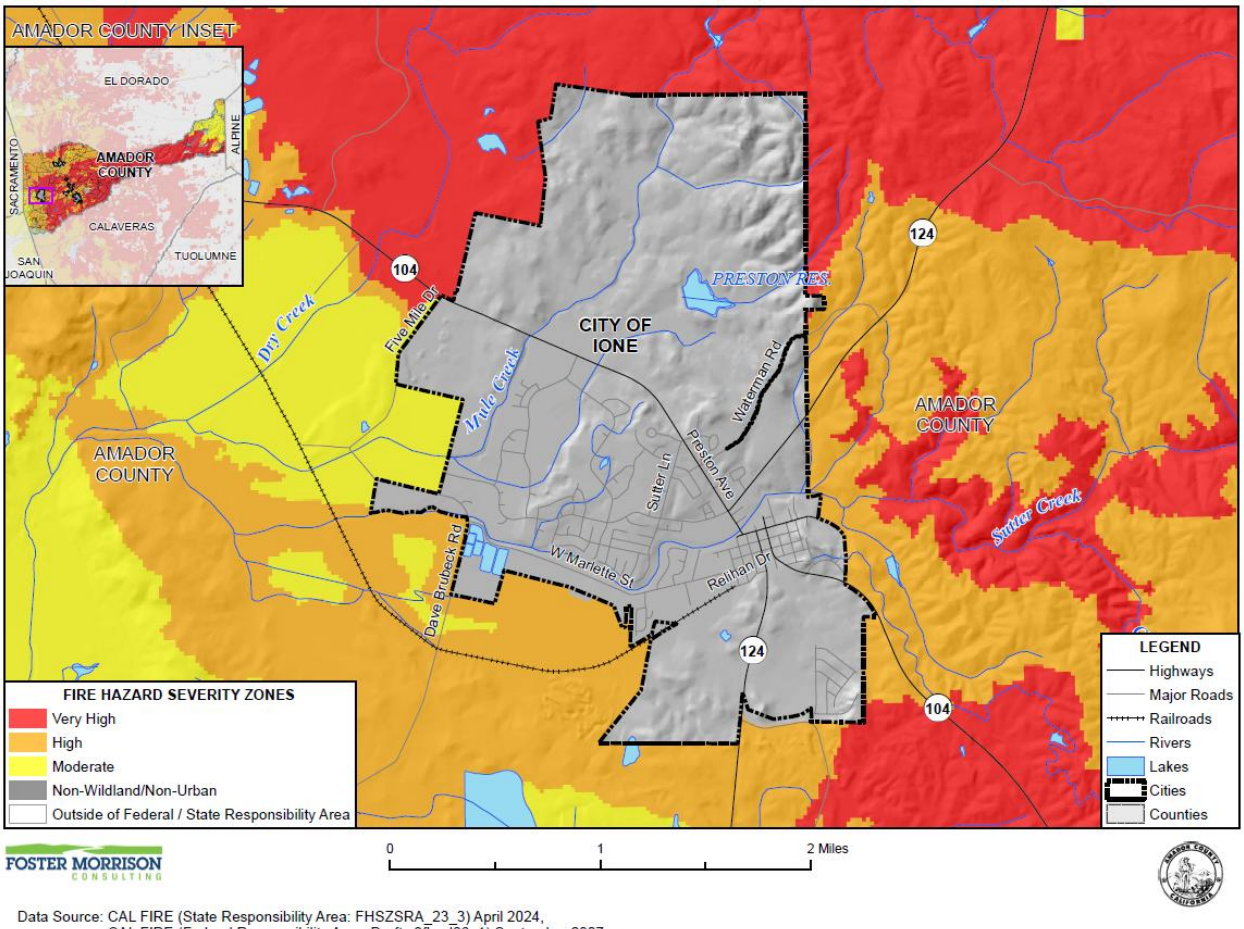
Smoke from wildfires is made up of gas and particulate matter, which can be easily observed in the air. Air quality standards have been established to protect human health with the pollutant referred to as PM2.5 which consists of particles 2.5 microns or less in diameter. These smaller sizes of particles are responsible for adverse health effects because of their ability to reach the lower regions of the respiratory tract.

Wildfire smoke can have negative effects to those who live in or near a fire burn area. Smoke and air pollution from wildfires can be a severe health hazard. Significant wildfires occurring in both Amador County and nearby northern California communities since the 2020 LHMP Update have created significant air pollution affecting area residents. This was the case during the 2021 Caldor Fire, as well as others that affected the nearby areas.

Location and Extent

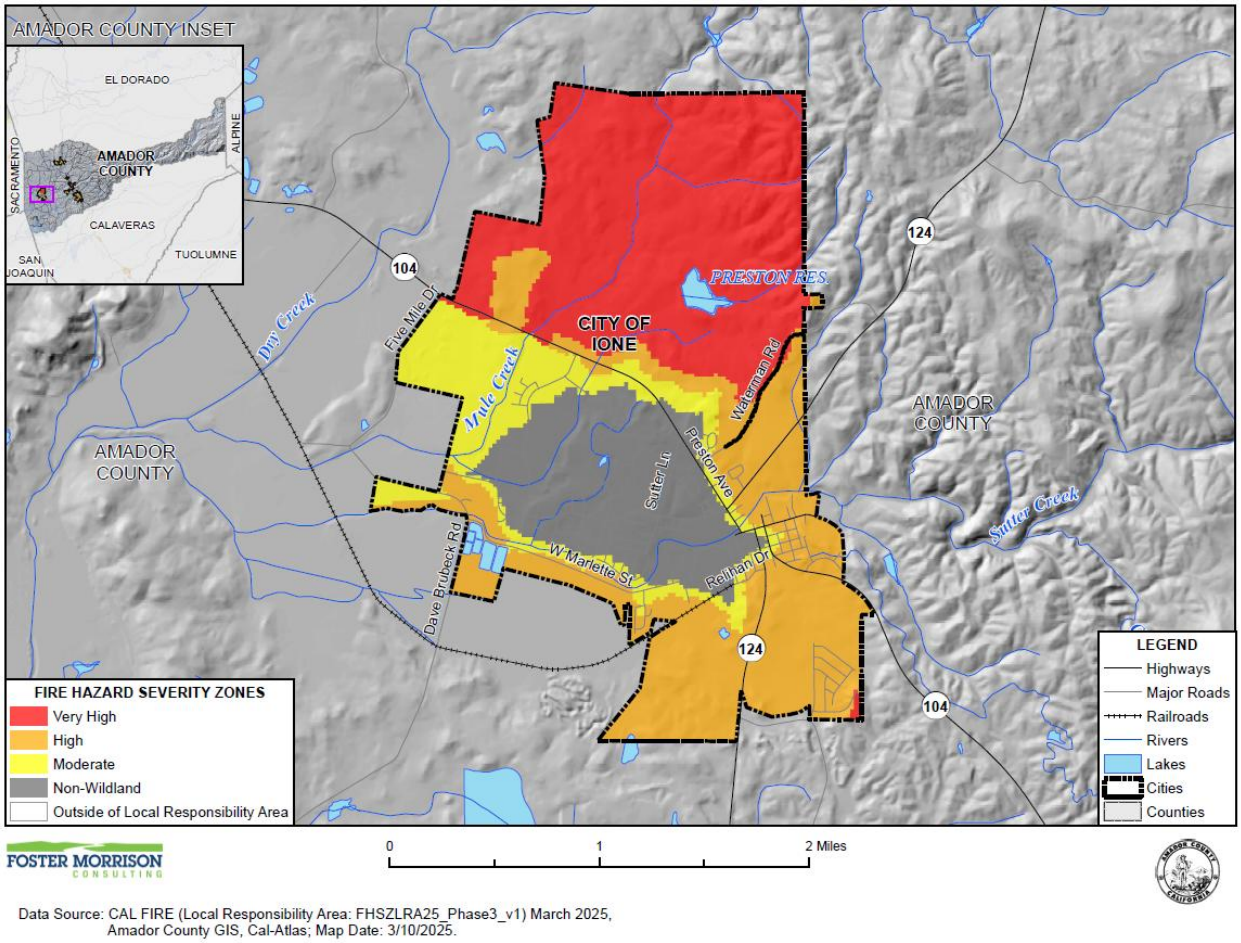
Wildfire can affect all areas of the City. CAL FIRE has estimated that the risk varies across the City and has created maps showing risk variance. Following the methodology described in Section 4.3.15 of the Base Plan, wildfire maps for the City of Ione were created. Figure B-21 shows the CAL FIRE Federal Responsibility Areas (FRA) and State Responsibility Areas (SRA) and their associated Fire Hazard Severity Zones (FHSZ) in the City. Figure B-22 shows the CAL FIRE Local Responsibility Areas (LRA) and their associated Fire Hazard Severity Zones (FHSZ) in the City. As shown on the maps, FHSZs within the City limits as well as outside, range from Non-Wildland/Non-Urban to Very High. It also should be noted that the City is predominantly covered by the new 2025 LRA mapping. The presence of SRA/FRA FHSZs in the City is likely due to slight differences in City boundary lines associated with the various GIS datasets.

Figure B-21 City of Ione – CAL FIRE SRA/FRA Fire Hazard Severity Zones



Data Source: CAL FIRE (State Responsibility Area: FHSZSRA_23_3) April 2024,
CAL FIRE (Federal Responsibility Area: Draft c3fhszl06_1) September 2007,
Amador County GIS, Cal-Atlas; Map Date: 3/12/2025.

Figure B-22 City of Ione – CAL FIRE LRA Fire Hazard Severity Zones



Data Source: CAL FIRE (Local Responsibility Area: FHSZLRA25_Phase3_v1) March 2025, Amador County GIS, Cal-Atlas; Map Date: 3/10/2025.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time or may have durations lasting for a week or more. Geographical FHSZ extents in the SRA/FRA are shown in Table B-28, while extents in the LRA are shown on Table B-29.

Table B-28 City of Ione – CAL FIRE SRA/FRA Fire Hazard Severity Zone Geographical Extents

Fire Responsibility/ Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
SRA						
Very High	0.8	0.03%	0.003	0.0005%	0.8	0.04%
High	2.8	0.1%	0.1	0.01%	2.7	0.1%
Moderate	0.9	0.0%	0.6	0.1%	0.3	0.0%
SRA Total	4.5	0.2%	0.7	0.1%	3.8	0.2%
Ione Total	**4.5**	**0.2%**	**0.7**	**0.1%**	**3.8**	**0.2%**

Grand Total	**4.5**	**0.2%**	**0.7**	**0.1%**	**3.8**	**0.2%**

Source: CAL FIRE

Table B-29 City of Ione – CAL FIRE LRA Fire Hazard Severity Zone Geographical Extents

Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Very High	1,114	37%	3	0.5%	1,111	49%
High	918	31%	198	29%	720	32%
Moderate	398	13%	0	0.0%	0	0.0%
Non-Wildland	526	18%	271	39%	255	11%
Outside of LRA Responsibility Area	17	0.6%	0.8	0.1%	16.3	0.7%
Ione Total	**2,973**	**100%**	**690**	**100%**	**2,283**	**100%**

Source: CAL FIRE

Past Occurrences

Disaster Declaration History

There has been three state and two federal disaster declarations due to fire, as shown in Table B-30.

Table B-30 Amador County – State and Federal Wildfire Disaster Declarations 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	3	1961 (unnamed), 2015 (Summer 2015 Fires), 2021 (Caldor Fire)	2	2016 (Butte Fire), 2021 (Caldor Fire)

Source: Cal OES, FEMA

NCDC Events

The NCDC has tracked 50 wildfire events in the County dating back to 1993.

City of Ione Events

The City noted that they had been indirectly affected by past fires:

- Butte Fire: The City was a Red Cross area for the fire, but the shelter was not heavily used. They received evacuees (people and animals) and provided shelters. The City also noted that there was significant smoke affecting the Ione area for a 2-day period where it was difficult to go outside.
- Sand Fire: City was not really affected except to the extent some people might have gone there to look for temporary housing.

Climate Change and Wildfire

It is likely that climate change will increase the chance of future occurrence as well as future impacts from wildfire. More information on future impacts to the City can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Warmer temperatures can exacerbate drought conditions. Drought often kills plants and trees, which serve as fuel for wildfires. Warmer temperatures could increase the number of wildfires and pest outbreaks, such as the western pine beetle. Cal-Adapt's wildfire tool predicts the potential increase in the amount of burned areas for the year 2090-2099, as compared to recent (2010) conditions. This is shown in Section 4.3.15 of the Base Plan. Based on this model, Cal-Adapt predicts that wildfire risk in Amador County will increase moderately at the end of the century. However, wildfire models can vary depending on the parameters used. Cal-Adapt does not take landscape and fuel sources into account in their model. In all likelihood, in the Amador County Planning Area, precipitation patterns, high levels of heat, topography, and fuel load will determine the frequency and intensity of future wildfire.

Vulnerability to Wildfire

Risk and vulnerability to the City from wildfire is of significant concern. Wildfires that occur in the City occur from a variety of both natural and manmade causes. The City can be affected both by fires that start on or near City lands as well as those that start elsewhere and move into the City. In addition to burning large areas of land, air quality can be affected in the City by smoke from fires occurring inside the City as well as those from many miles away. As growth continues and populations increase in the City, the potential for wildfires will also increase.

The whole of the City is at some measure of vulnerability to wildfire. An assessment of a community's vulnerability to wildfire begins with an understanding of local exposure to wildfire. This is included in the Local Concerns section below. After that section, assets at risk are discussed.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

From 2020 to 2025, events highlight vulnerabilities to infrastructure damage, power disruptions affecting critical facilities and hazards to vulnerable populations. A mitigation action to develop a comprehensive urban forestry and debris management program, including regular tree inspections and infrastructure hardening would reduce wind-related damages and enhance resilience.

Assets at Risk

Assets at risk from wildfire include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations are at vulnerable to wildfire. Certain vulnerable populations are at greater risk to the effects of wildfire as well as smoke and air quality issues that wildfires bring. Vulnerable populations include:

- Unhoused
- Infants and children under age five and their caregivers
- Elderly (65 and older)
- Individuals with disabilities
- Individuals' dependent on medical equipment
- Individuals who exercise, recreate, or work outdoors
- Individuals with impaired mobility

To further evaluate the impact to the residential population within the City, the CAL FIRE FHSZ dataset was overlayed on the parcel layer. Those residential parcels that intersect the FHSZs were counted and multiplied by the 2023 Census Bureau average household factors for the City of Ione – 2.29. According to this analysis, there is a total population of 0 residents of the City of Ione falling within the moderate or higher SRA/FRA FHSZs. This is shown in Table B-31. There is a total population of 1,836 residents of the City of Ione falling within the moderate or higher LRA FHSZs, as shown on Table B-32.

Table B-31 City of Ione – Improved Residential Parcels and Population by CAL FIRE SRA/FRA Fire Hazard Severity Zone

Jurisdiction	Very High		High		Moderate	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Ione	0	0	0	0	0	0

Source: CAL FIRE, Amador County 2024 Parcel/Assessor Data, US Census Bureau American Community Survey 2023 Household Size Estimates.

Table B-32 City of Ione – Improved Residential Parcels and Population by CAL FIRE LRA Fire Hazard Severity Zone

Jurisdiction	Very High		High		Moderate	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Ione	1	2	560	1,282	242	554

Source: CAL FIRE, 2024 Amador County Parcel/Assessor's Data, US Census Bureau American Community Survey 2023 Household Size Estimates.

The City noted that the Critical Facilities and Infrastructure section below includes the facilities used by At-Risk populations that are threatened by this hazard. While this is not specific to what special populations reside in the City, it does speak to facilities that area used to serve (portions) of this population.

Structures

All structures in the City have some risk to wildfire. GIS was used to determine the possible impacts of wildfire within the City of Ione. The methodology described in Section 4.3.15 of the Base Plan was followed in determining structures and values at risk in both the CAL FIRE's SRA/FRA and LRA Fire Hazard Severity Zone layer. There are no analysis results for the SRA/FRA in the City of Ione. Analysis results for the LRA in the City of Ione are shown in Table B-33, which summarizes total parcel counts, improved parcel counts and their structure values by LRA FHSZs.

Table B-33 City of Ione – Count and Value of Parcels and Structures by CAL FIRE LRA Fire Hazard Severity Zone

Fire Hazard Severity Zone/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Values	Total Value
Very High						
Agricultural	3	1	$736,416	$20,808	$20,808	$778,032
Commercial	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	8	1	$738,669	$39,497	$0	$778,166
Residential	10	1	$741,938	$145,656	$72,828	$960,422
Unknown	2	0	$1,827,251	$0	$0	$1,827,251
Very High Total	**23**	**3**	**$4,044,274**	**$205,961**	**$93,636**	**$4,343,871**
High						
Agricultural	8	2	$4,344,507	$11,424	$11,424	$4,367,355
Commercial	23	21	$4,006,728	$7,024,053	$7,024,053	$18,054,834
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	30	4	$629,471	$2,392,628	$0	$3,022,099
Residential	637	560	$63,318,122	$135,407,457	$67,703,729	$266,429,308
Unknown	7	0	$1,431,274	$0	$0	$1,431,274
High Total	**705**	**587**	**$73,730,102**	**$144,835,562**	**$74,739,206**	**$293,304,870**
Moderate						
Agricultural	0	0	$0	$0	$0	$0
Commercial	26	24	$4,286,195	$11,108,043	$11,108,043	$26,502,281
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	7	1	$665,337	$520,200	$0	$1,185,537
Residential	260	242	$23,994,562	$59,759,485	$29,879,743	$113,633,790
Unknown	1	0	$0	$0	$0	$0
Moderate Total	**294**	**267**	**$28,946,094**	**$71,387,728**	**$40,987,786**	**$141,321,608**
Non-Wildland						
Agricultural	0	0	$0	$0	$0	$0

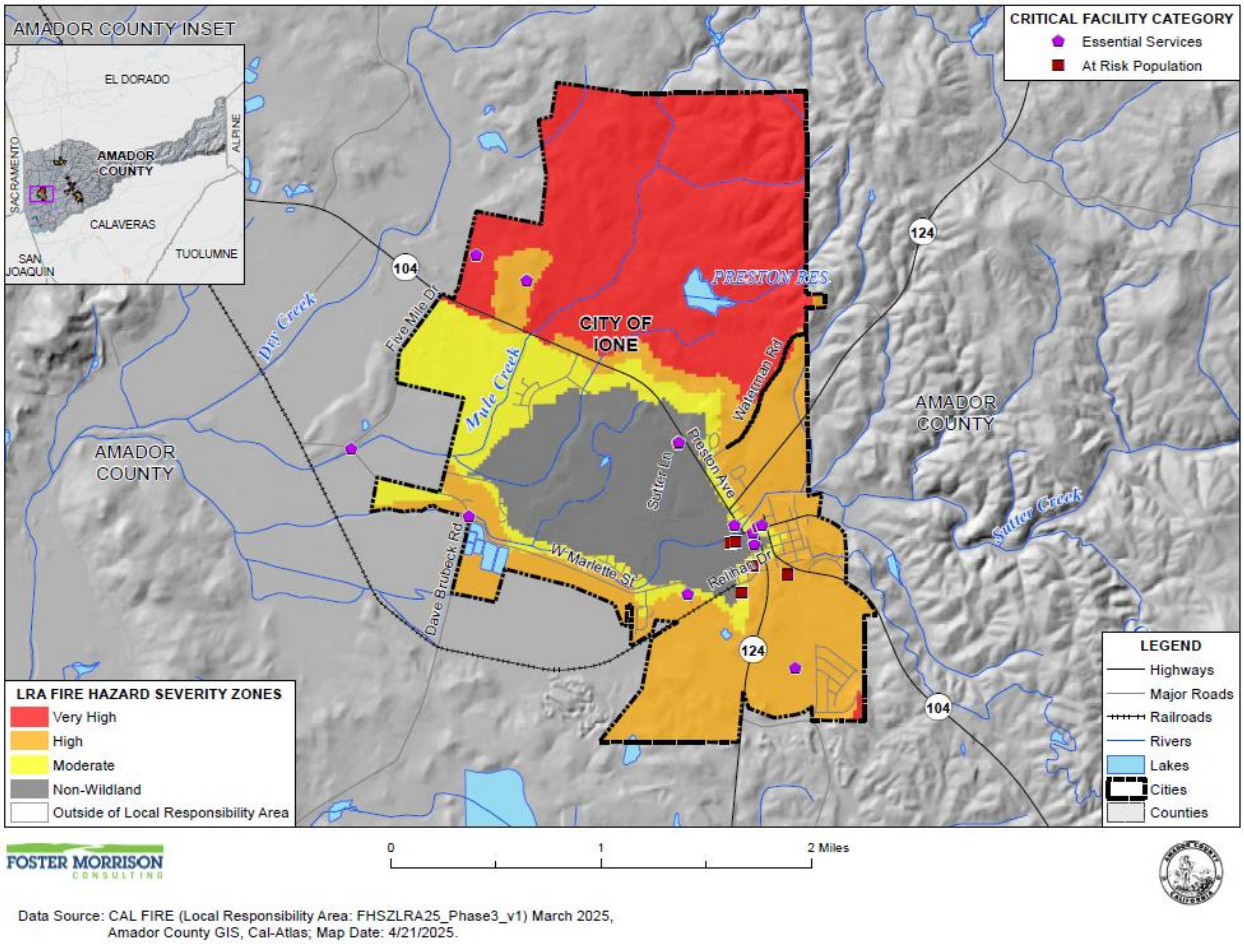
Fire Hazard Severity Zone/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Values	Total Value
Commercial	16	15	$1,826,558	$4,490,799	$4,490,799	$10,808,156
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	16	0	$671	$0	$0	$671
Residential	1,150	1,104	$111,444,130	$275,547,107	$137,773,554	$524,764,791
Unknown	1	0	$3,750,000	$0	$0	$3,750,000
Non-Wildland Total	**1,183**	**1,119**	**$117,021,359**	**$280,037,906**	**$142,264,353**	**$539,323,618**
Ione Total	**2,205**	**1,976**	**$223,741,829**	**$496,467,157**	**$258,084,980**	**$978,293,966**

Source: CAL FIRE, Amador County 2024 Parcel/Assessor Data

Critical Facilities and Infrastructure

Wildfire present a threat to critical facilities and infrastructure. The following analysis discusses critical facilities and infrastructure. A separate analysis was performed on the critical facility inventory in the City to determine which critical facilities fall into each fire hazard severity zone. Using GIS, the SRA/FRA and LRA fire hazard severity zones were overlayed on the critical facility GIS layer. Only LRA fire hazard severity zones intersect the City; as such no SRA/FRA analysis is presented here. Only LRA analysis is presented. This is shown on Figure B-23 for the LRA fire hazard severity zones. Table B-34 details which critical facilities fall in which LRA fire hazard severity zone. Details of critical facility categories, type, name, and address by SRA/FRA and LRA fire hazard severity zones are listed in Appendix F.

Figure B-23 City of Ione – Critical Facilities in LRA Fire Hazard Severity Zones



Data Source: CAL FIRE (Local Responsibility Area: FHSZLRA25_Phase3_v1) March 2025, Amador County GIS, Cal-Atlas; Map Date: 4/21/2025.

Table B-34 City of Ione – Critical Facilities by Category in LRA Fire Hazard Severity Zones

Fire Hazard Severity Zone/Critical Facility Category	Facility Count
Very High	
Essential Services	1
At Risk Population	0
Very High Total	**1**
High	
Essential Services	4
At Risk Population	1
High Total	**5**
Moderate	
Essential Services	3
At Risk Population	2
Moderate Total	**5**

Fire Hazard Severity Zone/Critical Facility Category	Facility Count
Non-Wildland	
Essential Services	5
At Risk Population	2
Non-Wildland Total	**7**
Ione Total	**18**

Source: CAL FIRE, City of Ione

Natural, Historic, and Cultural Resources

Natural, historic, and cultural resources located within areas at risk to wildfire would be vulnerable. Should a wildfire occur in the City, the impacts to natural, historic and cultural resources could be extensive and include air pollution, contamination from water runoff containing toxic products, and other environmental discharges or releases from burned materials affecting soils, habitat areas, wildlife, and aquatic resources. Historic and cultural resources can be damaged or destroyed and are often more vulnerable due to their older age, construction type, and lack of fire prevention infrastructure such as sprinklers.

Impacts from Wildfire

Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and timber; and loss of recreational opportunities. Out of control wildfires can have catastrophic impacts. Wildfires can cause short-term and long-term disruption to the City. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the City by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the City; smoke and air pollution from wildfires can be a severe health hazard. Smoke impacts may come from wildfires outside the City, as well as from within.

Although the physical damages and casualties arising from wildland-urban interface or conflagration fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate a PSPS which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

The impacts of a fire are felt long after the fire is extinguished. In addition to the loss of property in fires, the loss in vegetation and changes in surface soils alters the environment. When supporting vegetation is burned, hillsides become destabilized and prone to erosion. The burnt surface soils are harder and absorb less water. When winter rains come, this leads to increased runoff, erosion, and landslides in hilly areas.

Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the hazard profile above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City of Ione include the following:

- Climate change is likely to exacerbate future wildfire conditions and associated impacts and vulnerability of the City to wildfire.
- Population growth in the City of Ione has recently slowed. Additional population growth would likely bring continued diversity to the City. Vulnerable population groups could face disproportionate effects from wildfire and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions and the location of future events.
- Land use planning should be proactive to address future hazard conditions. Locating new development, structures and critical facilities and infrastructure within or near areas of wildfire risk may put additional development at risk. Future development in the City consists of two large subdivision projects which will add 962 new housing units to the City's current housing stock and increase overall populations in the City. Thus, future development in the City is initially thought to increase the impacts and associated vulnerability of the City to this hazard. However, City building codes are in effect to reduce this risk and should be updated as necessary to continue to address future wildfire conditions. Specifically, with the release of the new 2025 LRA mapping for Amador County, wildfire building codes should be updated as required to include enhanced measures to reduce wildfire impacts on new construction, and including the formal adoption of the new LRA maps. It should be noted that most of the growth in the City is occurring in areas outside the moderate or higher fire hazard severity zones. Thus, depending on the location of new development and adherence to protective building codes, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the City to this hazard. It should also be noted that once new building codes are adopted for LRA, should reduce vulnerability on new construction especially in the higher hazard zones.

Future Development

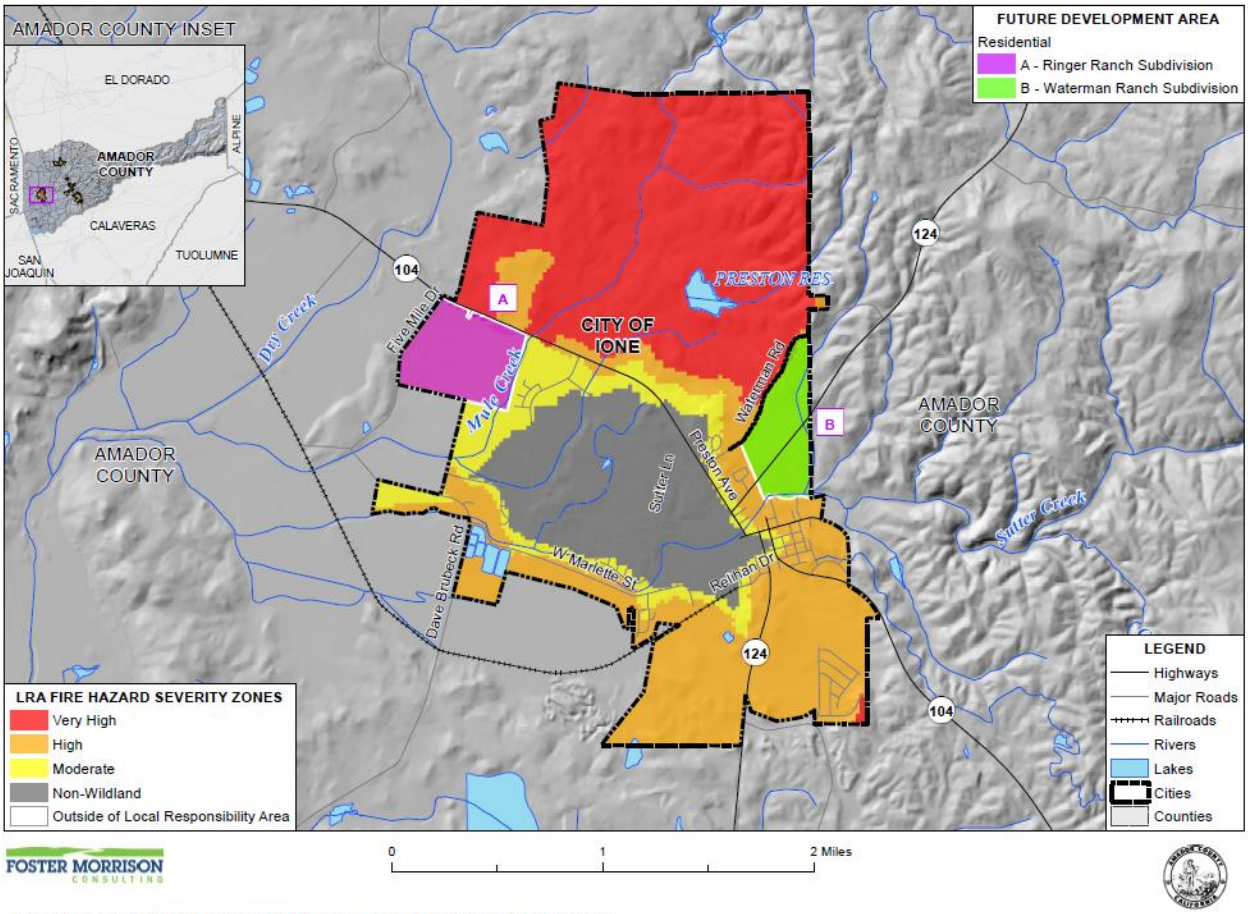
Additional growth and development within moderate or higher fire hazard severity zones in the City would place additional values at risk to wildfire. More vulnerable populations may experience a disproportionate impact from wildfire, and this should be considered as development continues. However, City building codes are in effect and should continue to be updated as appropriate to reduce future impacts. This is especially true in the VHFHSZ zones in the City. The City will also need to ensure that proper ingress and egress are fully constructed BEFORE houses in a subdivision are constructed. One of the key lessons from the Paradise fire was the lack of multiple escape routes added to the casualty list. Developments need at least 2 ways in and out of the subdivision to better ensure evacuation routes.

Future development areas and their vulnerability to wildfire are discussed further in the below GIS analysis.

GIS Analysis

The City provided two future development areas which were used as the basis for the inventory of future development for the City. This area were mapped in GIS. Utilizing the future development area spatial layer, the parcel polygon data was intersected to determine the future development areas within each SRA/FRA and LRA fire hazard severity zone. No facilities fell in the SRA/FRA fire hazard severity zones. Figure B-24 shows the locations of the future development area overlayed on the LRA fire hazard severity zones. As shown in Table B-35, the future development area falls in the Very High fire hazard severity zone.

Figure B-24 City of Ione – Future Development Areas in LRA Fire Hazard Severity Zones



Data Source: CAL FIRE (Local Responsibility Area: FHSZLRA25_Phase3_v1) March 2025, Amador County GIS, Cal-Atlas; Map Date: 10/22/2025.

Table B-35 City of Ione – Future Development Parcels and Acres in LRA Fire Hazard Severity Zones

Flood Zone / Site / Map ID	Future Development	Total Parcel Count	Improved Parcel Count"	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
Very High							
A	Ringer Ranch Subdivision	1	1	0	135.18	135.18	0
B	Waterman Ranch Subdivision	1	0	1	94.74	0	94.74
Grand Total		**2**	**1**	**1**	**229.92**	**135.18**	**94.74**

Source: CAL FIRE, City of Ione

B.5 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

B.5.1. Regulatory Mitigation Capabilities

Table B-36 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the City of Ione.

Table B-36 City of Ione's Regulatory Mitigation Capabilities

Plans	In Place Y/N	Does the plan address hazards? Can the plan be used to carry out mitigation actions? When was it last updated??
Capital Improvements Plan	Y	Yes
Climate Change Adaptation Plan	N	
Community Wildfire Protection Plan	N	
Comprehensive/Master Plan	Y	Yes
Continuity of Operations Plan	N	
Economic Development Plan	Y	Yes
Land Use Plan	N	
Local Emergency Operations Plan	Y	Yes
Stormwater Management Plan	N	
Transportation Plan	Y	Yes
Other		
Land Use Planning and Ordinances	**Y/N**	**Is the ordinance an effective way to reduce hazard impacts? Is the ordinance adequately administered and enforced?**
Acquisition of land for open space and public recreation use	Y	Yes Funding does not keep up with cost of maintaining.
Building code	Y	Yes
Flood insurance rate maps	Y	Yes Yes
Floodplain ordinance	Y	Yes Yes
Natural hazard-specific ordinance (stormwater, steep slope, wildfire)	Y	Somewhat yes
Subdivision ordinance	Y	Yes, yes
Zoning ordinance	Y	Yes, yes
Other		

How can these capabilities be expanded and improved to reduce risk?
Existing plans and ordinances need to be continually updated. Participation in the Community Rating System (CRS) program would be of benefit to property owners in the flood plain

Source: City of Ione

City of Ione General Plan (2009)

The City of Ione General Plan Program serves as the blueprint for future growth and development and provides comprehensive planning for the future. It encompasses what the City is now, and what it intends to be, and provides the overall framework of how to achieve this future condition (see the discussion in Section 4.3.1 Growth and Development Trends).

The General Plan includes a Safety Element that focuses on safety issues to be considered in planning for the present and future development of the City Planning Area. Identified hazards include wildfire, geologic/seismic, flooding, and other natural and man-made hazards (such as hazardous materials). Mitigation-related actions and objective summaries are as follows:

Goal NS-2: Maintain a safe community and environment.

Policies:

- Strive to reduce levels of risk of injury, death, and property damage resulting from reasonably foreseeable safety hazards in the area.
- Prepare for emergencies and disasters prior to their occurrence.

Goals NS-3: Reduce the possibility of flooding or drainage issues.

- Support and encourage efforts to limit and reduce the potential for community flooding from local waterways.
- Manage the risk of flooding by discouraging new development in areas which are likely to flood.
- Discourage the creation of new parcels when the presence of easements, floodplain, marsh or riparian habitat and/or other features would leave insufficient land to build and operate structures. This policy shall not apply to open space lots specifically created for dedication to the City or another appropriate party for habitat protection, flood control, drainage, or wetland maintenance.
- Ensure that adequate drainage exists for both existing and new development.
- Reduce the risk of adverse effects to residents or businesses as a result of geologic or seismic instability.
- Support efforts by federal, state, and local jurisdictions to investigate local seismic and geologic hazards and support those programs that effectively mitigate seismic and safety hazards.
- Ensure that new structures are protected from damage caused by geologic and/or soil conditions to the greatest extent feasible.
- Reduce the probability of fire damage to structures.
- The City shall ensure that the Ione Fire Department has sufficient resources and capabilities to reduce fire hazards, assist in fire suppression, and ensure efficient emergency medical response.
- Reduce the risks associated with wildfires in and around the City.

Mitigation Related Ordinances

Civil Defense and Disaster Council (Chapter 2.48)

The declared purposes of this chapter are to provide for the preparation and carrying out of plans for the protection of persons and property of the City of Ione in the event of an emergency, the direction of the emergency organization, and the coordination of the emergency services of this city with all other public agencies, corporations, organizations, and affected private persons. Any expenditures made in connection with said emergency and related activities, including mutual aid activities, shall be deemed conclusively to be for the direct protection and benefit of the residents and property of the city.

The city disaster council is hereby created, and shall consist of the following:

- The mayor, who shall serve as chairperson;
- The city manager, who shall serve as vice-chairperson and city's director of emergency services;
- The county director of emergency services;
- Such chiefs of emergency services as are provided for in a current city and Amador Emergency Operations Plan of this county, adopted pursuant to this chapter;
- Such representatives of civic, business, labor, veterans, professional, or other organizations having an official emergency responsibility, as may be appointed by the director with the advice and consent of the city council.

It shall be the duty of the city disaster council, and it is empowered, to develop and recommend for adoption by the city council, emergency and mutual-aid plans and agreements, and such ordinances and resolutions and rules and regulations as are necessary to implement such plans and agreements. The disaster council shall meet upon call of the chairman or, in his/her absence from the city or inability to call such meeting, upon call of the vice chairman.

Burning of Refuse, Vegetation, and Cuttings (Chapter 8.08)

This chapter is provided for the health, safety, and welfare of the residents of the city. No person, and no person for and on behalf of himself or herself or of any firm, partnership, association or corporation, shall set fire to or burn, inflame or ignite so as to cause to burn any weeds, brush at any place within the city limits, whether attended or unattended, without first obtaining a written permit to do so from the chief of the fire department of the city. Only burn piles are allowed, and shall not exceed four feet by four feet by four feet in height and shall be only vegetations and cuttings from the property for which the permit was issued.

No person, and no person for or on behalf of himself or herself or of any firm, partnership, association or corporation shall set fire to or burn, inflame or ignite so as cause to burn any trash, garbage, or other refuse at any place within the city limits.

Weed Abatement (Chapter 8.16)

All weeds, as defined in Section 39561.5 of the California Government Code, dry grasses, dead shrubs, dead trees, rubbish, or any material growing upon the streets, sidewalks, or upon private property within the city, which bear seeds of a wingy or downy nature or which by reason of their size, manner of growth

and location constitute a fire hazard to any building, improvements, crops or other property, and weeds and grasses which, when dry, will in reasonable probability constitute such a fire hazard, are declared to be a public nuisance.

Cultivated and useful grasses and pastures shall not be considered a public nuisance. However, if the fire chief or his authorized representative shall determine it necessary to protect adjacent improved property from fire exposure, an adequate firebreak may be required. Any lot of less than two acres shall be cleaned of all debris prior to June 1st or the start of fire season, whichever occurs first.

Lots on which weeds, dry grass, or other non-cultivated or non-useful grasses and pastures exist, shall be mowed, and shall be cut to a maximum height of two inches so as to not constitute a fire hazard throughout the calendar year. Dry grass and/or weeds so mowed shall be removed from the premises and not allowed to remain on the lot.

Any lot of two acres or more shall either be cleaned of all debris or have a minimum 20-foot wide firebreak around the perimeter in place prior to June 1st or the start of fire season, whichever occurs first. Firebreaks shall be disked around the entire perimeter of the lot. Scraping will also be allowed, provided that the scraped material is removed or spread evenly over the remaining unscraped property. Weeds and/or dry grass which are disked, cultivated or rotor-tilled should be performed with equipment that will cut the sod growth loose and bury it under any growth existing at that time. Dry leaves or wood chips hauled onto lots must be disked or turned under. If leaves or wood chips are being retained for the purpose of mulch or compost, they must be placed in a container so as to not constitute a fire hazard. Maintenance of parkways are the responsibility of the abutting property owner.

Buildings and Construction (Title 15)

Adoption of Uniform Codes: Note: the City of Ione will be adopting the 2025 CBC in January of 2026.

- The 2019 edition of the California Administrative Code, Title 24, Part 1, including tables, as adopted by the California Building Standards Commission in Title 24, Part 1 of the California Code of Regulations, and all future amendments thereto, are hereby adopted in the City of Ione.
- The 2019 edition of the California Building Code, Title 24, Part 2, including tables and Appendices C, I, and J, as amended herein, based on the 2015 International Building Code, as published by the California Building Standards Commission and codified in Title 24, Part 2 of the California Code of Regulations, and all future amendments thereto, are hereby adopted in the City of Ione, except as to amendments contained in this chapter.
- The 2019 edition of the California Residential Building Code, Title 24, Part 2.5, including tables and Appendix H, as amended herein, based on the 2015 International Residential Code, as adopted by the California Building Standards Commission in Title 24, Part 2.5 of the California Code of Regulations, and all future amendments thereto, are hereby adopted in the City of Ione.
- The 2019 edition of the California Mechanical Code, Title 24, Part 4, including tables, and Appendices B and D based on the 2015 Uniform Mechanical Code as published by the International Association of Plumbing and Mechanical Officials, and as adopted by the California Building Standards Commission in Title 24, Part 4 of the California Code of Regulations, and all future amendments thereto, are hereby adopted in the City of Ione.
- The 2019 edition of the California Plumbing Code, Title 24, part 5, including tables and Appendices A, B, D, H, and I, as amended, based on the 2015 Uniform Plumbing Code, as adopted and amended

by the California Building Standards Commission and codified in Title 24, Part 5 of the California Code of Regulations, and all future amendments thereto, are hereby adopted in the City of Ione.

- The 2019 edition of the California Energy Code, Title 24 Part 6, including Tables and Appendix "1-A", as adopted by the California Building Standards Commission in Title 24, Part 6 of the California Code of Regulations, and all future amendments thereto, are hereby adopted in the City of Ione.
- The 2015 edition of the International Code Council Property Maintenance Code, as published by the International Code Council (ICC), and all future amendments thereto, are hereby adopted in the City of Ione.
- The 2019 edition of the California Historical Building Code, Title 24, Part 8, including Tables and Appendix "A", as adopted by the California Building Standards Commission in Title 24, Part 8 of the California Code of Regulations, and all future amendments thereto, are hereby adopted in the City of Ione.
- The 2019 edition of the California Fire Code, Title 24, Part 9, including Tables and Appendices, as amended, based upon the 2015 edition of the International Fire Code as published by the International Code Council (ICC), and as adopted by the California Building Standards Commission and codified in Title 24, Part 9 of the California Code of Regulations, and all future amendments thereto are hereby adopted in the City of Ione, except as to amendments and additions contained in this Chapter.
- The 2019 edition of the California Existing Building Code, Title 24, Part 10, including tables, based on the 2015 International Existing Building Code, as adopted by the California Building Standards Commission in Title 24, Part 10 of the California Code of Regulations, and all future amendments thereto, are hereby adopted in the City of Ione.
- The 2019 edition of the California Green Building Standards Code, Title 24, Part 11, including tables and appendices, as adopted by the California Building Standards Commission in Title 24, Part 11 of the California Code of Regulations, and all future amendments thereto, are hereby adopted in the City of Ione.
- The 2019 edition of the California Referenced Standards Code, Title 24, Part 12, including tables, as adopted by the California Building Standards Commission in Title 24, Part 12 of the California Code of Regulations, and all future amendments thereto, are hereby adopted in the City of Ione.

A copy of this code is available for use and examination by the public at the Office of the Clerk of the City of Ione

Zoning (Title 17)

The city land use zoning code carries out the policies of the Ione general plan by classifying and regulating the uses of land and structures within the city, consistent with the general plan and the Municipal Code. This zoning code is adopted and established to serve the public health, safety, comfort, convenience and general welfare and to provide the economic and social advantages resulting from an orderly planned use of land resources, and to encourage, guide and provide a definite plan for the future growth and development of the city. More specifically, the purposes of this zoning code are to:

- Provide standards and guidelines for the orderly growth and development of the city that will assist in protecting the characteristics and community identity of Ione;
- Create a comprehensive and stable pattern of land uses up on which to plan transportation, water supply, sewerage, and other public facilities and utilities;
- Conserve and protect the city's natural features such as creeks, oak trees, and historic and environmental resources;
- Minimize automobile congestion by promoting safe and effective traffic circulation, and adequate off-street parking facilities; and
- Ensure compatibility between residential and non-residential development and land uses.

Subdivisions (Title 16)

It is the purpose of this title to regulate and control the division of land within the city and to supplement the provisions of the Subdivision Map Act concerning the design, improvement, and survey data of subdivisions, the form and content of all required maps provided by the Subdivision Map Act, and the procedure to be followed in securing the official approval of the city regarding the maps. To accomplish this purpose, the regulations contained in this title are determined to be necessary to:

- Preserve the public health, safety, and general welfare;
- Promote orderly growth and development through implementation of the city's general plan; and
- Ensure that properly designed infrastructure necessary to support public service needs, including but not limited to transportation and utility infrastructure, is provided in conjunction with subdivisions.

Floodplain Ordinance (Chapter 18.04)

The flood hazard areas of city are subject to periodic inundation which results in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety, and general welfare. These flood losses are caused by uses that are inadequately elevated, floodproofed, or protected from flood damage. The cumulative effect of obstructions in areas of special flood hazards which increase flood heights and velocities also contributes to flood losses.

It is the purpose of this chapter to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by legally enforceable regulations applied uniformly throughout the community to all publicly and privately owned land within flood prone, mudslide [i.e. mudflow] or flood related erosion areas. These regulations are designed to:

- Protect human life and health;
- Minimize expenditure of public money for costly flood control projects;
- Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- Minimize prolonged business interruptions;
- Minimize damage to public facilities and utilities such as water and gas mains; electric, telephone and sewer lines; and streets and bridges located in areas of special flood hazard;
- Help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future blighted areas caused by flood damage;
- Ensure that potential buyers are notified that property is in an area of special flood hazard; and
- Ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

In order to accomplish its purposes, this chapter includes regulations to:

- Restrict or prohibit uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or flood heights or velocities;
- Require that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
- Control the alteration of natural floodplains, stream channels, and natural protective barriers, which help accommodate or channel floodwaters;
- Control filling, grading, dredging, and other development which may increase flood damage; and

- Prevent or regulate the construction of flood barriers which will unnaturally divert floodwaters, or which may increase flood hazards in other areas.

This chapter shall apply to all areas of special flood hazards within the jurisdiction of city.

B.5.2. Administrative/Technical Mitigation Capabilities

Table B-37 identifies the City department(s) responsible for activities related to mitigation and loss prevention in the City of Ione.

Table B-37 City of Ione's Administrative and Technical Mitigation Capabilities

Administration	In Place Y/N	Describe capability Is coordination effective?
Staff		**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official	Y	Yes Yes
Civil Engineer, including dam and levee safety	Y	Yes Yes
Community Planner	**Y**	Yes Yes
Emergency Manager	Y	Yes Yes
Floodplain Administrator	Y	Yes Yes
GIS Coordinator	N	
Planning Commission	Y	Yes Yes
Other		
Technical	**Y/N**	**Has capability been used to assess/mitigate risk in the past?**
Grant writing	Y	Yes Yes
Hazard data and information	Y	Yes Yes
GIS analysis		
Mutual aid agreements	Y	Yes
Other		

How can these capabilities be expanded and improved to reduce risk?
Hire a GIS Coordinator: Establish a local GIS position to conduct detailed hazard mapping for floods, wildfires, and extreme heat, reducing reliance on Amador County. This would improve risk assessments for new developments and support mitigation actions. e. Expand Training on Best Management Practices: Provide regular training for the Chief Building Official, Civil Engineer, Community Planner, Emergency Manager, and Floodplain Administrator on updated BMPs for flood, wildfire, heat, and wind mitigation Increase Staffing for Growing Community: As Ione grows add part-time or shared staff for floodplain and emergency management to address financial constraints. Strengthen Inter-Agency Coordination: Formalize agreements with Amador County, CalFire, and Amador Water Agency for real-time hazard data sharing and response planning

Source: City of Ione

B.5.3. Fiscal Mitigation Capabilities

Table B-38 identifies financial tools or resources that the City could potentially use to help fund mitigation activities.

Table B-38 City of Ione's Fiscal Mitigation Capabilities

Funding Resource	In Place Y/N	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	Yes Yes
Community Development Block Grant	Y	Yes Yes
Federal funding programs (non-FEMA)	Y	No Yes
Fees for water, sewer, gas, or electric services	Y	Yes Yes
Impact fees for new development	Y	Yes Yes
State funding programs	Y	Yes Yes
Stormwater utility fee	N	No Yes
Other		
How can these capabilities be expanded and improved to reduce risk?		
Pursue FEMA and State Grants Aggressively: Apply for FEMA HMGP and BRIC grants to fund high-priority mitigation actions certification) and state grants for flood and wildfire projects. Leverage Public-Private Partnerships: Partner with businesses and community organizations to co-fund mitigation projects like cooling centers or urban forestry to reduce heat and wind risks Increase Impact Fee Utilization: Allocate impact fees from new developments to fund hazard-specific infrastructure		

Source: City of Ione

B.5.4. Mitigation Education, Outreach, and Partnerships

Table B-39 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table B-39 City of Ione's Mitigation Education, Outreach, and Partnerships

Program/Organization	In Place Y/N	How widespread are each of these in your community?
Community newsletters	N	
Hazard awareness campaigns (such as Firewise, Storm Ready, Severe Weather Awareness Week, school programs, public events)	Y	School Safety programs. Firewise Certification.
Local news	N	
Organizations that interact with underserved and vulnerable communities	N	
Social media		
How can these capabilities be expanded and improved to reduce risk?		
Expand Hazard Awareness Campaigns: Implement Firewise participation to all neighborhoods and introduce Storm Ready and Severe Weather Awareness Week programs to educate on wildfires, floods, heat waves, and wind events. Partner with schools to expand safety programs to include heat and flood preparedness. Establish Partnerships with Local News Outlets: Collaborate with local media to broadcast hazard alerts and preparedness tips during events like the 2023-2025 heat waves or 2021 wind storms and wildfires. Create Partnerships for Underserved Communities: Partner with Amador County Health and Human Services, churches and non-profits to deliver targeted outreach to low-income, elderly, disabled, and non-English speaking residents. Provide multilingual materials and door-to-door campaigns during heat waves or flood risks. Enhance Social Media Outreach: Increase frequency and targeting of hazard-related posts on the City website, Facebook, and Nextdoor Ione, including real-time alerts for heat waves, wildfires, flood warnings, and wind events.		

Source: City of Ione

B.5.5. Other Mitigation Efforts

The City has many other completed or ongoing mitigation efforts that include the following:

- The City of Ione has implemented several mitigation efforts to address hazards. These include providing sandbags during flood events to protect vulnerable areas. conducting controlled burning and brush cutting to reduce wildfire fuels in high-risk areas and performing tree removal to mitigate risks from heat- and wind-stressed trees, as seen after the 2021 wind event. School education programs promote hazard awareness among students, focusing on fire safety, while social media outreach targets all populations during heat waves, wildfires, wind events and floods, though efforts are limited by staffing and funding constraints.
- Brush cutting to remove fire hazards

B.6 Mitigation Strategy

B.6.1. Mitigation Goals and Objectives

The City of Ione adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

B.6.2. NFIP Mitigation Strategy

The City of Ione joined the National Flood Insurance Program (NFIP) on July 8, 1980. As a participant of the NFIP, the City of Ione has administered floodplain management regulations that meet the minimum requirements of the NFIP. The management program objective is to protect people and property within the City. The City of Ione will continue to comply with the requirements of the NFIP in the future.

In addition, the City of Ione actively participates with Amador County to address local NFIP issues through a regional approach. Many of the program activities are the same for the City of Ione as for Amador County since participation at the County level includes all local jurisdictions.

The City of Ione Building Inspector/Public Works Department provides public outreach activities which include map information services, public awareness, public hazard disclosure, and flood protection information. This information is readily available to the public and consists of current and accurate flood mapping. In addition, the Planning and Engineering Department provides information about our stormwater management program and up-to-date information related to the maintenance of our drainage system.

The NFIP's Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS which are to reduce flood losses, facilitate accurate insurance rating, and promote the awareness of flood insurance. The City of Ione is not a current participant in the CRS program.

More information about the floodplain administration in the City of Ione can be found in Table B-40.

Table B-40 City of Ione Compliance with NFIP

NFIP Topic	Comments
Staff Resources	
Who is responsible for floodplain management in your community? Provide Department/Title. Do they serve any roles other than Community Floodplain Administrator (FPA)?	Planning Department does flood management. Lead Planner is the main manager and serves other roles.
Is the Community FPA or NFIP Coordinator a Certified Floodplain Manager?	No
Is floodplain management an auxiliary function?	Auxiliary
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	Permit review
What are the barriers to running an effective NFIP program in the community, if any?	No barriers noted
Insurance Summary	
How many NFIP policies are in the community? What is the total premium and coverage?	51 policies $46,255 in premiums $2,730,000 in coverage

NFIP Topic	Comments
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	6 paid losses $3,691.57 in paid losses 0 substantial damage claims
How many structures (residential and non-residential) are exposed to flood risk within the community?	371 in 1% annual chance 159 in 0.2% annual chance
Are there Repetitive Loss (RL) and Severe Repetitive Loss Properties (SRL) structures in the community?	0 RL 0 SRL
Describe any areas of flood risk with limited NFIP policy coverage	No areas exist in the City with limited NFIP policy coverage
How does the community teach property owners or other stakeholders about the importance flood insurance?	City newsletter
What digital sources (like the FEMA Map Service Center, National Flood Hazard Layer) or non-regulatory tools does the community use?	FEMA Map Service Center
Compliance History	
Is the community in good standing with the NFIP?	Y
Are there any outstanding compliance issues (i.e., current violations)?	N
Who is responsible (Department, Title) for making substantial damage/improvement determinations? How does the community identify substantially damaged/improved structures? What is the process to make sure these structures are brought into compliance?	The City Manager or designee, serving as the Floodplain Administrator (FPA), is responsible for making substantial damage and substantial improvement determinations (Ione Municipal Code §18.04.140). The City uses FEMA Publication 213, "Answers to Questions About Substantially Damaged Buildings," to develop detailed procedures for identifying and administering substantial improvement and damage requirements, including defining "market value" (§18.04.150(B)(1)). Structures determined to be substantially damaged or improved must comply with the City's Floodplain Management Ordinance (Chapter 18.04) before permits are issued. The FPA coordinates with other departments to ensure corrective action and compliance (§18.04.150(B)(2), §18.04.080, §18.04.150(G)).
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	CAV – 10/29/2008 CAC – 10/12/2023
Is a CAV or CAC scheduled or needed?	N
Regulation	
When did the community enter the NFIP?	7/8/1980
Are the FIRMs digital or paper?	Digital
Has the community adopted the NFIP minimum floodplain management criteria via local regulation? Date of current local regulation?	The City adopted the minimum NFIP floodplain management criteria through Chapter 18.04, Floodplain Management, of the Ione Municipal Code. Date adopted: March 17, 2009 (Ord. No. 422, § I).

NFIP Topic	Comments
Has the community adopted the latest effective FIRM? Date adopted?	Yes. The City of Ione adopted the Flood Insurance Study (FIS) and Flood Insurance Rate Maps (FIRMs) dated June 6, 2000, with subsequent FEMA amendments as part of Chapter 18.04 (§18.04.070).
How does the community enforce local floodplain regulations and monitor compliance?	Update to be completed; current code reads: The City of Ione adopted the current effective Flood Insurance Rate Maps (FIRMs) and Flood Insurance Study (FIS) dated August 28, 2008, as required under Ione Municipal Code §18.04.070. Subsequent Letters of Map Revision (LOMRs) are incorporated via regular DFIRM updates from the FEMA Map Service Center.
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	Meet.
How are Letters of Map Change (LOMCs) tracked and compiled?	New DFIRMs are downloaded regularly which include the latest LOMCs, LOMRs, and CLOMRs
Provide an explanation of the permitting process.	A Floodplain Development Permit is required for all construction, improvements, or land alterations within areas of special flood hazard (§18.04.130). Applications are reviewed by the Floodplain Administrator to confirm compliance with floodplain management standards, verify FEMA elevation or floodproofing certifications, and ensure all other federal and state permits are obtained. Building permits cannot be issued until floodplain permit approval is granted (§18.04.150(A)).
Community Rating System	
Does the community participate in CRS? If so, what is the community's CRS Class Ranking?	No
What categories and activities provide CRS points and how can the class be improved?	N/A
Does the plan include CRS planning requirements?	N/A

Source: City of Ione

B.6.3. Mitigation Actions

The Planning Team for the City of Ione identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Climate Change
- Drought & Water Shortage (w/ tree mortality)
- Floods: 1%/0.2% annual chance (w/levee failure)
- Floods: Localized Stormwater
- Severe Weather: Extreme Heat
- Severe Weather: High Winds and Tornados

- Wildfire

Low priority hazards for mitigation planning include:

- Agricultural Hazards (severe weather/pests/invasive species)
- Avalanche
- Dam Failure
- Earthquake (w/subhazards)
- Landslide, Mudslide, and Debris Flow
- Severe Weather: Extreme Cold, Freeze, and Snow
- Severe Weather: Heavy Rain and Storms (Hail, Lightning)

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five-year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Mitigation Actions

The City has put forward the actions as shown in Table B-41. Details of the actions can be found below the table.

Table B-41 City of Ione Mitigation Actions

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
City of Ione					
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Previous Action	X	X		Prevention
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	Previous Action	X	X	X	Prevention Public Education
Action 3. Develop a Climate Adaptation Plan	New Action	X	X	X	Prevention Public Education
Action 4. Implement Water Conservation and Drought Preparedness Program	New Action	X	X		Prevention Property Protection Natural Resource Protection

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 5. Update Floodplain Ordinance and Join Community Rating System (CRS)	Previous Action	X	X	X	Prevention Property Protection Natural Resource Protection
Action 6. Develop a Storm Water Master Plan	Previous Action	X	X	X	Prevention Public Education
Action 7. Establish a Cooling Center Network and Shelter Upgrades	Previous Action	X	X		Emergency Services Prevention Property Protection Natural Resource Protection
Action 8. Implement Urban Forestry and Debris Management Program	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 9. Enhance Wildfire Preparedness and Defensible Space	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 10. Develop a Sustainable Sutter Creek Maintenance Program	New Action	X	X		Prevention Property Protection Natural Resource Protection

Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Hazards Addressed: Multi-hazard (Agricultural Hazards (severe weather/pests/invasive species), Avalanche, Climate Change, Dam Failure, Drought & Water shortage (w/ tree mortality), Earthquake (w/subhazards), Floods: 1%/0.2% annual chance (w/ levee failure), Floods: Localized Stormwater, Landslide, Mudslide, Debris Flow, Severe Weather: Extreme Cold, Freeze, and Snow, Severe Weather: Extreme Heat, Severe Weather: Heavy Rains and Storms (Hail, Lightning), Severe Weather: High Winds and Tornadoes, Wildfire (w/smoke and air quality))

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): Local jurisdictional reimbursement for mitigation projects and cost recovery after a disaster is guided by Government Code Section 8685.9 (AB 2140).

Project Description: Specifically, this section requires that each jurisdiction adopt a local hazard mitigation plan (LHMP) in accordance with the federal Disaster Mitigation Act of 2000 as part of the Safety Element of its General Plan. Adoption of the LHMP into the Safety Element of the General Plan may be by reference or incorporation.

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Safety Element of General Plan

Responsible Office/Partners: City of Ione Planning Department

Benefits (Losses Avoided): Incorporation of an adopted LHMP into the Safety Element of the General Plan will help jurisdictions maximize the cost recovery potential following a disaster.

Potential Funding (Local Budgets, Grant Funds, etc.): City General Fund

Timeline: Within 5 years.

Project Priority (High, Medium, Low): High

Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness

Hazards Addressed: Multi-hazard (Agricultural Hazards (severe weather/pests/invasive species), Avalanche, Climate Change, Dam Failure, Drought & Water shortage (w/ tree mortality), Earthquake (w/subhazards), Floods: 1%/0.2% annual chance (w/ levee failure), Floods: Localized Stormwater, Landslide, Mudslide, Debris Flow, Severe Weather: Extreme Cold, Freeze, and Snow, Severe Weather: Extreme Heat, Severe Weather: Heavy Rains and Storms (Hail, Lightning), Severe Weather: High Winds and Tornadoes, Wildfire (w/smoke and air quality))

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): The City and County play a key role in public outreach/education efforts to communicate the potential risk and vulnerability of their community to the effects of natural hazards. A comprehensive multi-hazard public education program will better inform the community of natural hazards of concern and actions the public can take to be better prepared for the next natural disaster event.

Project Description: A comprehensive multi-hazard outreach program will ascertain both broad and targeted educational needs throughout the community. The City will work with the County and other agencies as appropriate to develop timely and consistent annual outreach messages in order to communicate the risk and vulnerability of natural hazards of concern to the community. This includes measures the public can take to be better prepared and to reduce the damages and other impacts from a hazard event. The public outreach effort will leverage and build upon existing mechanisms, and will consider:

- Using a variety of information outlets, including websites, local radio stations, news media, schools, and local, public sponsored events;
- Creating and distributing (where applicable) brochures, leaflets, water bill inserts, websites, and public service announcements;
- Displaying public outreach information in County office buildings, libraries, and other public places and events;
- Developing public-private partnerships and incentives to support public education activities.

Other Alternatives: Continue public information activities currently in place.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Existing City and County outreach programs will be reviewed for effectiveness and leveraged and expanded upon to reach the broader region.

Responsible Office/Partners: City of Ione Planning Department in partnership with the County

Benefits (Losses Avoided): Increase residents' knowledge of potential hazards and activities required to mitigate hazards and be better prepared. Protect lives and reduce damages, relatively low cost to implement.

Potential Funding (Local Budgets, Grant Funds, etc.): City General Fund, grant funds (like CA DWR, Cal OESPDM, HMGP, FMA, BRIC, or other sources).

Timeline: Ongoing/Annual public awareness campaign

Project Priority (High, Medium, Low): High

Action 3. Develop a Climate Adaptation Plan

Hazards Addressed: Climate Change, Severe Weather: Extreme Heat, Drought & Water Shortage, Floods: 1%/0.2% Annual Chance, Floods: Localized Stormwater, Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): Climate change exacerbates Ione's hazards, increasing heat wave frequency (e.g., 2023-2025, 100-106°F), drought severity (2020-2022), and intense storms (2023), impacting vulnerable populations (13.8% low-income households, Table B-4) and infrastructure (e.g., downtown, $44.1M commercial value, Table B-6).

Project Description: Develop a Climate Adaptation Plan to integrate climate resilience into city planning, including heat-resistant building standards, water conservation measures, and flood mitigation strategies. Coordinate with Amador County and state agencies for data and funding.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: This action will create the planning mechanism.

Responsible Office/Partners: City of Ione Planning Department, City of Ione Administration, Amador County, CalOES, California Natural Resources Agency.

Benefits (Losses Avoided): Reduces long-term impacts on infrastructure, economic assets, and vulnerable populations (e.g., Ione Apartments) by addressing climate-driven hazards.

Potential Funding (Local Budgets, Grant Funds, etc.): FEMA Building Resilient Infrastructure and Communities (BRIC) or HMA grants, state climate grants, City General Fund.

Timeline: 2–3 years (2025-2028).

Project Priority (High, Medium, Low): High.

Action 4. Implement Water Conservation and Drought Preparedness Program

Hazards Addressed: Drought & Water Shortage, Climate Change

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background (Problem Statement): Ione's high-significance drought risk (2020 LHMP, likely/catastrophic) threatens water supplies for residents, businesses (e.g., Mule Creek State Prison, 20.7% employment, Table B-3), and new developments (e.g., Castle Oaks), worsened by climate change (2020-2022 drought).

Project Description: Launch a water conservation program with public education, low-flow fixture incentives, and xeriscaping requirements for new developments. Partner with Amador Water Agency to monitor supplies and enforce restrictions.

Other Alternatives: Be reactive instead of proactive.

Existing Planning Mechanism(s) through which Action Will Be Implemented: None.

Responsible Office/Partners: City of Ione Public Works, City of Ione Administration, Amador Water Agency, Planning Department, Amador County.

Benefits (Losses Avoided): Reduces water shortages, protects economic assets, and supports vulnerable populations during droughts.

Potential Funding (Local Budgets, Grant Funds, etc.): State grants (Department of Water Resources), CDBG, City General Fund.

Timeline: 1–2 years (2025-2027), ongoing.

Project Priority (High, Medium, Low): High.

Action 5. Update Floodplain Ordinance and Join Community Rating System (CRS)

Hazards Addressed: Floods: 1%/0.2% Annual Chance, Floods: Localized Stormwater, Climate Change

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background (Problem Statement): The Floodplain Ordinance (Chapter 18.04) ensures NFIP compliance but needs updates to address climate-driven flood risks (e.g., 2023 storms near Sutter Creek, Mule Creek). Joining CRS could reduce insurance costs for residents in flood-prone areas (e.g., downtown).

Project Description: Revise Chapter 18.04 to incorporate updated FEMA standards and CRS requirements, such as stricter development restrictions and public outreach. Enroll in CRS to lower flood insurance premiums.

Other Alternatives: Be out of compliance with FEMA NFIP.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Floodplain ordinance

Responsible Office/Partners: City of Ione Floodplain Administrator, Planning Department, City of Ione Administration, FEMA, Amador County.

Benefits (Losses Avoided): Reduces flood damage to downtown ($44.1M value, Table B-6) and vulnerable areas, lowers insurance costs, and enhances grant eligibility.

Potential Funding (Local Budgets, Grant Funds, etc.): FEMA HMGP, state grants, City General Fund.

Timeline: 1–2 years (2025-2027).

Project Priority (High, Medium, Low): High.

Action 6. Develop a Storm Water Master Plan

Hazards Addressed: Floods: Localized Stormwater, Floods: 1%/0.2% Annual Chance, Climate Change

Issue/Background (Problem Statement): Localized flooding in W. Marlette Road, Main Street, and Five Mile Drive (2025 Risk Assessment Worksheet) results from outdated clay pipes and insufficient drainage, worsened by 2023 storms and climate-driven rainfall intensity.

Project Description: Create a Storm Water Master Plan to assess and upgrade drainage systems, replace collapsed clay pipes, and implement green infrastructure (e.g., bioswales). Introduce a stormwater utility fee to fund maintenance.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: This will create the planning mech.

Responsible Office/Partners: City of Ione Public Works, City of Ione Administration City Engineer, Amador County, FEMA.

Benefits (Losses Avoided): Reduces flood damage to infrastructure and vulnerable areas (e.g., Jose's Apartment Complex), minimizing economic and safety impacts.

Potential Funding (Local Budgets, Grant Funds, etc.): FEMA HMGP, CDBG, state grants, stormwater utility fee.

Timeline: 2–3 years (2025-2028).

Project Priority (High, Medium, Low): High.

Action 7. Establish a Cooling Center Network and Shelter Upgrades

Hazards Addressed: Severe Weather: Extreme Heat, Climate Change

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background (Problem Statement): Heat waves (2023-2025, 100-106°F) strain Evalyn Bishop Hall's limited cooling capacity, leaving vulnerable populations (e.g., low-income, elderly at Ione Apartments) at risk. The Ione Branch Library's part-time hours (e.g., 10 a.m.-1 p.m. Mon/Wed) limit cooling access.

Project Description: Upgrade Evalyn Bishop Hall with high-efficiency air conditioning and accessibility features. Establish additional cooling centers at schools or churches (e.g., Community Methodist Church). Provide ice chests and water during heat waves, as done in 2023-2025.

Other Alternatives: None.

Existing Planning Mechanism(s) through which Action Will Be Implemented: None.

Responsible Office/Partners: City of Ione Emergency Manager, City of Ione Fire Department, City of Ione Administration, Public Works, Red Cross, Amador County OES.

Benefits (Losses Avoided): Reduces heat-related illnesses, protects vulnerable populations, and ensures reliable cooling during heat waves.

Potential Funding (Local Budgets, Grant Funds, etc.): FEMA HMGP, CDBG, state grants.

Timeline: 2–3 years (2025-2028).

Project Priority (High, Medium, Low): High.

Action 8. Implement Urban Forestry and Debris Management Program

Hazards Addressed: Severe Weather: High Winds and Tornadoes, Severe Weather: Extreme Heat, Wildfire, Climate Change

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): Wind events (e.g., 2021, 40-50 mph) and heat waves (2023-2025) caused tree falls, leading to cleanup costs and hazards (e.g., Main Street road closures). Dry vegetation increases wildfire risks.

Project Description: Develop a program for regular tree inspections, removal of stressed trees, and planting of heat-resistant species. Enhance debris management to reduce wildfire fuels and wind-related hazards.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Existing program.

Responsible Office/Partners: City of Ione Public Works, City of Ione Administration, City of Ione Fire Department, CalFire, Amador Resource Conservation District.

Benefits (Losses Avoided): Reduces debris hazards, wildfire risks, and urban heat impacts, protecting infrastructure and residents.

Potential Funding (Local Budgets, Grant Funds, etc.): USDA, state environmental grants, FEMA HMGP.

Timeline: 2–3 years (2025-2028).

Project Priority (High, Medium, Low): Medium.

Action 9. Enhance Wildfire Preparedness and Defensible Space

Hazards Addressed: Wildfire, Climate Change

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): High wildfire risk in grassland areas and was evident during the 2021 Caldor Fire, with smoke and evacuation threats. Current ordinances and Firewise efforts need expansion to cover new developments.

Project Description: Update wildfire ordinances to mandate defensible space and fire-resistant materials in high-risk areas. Expand Firewise certification community-wide and conduct controlled burns/brush cutting.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: None.

Responsible Office/Partners: City of Ione Fire Department, City of Ione Administration, Planning Department, CalFire, Planning Commission.

Benefits (Losses Avoided): Reduces wildfire spread, protects economic assets (e.g., downtown, $44.1M), and enhances safety.

Potential Funding (Local Budgets, Grant Funds, etc.): FEMA HMGP, state grants, impact fees.

Timeline: 1–2 years (2025-2027).

Project Priority (High, Medium, Low): High.

Action 10. Develop a Sustainable Sutter Creek Maintenance Program

Hazards Addressed: Floods: 1%/0.2% Annual Chance, Floods: Localized Stormwater, Climate Change

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background (Problem Statement): Sutter Creek's vegetation and debris accumulation increase flood risks (e.g., 2023 storms), requiring complex permitting from the California Department of Fish and Wildlife and coordination with multiple landowners.

Project Description: Establish a multi-year stream maintenance program to streamline permitting, secure landowner agreements, and conduct regular clearing. Distribute sandbags during flood events, as done in 2023.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: This action would create the program.

Responsible Office/Partners: City of Ione Public Works, City Engineer, Ione Creek Committee, California Department of Fish and Wildlife, Amador County, landowners.

Benefits (Losses Avoided): Reduces flood risks to downtown and vulnerable areas (e.g., Jose's Apartment Complex), minimizing property damage.

Potential Funding (Local Budgets, Grant Funds, etc.): FEMA HMGP, state grants (DWR), CDBG.

Timeline: 2–3 years (2025-2028).

Project Priority (High, Medium, Low): High.

Annex C City of Jackson

C.1 Introduction

This Annex details the hazard mitigation planning elements specific to the City of Jackson, a previously participating jurisdiction to the 2020 Amador County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the City. This Annex provides additional information specific to the City of Jackson, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this jurisdiction.

C.2 Planning Process

As described above, the City of Jackson followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Amador County Hazard Mitigation Planning Committee (HMPC), the City formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table C-1. Additional details on Plan participation and City representatives are included in Appendix A.

Table C-1 City of Jackson – Planning Team

Name	Position/Title	How Participated
Carl Simpson	City Manager	Coordination and oversight
Ryan Pidgeon	Fire Chief	Coordination/oversight/mitigation analysis and research/ attended HMPC meetings
Erin Ventura	Planner	Mitigation analysis and research
BJ Wallace	Building Inspector	Mitigation analysis and research

Coordination with other community planning efforts is paramount to the successful implementation of this LHMP Update. This section provides information on how the City integrated the previously approved 2020 LHMP into existing planning mechanisms and programs. Specifically, the City incorporated into or implemented the 2020 LHMP through other plans and programs shown in Table C-2.

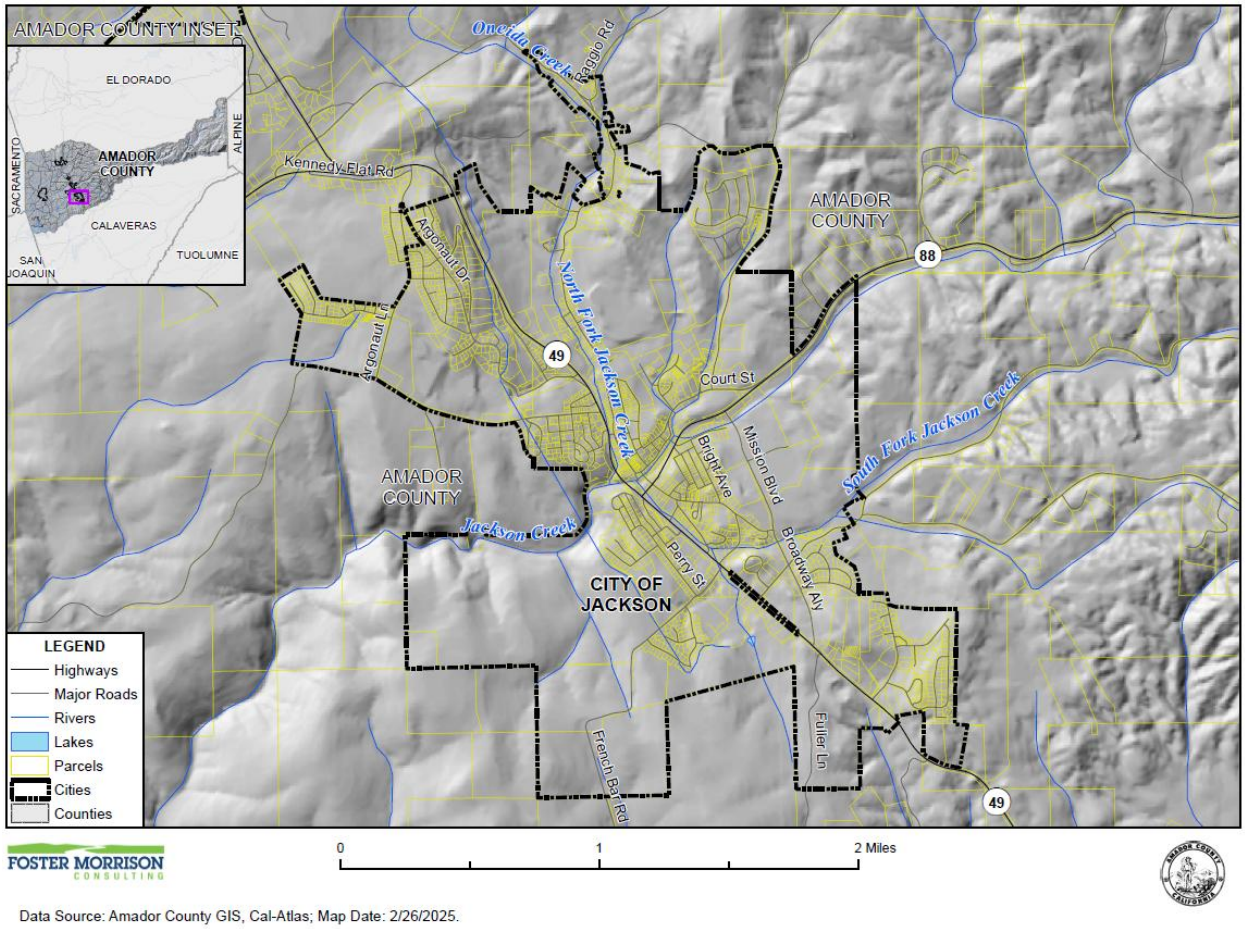
Table C-2 2020 LHMP Incorporation

Planning Mechanism 2020 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
General Plan Safety Element, 2023	LHMP was incorporated by reference
General Plan Land Use Element, 2023	LHMP was incorporated by reference

C.3 Community Profile

The community profile for the City of Jackson is detailed in the following sections. Figure C-1 displays a City map and the location of City of Jackson within Amador County.

Figure C-1 City of Jackson



Data Source: Amador County GIS, Cal-Atlas; Map Date: 2/26/2025.

C.3.1. Geography and Climate

The City of Jackson, at 1,200-1,600 feet, is located in the heart of California's historic Mother Lode in the Sierra Nevada foothills, 45 miles east of Sacramento and Stockton. Jackson began as a gold mining camp

in 1848 and today is the County Seat. Jackson combines the gold rush era downtown district and Victorian era neighborhoods with modern subdivisions and shopping centers. Jackson enjoys a diversified economy supported by agribusiness, government, and tourism. Commercial activities include a vibrant historic downtown district, two major grocery chain stores, and a variety of personal service providers. Jackson is also home to the only movie theater complex in Amador County, and hosts a number of well attended seasonal events and festivities that are famous throughout the Mother Lode, the Sacramento Valley, and Northern California. The Shenandoah Valley and its wineries are also close by.

Generally, Jackson enjoys a relatively mild climate. The climate in Jackson is characterized by warm summer and moderate winter temperatures. The mean annual temperature in the Jackson area is 46°F in January and 78°F in July. The mean annual precipitation is 22 inches, of which 6.2 inches falls in January and only 0.2 inches in July.

Summer temperatures generally range between 80°F and 102°F, with the occasional summer thunderstorm. During the winter months, temperatures can dip below the freezing mark but not for prolonged periods of time. Occasional snow will fall but normally not enough to impede normal living routines. Jackson rarely has, only about once every 8 years, more than usual snowfall activity. Jackson has very shallow to moderately deep, rocky, or gravelly soils composed of metabasic rocks and metasedimentary slate and schist.

C.3.2. History

Jackson, the person, was born early in the Gold Rush when miners began working the area near Marshall's discovery site. In 1848, Col. Alden Jackson and his party set up camp near a spring in the center of town. For years, Jackson was known as a "Mother Lode Mecca." Pits and small shafts were used in the 1850s, but after placers ran out in the 1860s, hard rock mining was king. The downtown area of Jackson was almost totally destroyed by fire in August 1862. Many downtown buildings date from the 1862-63 reconstruction.

C.3.3. Economy and Tax Base

US Census estimates show economic characteristics for the City of Jackson. These are shown in Table C-3 and Table C-4. Mean household income in the City was $89,766. Median household income in the City was $75,051.

Table C-3 City of Jackson – Civilian Employed Population 16 years and Over

Industry	Estimated Employment	Percent
Agriculture, forestry, fishing and hunting, and mining	57	2.9%
Construction	170	8.7%
Manufacturing	86	4.4%
Wholesale trade	0	0.0%
Retail trade	273	13.9%
Transportation and warehousing, and utilities	95	4.8%

Industry	Estimated Employment	Percent
Information	0	0.0%
Finance and insurance, and real estate and rental and leasing	133	6.8%
Professional, scientific, and management, and administrative and waste management services	243	12.4%
Educational services, and health care and social assistance	208	15.7%
Arts, entertainment, and recreation, and accommodation and food services	253	12.9%
Other services, except public administration	206	10.5%
Public administration	135	6.9%

Source: US Census Bureau American Community Survey 2023 Estimates

Table C-4 City of Jackson – Income and Benefits

Income Bracket	Percent
<$10,000	6.6%
$10,000 – $14,999	9.7%
$15,000 - $24,9999	2.3%
$25,000 – $34,999	9.5%
$35,000 – $49,999	7.6%
$50,000 – $74,999	14.2%
$75,000 – $99,999	19.6%
$100,000 – $149,999	14.6%
$150,000 – $199,999	8.1%
$200,000 or more	7.9%

Source: US Census Bureau American Community Survey 2023 Estimates

According to the California Economic Development Department, major employers in Jackson include:

- Amador County Sherriff and Coroner
- American Legion Ambulance
- Jackson Junior High School
- Kit Carson Nursing and Rehab
- Lowe's
- Raleys
- Safeway
- SaveMart
- Sutter Amador Hospital and Lab
- Timber Products Co
- Walmart

C.4 Risk Assessment

As defined by FEMA, risk is a combination of hazard, vulnerability, and exposure. "It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage."

The City of Jackson risk assessment identifies and profiles relevant hazards and assesses the exposure of lives, property, infrastructure, and the environment to these hazards. The process allows for a better understanding of the City's potential risk and vulnerability to hazards and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

Building on the Community Profile above, a risk assessment was performed for the City. This includes the following sections:

- C.4.1 Assets Inventory and Growth and Development Trends
- C.4.2 Hazard Identification
- C.4.3 Hazard Profiles and Vulnerability to Specific Hazards

C.4.1. Assets Inventory and Growth and Development Trends

This section provides an inventory of the City of Jackson's total assets potentially at risk to hazards and an overview of growth and development trends. This section is broken into two parts:

- **Asset Inventory** – The assets inventory identifies the City of Jackson's total assets, including the people and populations; structures; critical facilities and infrastructure; community lifelines; natural, historic, and cultural resources; and economic assets and community activities of value. This data is not hazard specific, but is representative of total assets within the City, potentially at risk to identified hazards as discussed in Section C.4.3 Hazard Profiles and Vulnerability to Specific Hazards.
- **Growth and Development Trends** – A discussion of growth and development trends in the City, both current and future, is presented.

Assets Inventory

The City's asset inventory is detailed in the following sections:

- People and Populations
- Structures
- Critical Facilities and Infrastructure
- Community Lifelines
- Natural, Historic, and Cultural Resources
- Economic Assets and Community Activities of Value

A discussion of each of these assets follows and serves as the template for the asset discussion for each hazard in Section C.4.3.

People and Populations

The most important asset within any community are the people and populations that reside in the community. This section includes an inventory of past and current populations of the City and also discusses vulnerable populations and underserved communities as a subsection of people and populations located within the City and potentially at risk to hazards. Information from the City, US Census Bureau, California Department of Finance, and other sources as detailed below form the basis of this discussion.

Historic Population Trends and Current Population

Population growth can increase the number of people living in hazard prone areas. The City of Jackson has 4,822 residents, as of January 1, 2025. The City of Jackson has seen growth rates as shown in Table C-5. As shown, the City has grown consistently since 1950, with growth slowing recently since the 2020 LHMP.

Table C-5 City of Jackson– Population Changes Since 1950

Year	Population	% Change
1950	1,879	–
1960	1,852	-1.4%
1970	1,924	3.9%
1980	2,331	21.2%
1990	3,545	52.1%
2000	3,989	12.5%
2010	4,651	16.6%
2020	5,019	7.9%
2025	4,822	-4.1%

Source: US Census Bureau, California Department of Finance (2025)

Underserved and Vulnerable Populations and Disadvantaged Communities

The City has a socially and economically diverse community, and many residents that are socially or economically disadvantaged or vulnerable due to varying reasons reside within the City. The City and surrounding County are no strangers to large natural disasters which have had a direct impact on the populations of the area. Thus, it is important to consider the potential effects of hazard events and disasters on these more vulnerable populations. Socially vulnerable and disadvantaged communities in the City are discussed by the following sources:

- CDC Social Vulnerability Index
- California Department of Water Resources (CA DWR) Special Populations and Disadvantaged Community Mapping
- FEMA Community Disaster Resilience Zones
- City Planning Team Input

CDC Social Vulnerability Index

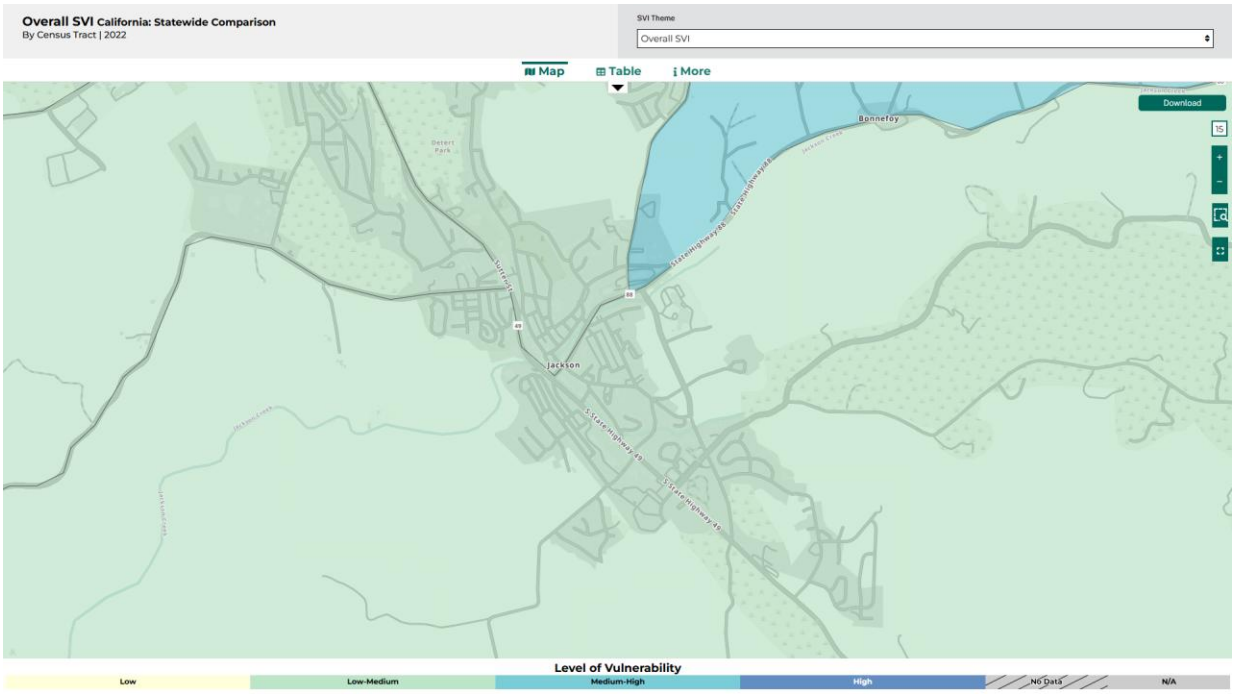
Every community must prepare for and respond to a hazard event, including the range of natural hazards addressed in this Plan, from severe weather extremes to large potentially catastrophic events such as wildfires or earthquakes. A number of factors, including poverty, lack of access to transportation, and crowded housing may weaken a community's ability to prevent human suffering and financial loss in a disaster. These factors are known as social vulnerability.

Social vulnerability refers to the potential negative effects on communities caused by external stresses on human health. Such stresses include natural or human-caused disasters, or disease outbreaks. Reducing social vulnerability can decrease both human suffering and economic loss. The Agency for Toxic Substances and Disease Registry (ATSDR) Geospatial Research, Analysis & Services Program (GRASP) created databases to help emergency response planners and public health officials identify and map communities that will most likely need support before, during, and after a hazardous event. The CDC used these databases to create the CDC Social Vulnerability Index (CDC SVI), which uses 15 U.S. census variables to help local officials identify communities that may need additional support before, during, or after disasters.

CDC SVI uses U.S. Census data to determine the social vulnerability of every census tract. Census tracts are subdivisions of counties for which the Census collects statistical data. The CDC SVI ranks each tract on 15 social factors, including poverty, lack of vehicle access, and crowded housing, and groups them into four related themes. Each tract receives a separate ranking for each of the four themes, as well as an overall ranking. Maps of the four themes for the City are shown in the figures below.

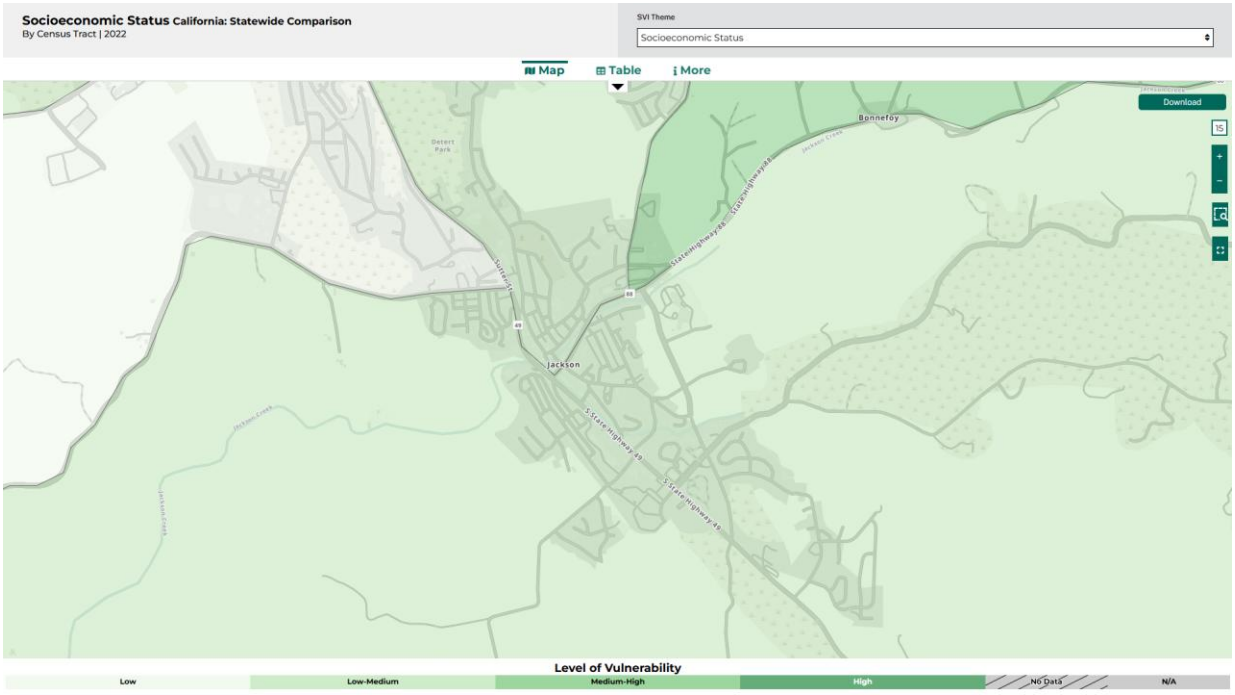
The overall SVI map is shown in Figure C-2; the socioeconomic SVI for the census tracts in and around the City are shown in Figure C-3; the household composition SVI is shown in Figure C-4; the minority and language SVI is shown in Figure C-5; and the housing and transportation SVI is shown in Figure C-6. Overall, the maps indicate that, in general, the City sees little change in social vulnerability regardless of location. As shown, there is very minimal change in each SVI across the City.

Figure C-2 City of Jackson – Overall Social Vulnerability



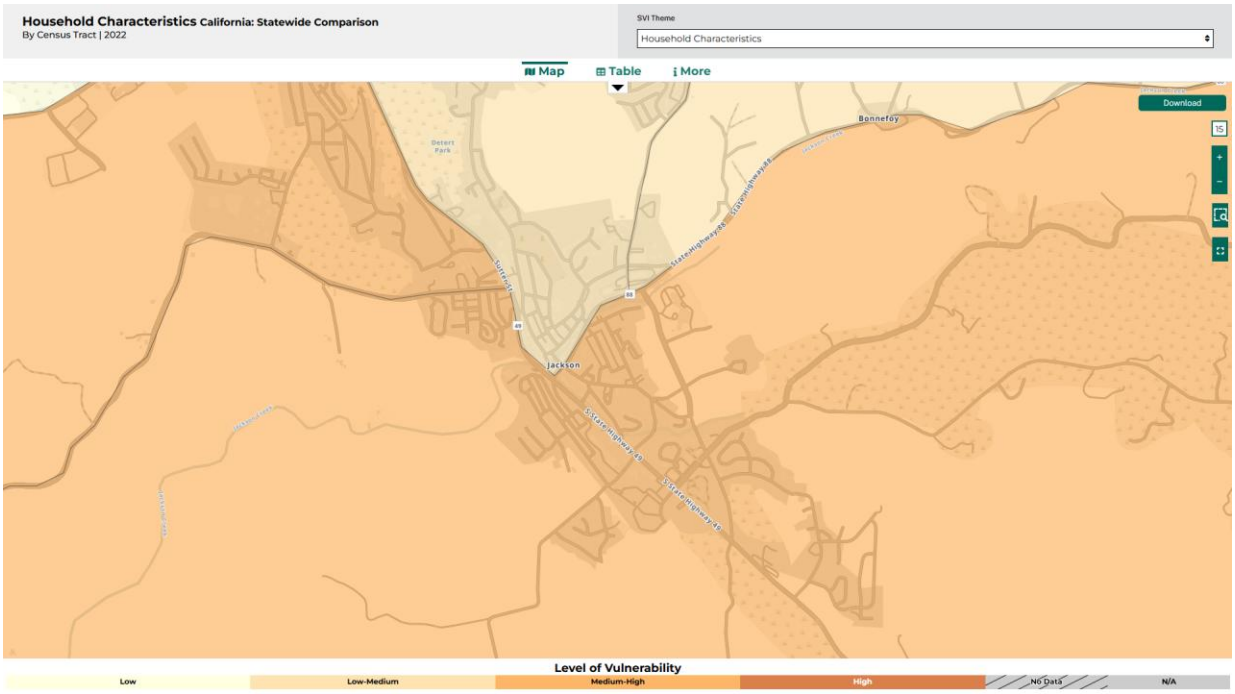
Source: CDC Social Vulnerability Index – map retrieved 12/16/2024
Level of Vulnerability Rating: **Yellow** – Low; **Green** – Low/Medium; **Aqua** – Medium/High; **Blue** – High; **Grey Hatched** – No Data; **Grey** – Not Available

Figure C-3 City of Jackson – Socioeconomic Status Vulnerability



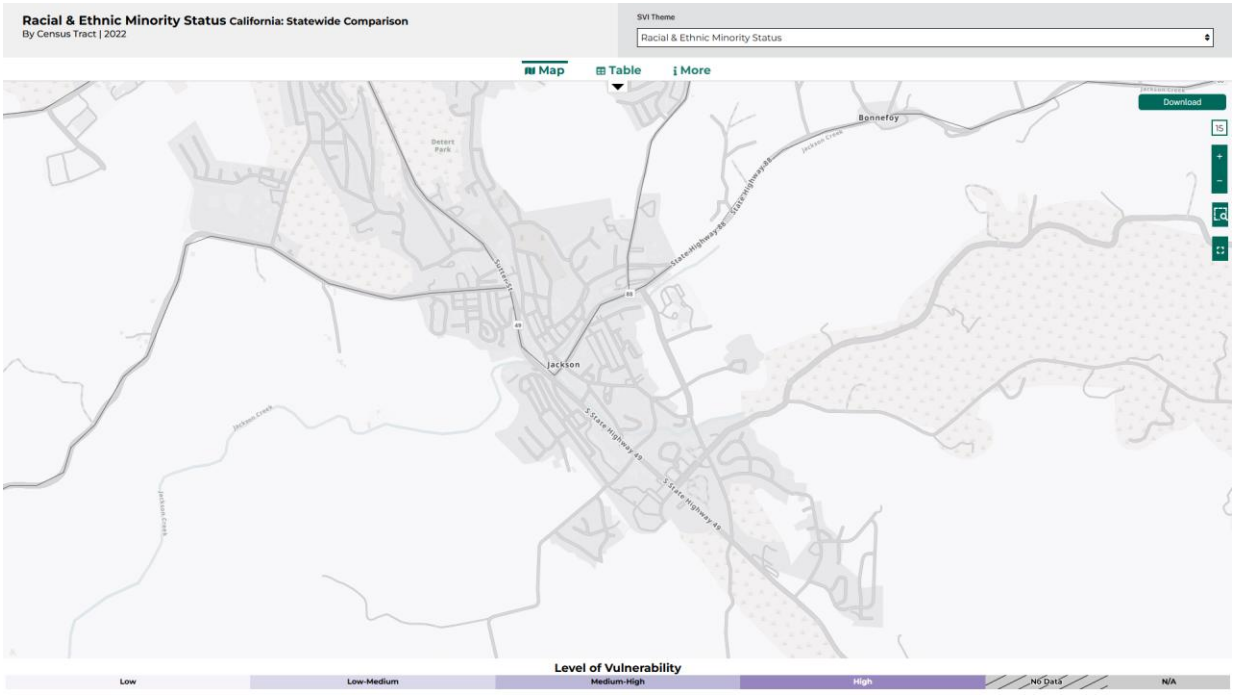
Source: CDC Social Vulnerability Index – map retrieved 12/16/2024
Level of Vulnerability Rating: **Faint Green** – Low; **Light Green** – Low/Medium; **Green** – Medium/High; **Dark Green** – High; **Grey Hatched** – No Data; **Grey** – Not Available

Figure C-4 City of Jackson – Household Characteristics



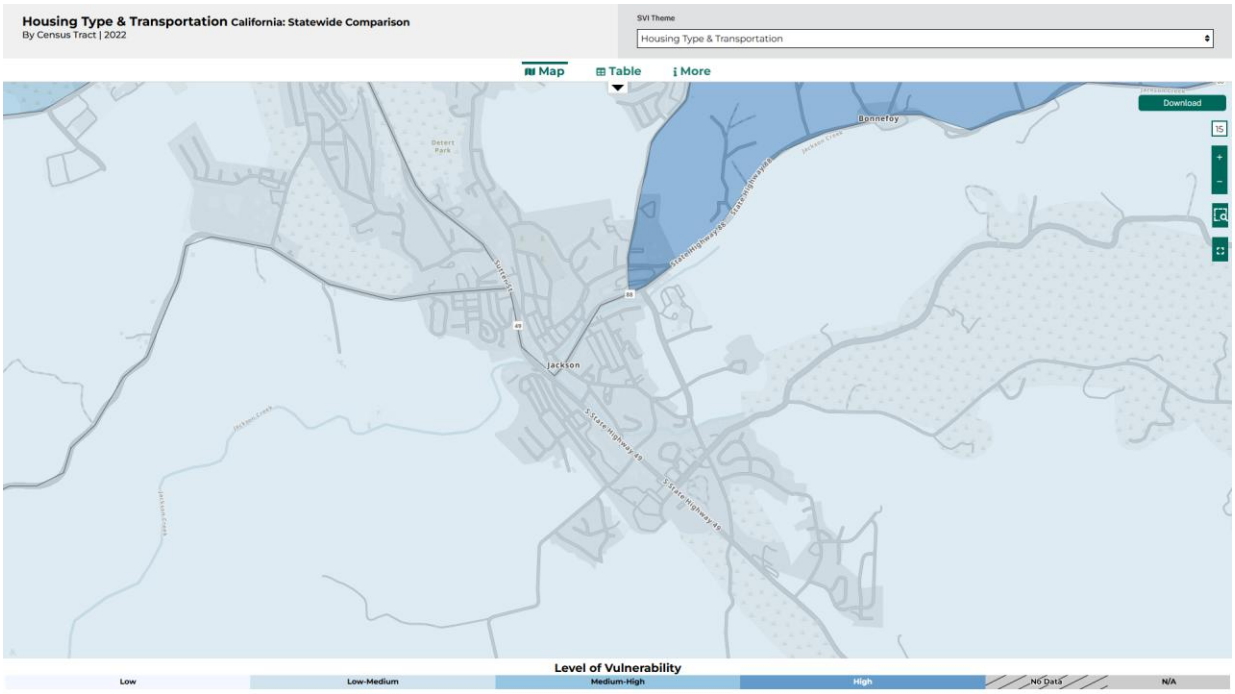
Source: CDC Social Vulnerability Index – map retrieved 12/16/2024
Level of Vulnerability Rating: **Faint Orange** – Low; **Light Orange**– Low/Medium; **Orange** – Medium/High; **Dark Orange** – High; **Grey Hatched** – No Data; **Grey** – Not Available

Figure C-5 City of Jackson – Racial and Ethnic Minority Status



Source: CDC Social Vulnerability Index – map retrieved 12/16/2024
Level of Vulnerability Rating: **Faint Purple** – Low; **Light Purple** – Low/Medium; **Purple** – Medium/High; **Dark Purple** – High; **Grey Hatched** – No Data; **Grey** – Not Available

Figure C-6 City of Jackson – Housing Type and Transportation

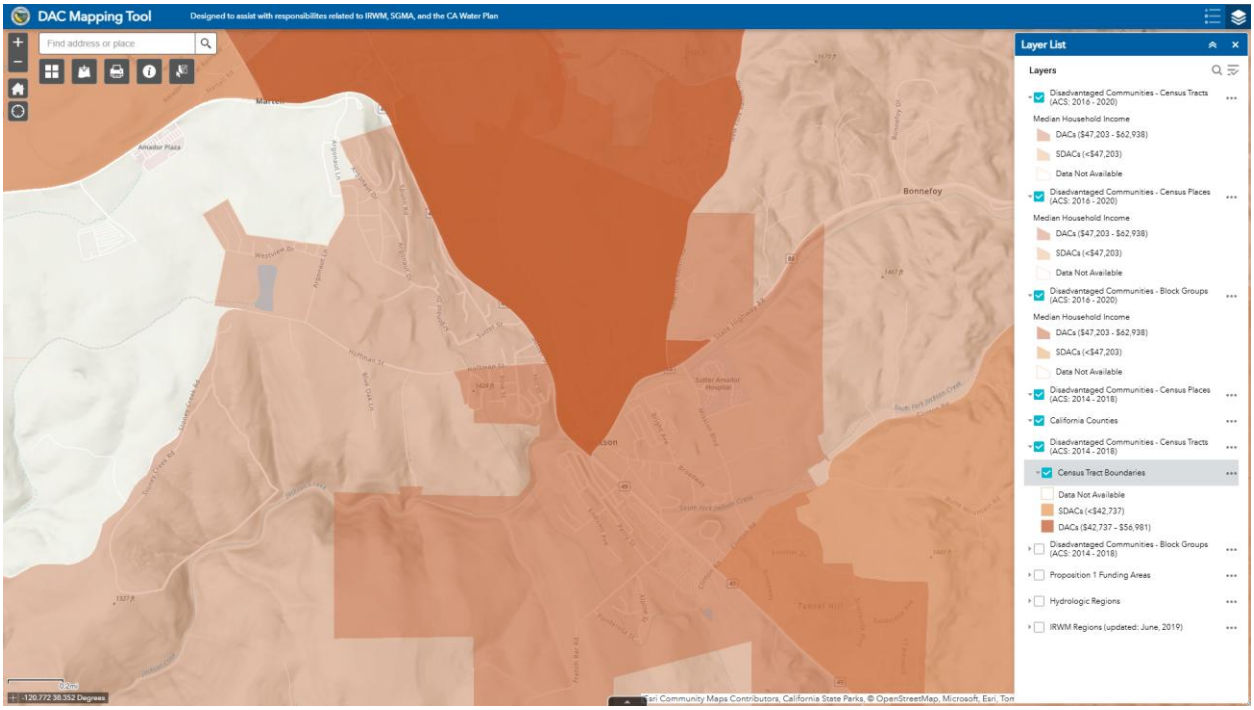


Source: CDC Social Vulnerability Index – map retrieved 12/16/2024
Level of Vulnerability Rating: **Faint Blue** – Low; **Light Blue** – Low/Medium; **Blue** – Medium/High; **Dark Blue** – High; **Grey Hatched** – No Data; **Grey** – Not Available

California DWR Disadvantaged Community Mapping Tool

The State of California's Proposition 1 Disadvantaged Community (DAC) Involvement Program is designated to ensure the involvement of DACs as well as Economically Distressed Areas and Underrepresented Communities, which DWR collectively refers to as DACs. The Cal DWR definition for a Disadvantaged Community is a community with an annual median household income (MHI) that is less than 80% of the Statewide annual MHI (PRC Section 75005(g)), and those census geographies with an annual MHI less than 60% of the Statewide annual MHI are considered "Severely Disadvantaged Communities". Those areas in the City considered disadvantaged are shown in Figure C-7. As shown, much of the City falls in these DAC areas.

Figure C-7 City of Jackson – Disadvantaged Areas

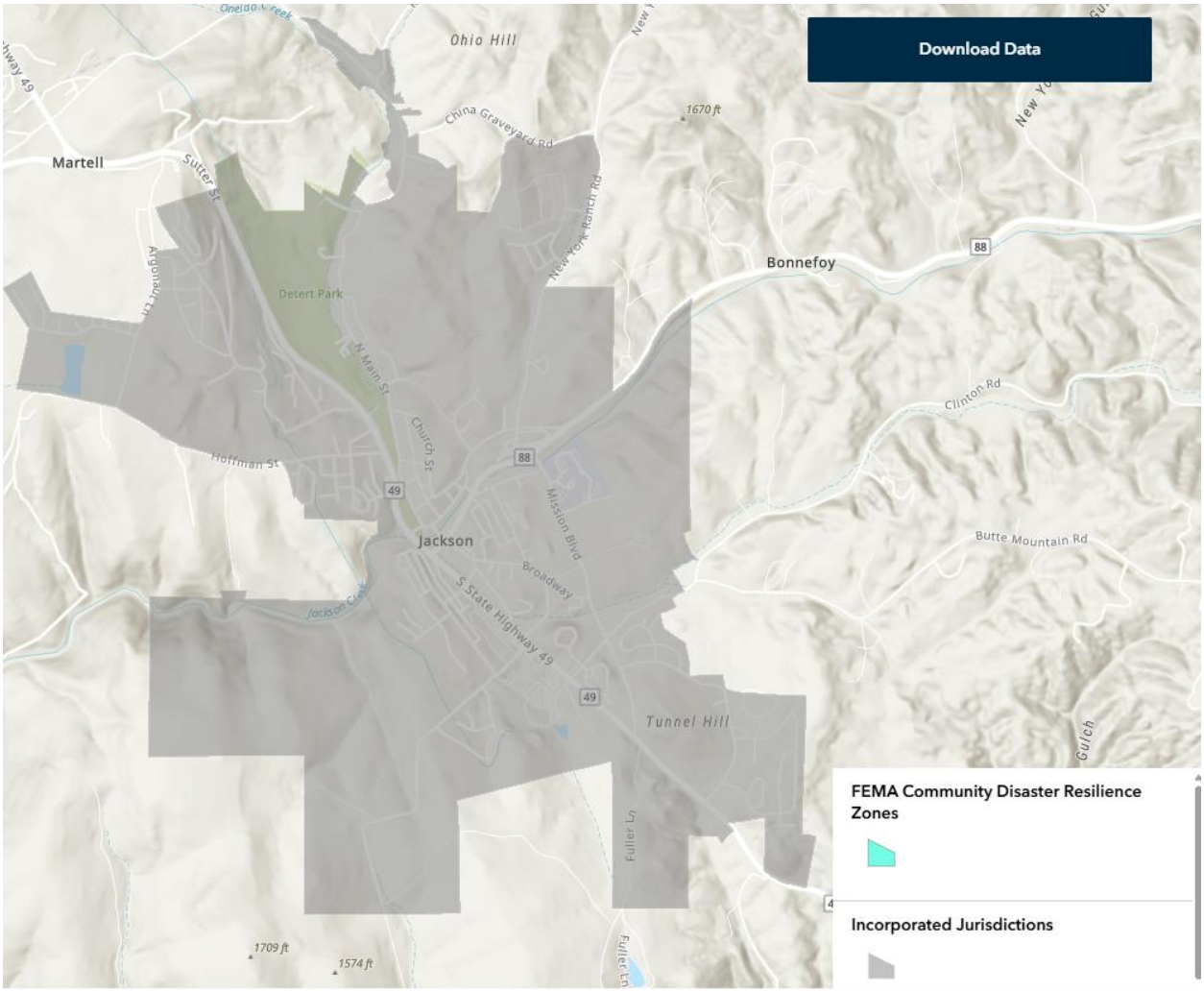


Source: Cal DWR DAC Mapping Tool – retrieved 12/16/2024

FEMA Community Disaster Resilience Zones

Community Disaster Resilience Zones aim to build and strengthen community resilience across the nation by driving federal, public, and private resources to the most at-risk and in-need communities. The Community Disaster Resilience Zones Act uses FEMA's National Risk Index to identify the most at-risk and in-need communities to identify resilience zones. Designated zones will be prioritized for targeted federal support, such as increased cost-share for resilience and mitigation projects, lessening the financial burden on communities to perform resilience-related activities. On September 6, 2023, FEMA announced the initial 483 designations in all 50 states and the District of Columbia. Figure C-8 shows these zones in teal green. As shown, these areas do not lie near the City.

Figure C-8 City of Jackson – FEMA Community Disaster Resilience Zones



Source: FEMA. Map retrieved 12/16/2024

City Planning Team Input

There are certain populations in the City that are at greater risk to hazards, due to circumstances beyond their control. These populations in the City present a unique challenge when natural hazards arise.

Approximately 33.8% (2023 US Census American Community Survey Estimates) of the City's population is over the age of 65. The bulk of these citizens reside in three age restricted (55 and older) subdivisions within the City limits: Rollingwood Mobile Home Park, Village Glen, and Jackson View Estates. A fair number also reside in the five residential care facilities located in the City.

City of Jackson Items from the Amador County 2021-2029 Housing Element

The City Planning Team noted that the Amador County 2021-2029 Housing Element discusses special populations in the City. While the Housing Element information can be found in the base plan, there are unique elements to the City that are included here. Discussions for seniors, those with disabilities,

developmental disabilities, people experiencing homelessness, large households, female headed households, extremely low-income households, and farmworkers were included. These are discussed below.

Seniors

The total population of seniors in the City is 1,397 (29.4%) persons. 35.7% of this population are owners while 5.2% rent their residence.

Disabled Citizens

The total population of disabled citizens in the City is 17.2% of the population.

People with Developmental Disabilities

Due to the method of gathering data using zip codes, it is estimated that there are a total of 85 individuals with developmental disabilities residing in the City.

People Experiencing Homelessness

The Amador Tuolumne Community Action Agency was contacted for homeless data, but there is no collection of data at the individual jurisdiction level. However, it was noted that the City does have a known homeless encampment at Detert Park.

Large Households

Large households are defined as 5 or more persons residing in the same home, which only makes up 6.9% of the total households countywide. In the City, 5.8% of this population owned homes with 5 or more people, with 5.7% renting.

Female Headed Households

Female headed households make up 22% of the City's population. Of this percentage, 63.6% live below the poverty line.

Farmworkers

The City data shows that 79 persons (4.3%) of 1,842 employed residents work in the agriculture, (also including forestry, fishing, hunting, and mining) industry.

Extremely Low Income

The level of poverty in a jurisdiction often influences the need for housing to accommodate those persons and families in the Very Low and Low-income categories. The U.S. Census Bureau measures poverty by using a set of money income thresholds that vary by family size and composition of who is in poverty. If a family's total income is less than the family's threshold, then that family and every individual in it is considered in poverty. While the overall County experiences a poverty rate of 9.9%, the City has a

percentage of individuals and households likely to be living in poverty. In 2019, 11.2% of individuals and families living in the City were living below the poverty level.

Structures

This section inventories the parcels (and associated structures) that make up the built environment of the City. The 2024 Amador County Assessor's data and the associated parcel layer was used as the basis of this inventory. The methodology used to derive the number of total and improved parcels (i.e., those with an improved structure value) and land and improved property values (as well as content replacement values) follows the same methodology detailed in Section 4.2.1 of the Base Plan. This data should only be used as a guideline to overall values in the City, as the information has some limitations. The most significant limitations are created by Proposition 13. With respect to Proposition 13, instead of adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result, overall value information is most likely low and does not reflect current market value of properties within the City. It is also important to note, in the event of a disaster, it is often the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a loss. However, depending on the type of hazard and impact of any given hazard event, land values may be adversely affected; thus, land values are included as appropriate. Table C-6 shows the Amador County Parcel/Assessor Data land and structure values and content replacement values (e.g., the values at risk) broken down by property use for the City.

Table C-6 City of Jackson – Total Value of Parcels and Structures by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	11	2	$4,610,305	$728,142	$728,142	$6,066,589
Commercial	268	217	$54,861,516	$183,539,907	$183,539,907	$421,941,330
Industrial	12	9	$3,001,381	$6,178,312	$9,267,468	$18,447,161
Miscellaneous	64	2	$616,210	$1,465,924	$0	$2,082,134
Residential	1,754	1,513	$137,725,805	$373,553,795	$186,776,898	$698,056,498
Unknown	15	13	$1,036,771	$2,408,659	$0	$3,445,430
Jackson Total	**2,124**	**1,756**	**$201,851,988**	**$567,874,739**	**$380,312,415**	**$1,150,039,142**

Source: 2024 Amador County Parcel/Assessor Data

Critical Facilities and Infrastructure

Beyond just the buildings and structures that comprise the built environment, it is important to identify the critical facilities and infrastructure that are critical for life safety and property protection. This is done for the City of Jackson below.

For purposes of this plan, a critical facility is defined as:

> ***Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in***

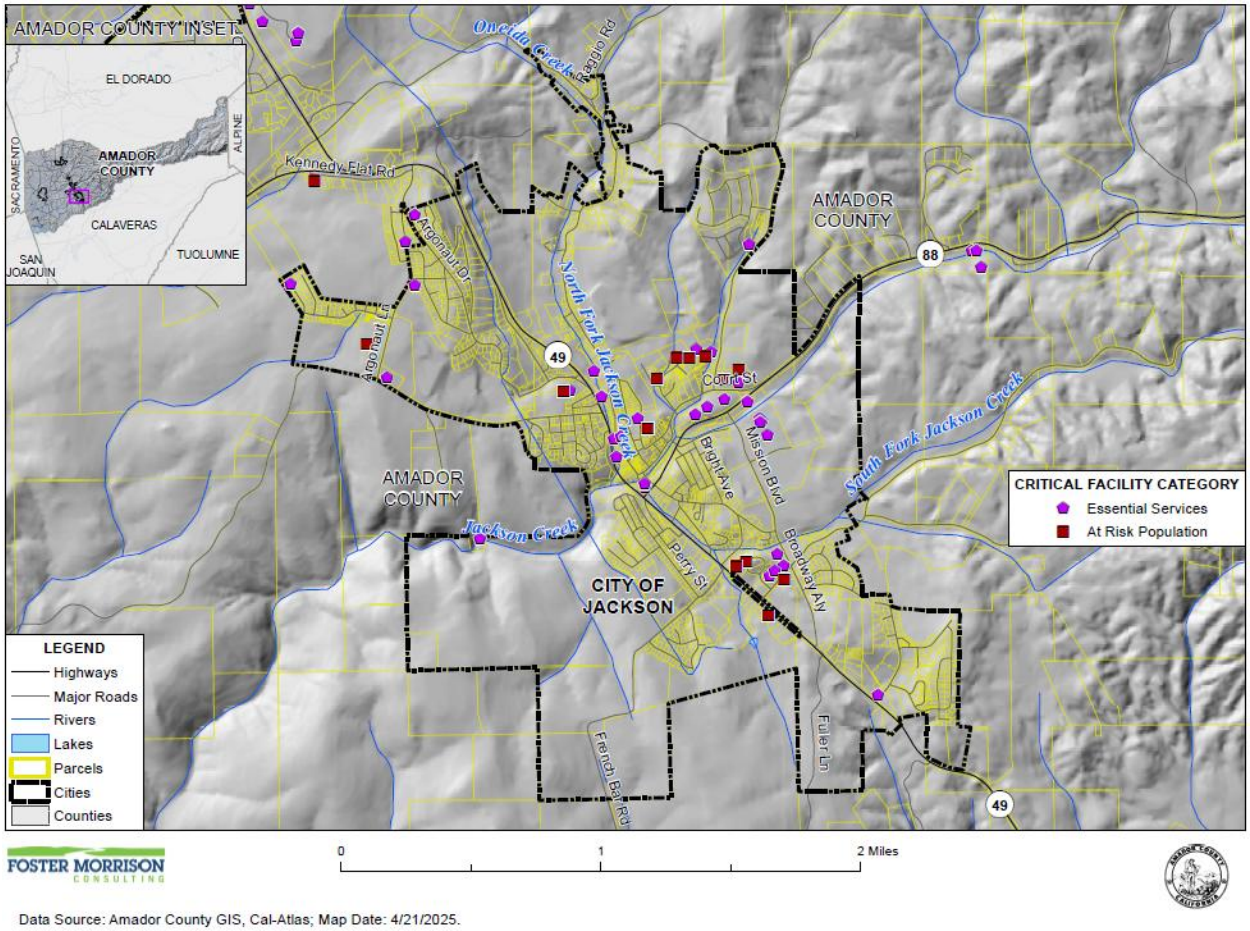
severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

A critical facility is classified by the following categories: (1) Essential Services Facilities, (2) At-Risk Populations Facilities, and (3) Hazardous Materials Facilities, as discussed in Section 4.3.1 of the Base Plan.

Note: The Hazardous Materials Facilities, while considered critical facilities for purposes of this Plan Update, are not mapped in this Plan due to the lack of an available GIS layer. In addition to the mapped critical facilities, it should further be noted that additional critical facilities, including infrastructure, utilities, and others have been identified for the City of Jackson and the larger Amador County Planning Area but are not included in the mapping and inventory due to privacy and security concerns.

An inventory of critical facilities in the City of Jackson from Amador County GIS is shown on Figure C-9. Table C-7 gives summary information about the critical facilities in the City. Table C-8 details the facility categories and breaks them down by facility type. Details of critical facility definition, type, name, address, and jurisdiction by hazard zone are listed in Appendix F.

Figure C-9 City of Jackson – Critical Facilities



Data Source: Amador County GIS, Cal-Atlas; Map Date: 4/21/2025.

Table C-7 City of Jackson – Critical Facilities by Category

Critical Facility Category	Facility Count
Essential Services Facilities	35
At Risk Population Facilities	13
City of Ione Total	**48**

Source: Amador County GIS

Table C-8 City of Jackson – Critical Facilities by Category and Type

Critical Facility Category	Critical Facility Type	Facility Count
Essential Services	Civic Center	1
	Clinic	9
	Communications	1
	Community Center	2
	Court House	1
	DMV	1
	EOC	1
	Evacuation Shelter	2
	Fire Station	2
	Government Administration	1
	Healthcare/School Services	1
	Hospital	1
	Jail	1
	Library	1
	Police Station	3
	Post Office	1
	Public Administration Building	2
	School District Office	1
	Wastewater Facility	2
	Wastewater Treatment Plant	1
	Essential Services Total	**35**
At Risk Population	Community Center	1
	Other	1
	Residential Care Facility	4
	School	5
	Veterans Services	2
	At Risk Population Total	**13**
Jackson Total		**48**

Source: Amador County GIS

Community Lifelines

Assessing the vulnerability of the City of Jackson to natural hazards and disasters also involves reviewing and inventorying the community lifelines in place that could be affected. It is important to include these items in hazard discussions as the continuous operation of critical government and business functions is essential to human health and safety, property protection, and economic security. The importance of community lifelines is discussed below:

- Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function.
- FEMA has developed a method for objectives-based response that prioritizes the rapid stabilization of Community Lifelines after a disaster.
- The integrated network of assets, services, and capabilities that provide lifeline services are used day-to-day to support the recurring needs of the community and enable all other aspects of society to function.
- When disrupted, decisive intervention (e.g., rapid re-establishment or employment of contingency response solutions) is required to stabilize the incident.

Community lifelines, as defined by FEMA, include the following:

- **Safety and Security** – Law Enforcement/Security, Fire Service, Search and Rescue, Government Service, Community Safety
- **Food, Hydration, Shelter** – Food, Water, Shelter, Agriculture
- **Health and Medical –** Medical Care, Public Health, Patient Movement, Medical Supply Chain, Fatality Management
- **Energy –** Power Grid, Fuel
- **Communications** – Infrastructure, Responder Communications, Alerts Warnings and Messages, Finance, 911 and Dispatch
- **Transportation** – Highway/Roadway/Motor Vehicle, Mass Transit, Railway, Aviation, Maritime
- **Hazardous Material –** Facilities, HAZMAT, Pollutants, Contaminants
- **Water Systems** – Potable Water Infrastructure, Wastewater Management

It should be noted that these community lifelines are all in place and functional as part of regular government operations in the Amador County Planning Area serving as a partnership between the cities, local special districts and agencies, and Amador County. Due to its more rural nature, there is an interplay in community lifelines between all jurisdictions in the County. Most all of the City's community lifelines overlap with the Planning Area's. It should also be noted that these lifelines collectively include many of the critical facilities and infrastructure assets inventoried for this LHMP. As such, specific information on these community lifelines in the City and how they may be affected by a hazard event or disaster are discussed collectively for all jurisdictions in the Base Plan.

Natural, Historic, and Cultural Resources

Assessing the vulnerability of the City of Jackson to natural hazards and disasters also involves inventorying the natural, historic, and cultural assets of the area. This step is important for the following reasons:

- Environmental and natural resources add to a community's identity and quality of life. They also help the local economy through agriculture, tourism, and recreation. They support ecosystem services, such as clean air and water.
- Conserving the environment may help people mitigate risk. It can also protect sensitive habitats, develop parks and trails, and build the economy.
- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- If these resources are impacted by a disaster, knowing so ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts are higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.

Natural Resources

The City contains a variety of natural resources. Natural resources are unique to each area, often provide an important function, and are difficult to replace. Should a natural disaster occur, these species, resources, and locations are at risk.

The three forks of Jackson Creek converge between the civic center and historic Downtown Jackson. These creeks played a key role in the early settlement of the Jackson area, not just by the American settlers who came in search of placer gold in the 1850s, but for the Native Americans who preceded them as well. There are also abundant areas of oak woodland in developed and undeveloped areas within City limits.

Wetlands and their Natural and Beneficial Functions

Wetlands are habitats in which soils are intermittently or permanently saturated or inundated. Wetland habitats vary from rivers to seasonal ponding of alkaline flats and include swamps, bogs, marshes, vernal pools, and riparian woodlands. Wetlands are considered to be waters of the United States and are subject to the jurisdiction of the U.S. Army Corps of Engineers as well as the California Department of Fish and Wildlife (CDFW). Where the waters provide habitat for federally endangered species, the U.S. Fish and Wildlife Service may also have authority.

Wetlands are a valuable natural resource for communities providing beneficial impact to water quality, wildlife protection, recreation, and education, and play an important role in hazard mitigation. Wetlands provide drought relief in water-scarce areas where the relationship between water storage and streamflow regulation is vital and reduce flood peaks and slowly release floodwaters to downstream areas. When surface runoff is dampened, the erosive powers of the water are greatly diminished. Furthermore, the reduction in the velocity of inflowing water as it passes through a wetland helps remove sediment being transported by the water.

Wetlands are often found in floodplains and depressional areas of a watershed. Many wetlands receive and store floodwaters, thus slowing and reducing downstream flow. Wetlands perform a variety of ecosystem functions including food web support, habitat for insects and other invertebrates, fish and wildlife habitat,

filtering of waterborne and dry-deposited anthropogenic pollutants, carbon storage, water flow regulation (e.g., flood abatement), groundwater recharge, and other human and economic benefits.

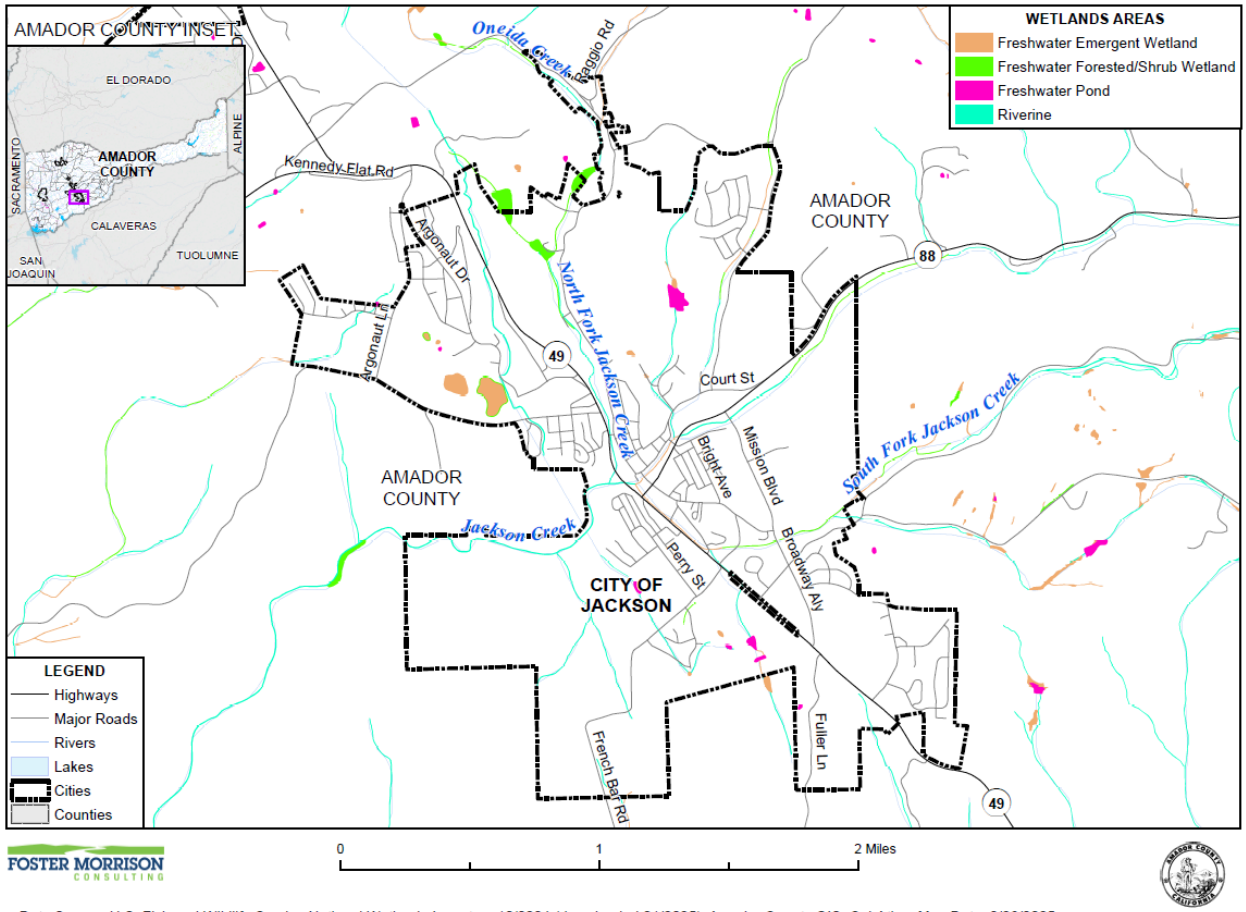
Wetlands, and other riparian and sensitive areas, provide habitat for insects and other invertebrates that are critical food sources to a variety of wildlife species, particularly birds. There are species that depend on these areas during all parts of their lifecycle for food, overwintering, and reproductive habitat. Other species use wetlands and riparian areas for one or two specific functions or parts of the lifecycle, most commonly for food resources. In addition, these areas produce substantial plant growth that serves as a food source to herbivores (wild and domesticated) and a secondary food source to carnivores.

Wetlands slow the flow of water through the vegetation and soil, and pollutants are often held in the soil. In addition, because the water is slowed, sediments tend to fall out, thus improving water quality and reducing turbidity downstream.

These natural floodplain functions associated with the natural or relatively undisturbed floodplain that moderates flooding, such as wetland areas, are critical for maintaining water quality, recharging groundwater, reducing erosion, redistributing sand and sediment, and providing fish and wildlife habitat. Preserving and protecting these areas and associated functions are a vital component of sound floodplain management practices for the City.

Wetlands in the City are shown in Figure C-10 and detailed in Table C-9.

Figure C-10 City of Jackson – Wetlands Areas



Data Source: U.S. Fish and Wildlife Service National Wetlands Inventory 10/2024 (downloaded 01/2025), Amador County GIS, Cal-Atlas; Map Date: 2/26/2025.

Table C-9 City of Jackson – Wetland Types and Acreages

Wetlands Area Type	Wetlands Count	Wetlands Area (in Acres)
Jackson		
Freshwater Emergent Wetland	20	16.01
Freshwater Forested/Shrub Wetland	13	10.61
Freshwater Pond	9	5.88
Lake	0	0.00
Riverine	22	22.25
Jackson Total	**64**	**54.75**

Source: US Fish and Wildlife Service

Historic and Cultural Resources

Historic and cultural resources are difficult to replace. Should a natural disaster occur, these properties and locations can be at risk. The City of Jackson has a stock of historically significant homes, public buildings, and landmarks. The California Department of Parks and Recreation Office of Historic Preservation (OHP) was the primary source of information. OHP administers the National Register of Historic Places, the

California Register of Historical Resources, California Historical Landmarks, and the California Points of Historical Interest programs. Each program has different eligibility criteria and procedural requirements. These requirements are detailed in Section 4.2.1 of the Base Plan. Table C-10 shows 16 historic buildings in the City in the OHP Database.

Table C-10 City of Jackson – Historic Resources

Resource Name (Plaque Number)	National Register	State Landmark	Point of Interest	Date Listed	City/ Community
Middle Bar (36)		X		8/1/1932	Jackson
Pioneer Hall (34)		X		8/1/1932	Jackson
Jackson Gate (118)		X		3/29/1933	Jackson
Argonaut And Kennedy Mines (786)		X		9/18/1963	Jackson
Amador County Hospital Building (N148)	X			2/23/1972	Jackson
Site of Jackson's Pioneer Jewish Synagogue (865)		X		11/16/1973	Jackson
Kennedy Mine Tailing Wheels (P397)			X	5/9/1975	Jackson
Kennedy Tailing Wheels (N959)	X			7/7/1981	Jackson
House and Indian Museum, Grace Blair Depue (P582)			X	3/1/1982	Jackson
Depue, Grace Blair, House and Indian Museum (N1101)	X			5/7/1982	Jackson
Saint Sava Serbian Orthodox Church (N1426)	X			3/6/1986	Jackson
Chichizola Family Store Complex (N1788)	X			8/14/1992	Jackson
Jackson Downtown Historic District (N2090)	X			4/14/2000	Jackson
Paugh, William H., House (N2364)	X	X		6/5/2007	Jackson
Butterfield, John A., House (N1461)	X			9/11/1986	Jackson
Butte Store (39)		X		8/1/1932	Jackson

Source: California Department of Parks and Recreation Office of Historic Preservation. Retrieved 12/3/2024.

It should be noted that these lists may not be complete, as they may not include those currently in the nomination process and not yet listed. Additionally, as defined by the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA), any property over 50 years of age is considered a historic resource and is potentially eligible for the National Register. Thus, in the event that the property is to be altered, or has been altered, as the result of a major federal action, the property must be evaluated under the guidelines set forth by CEQA and NEPA. Structural mitigation projects are considered alterations for the purpose of this regulation.

Economic Assets and Community Activities of Value

Assessing the vulnerability of the City of Jackson to natural hazards and disasters also involves inventorying the economic assets and community activities of value in the City.

Economic Assets

After a disaster, economic resiliency is one of the major drivers of a speedy recovery. Each community has specific economic drivers. These include:

- Primary Economic Sectors
- Major employers
- Commercial Centers

In the City of Jackson, this includes the following:

- Sutter Amador Hospital
- Fire Departments (2)
- Civic Center
- Grocery stores (4)
- Jackson Rancheria Casino Resort
- Laughton Ranch

Note: This inventory of economic assets is only included in this overall asset inventory for the City. To limit redundancy, it is not discussed further in the hazard profiles and vulnerability assessments in Section C.4.3 below. However, depending on the type, location, magnitude and extent of future hazard events and disasters, these City's economic assets may be vulnerable.

Community Activities of Value

Inventorying economic assets in the City and their vulnerability to natural hazards and disasters also involves inventorying activities that have value to the community. This includes activities that are important to a community, like long-standing traditions such as a festival or fair. Some areas rely on seasonal industries to sustain them throughout the year. Many of these activities also provide economic benefits to the City. A hazard event that cancels or shortens these can affect a community's livelihood and can make disaster recovery more difficult or prolonged. This includes activities such as:

- Festivals and Fairs
- Sporting Events
- Tourism
- Local Pools
- Local Splash Pools

The City noted the following community activities of value:

- Dandelion Days
- Memorial Weekend car show
- City Pool
- Detert Park and ball field
- Christmas Delights
- Halloween parade

Note: This inventory of community activities of value only occurs in this overall asset inventory for the City. To limit redundancy, it is not discussed further in the hazard profiles and vulnerability assessments in Section C.4.3 below. However, depending on the type, location, magnitude and extent of future hazard events and disasters, the City's community activities of value may be vulnerable.

Growth and Development Trends

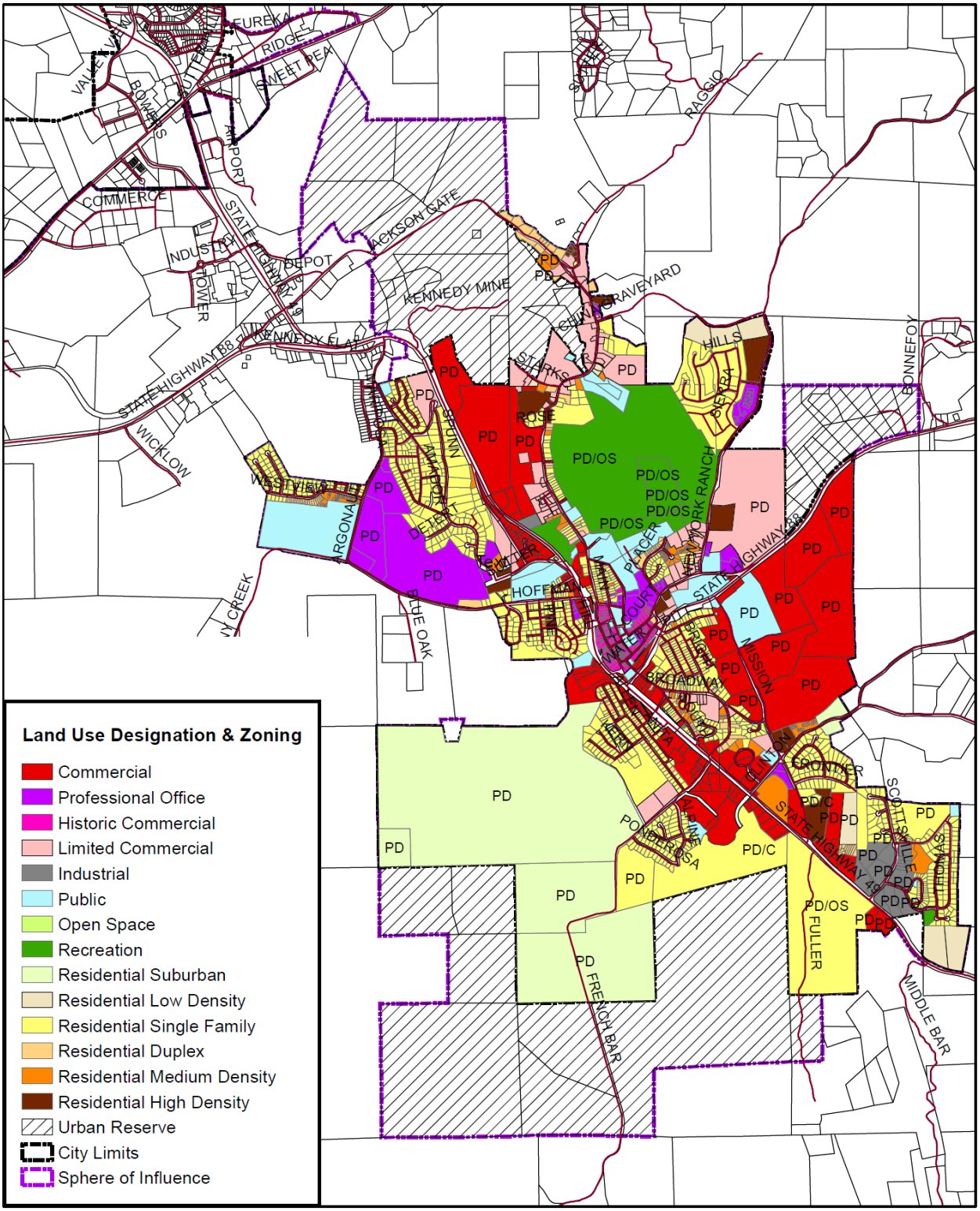
As part of the planning process, the City looked at changes in growth and development, both current and future, and examined these changes in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability over time.

Land Use

State planning law requires that the land use element of a general plan include a statement of the standard population density, building intensity, and allowed uses for the various land use designations in the plan (Government Code Section 65302(a)). The City's land use designations are generally described below and mapped on the Land Use Diagram (Figure C-11). The Jackson Municipal Code provides detailed land use and development standards for development.

With this General Plan, a variety of new land use designations have been established to reflect the more mixed and, in some cases, more intense land uses envisioned for Jackson. New mixed-use designations provide the opportunity for a combination of residential, commercial, and office uses on a single site, depending on the designation. Land Use Designations and Zoning for the City is shown on Figure C-11.

Figure C-11 City of Jackson – Land Use Diagram



Source: City of Jackson General Plan Land Use Element (2023)

Population Trends and Projections

There are no future City population projections. Amador County as a whole is expected to slowly continue to increase in population. As such, it is assumed that the City may see slow population growth as well.

Development since 2020 Plan

Development has occurred in the City since the last plan. Some of this has occurred in hazard prone areas. The City Planning Department tracked total building permits issued since 2020 for the City. These are tracked by total development, property use type, and hazard risk area. These are shown in Table C-11 and Table C-12.

Table C-11 City of Jackson – Total Development Since 2020

Property Use	2020	2021	2022	2023	2024
Residential	1	2	11	2	1
Commercial	0	0	0	0	0
Industrial	1	0	0	0	0
Other	0	0	0	0	0
Total	**2**	**2**	**11**	**2**	**1**

Source: City of Jackson Planning Department

Table C-12 City of Jackson – Development in Hazard Areas since 2020

Property Use	Moderate or Higher Fire Hazard Severity Zones	1% Annual Chance Flood	Landslide Potential Areas	Other
Residential	6	0	6	0
Commercial	0	0	0	0
Industrial	0	0	0	0
Other	0	0	0	0
Total	**6**	**0**	**06**	**0**

Source: City of Jackson Planning Department

[1]Moderate or higher wildfire risk area

Development has occurred in the identified hazard areas, including the landslide areas and moderate or higher wildfire risk areas. It was completed in accordance with all current and applicable development codes, including erosion ordinances, wildfire codes, and other applicable standards and should be adequately protected. Thus, with the exception of more people living in the area potentially exposed to natural hazards, this growth should not cause a significant change in vulnerability of the City to identified priority hazards.

Future Development Areas

It is important to review future development plans for the City. Future development should be sited in areas that are away from known hazard risks. If this is not possible, mitigation should be done to ensure that future development is protected against future hazards.

The City noted that development in Jackson is very slow, with very little commercial, industrial, or residential development occurring. There are currently no plans for the development of new City facilities. There is ongoing development in the Jackson View Subdivision.

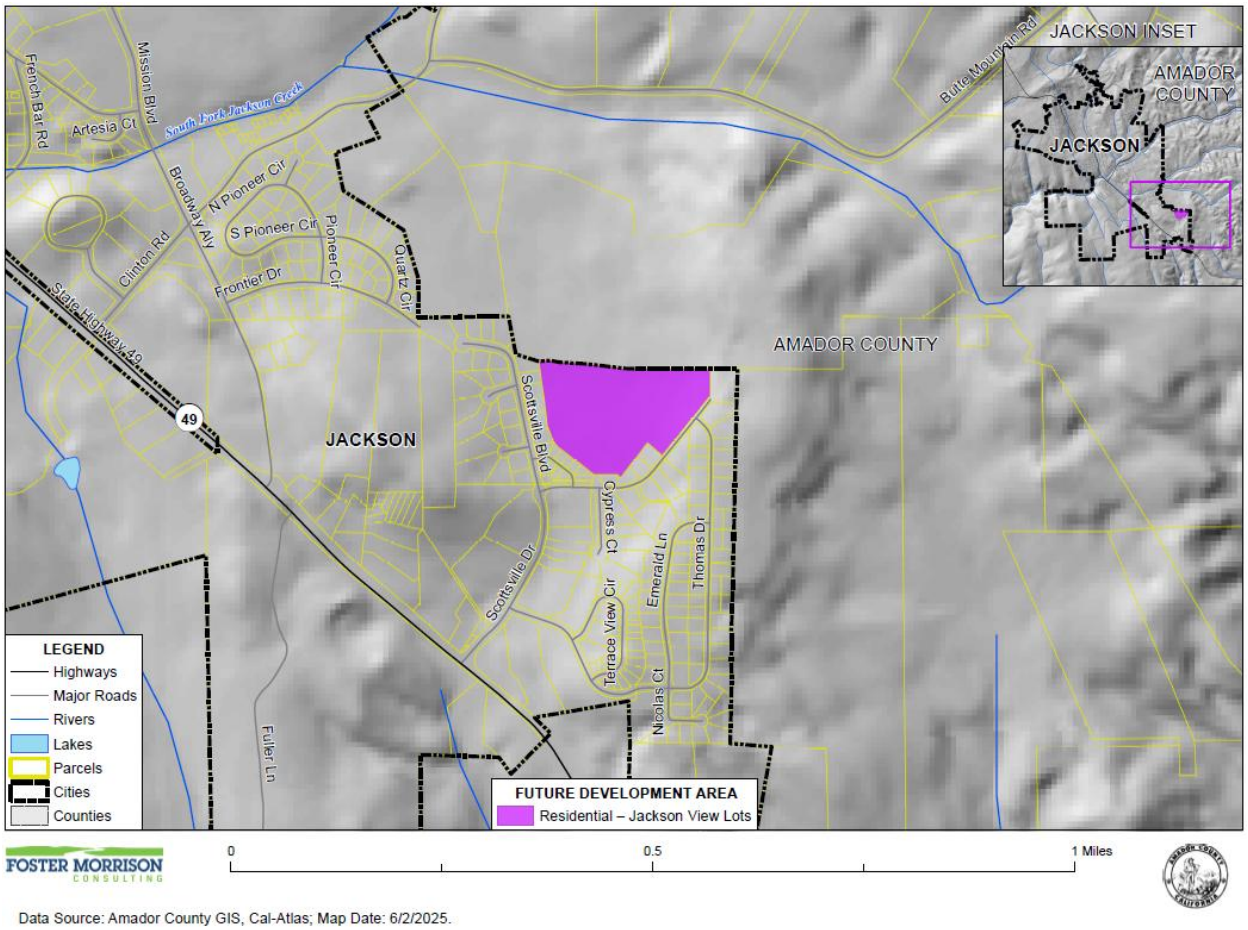
GIS Analysis

The City of Jackson provided an area in the City expected to see future development. In the area along Goldstone Avenue is the Jackson View future development area. Lots 87-92 were approved for future development. This will make an addition of 6 residential properties spanning 2.07 acres. The City of Jackson noted that this was approved by the City as:

- Tentative Map No. 185 approved 9/16/24; Lots 87-92 of a previously approved subdivision.

These future development areas were provided by the City of Jackson. Using GIS, these areas were mapped. This area is shown on Figure C-12, and detailed by parcels and acres in Table C-13.

Figure C-12 City of Jackson – Future Development Areas



Data Source: Amador County GIS, Cal-Atlas; Map Date: 6/2/2025.

Table C-13 City of Jackson – Parcels and Acres in Future Development Areas

Future Development / Property Use	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
Jackson View Lots 87-92						
Residential	1	0	1	2.07	0	2.07
Jackson View Lots 87-92 Total	**1**	**0**	**1**	**2.07**	**0**	**2.07**

Source: City of Jackson

C.4.2. Hazard Identification

The City of Jackson identified the hazards that affect the City and summarized their location, extent, likelihood of future occurrence, potential magnitude, and significance specific to the City (see Table C-14). Those hazards identified as a high or medium significance in Table C-14 are considered City of Jackson priority hazards for mitigation planning. Those hazards that occur infrequently or have little or no impact

in the City were determined to be of low significance and not considered a priority hazard. Significance was determined based on the hazard profile, focusing on key criteria such as frequency, extent, and resulting damage, including deaths/injuries and property, natural and cultural resources, and economic damage. The ability of a jurisdiction to reduce losses through implementation of existing and new mitigation measures was also considered as to the significance of a hazard. This assessment was used to prioritize those hazards of greatest significance, enabling the City to focus resources where they are most needed.

Table C-14 City of Jackson—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Agricultural Hazards (severe weather/pests/invasive species)	Extensive	Highly Likely	Limited	Low	Medium
Avalanche	Limited	Likely	Negligible	Low	Medium
Climate Change	Extensive	Likely	Limited	Medium	--
Dam Failure	Limited	Unlikely	Critical	High	Medium
Drought & Water shortage (w/ tree mortality)	Extensive	Likely	Limited	Medium	High
Earthquake (w/subhazards)	Significant	Occasional/ Unlikely	Catastrophic	High	Low
Floods: 1%/0.2% annual chance (w/ levee failure)	Significant	Occasional/ Unlikely	Critical	High	Medium
Floods: Localized Stormwater	Extensive	Highly Likely	Critical	Medium	Medium
Landslide, Mudslide, Debris Flow	Significant	Likely	Critical	Medium	Medium
Severe Weather: Extreme Cold, Freeze, and Snow	Significant	Highly Likely	Limited	Medium	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Limited	Medium	High
Severe Weather: Heavy Rains and Storms (Hail, Lightning)	Extensive	Highly Likely	Critical	Medium	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Highly Likely	Limited	Medium	Medium
Wildfire (w/smoke and air quality)	Extensive	Highly Likely	Catastrophic	High	Medium

Geographic Extent

Limited: Less than 10% of planning area

Significant: 10-50% of planning area

Extensive: 50-100% of planning area

Likelihood of Future Occurrences

Highly Likely: Near 100% chance of occurrence in next year, or happens every year.

Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.

Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.

Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Magnitude/Severity

Catastrophic: More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths

Critical: 25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability

Limited: 10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability

Negligible: Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance

Low: Minimal potential impact

Medium: Moderate potential impact

High: Widespread potential impact

Climate Change Influence

Low: Minimal potential impact

Medium: Moderate potential impact

High: Widespread potential impact

C.4.3. Hazard Profiles and Vulnerability to Specific Hazards

This section includes the hazard profiles and vulnerability assessment for hazards ranked of medium or high significance specific to the City of Jackson (as identified in the Significance column of Table C-14) and also includes a hazard profile and vulnerability assessment to the four primary hazards to the State of California: dam failure, earthquake, flood, and wildfire, regardless of the significance ranking by the City. Chapter 4 of the Base Plan provides more detailed information about these hazards and their impacts on the Amador County Planning Area. Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.2 of the Base Plan.

Hazard Profiles and Vulnerability Assessment

Each hazard is profiled in the following format:

- **Hazard Profile** – A hazard profile is included for each hazard. This includes information on:
  - ✓ **Hazard Overview** – A general discussion of the hazard and related issues is detailed here.
  - ✓ **Location** and **Extent** – Location is the geographic area within the City that is affected by the hazard. Extent is the expected range of intensity for each hazard. These are discussed in specific detail for mapped hazards, and in more general detail for those hazards that do not have discrete mapped hazard areas.
  - ✓ **Past Occurrences** – Past occurrences are discussed for each hazard. A discussion of disaster declarations is included in each hazard section. NCDC events are also discussed. Other past occurrences data specific to the City follow the disaster declarations and NCDC events for each hazard.
  - ✓ **Climate Change** – This section contains the effects of climate change (as applicable). The possible influence of climate change on the hazard is discussed.

After the hazard profile, a vulnerability assessment is presented. As part of the vulnerability assessment, an estimate of the vulnerability of the City to each identified hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low** – The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low** – Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium –** Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High** – Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High** – Very widespread with catastrophic impact.

After this classification, a general discussion of hazard vulnerabilities occurs. This is done in the following format:

- **Local Concerns** – This includes City provided information on how the City is uniquely affected by or vulnerable to each hazard.
- **Assets at Risk** – A discussion of the assets at risk follows, presented in the same order as in Section C.4.1 above, with a few exceptions. This includes sections on: People and Populations; Structures; Critical Facilities and Infrastructure, and Natural, Historic, and Cultural Resources. These are discussed in specific terms for mapped hazards, and in more general terms for those hazards that are unmapped. Sections on Community Lifelines and Economic Assets and Community Activities of Value are not included in the Sections below, as they are fully covered in Section C.4.1 above.
- **Impacts** – A discussion on hazard impacts follows. Impacts describe how each hazard can affect the City and its assets. The type and severity of impacts reflect both the potential magnitude of the hazard and the vulnerability of the asset.
- **Future Conditions/Future Development** – A discussion of how future conditions and future development may affect the hazard is also included. This is addressed specifically for mapped hazards, and in more general terms for those hazards that are unmapped.

Power Interruption/Power Failure: A Common Vulnerability of all Hazards

An impact of almost all hazards evaluated as part of this LHMP Update relates to power shortage and/or power failures. The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the U.S. Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power disruptions can be found in Section 4.3 of the Base Plan.

Public Safety Power Shutoff (PSPS)

An intentional disruption type of power shortage/failure event has been recently implemented in California as a result of wildfires starting as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are preparing all Californians for the threat of wildfires and power outages during times of extreme (fire) weather. To help protect customers and communities during extreme fire weather events, electric power may be shut off for public safety in an effort to proactively prevent wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3 of the Base Plan.

In addition to PSPSs, to help prevent wildfires, electric utilities have begun to evolve safety efforts. This includes installing safety settings on powerlines in and around high fire-risk areas. These are known as Enhanced Powerline Safety Settings (EPSS), and they help prevent falling tree branches, animals and other

hazards from starting a wildfire. By stopping ignitions, it helps prevent wildfires from starting and spreading. According to PG&E, if ignitions occur, the size of fires are much smaller due to EPSS. In 2022, there was a 99% decrease in acres impacted by ignitions (as measured by fire size from electric distribution equipment (compared to the 2018-2020 average). This decrease occurred despite dry conditions.

Local Concerns

The City noted that there have been no power outages or PSPS events that have affected them.

Climate Change

Likelihood of Future Occurrence–Likely
Vulnerability–High

Hazard Profile

Climate change adaptation is a key priority of the State of California. The 2023 State of California Multi-Hazard Mitigation Plan noted that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the State's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

California's Adaptation Planning Guide: Understanding Regional Characteristics (from 2017) has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. The City falls in the North Sierra Region. A map and climate projections for this region are shown in Section 4.3.7 of the Base Plan and include an increase in temperatures, moderate changes in rainfall, and increased risk to wildfire.

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the City of Jackson, the Amador County Planning Area, surrounding counties, and State of California. There is no scale to measure the extent of climate change. Climate change exacerbates other hazards, such as drought, extreme heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known but is feared to be tens to hundreds of years.

Past Occurrences

Disaster Declaration History

Climate change has never been directly linked to any declared disasters.

NCDC Events

NCDC does not track climate change events.

City of Jackson Events

The City noted that no specific events of climate change damages could be recalled.

Vulnerability to Climate Change

The whole of the City is at some measure of vulnerability to climate change. The City Planning Team has concerns that the vulnerability of the City to climate change will continue to increase in the future. An assessment of a community's vulnerability to climate change begins with an understanding of local exposure to climate change. This is included in the Local Concerns section below followed by a discussion of the City's assets at risk and impacts to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The 2015 Energy Action Plan for the City noted that the City of Jackson, like all foothill communities in the Sierra Nevada, faces challenges associated with climate change in the region. Increased frequency and altered timing of flooding will increase risks to agriculture, people, ecosystems, and infrastructure. Potential impacts on water resources include reduced mountain snowpack, delayed snow accumulation, earlier snow melting and ultimately shortages in runoff and water supply. Extended droughts may increase wildland fire risk. Since local economies in the area rely heavily on these resources for agriculture, tourism, recreation and other industries, climate change may negatively affect economic activity in Jackson, and ultimately impact quality of life for community members.

Assets at Risk

Assets at risk from climate change include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

Climate change affects people and populations within a community, especially those climate change issues related to increases in temperature over time. While all populations can be affected by temperature extremes, populations particularly vulnerable include the very old and very young, medically fragile people, people without means of shelter (and air conditioning or heat) or transportation, people who are socially isolated and other vulnerable or underserved populations (as shown in the discussion in Section C.4.1). Acclimatization to extreme temperatures and other weather extremes may help reduce impacts from these extreme events, such as from heat waves, in the healthy general population but may not be sufficient to protect those with underlying medical conditions.

Structures

Climate change, on its own, does not generally impact structures. However, structures in areas of increased wildfire, flood, or other areas exacerbated by the effects of climate change would be at increased risk, as described throughout this LHMP. More information on how structures may be affected by climate change can be found in Section 4.3.7 of the Base Plan.

Critical Facilities and Infrastructure

As with structures, critical facilities and infrastructure in areas of increased wildfire, flood, or other areas due to the effects of climate change would be at increased risk. Climate change is expected to increase the vulnerability of critical facilities and infrastructure to many natural hazards.

Natural, Historic, and Cultural Resources

The rivers, streams, agricultural areas, and open space areas of the City supports rich biodiversity, including many special-status species and habitat areas. These are all at risk from the effects of climate change. In addition, if heat continues to contribute to changes in wildfire patterns, all areas (on land) of the City are at increased risk from fire – including natural, historic, and cultural resources. Furthermore, as climate change exacerbates the drought hazard, areas of wetlands in the City may be reduced or dry up temporarily, which could damage habitat areas for waterfowl and other species that depend on these areas.

Impacts from Climate Change

The California APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra Region in which the City is part of:

- Increased temperatures
- Reduced precipitation
- Public health – heat and air pollution
- Reduced agricultural productivity (e.g., wine grapes)
- Reduced tourism

In addition to these sources, the 2023 State of California Hazard Mitigation Plan noted that according to California's Fourth Climate Change Assessment, the state will experience the following climate impacts:

- Annual average daily high temperatures are expected to rise by 2.7° F by 2040, 5.8°F by 2070, and 8.8°F by 2100 compared to observed and modeled historical conditions. These changes are statewide averages.
- Heat waves are projected to become longer, more intense, and more frequent.
- Warming temperatures are expected to increase soil moisture loss and lead to drier conditions. Summer dryness may become prolonged, with soil drying beginning earlier in the spring and lasting longer into the fall and winter.
- Droughts are likely to become more frequent and persistent through 2100.
- The strength of the most intense precipitation and storm events affecting California is expected to increase.

- Snowpack levels are projected to decline significantly by 2100 due to reduced snowfall and faster snowmelt.
- Marine layer clouds are projected to decrease.
- Extreme wildfires (i.e., fires larger than 24,710 acres) would occur 50 percent more frequently. The maximum area burned statewide may increase 178 percent by the end of the century.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City include the following:

- As climate change continues to accelerate over time, climate related impacts to the City will continue to increase.
- Climate change can influence population growth in the City over time. While the City is expected to see slow and steady growth, the City could see population fluctuations as a result of climate impacts relative to those experienced in other regions, and these fluctuations are expected to impact demand for housing and other development. While there are currently no formal studies of specific migration patterns expected to impact the City and larger Amador County region, climate-induced migration was recognized within the UNFCCC Conference of Parties Paris Agreement of 2015 and is expected to be the focus of future studies. So, while changes in population and population patterns are not expected to increase the impacts associated with this hazard, climate change may instead influence future population growth in the City which may leave more people vulnerable in the effects of climate change.
- Land use planning should be proactive to address future hazard conditions. The increasing severity and frequency of storms and other weather events and natural hazards due to the changing climate should be taken into account while considering land use planning for the City. Future development is limited in the City consisting of 6 residential properties spanning 2.07 acres. Thus future development is unlikely to increase the impacts of the the City to this hazard. In addition, new development is subject to current building codes which should reduce or mitigate the hazard vulnerability associated with new construction.

Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements, such as building codes, are followed, and varying needs for different demographic groups with intersecting identities that reside within the City are considered can help to make for a more disaster resilient community.

Dam Failure

Likelihood of Future Occurrence–Unlikely
Vulnerability–High

Hazard Profile

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any given year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped or fail. Overtopping is the primary cause of earthen dam failure in the United States.

Dam failure is a natural disaster from two perspectives. First, the inundation from released waters resulting from dam failure is related to naturally occurring floodwaters. Second, a total dam failure would most probably happen as a consequence of the natural disaster triggering the event, such as an earthquake.

Location and Extent

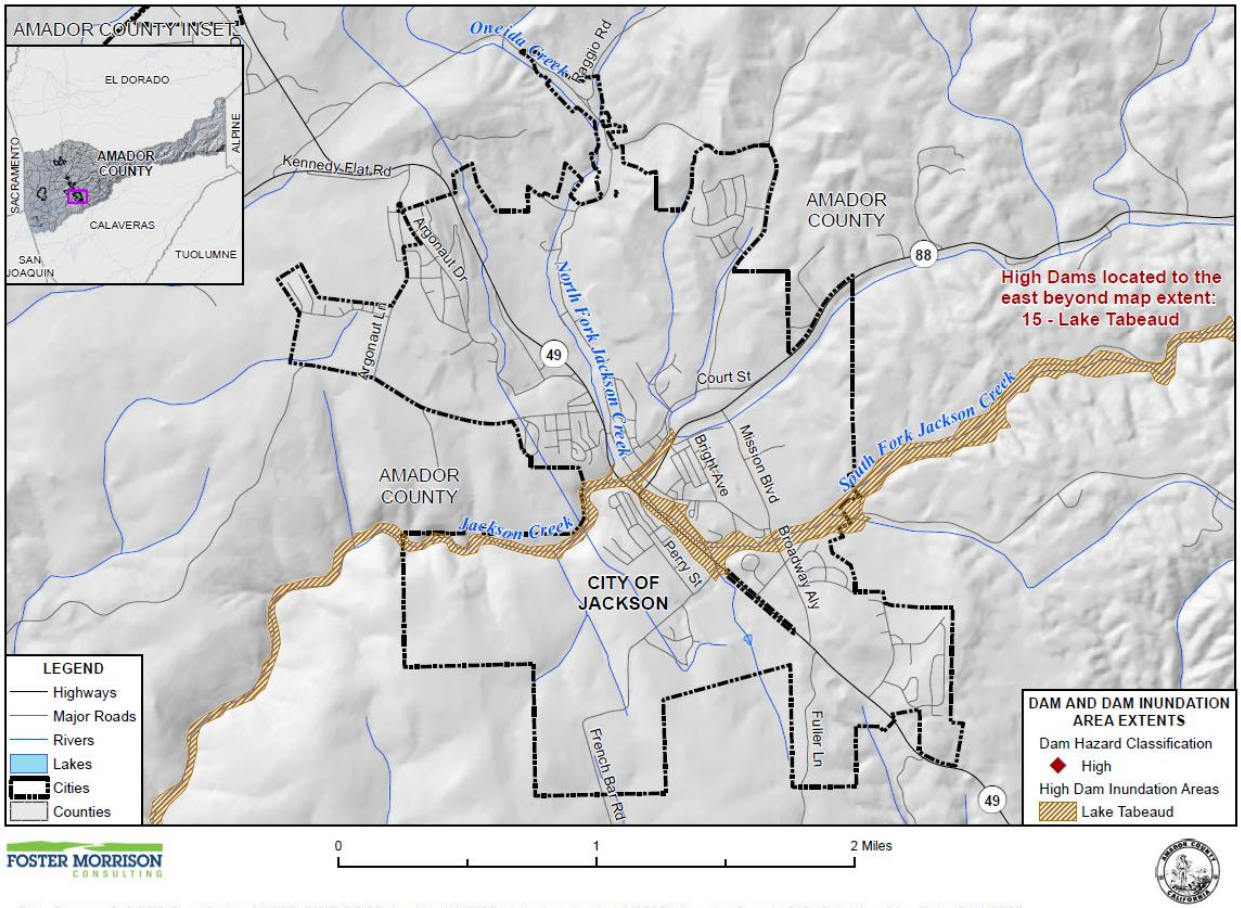
An inventory map of dams located within Amador County was shown in Section 4.3.9 in the Base Plan. Dams with an inundation area within the City of Jackson are shown on Figure C-13. Only one high hazard dam inundation area (Lake Tabeaud) intersects the City. As such, no extremely high hazard dam maps or analysis are shown for the City.

There is no scale with which to measure dam failure. However, FEMA and CA DWR Division of Safety of Dams (DSOD) assign hazard potential classifications to dams within the State that provides information on the potential impact should a dam fail. The following two factors are considered when assigning hazard ratings: existing land use and land use controls (zoning) downstream of the dam. FEMA categorizes the downstream hazard potential into three categories in increasing severity: Low, Significant, and High. DSOD adds a fourth category of Extremely High. Dams are classified in these four categories that identify the potential hazard to life and property. These were discussed in more detail in Section 4.3.9 of the Base Plan.

While a dam may fill slowly with runoff from winter storms, a dam break has a very quick speed of onset. The duration of dam failure is generally not long – only as long as it takes to empty the reservoir of water the dam held back. For dam overtopping, the speed of onset is somewhat slower than that of a dam break, and the duration is longer (as evidenced in the 2017 Oroville Dam spillway event). The City would be affected for as long as the flood waters from the dam failure took to drain downstream.

Geographic flood extent from the DSOD dam inundation areas is shown on Figure C-13, as well as in Table C-15.

Figure C-13 City of Jackson – High Hazard Dam Inundation Areas



Data Source: Cal OES Dam Status 2/2025, DWR DSOD (updated 1/2025; data downloaded 2/2025), Amador County GIS, Cal-Atlas; Map Date: 3/11/2025.

Table C-15 City of Jackson – Dam Inundation Areas Geographical Extents

Dam Hazard Class/ Dam Inundation Area	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
High Hazard Dams						
Lake Tabeaud	80	3.5%	31	3.9%	50	3.3%

Source: Cal OES, DSOD, Amador County GIS

Past Occurrences

Disaster Declaration History

There have been no state or federal disaster declarations for dam failure in Amador County.

NCDC Events

The NCDC does not contain any dam failure events for Amador County.

City of Jackson Events

The City noted no dam failure occurrences that have affected the City.

Climate Change and Dam Failure

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with dam failure. More information on future impacts to the City can be found below and in the Future Conditions/Future Development section of the Vulnerability Assessment below.

The 2023 California State Hazard Mitigation Plan noted that modeling described in California's Fourth Climate Change Assessment projects less frequent but more extreme daily precipitation. Year-to-year precipitation will become more volatile, and the number of dry years will increase by mid-century. As the climate continues to warm, atmospheric rivers will carry more moisture, and extreme precipitation may increase. Climate model projections show a tendency for the northern part of the State to become wetter. Increases in both precipitation and heat causing snow melt in areas upstream of dams could increase the potential for dam failure and uncontrolled releases in Amador County and the City.

Vulnerability to Dam Failure

The vulnerability of the City to dam failure flooding would vary depending on which dam fails and the nature and extent of the dam failure and associated flooding. An assessment of a community's vulnerability to dam failure begins with an understanding of local exposure to dam failure. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The City is downstream of Lake Tabeaud. While very unlikely, if the dam failed there would be damages in the City.

Assets at Risk

Assets at risk from dam failure include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All people and populations located in dam inundation areas are vulnerable to dam failure. Certain vulnerable populations may be at increased risk to dam failure, especially during a large event with minimal advance notice. These vulnerable populations may include: the unsheltered, those with limited mobility, and those that lack the resources to leave the area.

City residents that live in these dam inundation areas are often the most vulnerable. Not only are the residents at risk, but their homes and contents are all at risk, compounding the impacts associated with significant hazard events. To further evaluate the impact to the City of Jackson's residential populations located in these hazard areas, a separate analysis was performed to determine residential populations in the dam inundation areas. The DSOD dam inundation areas were overlayed on the parcel layer. Those residential parcel polygons that intersect the dam inundation areas were counted and multiplied by the Census Bureau average household factors for the City of Jackson – 2.20. This is shown in Table C-16.

Table C-16 City of Jackson – Improved Residential Parcels and Population by Dam Inundation Area

Dam Hazard Class /Dam Inundation Area	Improved Residential Parcels	Population
High Hazard Dams		
Lake Tabeaud	84	185

Source: Cal OES, DSOD, Amador County 2024 Parcel/Assessor Data, US Census Bureau American Community Survey 2023 Household Size Estimates.

The City noted that the Critical Facilities and Infrastructure section below includes the facilities used by At-Risk populations that are threatened by this hazard. While this is not specific to what special populations reside in the City, it does speak to facilities that area used to serve (portions) of this population.

Structures

Most structures in the City have some measure of risk to dam failure. Dam failure flooding can affect the built environment of the City. Structures in dam inundation areas are at risk and depending on flood depths, can range from slight damage to totally inundated. Analysis by extremely high hazard and high hazard dam follows.

A GIS based analysis was used to determine the possible impacts of dam inundation flooding on parcels and structures within the City of Jackson. The methodology described in Section 4.3.9 of the Base Plan was followed in determining City parcels and structures at risk to dam failure. Parcel counts, land and improved values (i.e., those with a structure improvement on the parcel), estimated content replacement values, and total values that fall within dam inundation areas in the City are presented below by hazard classification and by dam. The results are presented in Table C-17 below for the dam (Lake Tabeaud) that affects the City.

Table C-17 City of Jackson – Count and Value of Parcels and Structures in Lake Tabeuad Dam Inundation Area by Property Use

Dam Inundation Area / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	2	1	$3,161,099	$557,676	$557,676	$4,276,451
Commercial	59	45	$12,824,586	$31,051,404	$31,051,404	$74,927,394
Industrial	0	0	$0	$0	$0	$0

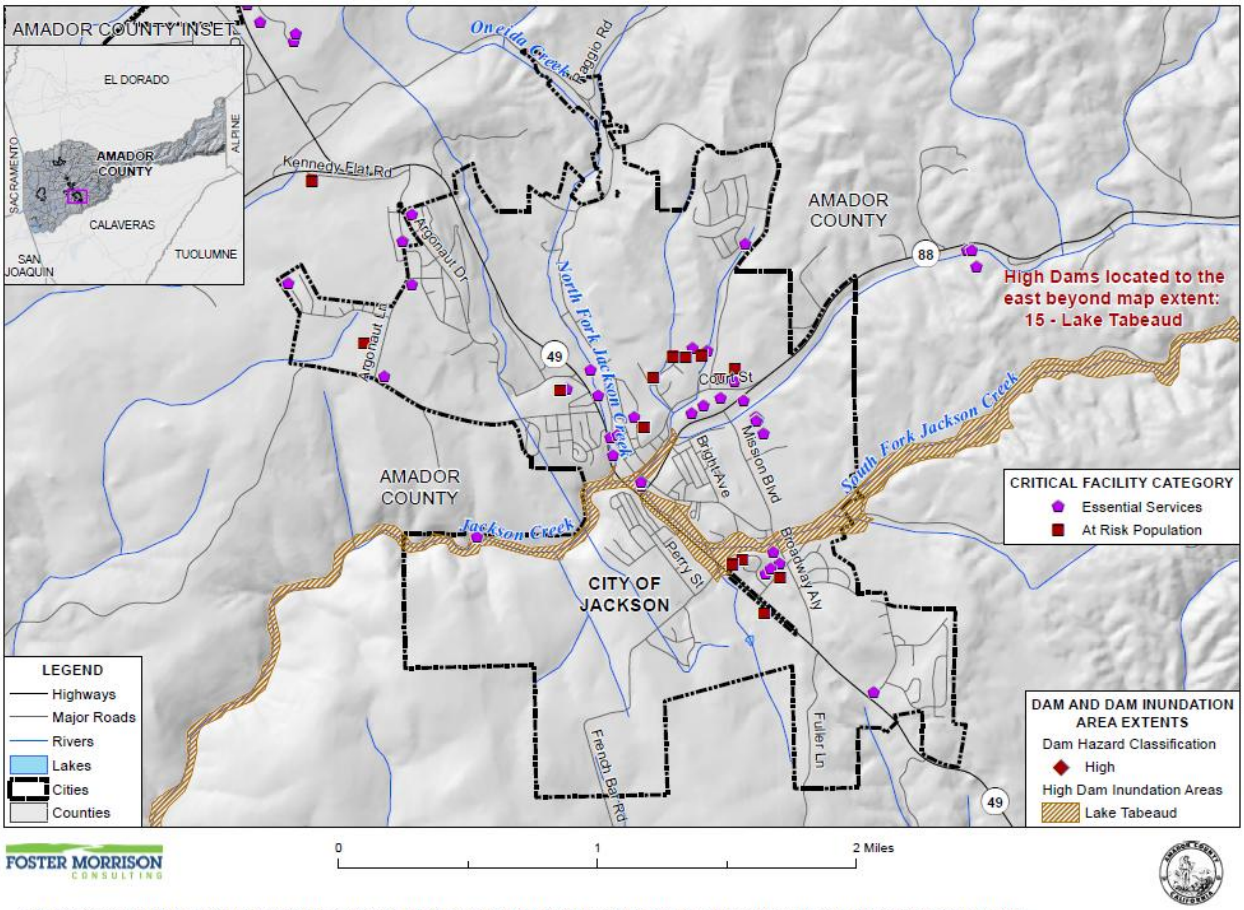
Dam Inundation Area / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Miscellaneous	6	0	$100	$0	$0	$100
Residential	116	84	$7,408,404	$17,355,494	$8,677,747	$33,441,645
Unknown	0	0	$0	$0	$0	$0
Lake Tabeaud Total	**183**	**130**	**$23,394,189**	**$48,964,574**	**$40,286,827**	**$112,645,590**

Source: Cal OES/DSOD, Amador County 2024 Parcel/Assessor Data

Critical Facilities and Infrastructure

Dam failure flooding presents a threat to critical facilities and infrastructure. The following analysis discusses critical facilities and infrastructure. A separate analysis was performed on the critical facility inventory in the City to determine which critical facilities fall into each DSOD dam inundation area. This was done separately for both extremely high hazard and high hazard dam inundation areas. Using GIS, the extremely high hazard dam inundation areas were overlayed on the critical facility GIS layer. None fall in the extremely high hazard dam inundation areas; as such, only high hazard dam analysis is presented below. Using GIS, the high hazard dam inundation areas were overlayed on the critical facility GIS layer. This is shown on Figure C-14 for the high hazard dam inundation areas. Table C-18 details which critical facilities fall in the high hazard dam inundation areas. Details of critical facility categories, type, name, and address by extremely high and high hazard dam inundation area are listed in Appendix F.

Figure C-14 City of Jackson – Critical Facilities in High Hazard Dam Inundation Areas



Data Source: Cal OES Dam Status 2/2025, DWR DSOD (updated 1/2025; data downloaded 2/2025), Amador County GIS, Cal-Atlas; Map Date: 4/21/2025.

Table C-18 City of Jackson – Critical Facilities by Category in High Hazard Dam Inundation Areas

Category / Critical Facility Type	Dam Inundation Area												
	Arroyo Seco	CPUD Middle Fork	CSP Mule Creek	CSP Mule Creek - Saddle	Goffinet	Henderson	Jackson Creek	Jeff Davis	Lake Tabeaud	Meadow Lake	Preston	Tiger Creek Afterbay	Tiger Creek Regulator
Essential Services													
Civic Center	0	0	0	0	0	0	0	0	1	0	0	0	0
Healthcare/School Services	0	0	0	0	0	0	0	0	1	0	0	0	0
Police Station	0	0	0	0	0	0	0	0	1	0	0	0	0
Public Administration Building	0	0	0	0	0	0	0	0	1	0	0	0	0

Category / Critical Facility Type	Dam Inundation Area												
	Arroyo Seco	CPUD Middle Fork	CSP Mule Creek	CSP Mule Creek - Saddle am	Goffinet	Henderson	Jackson Creek	Jeff Davis	Lake Tabeaud	Meadow Lake	Preston	Tiger Creek Afterbay	Tiger Creek Regulator
Wastewater Treatment Plant	0	0	0	0	0	0	0	0	1	0	0	0	0
Essential Services Total	0	0	0	0	0	0	0	0	**5**	0	0	0	0
Jackson Total	0	0	0	0	0	0	0	0	**5**	0	0	0	0

Source: Cal OES/DSOD, City of Jackson

Natural, Historic, and Cultural Resources

A major dam failure event and associated flooding could have a devastating impact on the City. Large flood events can affect all natural, historic, and cultural resources that lie in the dam inundation areas. There are a number of ways floodwaters associated with a dam failure event can impact natural resources and the environment: Wildlife habitats can be destroyed by floodwaters. Contaminated floodwater can pollute rivers and habitats. Silt and sediment can destroy natural areas. Riverbanks and natural levées can be eliminated as rivers reach bankfull capacity. Rivers can be widened, and deposition can increase downstream. Trees can be uprooted by high-velocity water flow. Plants that survive the initial flood may die due to being inundated with water. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to these structures within the inundated areas, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged, and lost during extreme dam failure flood events.

Impacts from Dam Failure

Impacts to the City from dam failure flooding could include loss of life and injury, flooding and damage to property and structures, damage to critical facilities and infrastructure, loss of natural resources, and all other flood related impacts. Additionally, evacuations may be necessary and compounded by impacts to transportation systems and infrastructure. Economic losses to the City and Amador County Planning Area can also be significant.

Other impacts associated with dam failure include landslides, bank erosion, and destruction of habitat. Dam failures can cause downstream flooding and can transport large volumes of sediment and debris and contaminants from the floodwaters. Other environmental impacts can include contamination from septic system failures and releases of contaminants from hazardous materials facilities, contamination of potable water supplies; changes in configurations of streams; loss of wildlife habitats; and degradation of wetlands. A large dam failure event could have significant and catastrophic impacts.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the Climate Change and Dam Failure discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City include the following:

- Climate change is likely to exacerbate future rain and storm conditions and associated impacts and vulnerability of the City to dam failure.
- Population growth in the City has recently slowed; however, additional growth within the dam inundation areas of the City would place additional populations at risk to dam failure. Additional population growth would likely bring continued diversity to the City. Vulnerable population groups could face disproportionate effects from a dam failure and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions and the location of future hazard events.
- Land use planning should be proactive to address future hazard conditions. Locating new development, structures, and critical facilities and infrastructure within or near areas of dam failure risk may put additional development at risk. Six residential lots are expected to be built in the next five years. These are outside of the dam inundation areas. City building codes are in effect to partially reduce this risk and should be updated as necessary to continue to address future dam failure conditions. Thus, changes in land use and development are not expected to increase the impacts and associated vulnerabilities of the City to this hazard.

Future Development

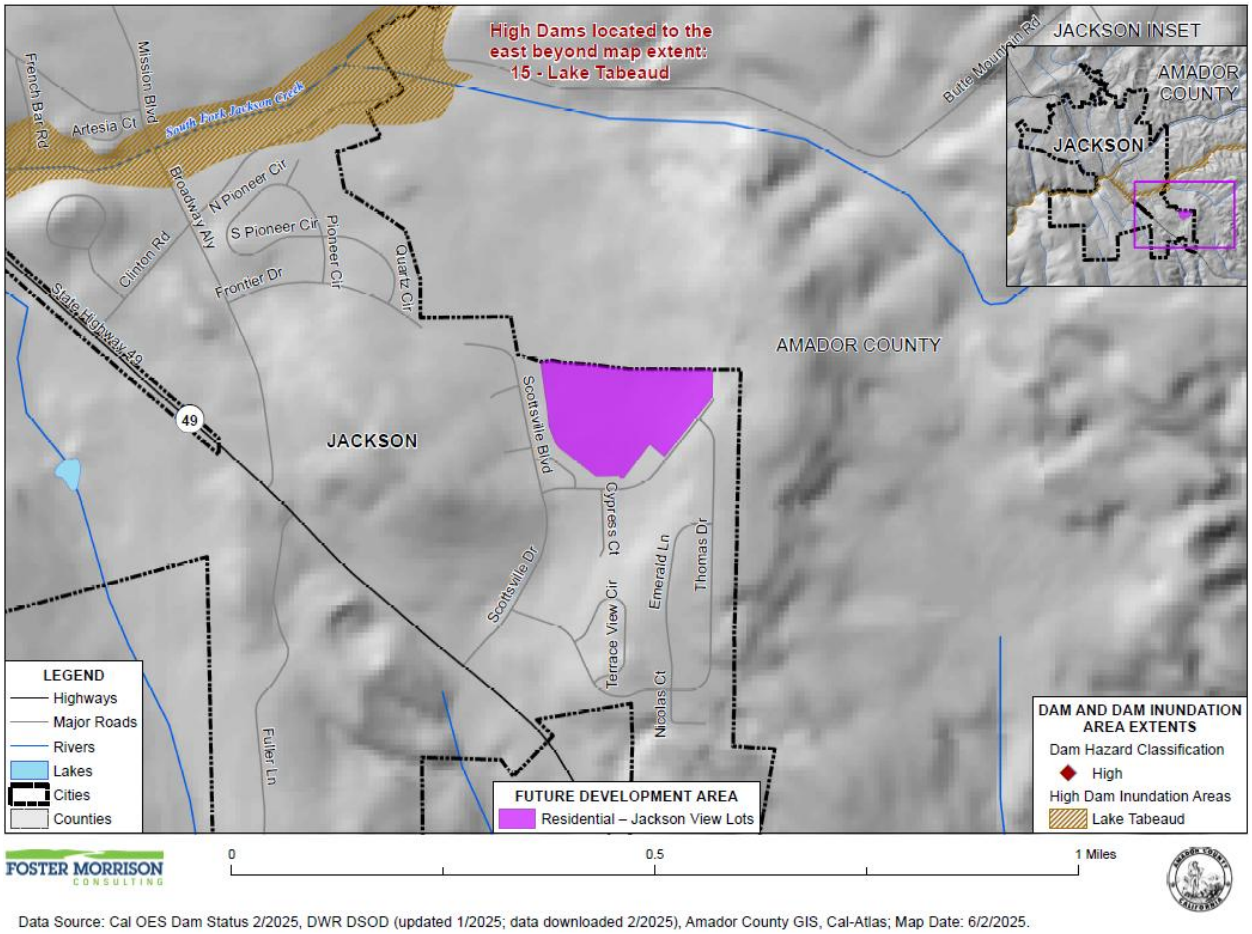
Future dam failure events may occur in the City. Given the number of affected parcels and structures, future development in the City could be affected by dam failures and associated flooding. Siting of future development areas should take dam failure flooding into account. The City enforces its floodplain ordinance, which helps to reduce risk to flooding by requiring structures to be above the base flood elevation, which depending on inundation depths may provide some relief.

Future development areas and their vulnerability to dam failure are discussed further in the below GIS analysis.

GIS Analysis

The City provided a future development area which were used as the basis for the inventory of future development for the City. This area were mapped in GIS. Utilizing the future development area spatial layer, the parcel polygon data was intersected to determine the future development areas within each mapped dam inundation area. No facilities intersect extremely high hazard dam inundation areas; as such no maps or tabular analysis are presented. Figure C-15 shows the locations of the future development area overlayed on the high hazard dam inundation areas. These lie outside of the mapped dam inundation areas; as such, no tabular analysis is presented.

Figure C-15 City of Jackson – Future Development Areas in High Hazard Dam Inundation Areas



Data Source: Cal OES Dam Status 2/2025, DWR DSOD (updated 1/2025; data downloaded 2/2025), Amador County GIS, Cal-Atlas; Map Date: 6/2/2025.

Drought & Water Shortage

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

Drought and water shortage are complex issues involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area's usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water supply is the most significant issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. Drought has also affected tree mortality in the area in the past. As the population in the area continues to grow, so will the demand for water.

Tree Mortality and Drought

One of the specific impacts of drought in the City of Jackson and the Amador County Planning Area is the increased risk to trees from beetle kill and other insects, pathogens and parasites, and other tree mortality and die back issues. Drought weakens trees and makes them more susceptible to insect infestation and other pathogens. Insects, such as bark beetles and others, frequently attack trees weakened by drought, disease, injuries, or other factors that may stress the tree. These insects and other pathogens can contribute to the decline and eventual death of trees throughout the City. The tree mortality and dieback problems are a high priority because of the issue of hazardous trees and an increased wildfire hazard. In addition to an increase in wildfire fuels, hazardous trees can fall onto structures causing damage and a result in a reduction on the tree canopy within the City that provides relief during extreme heat days.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the City and County is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme Drought
- D4 – Exceptional Drought

The Amador County Planning Area, including the City of Jackson, has been in and out of drought since 2014. Over the last five years since the 2020 LHMP, drought conditions have ranged from none to exceptional. Drought conditions are expected to continue to be cyclical in nature depending on the year." Current drought conditions in the City are shown in Section 4.3.10 of the Base Plan.

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time (which does not usually affect water shortages) or for longer periods (which may challenge water supplies). Should a drought last for a long period of time, water shortage becomes a larger issue.

According to the Amador Water Agency (AWA) 2024-2025 Annual Water Supply & Demand Assessment Shortage Report, the Agency has a significant surplus of water supply above current and projected demands. The Amador Water System (AWS) water supply is a pre-1914 water right that has never been curtailed in the most severe single-year or a multiple-year drought. In addition, while the water supply associated with the Central Amador Water Project (CAWP) was temporarily curtailed during recent drought years, the significant storage volume in the Lower Bear Reservoir has allowed previous water supply demands to be met, and are expected to be met in the future, even in dry years. In addition, the total well capacity for the portion of both systems reliant on groundwater are larger than current and projected demands.

Past Occurrences

Disaster Declaration History

There have been 2 state and 1 federal disaster declarations for Amador County. This can be seen in Table C-19. Additionally, there have been 16 USDA Secretarial Disaster Declarations from drought in the County.

Table C-19 Amador County –State and Federal Drought Disaster Declarations 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	2	1976, 2015	1	1977

Source: Cal OES, FEMA

NCDC Events

There have been 249 NCDC drought events in Amador County since 1993. These most likely had some impact on the City.

City of Jackson Events

Based on historical information, the occurrence of drought in California, including the City of Jackson, is cyclical, driven by weather patterns. Section 4.3.10 of the Base Plan notes that five droughts have occurred in the past 86 years. Drought has occurred in the past and will occur in the future.

Climate Change and Drought and Water Shortage

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with drought and water shortage. More information on future impacts to the City can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate scientists studying California find that drought conditions are likely to become more frequent and persistent over the 21st century due to climate change. The experiences of California during recent years

underscore the need to examine more closely the state's water storage, distribution, management, conservation, and use policies. The 2021 Climate Adaptation Study (as well as the 2024 Draft CAS) stresses the need for public policy development addressing long term climate change impacts on water supplies. The CAS notes that climate change is likely to significantly diminish California's future water supply, stating that: California must change its water management and uses because climate change will likely create greater competition for limited water supplies needed by the environment, agriculture, and cities.

A 2018 report from the Public Policy Institute of California noted that thousands of Californians – mostly in rural, small, disadvantaged communities – already face acute water scarcity, contaminated groundwater, or complete water loss. Climate change would make these effects worse.

Cal Adapt scenarios for modeled future drought scenarios were shown in Section 4.3.10 of the Base Plan.

Vulnerability to Drought and Water Shortage

Based on historical information, the occurrence of drought and water shortage in California, including the City, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. The vulnerability of the City of Jackson to drought may vary and include reduction in water supply, turf losses, impacts to natural resources, and an increase in dry fuels and tree dieback.

The whole of the City is at some measure of vulnerability to drought and water shortage. An assessment of a community's vulnerability to drought and water shortage begins with an understanding of local exposure to drought. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The HMPC did note that the City is served by AWA, which does have very "senior" water rights on the Mokelumne River, making the City less vulnerable than other areas in the State of California to drought and water shortage.

Assets at Risk

Assets at risk from drought and water shortage include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

The people and populations of the City are not directly affected by drought; although, their turfed areas, trees, and other water dependent resources can all be affected. In extreme drought conditions, however, residents and other populations within the City may be vulnerability to drought and water shortage issues. Water quality can be impacted, causing health problems, especially to vulnerable populations. Drought and water shortage can lead to an increase in wildfires, threatening City residents. Water shortages can have an effect on all of the populations in the City, but often have a greater effect on the unhoused and other vulnerable populations that may be unable to access clean drinking water during shortages. During periods of drought as the costs of water usage may increase, especially during mandated conservation times, those who are economically disadvantaged may be unable to afford the increased costs of potable water.

Structures

Structures have a limited vulnerability to drought and water shortage. It is the secondary hazard of drought (wildfire) which causes risks to structures. Drought can also stress trees, causing die off. These trees may fall on structures adjacent to them.

Critical Facilities and Infrastructure

Most critical facilities and infrastructure have a limited vulnerability to drought and water shortage. Should drought conditions be severe enough to cause water shortage reliability issues, some facilities and infrastructure may be affected. Water and wastewater systems may be impacted during times of reduced water supply and need to employ contingencies to remain functional and fully operational. Other water dependent systems may also be adversely affected. Further, the secondary hazard of drought (increased potential for spread of urban fires and wildfire) can pose a significant risk to critical facilities and infrastructure. Sufficient water supply for firefighting can also be an issue. Drought can also stress trees, causing die off. These trees may fall on critical infrastructure adjacent to them and impact power lines and other utilities.

Natural, Historic, and Cultural Resources

Drought and water shortage can have a significant impact on natural resources. Water levels in reservoirs and lakes may be reduced and a loss of wetlands and coastal marsh areas may occur. Severe drought conditions can contribute to an increase in erosion of soils and lead to poor soil quality. Further, all of the trees in the City are at risk to drought impacts and a reduction in water supply. These trees provide a wealth of social and environmental benefits to City residents and visitors, from shade and beauty to air quality, carbon reduction and stormwater management. Drought can devastate crops and dry out pastures, dry out forests and critical habitat areas, and reduce food and water available for wildlife and livestock. Additionally, drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. It is unlikely that drought and water shortage would have a significant impact on historic and cultural resources in the City.

Impacts from Drought and Water Shortage

The vulnerability of the City to drought is City-wide, but impacts may vary and include reduction in water supply and an increase in dry fuels. The potential for a reduction in water supply during drought conditions generally leads to both mandated and voluntary conservations measures during extended droughts. During these times, the costs of water can also increase. Also of concern, the increased dry fuels, fuel loads, and tree mortality events associated with drought conditions can result in an increased fire danger. In areas of extremely dry fuels, the intensity and speed of fires can be significant. Water supply and flows for fire suppression can also be an issue during extended droughts. Drought can also lead to turf losses and cause tree die off within the City.

Other qualitative impacts associated with drought in the City are those related to water intensive activities such as municipal usage, commerce, tourism, and recreation use. With more precipitation likely falling as rain instead of snow in the Sierra's, and warmer temperatures causing decreased snowfall to melt faster and earlier, water supply is likely to become more unreliable. In addition, drought and water shortage is predicted to become more common. This means less water available for use over the long run, and additional challenges for water supply reliability, especially during periods of extended drought.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the hazard profile discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City of Jackson include the following:

- Climate change is likely to exacerbate future drought conditions and associated impacts and vulnerability of the City to drought and water shortage.
- Future population growth should be considered as having more or less people in a community affects the overall hazard vulnerability to the City. Population growth in the City has recently slowed. According to the HMPC, the City and Amador County has access to large quantities of water through its groundwater as well as surface water. However, any future population growth in the City will add additional pressure to water companies during periods of drought and water shortage. Water companies will need to continue to plan for and add infrastructure capacity for population growth. As the population grows, the nature and makeup of populations will shift and change along with it. Vulnerable and underserved populations, such as those with low incomes and the unhoused that might not always have access to clean water, will need to be considered as future development continues, since they may experience a disproportionate impact from drought and water shortage. Potential population growth will be a challenge not only with regard to the City's water access for agricultural production, but state- and nation-wide with regard to food production. Should the City see a significant growth in population, it will increase the vulnerability and impacts to the County from this hazard.
- Land use planning should be proactive to address future hazard conditions. As the City continues to grow, more cropland may be taken out of production to provide housing to accommodate for population

growth. As the areas adjacent to the City's agricultural lands are reduced, it seems likely that there would be less of a competing demand for water. However, more development will also require an increase in water supply and associated infrastructure. Six residential lots are expected to be built in the next five years, with more likely in the extended future. Changes in land use and development may or may not increase the impacts and associated vulnerabilities of the City to this hazard depending on where and how this future growth occurs.

As the population in the area continues to grow, so will the demand for water. The AWA provides water to the City through reliable surface water sources. However, population growth in the City will continue to increase the demand for water. Ongoing planning will be needed by the City and AWA to account for population growth and increased water demands.

Earthquake

Likelihood of Future Occurrence–Occasional (minor)/ Unlikely (major)
Vulnerability–High

Hazard Profile

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction.

Location and Extent

Since earthquakes are regional events, the whole of the City is at risk to earthquake. The City of Jackson, Amador County, and surrounding areas have some level of risk from seismic and geologic hazards. Faults in and around the City were shown in Section 4.3.11 of the Base Plan. These include the Carson Range, Great Valley, and Rogers-Hayward Creek faults. A significant seismic event on any of these major faults could cause damage in the City of Jackson.

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales, as discussed in Section 4.3.11 of the Base Plan.

Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. The City is located in an area where earthquakes of some magnitude occur,

so both magnitude and intensity of earthquakes are expected to remain moderate. Seismic shaking maps for the area in Section 4.3.11 of the Base Plan show Amador County and the City fall within a low to moderate shake risk.

Past Occurrences

Disaster Declaration History

There has been no state or federal disaster declarations in Amador County from earthquake.

NCDC Events

The NCDC does not track earthquake events.

City of Jackson Events

As shown in the Base Plan, no disaster declarations have occurred in the County due to earthquake. The City noted no past occurrences of earthquakes that affected the City in any meaningful way.

Climate Change and Earthquake

Climate change is unlikely to increase earthquake frequency or strength. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Vulnerability to Earthquake

The combination of plate tectonics and associated California coastal mountain range building geology generates earthquakes as a result of the periodic release of tectonic stresses Earthquake vulnerability is primarily based on population and the built environment. Urban areas in high seismic hazard zones are the most vulnerable, while uninhabited areas are less vulnerable. The primary impacts of concern are life safety and property damage. Although several faults are in and near the Amador County Planning Area, seismic hazard mapping indicates that the City has low to moderate seismic hazard potential. There is the potential for the City and Amador County Planning Area to be subject to some level of moderate seismic shaking. Some degree of structural damage due to stronger seismic shaking could be expected.

Earthquake shaking can also cause liquefaction to occur. Areas with loose soil and high water tables are at risk from liquefaction. There are limited areas in and near the City prone to liquefaction.

The whole of the City is at some measure of vulnerability to earthquake. An assessment of a community's vulnerability to earthquakes begins with an understanding of local exposure to earthquakes. This is included in the Local Concerns section below. After that section, assets at risk are discussed.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The City of Jackson General Plan Safety Element noted that the City of Jackson is located in a low earthquake (seismic), hazard area. A major earth shaking might occur with a frequency of once in 50 years. The maximum probable intensity of an earthquake in the area, (VII on the Modified Mercalli Scale) is described as:

> ***Difficult to stand. Noticed by drivers of motor cars. Hanging objects quiver. Furniture broken. Damage to masonry, including cracks. Weak chimneys broken at roof line. Fall of plaster, loose bricks, stones, tiles, cornices, unbraced parapets, and architectural ornaments. Some cracks in masonry. Waves on ponds. Water turbid with mud. Small slides and caving in along sand and gravel banks. Large bells ring. Concrete irrigation ditches damaged.***

A more likely earthquake, (Von the Modified Mercalli Scale), is described as:

> ***Felt outdoors; direction estimated. Sleepers wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset. Doors swing, close, open. Shutters, pictures move. Pendulum clocks stop, start, change rate.***

The epicenters of the highest magnitude earthquakes to be felt in this area are likely to be located along the San Andreas and Hayward faults in the Bay Area. The greatest concern for the City is related to the unreinforced masonry buildings in the City.

The City of Jackson General Plan Safety Element also noted that there are pre-1955 structures built of masonry and chimneys, cornices, and second story porches where reinforcing was not provided to withstand seismic stresses and major storms. Many of the older structures, both masonry and wood frame, are historic and should be preserved but they need rehabilitation to provide structural safety, fire safety, sanitation facilities, and adequate exits in order to be used as places of public assembly.

The Uniform Building Code (UBC) identifies four seismic zones in the United States. The zones are numbered one through four, with Zone 4 representing the highest level of seismic hazard. The UBC establishes more stringent construction standards for areas within Zones 3 and 4. All of California lies within either Zone 3 or Zone 4. The City of Jackson is within Zone 3.

Assets at Risk

Many assets in the City are at risk to ground shaking. Assets at risk from earthquake include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All people and populations are at risk from earthquake events. Those at heightened risk include:

- The unsheltered
- Infants and children under age five and their caregivers
- Elderly (65 and older)
- Individuals with disabilities
- Individuals dependent on medical equipment
- Individuals with impaired mobility

The greatest risk to people and populations from earthquake is death and injury. More information on people and populations at risk to earthquake shaking events can be seen in the Hazus scenarios developed for this LHMP. More information on the Hazus scenarios and how the County is affected is included in Section 4.3.11 of the Base Plan. Given the nature of earthquake events causing significant ground shaking among other issues, those critical facilities and infrastructure that include underground components such as water and wastewater facilities would be uniquely vulnerable to damaging earthquakes.

Structures

All structures in the City are vulnerable to earthquakes, depending on the severity and location of the event. The Hazus scenarios conducted for the entire Amador County Planning Area show how structures may be affected.

Critical Facilities and Infrastructure

Earthquake and its related hazards present risks to the City. Earthquakes can damage critical facilities and infrastructure that provide vital services to the City. Damage to critical facilities from the Hazus earthquake scenarios for the Amador County Planning Area, including the City of Jackson, are presented in the Hazus analysis in Section 4.3.11 of the Base Plan. Given the nature of earthquake events causing significant ground shaking among other issues, those critical facilities and infrastructure that include underground components such as water and wastewater facilities would be uniquely vulnerable to damaging earthquakes.

Natural, Historic, and Cultural Resources

The 2023 State Hazard Mitigation Plan noted that environmental problems from earthquakes can be numerous. It is possible for earthquakes to reroute streams, which can change the water quality, possibly damaging habitat and feeding areas. Streams fed by groundwater and/or springs may dry up because of changes in underlying geology. Another threat to the environment from earthquakes is the potential release of hazardous materials into the natural environment causing contamination that can be difficult to contain. Historical and cultural resources are at risk, often due to their age and construction types. The Hazus scenarios in Section 4.3.11 of the Base Plan and included below are relatively silent on the vulnerability to natural, historic, and cultural resources, but impacts to these resources could be long lasting.

Impacts from Earthquake

Earthquakes can strike without warning and cause dramatic changes to the landscape of an area that can have devastating impacts on the built environment. The greatest impact is to life safety of the City of Jackson residents and visitors. Other impacts to the City could include damages to infrastructure such as roads, bridges, and dams; damages and loss of services to utilities and critical infrastructure, including those related to gas, power, water, wastewater and communication systems; damages to structures and other development; and possible loss of life and injuries.

Earthquakes can also cause failure of dams, levees, and reservoirs. Facilities and land downslope from dams or water reservoirs or behind levees might be subject to flooding, if the dams, reservoirs, or levees fail as a result of an earthquake. The City has locations with significant flood risk that include facilities downslope from dams or reservoirs that could be affected by a significant earthquake event.

Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City of Jackson include the following:

- Climate change is likely to have no effect on future earthquake conditions and associated impacts and vulnerability of the City.
- Population growth in the City of Jackson has recently slowed. Any additional growth in the City would place additional populations at risk to earthquake. Additional population growth would likely bring continued diversity to the City. Vulnerable population groups could face disproportionate effects from an earthquake and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions and location and severity of future earthquake events.
- Land use planning should be proactive to address future hazard conditions. Six residential lots are expected to be built in the next five years. City building codes are in effect to reduce structure damage, including damage to critical facilities and infrastructure, and should be updated as necessary to continue

to address future earthquake conditions. Depending on the location of new development and adherence to protective building codes, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the City to this hazard.

Although new growth and development corridors would fall in the area affected by earthquake, given the limited chance of major earthquake and the building codes in effect, development in areas prone to earthquakes will continue to occur. The City enforces the state building code, which mandates construction techniques that minimize seismic hazards. Future development in the City is subject to these building codes and land use planning.

Flood: 1%/0.2% Annual Chance

Likelihood of Future Occurrence–Occasional (1%)/Unlikely (0.2%)
Vulnerability–High

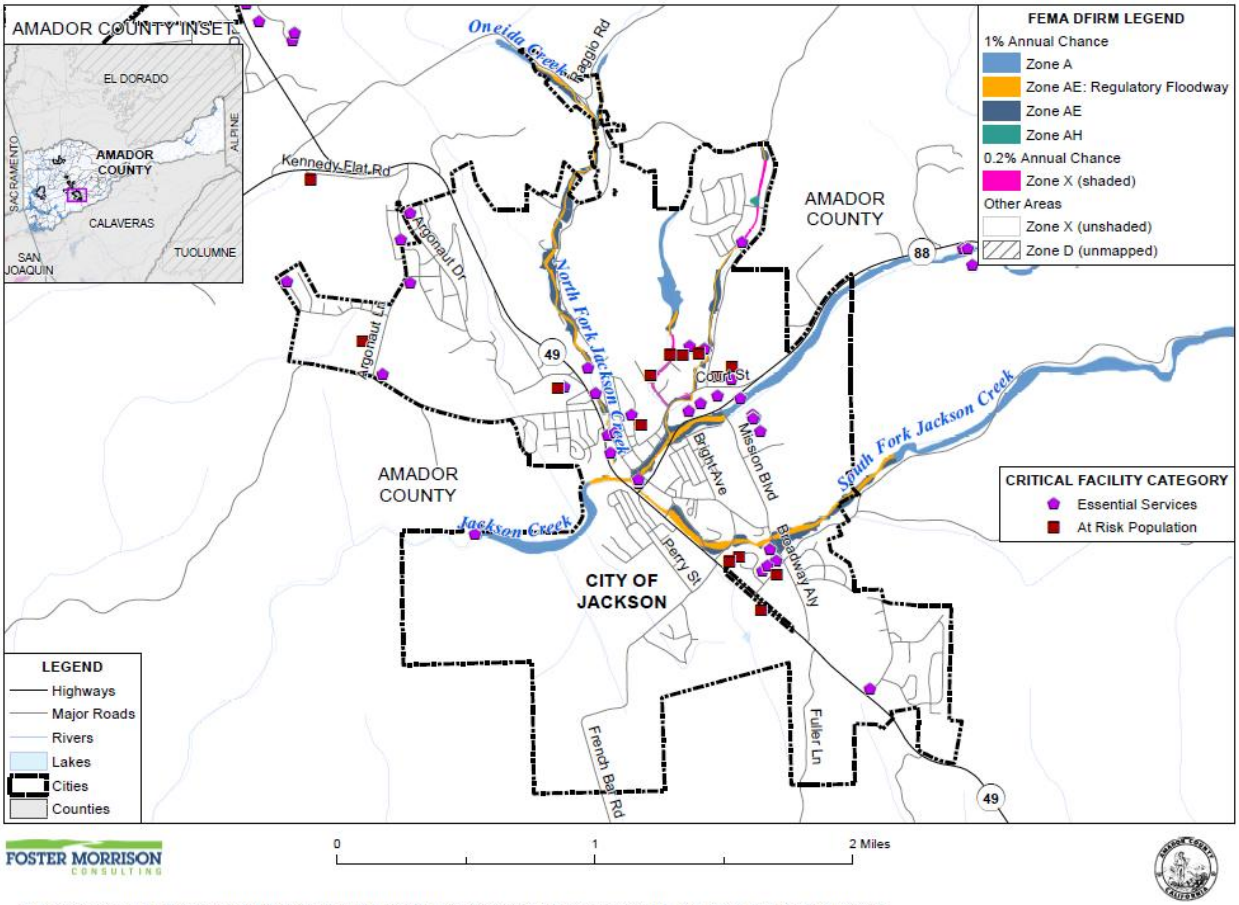
Hazard Profile

This hazard analyzes the FEMA DFIRM 1% and 0.2% annual chance floods. These tend to be the larger floods that can occur in the City and have caused damage in the past. Flooding can be a problem in the City. Historically, the City has been at risk to flooding primarily during the winter and spring months when river systems in the City swell with heavy rainfall and snowmelt runoff. The City has also been at risk during atmospheric river flood events. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures located throughout the Amador County Planning Area and the City of Jackson. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage. Flooding has occurred both within the 1% and 0.2% annual chance floodplains and in other localized areas in the City.

Location and Extent

The City of Jackson has areas located in the 1% and 0.2% annual chance flood zones. This is seen in Figure C-16.

Figure C-16 City of Jackson – FEMA DFIRM Flood Zones



Data Source: FEMA Effective DFIRM 01/20/2016 (NFHL 01/21/2025 database), Amador County GIS, Cal-Atlas; Map Date: 4/21/2025.

Table C-20 details the DFIRM mapped flood zones located within the City.

Table C-20 City of Jackson– DFIRM Flood Hazard Zones

Flood Zone	Description	Present in City of Jackson
A	1% annual chance flooding: No base flood elevations provided	X
AE	1% annual chance flooding: Base flood elevations provided	X
AE Regulatory Floodway	1% annual chance flood: Regulatory floodway; Base flood elevations provided	X
AH	1% annual chance flood areas of shallow flooding between one to three feet deep. Regulatory floodway; Base flood elevations provided	X
Shaded X	0.2% annual chance flooding: The areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood	X
X (unshaded)	No flood hazard	X

Source: FEMA DFIRM 1/20/2016

Additionally, flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the City vary, depending on the nature and extent of a flood event; specific depths are unknown. Flood durations in the City tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Flooding in the City tends to have a shorter speed of onset, due to the amount of water that flows through the City.

Geographical flood extents for the City from the FEMA DFIRMs are shown in Table C-21.

Table C-21 City of Jackson – Geographical DFIRM Flood Zone Extents

Flood Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
1% Annual Chance Flood Hazard	104	5%	41	5%	63	4%
0.2% Annual Chance Flood Hazard	4	0.2%	2	0.2%	2	0.2%
Other Areas	2,194	95%	740	95%	1,454	96%
Jackson Total	**2,302**	**100%**	**782**	**100%**	**1,520**	**100%**

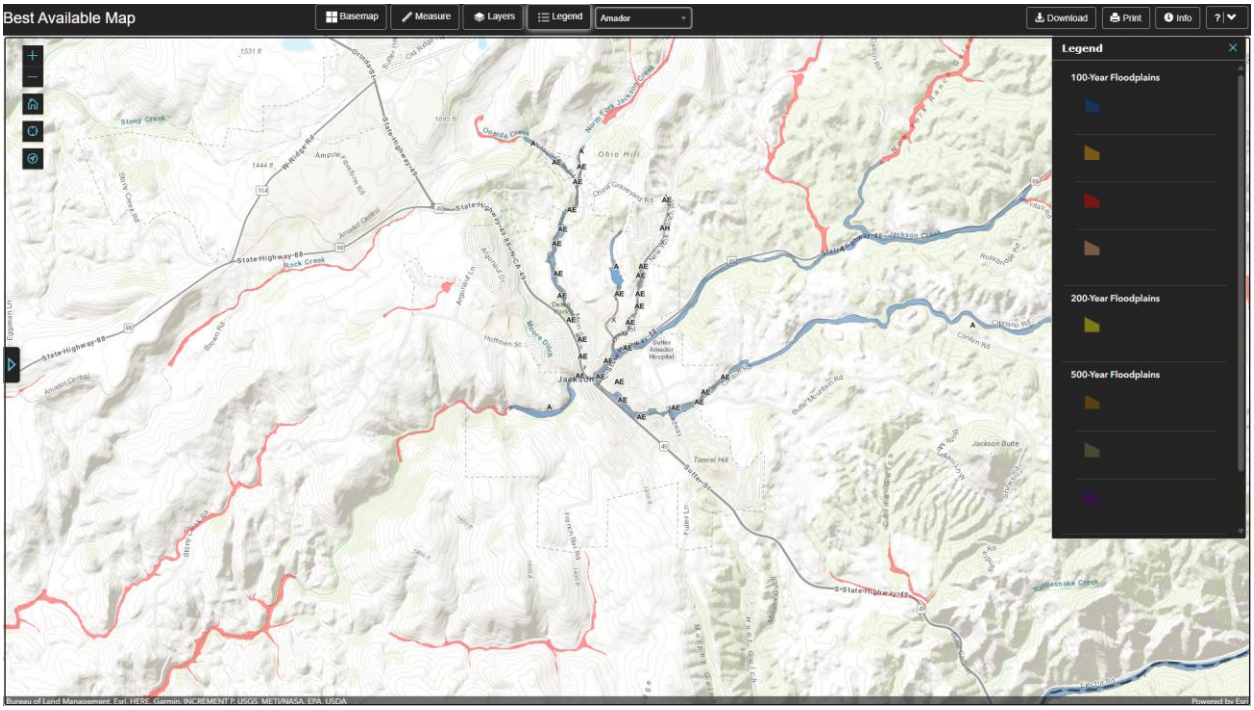
Source: FEMA DFIRM 1/20/2016

California Department of Water Resources Best Available Maps (BAM)

The FEMA regulatory maps provide just one perspective on flood risks in the City. Senate Bill 5 (SB 5), enacted in 2007, authorized the California DWR to develop the Best Available Maps (BAM) displaying 100- and 200-year floodplains for areas located within the Nevada-San Joaquin (SAC-SJ) Valley watershed. This effort was completed by DWR in 2008. DWR has expanded the BAM to cover all counties in the State and to include 500-year floodplains.

Different than the FEMA DFIRMs which have been prepared to support the NFIP and reflect only the 100-year event risk, the BAMs are provided for informational purposes and are intended to reflect current 100-, 200-(as applicable), and 500-year event risks using the best available data. The 100-year floodplain limits on the BAM are a composite of multiple 100-year floodplain mapping sources. It is intended to show all currently identified areas at risk for a 100-year flood event, including FEMA's 100-year floodplains. The BAM are comprised of different engineering studies performed by FEMA, Corps, and DWR for assessment of potential 100-, 200-, and 500-year floodplain areas. These studies are used for different planning and/or regulatory applications, and for each flood frequency may use varied analytical and quality control criteria depending on the study type requirements. The value in the BAMs is that they provide a bigger picture view of potential flood risk to the City than that provided in the FEMA DFIRMs. The BAM map for the City of Jackson is shown in Figure C-17.

Figure C-17 City of Jackson – Best Available Map



Source: California DWR

Legend explanation: **Blue** - FEMA 100-Year, **Orange** – Local 100-Year (developed from local agencies), **Red** – DWR 100-year (Awareness floodplains identify the 100-year flood hazard areas using approximate assessment procedures.), **Pink** – USACE 100-Year (2002 Sac and San Joaquin River Basins Comp Study), **Yellow** – USACE 200-Year (2002 Sac and San Joaquin River Basins Comp Study), **Tan** – FEMA 500-Year, Grey – Local 500-Year (developed from local agencies), **Purple** – USACE 500-Year (2002 Sac and San Joaquin River Basins Comp Study).

Past Occurrences

Disaster Declaration History

A list of state and federal disaster declarations for Amador County from flooding is shown on Table C-22. These events also likely affected the City to some degree.

Table C-22 Amador County – State and Federal Disaster Declarations from Flood 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	22	1950, 1955, 1958 (twice), 1959, 1963, 1964, 1969, 1980, 1982, 1986, 1995 (twice), 1997, 2006 (twice), 2017 (twice), 2019, 2021, 2023 (twice)	20	1950, 1955, 1958, 1962, 1963, 1964, 1969, 1986, 1995 (twice), 1997, 1998, 2006 (twice), 2017 (twice), 2019, 2023 (three)

Source: Cal OES, FEMA

NCDC Events

The NCDC tracks flooding events for the County. Events have been tracked for flooding since 1993. Amador County has seen 43 events. These events most likely had some impact on the City.

City of Jackson Events

The City noted that the following events had affects and damages to the City:

The City noted an event in **January and February 2017**. Heavy rains caused damages to multiple areas in the City:

- Wastewater Treatment Plant Road: The slope slipped at the road to the sewer treatment plant. An emergency repair was made to repair the slope and road. ($600,000 in damages)
- Michelle Drive/Kristi Court Intersection: Asphalt concrete experienced transverse cracking in multiple locations. Asphalt concrete would be ground out and replaced. ($20,000 in damages)
- Westview Drive and Westview Drive at Terry Place & Erinn Place Intersection: Asphalt concrete experienced alligator cracking in multiple locations. Asphalt concrete would be ground out and replaced. ($20,000 in damages)
- Busi Parking: There is slope slippage at the Busi Parking lot adjacent to Mel's Diner. The slope would require reconstruction. ($500,000 in damages)
- Summit Street: Asphalt erosion has deteriorated the road. Asphalt concrete would be ground out and replaced. ($30,000 in damages)
- City Hall Roof: High gusty winds damaged the roof at City Hall. The roof will require fixing to alleviate the damage. ($60,000 in damages)
- Argonaut Drive: Asphalt concrete has deteriorated on road way adjacent to Fire Station. Asphalt concrete would be ground out and replaced. ($20,000 in damages)
- Stark Ln: existing bridge deck damaged underneath the deck, concrete is falling off and reinforcement is now exposed. Bridge to be replaced with a concrete box culvert before it fails. ($950,000 in damages)
- Jackson Gate Rd - Kennedy Mine walking trail, the base rock was washed out and material ended up on Jackson Gate Road. The runoff has created large rills in the trail. Place new base rock and compact. ($20,000 in damages)
- Jackson Gate/China Graveyard: the material around an existing culvert that crosses Jackson Gate from China Graveyard was undermined from the large amount of runoff. Pipe needs to be exposed and re-backfilled with cement slurry and the trench repaved. ($12,000 in damages)
- China Graveyard: the existing roadside ditch along the north side of the road starting from New York Ranch Rd east 630 has been washed out and the westbound lane edge of pavement is sluffing off and starting to get undermined. A 6' wide section of the edge of the road needs to be rebuilt with 3" ac over 8" ab. Roadside ditch needs to be cleaned and regraded and RSP placed in the ditch. ($85,350 in damages)
- Mattley St: repair bank failure above city parking lot bathrooms. ($525,000 in damages)
- Sutter St: existing roadside ditch washed out and asphalt concrete ditch has been undermined from the high flows coming down Sutter St. 800 linear feet of a new asphalt concrete ditch that ties into the existing roadway edge of pavement needs to be constructed. ($52,600 in damages)
- Spunn Rd: there are two existing culverts that daylight on the east side of the road at 10340 Spunn Rd. High flows have eroded the bank at the outlet of the culverts. An energy dissipator is needed with rip rap at the two outlets. ($21,000 in damages)

The City also noted flooding occurred inside the City from **December 27, 2022 to January 2, 2023**. Heavy rains from an atmospheric river storm event occurred. This caused both riverine flooding as well as

localized flooding. Water had to be pumped from the Argonaut HS lift station and dumped into a manhole on Hoffman to keep that area from flooding. Areas along the North Fork of Jackson Creek caused soil erosion that exposed pipes that ran along the river, which needed to be fixed. These were sewer lines that were buried under and within creek beds. The Wastewater Treatment Plant saw damages from flooding, high sewer flows, as well as landsliding in areas around the Plant (as discussed in the Past Occurrences of Landslide, Mudslide, and Debris Flow below). The City saw stormwater drainage issues and damages in the French Bar Road and South Avenue areas.

The City utilized force account labor overtime, materials, and contracts in taking the Emergency Protective Measures of providing emergency access by clearing debris from roadways and conducting emergency road repairs, flood fighting including emergency pumping including removal of stormwater from sewer lift station and overtime labor to keep wastewater treatment facility operational throughout the incident, emergency slope stabilization including repairs to a slope where a mudslide occurred depositing debris onto a public roadway, and emergency repairs necessary to prevent further damage including mudslide remediation at wastewater treatment plant and repairs to pump valves to lessen or eliminate immediate threats to lives, public health and safety, and improved property.

Climate Change and Flood

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with flood. More information on future impacts to the City can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

According to the 2021 CAS (as well as the 2024 Draft CAS), climate change may affect flooding in California, the Amador County Planning Area, and the City of Jackson. While average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is possible that average soil moisture and runoff could decline, however, due to increasing temperature, evapotranspiration rates, and spacing between rainfall events. Reduced snowpack and increased number of intense rainfall events are likely to put additional pressure on water infrastructure which could increase the chance of flooding associated with breaches or failures of flood control structures such as levees and dams. Cal Adapt future precipitation projections were shown in Section 4.3.4.

Vulnerability to Flood: 1% and 0.2% Annual Chance

Floods have been a part of the City's historical past and will continue to be so in the future. During winter months, long periods of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread structural and property damage. Predominantly, the effects of 1% and 0.2% annual chance flooding are generally confined to areas near the waterways of the City. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat.

The whole of the City is at some measure of vulnerability to floods. An assessment of a community's vulnerability to flood begins with an understanding of local exposure to flood. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The General Plan Safety Element noted that the historic center of the Jackson area is the junction of the branches of Jackson Creek into the main stream. There are no major dams located on the creeks upstream from the City. Flooding is confined to narrow areas along the streams, typically less than 150 feet wide, as shown on the DFIRM. The flood waters seldom rise above the natural high banks of the streams. In the central business district, portions of the natural banks have been replaced with masonry walls and in a few places the North Fork has been covered over with buildings.

During periods of heavy rains and more recently, atmospheric rivers, flooding can be extensive along the waterways resulting in a variety of damages. Recent events have caused local stormwater drainage systems to be overwhelmed causing damage to culverts and underground pipes; roads, ditches, and bridges have been damaged and eroded, and certain key facilities, such as the WWTP, City Hall, and the Argonaut High School have experienced damage, as seen in the 2017 and 2022/2023 storm events. There are numerous areas around the City that experience a variety of issues during larger flood events.

Assets at Risk

Assets at risk from flood include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All people and populations located in the 1% and 0.2% annual chance floodplains are at some risk to flooding. Certain vulnerable populations located within areas prone to flooding may be at increased risk to this hazard, especially during a large event with minimal advance notice. These vulnerable populations include: the unsheltered, those with limited mobility, and those that lack the resources to leave the area.

City residents that live in the 1% and 0.2% annual chance floodplains are often the most vulnerable. Not only are the residents at risk, but their homes and contents are all at risk, compounding the impacts associated with significant hazard events. To further evaluate the impact to the City of Jackson's residential population residing within these hazard areas, the DFIRM flood zones were overlayed on the parcel layer. Those residential parcels that intersect the flood zones were counted and multiplied by the 2023 Census Bureau average household factors for the City of Jackson – 2.20. According to this analysis, there is a total population of 332 and 29 residents of the City at risk to flooding in the 1% and 0.2% annual chance floodplains, respectively. This is shown in Table C-23.

Table C-23 City of Jackson – Improved Residential Parcels and Population by Summary FEMA DFIRM Flood Zone

Jurisdiction	1% Annual Chance		0.2% Annual Chance	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Jackson	151	332	13	29

Source: FEMA DFIRM 1/20/2016, Amador County 2024 Parcel/Assessor Data, US Census Bureau American Community Survey 2023 Household Size Estimates.

The City noted that the Critical Facilities and Infrastructure section below includes the facilities used by At-Risk populations that are threatened by this hazard. While this is not specific to what special populations reside in the City, it does speak to facilities that area used to serve (portions) of this population.

Structures

Certain structures in the City are at risk of DFIRM flooding and primarily include those structures located within the 1% and 0.2% annual chance floodplains. GIS was used to determine the possible impacts of flooding on parcels and structures within the City of Jackson. The methodology described in Section 4.3.11 of the Base Plan was followed in determining structures and values at risk to the 1% (100-year) and 0.2% (500-year) annual chance flood event. Table C-24 is a summary table for the City of Jackson. Parcel counts, land and improved values (i.e., those with a structure improvement on the parcel), estimated content replacement values, and total values in the City are shown for the 1% and 0.2% annual chance flood zones, as well as for those properties that fall outside of the mapped FEMA DFIRM flood zones. Table C-25 breaks down Table C-24 and shows the same analysis further broken out by detailed FEMA flood zone and property use.

Table C-24 City of Jackson – Count and Value of Parcels and Structures in Summary DFIRM Flood Zone

Flood Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
1% Annual Chance Flood Hazard	291	207	$38,297,775	$145,588,113	$122,294,239	$306,180,127
0.2% Annual Chance Flood Hazard	29	24	$3,525,241	$10,794,147	$9,553,139	$23,872,527
Other Areas	1,804	1,525	$160,028,972	$411,492,479	$248,465,038	$819,986,489
Jackson Total	**2,124**	**1,756**	**$201,851,988**	**$567,874,739**	**$380,312,415**	**$1,150,039,142**

Source: FEMA DFIRM 1/20/2016, Amador County 2024 Parcel/Assessor Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Table C-25 City of Jackson – Count and Values of Parcels and Structures by Detailed DFIRM Flood Zone and Property Use

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
1% Annual Chance Flood Hazard						
Agricultural	4	1	$4,307,193	$557,676	$557,676	$5,422,545
Commercial	67	54	$16,456,161	$98,463,104	$98,463,104	$213,382,369
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	15	0	$100	$0	$0	$100
Residential	204	151	$17,527,135	$46,546,917	$23,273,459	$87,347,511
Unknown	1	1	$7,186	$20,416	$0	$27,602
1% Annual Chance Flood Hazard Total	**291**	**207**	**$38,297,775**	**$145,588,113**	**$122,294,239**	**$306,180,127**
0.2% Annual Chance Flood Hazard						
Agricultural	0	0	$0	$0	$0	$0
Commercial	12	11	$2,471,163	$8,312,130	$8,312,130	$19,095,423
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	2	0	$0	$0	$0	$0
Residential	15	13	$1,054,078	$2,482,017	$1,241,009	$4,777,104
Unknown	0	0	$0	$0	$0	$0
0.2% Annual Chance Flood Hazard Total	**29**	**24**	**$3,525,241**	**$10,794,147**	**$9,553,139**	**$23,872,527**
Other Areas						
Agricultural	7	1	$303,112	$170,466	$170,466	$644,044
Commercial	189	152	$35,934,192	$76,764,673	$76,764,673	$189,463,538
Industrial	12	9	$3,001,381	$6,178,312	$9,267,468	$18,447,161
Miscellaneous	47	2	$616,110	$1,465,924	$0	$2,082,034
Residential	1,535	1,349	$119,144,592	$324,524,861	$162,262,431	$605,931,884
Unknown	14	12	$1,029,585	$2,388,243	$0	$3,417,828
Other Areas Total	**1,804**	**1,525**	**$160,028,972**	**$411,492,479**	**$248,465,038**	**$819,986,489**
Jackson Total	**2,124**	**1,756**	**$201,851,988**	**$567,874,739**	**$380,312,415**	**$1,150,039,142**

Source: FEMA DFIRM 1/20/2016, Amador County 2024 Parcel/Assessor Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Table C-26 summarizes Table C-25 and shows City of Jackson loss estimates and improved values at risk by FEMA 1% and 0.2% annual chance flood zones. According to Table C-25 and Table C-26, the City of Jackson has 207 parcels and $53.6 million of structure and contents values or values in the 1% annual chance flood zone, and 24 improved parcels and $267.9 million of structure and contents values in the 0.2% annual chance flood zone. These values can be refined a step further. Applying the 20 percent damage factor as previously described in Section 4.3.11 of the Base Plan, there is a 1% chance in any given year of a flood event causing $53.6 million in damage and a 0.2% chance in any given year of a flood event causing $1.4 million in damage in the City of Jackson. The loss ratio of 0.775% indicates that flood losses for 1% annual chance flooding would be relatively minor, but the City would be able to readily recover. The loss ratio of 0.59% indicates that flood losses for 0.2% annual chance flooding would be relatively minor and the City should also be able to recover with limited.

Table C-26 City of Jackson – Flood Loss Estimates

Flood Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value	Loss Estimate	Loss Ratio
1% Annual Chance Flood Hazard	291	207	$38,297,775	$145,588,113	$122,294,239	$267,882,352	$53,576,470	0.775%
0.2% Annual Chance Flood Hazard	29	24	$3,525,241	$10,794,147	$9,553,139	$20,347,286	$4,069,457	0.059%
Total	**320**	**231**	**$41,823,016**	**$156,382,260**	**$131,847,378**	**$288,229,638**	**$57,645,927**	**0.008%**

Source: FEMA DFIRM 1/20/2016, Amador County 2024 Parcel/Assessor Data

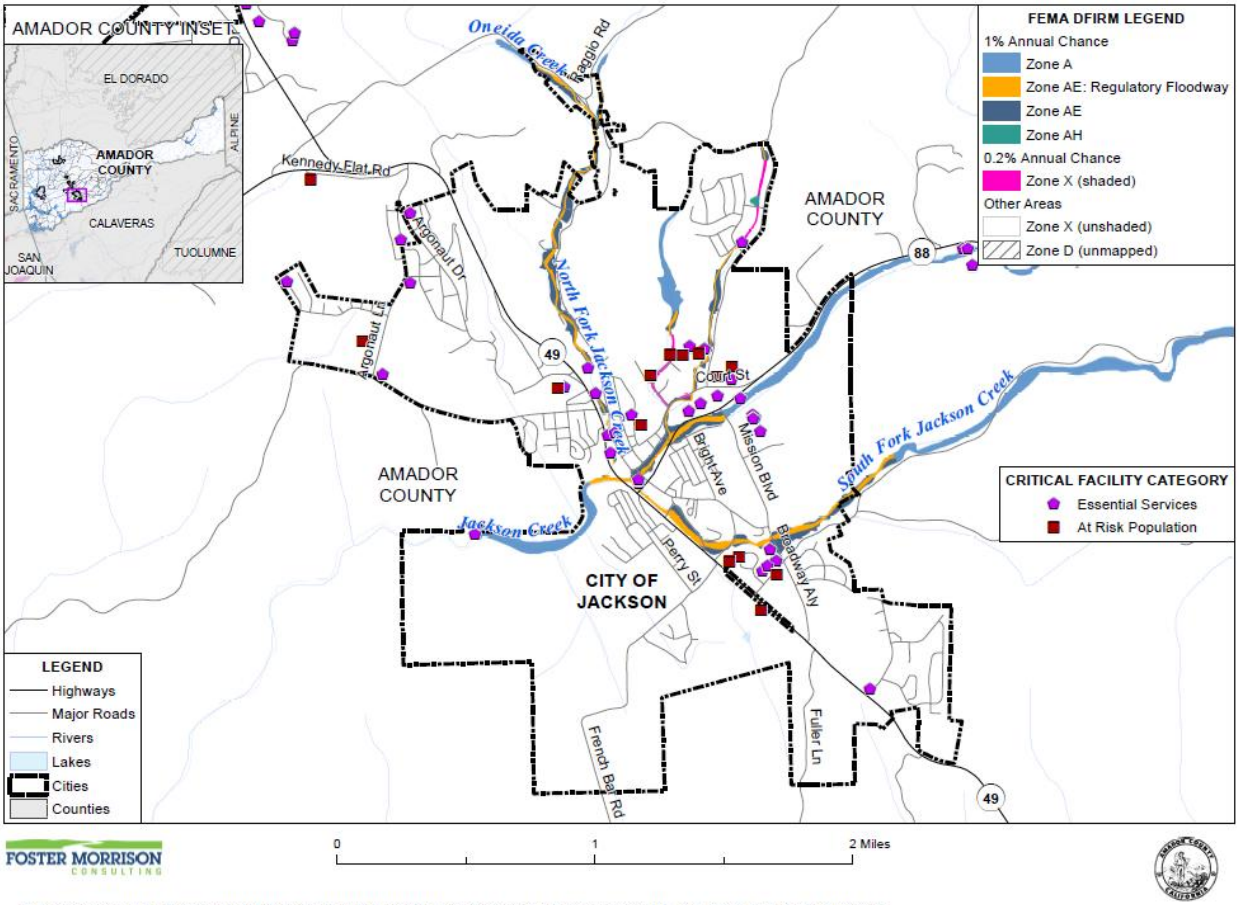
*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Critical Facilities and Infrastructure

1% and 0.2% annual chance flooding present a threat to critical facilities and infrastructure. The following analysis discusses critical facilities and infrastructure. A separate analysis was performed on the critical facility inventory in the City to determine which critical facilities fall into each FEMA DFIRM flood zone. Using GIS, the FEMA DFIRM flood zones were overlayed on the critical facility GIS layer. This is shown on Figure C-25 for the FEMA DFIRM flood zones. Table C-46 details which critical facilities fall in which FEMA DFIRM flood zones. Details of critical facility categories, type, name, and address by FEMA DFIRM flood zones are listed in Appendix F.

Figure C-18 City of Jackson – Critical Facilities in FEMA DFIRM Flood Zones



Data Source: FEMA Effective DFIRM 01/20/2016 (NFHL 01/21/2025 database), Amador County GIS, Cal-Atlas; Map Date: 4/21/2025.

Table C-27 City of Jackson – Critical Facilities by Category and Type in FEMA DFIRM Flood Zones

Flood Zone	Critical Facility Category / Critical Facility Type	Facility Count
1% Annual Chance Flood Hazard		
Zone A	**Essential Services**	
	Clinic	1
	Essential Services Total	1
	Zone A Total	**1**
Zone AE	**Essential Services**	
	Civic Center	1
	Police Station	1
	Public Administration Building	1
	Essential Services Total	**3**
	Zone AE Total	**3**
1% Annual Chance Flood Hazard Total		**4**

Flood Zone	Critical Facility Category / Critical Facility Type	Facility Count
0.2% Annual Chance Flood Hazard		
Zone X (shaded)	**Essential Services**	
	Clinic	1
	Essential Services Total	**1**
	Zone X (shaded) Total	**1**
0.2% Annual Chance Flood Hazard Total		**1**
Other Areas		
Zone X (unshaded)	**Essential Services**	
	Clinic	7
	Communications	1
	Community Center	2
	Court House	1
	DMV	1
	EOC	1
	Evacuation Shelter	2
	Fire Station	2
	Government Administration	1
	Healthcare/School Services	1
	Hospital	1
	Jail	1
	Library	1
	Police Station	2
	Post Office	1
	Public Administration Building	1
	School District Office	1
	Wastewater Facility	2
	Wastewater Treatment Plant	1
	Essential Services Total	**30**
	At Risk Population	
	Community Center	1
	Other	1
	Residential Care Facility	4
	School	5
	Veterans Services	2
	At Risk Population Total	**13**
	Zone X (unshaded) Total	**43**

Flood Zone	Critical Facility Category / Critical Facility Type	Facility Count
Other Areas Total		**43**
Jackson Total		**48**

Source: FEMA DFIRM 1/20/2016, City of Jackson

Natural, Historic, and Cultural Resources

Large flood events can affect natural, historic, and cultural resources. There are a number of ways floodwaters can impact natural resources and the environment. Wildlife habitats can be destroyed by floodwaters. Contaminated floodwater can pollute rivers and habitats. Silt and sediment can destroy natural areas. Riverbanks and natural levees can be eliminated as rivers reach bankfull capacity. Rivers can be widened, and deposition can increase downstream. Trees can be uprooted by high-velocity water flow. Plants that survive the initial flood may die due to being inundated with water. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to structures within the flooded areas, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged and lost during extreme flood events. Any of these that fall in the flood zones shown on Figure C-16 would be vulnerable.

Impacts from Flood: 1% and 0.2% Annual Chance

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Large flood events, including those associated with 1% and 0.2% annual chance floods, can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. People may be swept away in floodwaters, causing injuries or deaths. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Structures can be damaged directly from floodwaters and can also be damaged from trees falling as a result of water-saturated soils. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services causing power outages. The interruption of power causes major problems and can result in the closure of governmental offices and community businesses. Public schools may also be required to close or be placed on a delayed start schedule. Roads can be damaged and closed, causing safety and evacuation issues.

Standing water can cause damage to crops, roads, foundations, and electrical circuits. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, loss of environmental resources, and economic impacts.

Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;

- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the hazard profile discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Insurance Coverage, Claims Paid, and Repetitive Losses

Standard property insurance does not include flood coverage because of the relatively high risk. The National Flood Insurance Program (NFIP) provides flood insurance to residents in those communities that participate in the NFIP. Federal financial assistance requires the purchase of flood insurance for structures located within a 100-year floodplain – a requirement that affects nearly all mortgages financed through commercial lending institutions. Flood insurance is also recommended for all structures protected by levees, even if not mapped within a floodplain.

The City of Jackson joined the National Flood Insurance Program (NFIP) on August 19, 1985. The City does not participate in the CRS program. NFIP data indicates that as of March 2, 2020, there were 28 flood insurance policies in force in the City with $8,054,500 of coverage. There have been 40 historical claims for flood losses totaling $1,030,257.19. 29 were for pre-FIRM structures. 25 of these pre-FIRM losses was in the A zone, while the other 4 were in the B, C, or X zones. 5 were for post-FIRM structure in the A zone. NFIP data further indicates that there are 7 repetitive loss and 0 severe repetitive loss buildings in the City. The repetitive loss buildings are 2 single family homes, 1 multi-family home, and one non-residential building. There has been one substantial damage claim since 1978 in the City.

Based on this analysis of insurance coverage, the City has values at risk to the 1% annual chance and greater floods. Of the 207 improved parcels within the 1% annual chance flood zone, 24 of those parcels maintain flood insurance. This can be seen on Table C-28.

Table C-28 City of Jackson – Percentage of Policy Holders to Improved Parcels in the 1% Annual Chance Floodplain

Jurisdiction	Improved Parcels in SFHA (1% Annual Chance) Floodplain*	Insurance Policies in the SFHA (1% Annual Chance) Floodplain	Percentage of 1% Annual Chance Floodplain Parcels Currently Insured
City of Jackson	207	24	11.6%

Source: FEMA DFIRM 1/20/2016, Amador County 2024 Parcel/Assessor Data, NFIP CIS data.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City of Jackson include the following:

- Climate change is likely to exacerbate future flood conditions and associated impacts and vulnerability of the County to 1% and 0.2% annual chance flooding.
- Future population growth should be considered, as having more or less people in a community affects the overall hazard vulnerability to the City. Population growth in the City of Jackson has recently slowed; however, additional growth within the levee protected areas of the County and other 1% and 0.2% annual chance floodplains would place additional populations at risk to flood. Additional population growth would likely bring continued diversity to the County. Vulnerable population groups could face disproportionate effects from flooding and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions and the location of future flood events.
- Land use planning should be proactive to address future hazard conditions. Six residential lots are expected to be built in the next five years. These are located outside of the known floodplain. Locating new development, structures and critical facilities and infrastructure within or near areas of flood risk may put additional development at risk. However, City building codes and the City's floodplain ordinance are in effect to reduce this risk and should be updated as necessary to continue to address future flood conditions. Six residential lots are expected to be built in the next five years, with more likely in the extended future. Changes in land use and development may or may not increase the impacts and associated vulnerabilities of the City to this hazard depending on where and how this future growth occurs and the nature and extent of future flood events.

Future Development

The potential for flooding may increase as floodwaters are channeled due to land development. Such changes can exacerbate flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. Floodplain modeling and master planning should be based on built out property use to ensure that all new development remains safe from future flooding. While local floodplain management, stormwater management, and water quality regulations and policies address these changes on a site-by-site basis, their cumulative effects can have a negative impact on the overall floodplain.

The City enforces its floodplain management ordinance. The City's floodplain ordinance should be updated to ensure new development within floodplains is adequately protected. More detail on the specifics of the floodplain ordinance can be found in the Capability section below.

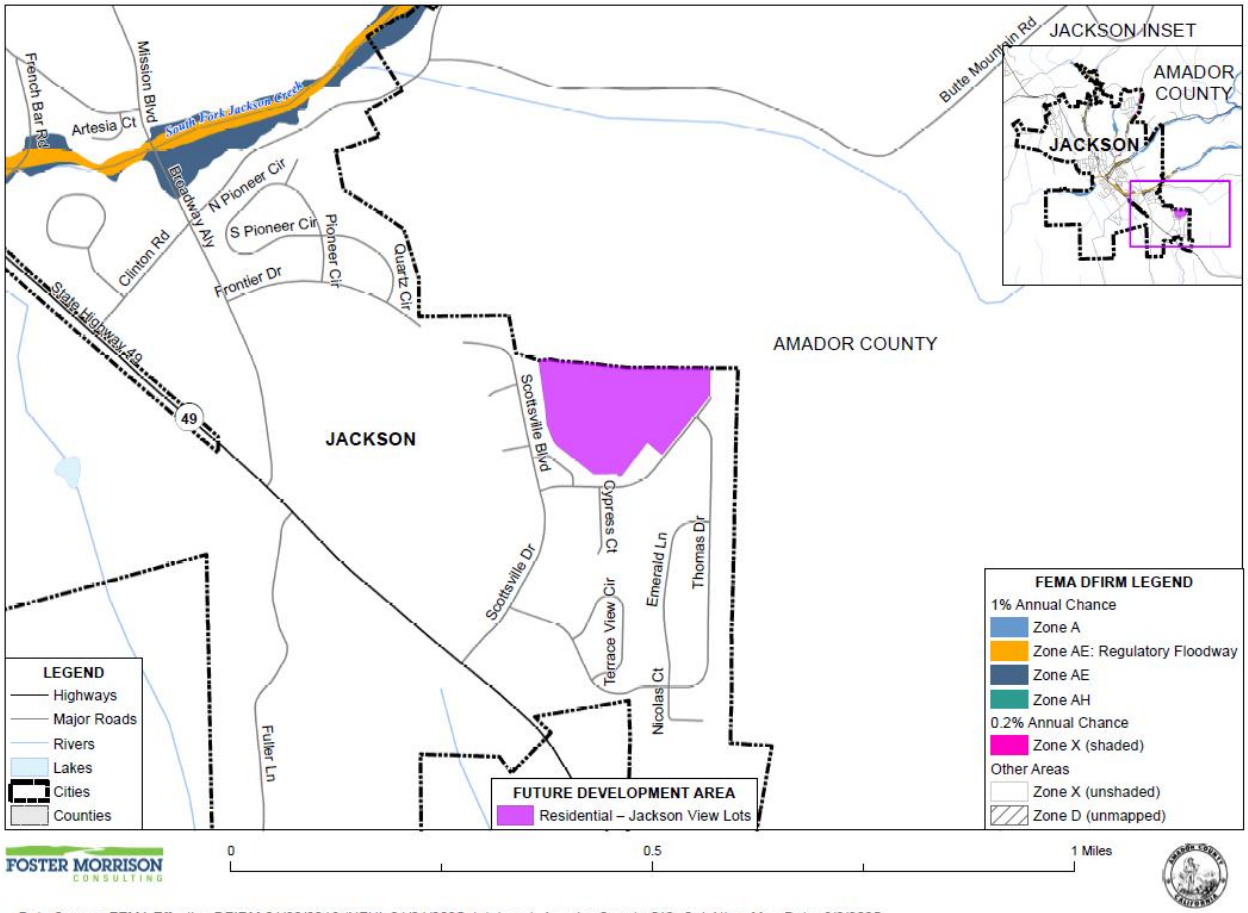
Future development areas and their vulnerability to 1% and 0.2% annual chance flood are discussed further in the below GIS analysis.

GIS Analysis

The City provided a future development area which was used as the basis for the inventory of future development for the City. This area was mapped in GIS. Utilizing the future development area spatial

layer, the parcel polygon data was intersected to determine the future development areas within each DFIRM flood zone. Figure C-19 shows the locations of the future development area overlayed on the DFIRM flood zones. These lie outside of the mapped DFIRM flood zones; as such, no tabular analysis is presented.

Figure C-19 City of Jackson – Future Development Areas in FEMA DFIRM Flood Zones



Data Source: FEMA Effective DFIRM 01/20/2016 (NFHL 01/21/2025 database), Amador County GIS, Cal-Atlas; Map Date: 6/2/2025.

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the City during the rainy season from November through April. Prolonged heavy rainfall (including that from atmospheric river events) contributes to a large volume of runoff resulting in high peak flows of moderate duration.

Location and Extent

The City of Jackson is subject to localized flooding throughout the City. Areas prone to localized flooding are included in Table C-29 below. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the City vary by location. Flood durations in the City tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the City tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

Past Occurrences

Disaster Declaration History

There have been no state or federal disaster declarations from localized floods. There would most likely have been localized flood events during the disaster declarations from flood as shown in the previous 1%/0.2% annual chance flood section.

NCDC Events

The NCDC occurrences of localized flooding are included in the 1% and 0.2% annual chance flood hazard profile above where past flood events were noted.

City of Jackson Events

The City noted that localized flooding happens every year, to varying extent. There were issues in 2017 and 2022/2023 that were discussed in the Flood:-1% and 0.2% annual chance flood section of this Annex.

Climate Change and Localized Flood

It is likely that climate change will increase the chance of future occurrence as well as future impacts from localized flood. More information on future impacts to the City can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Even if average annual rainfall may decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century, increasing the likelihood of overwhelming stormwater systems built to historical rainfall averages. This makes localized flooding more likely.

Vulnerability to Localized Flood

Flood vulnerability and their impacts vary by location and severity of any given flood event and will likely only affect certain areas of the City during specific times. Based on the risk assessment, it is evident that floods will continue to have potentially significant impacts to certain areas of the City. However, while flooding can cause significant impacts, depending on the duration and volume of precipitation and the drainage in any given area, many of the floods in the City are minor, localized flood events that are more of a nuisance than a disaster.

Many areas of the City are at some measure of vulnerability to localized flooding. An assessment of a community's vulnerability to localized flooding begins with an understanding of local exposure to localized flooding. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Historically, the City has been affected by flooding of streams and creeks occurring during heavy rain and storm (including atmospheric river) events. Additional development in the City and in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff and contributes to localized flooding occurring in areas throughout the City. The lack of or inadequate drainage infrastructure in the City contributes to localized flooding issues.

The City tracks localized flooding areas. Affected localized flood areas identified by the City of Jackson are summarized in Table C-29.

Table C-29 City of Jackson – List of Localized Flooding Problem Areas

Area Name	Flooding	Pavement Deterioration	Washout	High Water	Landslide/ Mudslide	Debris	Downed Trees
Argonaut Heights area along Buena Vista Drive	X						
Westview Drive in the Westview Estates subdivision area	X						
South Avenue	X						
Jackson Gate Road	X						
Area of 749 No. Main, Downstream of French Bar Bridge, Area of 315 No. Main St, Quail Hollow area	X						
Below Mattley St, Busi parking lot and downstream of Busi parking lot					X		
French Bar Road	X		X				

Source: City of Jackson

Assets at Risk

Assets at risk from localized flood include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

People and populations (including vulnerable populations) are traditionally not highly vulnerable to localized flooding, but their structures and contents can be at risk. Localized flooding may also cause transportation issues as roads and lanes are impacted or closed and affect the ability for people to travel throughout the City.

Structures

Structures in areas with localized flooding can be affected if floodwaters intrude into the structure. Structures in low lying areas, or those with basements can be at greater risk. Buildings with older foundations that are prone to water intrusion are also at greater risk. Once water finds its way into a structure, it tends to continue to do so until the path that brings water into a structure is mitigated. Structures can also be damaged by trees that have become uprooted and fall during rain and storm events. Large trees falling onto structures can cause significant damage.

Critical Facilities and Infrastructure

Localized flooding, while often more of a nuisance, can cause damage to critical facilities and infrastructure during a heavy rain and storm event. Any facility that experiences localized flooding can be impacted. Utilities and other critical infrastructure can all be affected, causing interruptions in service until repairs can be made. For example, water and wastewater systems can be vulnerable to heavy rains and flood events. Rainfall creates a high water table, surging streams and creeks, and saturates soil. Infiltration of stormwater into water and wastewater systems may occur and presents a threat to public health and safety, when the infrastructure is no longer able to meet operational needs and local demands. Other critical facilities such as roads, bridges and other transportation facilities can also experience localized flooding causing road closures and other impacts until storm waters recede. This can result in extended road closures requiring alternate routes.

Natural, Historic, and Cultural Resources

Natural resource assets may have some vulnerabilities to localized flood during major storm events, but can benefit from floodwaters, often by design. Many parks and green spaces are designed to take overflow water and release it into the underlying soils and natural areas. Wetlands areas in the City actually help reduce the risk of flooding, as they can absorb excess rainfall that would have to be drained away from impervious surfaces. Flooding can provide many benefits to the natural environment, including recharging wetlands and groundwater, increasing fish production, creating wildlife habitat, and rejuvenating soil fertility. These smaller localized flooding events often provide more benefits to the environment in comparison to negative impacts associated with large flood events. Historic and cultural resources may be at some measure of vulnerability if they are located in areas subject to repeated localized flooding.

Impacts from Localized Flood

Primary concerns associated with stormwater flooding include impacts to infrastructure that provide a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Objects can also

be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services. Standing water can cause damage to crops, roads, and foundations. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Life safety issues from localized flooding would be more limited. The amount and type of damage or flooding that occurs varies from year to year and from storm to storm, depending on the quantity of precipitation and runoff.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City of Jackson include the following:

- Climate change is likely to exacerbate future heavy rain conditions and associated impacts and vulnerability of the City to localized flood.
- Population growth in the City of Jackson has recently slowed. Additional population growth would likely bring continued diversity to the City. This can also impact the vulnerable populations, like low-income individuals and households living in areas that are typically more hazardous. Vulnerable population groups such as low-income individuals and households living in flood prone areas could face disproportionate effects from localized flood and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. Development in more urban areas causes an increase in peak flow and stormwater runoff. Six residential lots are expected to be built in the next five years. Such growth will consume previously undeveloped acres, and the impacts may overwhelm existing drainage and flood control facilities. Locating new development, structures and critical facilities and infrastructure within or near areas of localized flooding risk may put additional development at risk. However, City building codes are in effect to reduce this risk and should be updated as necessary to continue to address future localized flood conditions. Depending on the location of new development and adherence to protective building codes, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the City to this hazard.

The City will need to be proactive to ensure that increased development has proper siting and drainage for stormwaters. The risk of localized flooding to future development can also be minimized by accurate recordkeeping of repetitive localized storm activity. Mitigating the root causes of the localized stormwater flooding will reduce future risks of losses.

Landslide, Mudslide, and Debris Flow

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

Like its earthquake-generating faults, California's mountainous terrain is a consequence of dynamic geologic processes in operation as the North American Plate grinds past the Pacific Plate. According to the CGS, a landslide is a general term for a variety of mass-movement processes that generate a down-slope movement of mud, soil, rock, and/or vegetation. Landslides are classified into many different types based on form and type of movement. They range from slow-moving rotational slumps and earth flows, which can slowly distress structures but are less threatening to personal safety, to fast-moving rock avalanches and debris flows that are a serious threat to structures and have been responsible for most fatalities during landslide events. For the purposes of this LHMP Update, the term landslide includes mudslides, debris flows, and rockfalls that tend to occur suddenly; as well as hillside erosion, which is a similar process that tends to occur on smaller scales and more gradually but can exacerbate landslide events.

Landslides, debris flows and mudslides are closely related to flooding, as both processes are related to precipitation, runoff, and the saturation of ground by water. In addition, landslides, mud flows, and debris flows can occur on small, steep stream channels and are often mistaken for floods. However, landslide events may be much more destructive than floods because of their higher densities, high debris loads, and high velocities.

Soil erosion is another common form of soil instability. Erosion is a function of soil type, slope, rainfall intensity, and groundcover. It accounts for a loss in many dollars of valuable soil, is aesthetically displeasing, and often induces even greater rates of erosion and sedimentation. Sedimentation is simply the accumulation of soil as a result of erosion. Construction activities often contribute greatly to erosion and sedimentation. Besides being a pollutant in its own right, sediment acts as a transport medium for other pollutants, especially nutrients, pesticides, and heavy metals, which adhere to the eroded soil particles. As the sediment drains into watercourses, the combination of these pollutants adversely affects water quality.

Natural conditions that contribute to landslide, mudslides, debris flows, hillside and streambank erosion, include the following:

- Degree of slope
- Water (heavy rain, river flows, or wave action)
- Unconsolidated soil or soft rock and sediments
- Lack of vegetation (no stabilizing root structure)
- Previous wildfires and other forest disturbances (discussed in the Wildfire section below)
- Road building, excavation, and grading
- Earthquake

The 2023 California State Hazard Mitigation Plan noted that more than one third of California is mountainous terrain that generally trends parallel to the coast, forming a barrier that captures moisture from offshore storms originating in the Gulf of Alaska and Mexico. Steep topography, weak rocks, heavy winter

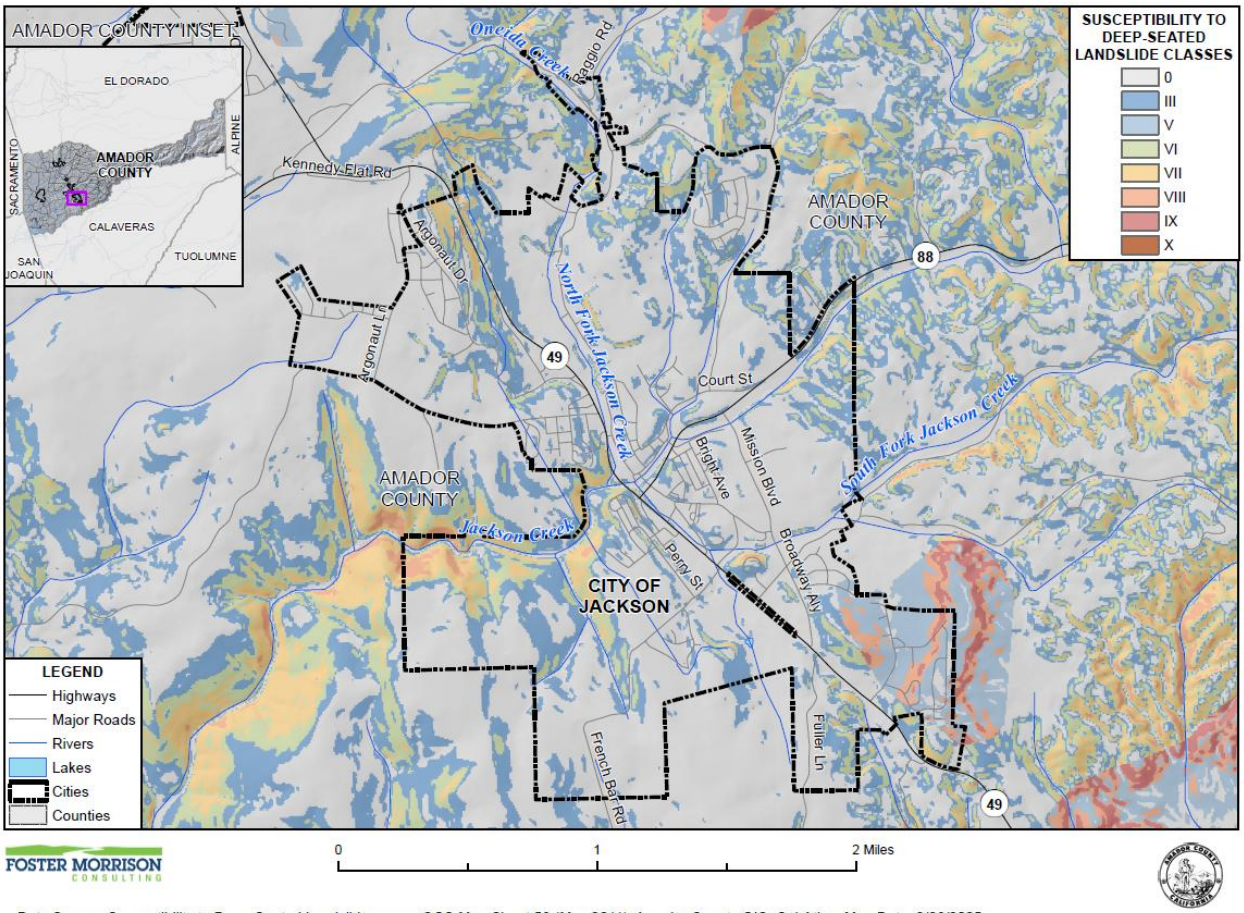
rains, and occasional earthquakes all lead to slope failures more frequently than would otherwise occur under gravity alone.

Location and Extent

Landslides can occur in areas with steep slopes and weak soils. It can also occur in areas where erosion has previously occurred. Both winter storms (precipitation-induced) and earthquake triggered landslides tend to occur in or near places that have experienced previous landslides. However, landslides may also occur in other locations over time. Landslides may also occur in fire burn scar areas.

Figure C-20 shows the CGS areas at susceptible to deep-seated landslides. The legend on Figure C-20 shows the susceptibility scale (from 0-X with 0 being the least and X being the most susceptible) that the CGS uses to show the susceptibility of landslides. It is a primarily a combination of slope class and rock strength. Geographic extents of these classes are shown on Table C-30. According to the 2023 State Hazard Mitigation Plan, the susceptibility classes were further categorized into Very High (susceptibility class X) and High (susceptibility classes VII, VIII, & IX) for exposure analysis. The rest of the classes were not categorized. CGS mapping indicates that there are areas of the City and surrounding area are at high to very high susceptibility areas for landslides. This can be seen in the darker orange and red colors. The speed of onset of landslide is often short, especially in past landslide areas as well as in post-wildfire burn scar areas, but it can also take years for a slope to fail. Landslide duration is usually short, though digging out and repairing landslide areas can take some time.

Figure C-20 City of Jackson – Susceptibility to Deep-Seated Landslides



Data Source: Susceptibility to Deep-Seated Landslides map - CGS Map Sheet 58 (May 2011), Amador County GIS, Cal-Atlas; Map Date: 2/26/2025.
https://gis.data.ca.gov/maps/08d18656a0194881a7e0f95fde19f08c/explore?location=37.559285%2C-122.059821%2C11.00

Table C-30 City of Jackson – Susceptibility to Deep-Seated Landslide Geographical Extents by Class

Susceptibility to Deep-Seated Landslide Class	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
0	1,569	68%	561	72%	1,009	66%
III	419	18%	132	17%	287	19%
V	61	3%	30	4%	31	2%
VI	145	6%	38	5%	107	7%
VII	70	3%	12	2%	57	4%
VIII	33	1%	8	1%	25	2%
IX	3	0.1%	1	0.1%	3	0.2%
X	0	0.0%	0	0.0%	0	0.0%
Jackson Total	**2,302**	**100%**	**782**	**100%**	**1,520**	**100%**

Source: CGS

Past Occurrences

Disaster Declarations

There have been no disaster declarations associated with solely landslides in Amador County; however, as shown in Table C-31, there have been 9 state and 10 federal disaster declarations for flood which included landslides as a component.

Table C-31 Amador County – Federal and State Disaster Declarations Summary 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (events that included landslide)	9	1995 (twice), 2006 (twice), 2017 (twice), 2019, 2023 (twice)	10	1995 (twice), 2006 (twice), 2017 (twice), 2019, 2023 (three)

Source: Cal OES, FEMA. Retrieved March 2025.

NCDC Events

The NCDC contains no records for landslides in Amador County, but there was one record for debris flow. This was not known to affect the City.

City of Jackson Past Occurrences

The City has seen damages in the past from landslides. The City noted an event on March 4th of 2009. A hillside slip near Main Street and State Route 49/88 damaged a public building. Mattley Street was closed to evaluate the damages. Damages are shown in Figure C-21 through Figure C-23.

Figure C-21 City of Jackson – Past Damages from Landslide

Source: City of Jackson

Figure C-22 City of Jackson – Past Damages from Landslide

Source: City of Jackson

Figure C-23 City of Jackson – Past Damages from Landslide

Source: City of Jackson

The City had a slide in the Busi Parking Lot in 2017 during the storm events. Repairs have been made but that area is still unstable.

The City noted that landsliding occurred during rainstorm events in the **winter of 2022/2023**. Atmospheric river rains caused areas to landslide. The City saw landsliding at the Mattley Street hillside near the wastewater treatment plant. A mudslide occurred, depositing soil and rock onto a public roadway. This can be seen on Figure C-24.

Figure C-24 City of Jackson – 2022/2023 Mattley St Hillside Landslide

Source: City of Jackson

Additionally, a sinkhole occurred in the Scout Hut parking lot during this event.

Climate Change and Landslide and Debris Flows

According to the 2021 CAS (as well as the 2024 Draft CAS), climate change may result in precipitation extremes (i.e., wetter wet periods and drier dry periods). More information on precipitation increases can be found in Section 4.3.4 of the Base Plan. While total average annual rainfall may decrease only slightly, rainfall is predicted to occur in fewer, more intense precipitation events. The combination of a generally drier climate in the future, which will increase the chance of drought and wildfires, and the occasional extreme downpour is likely to cause more mudslides, landslides, and debris flows.

Vulnerability from Landslide

Portions of the City are at some measure of vulnerability to landslide. This is true when atmospheric river or heavy rain and storm events occur. An assessment of a community's vulnerability to landslide begins with an understanding of local exposure to landslide. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The City of Jackson General Plan Safety Element noted that due to the high angles of tilting in many of the rock sequences found in the Jackson area great care must be taken in making open cuts in rock slopes. Professional geophysical-geological advice is needed to avoid creating hazardous new rockslides. Two existing large cuts are located on the western side of Highway 88-49: one adjacent to the southern side of the Safeway market, the other on the northern side of the Busi Municipal Parking Lot. While the southern cut is quite stable, the rockslides in portions of the Busi cut are obvious. One can clearly see the fracturing, joint systems, and tilting of the rock strata north of the parking lot.

The bedrock in the Jackson area has undergone fracturing, tilting, faulting, and weathering creating areas of instability where there are steep slopes or open cuts. Where slopes of over 20% occur or are proposed, careful consideration must be given to any change in the landforms and to the uses to be placed or maintained on or near the steep slopes. The steep slopes are also the location of possible dangerous wildfires of natural vegetation. Because of the inaccessibility the vegetation is usually allowed to grow rankly providing considerable fuel in many years when there have been favorable weather conditions. The inaccessibility of the site frequently hampers firefighting. Adequate clearing of vegetation is needed around structures and land uses that would suffer severe damage from wildfires on the steep slopes.

The City also noted that the Mattley Hill area has seen recent landsliding. Plans are being made to mitigate the risk in this area.

Assets at Risk

Assets at risk from landslide include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations located within areas of landslide susceptibility, especially in the High to Very High hazard areas (i.e., Classes VII to X) are at some vulnerability to landslide. This includes those people residing in these landslide potential areas as well as those that might reside or work within the landslide run out areas. People residing in these areas may also be cut off from transportation routes if roads and streets providing a means of ingress and egress are impacted. Certain vulnerable populations may be at greater risk due to the often sudden onset of a landslide event and include: the unsheltered, those with limited mobility, and those that lack the resources to leave the area.

City residents that live in the High and Very High landslide susceptibility areas are often the most vulnerable, but those who live in in the landslide run out areas (which are not mapped) are also vulnerable. Not only are the residents at risk, but their homes and contents are all at risk, compounding the impacts associated with significant hazard events. To further evaluate the impact to the City's residential population residing within these hazard areas, an analysis was conducted of those who physically reside in the mapped landslide susceptibility areas. The CGS Susceptibility to Deep-Seated Landslide maps were overlayed on the parcel layer and linked to the assessor data. Those residential parcel polygons that intersect the High or Very High risk areas (Class VII or higher) were counted and multiplied by the 2023 Census Bureau average household factors for the City of Jackson – 2.2. Analysis results are shown in Table C-32. According to this analysis, there is a total population of 255 residents of the City at high or very high risk to landslides.

Table C-32 City of Jackson – Improved Residential Parcels and Population in Susceptibility to Deep-Seated Landslides - Classes VII, VIII, IX, and X

Deep Seated Landslide Class	Improved Residential Parcels	Population
VII	49	108
VIII	50	110
IX	17	37
X	0	0

Source: CGS, Amador County 2024 Parcel/Assessor Data, US Census Bureau American Community Survey 2023 Household Size Estimates.

The City noted that the Critical Facilities and Infrastructure section below includes the facilities used by At-Risk populations that are threatened by this hazard. While this is not specific to what special populations reside in the City, it does speak to facilities that area used to serve (portions) of this population.

Structures

Landslides can affect the built environment of the City and those structures located within the High to Very High hazard areas (i.e., Classes VII to X) are especially vulnerable, as are the structures located within the landslide run out areas. The CGS Deep-Seated Landslide layer was overlaid with the City parcel (structure) layer in GIS and linked to the assessor data. The mapped landslide susceptibility areas are shown on Figure C-20. Table C-33 summarizes parcel counts, land and improved values (i.e., those with a structure improvement on the parcel), estimated content replacement values, and total values in the City for landslide susceptibility areas. Table C-34 shows the same analysis further broken out by property use.

Table C-33 City of Jackson – Count and Value of Parcels and Structures Susceptible to Deep-Seated Landslide Classes

Susceptibility to Deep-Seated Landslide Class	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
0	1,037	922	$81,153,812	$205,409,492	$126,515,881	$413,079,185
III	540	440	$48,822,598	$138,243,500	$85,274,597	$272,340,695
V	115	100	$9,973,704	$30,412,696	$15,125,519	$55,511,919
VI	224	161	$27,645,839	$135,031,474	$110,107,041	$272,784,354
VII	99	59	$20,349,425	$32,993,251	$26,423,486	$79,766,162
VIII	79	57	$11,053,270	$20,588,206	$14,267,832	$45,909,308
IX	30	17	$2,853,340	$5,196,120	$2,598,060	$10,647,520
Jackson Total	**2,124**	**1,756**	**$201,851,988**	**$567,874,739**	**$380,312,415**	**$1,150,039,142**

Source: CGS, Amador County 2024 Parcel/Assessor Data

Table C-34 City of Jackson – Count and Value of Parcels and Structures in Deep-Seated Landslide Classes by Property Use

Susceptibility to Deep-Seated Landslide Class/Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Estimated Contents Value
0						
Agricultural	2	0	$5,956	$0	$0	$5,956
Commercial	151	135	$18,058,442	$46,149,429	$46,149,429	$110,357,300
Industrial	1	1	$360,544	$840,553	$1,260,830	$2,461,927
Miscellaneous	28	1	$1,194	$15,924	$0	$17,118
Residential	851	782	$62,564,388	$158,211,244	$79,105,622	$299,881,254
Unknown	4	3	$163,288	$192,342	$0	$355,630
0 Total	**1,037**	**922**	**$81,153,812**	**$205,409,492**	**$126,515,881**	**$413,079,185**
III						
Agricultural	1		$10,268	$0	$0	$10,268
Commercial	61	44	$12,835,412	$31,619,030	$31,619,030	$76,073,472
Industrial	2	1	$120,187	$343,332	$514,998	$978,517
Miscellaneous	17	**0**	$7,060	$0	$0	$7,060
Residential	459	395	$35,849,671	$106,281,138	$53,140,569	$195,271,378
III Total	**540**	**440**	**$48,822,598**	**$138,243,500**	**$85,274,597**	**$272,340,695**
V						
Industrial	4	3	$618,634	$730,698	$1,096,047	$2,445,379
Residential	102	89	$8,747,683	$28,058,943	$14,029,472	$50,836,098
Unknown	9	8	$607,387	$1,623,055	$0	$2,230,442
V Total	**115**	**100**	**$9,973,704**	**$30,412,696**	**$15,125,519**	**$55,511,919**

Susceptibility to Deep-Seated Landslide Class/Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Estimated Contents Value
VI						
Agricultural	2	1	$57,025	$557,676	$557,676	$1,172,377
Commercial	36	28	$11,352,210	$86,074,932	$86,074,932	$183,502,074
Miscellaneous	11	1	$600,000	$1,450,000	$0	$2,050,000
Residential	175	131	$15,636,604	$46,948,866	$23,474,433	$86,059,903
VI Total	**224**	**161**	**$27,645,839**	**$135,031,474**	**$110,107,041**	**$272,784,354**
VII						
Agricultural	1		$3,114,546	$0	$0	$3,114,546
Commercial	4	1	$718,937	$13,262	$13,262	$745,461
Industrial	4	4	$1,577,016	$4,263,729	$6,395,594	$12,236,339
Miscellaneous	1		$100	$0	$0	$100
Residential	67	50	$5,376,575	$15,717,953	$7,858,977	$28,953,505
Unknown	2	2	$266,096	$593,262	$0	$859,358
VIII Total	**79**	**57**	**$11,053,270**	**$20,588,206**	**$14,267,832**	**$45,909,308**
VIII						
Agricultural	1	0	$3,114,546	$0	$0	$3,114,546
Commercial	4	1	$718,937	$13,262	$13,262	$745,461
Industrial	4	4	$1,577,016	$4,263,729	$6,395,594	$12,236,339
Miscellaneous	1	0	$100	$0	$0	$100
Residential	67	50	$5,376,575	$15,717,953	$7,858,977	$28,953,505
Unknown	2	2	$266,096	$593,262	$0	$859,358
VIII Total	**79**	**57**	**$11,053,270**	**$20,588,206**	**$14,267,832**	**$45,909,308**
IX						
Commercial	3	0	$193,204	$0	$0	$193,204
Industrial	1	0	$325,000	$0	$0	$325,000
Miscellaneous	2	0	$100	$0	$0	$100
Residential	24	17	$2,335,036	$5,196,120	$2,598,060	$10,129,216
IX Total	**30**	**17**	**$2,853,340**	**$5,196,120**	**$2,598,060**	**$10,647,520**
Jackson Total	**2,124**	**1,756**	**$201,851,988**	**$567,874,739**	**$380,312,415**	**$1,150,039,142**

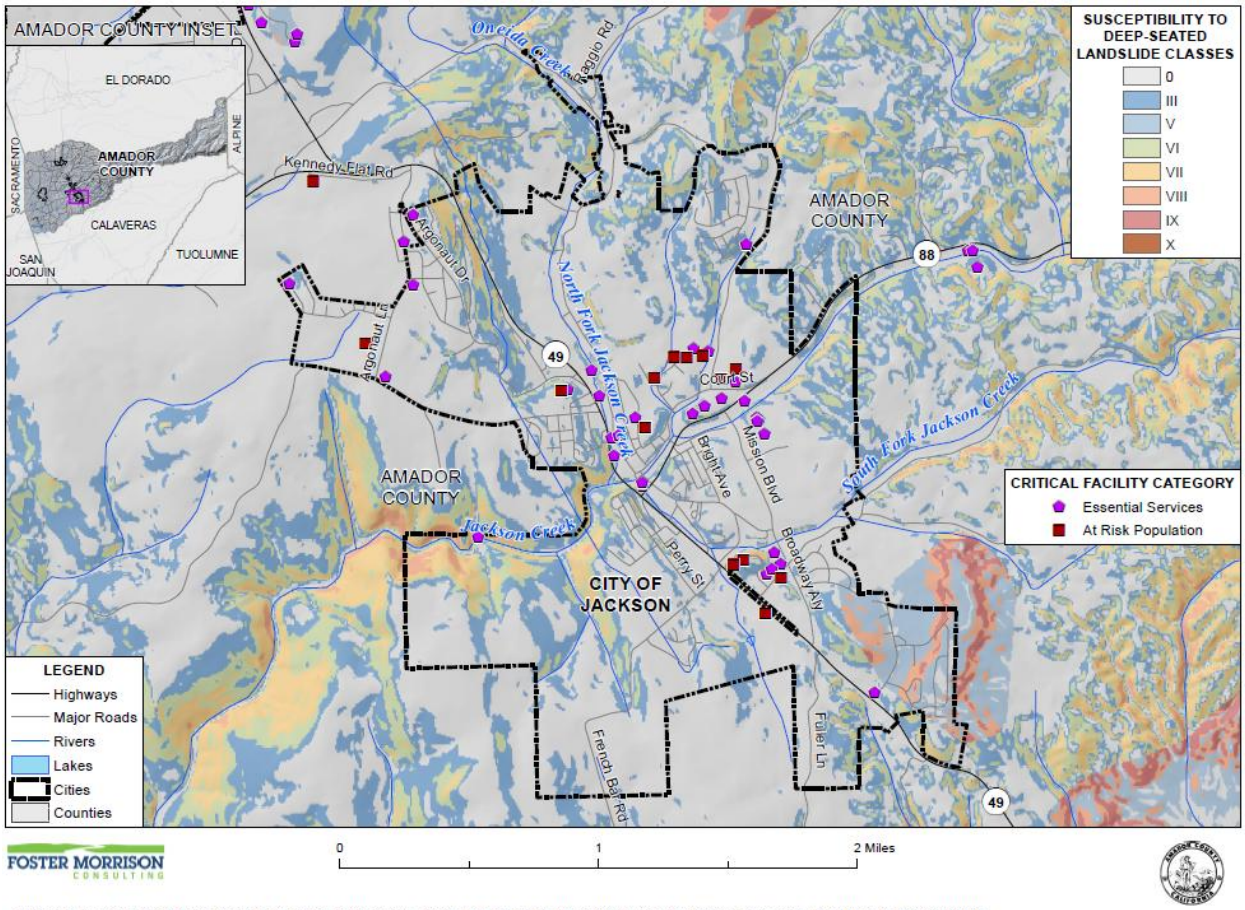
Source: CGS, Amador County 2024 Parcel/Assessor Data

Critical Facilities and Infrastructure

Landslides present a threat to both critical facilities and infrastructure. The following analysis discusses critical facilities and infrastructure. A separate analysis was performed on the critical facility inventory in the City to determine which critical facilities fall into each deep-seated landslide classes. Using GIS, the

deep-seated landslide classes were overlayed on the critical facility GIS layer. This is shown on Figure C-25 for the deep-seated landslide classes. Table C-35 summarizes Table C-36 details which critical facilities fall in which landslide class. Details of critical facility categories, type, name, and address by deep-seated landslide class are listed in Appendix F.

Figure C-25 City of Jackson – Critical Facilities in Deep-Seated Landslide Classes



Data Source: Susceptibility to Deep-Seated Landslides map - CGS Map Sheet 58 (May 2011), Amador County GIS, Cal-Atlas; Map Date: 4/21/2025.
https://gis.data.ca.gov/maps/08d18656a0194881a7e0f95fde19f08c/explore?location=37.559285%2C-122.059821%2C11.00

Table C-35 City of Jackson– Critical Facilities by Category in Deep-Seated Landslide Classes

Susceptibility to Deep-Seated Landslide Class / Critical Facility Category	Facility Count
0	
Essential Services	30
At Risk Population	9
0 Total	**39**
III	
Essential Services	3
At Risk Population	2
III Total	**5**

Susceptibility to Deep-Seated Landslide Class / Critical Facility Category	Facility Count
VI	
Essential Services	2
At Risk Population	1
VI Total	**3**
VII	
Essential Services	0
At Risk Population	1
VII Total	**1**
Jackson Total	**48**

Source: CGS, City of Jackson

Table C-36 City of Jackson – Critical Facilities by Category and Type in Deep-Seated Landslide Classes

Susceptibility to Deep-Seated Landslide Class	Critical Facility Category	Facility Type	Facility Count
0	Essential Services Facilities	Clinic	8
		Communications	1
		Community Center	2
		Court House	1
		DMV	1
		EOC	1
		Evacuation Shelter	2
		Fire Station	2
		Government Administration	1
		Healthcare/School Services	1
		Hospital	1
		Jail	1
		Library	1
		Police Station	2
		Post Office	1
		Public Administration Building	1
		School District Office	1
		Wastewater Facility	2
		Essential Services Total	**30**
	0 Total		**30**

Susceptibility to Deep-Seated Landslide Class	Critical Facility Category	Facility Type	Facility Count
III	Essential Services Facilities	Civic Center	1
		Clinic	1
		Police Station	1
		Essential Services Total	**3**
	At Risk Populations	Residential Care Facility	1
		School	1
		At Risk Population Total	**2**
	III Total		**5**
VI	Essential Services Facilities	Public Administration Building	1
		Wastewater Treatment Plant	1
		Essential Services Total	**2**
	At Risk Population	School	1
		At Risk Population Total	**1**
	VI Total		**3**
VII	At Risk Population	School	1
		At Risk Population Total	**1**
	VII Total		**1**
City of Jackson Total			**48**

Source: CGS, City of Jackson

Natural, Historic, and Cultural Resources

Landslides can affect natural, historic, and cultural resources that lie in the landslide area, or the landslide run out area. Landslides can destroy large tracts of forest and open space areas, destroy wildlife habitat, and remove productive soils and vegetation from slopes. It can also fill in waterways, impact water quality, and potentially affect flooding potential. Natural resources that fall in the High or Very High susceptibility areas shown on Figure C-20 would be most vulnerable, as well as those in the run-out areas. As shown on the map, this would include a relatively small area of the developed area City, since most of this occurs in the in the City (which is undeveloped).

Impacts from Landslide

Any type of landslide may result in damages or complete destruction of buildings in their path, as well as deaths and injuries. Landslides can cause road blockages by depositing debris on road surfaces or road

damage if the road surface itself slides downhill. Utility lines and pipes are also prone to breakage in slide areas. Large landslides can collapse into water bodies, causing seiches. Landslides can relocate river channels. Landslides and debris flows can also impact water quality and the storage capacity of surface water reservoirs used to store potable water.

Landslides, debris flows, and mud flows impacts vary by location and severity of any given event and will likely only affect certain areas of the City susceptible to landslide. Based on the risk assessment, there is limited potential for significant landslides to occur in the City. Most, but not all, of the historic landslides in the City have been minor, localized events that are more of a nuisance than a disaster. Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the hazard profile above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City include the following:

- Climate change is likely to exacerbate future landslide, mudslide, and debris flow conditions and associated impacts and vulnerability of the City to landslide.
- Population growth in the City has recently slowed; however, additional growth within the areas at risk to deep-seated landslides in the City would place additional populations at risk. However, these areas are unlikely to be developed. Vulnerable population groups could face disproportionate effects from a landslide and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions and the location of future landslide events.
- Land use planning should be proactive to address future hazard conditions. Locating new development, structures and critical facilities and infrastructure within or near areas of landslide risk may put additional development at risk. However, City building codes are in effect to reduce this risk and should

be updated as necessary to continue to address future landslide conditions. It should be noted that most of the growth in the City is occurring in areas outside the landslide risk areas. Thus, depending on the location of new development and adherence to protective building codes, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the City to this hazard.

Future Development

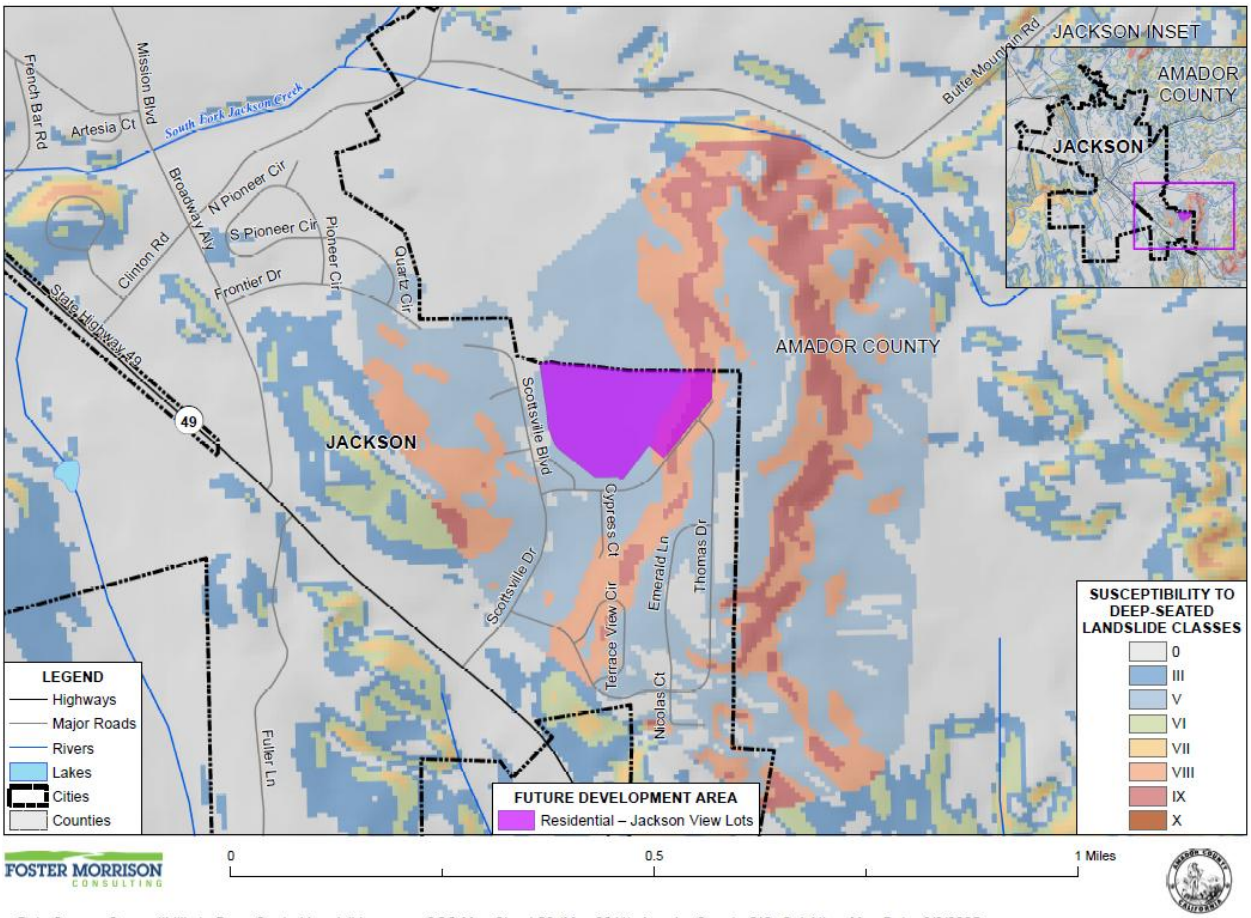
Additional growth and development within moderate or higher deep-seated landslide susceptibility classes in the City would place additional values at risk to landslide. More vulnerable populations may experience a disproportionate impact from landslide, and this should be considered as development continues.

Future development areas and their vulnerability to landslides are discussed further in the below GIS analysis.

GIS Analysis

The City provided a future development area which were used as the basis for the inventory of future development for the City. This area were mapped in GIS. Utilizing the future development area spatial layer, the parcel polygon data was intersected to determine the future development areas within each deep-seated landslide class. Figure C-26 shows the locations of the future development area overlayed on the deep-seated landslide classes. These lie partially in the III, and partially inside the VIII and IX deep-seated landslide class. Since the highest hazard class is applied to all parcels, these are considered to be in IX as shown in Table C-37.

Figure C-26 City of Jackson – Future Development Areas in Deep Seated Landslide Classes



Data Source: Susceptibility to Deep-Seated Landslides map - CGS Map Sheet 58 (May 2011), Amador County GIS, Cal-Atlas; Map Date: 6/2/2025.

Table C-37 City of Jackson – Future Development Parcels and Acres in Deep Seated Landslide Classes

Deep-Seated Landslide Classes / Future Development	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
IX						
Jackson View Lots 87-92	1	0	1	2.07	0	2.07
Very High Total	1	0	1	2.07	0	2.07
Grand Total	**1**	**0**	**1**	**2.07**	**0**	**2.07**

Source: CGS, City of Jackson

Severe Weather: Extreme Cold, Freeze, and Snow

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

According to the National Weather Service (NWS) and the Western Regional Climate Center (WRCC), extreme cold often accompanies a winter storm or is left in its wake. Snow can occur during these events. Prolonged exposure to cold can cause frostbite or hypothermia and can be life-threatening. Infants and the elderly are most susceptible. Pipes may freeze and burst in homes or buildings that are poorly insulated or without heat. Freezing temperatures can cause significant damage to agricultural industry.

Location and Extent

Due to size of the County and changes in elevation (i.e., from approximately 250 feet to almost 10,000 feet above mean sea level (msl)) and climate, weather conditions can vary greatly across the County. The City falls in western Amador County, which is predominantly below an elevation of 2,000 feet above msl, is generally below the snowfall line, and includes the land to the west (including all incorporated communities). The City is generally below the snowfall line. According to the WRCC, in western Amador County monthly average minimum temperatures from November through April range from the upper-30s to mid-50s. The lowest recorded daily extreme was 20°F on December 20, 1998. In a typical year, minimum temperatures fall below 32°F on 5.2 days with no days falling below 0°F. Extreme cold and freeze events occur on a regional basis. Extreme cold can occur in any location of the City. All portions of the City and County are at risk to extreme cold and freeze.

Past Occurrences

Disaster Declaration History

The County has had no past federal and one past state (2007) disaster declarations for extreme cold and freeze. There have been two freeze events in 2022 that resulted in USDA disaster declarations.

NCDC Events

The NCDC data shows 575 extreme cold, freeze, and snow incidents for Amador County since 1993, some of which likely affected the City.

City of Jackson Events

The City noted that extreme cold, freeze, and snow occur every year, but no events where damages, injuries, or deaths occurred could be recalled.

Climate Change and Extreme Cold, Freeze, and Snow

According to the 2021 CAS (as well as the 2024 Draft CAS), freezing spells and snow are likely to become less frequent in California as climate temperatures increase; if emissions increase, freezing events could

occur only once per decade in large portion of the State by the second half of the 21st century. According to a California Natural Resources Report in 2014, it was determined that while fewer freezing spells would decrease cold related health effects, too few freezes could lead to increased incidence of disease as vectors and pathogens do not die off.

Vulnerability to Extreme Cold, Freeze, and Snow

Extreme cold and freeze events happen in the City each year. Snow can occur, but it is rare. Cold and freeze can impact both structures and populations in the Planning Area. The whole of the City and County Planning Area has some measure of vulnerability to extreme cold and freeze.

An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to City. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect the City. These sections include assets at risk, impacts, and how future development and future conditions can be affected by this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The City noted that traffic accidents occur more frequently during these storms in the City. Warming may be needed for certain vulnerable populations. Generators should be sought for these facilities.

Assets at Risk

Assets at risk from extreme cold, freeze, and snow include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations within the City are vulnerable to extreme cold and freeze, but this hazard generally affects vulnerable populations and those spending large amounts of time outside. Prolonged exposure to cold can cause frostbite or hypothermia and can be life-threatening. Vulnerable populations to cold and freeze include the unhoused; individuals who exercise or train outdoors; outdoor workers; individuals that lack the resources to afford heat; and the young, old, or medically fragile individuals that are more susceptible to cold related impacts. In addition to vulnerable populations, pets and livestock are at risk to freeze and cold. Since snow is rare, its effect on people and populations are minimal.

Structures

Structures in the City have some measure of risk from extreme cold and freeze. Buildings can be affected directly by freeze, pipes that feed buildings can be damaged during periods of extreme cold and cause water

damage and other related impacts to a structure. Structures can also be damaged by downed trees during freeze and winter storm events. Snowfall can occur, but it is usually not heavy enough to damage structures.

Critical Facilities and Infrastructure

Extreme cold and freeze, occasionally accompanied by high winds and snow, can cause downed trees and power lines, power outages, accidents, and road closures. Transportation networks, communications, and utilities infrastructure are the most vulnerable physical assets in the City. Depending on the facility type and function, critical facilities and infrastructure may be affected directly by freeze. Damage to pipes that feed buildings can be damaged during periods of extreme cold. Other equipment may also be affected. Infrastructure such as roads, highways, and bridges can become slippery, causing accidents and road closures.

Natural, Historic, and Cultural Resources

Depending on how low the temperatures go and the duration of an extreme cold and freeze event, natural resources in the City may be affected. During periods of freeze, trees in the City may be damaged. This is especially true if a freeze occurs during a winter storm with winds and precipitation. Other natural resources like wildlife may be at risk during a period of freeze. While it is rare for historic buildings to be affected directly by freeze, damages to pipes that feed historic buildings can be damaged during periods of extreme cold and cause additional impacts to the structures. Snow is relatively rare and is unlikely to affect natural, historic, or cultural facilities.

Impacts from Severe Weather: Extreme Cold, Freeze, and Snow

Extreme cold and freeze can affect critical facilities and infrastructure, down trees, break pipes, and can be a life safety issue. Transportation networks, communications, and utilities infrastructure are often the most vulnerable physical assets in the City. Infrastructure such as roads and utilities are at risk to freezing temperatures and snow, causing failures and hazardous road conditions. When extreme cold is coupled with high winds, snows, and freezing storms, power lines may be downed, resulting in power outages and an interruption of utilities and critical services. During periods of extremely low or prolonged cold temperatures, other impacts to the City can include interruption in business and school activities.

The elderly, the young, and those experiencing medical issues are often more vulnerable to temperature extremes, but anyone can be affected. Exposure to cold temperatures can cause hypothermia and frostbite. Those exercising or recreating outdoors, outdoor workers, and the unhoused may be at a higher risk.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on these factors for the City include the following:

- Climate change is unlikely to exacerbate extreme cold, freeze, and snow and their associated impacts to the City.
- The population of the City is expected to slowly increase as time progresses. Future population growth should be considered, as having more or less people in a community affects the overall hazard vulnerability to the City. Changes in populations patterns should also be considered. Especially vulnerable individuals to this hazard include older adults, children, migrant farm workers, those below the poverty line and the unhoused. During hazard events, existing inequities can get worse, and these groups are the most likely to be affected and may require extra assistance. Planning for population changes will help to decrease the City's overall vulnerability. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of population growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. Six residential lots are expected to be built in the next five years. City building codes are in effect to reduce this risk and should be updated as necessary to continue to address future freeze and extreme cold conditions. Due to adherence to protective building codes, changes in land use and development will likely not increase the impacts and associated vulnerabilities of the City to this hazard.

Future development built to code should be able to withstand extreme cold, freeze, and heavy snow. Current building codes provide such provisions for new construction. Older buildings and infrastructure should be evaluated to ensure that extreme cold and freeze will not cause negative impacts. Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements such as building codes are followed, and varying needs for different demographic groups that reside within the County are considered can help make for a more resilient community.

Severe Weather: Extreme Heat

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

According to FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and lasts for several weeks. Heat kills by taxing the human body beyond its abilities. In extreme heat and high humidity, evaporation is slowed, and the body must work extra hard to maintain a normal temperature." Most heat disorders occur because the victim has been overexposed to heat or has over-exercised for his or her age and physical condition. Older adults, young children, those who are sick or overweight, and those that work or recreate outdoors are more likely to experience heat exhaustion or succumb to extreme heat.

In addition to the risks faced by citizens of the City, there are risks to the built environment from extreme heat. While extreme heat on its own does not usually affect structures, extreme heat during times of drought can cause wildfire risk to heighten. Extreme heat can lead to interruptions in power, power outages, and when combined with high winds, to Public Safety Power Shutdown (PSPS) events, creating significant issues in the City.

Location and Extent

Heat is a regional phenomenon and affects the whole of the City. Heat emergencies are often slower to develop, taking several days of continuous, oppressive heat before a significant or quantifiable impact is seen. Heat waves do not strike victims immediately, but rather their cumulative effects slowly affect general and vulnerable populations and communities. Heat waves do not generally cause damage or elicit the immediate response of floods, fires, earthquakes, or other more "typical" disaster scenarios. The City experiences temperatures in excess of 100°F during the summer and fall months. The temperature moves to 105-110°F in rather extreme situations.

The NWS has in place a system to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color (green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Section 4.3.3 of the Base Plan.

Past Occurrences

Disaster Declaration History

There have been no federal or state disaster declarations from extreme heat.

NCDC Events

The NCDC data shows 124 extreme heat incidents for Amador County since 1993, some of which likely affected the City.

City of Jackson Events

The City noted that extreme heat occurs every year. No specific damages, deaths, or injuries could be recalled.

Climate Change and Extreme Heat

The 2021 CAS (as well as the 2024 Draft CAS), citing a California Energy Commission study, states that "over the past 15 years, heat waves have claimed more lives in California than all other declared disaster events combined." This study shows that California is getting warmer, leading to an increased frequency, magnitude, and duration of heat waves. These factors may lead to increased mortality from excessive heat.

As temperatures increase, California and Amador County will face increased risk of death from dehydration, heat stroke, heat exhaustion, heart attack, stroke and respiratory distress caused by extreme heat. According to the 2021 CAS (as well as the 2024 Draft CAS) report and the 2023 State of California Hazard Mitigation Plan, by 2100, hotter temperatures are expected throughout the state, with projected increases of 3-5.5°F (under a lower emissions scenario) to 8-10.5°F (under a higher emissions scenario). These changes could lead to an increase in deaths related to extreme heat in Amador County.

Vulnerability to Severe Weather: Extreme Heat

Extreme heat is becoming more frequent, intense, longer lasting and geographically widespread. Extreme heat occurs on an annual basis in the County and the City. In recent years, compounded by climate change conditions, summer months continue to get a bit hotter. The whole of the City is at some measure of vulnerability to extreme heat. An assessment of a community's vulnerability to extreme heat begins with an understanding of local exposure to extreme heat. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The City is concerned about having readily available cooling shelters. The City uses the City Civic Center but it takes significant amount of time to activate. Amador Transit is used for transportation to the shelter, but there is concern that not all citizens know this. A backup generator is sought at this facility as well.

Assets at Risk

Assets at risk from extreme heat include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations within the City are vulnerable to extreme heat, but it generally affects people spending large amounts of time outside or without means of cooling indoor structures. During extended periods of high temperatures, extreme heat may overload the demands for electricity to run air conditioners and can present health concerns to individuals. When interruptions in power occur during extreme heat, the risk of heat related illnesses and deaths increases. Extreme heat is a significant concern to vulnerable populations. The unhoused; individuals who exercise or train outdoors; outdoor workers; individuals that lack the resources to afford heat; and the young, old, or medically fragile individuals that are more susceptible to heat related impacts. In addition to vulnerable populations, pets and livestock are at risk to extreme heat conditions.

Structures

Extreme heat normally does not generally impact structures, but individuals working in structures may be affected during periods of extended heat, especially in structures that might not be equipped with air

conditioning or other means of cooling. The City noted that extreme heat has caused interruptions to power in the past. Also depending on the structure, sensitive contents such as IT equipment can be impacted, especially if a power outage occurs.

Critical Facilities and Infrastructure

Depending on their type and function, critical facilities and infrastructure can also be affected by extreme heat. Interruptions in power caused by extreme heat can lead to system failures. Schools without air conditioning may have to close or operate on a reduced schedule.

Natural, Historic, and Cultural Resources

Natural resource assets, including those located in City park areas, may be vulnerable during periods of extreme heat. These include turfed areas; landscapes, City trees, wildlife and habitat areas, and wetlands and marsh lands. Recently, trees were lost in areas of the City that were weakened by drought and extreme heat. Extreme heat may also cause drought-like conditions, contributing to other issues. For example, several weeks of extreme heat increases evapotranspiration and reduces moisture content in vegetation, leading to higher wildfire vulnerability in the region for that time period, even if the rest of the season is relatively moist. Historic and cultural resources are not expected to be affected by extreme heat.

Impacts from Severe Weather: Extreme Heat

The City experiences temperatures in excess of 100°F during the summer and fall months. The temperature moves to 105-110°F in rather extreme situations. During these times, drought conditions may worsen, and the City may see an increase in dry fuels. Also, power outage and PSPS events may occur during these times as well. Health issues are a primary concern with this hazard, especially to vulnerable populations, although economic impacts can also be an issue.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for City include the following:

- Climate change is likely to exacerbate future extreme heat conditions and associated impacts and vulnerability of the City.
- Future population growth should be considered, as having more or less people in a community affects the overall hazard vulnerability to the City. Population is expected to increase for the City and, as such, the vulnerability to this hazard may increase, specifically affecting growing vulnerable populations as the senior citizen population continues to reside in and age within the communities of the City. Along with this, low income and the unhoused population are at risk to extreme heat which can put strain on

emergency services and shelters. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.

- Land use planning should be proactive to address future hazard conditions. Six residential lots are expected to be built in the next five years. City building codes are in effect to reduce this risk and should be updated as necessary to continue to address future extreme heat conditions. Due to adherence to protective building codes, changes in land use and development will likely not increase the impacts and associated vulnerabilities of the County to this hazard.

Future development of new buildings in the City will likely not be affected by extreme heat. Extreme heat is more likely to affect vulnerable populations. Vulnerability to extreme heat will increase as the average age of the population shifts. It is encouraged that nursing homes and elder care facilities have emergency plans or backup power to address power failure during times of extreme heat and in the event of a PSPS. Low-income residents and unhoused populations are also more vulnerable and should be considered in future growth plans for the City.

Severe Weather: Heavy Rains and Storms

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

Storms in the City occur annually and are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the City falls mainly in the fall, winter, and spring months. Wind often accompanies these storms; hail and lightning are rare in the City.

Location and Extent

Heavy rain events occur on a regional basis. Rains and storms can occur in any location of the City. All portions of the City are at risk to heavy rains and storms. Most of the severe rains occur during the fall, winter, and spring months in the City as discussed below (with problem flooding areas associated with heavy rains and storms shown in Table C-29 in the Flood: Localized Stormwater section). There is no scale by which heavy rains and severe storms are measured. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Hail and lightning are rarer in the City and Amador County. Duration of severe storms in the City can range from minutes to hours to days. Information on precipitation extremes can be found in Section 4.3.4 of the Base Plan.

Past Occurrences

Disaster Declaration History

According to historical hazard data, severe weather, including heavy rains and storms, is an annual occurrence in the City. This contributes to many of the federal disaster declarations related to flooding. Disaster declarations from flooding are shown on Table C-38.

Table C-38 Amador County – State and Federal Disaster Declarations from Flood (Heavy Rain and Storms) 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	22	1950, 1955, 1958 (twice), 1959, 1963, 1964, 1969, 1980, 1982, 1986, 1995 (twice), 1997, 2006 (twice), 2017 (twice), 2019, 2021, 2023 (twice)	20	1950, 1955, 1958, 1962, 1963, 1964, 1969, 1986, 1995 (twice), 1997, 1998, 2006 (twice), 2017 (twice), 2019, 2023 (three)

Source: Cal OES, FEMA

NCDC Events

The NCDC data recorded 114 hail, heavy rain, and winter weather incidents for Amador County since 1950.

City of Jackson Events

The City noted that heavy rains and storms are an annual occurrence. Events causing issues are listed in the Past Occurrences section of the Flood: 1%/0.2% Annual Chance and Flood: Localized Stormwater Flooding discussions above. Winter weather events tend to be rain in the lower elevations of the County, while snow falls in the upper elevations.

Climate Change and Heavy Rains and Storms

It is likely that climate change will increase the chance of future occurrence as well as future impacts from heavy rains and storms. More information on future impacts to the City can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

According to the 2021 CAS (as well as the 2024 Draft CAS), while average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is unlikely that hail will become more common in Amador County and the City of Jackson. The amount of lightning is not projected to change.

Cal-Adapt noted that, on average, the projections show little change in total annual precipitation in California. Furthermore, among several models, precipitation projections do not show a consistent trend during the next century. Cal-Adapt modeled scenarios are shown in Section 4.3.4 of the Base Plan.

Vulnerability to Heavy Rain and Storms

Heavy rain and severe storms are the most frequent type of severe weather occurrences in the City. These events can cause both significant and localized flooding. Flooding can be worse during times where the ground is already saturated. Wind often accompanies these storms and has caused damage in the past. Hail and lightning are rare in the City, but also can cause damage, with lightning occasionally igniting wildfires.

The whole of the City is at some measure of vulnerability to heavy rain and storms. An assessment of a community's vulnerability to heavy rains and storms begins with an understanding of local exposure to heavy rain and storms. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Heavy rains and storms can cause flooding in the City. The City also noted that heavy rains and storms cause localized flooding in the City. The problem areas area shown on Table C-29 above. Atmospheric river events in recent years have increased the impact and damages to the City from these large storms.

Assets at Risk

Assets at risk from heavy rain and storms include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations (including vulnerable populations) in the City have some measure of risk to heavy rains and storms. Those populations that work or recreate outside and unhoused individuals are more vulnerable to impacts from heavy storm events. Heavy rains and storms occur every year and do not generally cause significant adverse impacts to individuals; it is the secondary hazard, flooding, which poses the biggest impact to people. Populations at risk to flooding resulting from heavy rains and storm events include those who live in floodplains (discussed in further detail in the Flood: 1%/0.2% Annual Chance section above) and those who live in and near localized flooding areas (discussed in further detail in the Flood: Localized Stormwater Flooding section above).

Structures

Structures in the City have some risk to heavy rains and storms. Structures built to modern building codes are built to withstand heavy rains and storms (including high winds and lightning). During a heavy storm, localized flooding may cause water intrusion into buildings from the outside. Trees can be downed causing impacts to structures. Older homes and buildings may be at increased risk to heavy rains and storms. Power outages during severe storm events can occur, impacting the use of structures until the power is back online.

Critical Facilities and Infrastructure,

Heavy rain and storms can affect critical facilities and infrastructure during large events. Power outages may occur taking facilities offline. High winds can down power lines and trees impacting facilities. Water intrusion into facilities and infrastructure can impact operations. City roads, streets, and bridges can be impacted resulting in closures restricting traffic flow in the City. In certain areas, large storms can cause erosion and localized landslides which can impact facilities. Many critical facilities are built to modern design standards that take heavy rains and storms into account when siting and building these structures, and others may need to be retrofitted to better withstand these events.

Natural, Historic, and Cultural Resources

Large rain and storm events and associated flooding can affect natural, historic, and cultural resources. Silt and sediment can damage natural areas. Trees can be uprooted and downed by high winds. Extended periods of rainfall can erode natural banks along waterways and degrade soil stability for terrestrial species. While some natural systems can be adversely impacted during these large storms, heavy rain events can also provide benefits. Groundwater and wetland areas can be recharged and water supplies replenished. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to structures affected by large storm events, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged, and lost during extreme rain and storm and events.

Impacts from Heavy Rain and Storms

Impacts from heavy rains and storms include damage to property, critical facilities and infrastructure, and the natural landscape. This includes: erosion; downed trees; damaged utility structures and infrastructure; power outages; road damage and blockages; and even lightning strikes to critical infrastructure and people. Lightning can also cause wildfires and urban fires to occur. Landsliding and erosion occur when the soil on slopes becomes oversaturated and fails. Climate change may cause these impacts to worsen.

Actual damage associated with the primary effects of severe storms and heavy rains has been somewhat limited. It is the secondary hazards caused by these severe weather events, such as floods and erosion that would likely have the greatest impact.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City include the following:

- Climate change is likely to exacerbate future heavy rain and storm conditions and associated impacts and vulnerability of the City to flooding.
- Population is expected to slowly increase for the City of Jackson; as such, the vulnerability may change depending on changes to the makeup of more vulnerable populations. Certain vulnerable populations, such as those who work or spend extended periods outdoors, could experience disproportional effects from this hazard. and should be addressed as the City continues to grow. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions and the nature and intensity of future storm events.
- Land use planning should be proactive to address future hazard conditions. Six residential lots are expected to be built in the next five years. These changes in land use may also amplify the impacts of heavy rains and storms, as additional impervious surfaces can cause additional runoff and localized flooding throughout the City. However, with only six new residential lots identified for development, new development is unlikely increase the impacts and associated vulnerabilities of the City to this hazard.

Building codes in the City ensure that new development is built to current building standards, which should reduce the risk to future development in the City from heavy rains and storms. New critical facilities such as communications towers and others should be built to withstand hail damage, lightning, and thunderstorm winds. With adherence to development standards, future losses to new development should be minimal. Changes in land use may also amplify the impacts of heavy rains and storms, as additional impervious surfaces can cause additional runoff and localized flooding throughout the City.

Severe Weather: High Winds and Tornado

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

High winds, as defined by the NWS glossary, are sustained wind speeds of 40 mph or greater lasting for 1 hour or longer, or winds of 58 mph or greater for any duration. High winds can cause significant property damage, threaten public safety, and have adverse economic impacts from business closures and power loss. High winds, when combined with high temperatures and low humidity can also lead to PSPS events. Winds can also drive fires in and near the City.

Portions of the City are also located in or near a special wind hazard region, which is a result of foehn winds. A foehn wind is a type of dry down-slope wind that occurs in the lee (downwind side) of a mountain range. Winds of this type are called "snow-eaters" for their ability to make snow melt or sublimate rapidly. These types of winds are also associated with the rapid spread of wildfires, making some regions which experience these winds particularly fire prone.

Tornadoes are rotating columns of air marked by a funnel-shaped downward extension of a cumulonimbus cloud whirling at destructive speeds of up to 300 mph, usually accompanying a thunderstorm. Tornadoes form when cool, dry air sits on top of warm, moist air. Tornadoes are the most powerful storms that exist.

Tornadoes, though rare, can affect areas of the City, primarily during the rainy season in the late fall, winter, and early spring.

Location and Extent

The entire City is subject to significant, non-tornadic (straight-line), winds. Each area of the City is at risk to high winds. Magnitude of winds is measured often in speed and damages. These events are often part of a heavy rain and storm event but can occur outside of storms. The speed of onset of winds can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of winds in California is often short, ranging from minutes to hours. The Beaufort scale is an empirical 12 category scale that relates wind speed to observed conditions at sea or on land. Its full name is the Beaufort Wind Force Scale. The Beaufort Scale was shown in Section 4.3.5 of the Base Plan.

Tornadoes, while rare, can occur at any location in the City. Prior to February 1, 2007, tornado intensity was measured by the Fujita (F) scale. This scale was revised and is now the Enhanced Fujita scale. Both scales are sets of wind estimates (not measurements) based on damage. The new scale (EF) provides more damage indicators (28) and associated degrees of damage, allowing for more detailed analysis and better correlation between damage and wind speed. It is also more precise because it considers the materials affected and the construction of structures damaged by a tornado. The F Scale and EF Scale are shown in Section 4.3.5 of the Base Plan.

Past Occurrences

Disaster Declarations

There have been no federal or state disaster declarations in the County for winds and tornadoes.

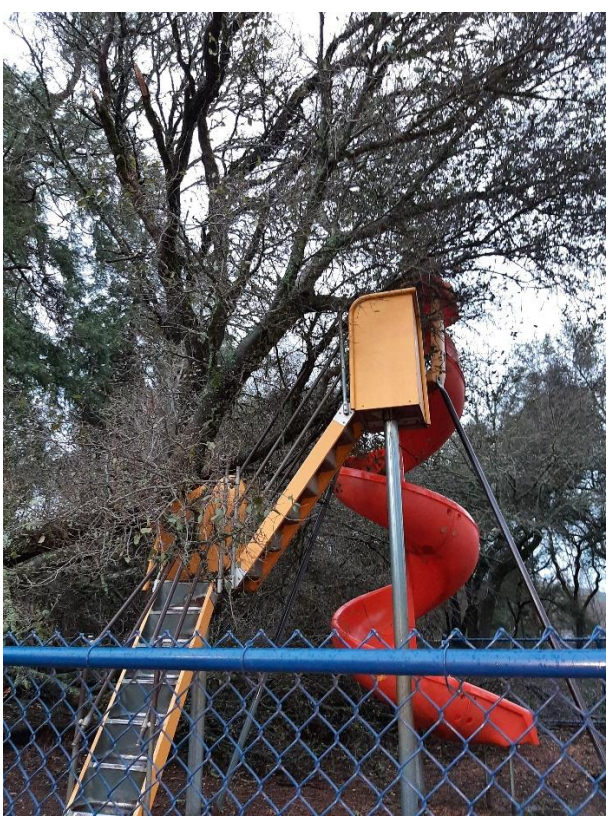
NCDC Events

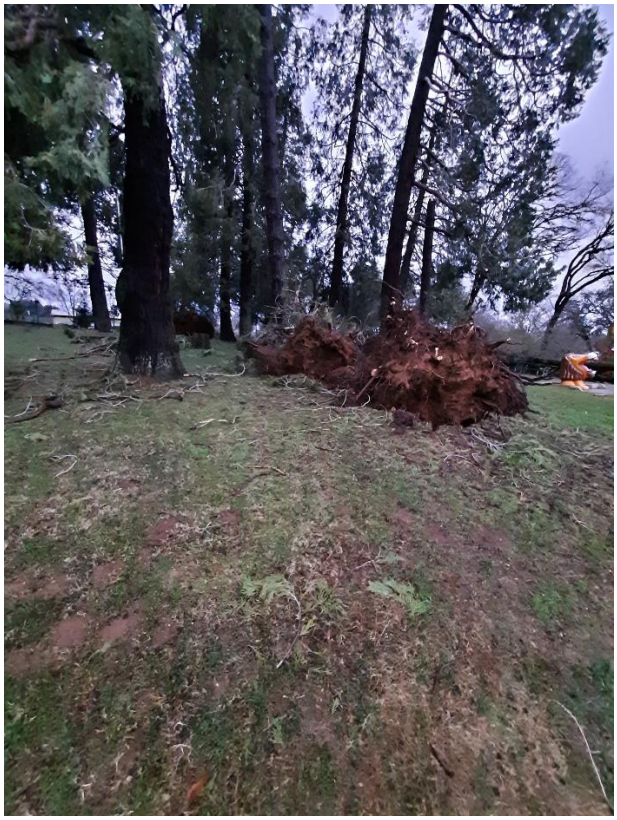
The NCDC data recorded 160 high wind, 3 funnel cloud, and 0 tornado incidents for Amador County since 1950. Many of these wind events likely affected the City.

City of Jackson Past Occurrences

The City noted that past events where trees have come down in the City have occurred. This happened in the winter of 2022/2023. Some of this was discussed in the Flood discussion above. During this event, winds knocked over trees whose root masses were loosened by heavy rains. This occurred in Detert Park. Multiple trees were blown over. One of these trees fell on a playground. This can be seen on Figure C-27 and Figure C-28.

Figure C-27 City of Jackson – Detert Park Trees Downed during 2022/2023 Storms





Source: City of Jackson

Figure C-28 City of Jackson – Detert Park Trees Downed during 2022/2023 Storms

Source: City of Jackson

Climate Change and High Winds and Tornado

According to the 2021 CAS (as well as the 2024 Draft CAS), while average annual rainfall may increase or decrease slightly, the intensity of individual thunderstorm events is likely to increase during the 21st century. This may bring stronger thunderstorm winds. The CAS does not discuss non-thunderstorm winds or tornadoes.

Vulnerability to Severe Weather: High Wind and Tornadoes

The City is subject to potentially destructive high winds and tornadoes. High winds are common throughout the area and can happen during most times of the entire year and outside of a severe storm event. Tornadoes are rare. High winds and tornadoes can be a significant public safety and economic concern. The whole of the City is at some measure of vulnerability to wind and tornadoes.

An assessment of a community's vulnerability to high winds begins with an understanding of local exposure to wind and tornadoes. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The City is in or adjacent to a special wind hazard region, which is a result of foehn winds. A foehn wind is a type of dry down-slope wind that occurs in the lee (downwind side) of a mountain range. Winds of this type are called "snow-eaters" for their ability to make snow melt or sublimate rapidly. This snow-removing ability is caused not only by warmer temperatures, but also the low relative humidity of the air mass coming over the mountain(s). They are also associated with the rapid spread of wildfires, making some regions which experience these winds particularly fire prone. Burn patterns of almost all historic large wildfires in the larger County indicate they occurred during foehn winds.

Downed trees during high wind events are an ongoing concern to the City, as evidenced during the 2022/2023 storm events. High wind events can also cause power outages and lead to PSPS events. The City has numerous critical facilities that may lose power during high wind events. These critical facilities should have reliable backup power sources to keep them up and running during high winds and storm events. The City is also concerned with the potential for wind driven fires that can cause significant damages. Any ignition, under certain conditions, has the potential to become a out of control wildfire which could quickly move through the City creating the potential for catastrophic damages.

Assets at Risk

Assets at risk from winds and tornadoes include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations are at some vulnerability to high winds and tornadoes. Certain vulnerable populations are at the greatest risk to the effects of high winds and tornadoes. These include:

- The unsheltered.
- Citizens who reside in mobile homes.
- Citizens in buildings with no tornado shelter or below ground floors.
- Those with access and functional needs.
- The medically fragile experiencing power outages as a result of wind events.
- Those working or caught outdoors during a wind or tornado event.

Structures

All structures in the City have some measure of risk from high wind and tornadoes. Though rare, a tornado could cause damage to virtually all facilities in the tornado touchdown path. This would affect homes, businesses, commercial property, as well as government and critical facilities. During a wind or tornado event, power lines in the City can be damaged by falling trees caused by wind. High winds are a cause for PSPS events to be declared, causing power outages to occur. High winds and tornadoes could cause sparks

from electric wires and other sources, which could lead to wildfire ignition. Once ignited, high winds can also cause wildfires to rapidly spread and become out of control. High wind conditions can cause wildfires to move into more urban areas destroying structures and whole subdivisions, as seen in recent wildfire events in the West.

Critical Facilities and Infrastructure

Though most critical facilities are built to withstand winds, high wind speeds can still cause damage to critical facilities and infrastructure in the City. Though rare, a tornado could cause damage to virtually all facilities in the tornado touchdown path. Winds can cause power outages affecting system operations. Winds can also contribute to PSPS events, and lead to out of control wildfires, which can damage critical facilities and impact their abilities to perform their critical roles in the community.

Natural, Historic, and Cultural Resources

Natural resources, such as trees, are vulnerable to winds. Increased levee and streambank erosion can occur during periods of high water and high winds. High wave action during significant wind events can impact marsh lands and habitat areas. Soil erosion can also occur during high winds. Most all natural, historic, or cultural resources are at risk to tornadoes. Tornadoes can tear apart habitats, causing fragmentation across ecosystems and can damage and destroy historic structures and cultural resources.

Impacts from Severe Weather: High Wind and Tornado

Wind and tornadoes can cause damage to property and loss of life. While most tornado damage is caused by violent winds, the majority of injuries and deaths generally result from flying debris. Property damage can include damage to buildings, fallen trees, and power lines. Local industries may also be damaged or destroyed. Access roads and streets may be blocked by debris, delaying necessary emergency response. Winds can push automobiles off roads, damage roofs and structures, cause power outages, and cause secondary damage due to flying debris and hazardous trees. High winds can also contribute to the spread and intensity of wildfires. High winds during periods of high water can cause impacts to levees and streambanks from accelerated erosion. Climate change may affect this hazard and cause winds to increase in velocity and more tornadoes to affect the City.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City include the following:

- Climate change is likely to exacerbate future wind conditions and associated impacts and vulnerability of the County. Climate change is not likely to affect future tornado conditions.

- Future population growth should be considered as having more or less people in a community affects the overall hazard vulnerability to the City. Population growth in the City is expected to continue slowly. Vulnerable populations could experience disproportional effects from this hazard and should be planned for as development of the City continues. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. Six residential lots are expected to be built in the next five years. Building codes in the City ensure that new development is built to current building standards to withstand high winds, which should reduce the risk to future development in the City from high winds and tornadoes. With adherence to development standards, future losses to new development should be minimal. Changes in land use and increased development may amplify the impacts of high winds and tornadoes, as additional structures in the City increase the number of buildings at risk to high winds and tornadoes; however, given the limited development planned in the next five years, any increase in vulnerability of the City should be limited.

Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements, such as building codes, are followed, and varying needs for different demographic groups with intersecting identities that reside within the City are considered can help make for a more resilient community. The City enforces the state building codes which includes standards for new development to minimize damage from windstorms. New and existing critical facilities and infrastructure should also consider adding backup power systems to limit impacts associated with power outages.

Wildfire (with smoke and air quality)

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Extremely High

Hazard Profile

Wildland fire and the risk of a conflagration is an ongoing concern for the City of Jackson. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of fire regimes. Wildland fires affect grass, forest, and brushlands, as well as structures. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern.

Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. These weather conditions can result in red flag (e.g., fire weather) days, and can result in PSPS events in the City. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas. There is also the concern of wildfires occurring in these more remote, forested areas that under certain weather conditions, can extend into areas not generally

considered at a high risk to wildfire. Smoke and air quality also become an issue, both from fires occurring inside and outside of the Amador County Planning Area and the City.

Wildfire Smoke and Air Quality

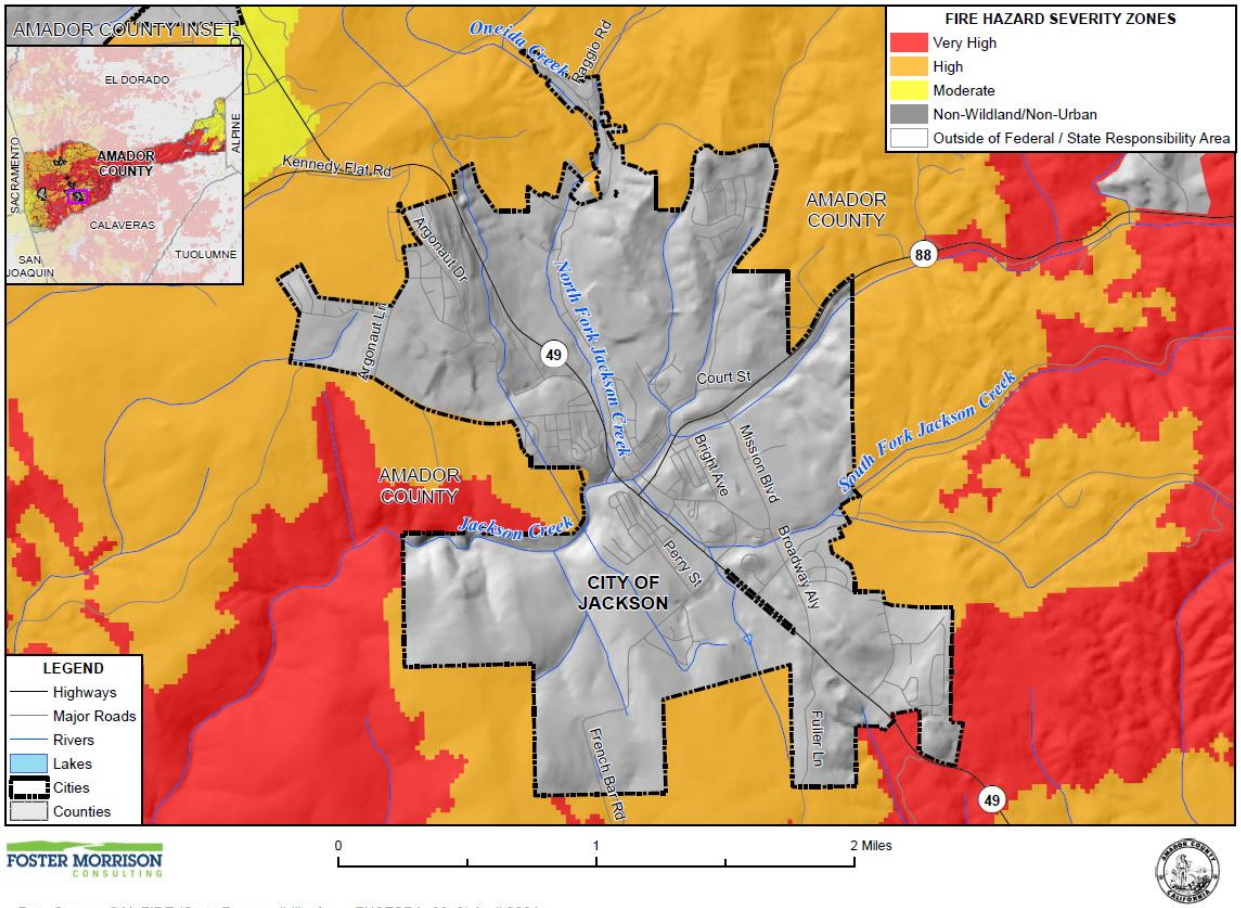
Smoke from wildfires is made up of gas and particulate matter, which can be easily observed in the air. Air quality standards have been established to protect human health with the pollutant referred to as PM2.5 which consists of particles 2.5 microns or less in diameter. These smaller sizes of particles are responsible for adverse health effects because of their ability to reach the lower regions of the respiratory tract.

Wildfire smoke can have negative effects to those who live in or near a fire burn area. Smoke and air pollution from wildfires can be a severe health hazard. Significant wildfires occurring in both Amador County and nearby northern California communities since the 2020 LHMP Update have created significant air pollution affecting area residents. This was the case during the 2021 Caldor Fire, as well as others that affected the nearby areas.

Location and Extent

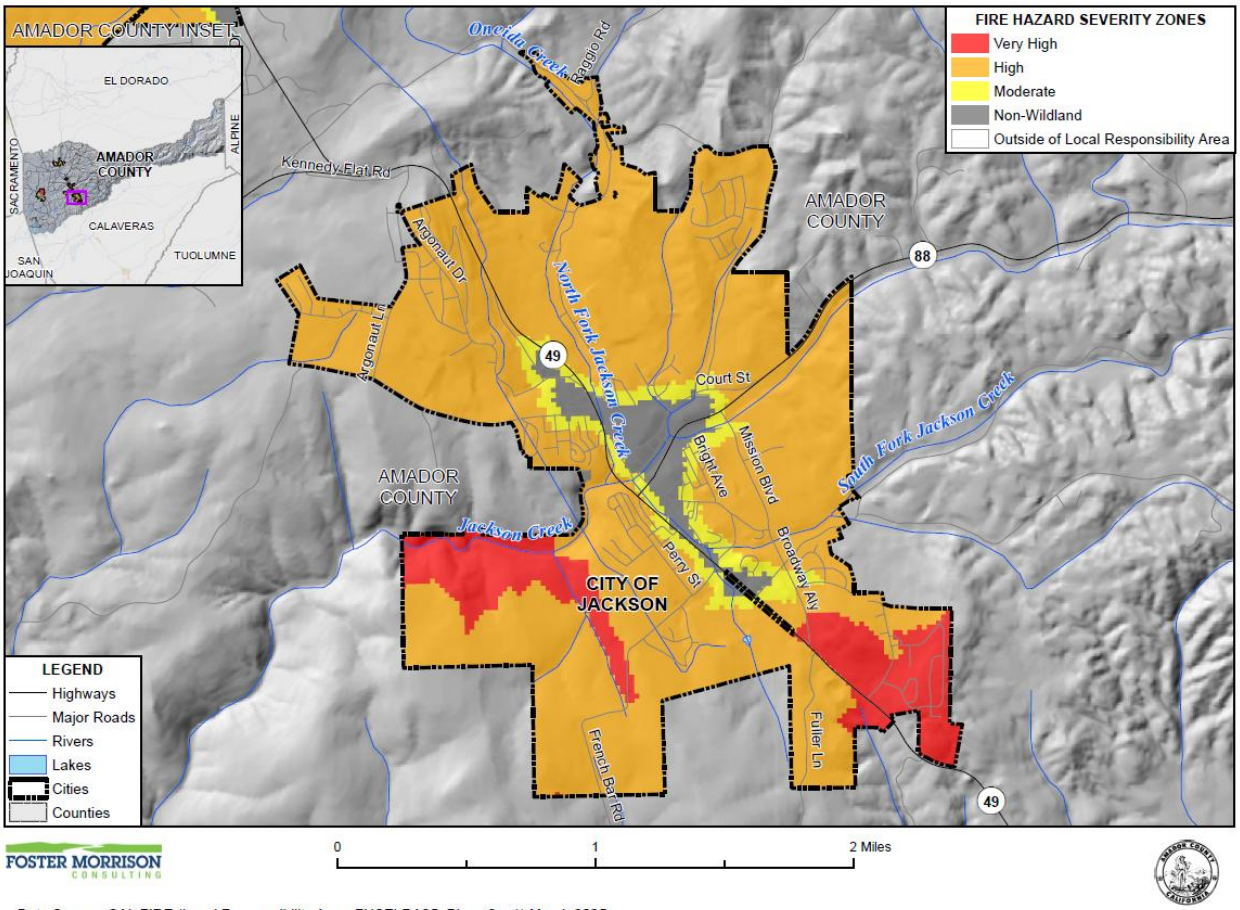
Wildfire can affect all areas of the City. CAL FIRE has estimated that the risk varies across the City and has created maps showing risk variance. Following the methodology described in Section 4.3.15 of the Base Plan, wildfire maps for the City of Jackson were created. Figure C-29 shows the CAL FIRE Federal Responsibility Areas (FRA) and State Responsibility Areas (SRA) and their associated Fire Hazard Severity Zones (FHSZ) in the City. Figure C-30 shows the CAL FIRE Local Responsibility Areas (LRA) and their associated Fire Hazard Severity Zones (FHSZ) in the City. As shown on the maps, FHSZs within the City range from Non-wildland to Very High.

Figure C-29 City of Jackson – CAL FIRE SRA/FRA Fire Hazard Severity Zones



Data Source: CAL FIRE (State Responsibility Area: FHSZSRA_23_3) April 2024,
CAL FIRE (Federal Responsibility Area: Draft c3fhszl06_1) September 2007,
Amador County GIS, Cal-Atlas; Map Date: 3/12/2025.

Figure C-30 City of Jackson – CAL FIRE LRA Fire Hazard Severity Zones



Data Source: CAL FIRE (Local Responsibility Area: FHSZLRA25_Phase3_v1) March 2025, Amador County GIS, Cal-Atlas; Map Date: 3/10/2025.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time or may have durations lasting for a week or more. Geographical FHSZ extents in the SRA/FRA are shown in Table C-39, while extents in the LRA are shown on Table C-40.

Table C-39 City of Jackson – CAL FIRE SRA/FRA Fire Hazard Severity Zone Geographical Extents

Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
SRA						
Very High	0.6	0.0%	0.1	0.0%	0.5	0.0%
High	12.2	0.5%	3.1	0.4%	9.1	0.6%
SRA Total	12.8	0.6%	3.2	0.4%	9.6	0.6%
Jackson Total	**12.8**	**0.6%**	**3.2**	**0.4%**	**9.6**	**0.6%**

Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Grand Total	**12.8**	**0.6%**	**3.2**	**0.4%**	**9.6**	**0.6%**

Source: CAL FIRE

Table C-40 City of Jackson – CAL FIRE LRA Fire Hazard Severity Zone Geographical Extents

Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Very High	253	11%	65	8%	188	12%
High	1,810	79%	590	75%	1,220	80%
Moderate	126	5%	0	0.0%	0	0.0%
Non-Wildland	109	5%	53	7%	56	4%
Outside of LRA Responsibility Area	6	0.2%	2	0.3%	3	0.2%
Jackson Total	**2,302**	**100%**	**782**	**100%**	**1,520**	**100%**

Source: CAL FIRE

Past Occurrences

Disaster Declaration History

There has been three state and two federal disaster declarations due to fire, as shown in Table C-41.

Table C-41 Amador County – State and Federal Wildfire Disaster Declarations 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	3	1961 (unnamed), 2015 (Summer 2015 Fires), 2021 (Caldor Fire)	2	2016 (Butte Fire), 2021 (Caldor Fire)

Source: Cal OES, FEMA

NCDC Events

The NCDC has tracked 50 wildfire events in the County dating back to 1993.

City of Jackson Events

The City noted no past events of wildfire inside the City. The City has had smoke issues from previous fires, especially the Butte Fire in 2015, the Caldor Fire in 2021, and the Electra Fire in 2022.

Climate Change and Wildfire

It is likely that climate change will increase the chance of future occurrence as well as future impacts from wildfire. More information on future impacts to the City can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Warmer temperatures can exacerbate drought conditions. Drought often kills plants and trees, which serve as fuel for wildfires. Warmer temperatures could increase the number of wildfires and pest outbreaks, such as the western pine beetle. Cal-Adapt's wildfire tool predicts the potential increase in the amount of burned areas for the year 2090-2099, as compared to recent (2010) conditions. This is shown in Section 4.3.15 of the Base Plan. Based on this model, Cal-Adapt predicts that wildfire risk in Amador County will increase moderately at the end of the century. However, wildfire models can vary depending on the parameters used. Cal-Adapt does not take landscape and fuel sources into account in their model. In all likelihood, in the Amador County Planning Area, precipitation patterns, high levels of heat, topography, and fuel load will determine the frequency and intensity of future wildfire.

Vulnerability to Wildfire

Risk and vulnerability to the City from wildfire is of significant concern. Wildfires that occur in the City occur from a variety of both natural and manmade causes. The City can be affected both by fires that start on or near City lands as well as those that start elsewhere and move into the City. In addition to burning large areas of land, air quality can be affected in the City by smoke from fires occurring inside the City as well as those from many miles away. As growth continues and populations increase in the City, the potential for wildfires will also increase.

The whole of the City is at some measure of vulnerability to wildfire. An assessment of a community's vulnerability to wildfire begins with an understanding of local exposure to wildfire. This is included in the Local Concerns section below. After that section, assets at risk are discussed.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The City of Jackson General Plan Safety Element also noted that the bedrock in the Jackson area has undergone fracturing, tilting, faulting, and weathering creating areas of instability where there are steep slopes or open cuts. Where slopes of over 20% occur or are proposed, careful consideration must be given to any change in the landforms and to the uses to be placed or maintained on or near the steep slopes. The steep slopes are also the location of possible dangerous wildfires of natural vegetation. Because of the inaccessibility the vegetation is usually allowed to grow rankly providing considerable fuel in many years when there have been favorable weather conditions. The inaccessibility of the site frequently hampers firefighting. Adequate clearing of vegetation is needed around structures and land uses that would suffer severe damage from wildfires on the steep slopes.

The City of Jackson General Plan Safety Element also noted that there are two major conflagration hazards: one would be a major fire in the historic central business district where there are few large open spaces between buildings; the other could occur in any built up portion of the area if a broad area wildfire occurred during an extremely dry spell with a high hot wind. Firefighting is difficult in the Jackson area because of the steep grades. Also, there are several narrow roadways and local access streets without turnaround areas in which the firefighting equipment can maneuver safely.

Jackson Creek is annually overgrown with vegetation. This vegetation can cause an increase in wildfire risk. Currently, the City contracts with CalFire and other organizations to clear the vegetation by hand, annually.

The City noted that it does not have a large risk to large scale wildfires as a higher density population compared to other areas in Amador County. The greatest risk is a WUI wildfire situation and the lack of personnel to fight the fire.

Assets at Risk

Assets at risk from wildfire include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations are at vulnerable to wildfire. Certain vulnerable populations are at greater risk to the effects of wildfire as well as smoke and air quality issues that wildfires bring. Vulnerable populations include:

- Unhoused
- Infants and children under age five and their caregivers
- Elderly (65 and older)
- Individuals with disabilities
- Individuals' dependent on medical equipment
- Individuals who exercise, recreate, or work outdoors
- Individuals with impaired mobility

To further evaluate the impact to the residential population within the City, the CAL FIRE FHSZ dataset was overlayed on the parcel layer. Those residential parcels that intersect the FHSZs were counted and multiplied by the 2023 Census Bureau average household factors for the City of Jackson – 2.20 According to this analysis, there is a total population of 0 residents of the City of Jackson falling within the moderate or higher SRA/FRA FHSZs. This is shown in Table C-42. There is a total population of 3,025 residents of the City of Jackson falling within the moderate or higher LRA FHSZs, as shown on Table C-43.

Table C-42 City of Jackson – Improved Residential Parcels and Population by CAL FIRE SRA/FRA Fire Hazard Severity Zone

Jurisdiction	Very High		High		Moderate	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Jackson	0	0	0	0	0	0

Source: CAL FIRE, Amador County 2024 Parcel/Assessor Data, US Census Bureau American Community Survey 2023 Household Size Estimates.

Table C-43 City of Jackson – Improved Residential Parcels and Population by CAL FIRE LRA Fire Hazard Severity Zone

Jurisdiction	Very High		High		Moderate	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Jackson	144	317	1,054	2,319	177	389

Source: CAL FIRE, 2024 Amador County Parcel/Assessor's Data, US Census Bureau American Community Survey 2023 Household Size Estimates.

The City noted that the Critical Facilities and Infrastructure section below includes the facilities used by At-Risk populations that are threatened by this hazard. While this is not specific to what special populations reside in the City, it does speak to facilities that area used to serve (portions) of this population.

Structures

All structures in the City have some risk to wildfire. GIS was used to determine the possible impacts of wildfire within the City of Jackson. The methodology described in Section 4.3.15 of the Base Plan was followed in determining structures and values at risk in both the CAL FIRE's SRA/FRA and LRA Fire Hazard Severity Zone layer. Analysis results for the SRA/FRA in the City of Jackson are shown in Table C-44, which summarizes total parcel counts, improved parcel counts and their structure values by SRA/FRA FHSZs. Analysis results for the LRA in the City of Jackson are shown in Table C-45, which summarizes total parcel counts, improved parcel counts and their structure values by SRA/FRA FHSZs.

Table C-44 City of Jackson – Count and Value of Parcels and Structures by CAL FIRE SRA/FRA Fire Hazard Severity Zone

Fire Hazard Severity Zone/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Values	Total Value
SRA						
High						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0

Fire Hazard Severity Zone/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Values	Total Value
Miscellaneous	1	0	$7,756	$0	$0	$7,756
Residential	2	0	$819	$0	$0	$819
Unknown	0	0	$0	$0	$0	$0
High Total	**3**	**0**	**$8,575**	**$0**	**$0**	**$8,575**
SRA Total	**3**	**0**	**$8,575**	**$0**	**$0**	**$8,575**
Jackson Total	**3**	**0**	**$8,575**	**$0**	**$0**	**$8,575**

Source: CAL FIRE, Amador County 2024 Parcel/Assessor Data

Table C-45 City of Jackson – Count and Value of Parcels and Structures by CAL FIRE LRA Fire Hazard Severity Zone

Fire Hazard Severity Zone/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Values	Total Value
Very High						
Agricultural	2	0	$3,244,494	$0	$0	$3,244,494
Commercial	11	6	$1,192,328	$3,620,224	$3,620,224	$8,432,776
Industrial	9	7	$2,520,650	$4,994,427	$7,491,641	$15,006,718
Miscellaneous	4	1	$1,394	$15,924	$0	$17,318
Residential	176	144	$15,359,688	$44,148,162	$22,074,081	$81,581,931
Unknown	11	10	$873,483	$2,216,317	$0	$3,089,800
Very High Total	**213**	**168**	**$23,192,037**	**$54,995,054**	**$33,185,946**	**$111,373,037**
High						
Agricultural	9	2	$1,365,811	$728,142	$728,142	$2,822,095
Commercial	124	102	$38,194,407	$142,367,619	$142,367,619	$322,929,645
Industrial	3	2	$480,731	$1,183,885	$1,775,828	$3,440,444
Miscellaneous	48	1	$614,816	$1,450,000	$0	$2,064,816
Residential	1,233	1,054	$98,193,294	$270,478,069	$135,239,035	$503,910,398
Unknown	4	3	$163,288	$192,342	$0	$355,630
High Total	**1,421**	**1,164**	**$139,012,347**	**$416,400,057**	**$280,110,623**	**$835,523,027**
Moderate						
Agricultural	0	0	$0	$0	$0	$0
Commercial	75	66	$11,848,348	$30,718,636	$30,718,636	$73,285,620
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	6	0	$0	$0	$0	$0
Residential	195	177	$13,373,268	$33,139,286	$16,569,643	$63,082,197
Unknown	0	0	$0	$0	$0	$0

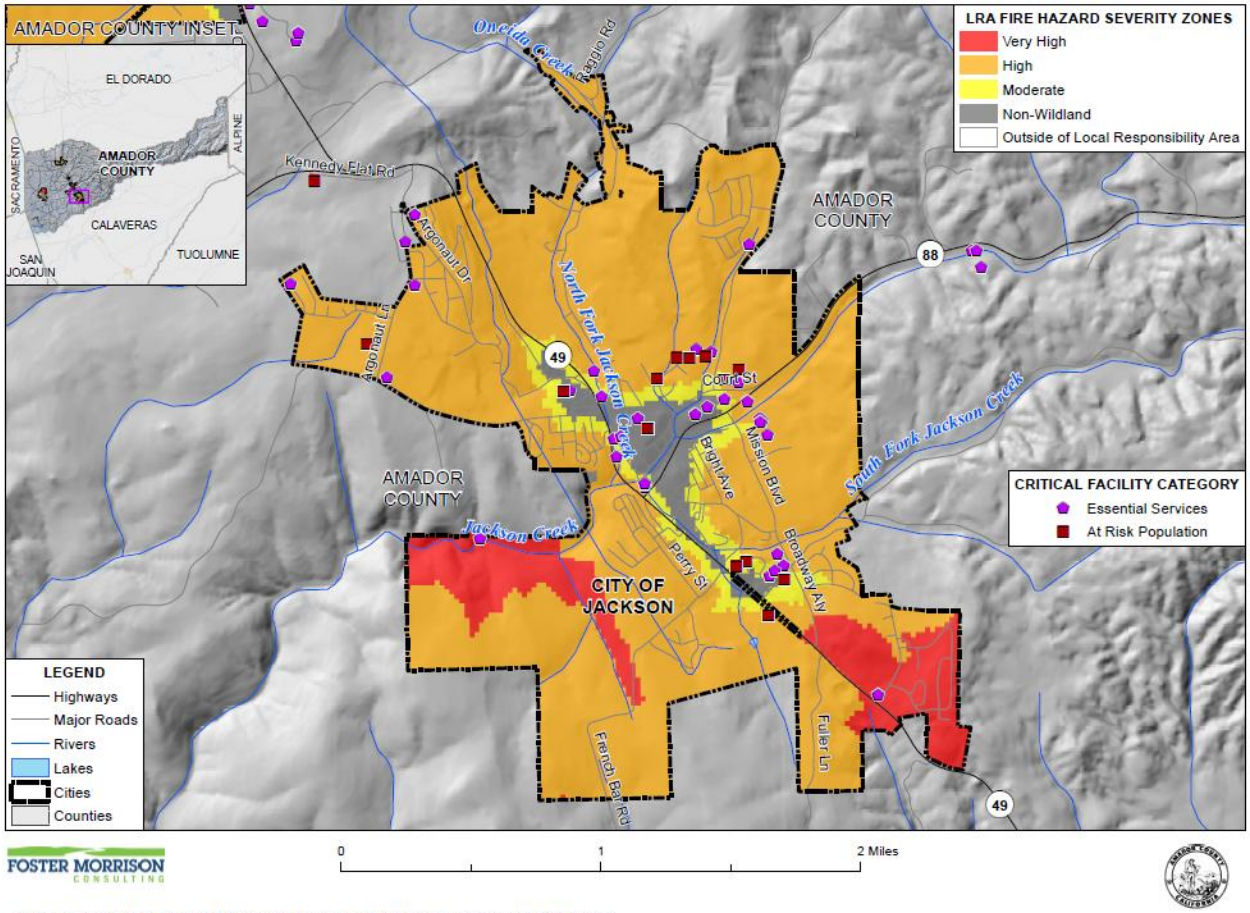
Fire Hazard Severity Zone/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Values	Total Value
Moderate Total	**276**	**243**	**$25,221,616**	**$63,857,922**	**$47,288,279**	**$136,367,817**
Non-Wildland						
Agricultural	0	0	$0	$0	$0	$0
Commercial	58	43	$3,626,433	$6,833,428	$6,833,428	$17,293,289
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	6	0	$0	$0	$0	$0
Residential	149	138	$10,726,971	$25,788,278	$12,894,139	$49,409,388
Unknown	0	0	$0	$0	$0	$0
Non-Wildland Total	**213**	**181**	**$14,353,404**	**$32,621,706**	**$19,727,567**	**$66,702,677**
Outside of LRA Responsibility Area						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	1	0	$72,584	$0	$0	$72,584
Unknown	0	0	$0	$0	$0	$0
Outside of LRA Responsibility Area Total	**1**	**0**	**$72,584**	$0	$0	**$72,584**
Jackson Total	**2,124**	**1,756**	**$201,851,988**	**$567,874,739**	**$380,312,415**	**$769,726,727**

Source: CAL FIRE, Amador County 2024 Parcel/Assessor Data

Critical Facilities and Infrastructure

Wildfire present a threat to critical facilities and infrastructure. The following analysis discusses critical facilities and infrastructure. A separate analysis was performed on the critical facility inventory in the City to determine which critical facilities fall into each fire hazard severity zone. Using GIS, the SRA/FRA and LRA fire hazard severity zones were overlayed on the critical facility GIS layer. Only LRA fire hazard severity zones intersect critical facilities in the City; as such no SRA/FRA analysis is presented here. Only LRA analysis is presented. This is shown on Figure C-25 for the LRA fire hazard severity zones. Table C-46 details which critical facilities fall in which LRA fire hazard severity zone. Details of critical facility categories, type, name, and address by SRA/FRA and LRA fire hazard severity zones are listed in Appendix F.

Figure C-31 City of Jackson – Critical Facilities in LRA Fire Hazard Severity Zones



Data Source: CAL FIRE (Local Responsibility Area: FHSZLRA25_Phase3_v1) March 2025, Amador County GIS, Cal-Atlas; Map Date: 4/21/2025.

Table C-46 City of Jackson – Critical Facilities by Category in LRA Fire Hazard Severity Zones

Fire Hazard Severity Zone	Critical Facility Category	Facility Type	Facility Count
Very High	Essential Services Facilities	Wastewater Facility	1
		Essential Services Total	**1**
	Very High Total		**1**
High Total	Essential Services Facilities	Clinic	8
		Community Center	1
		Court House	1
		Evacuation Shelter	1
		Fire Station	1
		Healthcare/School Services	1
		Hospital	1
		Library	1

Fire Hazard Severity Zone	Critical Facility Category	Facility Type	Facility Count
		Police Station	1
		Wastewater Facility	1
		Essential Services Total	**17**
	At Risk Population	Community Center	1
		Other	1
		Residential Care Facility	4
		School	1
		Veterans Services	1
		At Risk Population Total	**8**
	High Total		**25**
Moderate Total	Essential Services Facilities	Civic Center	1
		Clinic	1
		Evacuation Shelter	1
		Fire Station	1
		Police Station	1
		Post Office	1
		Public Administration Building	2
		Essential Services Total	**8**
	At Risk Population	School	2
		Veterans Services	1
		At Risk Population Total	**3**
	Moderate Total		**11**
Non-Wildland	Essential Services Facilities	Communications	1
		Community Center	1
		DMV	1
		EOC	1
		Government Administration	1
		Jail	1
		Police Station	1
		School District Office	1
		Essential Services Total	**8**
	At Risk Population	School	2
		At Risk Population Total	**2**
	Non-Wildland Total		**10**

Fire Hazard Severity Zone	Critical Facility Category	Facility Type	Facility Count
City of Jackson Total			**47**

Source: CGS, City of Jackson

Natural, Historic, and Cultural Resources

Natural, historic, and cultural resources located within areas at risk to wildfire would be vulnerable. Should a wildfire occur in the City, the impacts to natural, historic and cultural resources could be extensive and include air pollution, contamination from water runoff containing toxic products, and other environmental discharges or releases from burned materials affecting soils, habitat areas, wildlife, and aquatic resources. Historic and cultural resources can be damaged or destroyed and are often more vulnerable due to their older age, construction type, and lack of fire prevention infrastructure such as sprinklers.

Impacts from Wildfire

Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and timber; and loss of recreational opportunities. Out of control wildfires can have catastrophic impacts. Wildfires can cause short-term and long-term disruption to the City. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the City by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the City; smoke and air pollution from wildfires can be a severe health hazard. Smoke impacts may come from wildfires outside the City, as well as from within.

Although the physical damages and casualties arising from wildland-urban interface or conflagration fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate a PSPS which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

The impacts of a fire are felt long after the fire is extinguished. In addition to the loss of property in fires, the loss in vegetation and changes in surface soils alters the environment. When supporting vegetation is burned, hillsides become destabilized and prone to erosion. The burnt surface soils are harder and absorb less water. When winter rains come, this leads to increased runoff, erosion, and landslides in hilly areas.

Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;

- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the hazard profile above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City of Jackson include the following:

- Climate change is likely to exacerbate future wildfire conditions and associated impacts and vulnerability of the City to wildfire.
- Population growth in the City of Jackson has recently slowed. Additional population growth would likely bring continued diversity to the City. Vulnerable population groups could face disproportionate effects from wildfire and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions.
- Land use planning should be proactive to address future hazard conditions. Six residential lots are expected to be built in the next five years. These are in the Very High FHSZ. Locating new development, structures and critical facilities and infrastructure within or near areas of wildfire risk may put additional development at risk. However, City building codes are in effect to reduce this risk and should be updated as necessary to continue to address future wildfire conditions. Specifically, with the release of the new 2025 LRA mapping for Amador County, wildfire building codes should be updated as required to include enhanced measures to reduce wildfire impacts on new construction, and including the formal adoption of the new LRA maps. It should be noted that most of the growth in the City is occurring in areas outside the moderate or higher fire hazard severity zones. Thus, depending on the location of new development and adherence to protective building codes, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the City to this hazard. It should also be noted that once new building codes are adopted for LRA, it should reduce vulnerability on new construction especially in the higher hazard zones.

Future Development

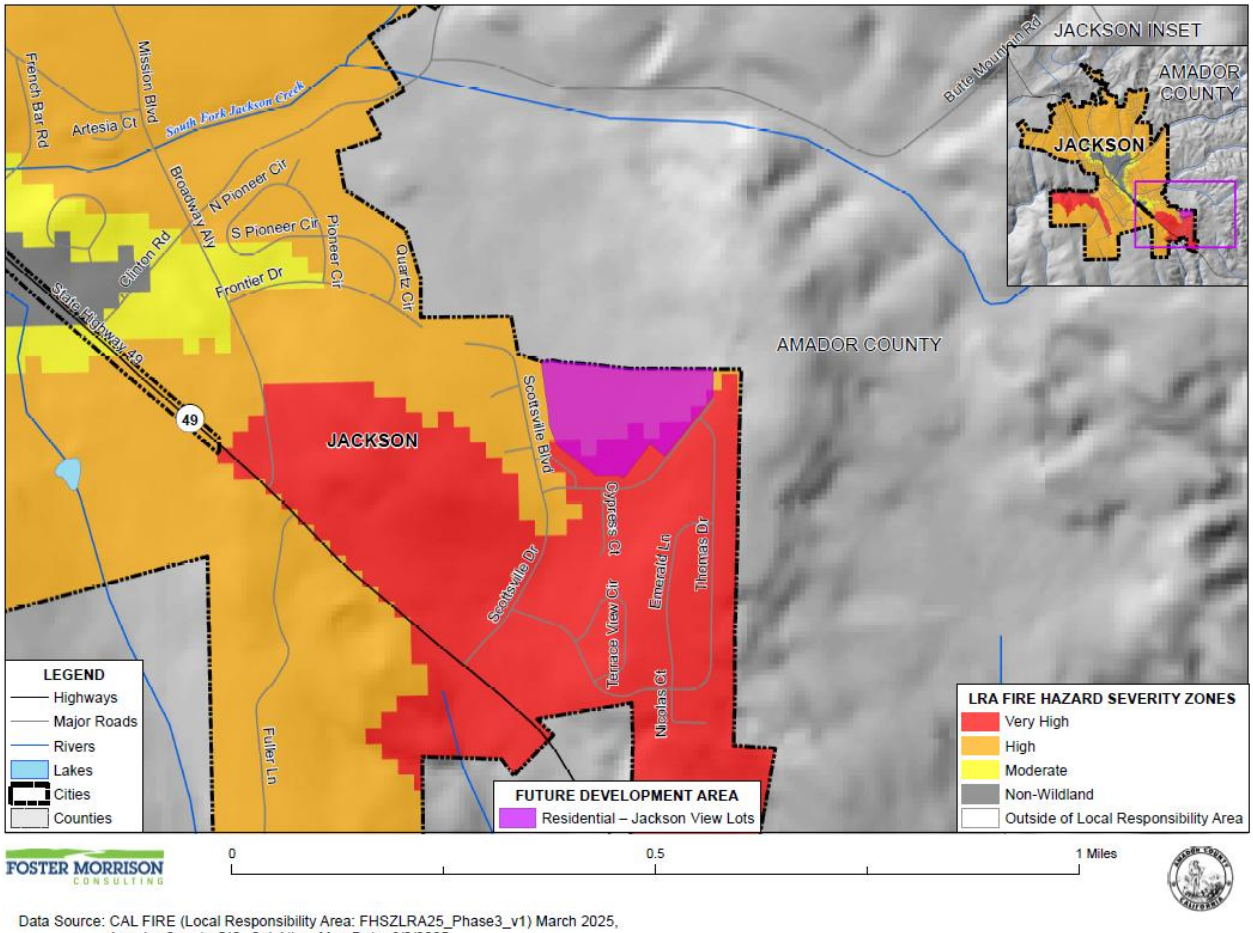
Additional growth and development within moderate or higher fire hazard severity zones in the City would place additional values at risk to wildfire. More vulnerable populations may experience a disproportionate impact from wildfire, and this should be considered as development continues. However, City building codes are in effect and should continue to be updated as appropriate to reduce future impacts.

Future development areas and their vulnerability to wildfire are discussed further in the below GIS analysis.

GIS Analysis

The City provided a future development area which was used as the basis for the inventory of future development for the City. This area were mapped in GIS. Utilizing the future development area spatial layer, the parcel polygon data was intersected to determine the future development areas within each SRA/FRA and LRA fire hazard severity zone. No facilities fell in the SRA/FRA fire hazard severity zones. Figure C-32 shows the locations of the future development area overlayed on the LRA fire hazard severity zones. As shown in Table C-47, the future development area falls in the Very High fire hazard severity zone.

Figure C-32 City of Jackson – Future Development Areas in LRA Fire Hazard Severity Zones



Data Source: CAL FIRE (Local Responsibility Area: FHSZLRA25_Phase3_v1) March 2025, Amador County GIS, Cal-Atlas; Map Date: 6/2/2025.

Table C-47 City of Jackson – Future Development Parcels and Acres in LRA Fire Hazard Severity Zones

Fire Hazard Severity Zone / Future Development	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
Very High						
Jackson View Lots 87-92	1	0	1	2.07	0	2.07
Very High Total	1	0	1	2.07	0	2.07
Grand Total	**1**	**0**	**1**	**2.07**	**0**	**2.07**

Source: CAL FIRE, City of Jackson

C.5 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

C.5.1. Regulatory Mitigation Capabilities

Table C-48 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the City of Jackson.

Table C-48 City of Jackson's Regulatory Mitigation Capabilities

Plans	In Place Y/N	Does the plan address hazards? Can the plan be used to carry out mitigation actions? When was it last updated??
Capital Improvements Plan	N	
Climate Change Adaptation Plan	N	
Community Wildfire Protection Plan	N	
Comprehensive/Master Plan	Y	Comprehensive update in 2023
Continuity of Operations Plan	N	
Economic Development Plan	N	
Land Use Plan	Y	2023
Local Emergency Operations Plan	Y	
Stormwater Management Plan	N	
Transportation Plan	Y	2023
Other	N	

Land Use Planning and Ordinances	Y/N	Is the ordinance an effective way to reduce hazard impacts? Is the ordinance adequately administered and enforced?
Acquisition of land for open space and public recreation use	N	
Building code	Y	Yes
Flood insurance rate maps	Y	Yes
Floodplain ordinance	Y	Yes
Natural hazard-specific ordinance (stormwater, steep slope, wildfire)	Y	Yes
Subdivision ordinance	Y	Yes
Zoning ordinance	Y	Yes
Other		
How can these capabilities be expanded and improved to reduce risk?		
General Plan was updated in 2023 to address climate change, hazards, wildfire interface, emergency services, circulation, etc. It will be important to align future practices with new General Plan goals, objectives, and policies.		

Source: City of Jackson

City of Jackson General Plan (dates vary by element)

The City of Jackson General Plan Program serves as the blueprint for future growth and development and provides comprehensive planning for the future. It encompasses what the City is now, and what it intends to be, and provides the overall framework of how to achieve this future condition (see the discussion in Section 4.3.1 Growth and Development Trends).

The General Plan is a document that guides the future development within the City. It contains broad community values and goals, giving a picture of the desired character and quality of development in the County and policies which outline the steps to accomplish those goals. Of primary concern to this planning document is the Safety and Land Use Elements of the General Plan. The Safety Element, adopted in 1981, reflects hazards related to the City. The Land Use Element, adopted in 2008, is more specific and implementation oriented with respect to protecting future development in the City.

Goals, Policies, and Implementation Measures related to hazard mitigation include the following:

- Goal 1: Growth in the City of Jackson shall occur only if new development adequately mitigates its environmental impacts, addresses housing availability and affordability needs, respects open space resources and occurs so that the growth is in a manner which is not detrimental to the City's neighborhoods and small town quality of life.
  - ✓ Policy 1.5: A hazards study shall be performed for the purpose of outlining areas considered hazardous due mainly to historic mining operations. The hazards study shall consider hazards associated with the use of hazardous materials and with ground disturbances that may have resulted in land instability. Once identified, these areas will be designated in a Hazards Overlay to be incorporated into this Land Use Element. New development standards for properties within this overlay shall be developed to protect the City's citizens from exposure to hazardous materials.

- Goal 2: The City of Jackson has numerous natural and historic features. These features shall be identified, enhanced if necessary, and protected.
  - ✓ Policy 2.5: Limit new development within the Creek/Floodplain overlay by requiring new development proposed within the overlay to obtain Planning Commission approval.

Mitigation Related Ordinances

Weed Abatement (Chapter 8.12)

This ordinance provides for the declaration and abatement of Nuisances to include, "any brush or weeds which attain such large growth as to become, when dry, a fire menace to adjacent improved property".

Uniform Codes (Chapter 14.04)

The following codes are adopted for the City of Jackson:

- The 2022 Edition of the California Administrative Code contained in Part 1 of Title 24 of the California Code of Regulations is hereby adopted by reference as the Administrative Code of the City of Jackson;
- The 2022 Edition of the California Building Code contained in Part 2, Volume 1 and Volume 2, of Title 24 of the California Code of Regulations, which incorporates and amends the 2015 Edition of the International Building Code published by the International Code Council, including Chapter 1, is hereby adopted by reference as the Building Code of the City of Jackson;
- The 2022 Edition of the California Residential Code contained in Part 2.5 of Title 24 of the California Code of Regulations, which incorporates and amends the 2015 Edition of the International Residential Code, Second Printing, and the 2012 Edition of the International Residential Code published by the International Code Council, including Chapter 1, is hereby adopted by reference as the Reference Code of the City of Jackson;
- The 2022 Edition of the California Electrical Code contained in Part 3 of Title 24 of the California Code of Regulations, which incorporates and amends the 2014 Edition of the National Electric Code published by the National Fire Protection Association, including Chapter 1, is hereby adopted by reference as the Electrical Code of the City of Jackson;
- The 2022 Edition of the California Mechanical Code contained in Part 4 of Title 24 of the California Code of Regulations, which incorporates and amends the 2015 Edition of the Uniform Mechanical Code published by the International Association of Plumbing and Mechanical Officials, including Chapter 1, is hereby adopted by reference as the Mechanical Code of the City of Jackson;
- The 2022 Edition of the California Plumbing Code contained in Part 5 of Title 24 of the California Code of Regulations, which incorporates and amends the 2015 Edition of the Uniform Plumbing Code published by the International Association of Plumbing and Plumbing Officials, including Chapter 1, is hereby adopted as the Plumbing Code of the City of Jackson;
- The 2022 Edition of the California Energy Code contained in Part 6 of Title 24 of the California Code of Regulations is hereby adopted by reference as the Energy Code of the City of Jackson;
- The 2022 Edition of the California Historical Building Code contained in Part 8 of Title 24 of the California Code of Regulations is hereby adopted by reference as the Historical Building Code of the City of Jackson;
- The 2022 Edition of the California Fire Code contained in Part 9 of Title 24 of the California Code of Regulations, which incorporates and amends the 2015 Edition of the International Fire Code as published by the International Code Council, including Chapter 1, is hereby adopted as the Fire Code of the City of Jackson;

- The 2022 Edition of the California Existing Building Code contained in Part 10 of Title 24 of the California Code of Regulations is hereby adopted by reference as the Existing Building Code of the City of Jackson;
- The 2022 Edition of the California Green Building Standards Code contained in Part 11 of Title 24 of the California Code of Regulations is hereby adopted by reference as the Green Building Standards Code of the City of Jackson;
- The 2022 Edition of the California Referenced Standards Code contained in Part 12 of Title 24 of the California Code of Regulations is hereby adopted by reference as the Referenced Standards Code of the City of Jackson;
- The 2021 Edition of the International Property Maintenance Code as published by the International Code Council is hereby adopted by reference as the Property Maintenance Code of the City of Jackson;
- The 2021 Edition of the Uniform Swimming Pool, Spa and Hot Tub Code as published by the International Association of Plumbing and Mechanical Officials is hereby adopted by reference as the Swimming Pool Code of the City of Jackson;
- The 1997 Edition of the Uniform Code for the Abatement of Dangerous Buildings, published by the International Conference of Building Officials, is hereby adopted by reference as the Dangerous Buildings Code of the City of Jackson;
- The 1997 Edition of the Uniform Housing Code, published by the International Conference of Building Officials, as referenced and adopted by the California Department of Housing and Community Development in Title 25 of the California Code of Regulations pursuant to Sections 17958, 17958.5, 17958.7, 17958.9 and 17959 of the Health & Safety Code is hereby adopted by reference as the Housing Code of the City of Jackson;
- The 1997 Edition of the Uniform Building Security Code, published by the International Conference of Building Officials, is hereby adopted by reference as the Security Building Code of the City of Jackson;

The above-identified codes in this Section 14.04.010 (hereinafter collectively referred to as the "Uniform Codes") are adopted for the purpose of prescribing regulations for the erection, construction, modification, repair, maintenance, demolition, use and occupancy of buildings and structures. One copy of each of the Uniform Codes shall be maintained for use and examination of the public in the Office of the Building Official.

Floodplain Management (Chapter 17.34)

The flood hazard areas of the City are subject to periodic inundation which results in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety, and general welfare.

These flood losses are caused by uses that are inadequately elevated, floodproofed, or protected from flood damage. The cumulative effect of obstructions in areas of special flood hazards which increase flood heights and velocities also contribute to the flood loss.

It is the purpose of this Chapter to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed to:

- Protect human life and health;
- Minimize expenditure of public money for costly flood control projects;

- Minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- Minimize prolonged business interruptions;
- Minimize damage to public facilities and utilities such as water and gas mains; electric, telephone and sewer lines; and streets and bridges located in areas of special flood hazard;
- Help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future blighted areas caused by flood damage:
- Ensure that potential buyers are notified that property is in an area of special flood hazard; and
- Ensure that those who occupy areas of special flood hazard assume responsibility for their actions.
- In order to accomplish the above purpose, this Chapter includes methods and provisions to:
- Restrict or prohibit uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damage increases in erosion or flood heights or velocities;
- Require that uses vulnerable to floods, including facilities which serve the uses, be protected against flood damage at the time of initial construction;
- Control the alteration of natural flood plains, stream channels, and natural protective barriers, which help accommodate or channel flood waters;
- Control, file, grade, dredge, and other development which may increase flood damage; and
- Prevent or regulate the construction of flood barriers which will unnaturally divert flood waters, or which may increase flood hazards in other areas.

17.34.220 – Floodways

Locations within areas of special flood hazard established in Section 17.34.070 (Basis for Establishing the Areas of Special Flood Hazard) are designated as floodways. Since the floodway is an extremely hazardous area due to the velocity of floodwaters which carry debris, potential projectiles, and erosion potential, the following provisions apply.

- Prohibit encroachments, including fill, new construction, substantial improvement, and other new development unless certification by a registered professional engineer or architect is provided demonstrating that encroachments shall not result in any increase in (the base) flood elevation during the occurrence of the base flood discharge.
- If subsection (A) is satisfied, all new construction, substantial improvement, and other proposed new development shall comply with all other applicable flood hazard reduction provisions of Sections 17.34.170 (Standards of Construction) through 17.34.250 (Flood-related Erosion-Prone Areas).

17.34.240 - Mudslide Prone Areas

The floodplain administrator shall review permits for proposed construction of other development to determine if it is proposed within a mudslide area.

Permits shall be reviewed to determine that the proposed site and improvement will be reasonably safe from mudslide hazards. Factors to be considered in making this determination include but are not limited to the:

- Type and quality of soils;
- Evidence of groundwater or surface water problems;
- Depth and quality of any fill;
- Overall slope of the site; and
- Weight that any proposed development will impose on the slope.

Within areas which may have mudslide hazards, the floodplain administrator shall require that:

- A site investigation and further review be made by persons qualified in geology and soils engineering;
- The proposed grading, excavation, new construction, and substantial improvement be adequately designed and protected against mudslide damages;
- The proposed grading, excavation, new construction, and substantial improvement not aggravate the existing hazard by creating either on-site or off-site disturbances; and
- Drainage, planting, watering, and maintenance not endanger slope stability.

17.34.250 - Flood-related Erosion-Prone Areas

- The floodplain administrator shall require permits for proposed construction and other development within all flood-related, erosion-prone areas identified by the community.
- Permit applications shall be reviewed to determine whether the proposed site alterations and improvements will be reasonably safe from flood-related erosion and will not cause flood-related erosion hazards or otherwise aggravate the existing hazard.
- If a proposed improvement is found to be in the path of flood-related erosion or would increase the erosion hazard, such improvement shall be relocated or adequate protective measures shall be taken to avoid aggravating the existing erosion hazard.
- Within Zone E on the Flood Insurance Rate Map, a setback is required for all new development from a body of water to create a safety buffer consisting of a natural vegetative or contour strip. This buffer shall be designated according to the flood related erosion hazard and erosion rate, in relation to the anticipated ―useful life of structures, and depending upon the geologic, hydrologic, topographic, and climatic characteristics of the land. The buffer may be used for suitable open space purposes, such as for agricultural, forestry, outdoor recreation, and wildlife habitat areas, and for other activities using temporary and portable structures only.

Development Code (Title 17)

This Development Code carries out the policies of the City of Jackson General Plan by classifying and regulating the uses of land and structures within the City of Jackson. This Development Code is adopted to protect and to promote the public health, safety, comfort, convenience, prosperity, and general welfare of residents, and businesses in the City. Additional purposes of this Development Code are to:

- Implement the General Plan by encouraging the uses of land designated by the General Plan;
- Provide standards for the orderly growth and development of the City that will maintain its established historic, small town, and open space characteristics;
- Enhance and maintain the relationship between the citizens of the City of Jackson, our environment, and the City's many attributes essential for a continued high quality of life.
- Encourage growth in a manner that does not detract from the City's attributes or negatively impact the environment.
- Require high quality planning and design for development, that enhances the visual character of the City, avoids conflicts between land uses, and preserves the scenic qualities of the City by maintaining adequate open space;
- Create a comprehensive and stable pattern of land uses consistent with the limitations of the Resource Constraints and Priority Allocation Ordinance; and
- Provide regulations for the subdivision of land in compliance with the Subdivision Map Act, Title 7, Section 4, Division 2 of the California Government Code.

C.5.2. Administrative/Technical Mitigation Capabilities

Table C-49 identifies the City department(s) responsible for activities related to mitigation and loss prevention in the City of Jackson.

Table C-49 City of Jackson's Administrative and Technical Mitigation Capabilities

Administration	In Place Y/N	Describe capability Is coordination effective?
Staff		**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official	Y	Yes/Yes/Yes
Civil Engineer, including dam and levee safety	Y	Yes/Yes/Yes
Community Planner	**Y**	Yes/Yes/Yes
Emergency Manager	N	
Floodplain Administrator	Y	Yes/Yes/Yes
GIS Coordinator	Y	
Planning Commission	Y	Yes
Other		
Technical	**Y/N**	**Has capability been used to assess/mitigate risk in the past?**
Grant writing	N	
Hazard data and information	Y	
GIS analysis	N	
Mutual aid agreements	Y	Yes
Other		
How can these capabilities be expanded and improved to reduce risk?		
Additional Funding for increase training.		

Source: City of Jackson

C.5.3. Fiscal Mitigation Capabilities

Table C-50 identifies financial tools or resources that the City could potentially use to help fund mitigation activities.

Table C-50 City of Jackson's Fiscal Mitigation Capabilities

Funding Resource	In Place Y/N	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	Yes/Yes
Community Development Block Grant	Y	Yes/Yes
Federal funding programs (non-FEMA)	Y	No/Yes
Fees for water, sewer, gas, or electric services	Y	Yes/Yes
Impact fees for new development	Y	Yes/Yes
State funding programs	Y	Yes/Yes
Stormwater utility fee	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Funding needed to address deferred maintenance of infrastructure.		

Source: City of Jackson

C.5.4. Mitigation Education, Outreach, and Partnerships

Table C-51 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table C-51 City of Jackson's Mitigation Education, Outreach, and Partnerships

Program/Organization	In Place Y/N	How widespread are each of these in your community?
Community newsletters	Y	City announcements
Hazard awareness campaigns (such as Firewise, Storm Ready, Severe Weather Awareness Week, school programs, public events)	Y	City School Program
Local news	Y	Local News networks
Organizations that interact with underserved and vulnerable communities	Y	Locally
Social media	Y	Locally
How can these capabilities be expanded and improved to reduce risk?		
Increased funding is necessary to expand programs.		

Source: City of Jackson

C.5.5. Other Mitigation Efforts

The City has many other completed or ongoing mitigation efforts that include the following:

- The City has participated in the Oro De Amador Dam clean up
- Local community clean up dates (wildfire prevention) occur relatively frequently.
- A weed abatement program occurs in the City.
- The City has successfully partnered with the State of California Office of Emergency Services and the County of Amador Office of Emergency Services on previous mitigation grants and outreach. This was the case with the Marcucci Lane Culvert Bridge replacement adjacent to Highway 49.
- The City also works with the CAL FIRE crews on an annual basis to clear the vegetation growth in Jackson Creek to reduce the potential for flooding within the City
- The City is in the process of replacing three potentially hazardous bridges: South Avenue Bridge, Pitt Street Bridge and French Bar Road Bridge. All three of these replacement projects are FHWA funded.
- The slide in the Busi Parking Lot has been repaired.
- The City utilized FEMA funds to repair the WWTP access road that was damaged during the 2017 storms.
- The City utilized FEMA funds to replace a damaged culvert on Jackson Gate Road.

C.6 Mitigation Strategy

C.6.1. Mitigation Goals and Objectives

The City of Jackson adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

C.6.2. NFIP Mitigation Strategy

The City of Jackson joined the National Flood Insurance Program (NFIP) on August 19, 1985. As a participant of the NFIP, the City of Jackson has administered floodplain management regulations that meet the minimum requirements of the NFIP. The management program objective is to protect people and property within the City. The City of Jackson will continue to comply with the requirements of the NFIP in the future.

In addition, the City of Jackson actively participates with Amador County to address local NFIP issues through a regional approach. Many of the program activities are the same for the City of Jackson as for Amador County since participation at the County level includes all local jurisdictions.

The City of Jackson Building Department provides public outreach activities which include map information services, public awareness, public hazard disclosure, and flood protection information. This information is readily available to the public and consists of current and accurate flood mapping. In addition, the Planning and Engineering Department provides information about our stormwater management program and up-to-date information related to the maintenance of our drainage system.

The NFIP's Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS which are to reduce flood losses, facilitate accurate insurance rating, and promote the awareness of flood insurance. The City of Jackson is not a current participant in the CRS program.

More information about the floodplain administration in the City of Jackson can be found in Table C-52.

Table C-52 City of Jackson Compliance with NFIP

NFIP Topic	Comments
Staff Resources	
Who is responsible for floodplain management in your community? Provide Department/Title. Do they serve any roles other than Community Floodplain Administrator (FPA)?	Building Official. They serve other roles other than FPA.
Is the Community FPA or NFIP Coordinator a Certified Floodplain Manager?	No
Is floodplain management an auxiliary function?	Yes
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	Permit review
What are the barriers to running an effective NFIP program in the community, if any?	None known
Insurance Summary	
How many NFIP policies are in the community? What is the total premium and coverage?	28 policies $35,579 in premiums $8,054,000 in coverage.
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	40 paid claims $1,030,257.19 in paid losses 1 substantial damage claims
How many structures (residential and non-residential) are exposed to flood risk within the community?	207 in 1% annual chance floodplain 24 in 0.2% annual chance floodplain
Are there Repetitive Loss (RL) and Severe Repetitive Loss Properties (SRL) structures in the community?	2 RL 0 SRL
Describe any areas of flood risk with limited NFIP policy coverage	None known.
How does the community teach property owners or other stakeholders about the importance flood insurance?	Point residents to the FEMA Map Service Center pages for information.
What digital sources (like the FEMA Map Service Center, National Flood Hazard Layer) or non-regulatory tools does the community use?	Publicly accessible sources - National Flood Hazard Layers
Compliance History	
Is the community in good standing with the NFIP?	Y
Are there any outstanding compliance issues (i.e., current violations)?	N
Who is responsible (Department, Title) for making substantial damage/improvement determinations? How does the community identify substantially damaged/improved structures? What is the process to make sure these structures are brought into compliance?	City Building Official; follows the permitting process and floodplain ordinance. Building Official identifies substantially damaged structures and applies available remedies to bring back into compliance (in coordination with the owners of the property).
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	1/28/2009 (CAV) 12/8/2017 (CAC)

NFIP Topic	Comments
Is a CAV or CAC scheduled or needed?	No
Regulation	
When did the community enter the NFIP?	August 19, 1985
Are the FIRMs digital or paper?	Digital
Has the community adopted the NFIP minimum floodplain management criteria via local regulation? Date of current local regulation?	Y 1990
Has the community adopted the latest effective FIRM? Date adopted?	Y 2016 was last Flood Insurance Study
How does the community enforce local floodplain regulations and monitor compliance?	Y, through the permitting process and per the flood ordinance.
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	Meet.
How are Letters of Map Change (LOMCs) tracked and compiled?	New DFIRMs are downloaded regularly which include the latest LOMCs, LOMRs, and CLOMRs
Provide an explanation of the permitting process.	For the permitting process, typically when any applications are made, the building department checks the location of the proposed development in relationship to the floodplains and floodways within the City. If a property is in a floodplain, conditions (whether it be on a developer or a single applicant) are placed on the permit requiring them to meet the City's_ floodplain ordinance and building requirements. With respect to structures proposed in floodways, no construction is allowed in floodways. If construction is to take place within floodplains, flood elevation certificates are required for all homes to prove that the finished floor elevation meets with the City's ordinances. Additionally, if its's a development, a full floodplain analysis, CLOMR and LOMR is required.
Community Rating System	
Does the community participate in CRS? If so, what is the community's CRS Class Ranking?	No
What categories and activities provide CRS points and how can the class be improved?	N/A
Does the plan include CRS planning requirements?	N/A

Source: City of Jackson

C.6.3. Mitigation Actions

The Planning Team for the City of Jackson identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Climate Change
- Dam Failure
- Drought & Water Shortage (w/ tree mortality)
- Earthquake (w/subhazards)
- Floods: 1%/0.2% annual chance (w/ levee failure)
- Floods: Localized Stormwater
- Landslide, Mudslide, and Debris Flow
- Severe Weather: Extreme Cold, Freeze, Snow
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rain and Storms (Hail, Lightning)
- Severe Weather: High Winds and Tornados
- Wildfire

Low priority hazards for mitigation planning include:

- Agricultural Hazards (severe weather/pests/invasive species)
- Avalanche

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five-year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Mitigation Actions

The City has put forward the actions as shown in Table C-53. Details of the actions can be found below the table.

Table C-53 City of Jackson Mitigation Actions

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
City of Jackson					
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Previous Action	X	X		Prevention

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	Previous Action	X	X	X	Prevention Public Education
Action 3. Creation of Drone Program	New Action	X	X		Property Protection Natural Resource Protection
Action 4. Backup Power Projects for Critical Facilities and Infrastructure (e.g. Generators, Batteries, Solar, Etc.)	New Action	X	X		Property Protection Structural
Action 5. Creek Excavation and Annual Clearing Projects	Previous Action	X	X	X	Property Protection Natural Resource Protection
Action 6. Pitt Street Bridge Replacement	New Action	X	X	X	Structural
Action 7. Mattley Street Erosion Project	New Action	X	X	X	Prevention Property Protection Natural Resource Protection
Action 8. Home Hardening Education Program/Go Bags, ARC	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 9. Defensible Space Public Education	Previous Action	X	X		Public Education
Action 10. Fuel Break Projects	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 11. Jackson Fire Station 131 Replacement Project	New Action	X	X		Structural

Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Hazards Addressed: Multi-hazard (Agricultural Hazards (severe weather/pests/invasive species), Avalanche, Climate Change, Dam Failure, Drought & Water shortage (w/ tree mortality), Earthquake (w/subhazards), Floods: 1%/0.2% annual chance (w/ levee failure), Floods: Localized Stormwater, Landslide, Mudslide, Debris Flow, Severe Weather: Extreme Cold, Freeze, and Snow, Severe Weather: Extreme Heat, Severe Weather: Heavy Rains and Storms (Hail, Lightning), Severe Weather: High Winds and Tornadoes, Wildfire (w/smoke and air quality))

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): Local jurisdictional reimbursement for mitigation projects and cost recovery after a disaster is guided by Government Code Section 8685.9 (AB 2140). Specifically, this

section requires that each jurisdiction adopt a local hazard mitigation plan (LHMP) in accordance with the federal Disaster Mitigation Act of 2000 as part of the Safety Element of its General Plan. Adoption of the LHMP into the Safety Element of the General Plan may be by reference or incorporation.

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Safety Element of General Plan

Responsible Office/Partners: City of Jackson Planning Department

Benefits (Losses Avoided): Incorporation of an adopted LHMP into the Safety Element of the General Plan will help jurisdictions maximize the cost recovery potential following a disaster.

Potential Funding (Local Budgets, Grant Funds, etc.): City General Fund

Timeline: Within 1 years

Priority (H, M, L): High

Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness

Hazards Addressed: Multi-hazard (Agricultural Hazards (severe weather/pests/invasive species), Avalanche, Climate Change, Dam Failure, Drought & Water shortage (w/ tree mortality), Earthquake (w/subhazards), Floods: 1%/0.2% annual chance (w/ levee failure), Floods: Localized Stormwater, Landslide, Mudslide, Debris Flow, Severe Weather: Extreme Cold, Freeze, and Snow, Severe Weather: Extreme Heat, Severe Weather: Heavy Rains and Storms (Hail, Lightning), Severe Weather: High Winds and Tornadoes, Wildfire (w/smoke and air quality))

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): The City and County play a key role in public outreach/education efforts to communicate the potential risk and vulnerability of their community to the effects of natural hazards. A comprehensive multi-hazard public education program will better inform the community of natural hazards of concern and actions the public can take to be better prepared for the next natural disaster event.

Project Description: A comprehensive multi-hazard outreach program will ascertain both broad and targeted educational needs throughout the community. The City will work with the County and other agencies as appropriate to develop timely and consistent annual outreach messages in order to communicate the risk and vulnerability of natural hazards of concern to the community. This includes measures the public can take to be better prepared and to reduce the damages and other impacts from a hazard event. The public outreach effort will leverage and build upon existing mechanisms, and will consider:

- Using a variety of information outlets, including websites, local radio stations, news media, schools, and local, public sponsored events;
- Creating and distributing (where applicable) brochures, leaflets, water bill inserts, websites, and public service announcements;
- Displaying public outreach information in County office buildings, libraries, and other public places and events;
- Developing public-private partnerships and incentives to support public education activities.

Other Alternatives: Continue public information activities currently in place.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Existing City and County outreach programs will be reviewed for effectiveness and leveraged and expanded upon to reach the broader region.

Responsible Office/Partners: City of Jackson Planning Department in partnership with the County

Benefits (Losses Avoided): Increase residents' knowledge of potential hazards and activities required to mitigate hazards and be better prepared. Protect lives and reduce damages, relatively low cost to implement.

Potential Funding (Local Budgets, Grant Funds, etc.): City General Fund, grant funds (like CA DWR, Cal OESPDM, HMGP, FMA, BRIC, or other sources).

Timeline: Ongoing/Annual public awareness campaign

Project Priority (High, Medium, Low): High

Action 3. Creation of Drone Program

Hazards Addressed: Climate Change, Dam Failure, Drought & Water Shortage, Earthquake, Flood: 1%/0.2% Annual Chance, Flood: Localized Stormwater Flooding, Landslide, Mudslide, Debris Flow, Severe Weather: Extreme Cold, Freeze, and Snow, Severe Weather: Extreme Heat, Severe Weather: Heavy Rains and Storms, Severe Weather: High Winds and Tornados, and Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): The City of Jackson currency lacks an organized plan/mitigation actions for a drone program.

Project Description: The creation and implementation of a drone program within the City of Jackson would greatly enhance the Fire Department's (and all city departments) capabilities across all phases of emergency management—mitigation, response, and recovery. Drones equipped with high-resolution cameras, thermal imaging, and mapping software can provide real-time situational awareness during wildfires, floods, and other disasters, allowing for faster, safer, and more informed decision-making.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Emergency Management plans and program. The City of Jackson currently has no funding mechanism to dedicate towards this project

Responsible Office/Partners: All Agencies within the City of Jackson

Benefits (Losses Avoided): Developing and maintaining fuel breaks around the City of Jackson will enhance wildfire protection by slowing fire spread, creating defensible space for firefighting operations, and safeguarding homes, infrastructure, and evacuation routes.

Potential Funding (Local Budgets, Grant Funds, etc.): CalOES grants, FEMA Mitigation Grants, PDM, BRIC, HMGP, and FMA

Timeline: 1-2 years

Project Priority (High, Medium, Low): Medium

Action 4. Backup Power Projects for Critical Facilities and Infrastructure (e.g., Generators, Batteries, Solar, Etc.)

Hazards Addressed: Climate Change, Dam Failure, Drought & Water Shortage, Earthquake, Flood: 1%/0.2% Annual Chance, Flood: Localized Stormwater Flooding, Landslide, Mudslide, Debris Flow, Severe Weather: Extreme Cold, Freeze, and Snow, Severe Weather: Extreme Heat, Severe Weather: Heavy Rains and Storms, Severe Weather: High Winds and Tornados, and Wildfire

Goals Addressed: 1, 2, 4, 6

Issue/Background (Problem Statement): The City of Jackson currently lacks backup power supplies for the majority of the critical infrastructure locations. These locations can be affected by any of the hazards shown in the Hazards Addressed list above. This includes facilities that can serve as heating and cooling centers during times of extreme temperatures.

Project Description: The City of Jackson would like to add back up power sources (generators) to critical infrastructure sites such as Public Works Yard, pump stations

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Emergency Management plans and program. The City of Jackson currently has no funding mechanism to dedicate towards this project

Responsible Office/Partners: City of Jackson Public Works

Benefits (Losses Avoided): Securing reliable backup power supplies for critical infrastructure in the City of Jackson is essential to ensuring continuity of operations during emergencies and natural disasters, particularly wildfires and severe weather events that frequently result in extended power outages. At

present, many of the City's vital facilities—including public works yards, water systems—lack sufficient backup power capabilities.

Potential Funding (Local Budgets, Grant Funds, etc.): CalOES grants, FEMA Mitigation Grants, PDM, BRIC, HMGP, and FMA.

Timeline: 2-3 Years

Project Priority (High, Medium, Low): Medium

Action 5. Creek Excavation and Annual Clearing Projects

Hazards Addressed: Flood: 1%/0.2% Annual Chance, Flood: Localized Stormwater Flooding, Wildfire

Goals Addressed: 1, 2, 4, 6

Issue/Background (Problem Statement): The Jackson Creek is annually overgrown with vegetation that causes the risk of flooding as vegetation builds up and causes drainage issues. In addition, this vegetation can cause an increase in wildfire risk. Currently, the City contracts with CalFire and other organizations to clear the vegetation by hand, annually.

Project Description: Dredge the entire creek bed and install a permanent barrier to prevent vegetation from growing in the creek bed.

Other Alternatives: Allow overgrowth to continue.

Existing Planning Mechanism(s) through which Action Will Be Implemented: The City of Jackson currently contracts with CalFire and other organizations to clear the vegetation by hand. This involved personnel to physically enter the creek bed and remove the overgrown vegetation.

Responsible Office/Partners: City of Jackson Public Works

Benefits (Losses Avoided): Would allow for a permanent fix to the vegetation overgrowth causing flooding risk as well as allow for resources to be allocated towards other city projects.

Potential Funding (Local Budgets, Grant Funds, etc.): CalOES grants, FEMA Mitigation Grants, PDM, BRIC, HMGP, and FMA.

Timeline: From beginning of plan and annually after that.

Project Priority (High, Medium, Low): Medium

Action 6. Pitt Street Bridge Replacement

Hazards Addressed: Flood: 1%/0.2% Annual Chance, Flood: Localized Stormwater Flooding (and any other hazard requiring evacuation)

Goals Addressed: 1, 2, 4, 6

Issue/Background (Problem Statement): The Pitt Street Bridge is currently closed due to age and degradation. This bridge is a critical infrastructure that connects two highly trafficked streets including Water Street (an extension of our Historic Main Street and Highway 88. This bridge was utilized as an evacuation route for two neighborhoods of the City of Jackson.

Project Description: Full replacement of bridge and footings

Other Alternatives: Keep bridge closed and continue to drive alternative routes.

Existing Planning Mechanism(s) through which Action Will Be Implemented: The City of Jackson currently has no planning or funding mechanism to replace this bridge.

Responsible Office/Partners: City of Jackson Public Works, CalTrans

Benefits (Losses Avoided): Replacement of this bridge would provide for an additional evacuation route for two neighborhoods in the City of Jackson. A secondary benefit would allow for reduced response times for emergency vehicles who are now forced to respond around an alternate route.

Potential Funding (Local Budgets, Grant Funds, etc.): CalOES Grants**,** FEMA Mitigation Grants, PDM, BRIC, HMGP, and FMA

Timeline: Once funding becomes available, it is hoped to be finished within 5 years.

Project Priority (High, Medium, Low): High

Action 7. Mattley Street Erosion Project

Hazards Addressed: Flood: 1%/0.2% Annual Chance, Flood: Localized Stormwater Flooding, Severe Weather: Heavy Rains and Storms, Landslide

Goals Addressed: 1, 2, 4, 6

Issue/Background (Problem Statement): The hillside of Mattley Street in the City of Jackson is located directly across the street (uphill) of Fire Station 131. This parcel has experienced significant erosion over the past few years. This erosion was partially mitigated via anti-erosion measures, where the City invested in a concrete covering that attached bored rods into the hillside.

Project Description: Further anti-erosion measures will be needed in the future to ensure existing measures remain stable

Other Alternatives: Keep status quo.

Existing Planning Mechanism(s) through which Action Will Be Implemented: The City of Jackson currently has no planning or funding mechanism to dedicate towards additional anti erosion measures for this parcel.

Responsible Office/Partners: City of Jackson Public Works

Benefits (Losses Avoided): Funding this project would help protect critical public safety infrastructure, specifically Fire Station 131, which is located directly downhill from the eroding hillside on Mattley Street. The current erosion poses a long-term threat to the stability and operational integrity of the fire station and nearby properties. While previous anti-erosion efforts have helped stabilize the slope temporarily, additional measures are necessary to reinforce the hillside, preserve the effectiveness of prior mitigation investments, and prevent future flood and erosion-related damages.

Potential Funding (Local Budgets, Grant Funds, etc.): CalOES Grants, FEMA Mitigation Grants, PDM, BRIC, HMGP, and FMA

Timeline: 3-5 Years

Project Priority (High, Medium, Low): Medium

Action 8. Jackson Fire Station 131 Replacement Project

Hazards Addressed: Climate Change, Drought & Water Shortage, Earthquake, Flood: Localized Stormwater, Severe Weather: High Winds and Tornados, and Wildfire

Goals Addressed: 1, 2, 4, 5, 6

Issue/Background (Problem Statement): The Jackson Fire Department Station 131 is currently located at 175 Main Street, which is at the entrance to our Historic Main Street. This fire station was constructed in the 1950's (approximately) and was built over top of the Jackson Creek. This fire station is at a severe risk of destruction if significant flooding or earthquake occurs. This facility is a critical infrastructure to the City and is at the highest risk based on its location.

Project Description: Decommission of Station 131 and new construction of fire station at a more sustainable and less hazard prone location.

Other Alternatives: Significant structural modifications. This would likely be more costly than new construction.

Existing Planning Mechanism(s) through which Action Will Be Implemented: The City of Jackson currently has no planning or funding mechanism to replace this building. The current plan is to keep this building as is.

Responsible Office/Partners: City of Jackson Fire Department

Benefits (Losses Avoided): The replacement of this fire station would allow for the risk reduction of an inadequately built building and would allow for critical infrastructure to remain open to respond to the public need in times of emergencies. A secondary benefit would be to allow for the modernization of a new facility that could meet the demands of the modern fire service that are not possible with this existing facility.

Potential Funding (Local Budgets, Grant Funds, etc.): CalOES Grants, FEMA Mitigation Grants, PDM, BRIC, HMGP, and FMA

Timeline: Once funding becomes available. It is hoped to finish within 5 years.

Project Priority (High, Medium, Low): High

Action 9. Defensible Space Public Education

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): The City of Jackson currently lacks a Defensible Space Education Program for City residents.

Project Description: The City of Jackson would like to create a program to educate city residents about the benefits of creating and maintaining defensible spaces at their properties.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: The City of Jackson currently has no planning or funding mechanism to dedicate towards this project

Responsible Office/Partners: City of Jackson Fire Department

Benefits (Losses Avoided): Establishing a Defensible Space Public Education Program in the City of Jackson would significantly enhance community wildfire resilience by empowering residents with the knowledge and tools to reduce fire risk around their homes. As wildfire threats continue to grow in frequency and intensity across California, proactive public education is a critical, cost-effective measure to minimize the likelihood of structure loss, protect lives, and support firefighter safety during emergency response.

Potential Funding (Local Budgets, Grant Funds, etc.): CalOES grants, FEMA Mitigation Grants, PDM, BRIC, FMA, and HMGP.

Timeline: 1 Year and annually as needed

Project Priority (High, Medium, Low): Medium

Action 10. Fuel Break Projects

Hazards Addressed: Wildfire, Drought, Severe Weather: High Winds

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): The City of Jackson currency lacks an organized plan/mitigation actions for fuel breaks within city limits

Project Description: The City of Jackson would like to develop and maintain fuel breaks around the city as a vital wildfire mitigation strategy that would significantly reduce the risk of fast-moving wildfires threatening populated areas and critical infrastructure. Currently, the City lacks a formal program or funding mechanism to construct and sustain these fire-resistant buffer zones

Other Alternatives: No action. Fight fires as they occur.

Existing Planning Mechanism(s) through which Action Will Be Implemented: The City of Jackson currently has no planning or funding mechanism to dedicate towards this project

Responsible Office/Partners: City of Jackson Code Enforcement/Fire Department

Benefits (Losses Avoided): Developing and maintaining fuel breaks around the City of Jackson will enhance wildfire protection by slowing fire spread, creating defensible space for firefighting operations, and safeguarding homes, infrastructure, and evacuation routes.

Potential Funding (Local Budgets, Grant Funds, etc.): CalOES grants, FEMA Mitigation Grants, PDM, BRIC, HMGP, and FMA

Timeline: 1-2 years, with maintenance as needed

Project Priority (High, Medium, Low): High

Action 11. Home Hardening Education Program/ Go Bags, ARC

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): The City of Jackson currently lacks a Home Hardening Education Program for City Residents.

Project Description: The City of Jackson would like to create a program to educate city residents about the benefits of home hardening to reduce the risk of conflagration caused by wildfire. In addition, the City is seeking to educate its residents on the use of a prepacked "Go Bag" for use during emergencies.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented: The City of Jackson currently has no planning or funding mechanism to dedicate towards this project

Responsible Office/Partners: City of Jackson Fire Department

Benefits (Losses Avoided): Implementing a Home Hardening Education Program in the City of Jackson would be a critical step in reducing wildfire-related losses by increasing public awareness and preparedness at the individual property level. As wildfire risk continues to escalate across California, it is essential that residents understand how to make their homes more resistant to ember intrusion and heat exposure—the leading causes of structure loss during wildfires.

Potential Funding (Local Budgets, Grant Funds, etc.): CalOES Grants, FEMA Mitigation Grants, PDM, BRIC, HMGP, and FMA

Timeline: 1 Year

Project Priority (High, Medium, Low): Medium

Annex D City of Plymouth

D.1 Introduction

This Annex details the hazard mitigation planning elements specific to the City of Plymouth, a previously participating jurisdiction to the 2020 Amador County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the City. This Annex provides additional information specific to the City of Plymouth, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this jurisdiction.

D.2 Planning Process

As described above, the City of Plymouth followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Amador County Hazard Mitigation Planning Committee (HMPC), the City formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table D-1. Additional details on Plan participation and City representatives are included in Appendix A.

Table D-1 City of Plymouth – Planning Team

Name	Position/Title	How Participated
Margaret Roberts	City Manager	Emailed information and mitigation action worksheets
Cathleen Johnson	Public Works Director	Emailed information and M mitigation action worksheets Attended meetings
Boone Davidson	Public Works	Conducted hazard research and provided data
Superintendent	Superintendent	Emailed information and handled correspondence
Cameron Begbie	City Manager	Attended meetings

Coordination with other community planning efforts is paramount to the successful implementation of this LHMP Update. This section provides information on how the City integrated the previously approved 2020 LHMP into existing planning mechanisms and programs. Specifically, the City incorporated into or implemented the 2020 LHMP through other plans and programs shown in Table D-2.

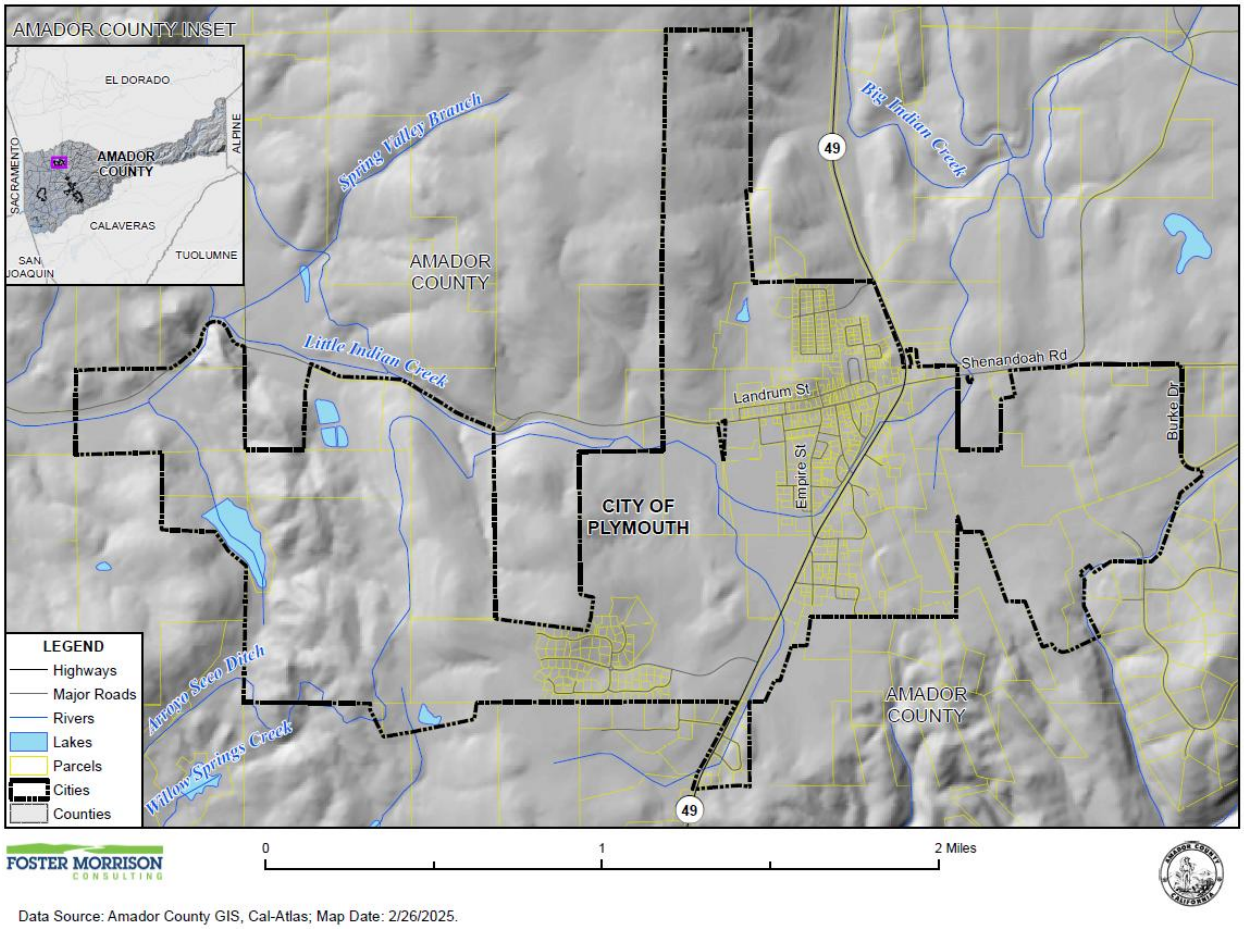
Table D-2 2020 LHMP Incorporation

Planning Mechanism 2020 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
County hazardous materials plan	By County OES in collaboration with the City's LHMP
County long-term care facility evacuation plan	By County OES in collaboration with the City's LHMP

D.3 Community Profile

The community profile for the City of Plymouth is detailed in the following sections. Figure D-1 displays a City map and the location of City of Plymouth within Amador County.

Figure D-1 City of Plymouth



D.3.1. Geography and Climate

The City of Plymouth lies on flat to gently rolling terrain located at the lower elevations of the Western Slope of California's Sierra Nevada. The benchmark elevation at the City is 1,086 feet. Changes in elevation across town vary less than one hundred feet. The City is traversed by several seasonal streams.

They join together southwest of town and become the westward flowing Little Indian Creek. The climate is similar to the climate of other valley communities in Amador County, as discussed in the Base Plan.

D.3.2. History

Plymouth dates from 1852 when mining prospectors established a camp (Pokerville), before moving a mile to the permanent Puckerville in 1855. The name Plymouth was used for the first time a year later for a quartz mill, while the settlement itself became Plymouth in 1871, named after the Plymouth Mine Company, a gold mining concern. The last of the mines closed in the late 1940s, and today, Plymouth, the "Gateway to the Shenandoah Valley", is renowned for its wine production.

D.3.3. Economy and Tax Base

US Census estimates show economic characteristics for the City of Plymouth. These are shown in Table D-3 and Table D-4. Mean household income in the City was $95,211. Median household income in the City was $81,250.

Table D-3 City of Plymouth – Civilian Employed Population 16 years and Over

Industry	Estimated Employment	Percent
Agriculture, forestry, fishing and hunting, and mining	64	10.5%
Construction	88	14.4%
Manufacturing	72	11.8%
Wholesale trade	23	3.8%
Retail trade	105	17.2%
Transportation and warehousing, and utilities	23	3.8%
Information	0	0.0%
Finance and insurance, and real estate and rental and leasing	25	4.1%
Professional, scientific, and management, and administrative and waste management services	32	5.2%
Educational services, and health care and social assistance	72	11.9%
Arts, entertainment, and recreation, and accommodation and food services	45	7.4%
Other services, except public administration	38	6.2%
Public administration	23	3.8%

Source: US Census Bureau American Community Survey 2023 Estimates

Table D-4 City of Plymouth – Income and Benefits

Income Bracket	Percent
<$10,000	12.8%
$10,000 – $14,999	4.0%
$15,000 - $24,9999	2.5%
$25,000 – $34,999	4.7%

Income Bracket	Percent
$35,000 – $49,999	3.6%
$50,000 – $74,999	10.1%
$75,000 – $99,999	23.1%
$100,000 – $149,999	15.7%
$150,000 – $199,999	13.0%
$200,000 or more	10.5%

Source: US Census Bureau American Community Survey 2023 Estimates

Plymouth's largest employers are the 49 Village RV Resort, Pokerville Market and the numerous wineries located in the unincorporated area of Plymouth. Plymouth is home to a large senior/retired population, as well as winery agriculture workers. It is also the hub of Northwestern Amador County providing necessary essential services such as gas and groceries to the area. It relies heavily on the wine tourism market.

D.4 Risk Assessment

As defined by FEMA, risk is a combination of hazard, vulnerability, and exposure. "It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage."

The City of Plymouth risk assessment identifies and profiles relevant hazards and assesses the exposure of lives, property, infrastructure, and the environment to these hazards. The process allows for a better understanding of the City's potential risk and vulnerability to hazards and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

Building on the Community Profile above, a risk assessment was performed for the City. This includes the following sections:

- D.4.1 Assets Inventory and Growth and Development Trends
- D.4.2 Hazard Identification
- D.4.3 Hazard Profiles and Vulnerability to Specific Hazards

D.4.1. Assets Inventory and Growth and Development Trends

This section provides an inventory of the City of Plymouth's total assets potentially at risk to hazards and an overview of growth and development trends. This section is broken into two parts:

- **Asset Inventory** – The assets inventory identifies the City of Plymouth's total assets, including the people and populations; structures; critical facilities and infrastructure; community lifelines; natural, historic, and cultural resources; and economic assets and community activities of value. This data is not hazard specific, but is representative of total assets within the City, potentially at risk to identified hazards as discussed in Section D.4.3 Hazard Profiles and Vulnerability to Specific Hazards.
- **Growth and Development Trends** – A discussion of growth and development trends in the City, both current and future, is presented.

Assets Inventory

The City's asset inventory is detailed in the following sections:

- People and Populations
- Structures
- Critical Facilities and Infrastructure
- Community Lifelines
- Natural, Historic, and Cultural Resources
- Economic Assets and Community Activities of Value

A discussion of each of these assets follows and serves as the template for the asset discussion for each hazard in Section D.4.3.

People and Populations

The most important asset within any community are the people and populations that reside in the community. This section includes an inventory of past and current populations of the City and also discusses vulnerable populations and underserved communities as a subsection of people and populations located within the City and potentially at risk to hazards. Information from the City, US Census Bureau, California Department of Finance, and other sources as detailed below form the basis of this discussion.

Historic Population Trends and Current Population

Population growth can increase the number of people living in hazard prone areas. The City of Plymouth has 1,122 residents, as of January 1, 2025. The City of Plymouth has seen growth rates as shown in Table D-5. As shown, the City has grown consistently since 1950, with growth slowing recently, since the 2020 LHMP.

Table D-5 City of Plymouth– Population Changes Since 1950

Year	Population	% Change
1950	382	–
1960	489	34.1%
1970	501	2.5%
1980	699	39.5%
1990	811	16%
2000	980	20.8%
2010	1,005	2.6%
2020	1,078	7.3%
2025	1,122	4.1%

Source: US Census Bureau, California Department of Finance (2025)

Underserved and Vulnerable Populations and Disadvantaged Communities

The City has a socially and economically diverse community, and many residents that are socially or economically disadvantaged or vulnerable due to varying reasons reside within the City. The City and surrounding County are no strangers to large natural disasters which have had a direct impact on the populations of the area. Thus, it is important to consider the potential effects of hazard events and disasters on these more vulnerable populations. Socially vulnerable and disadvantaged communities in the City are discussed by the following sources:

- CDC Social Vulnerability Index
- California Department of Water Resources (CA DWR) Special Populations and Disadvantaged Community Mapping
- FEMA Community Disaster Resilience Zones
- City Planning Team Input

CDC Social Vulnerability Index

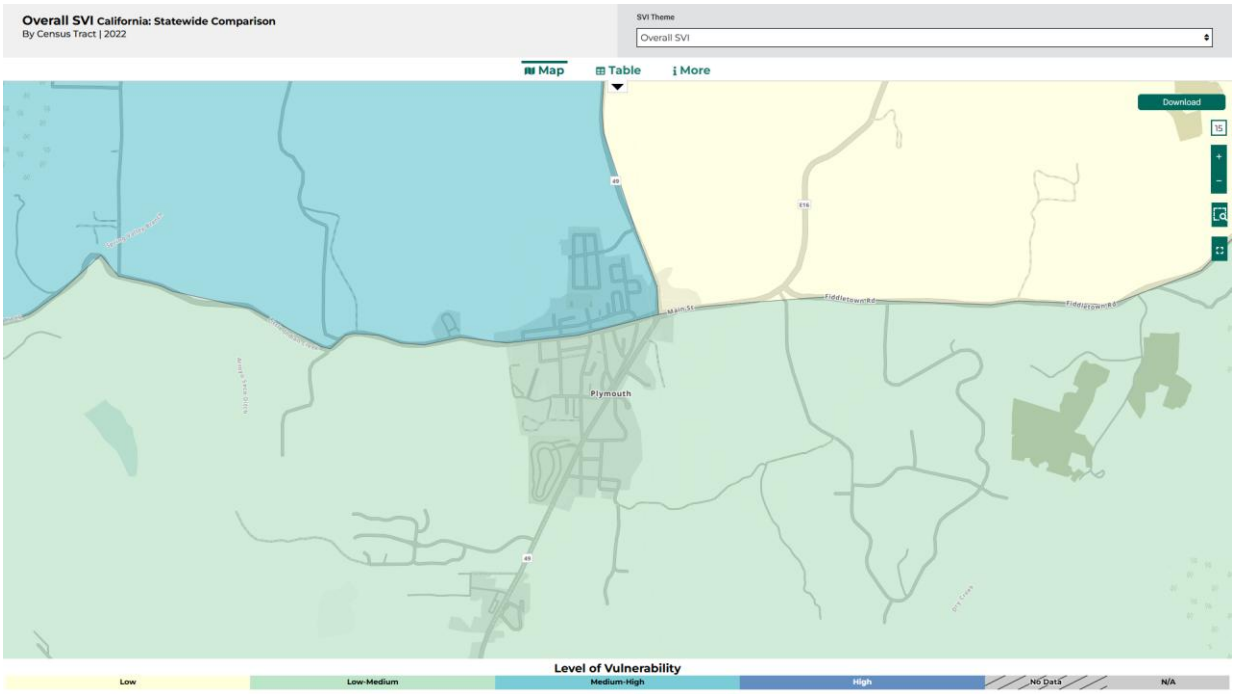
Every community must prepare for and respond to a hazard event, including the range of natural hazards addressed in this Plan, from severe weather extremes to large potentially catastrophic events such as wildfires or earthquakes. A number of factors, including poverty, lack of access to transportation, and crowded housing may weaken a community's ability to prevent human suffering and financial loss in a disaster. These factors are known as social vulnerability.

Social vulnerability refers to the potential negative effects on communities caused by external stresses on human health. Such stresses include natural or human-caused disasters, or disease outbreaks. Reducing social vulnerability can decrease both human suffering and economic loss. The Agency for Toxic Substances and Disease Registry (ATSDR) Geospatial Research, Analysis & Services Program (GRASP) created databases to help emergency response planners and public health officials identify and map communities that will most likely need support before, during, and after a hazardous event. The CDC used these databases to create the CDC Social Vulnerability Index (CDC SVI), which uses 15 U.S. census variables to help local officials identify communities that may need additional support before, during, or after disasters.

CDC SVI uses U.S. Census data to determine the social vulnerability of every census tract. Census tracts are subdivisions of counties for which the Census collects statistical data. The CDC SVI ranks each tract on 15 social factors, including poverty, lack of vehicle access, and crowded housing, and groups them into four related themes. Each tract receives a separate ranking for each of the four themes, as well as an overall ranking. Maps of the four themes for the City are shown in the figures below.

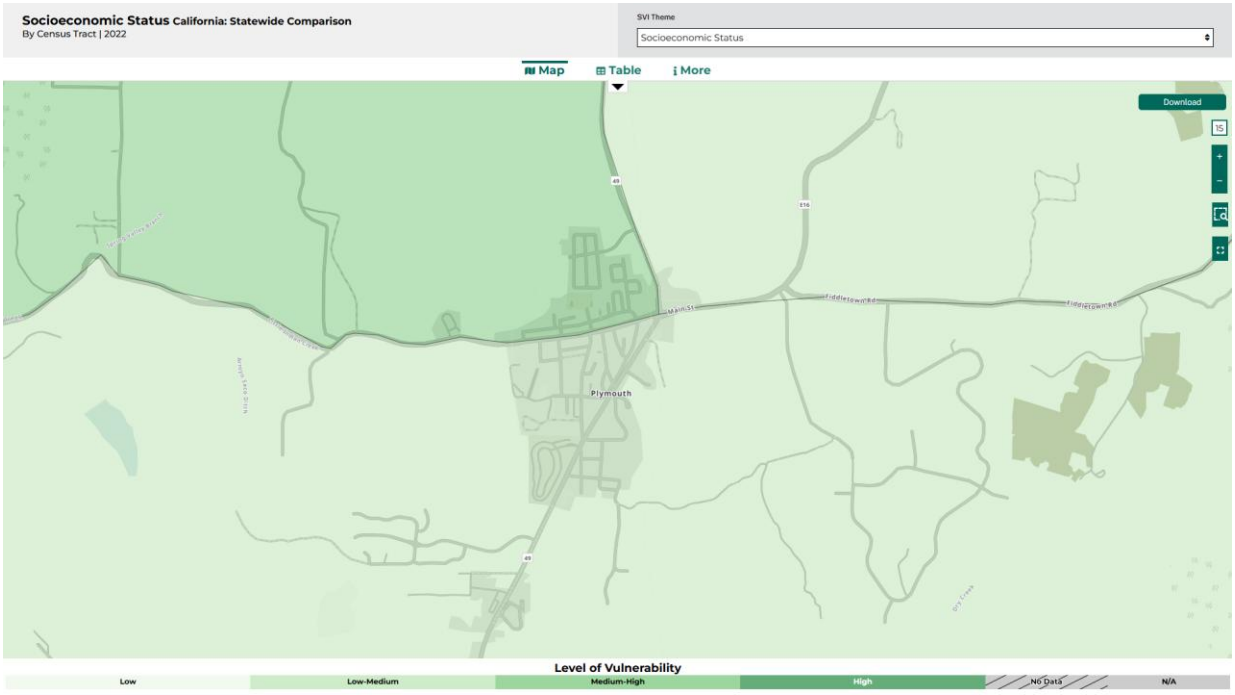
The overall SVI map is shown in Figure D-2; the socioeconomic SVI for the census tracts in and around the City are shown in Figure D-3; the household composition SVI is shown in Figure D-4; the minority and language SVI is shown in Figure D-5; and the housing and transportation SVI is shown in Figure D-6. Overall, the maps indicate that, in general, the City sees little change in social vulnerability regardless of location. As shown, there is very minimal change in the SVI across the City, with the northwestern part of the City typically seeing a slightly higher rating.

Figure D-2 City of Plymouth – Overall Social Vulnerability



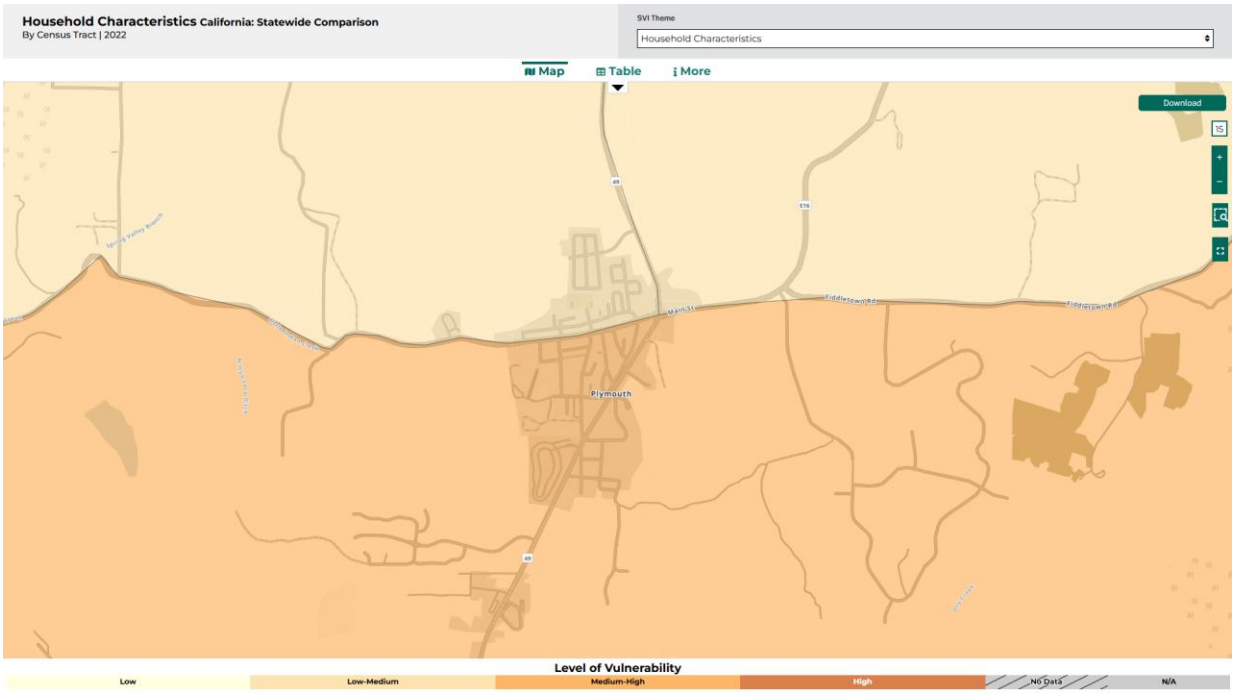
Source: CDC Social Vulnerability Index – map retrieved 12/16/2024
Level of Vulnerability Rating: **Yellow** – Low; **Green** – Low/Medium; **Aqua** – Medium/High; **Blue** – High; **Grey Hatched** – No Data; **Grey** – Not Available

Figure D-3 City of Plymouth – Socioeconomic Status Vulnerability



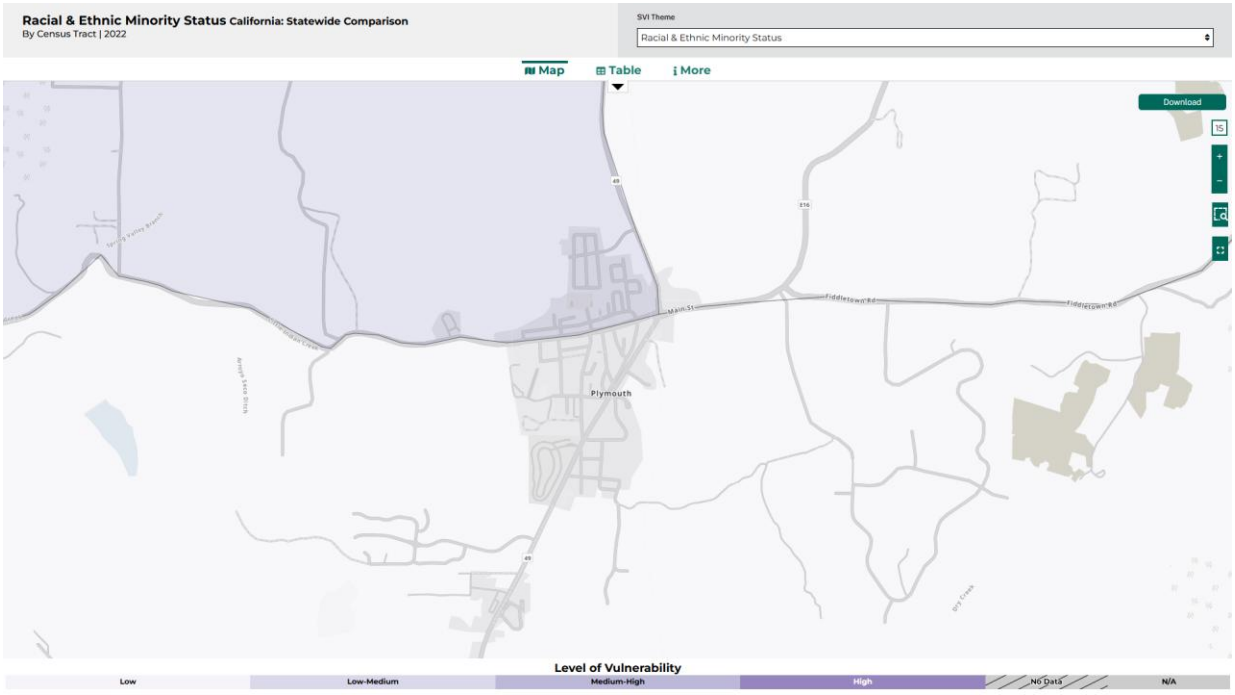
Source: CDC Social Vulnerability Index – map retrieved 12/16/2024
Level of Vulnerability Rating: **Faint Green** – Low; **Light Green** – Low/Medium; **Green** – Medium/High; **Dark Green** – High; **Grey Hatched** – No Data; **Grey** – Not Available

Figure D-4 City of Plymouth – Household Characteristics



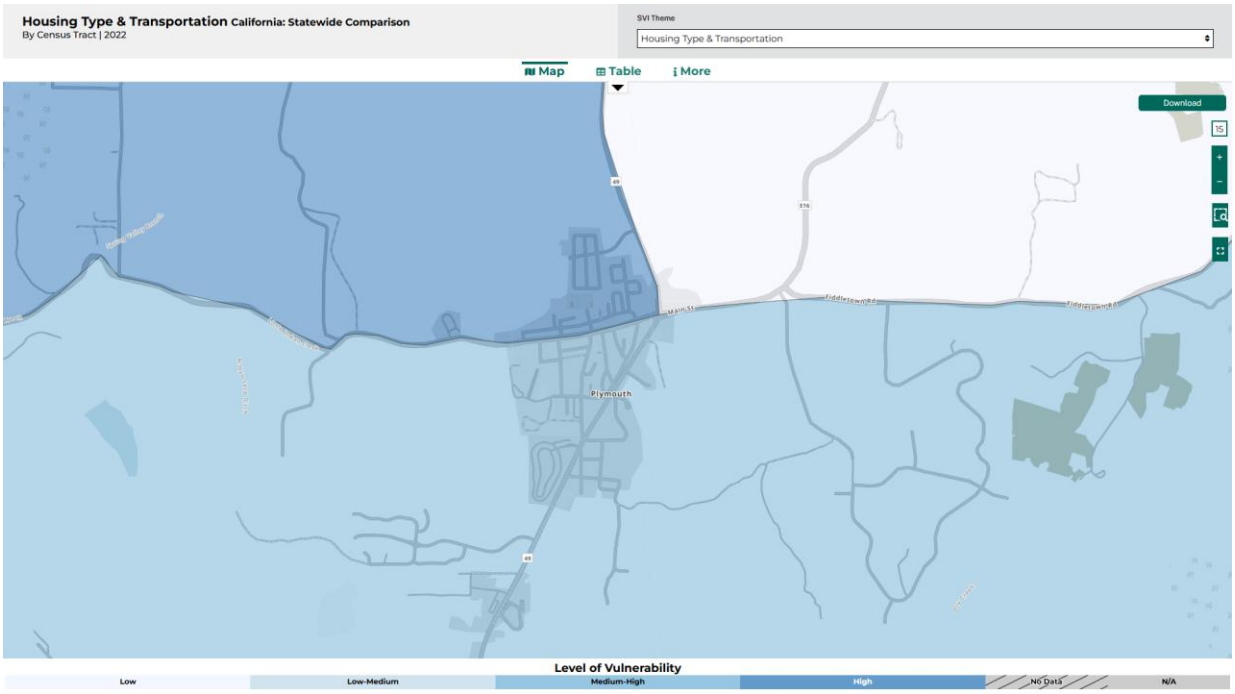
Source: CDC Social Vulnerability Index – map retrieved 12/16/2024
Level of Vulnerability Rating: **Faint Orange** – Low; **Light Orange**– Low/Medium; **Orange** – Medium/High; **Dark Orange** – High; **Grey Hatched** – No Data; **Grey** – Not Available

Figure D-5 City of Plymouth – Racial and Ethnic Minority Status



Source: CDC Social Vulnerability Index – map retrieved 12/16/2024
Level of Vulnerability Rating: **Faint Purple** – Low; **Light Purple** – Low/Medium; **Purple** – Medium/High; **Dark Purple** – High; **Grey Hatched** – No Data; **Grey** – Not Available

Figure D-6 City of Plymouth – Housing Type and Transportation

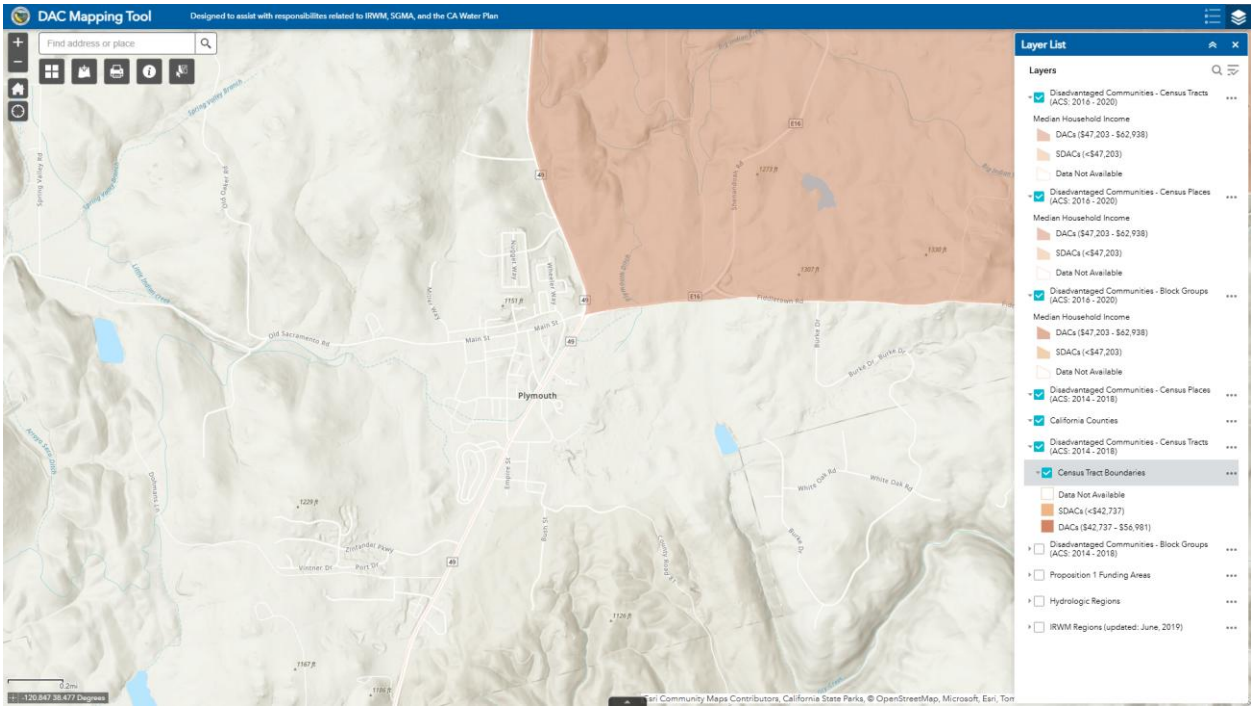


Source: CDC Social Vulnerability Index – map retrieved 12/16/2024
Level of Vulnerability Rating: **Faint Blue** – Low; **Light Blue** – Low/Medium; **Blue** – Medium/High; **Dark Blue** – High; **Grey Hatched** – No Data; **Grey** – Not Available

California DWR Disadvantaged Community Mapping Tool

The State of California's Proposition 1 Disadvantaged Community (DAC) Involvement Program is designated to ensure the involvement of DACs as well as Economically Distressed Areas and Underrepresented Communities, which DWR collectively refers to as DACs. The Cal DWR definition for a Disadvantaged Community is a community with an annual median household income (MHI) that is less than 80% of the Statewide annual MHI (PRC Section 75005(g)), and those census geographies with an annual MHI less than 60% of the Statewide annual MHI are considered "Severely Disadvantaged Communities". Those areas in the City considered disadvantaged are shown in Figure D-7. As shown, these areas fall adjacent to the northeastern part of the City.

Figure D-7 City of Plymouth – Disadvantaged Areas

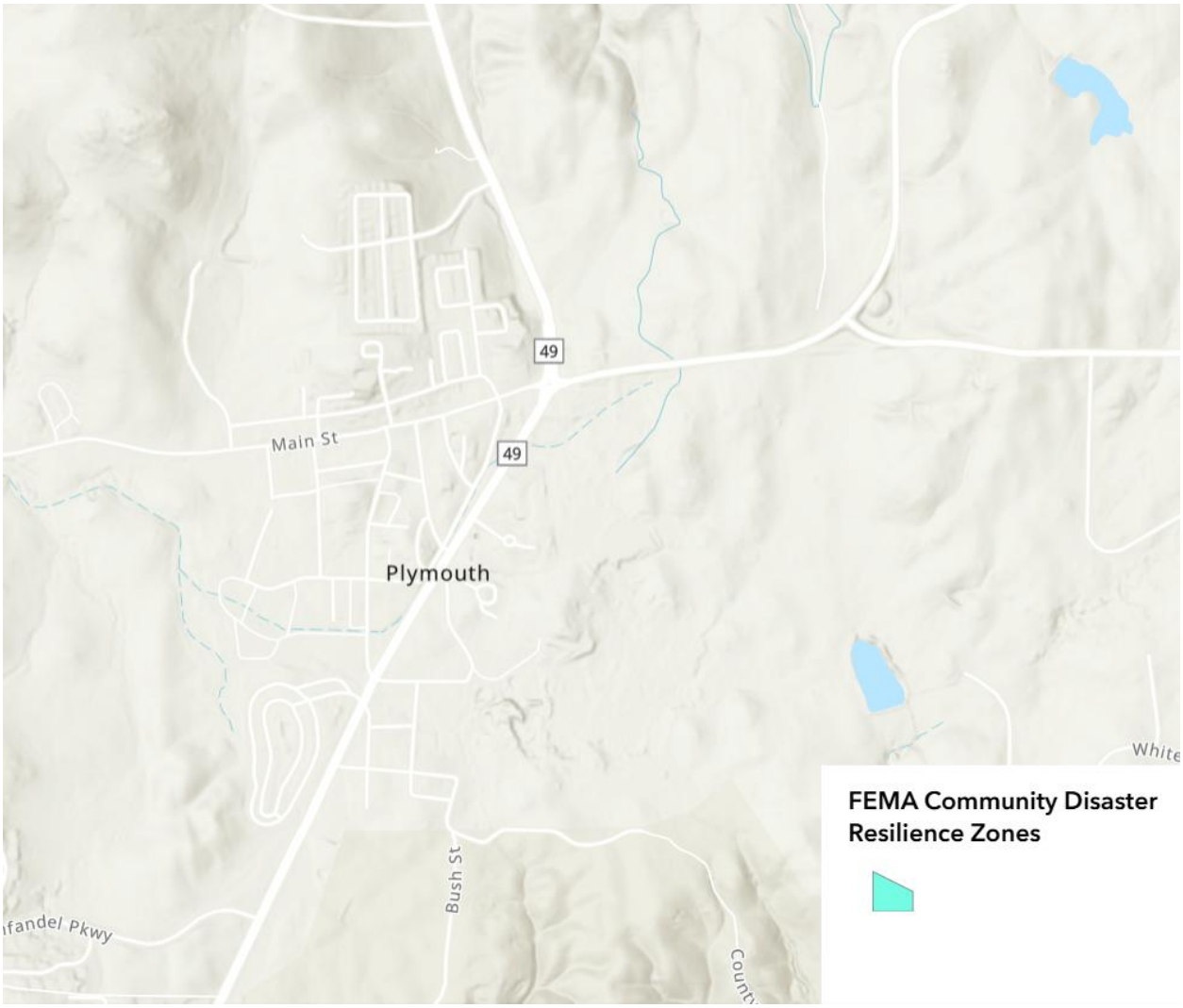


Source: Cal DWR DAC Mapping Tool – retrieved 12/16/2024

FEMA Community Disaster Resilience Zones

Community Disaster Resilience Zones aim to build and strengthen community resilience across the nation by driving federal, public, and private resources to the most at-risk and in-need communities. The Community Disaster Resilience Zones Act uses FEMA's National Risk Index to identify the most at-risk and in-need communities to identify resilience zones. Designated zones will be prioritized for targeted federal support, such as increased cost-share for resilience and mitigation projects, lessening the financial burden on communities to perform resilience-related activities. On September 6, 2023, FEMA announced the initial 483 designations in all 50 states and the District of Columbia. Figure D-8 shows these zones in teal green. As shown, there are no zones near the City limits.

Figure D-8 City of Plymouth – FEMA Community Disaster Resilience Zones



Source: FEMA. Map retrieved 12/16/2024

City Planning Team Input

There are certain populations in the City that are at greater risk to hazards, due to circumstances beyond their control. These populations in the City present a unique challenge when natural hazards arise. The City noted a few special populations that exist in the City:

- 21.3% of the population speaks Spanish. Many of these are agricultural workers. This language barrier presents unique challenges.
- 12.9% of adults are senior citizens. Some (but not all) lack mobility. This can cause issues during evacuations. This can also cause challenges during times of Public Safety Power Shutdowns (PSPS).

City of Plymouth Items from the Amador County 2021-2029 Housing Element

The City Planning Team noted that the Amador County 2021-2029 Housing Element discusses special populations in the City. While the Housing Element information can be found in the base plan, there are

unique elements to the City that are included here. Discussions for seniors, those with disabilities, developmental disabilities, people experiencing homelessness, large households, female headed households, extremely low-income households, and farmworkers were included. These are discussed below.

Seniors

The total population of seniors in Plymouth is 105 (10.7%) persons. 13.3% of this population are owners while 5.4% rent their residence.

Disabled Citizens

The total population of disabled citizens in the City is 9.5% of the population.

People with Developmental Disabilities

Due to the method of gathering data using zip codes, it is estimated that there are a total of >11 individuals with developmental disabilities residing in the City.

People Experiencing Homelessness

The Amador Tuolumne Community Action Agency was contacted for homeless data, but there is no collection of data at the individual jurisdiction level.

Large Households

Large households are defined as 5 or more persons residing in the same home, which only makes up 6.9% of the total households countywide. In the City, 12.5% of this population owned homes with 5 or more people, with 21.0% renting.

Female Headed Households

Female headed households make up 17.3% of the City's population. Of this percentage, 53.8% live below the poverty line.

Farmworkers

The City data shows that 75 persons (14.8%) of 506 employed residents work in the agriculture, (also including forestry, fishing, hunting, and mining) industry.

Extremely Low Income

The level of poverty in a jurisdiction often influences the need for housing to accommodate those persons and families in the Very Low and Low-income categories. The U.S. Census Bureau measures poverty by using a set of money income thresholds that vary by family size and composition of who is in poverty. If a family's total income is less than the family's threshold, then that family and every individual in it is considered in poverty. While the overall County experiences a poverty rate of 9.9%, the City has a

percentage of individuals and households likely to be living in poverty. In 2019, 10.6% of individuals and families living in the City were living below the poverty level.

Structures

This section inventories the parcels (and associated structures) that make up the built environment of the City. The 2024 Amador County Assessor's data and the associated parcel layer was used as the basis of this inventory. The methodology used to derive the number of total and improved parcels (i.e., those with an improved structure value) and land and improved property values (as well as content replacement values) follows the same methodology detailed in Section 4.2.1 of the Base Plan. This data should only be used as a guideline to overall values in the City, as the information has some limitations. The most significant limitations are created by Proposition 13. With respect to Proposition 13, instead of adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result, overall value information is most likely low and does not reflect current market value of properties within the City. It is also important to note, in the event of a disaster, it is often the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a loss. However, depending on the type of hazard and impact of any given hazard event, land values may be adversely affected; thus, land values are included as appropriate. Table D-6 shows the Amador County Parcel/Assessor Data land and structure values and content replacement values (e.g., the values at risk) broken down by property use for the City.

Table D-6 City of Plymouth – Total Value of Parcels and Structures by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	12	6	$5,876,107	$1,031,502	$1,031,502	$7,939,111
Commercial	60	46	$15,510,755	$20,047,039	$20,047,039	$55,604,833
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	33	0	$68,833	$0	$0	$68,833
Residential	512	433	$63,263,187	$96,367,200	$48,183,600	$207,813,987
Unknown	8	3	$424,481	$921,665	$0	$1,346,146
Plymouth Total	**625**	**488**	**$85,143,363**	**$118,367,406**	**$69,262,141**	**$272,772,910**

Source: 2024 Amador County Parcel/Assessor Data

Critical Facilities and Infrastructure

Beyond just the buildings and structures that comprise the built environment, it is important to identify the critical facilities and infrastructure that are critical for life safety and property protection. This is done for the City of Plymouth below.

For purposes of this plan, a critical facility is defined as:

> ***Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in***

severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.

A critical facility is classified by the following categories: (1) Essential Services Facilities, (2) At-Risk Populations Facilities, and (3) Hazardous Materials Facilities, as discussed in Section 4.3.1 of the Base Plan.

Note: The Hazardous Materials Facilities, while considered critical facilities for purposes of this Plan Update, are not mapped in this Plan due to the lack of an available GIS layer. In addition to the mapped critical facilities, it should further be noted that additional critical facilities, including infrastructure, utilities, and others have been identified for the City of Plymouth and the larger Amador County Planning Area but are not included in the mapping and inventory due to privacy and security concerns.

An inventory of critical facilities in the City of Plymouth from Amador County GIS is shown on Figure D-9. Table D-7 gives summary information about the critical facilities in the City. Table D-8 details the facility categories and breaks them down by facility type. Details of critical facility definition, type, name, address, and jurisdiction by hazard zone are listed in Appendix F.

Figure D-9 City of Plymouth – Critical Facilities

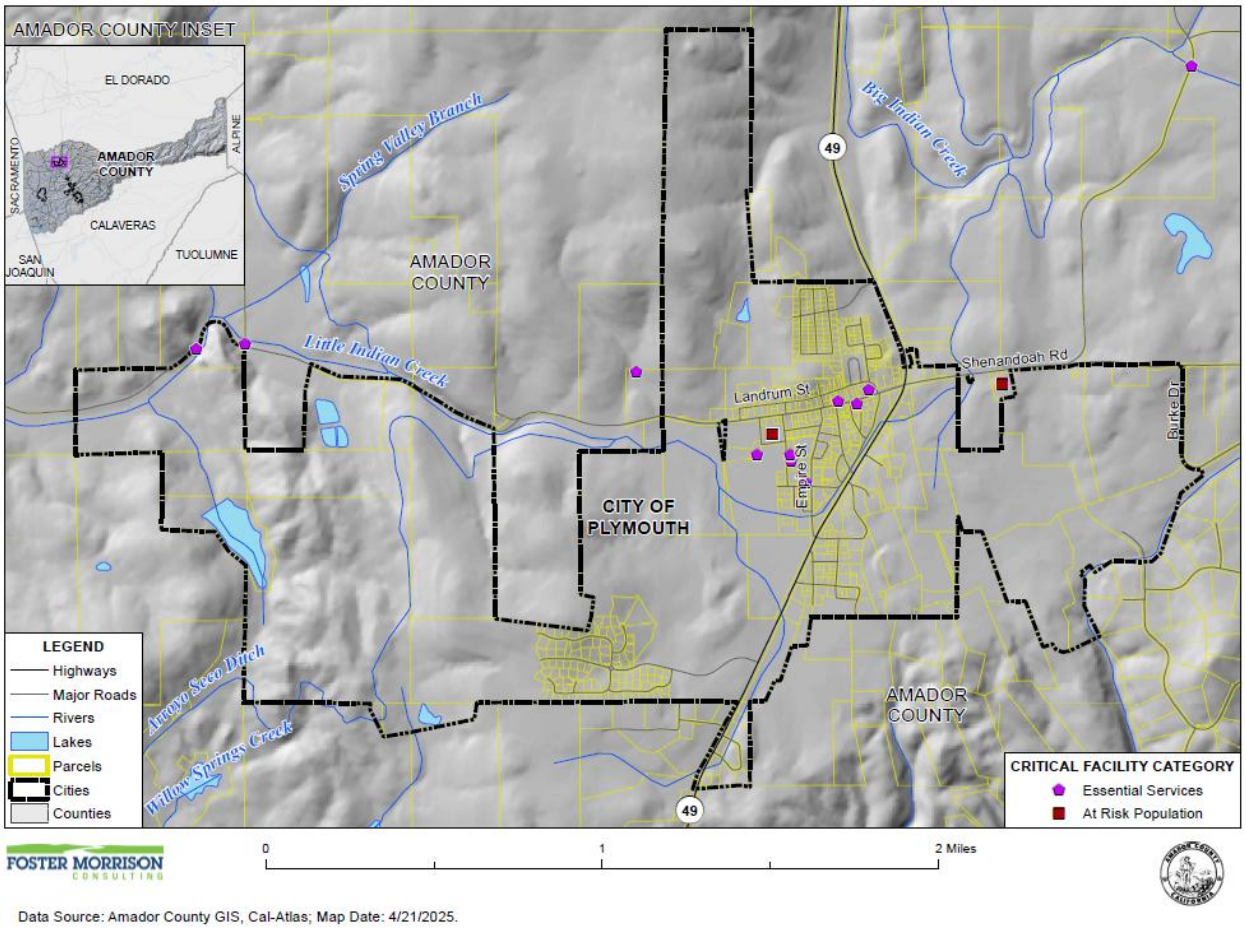


Table D-7 City of Plymouth – Critical Facilities by Category

Critical Facility Category	Facility Count
Essential Services Facilities	8
At Risk Population Facilities	1
City of Plymouth Total	**9**

Source: Amador County GIS

Table D-8 City of Plymouth – Critical Facilities by Category and Type

Critical Facility Category	Critical Facility Type	Facility Count
Essential Services	Bridge	1
	Clinic	1
	EMS Station	1
	Evacuation Shelter	1
	Fire Station	1
	Library	1
	Post Office	1
	Public Administration Building	1
	Essential Services Total	8
At Risk Population	School	1
	At Risk Population Total	**1**
Plymouth Total		**9**

Source: Amador County GIS

Community Lifelines

Assessing the vulnerability of the City of Plymouth to natural hazards and disasters also involves reviewing and inventorying the community lifelines in place that could be affected. It is important to include these items in hazard discussions as the continuous operation of critical government and business functions is essential to human health and safety, property protection, and economic security. The importance of community lifelines is discussed below:

- Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function.
- FEMA has developed a method for objectives-based response that prioritizes the rapid stabilization of Community Lifelines after a disaster.
- The integrated network of assets, services, and capabilities that provide lifeline services are used day-to-day to support the recurring needs of the community and enable all other aspects of society to function.
- When disrupted, decisive intervention (e.g., rapid re-establishment or employment of contingency response solutions) is required to stabilize the incident.

Community lifelines, as defined by FEMA, include the following:

- **Safety and Security** – Law Enforcement/Security, Fire Service, Search and Rescue, Government Service, Community Safety
- **Food, Hydration, Shelter** – Food, Water, Shelter, Agriculture
- **Health and Medical –** Medical Care, Public Health, Patient Movement, Medical Supply Chain, Fatality Management
- **Energy –** Power Grid, Fuel
- **Communications** – Infrastructure, Responder Communications, Alerts Warnings and Messages, Finance, 911 and Dispatch
- **Transportation** – Highway/Roadway/Motor Vehicle, Mass Transit, Railway, Aviation, Maritime
- **Hazardous Material –** Facilities, HAZMAT, Pollutants, Contaminants
- **Water Systems** – Potable Water Infrastructure, Wastewater Management

It should be noted that these community lifelines are all in place and functional as part of regular government operations in the Amador County Planning Area serving as a partnership between the cities, local special districts and agencies, and Amador County. Due to its more rural nature, there is an interplay in community lifelines between all jurisdictions in the County. Most all of the City's community lifelines overlap with the Planning Area's s. It should also be noted that these lifelines collectively include many of the critical facilities and infrastructure assets inventoried for this LHMP. As such, specific information on these community lifelines in the City and how they may be affected by a hazard event or disaster are discussed collectively for all jurisdictions in the Base Plan.

Natural, Historic, and Cultural Resources

Assessing the vulnerability of the City of Plymouth to natural hazards and disasters also involves inventorying the natural, historic, and cultural assets of the area. This step is important for the following reasons:

- Environmental and natural resources add to a community's identity and quality of life. They also help the local economy through agriculture, tourism, and recreation. They support ecosystem services, such as clean air and water.
- Conserving the environment may help people mitigate risk. It can also protect sensitive habitats, develop parks and trails, and build the economy.
- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- If these resources are impacted by a disaster, knowing so ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts are higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.

Natural Resources

The City contains a variety of natural resources. Natural resources are unique to each area, often provide an important function, and are difficult to replace. Should a natural disaster occur, these species, resources, and locations are at risk.

Plymouth is located in the Foothill Belt or Upper Sonoran Zone. It is a region that runs north and south along the foothills of the Sierra Nevada that is characterized by digger pine, interior live oak, blue oak, and various types of chaparral. A diverse group of wildlife species occur within the City and immediate area, due primarily to the variety of habitat types. Many of the wildlife species found are year-round residents, while others are migratory. Examples of wildlife found in the area include:

- Reptiles and amphibians. Garter snake, king snake, rattle snake, gopher snake, racers, western fence lizard, alligator lizard, western skink, slender salamander, arboreal salamander, western toad, California newt, and California tree frog.
- Birds. Scrub jay, Stellar's jay, rufous-sided towhee, sparrows, vireos, warblers, wrens, bluebird, western tanager, varied thrush, whitebreasted nuthatch, plain titmouse, acorn woodpecker, northern flicker, great horned owl, northern oriole, red-tailed hawk, American kestrel, wild turkey, and quail.
- Mammals. Mule deer, jack rabbit, bobcat, red fox, grey fox, mountain lion, black bear, deer mouse, California vole, Botta's pocket gopher, ground squirrel, western grey squirrel, striped skunk, raccoon, opossum, and porcupine.

Special status species are those plants and animals listed as rare, threatened, or endangered by the state or Federal governments, species designated as candidates for inclusion in those listings, and species categorized as California Species of Special Concern.

Recently, the Western Burrowing Owl, Sierra Nevada Red Fox and Bearlake Buckwheat shrub were all granted protection under the 2024 California Endangered Species Act (CESA). These are all present in areas surrounding the City.

Wetlands and their Natural and Beneficial Functions

Wetlands are habitats in which soils are intermittently or permanently saturated or inundated. Wetland habitats vary from rivers to seasonal ponding of alkaline flats and include swamps, bogs, marshes, vernal pools, and riparian woodlands. Wetlands are considered to be waters of the United States and are subject to the jurisdiction of the U.S. Army Corps of Engineers as well as the California Department of Fish and Wildlife (CDFW). Where the waters provide habitat for federally endangered species, the U.S. Fish and Wildlife Service may also have authority.

Wetlands are a valuable natural resource for communities providing beneficial impact to water quality, wildlife protection, recreation, and education, and play an important role in hazard mitigation. Wetlands provide drought relief in water-scarce areas where the relationship between water storage and streamflow regulation is vital and reduce flood peaks and slowly release floodwaters to downstream areas. When surface runoff is dampened, the erosive powers of the water are greatly diminished. Furthermore, the reduction in the velocity of inflowing water as it passes through a wetland helps remove sediment being transported by the water.

Wetlands are often found in floodplains and depressional areas of a watershed. Many wetlands receive and store floodwaters, thus slowing and reducing downstream flow. Wetlands perform a variety of ecosystem functions including food web support, habitat for insects and other invertebrates, fish and wildlife habitat, filtering of waterborne and dry-deposited anthropogenic pollutants, carbon storage, water flow regulation (e.g., flood abatement), groundwater recharge, and other human and economic benefits.

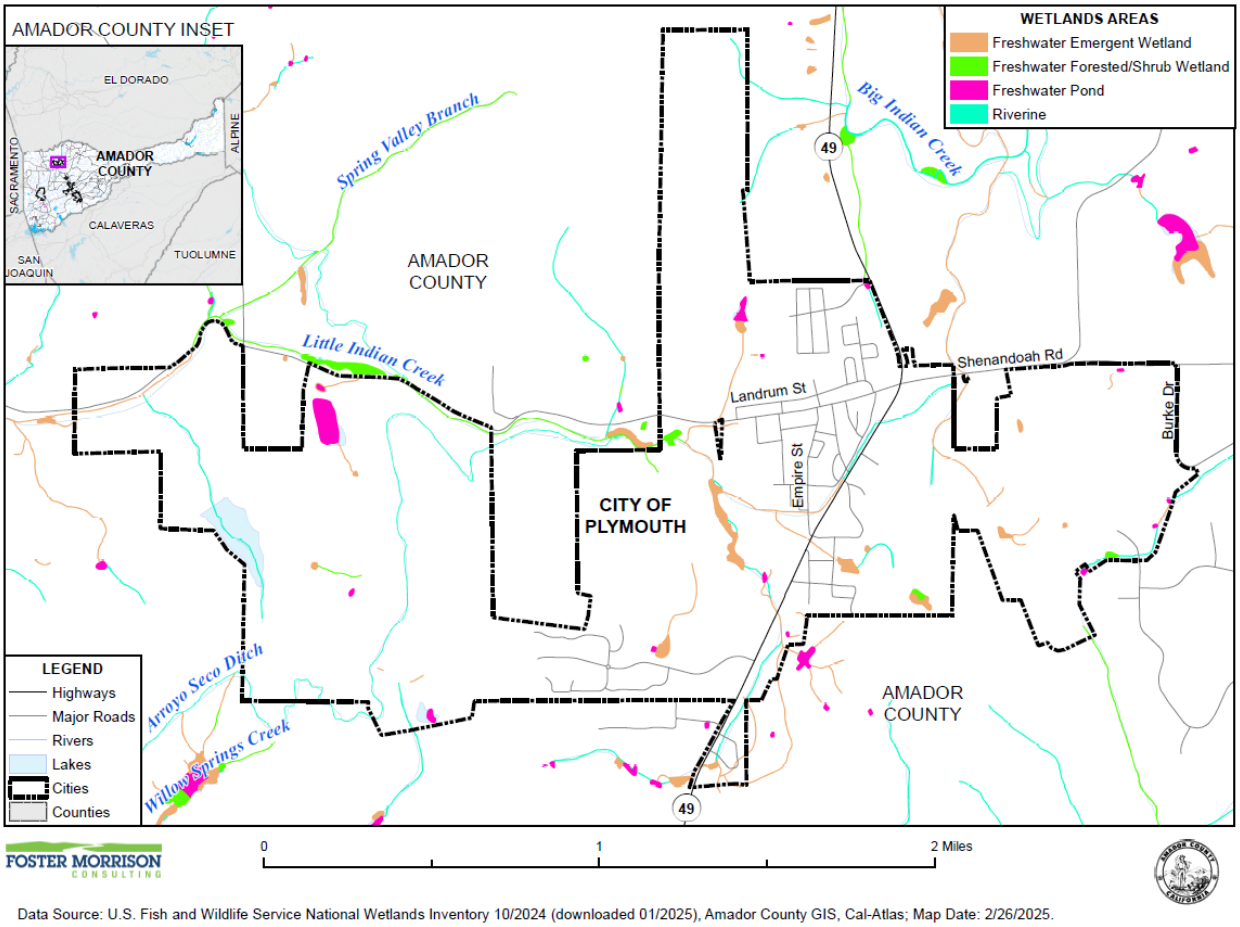
Wetlands, and other riparian and sensitive areas, provide habitat for insects and other invertebrates that are critical food sources to a variety of wildlife species, particularly birds. There are species that depend on these areas during all parts of their lifecycle for food, overwintering, and reproductive habitat. Other species use wetlands and riparian areas for one or two specific functions or parts of the lifecycle, most commonly for food resources. In addition, these areas produce substantial plant growth that serves as a food source to herbivores (wild and domesticated) and a secondary food source to carnivores.

Wetlands slow the flow of water through the vegetation and soil, and pollutants are often held in the soil. In addition, because the water is slowed, sediments tend to fall out, thus improving water quality and reducing turbidity downstream.

These natural floodplain functions associated with the natural or relatively undisturbed floodplain that moderates flooding, such as wetland areas, are critical for maintaining water quality, recharging groundwater, reducing erosion, redistributing sand and sediment, and providing fish and wildlife habitat. Preserving and protecting these areas and associated functions are a vital component of sound floodplain management practices for the City.

Wetlands in the City are shown in Figure D-10 and detailed in Table D-9.

Figure D-10 City of Plymouth – Wetlands Areas



Data Source: U.S. Fish and Wildlife Service National Wetlands Inventory 10/2024 (downloaded 01/2025), Amador County GIS, Cal-Atlas; Map Date: 2/26/2025.

Table D-9 City of Plymouth – Wetland Types and Acreages

Wetlands Area Type	Wetlands Count	Wetlands Area (in Acres)
Freshwater Emergent Wetland	35	19.89
Freshwater Forested/Shrub Wetland	6	3.23
Freshwater Pond	19	8.40
Lake		
Riverine	19	9.75
Plymouth Total	**79**	**41.27**

Source: US Fish and Wildlife Service

Historic and Cultural Resources

Historic and cultural resources are difficult to replace. Should a natural disaster occur, these properties and locations can be at risk. The City of Plymouth has a stock of historically significant homes, public buildings, and landmarks. The California Department of Parks and Recreation Office of Historic Preservation (OHP) was the primary source of information. OHP administers the National Register of Historic Places, the California Register of Historical Resources, California Historical Landmarks, and the California Points of Historical Interest programs. Each program has different eligibility criteria and procedural requirements. These requirements are detailed in Section 4.2.1 of the Base Plan. Table D-10 shows 2 historic buildings in the City in the OHP Database.

Table D-10 City of Plymouth – Historic Resources

Resource Name (Plaque Number)	National Register	State Landmark	Point of Interest	Date Listed	City/ Community
Plymouth Trading Post (470)		X		8/30/1950	Plymouth
D'Agostini Winery (762)		X		4/28/1961	Plymouth

Source: California Department of Parks and Recreation Office of Historic Preservation. Retrieved 12/3/2024.

It should be noted that these lists may not be complete, as they may not include those currently in the nomination process and not yet listed. Additionally, as defined by the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA), any property over 50 years of age is considered a historic resource and is potentially eligible for the National Register. Thus, in the event that the property is to be altered, or has been altered, as the result of a major federal action, the property must be evaluated under the guidelines set forth by CEQA and NEPA. Structural mitigation projects are considered alterations for the purpose of this regulation.

Economic Assets and Community Activities of Value

Assessing the vulnerability of the City of Plymouth to natural hazards and disasters also involves inventorying the economic assets and community activities of value in the City.

Economic Assets

After a disaster, economic resiliency is one of the major drivers of a speedy recovery. Each community has specific economic drivers. These include:

- Primary Economic Sectors
- Major employers
- Commercial Centers

In the City of Plymouth, this includes the following:

- 49er Village RV Resort, Pokerville Market and numerous wineries throughout the unincorporated area of Plymouth

Note: This inventory of economic assets is only included in this overall asset inventory for the City. To limit redundancy, it is not discussed further in the hazard profiles and vulnerability assessments in Section D.4.3 below. However, depending on the type, location, magnitude and extent of future hazard events and disasters, these City's economic assets may be vulnerable.

Community Activities of Value

Inventorying economic assets in the City and their vulnerability to natural hazards and disasters also involves inventorying activities that have value to the community. This includes activities that are important to a community, like long-standing traditions such as a festival or fair. Some areas rely on seasonal industries to sustain them throughout the year. Many of these activities also provide economic benefits to the City. A hazard event that cancels or shortens these can affect a community's livelihood and can make disaster recovery more difficult or prolonged. This includes activities such as:

- Festivals and Fairs
- Sporting Events
- Tourism
- Local Pools
- Local Splash Pools

The City noted the following community activities of value:

- The Amador County Fair
- The Berry Festival (Fairgrounds)
- Annual Farmer's Market (only in the month of August)
- Sounds of September (live music and food trucks in Mcgee Park)
- 4th of July parade and fireworks event on Main Street

Note: This inventory of community activities of value only occurs in this overall asset inventory for the City. To limit redundancy, it is not discussed further in the hazard profiles and vulnerability assessments in Section D.4.3 below. However, depending on the type, location, magnitude and extent of future hazard events and disasters, the City's community activities of value may be vulnerable.

Growth and Development Trends

As part of the planning process, the City looked at changes in growth and development, both current and future, and examined these changes in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability over time.

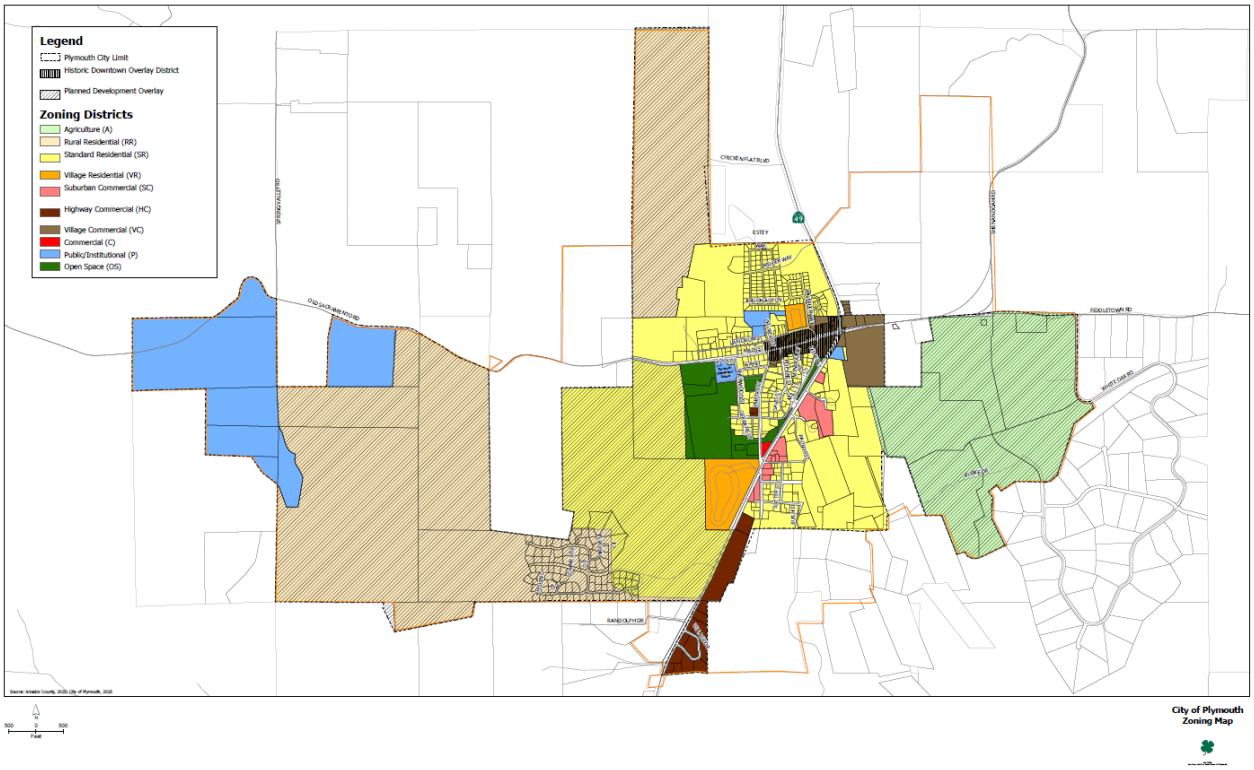
Land Use

State planning law requires that a land use element of a general plan includes a statement of the standard population density, building intensity, and allowed uses for the various land use designations in the plan (Government Code Section 65302(a)). The City's land use designations are generally described below and mapped on the Land Use Diagram (Figure D-11). The City of Plymouth Municipal Code provides detailed land use and development standards for development.

The Municipal Code works hand in hand with the City's General Plan Land Use Element (last completed in 2009). The purpose of the Land Use Element is to provide goals, policies, actions diagrams and standards to guide future land use decisions in the City of Plymouth. While all elements of the General Plan have equal weight under California law, in some respects this Element is the most far-reaching. It informs all other elements of the General Plan, shaping the future transportation network and the location of future housing sites, and influencing public facility requirements and park and recreation needs. It defines the City's future open space system and responds to natural resource conservation issues and safety hazards. It establishes the basic pattern of development in the City for the next 20-25 years, including land uses and densities, and presents the policies and actions to ensure that future development will enhance the quality of life for all City of Plymouth residents.

The City Zoning Map (based on the 2009 Land Use Element but updated in 2025) is shown on Figure D-11.

Figure D-11 City of Plymouth – Land Use Diagram



Source: City of Plymouth Planning Department. Retrieved 7/23/2025.

Population Trends and Projections

There are no future City population projections. Amador County as a whole is expected to slowly continue to increase in population. As such, it is assumed that the City may see slow population growth as well.

Development since 2020 Plan

Development has occurred in the City since the last plan. Some of this has occurred in hazard prone areas. The City Planning Department tracked total building permits issued since 2020 for the City. These are tracked by total development, property use type, and hazard risk area. These are shown in Table D-11 and Table D-12.

Table D-11 City of Plymouth – Total Development Since 2020

Property Use	2020	2021	2022	2023	2024
Residential	76	52	96	49	59
Commercial	4	12	14	9	9
Industrial	0	1	0	0	1
Other	1	0	1	3	2
Total	**81**	**65**	**111**	**61**	**71**

Source: City of Plymouth Planning Department

Table D-12 City of Plymouth – Development in Hazard Areas since 2020

Property Use	1% Annual Chance Flood	Levee Protected Area	Wildfire Risk Area[1]	Other
Total	**1**	**0**	**1**	**0**

Source: City of Plymouth Planning Department
[1]Moderate or higher wildfire risk area

Development has occurred in the identified hazard areas, including the 1% annual chance floodplains and high wildfire risk areas. It was completed in accordance with all current and applicable development codes, including floodplain ordinances, wildfire codes, and other applicable standards and should be adequately protected. Thus, with the exception of more people living in the area potentially exposed to natural hazards, this growth should not cause a significant change in vulnerability of the City to identified priority hazards.

Future Development Areas

It is important to review future development plans for the City. Future development should be sited in areas that are away from known hazard risks. If this is not possible, mitigation should be done to ensure that future development is protected against future hazards.

GIS Analysis

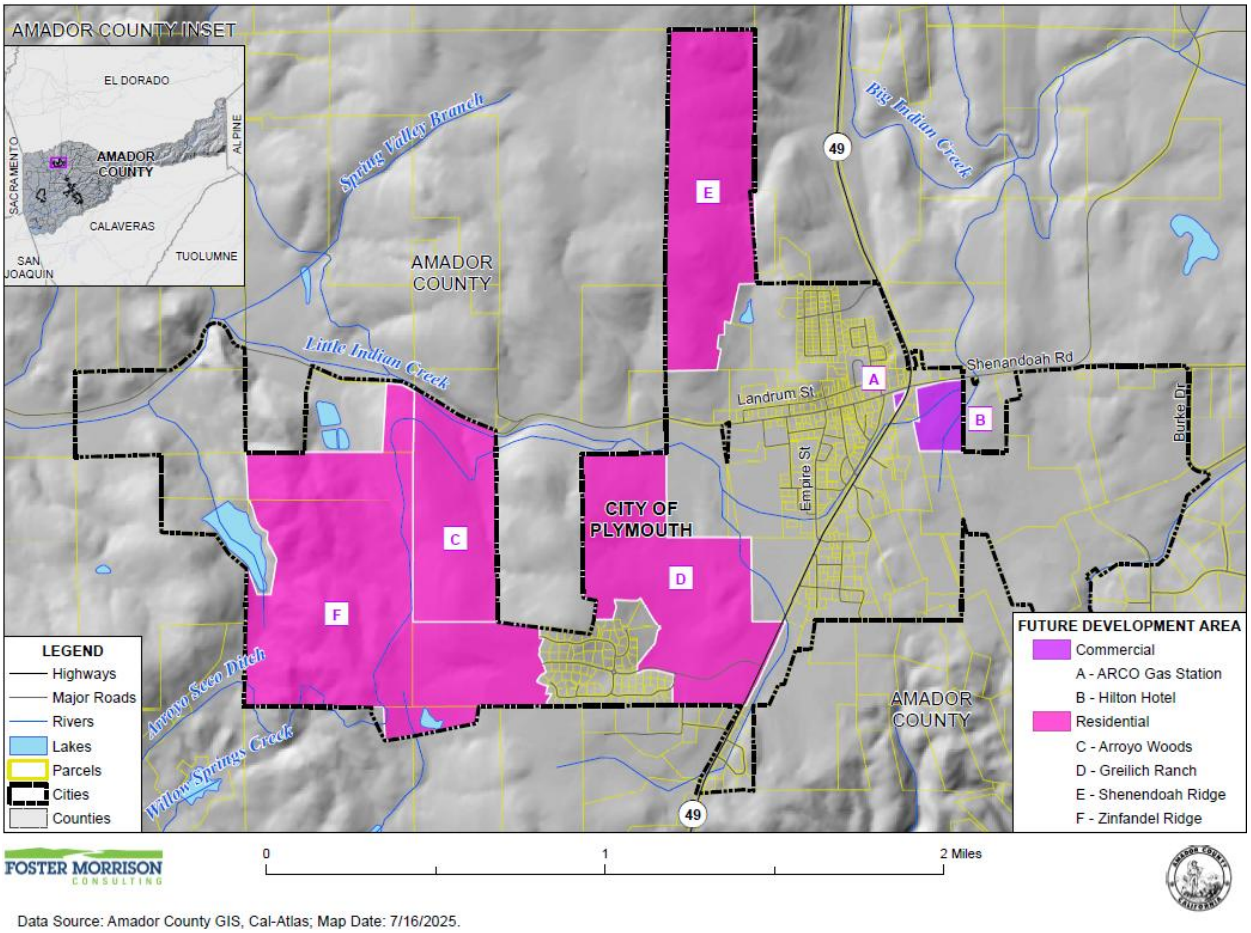
The City of Plymouth provided six areas in the City expected to see future development. These areas are described in Table D-13, then shown in Figure D-12 and detailed by parcels and acres in Table D-14.

Table D-13 City of Plymouth – Future Development Area Descriptions

Site / Map ID	Site/Location Name	Future Development Type	Units	Future Development Status	Comments / Description	Comments
A	ARCO Gas Station	Commercial	1	In Progress	New gas station with car wash and small market.	Planning Commission review noticed for June 19th with City Council to follow. Applicant plans on submitting immediately after Council hearing.
B	Hilton Hotel	Commercial	1	Under Review	88 Hotel rooms currently in planning review.	4.21 acres of an 17.47 acre site. Hotel parcel will be split from larger site.
C	Arroyo Woods	Residential	1	Proposed	Single family residential development	

Site / Map ID	Site/Location Name	Future Development Type	Units	Future Development Status	Comments / Description	Comments
D	Greilich Ranch	Residential	234	Under Review	234 Single family dwellings plus ADUs. CEQA work is underway.	008-060-044 (6/24/25 verified APN is not 008-060-039)
E	Shenendoah Ridge	Residential	137	TMAP Approved	Tentative Map has been approved, Final Map has not been recorded.	
F	Zinfandel Ridge	Residential	65	Approved	Phases 1-3 are built. Phase 4 is last remaining phase with 65 units	See map attached for location on Phase 4

Figure D-12 City of Plymouth – Future Development Areas



Data Source: Amador County GIS, Cal-Atlas; Map Date: 7/16/2025.

Table D-14 City of Plymouth – Parcels and Acres in Future Development Areas

Property Use /Site/Map ID - Future Development"	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
Commercial						
A - ARCO Gas Station	1	1	0	1.91	1.91	0
B - Hilton Hotel	1	0	1	4.21	0	4.21
Commercial Total	**2**	**1**	**1**	**6.12**	**1.91**	**4.21**
Residential						
C - Arroyo Woods	1	0	1	0	0	0
D - Greilich Ranch	1	1	0	161	161	0
E - Shenendoah Ridge	1	0	1	147	0	147
F - Zinfandel Ridge	5	0	5	365	0	365
Residential Total	**8**	**1**	**7**	**673**	**161**	**512**
Grand Total	**10**	**2**	**8**	**679.12**	**162.91**	**516.21**

Source: City of Plymouth

D.4.2. Hazard Identification

The City of Plymouth identified the hazards that affect the City and summarized their location, extent, likelihood of future occurrence, potential magnitude, and significance specific to the City (see Table D-15). Those hazards identified as a high or medium significance in Table D-15 are considered City of Plymouth priority hazards for mitigation planning. Those hazards that occur infrequently or have little or no impact in the City were determined to be of low significance and not considered a priority hazard. Significance was determined based on the hazard profile, focusing on key criteria such as frequency, extent, and resulting damage, including deaths/injuries and property, natural and cultural resources, and economic damage. The ability of a jurisdiction to reduce losses through implementation of existing and new mitigation measures was also considered as to the significance of a hazard. This assessment was used to prioritize those hazards of greatest significance, enabling the City to focus resources where they are most needed.

Table D-15 City of Plymouth—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Agricultural Hazards (severe weather/pests/invasive species)	Limited	Unlikely	Negligible	Low	Medium
Avalanche	Limited	Unlikely	Negligible	Low	Medium
Climate Change	Extensive	Likely	Limited	Medium	--
Dam Failure	Limited	Occasional	Limited	Low	Medium
Drought & Water shortage (w/ tree mortality)	Extensive	Likely	Limited	High	High
Earthquake (w/subhazards)	Limited	Unlikely	Negligible	Low	Low
Floods: 1%/0.2% annual chance (w/ levee failure)	Limited	Occasional	Limited	Medium	Medium
Floods: Localized Stormwater	Limited	Occasional	Limited	Medium	Medium
Landslide, Mudslide, Debris Flow	Limited	Occasional	Limited	Low	Medium
Severe Weather: Extreme Cold, Freeze, and Snow	Limited	Occasional	Negligible	Low	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Limited	Medium	High
Severe Weather: Heavy Rains and Storms (Hail, Lightning)	Extensive	Likely	Limited	Medium	Medium
Severe Weather: High Winds and Tornadoes	Limited	Unlikely	Negligible	Low	Medium
Wildfire (w/smoke and air quality)	Extensive	Likely	Catastrophic	High	Medium

Geographic Extent

Limited: Less than 10% of planning area

Significant: 10-50% of planning area

Extensive: 50-100% of planning area

Likelihood of Future Occurrences

Highly Likely: Near 100% chance of occurrence in next year, or happens every year.

Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.

Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.

Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Magnitude/Severity

Catastrophic: More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths

Critical: 25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability

Limited: 10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability

Negligible: Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance

Low: Minimal potential impact

Medium: Moderate potential impact

High: Widespread potential impact

Climate Change Influence

Low: Minimal potential impact

Medium: Moderate potential impact

High: Widespread potential impact

D.4.3. Hazard Profiles and Vulnerability to Specific Hazards

This section includes the hazard profiles and vulnerability assessment for hazards ranked of medium or high significance specific to the City of Plymouth (as identified in the Significance column of Table D-15) and also includes a hazard profile and vulnerability assessment to the four primary hazards to the State of California: dam failure, earthquake, flood, and wildfire, regardless of the significance ranking by the City. Chapter 4 of the Base Plan provides more detailed information about these hazards and their impacts on the Amador County Planning Area. Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.2 of the Base Plan.

Hazard Profiles and Vulnerability Assessment

Each hazard is profiled in the following format:

- **Hazard Profile** – A hazard profile is included for each hazard. This includes information on:
  - ✓ **Hazard Overview** – A general discussion of the hazard and related issues is detailed here.
  - ✓ **Location** and **Extent** – Location is the geographic area within the City that is affected by the hazard. Extent is the expected range of intensity for each hazard. These are discussed in specific detail for mapped hazards, and in more general detail for those hazards that do not have discrete mapped hazard areas.
  - ✓ **Past Occurrences** – Past occurrences are discussed for each hazard. A discussion of disaster declarations is included in each hazard section. NCDC events are also discussed. Other past occurrences data specific to the City follow the disaster declarations and NCDC events for each hazard.
  - ✓ **Climate Change** – This section contains the effects of climate change (as applicable). The possible influence of climate change on the hazard is discussed.

After the hazard profile, a vulnerability assessment is presented. As part of the vulnerability assessment, an estimate of the vulnerability of the City to each identified hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

After this classification, a general discussion of hazard vulnerabilities occurs. This is done in the following format:

- **Local Concerns** – This includes City provided information on how the City is uniquely affected by or vulnerable to each hazard.
- **Assets at Risk** – A discussion of the assets at risk follows, presented in the same order as in Section D.4.1 above, with a few exceptions. This includes sections on: People and Populations; Structures; Critical Facilities and Infrastructure, and Natural, Historic, and Cultural Resources. These are discussed in specific terms for mapped hazards, and in more general terms for those hazards that are unmapped. Sections on Community Lifelines and Economic Assets and Community Activities of Value are not included in the Sections below, as they are fully covered in Section D.4.1 above and in Chapter 4 of the Base Plan.
- **Impacts** – A discussion on hazard impacts follows. Impacts describe how each hazard can affect the City and its assets. The type and severity of impacts reflect both the potential magnitude of the hazard and the vulnerability of the asset.
- **Future Conditions/Future Development** – A discussion of how future conditions and future development may affect the hazard is also included. This is addressed specifically for mapped hazards, and in more general terms for those hazards that are unmapped.

Power Interruption/Power Failure: A Common Vulnerability of all Hazards

An impact of almost all hazards evaluated as part of this LHMP Update relates to power shortage and/or power failures. The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the U.S. Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power disruptions can be found in Section 4.3 of the Base Plan.

Public Safety Power Shutoff (PSPS)

An intentional disruption type of power shortage/failure event has been recently implemented in California as a result of wildfires starting as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are preparing all Californians for the threat of wildfires and power outages during times of extreme (fire) weather. To help protect customers and communities during extreme fire weather events, electric power may be shut off for public safety in an effort to proactively prevent wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3 of the Base Plan.

In addition to PSPSs, to help prevent wildfires, electric utilities have begun to evolve safety efforts. This includes installing safety settings on powerlines in and around high fire-risk areas. These are known as

Enhanced Powerline Safety Settings (EPSS), and they help prevent falling tree branches, animals and other hazards from starting a wildfire. By stopping ignitions, it helps prevent wildfires from starting and spreading. According to PG&E, if ignitions occur, the size of fires are much smaller due to EPSS. In 2022, there was a 99% decrease in acres impacted by ignitions (as measured by fire size from electric distribution equipment (compared to the 2018-2020 average). This decrease occurred despite dry conditions.

Local Concerns

The City noted that there have been no PSPS events that have affected them.

Climate Change

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

Climate change adaptation is a key priority of the State of California. The 2023 State of California Multi-Hazard Mitigation Plan noted that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the State's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

California's Adaptation Planning Guide: Understanding Regional Characteristics (from 2017) has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. The City falls in the North Sierra Region. A map and climate projections for this region are shown in Section 4.3.7 of the Base Plan and include an increase in temperatures, moderate changes in rainfall, and increased risk to wildfire.

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the City of Plymouth, the Amador County Planning Area, surrounding counties, and State of California. There is no scale to measure the extent of climate change. Climate change exacerbates other hazards, such as drought, extreme heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known but is feared to be tens to hundreds of years.

Past Occurrences

Disaster Declaration History

Climate change has never been directly linked to any declared disasters.

NCDC Events

NCDC does not track climate change events.

City of Plymouth Events

Climate change has never been directly linked to any declared disasters. While the City noted that climate change is of concern, no specific impacts of climate change could be recalled. The City and HMPC members noted that the strength of storms does seem to be increasing and the temperatures seem to be getting hotter.

Vulnerability to Climate Change

The whole of the City is at some measure of vulnerability to climate change. The City Planning Team has concerns that the vulnerability of the City to climate change will continue to increase in the future. An assessment of a community's vulnerability to climate change begins with an understanding of local exposure to climate change. This is included in the Local Concerns section below followed by a discussion of the City's assets at risk, and impacts to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The City is concerned that climate change could drive additional wildfires in the City and surrounding County.

Assets at Risk

Assets at risk from climate change include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

Climate change affects people and populations within a community, especially those climate change issues related to increases in temperature over time. While all populations can be affected by temperature extremes, populations particularly vulnerable include the very old and very young, medically fragile people, people without means of shelter (and air conditioning or heat) or transportation, people who are socially isolated and other vulnerable or underserved populations (as shown in the discussion in Section D.4.1). Acclimatization to extreme temperatures and other weather extremes may help reduce impacts from these extreme events, such as from heat waves, in the healthy general population but may not be sufficient to protect those with underlying medical conditions.

Structures

Climate change, on its own, does not generally impact structures. However, structures in areas of increased wildfire, flood, or other areas exacerbated by the effects of climate change would be at increased risk, as described throughout this LHMP. More information on how structures may be affected by climate change can be found in Section 4.3.7 of the Base Plan.

Critical Facilities and Infrastructure

As with structures, critical facilities and infrastructure in areas of increased wildfire, flood, or other areas due to the effects of climate change would be at increased risk. Climate change is expected to increase the vulnerability of critical facilities and infrastructure to many natural hazards.

Natural, Historic, and Cultural Resources

The rivers, streams, agricultural areas, and open space areas of the City supports rich biodiversity, including many special-status species and habitat areas. These are all at risk from the effects of climate change. In addition, if heat continues to contribute to changes in wildfire patterns, all areas (on land) of the City are at increased risk from fire – including natural, historic, and cultural resources. Furthermore, as climate change exacerbates the drought hazard, areas of wetlands in the City may be reduced or dry up temporarily, which could damage habitat areas for waterfowl and other species that depend on these areas.

Impacts from Climate Change

The California APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra Region in which the City is part of:

- Increased temperatures
- Reduced precipitation
- Public health – heat and air pollution
- Reduced agricultural productivity (e.g., wine grapes)
- Reduced tourism

In addition to these sources, the 2023 State of California Hazard Mitigation Plan noted that according to California's Fourth Climate Change Assessment, the state will experience the following climate impacts:

- Annual average daily high temperatures are expected to rise by 2.7° F by 2040, 5.8°F by 2070, and 8.8°F by 2100 compared to observed and modeled historical conditions. These changes are statewide averages.
- Heat waves are projected to become longer, more intense, and more frequent.
- Warming temperatures are expected to increase soil moisture loss and lead to drier conditions. Summer dryness may become prolonged, with soil drying beginning earlier in the spring and lasting longer into the fall and winter.
- Droughts are likely to become more frequent and persistent through 2100.
- The strength of the most intense precipitation and storm events affecting California is expected to increase.

- Snowpack levels are projected to decline significantly by 2100 due to reduced snowfall and faster snowmelt.
- Marine layer clouds are projected to decrease.
- Extreme wildfires (i.e., fires larger than 24,710 acres) would occur 50 percent more frequently. The maximum area burned statewide may increase 178 percent by the end of the century.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City include the following:

- As climate change continues to accelerate over time, climate related impacts to the City will continue to increase.
- Climate change can influence population growth in the City over time. While the City is expected to see slow and steady growth, the City could see population fluctuations as a result of climate impacts relative to those experienced in other regions, and these fluctuations are expected to impact demand for housing and other development. While there are currently no formal studies of specific migration patterns expected to impact the City and larger Amador County region, climate-induced migration was recognized within the UNFCCC Conference of Parties Paris Agreement of 2015 and is expected to be the focus of future studies. As such, climate change may influence future population growth in the City which may leave more people vulnerable in the effects of climate change. In addition, given the future development plans for the City that includes a new Hilton Hotel and 437 single and multifamily units, new development could add an additional 1223 residents and additional hotel occupants to the City. This would likely increase the vulnerability of the City to this hazard.
- Land use planning should be proactive to address future hazard conditions. The increasing severity and frequency of storms and other weather events and natural hazards due to the changing climate should be taken into account while considering land use planning for the City. Future development occurring in the City consists of 2 commercial developments, with one being a new hotel and 4 residential developments comprised of 437 new units of both single and multifamily uses. Collectively this new construction adds an additional 679 acres of developed land within the City and an additional 1223 residents and additional hotel occupants to the City. Ensuring that regulatory requirements, such as building codes, are updated and followed will help reduce future impacts to this hazard. However, given the number of new units and land associated with these developments, it is likely that this new development will increase the impacts and vulnerability of the City to this hazard.

Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements, such as building codes, are followed, and varying needs for different demographic groups with intersecting identities that reside within the County are considered can help to make for a more disaster resilient community.

Dam Failure

Note: though a low significance hazard in the City, due to its importance in the County and in the State of California, this hazard is profiled here. It is not considered a priority for mitigation planning purposes.

Likelihood of Future Occurrence–Occasional
Vulnerability–Low

Hazard Profile

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any given year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped or fail. Overtopping is the primary cause of earthen dam failure in the United States.

Dam failure is a natural disaster from two perspectives. First, the inundation from released waters resulting from dam failure is related to naturally occurring floodwaters. Second, a total dam failure would most probably happen as a consequence of the natural disaster triggering the event, such as an earthquake.

Location and Extent

An inventory map of dams located within Amador County was shown in Section 4.3.9 in the Base Plan. Dams with an inundation area within the City of Plymouth are not shown as there are no inundation areas that intersect with the City.

There is no scale with which to measure dam failure. However, FEMA and CA DWR Division of Safety of Dams (DSOD) assign hazard potential classifications to dams within the State that provides information on the potential impact should a dam fail. The following two factors are considered when assigning hazard ratings: existing land use and land use controls (zoning) downstream of the dam. FEMA categorizes the downstream hazard potential into three categories in increasing severity: Low, Significant, and High. DSOD adds a fourth category of Extremely High. Dams are classified in these four categories that identify the potential hazard to life and property. These were discussed in more detail in Section 4.3.9 of the Base Plan.

While a dam may fill slowly with runoff from winter storms, a dam break has a very quick speed of onset. The duration of dam failure is generally not long – only as long as it takes to empty the reservoir of water the dam held back. For dam overtopping, the speed of onset is somewhat slower than that of a dam break, and the duration is longer (as evidenced in the 2017 Oroville Dam spillway event). The City would be affected for as long as the flood waters from the dam failure took to drain downstream.

Geographic flood extent from the DSOD dam inundation areas is not shown as they do not intersect with the City.

Drought & Water Shortage

Likelihood of Future Occurrence–Likely
Vulnerability–High

Hazard Profile

Drought and water shortage are complex issues involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area's usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water supply is the most significant issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. Drought has also affected tree mortality in the area in the past. As the population in the area continues to grow, so will the demand for water.

Tree Mortality and Drought

One of the specific impacts of drought in the City of Plymouth and the Amador County Planning Area is the increased risk to trees from beetle kill and other insects, pathogens and parasites, and other tree mortality and die back issues. Drought weakens trees and makes them more susceptible to insect infestation and other pathogens. Insects, such as bark beetles and others, frequently attack trees weakened by drought, disease, injuries, or other factors that may stress the tree. These insects and other pathogens can contribute to the decline and eventual death of trees throughout the City. The tree mortality and dieback problems are a high priority because of the issue of hazardous trees and an increased wildfire hazard. In addition to an increase in wildfire fuels, hazardous trees can fall onto structures causing damage and a result in a reduction on the tree canopy within the City that provides relief during extreme heat days.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the City and County is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme Drought
- D4 – Exceptional Drought

The Amador County Planning Area, including the City of Plymouth, has been in and out of drought since 2014. Over the last five years since the 2020 LHMP, drought conditions have ranged from none to exceptional. Drought conditions are expected to continue to be cyclical in nature depending on the year." Current drought conditions in the City are shown in Section 4.3.10 of the Base Plan.

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time (which does not usually affect water shortages) or for longer periods (which may challenge water supplies). Should a drought last for a long period of time, water shortage becomes a larger issue.

According to the Amador Water Agency (AWA) 2024-2025 Annual Water Supply & Demand Assessment Shortage Report, the Agency has a significant surplus of water supply above current and projected demands. The Amador Water System (AWS) water supply is a pre-1914 water right that has never been curtailed in the most severe single-year or a multiple-year drought. In addition, while the water supply associated with the Central Amador Water Project (CAWP) was temporarily curtailed during recent drought years, the significant storage volume in the Lower Bear Reservoir has allowed previous water supply demands to be met, and are expected to be met in the future, even in dry years. In addition, the total well capacity for the portion of both systems reliant on groundwater are larger than current and projected demands.

Past Occurrences

Disaster Declaration History

There have been 2 state and 1 federal disaster declarations for Amador County. This can be seen in Table D-16. Additionally, there have been 16 USDA Secretarial Disaster Declarations from drought in the County.

Table D-16 Amador County –State and Federal Drought Disaster Declarations 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	2	1976, 2015	1	1977

Source: Cal OES, FEMA

NCDC Events

There have been 249 NCDC drought events in Amador County since 1993. These most likely had some impact on the City.

City of Plymouth Events

Based on historical information, the occurrence of drought in California, including the City of Plymouth, is cyclical, driven by weather patterns. Section 4.3.10 of the Base Plan notes that five droughts have occurred in the past 86 years. Drought has occurred in the past and will occur in the future.

The HMPC did note that the drought of 2014 revealed several issues within the City. First, there was an increase in grass fires throughout the City. Second, a lower flow level for the City's Arroyo Ditch which distributes agriculture water throughout the area. And thirdly, instituting water restriction policies, education, and enforcement on the community the City serves.

Additionally, there have been four drought events that have affected the City since 2020:

- 5/10/21: 41 CA counties issued drought emergency declarations (Plymouth was partially affected).

- 10/19/21: Statewide drought emergency issued by Gov Newsom.
- 3/24/23: Some restrictions from the statewide declaration were rolled back (Plymouth positively affected).
- 12/21/23: Some regulations from the statewide declaration expired (Plymouth positively affected).

Climate Change and Drought and Water Shortage

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with drought and water shortage. More information on future impacts to the City can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate scientists studying California find that drought conditions are likely to become more frequent and persistent over the 21st century due to climate change. The experiences of California during recent years underscore the need to examine more closely the state's water storage, distribution, management, conservation, and use policies. The 2021 Climate Adaptation Study (as well as the 2024 Draft CAS) stresses the need for public policy development addressing long term climate change impacts on water supplies. The CAS notes that climate change is likely to significantly diminish California's future water supply, stating that: California must change its water management and uses because climate change will likely create greater competition for limited water supplies needed by the environment, agriculture, and cities.

A 2018 report from the Public Policy Institute of California noted that thousands of Californians – mostly in rural, small, disadvantaged communities – already face acute water scarcity, contaminated groundwater, or complete water loss. Climate change would make these effects worse.

Cal Adapt scenarios for modeled future drought scenarios were shown in Section 4.3.10 of the Base Plan.

Vulnerability to Drought and Water Shortage

Based on historical information, the occurrence of drought and water shortage in California, including the City, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. The vulnerability of the City of Plymouth to drought may vary and include reduction in water supply, turf losses, impacts to natural resources, and an increase in dry fuels and tree dieback.

The whole of the City is at some measure of vulnerability to drought and water shortage. An assessment of a community's vulnerability to drought and water shortage begins with an understanding of local exposure to drought. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The City's current water storage tank is in urgent need of renovation (est. 2 years before potential tank failure). In order for the renovation to be completed, the City will need a 500,000 to 1,000,000 gallon tank in addition to the existing tank to ensure water supply during said tank renovation. This is a mitigation action for the City, as shown in Section D.6.3.

In addition, the City is concerned with droughts that affect local wine growing areas. The City has tourism that depends on the wine industry.

Assets at Risk

Assets at risk from drought and water shortage include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

The people and populations of the City are not directly affected by drought; although, their turfed areas, trees, and other water dependent resources can all be affected. In extreme drought conditions, however, residents and other populations within the City may be vulnerability to drought and water shortage issues. Water quality can be impacted causing health problems, especially to vulnerable populations. Drought and water shortage can lead to an increase in wildfires threatening City residents. Water shortages can have an effect on all of the population in the City, but often have a greater effect on the unhoused and other vulnerable populations that may be unable to access clean drinking water during shortages. During periods of drought as the costs of water usage may increase, especially during mandated conservation times, those who are economically disadvantaged may be unable to afford the increased costs of potable water.

Structures

Structures have a limited vulnerability to drought and water shortage. It is the secondary hazard of drought (wildfire) which causes risks to structures. Drought can also stress trees, causing die off. These trees may fall on structures adjacent to them.

Critical Facilities and Infrastructure

Most critical facilities and infrastructure have a limited vulnerability to drought and water shortage. Should drought conditions be severe enough to cause water shortage reliability issues, some facilities and infrastructure may be affected. Water and wastewater systems may be impacted during times of reduced water supply and need to employ contingencies to remain functional and fully operational. Other water dependent systems may also be adversely affected. Further, the secondary hazard of drought (increased potential for spread of urban fires and wildfire) can pose a significant risk to critical facilities and

infrastructure. Sufficient water supply for firefighting can also be an issue. Drought can also stress trees, causing die off. These trees may fall on critical infrastructure adjacent to them and impact power lines and other utilities.

Natural, Historic, and Cultural Resources

Drought and water shortage can have a significant impact on natural resources. Water levels in reservoirs and lakes may be reduced and a loss of wetlands and coastal marsh areas may occur. Severe drought conditions can contribute to an increase in erosion of soils and lead to poor soil quality. Further, all of the trees in the City are at risk to drought impacts and a reduction in water supply. These trees provide a wealth of social and environmental benefits to City residents and visitors, from shade and beauty to air quality, carbon reduction and stormwater management. Drought can devastate crops and dry out pastures, dry out forests and critical habitat areas, and reduce food and water available for wildlife and livestock. Additionally, drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. It is unlikely that drought and water shortage would have a significant impact on historic and cultural resources in the City.

Impacts from Drought and Water Shortage

The vulnerability of the City to drought is City-wide, but impacts may vary and include reduction in water supply and an increase in dry fuels. The potential for a reduction in water supply during drought conditions generally leads to both mandated and voluntary conservations measures during extended droughts. During these times, the costs of water can also increase. Also of concern, the increased dry fuels, fuel loads, and tree mortality events associated with drought conditions can result in an increased fire danger. In areas of extremely dry fuels, the intensity and speed of fires can be significant. Water supply and flows for fire suppression can also be an issue during extended droughts. Drought can also lead to turf losses and cause tree die off within the City. In addition, adequate and reliable water supply is an important resource for the City's grape and wine industry.

Other qualitative impacts associated with drought in the City are those related to water intensive activities such as municipal usage, commerce, tourism, and recreation use. With more precipitation likely falling as rain instead of snow in the Sierra's, and warmer temperatures causing decreased snowfall to melt faster and earlier, water supply is likely to become more unreliable. In addition, drought and water shortage is predicted to become more common. This means less water available for use over the long run, and additional challenges for water supply reliability, especially during periods of extended drought.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the hazard profile discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City of Plymouth include the following:

- Climate change is likely to exacerbate future drought conditions and associated impacts and vulnerability of the City to drought and water shortage.
- Future population growth should be considered as having more or less people in a community affects the overall hazard vulnerability to the City. Population growth in the City has seen a slow yet steady increase. According to the HMPC, the City and Amador County has access to large quantities of water through its groundwater as well as surface water. However, any future population growth in the City will add additional pressure to water companies during periods of drought and water shortage. Water companies will need to continue to plan for and add infrastructure capacity for population growth. As the population grows, the nature and makeup of populations will shift and change along with it. Vulnerable and underserved populations, such as those with low incomes and the unhoused that might not always have access to clean water, will need to be considered as future development continues, since they may experience a disproportionate impact from drought and water shortage. Potential population growth will be a challenge not only with regard to the City's water access for agricultural production, but state- and nation-wide with regard to food production. Should the City see a growth in population, it will increase the vulnerability and impacts to the County from this hazard. Given the future development plans for the City that includes a new Hilton Hotel and 437 single and multifamily units, new development could add an additional 1223 residents and additional hotel occupants to the City. This would likely increase the vulnerability of the City to this hazard.
- Land use planning should be proactive to address future hazard conditions. As the City continues to grow, more cropland may be taken out of production to provide housing to accommodate for population growth. As the areas adjacent to the City's agricultural lands are reduced, it seems likely that there would be less of a competing demand for water. However, with the wine industry being a key economic industry, the City may prioritize maintaining their agricultural lands for grape growing and production. Future development occurring in the City consists of 2 commercial developments, with one being a new hotel and 4 residential developments comprised of 437 new units of both single and multifamily uses. Collectively this new construction adds an additional 679 acres of developed land within the City. Ensuring that regulatory requirements, such as building codes, are updated and followed will help reduce future impacts to this hazard. However, given the number of new units and land associated with these developments, it is likely that this new development will increase the impacts and vulnerability of the City to this hazard.

As the population in the area continues to grow, so will the demand for water. The AWA provides water to the City through reliable surface water sources. However, population growth in the City will continue to increase the demand for water. Ongoing planning will be needed by the City and AWA to account for population growth and increased water demands, both for future populations and to support their wine industry.

Earthquake

Note: though a low significance hazard in the City, due to its importance in the County and in the State of California, this hazard is profiled here. It is not considered a priority for mitigation planning purposes.

Likelihood of Future Occurrence–Unlikely
Vulnerability–High

Hazard Profile

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction.

Location and Extent

Since earthquakes are regional events, the whole of the City is at risk to earthquake. The City of Plymouth, Amador County, and surrounding areas have some level of risk from seismic and geologic hazards. Faults in and around the City were shown in Section 4.3.11 of the Base Plan. These include the Carson Range, Great Valley, and Rogers-Hayward Creek faults. A significant seismic event on any of these major faults could cause damage in the City of Plymouth.

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales, as discussed in Section 4.3.11 of the Base Plan.

Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. The City is located in an area where earthquakes of some magnitude occur, so both magnitude and intensity of earthquakes are expected to remain moderate. Seismic shaking maps for the area in Section 4.3.11 of the Base Plan show Amador County and the City fall within a low to moderate shake risk.

Flood: 1%/0.2% Annual Chance

Likelihood of Future Occurrence–Occasional (1%)/Unlikely (0.2%)
Vulnerability–Medium

Hazard Profile

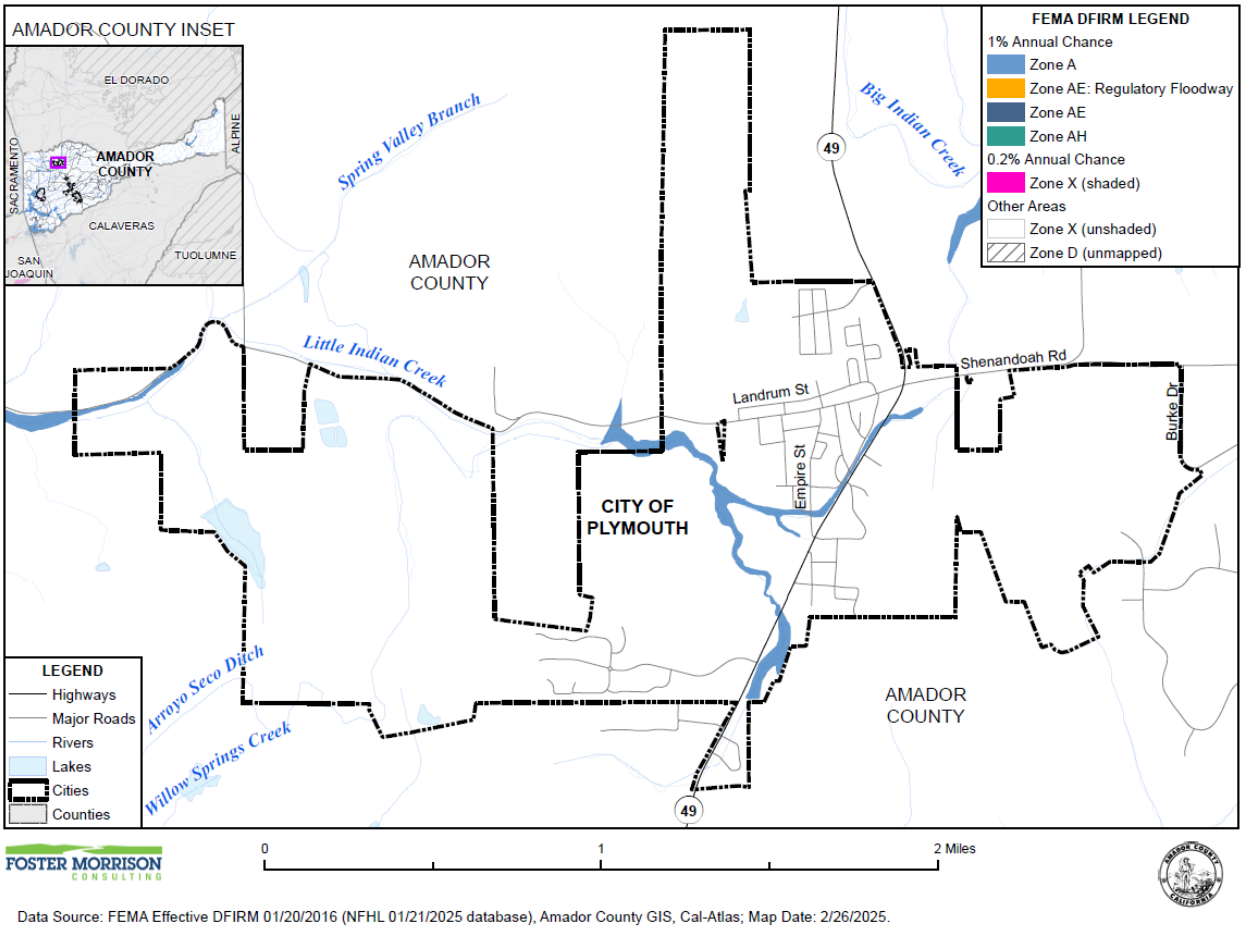
This hazard analyzes the FEMA DFIRM 1% and 0.2% annual chance floods. These tend to be the larger floods that can occur in the City and have caused damage in the past. Flooding can be a problem in the City. Historically, the City has been at risk to flooding primarily during the winter and spring months when

river systems in the City swell with heavy rainfall and snowmelt runoff. The City has also been at risk during atmospheric river flood events. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures located throughout the Amador County Planning Area and the City of Plymouth. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage. Minor flooding has occurred within the 1% and in other localized areas in the City.

Location and Extent

The City of Plymouth has areas located in the 1% annual chance flood zones. This is seen in Figure D-13.

Figure D-13 City of Plymouth – FEMA DFIRM Flood Zones



Data Source: FEMA Effective DFIRM 01/20/2016 (NFHL 01/21/2025 database), Amador County GIS, Cal-Atlas; Map Date: 2/26/2025.

Table D-17 details the DFIRM mapped flood zones located within the City.

Table D-17 City of Plymouth– DFIRM Flood Hazard Zones

Flood Zone	Description	Present in City of Plymouth
A	1% annual chance flooding: No base flood elevations provided	X
AE	1% annual chance flooding: Base flood elevations provided	

Flood Zone	Description	Present in City of Plymouth
AE Regulatory Floodway	1% annual chance flood: Regulatory floodway; Base flood elevations provided	
AH	1% annual chance flood areas of shallow flooding between one to three feet deep. Regulatory floodway; Base flood elevations provided	
Shaded X	0.2% annual chance flooding: The areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood	
X (unshaded)	No flood hazard	X

Source: FEMA DFIRM 1/20/2016

Additionally, flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the City vary, depending on the nature and extent of a flood event; specific depths are unknown. Flood durations in the City tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Flooding in the City tends to have a shorter speed of onset, due to the amount of water that flows through the City.

Geographical flood extents for the City from the FEMA DFIRMs are shown in Table D-18.

Table D-18 City of Plymouth – Geographical DFIRM Flood Zone Extents

Flood Zone/Property Use	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
1% Annual Chance Flood Hazard						
Zone A						
Agricultural	8	0.5%	2	0.4%	6	0.5%
Commercial	2.2	0.1%	1.7	0.3%	0.5	0.05%
Industrial	0	0.0%	0	0.0%	0	0.0%
Miscellaneous	9	0.5%	0	0.0%	9	0.8%
Residential	10	0.6%	0.8	0.1%	9.6	0.9%
Unknown	0	0.0%	0	0.0%	0	0.0%
Zone A Total	**30**	**1.7%**	**5**	**0.8%**	**25**	**2.3%**
1% Annual Chance Flood Hazard Total	**30**	**1.7%**	**5**	**0.8%**	**25**	**2.3%**
Other Areas						
Zone X (unshaded)	0	0.0%	0	0.0%	0	0.0%
Agricultural	959	56%	387	64%	572	52%
Commercial	91	5%	62	10%	29	3%
Industrial	0	0.0%	0	0.0%	0	0.0%
Miscellaneous	221	13%	0	0.0%	221	20%
Residential	392	23%	145	24%	247	23%

Unknown	4	0.3%	1.3	0.2%	3	0.3%
Zone X (unshaded) Total	**1,668**	**98%**	**595**	**99%**	**1,073**	**98%**
Other Areas Total	**1,668**	**98%**	**595**	**99%**	**1,073**	**98%**
Plymouth Total	**1,698**	**100%**	**600**	**100%**	**1,098**	**100%**

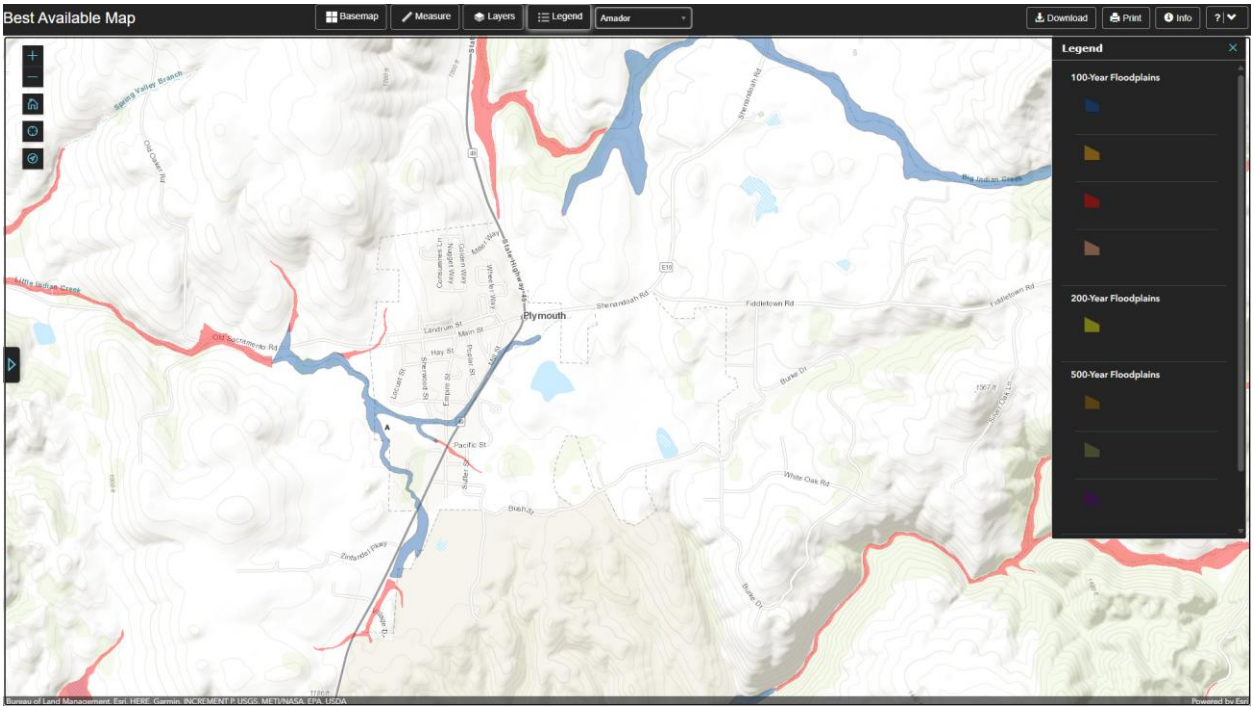
Source: FEMA DFIRM 1/20/2016

California Department of Water Resources Best Available Maps (BAM)

The FEMA regulatory maps provide just one perspective on flood risks in the City. Senate Bill 5 (SB 5), enacted in 2007, authorized the California DWR to develop the Best Available Maps (BAM) displaying 100- and 200-year floodplains for areas located within the Nevada-San Joaquin (SAC-SJ) Valley watershed. This effort was completed by DWR in 2008. DWR has expanded the BAM to cover all counties in the State and to include 500-year floodplains.

Different than the FEMA DFIRMs which have been prepared to support the NFIP and reflect only the 100-year event risk, the BAMs are provided for informational purposes and are intended to reflect current 100-, 200-(as applicable), and 500-year event risks using the best available data. The 100-year floodplain limits on the BAM are a composite of multiple 100-year floodplain mapping sources. It is intended to show all currently identified areas at risk for a 100-year flood event, including FEMA's 100-year floodplains. The BAM are comprised of different engineering studies performed by FEMA, Corps, and DWR for assessment of potential 100-, 200-, and 500-year floodplain areas. These studies are used for different planning and/or regulatory applications, and for each flood frequency may use varied analytical and quality control criteria depending on the study type requirements. The value in the BAMs is that they provide a bigger picture view of potential flood risk to the City than that provided in the FEMA DFIRMs. The BAM map for the City of Plymouth is shown in Figure D-14.

Figure D-14 City of Plymouth – Best Available Map



Source: California DWR

Legend explanation: **Blue** - FEMA 100-Year, **Orange** – Local 100-Year (developed from local agencies), **Red** – DWR 100-year (Awareness floodplains identify the 100-year flood hazard areas using approximate assessment procedures.), **Pink** – USACE 100-Year (2002 Sac and San Joaquin River Basins Comp Study), **Yellow** – USACE 200-Year (2002 Sac and San Joaquin River Basins Comp Study), **Tan** – FEMA 500-Year, Grey – Local 500-Year (developed from local agencies), **Purple** – USACE 500-Year (2002 Sac and San Joaquin River Basins Comp Study).

Past Occurrences

Disaster Declaration History

A list of state and federal disaster declarations for Amador County from flooding is shown on Table D-19. These events also likely affected the City to some degree.

Table D-19 Amador County – State and Federal Disaster Declarations from Flood 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	22	1950, 1955, 1958 (twice), 1959, 1963, 1964, 1969, 1980, 1982, 1986, 1995 (twice), 1997, 2006 (twice), 2017 (twice), 2019, 2021, 2023 (twice)	20	1950, 1955, 1958, 1962, 1963, 1964, 1969, 1986, 1995 (twice), 1997, 1998, 2006 (twice), 2017 (twice), 2019, 2023 (three)

Source: Cal OES, FEMA

NCDC Events

The NCDC tracks flooding events for the County. Events have been tracked for flooding since 1993. Amador County has seen 43 events. These events most likely had some impact on the City.

City of Plymouth Events

The City noted that major flooding did not occur in recent flood events (those since 2020). The Arroyo Ditch does seasonally flood near the crossing of Highway 16 on the eastern side of town.

Climate Change and Flood

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with flood. More information on future impacts to the City can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

According to the 2021 CAS (as well as the 2024 Draft CAS), climate change may affect flooding in California, the Amador County Planning Area, and the City of Plymouth. While average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is possible that average soil moisture and runoff could decline, however, due to increasing temperature, evapotranspiration rates, and spacing between rainfall events. Reduced snowpack and increased number of intense rainfall events are likely to put additional pressure on water infrastructure which could increase the chance of flooding associated with breaches or failures of flood control structures such as levees and dams. Cal Adapt future precipitation projections were shown in Section 4.3.4.

Vulnerability to Flood: 1% and 0.2% Annual Chance

Floods have been a part of the City's historical past and will continue to be so in the future. During winter months, long periods of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread structural and property damage. Predominantly, the effects of 1% and 0.2% annual chance flooding are generally confined to areas near the waterways of the City. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat.

The whole of the City is at some measure of vulnerability to floods. An assessment of a community's vulnerability to flood begins with an understanding of local exposure to flood. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The 2009 General Plan Safety Element noted that flooding is an issue in the Foothills of the Sierra Nevada Mountains. With several months of rain and snow each year, the possibility of a flood warrants preparation

by the City. The City has adopted the FEMA floodplain boundaries, which identify areas that present a risk of flooding every 100 years (1% chance of flooding each year). These boundaries are used to avoid a potential flood disaster.

The City also noted that the City is affected by flooding outside the City limits. Old Sacramento Road is a County Road that has had flooding issues in the past. Sacramento Road provides access to the City of Plymouth sewer plant. If it is unpassable, there is great difficulty reaching the sewer plant. The clearing of obstructions/re-grading of the ditches/creeks in City limits and on Old Sacramento Rd would greatly improve/mitigate the issue of flooding.

Assets at Risk

Assets at risk from flood include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All people and populations located in the 1% and 0.2% annual chance floodplains are at some risk to flooding. Certain vulnerable populations located within areas prone to flooding may be at increased risk to this hazard, especially during a large event with minimal advance notice. These vulnerable populations include: the unsheltered, those with limited mobility, and those that lack the resources to leave the area.

City residents that live in the 1% and 0.2% annual chance floodplains are often the most vulnerable. Not only are the residents at risk, but their homes and contents are all at risk, compounding the impacts associated with significant hazard events. To further evaluate the impact to the City of Plymouth's residential population residing within these hazard areas, the DFIRM flood zones were overlayed on the parcel layer. Those residential parcels that intersect the flood zones were counted and multiplied by the 2023 Census Bureau average household factors for the City of Plymouth – 2.80. According to this analysis, there is a total population of 12 and 0 residents of the City at risk to flooding in the 1% and 0.2% annual chance floodplains, respectively. This is shown in Table D-20.

Table D-20 City of Plymouth – Improved Residential Parcels and Population by Summary FEMA DFIRM Flood Zone

Jurisdiction	1% Annual Chance		0.2% Annual Chance	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Plymouth	4	12	0	0

Source: FEMA DFIRM 1/20/2016, Amador County 2024 Parcel/Assessor Data, US Census Bureau American Community Survey 2023 Household Size Estimates.

The City noted that the Critical Facilities and Infrastructure section below includes the facilities used by At-Risk populations that are threatened by this hazard. While this is not specific to what special populations reside in the City, it does speak to facilities that area used to serve (portions) of this population.

Structures

Certain structures in the City are at risk of DFIRM flooding and primarily include those structures located within the 1% and 0.2% annual chance floodplains. GIS was used to determine the possible impacts of flooding on parcels and structures within the City of Plymouth. The methodology described in Section 4.3.11 of the Base Plan was followed in determining structures and values at risk to the 1% (100-year) and 0.2% (500-year) annual chance flood event. Table D-21 is a summary table for the City of Plymouth. Parcel counts, land and improved values (i.e., those with a structure improvement on the parcel), estimated content replacement values, and total values in the City are shown for the 1% and 0.2% annual chance flood zones, as well as for those properties that fall outside of the mapped FEMA DFIRM flood zones. Table D-22 breaks down Table D-21 and shows the same analysis further broken out by detailed FEMA flood zone and property use.

Table D-21 City of Plymouth – Count and Value of Parcels and Structures in Summary DFIRM Flood Zone

Flood Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
1% Annual Chance Flood Hazard	25	7	$8,477,615	$9,727,971	$9,582,027	$27,787,613
0.2% Annual Chance Flood Hazard	0	0	$0	$0	$0	$0
Other Areas	600	481	$76,665,748	$108,639,435	$59,680,115	$244,985,298
Plymouth Total	**625**	**488**	**$85,143,363**	**$118,367,406**	**$69,262,141**	**$272,772,910**

Source: FEMA DFIRM 1/20/2016, Amador County 2024 Parcel/Assessor Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Table D-22 City of Plymouth – Count and Values of Parcels and Structures by Detailed DFIRM Flood Zone and Property Use

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
1% Annual Chance Flood Hazard						
Agricultural	2	1	$394,650	$3,583	$3,583	$401,816
Commercial	4	2	$7,035,867	$9,432,499	$9,432,499	$25,900,865
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	10	0	$67,380	$0	$0	$67,380
Residential	9	4	$979,718	$291,889	$145,945	$1,417,552
Unknown	0	0	$0	$0	$0	$0

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
1% Annual Chance Flood Hazard Total	**25**	**7**	**$8,477,615**	**$9,727,971**	**$9,582,027**	**$27,787,613**
0.2% Annual Chance Flood Hazard						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	0	0	$0	$0	$0	$0
Unknown	0	0	$0	$0	$0	$0
0.2% Annual Chance Flood Hazard Total	0	0	**$0**	**$0**	**$0**	**$0**
Other Areas						
Agricultural	10	5	$5,481,457	$1,027,919	$1,027,919	$7,537,295
Commercial	56	44	$8,474,888	$10,614,540	$10,614,540	$29,703,968
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	23	0	$1,453	$0	$0	$1,453
Residential	503	429	$62,283,469	$96,075,311	$48,037,656	$206,396,436
Unknown	8	3	$424,481	$921,665	$0	$1,346,146
Other Areas Total	**600**	**481**	**$76,665,748**	**$108,639,435**	**$59,680,115**	**$244,985,298**
Plymouth Total	**625**	**488**	**$85,143,363**	**$118,367,406**	**$69,262,141**	**$272,772,910**

Source: FEMA DFIRM 1/20/2016, Amador County 2024 Parcel/Assessor Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Table D-23 summarizes Table D-22 and shows City of Plymouth loss estimates and improved values at risk by FEMA 1% and 0.2% annual chance flood zones. According to Table D-22 and Table D-23, the City of Plymouth has 32 parcels and $27.7 million of structure and contents values or values in the 1% annual chance flood zone, and 0 improved parcels and $0 million of structure and contents values in the 0.2% annual chance flood zone. These values can be refined a step further. Applying the 20 percent damage factor as previously described in Section 4.3.11 of the Base Plan, there is a 1% chance in any given year of a flood event causing $3.9 million in damage and a 0.2% chance in any given year of a flood event causing $0 in damage in the City of Plymouth. The loss ratio of 0.056% indicates that flood losses for 1% annual chance flooding would be minor, but the City would be able recover quickly. No losses are expected from the 0.2% annual chance flood as this flood zone is not present in the City.

Table D-23 City of Plymouth – Flood Loss Estimates

Flood Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value	Loss Estimate	Loss Ratio
1% Annual Chance Flood Hazard	25	7	$8,477,615	$9,727,971	$9,582,027	$19,309,998	$3,862,000	0.056%
0.2% Annual Chance Flood Hazard	0	0	$0	$0	$0	$0	$0	0.00%
Total	**25**	**7**	**$8,477,615**	**$9,727,971**	**$9,582,027**	**$19,309,998**	**$3,862,000**	**0.056%**

Source: FEMA DFIRM 1/20/2016, Amador County 2024 Parcel/Assessor Data

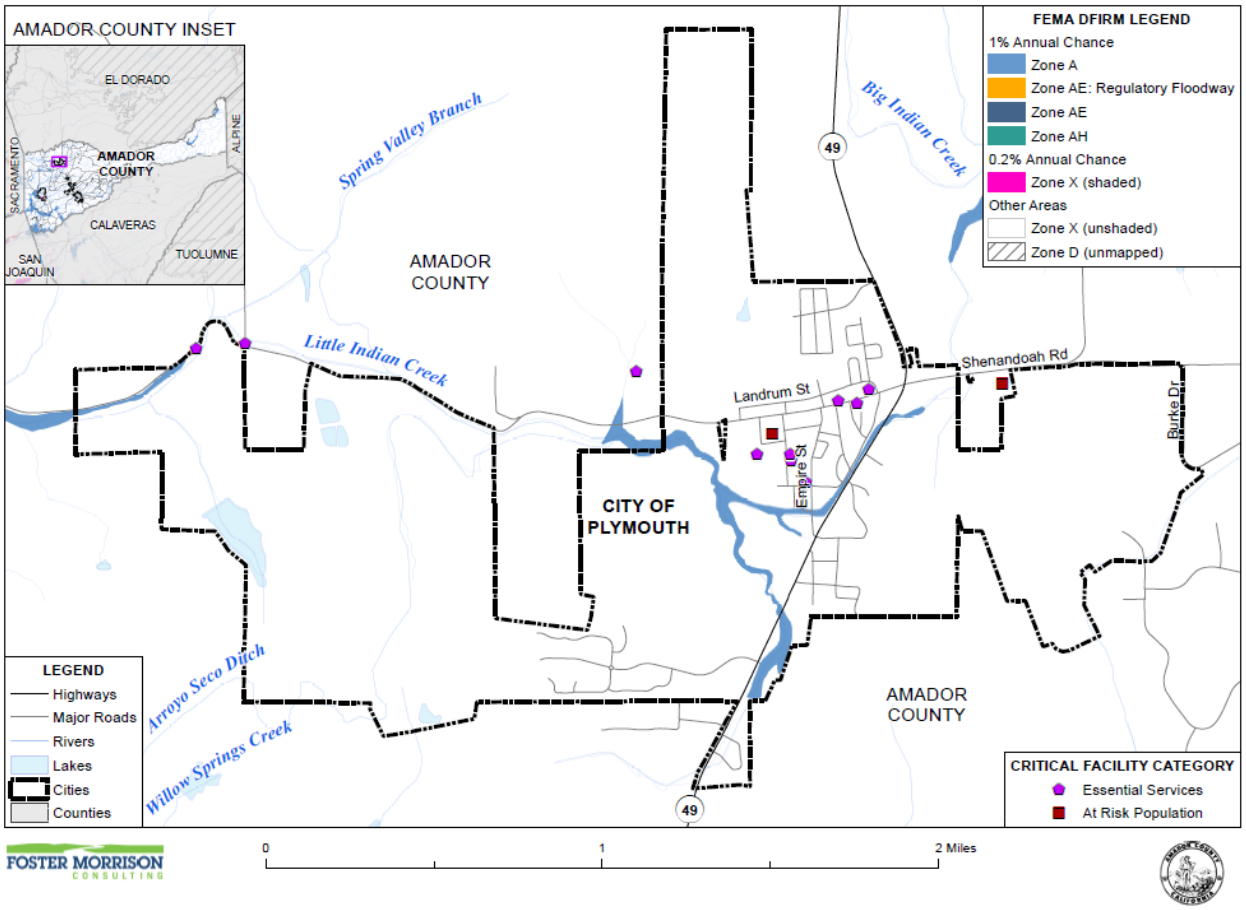
*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Critical Facilities and Infrastructure

1% annual chance flooding present a threat to critical facilities and infrastructure. The following analysis discusses critical facilities and infrastructure. A separate analysis was performed on the critical facility inventory in the City to determine which critical facilities fall into each FEMA DFIRM flood zone. Using GIS, the FEMA DFIRM flood zones were overlayed on the critical facility GIS layer. This is shown on Figure D-15 for the FEMA DFIRM flood zones. Table D-36 details which critical facilities fall in which FEMA DFIRM flood zones. None of the facilities fall within the 1% or 0.2% chance annual floodplain. Details of critical facility categories, type, name, and address by FEMA DFIRM flood zones are listed in Appendix F.

Figure D-15 City of Plymouth – Critical Facilities in FEMA DFIRM Flood Zones



Data Source: FEMA Effective DFIRM 01/20/2016 (NFHL 01/21/2025 database), Amador County GIS, Cal-Atlas; Map Date: 4/21/2025.

Table D-24 City of Plymouth – Critical Facilities by Category and Facility Type in FEMA DFIRM Flood Zones

Flood Zone	Critical Facility Category / Critical Facility Type	Facility Count
Other Areas		
Zone X (unshaded)	**Essential Services**	
	Bridge	1
	Clinic	1
	EMS Station	1
	Evacuation Shelter	1
	Fire Station	1
	Library	1
	Post Office	1
	Public Administration Building	1
	Essential Services Total	**8**
	At Risk Population	

Flood Zone	Critical Facility Category / Critical Facility Type	Facility Count
	School	1
	At Risk Population Total	**1**
	Zone X (unshaded) Total	**9**
Other Areas Total		**9**
Plymouth Total		**9**

Source: FEMA DFIRM 1/20/2016, City of Plymouth

Natural, Historic, and Cultural Resources

Large flood events can affect natural, historic, and cultural resources. There are a number of ways floodwaters can impact natural resources and the environment. Wildlife habitats can be destroyed by floodwaters. Contaminated floodwater can pollute rivers and habitats. Silt and sediment can destroy natural areas. Riverbanks and natural levees can be eliminated as rivers reach bankfull capacity. Rivers can be widened, and deposition can increase downstream. Trees can be uprooted by high-velocity water flow. Plants that survive the initial flood may die due to being inundated with water. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to structures within the flooded areas, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged and lost during extreme flood events. Any of these that fall in the flood zones shown on Figure D-13 would be vulnerable.

Impacts from Flood: 1% and 0.2% Annual Chance

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Large flood events, including those associated with 1% and 0.2% annual chance floods, can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. People may be swept away in floodwaters, causing injuries or deaths. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Structures can be damaged directly from floodwaters and can also be damaged from trees falling as a result of water-saturated soils. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services causing power outages. The interruption of power causes major problems and can result in the closure of governmental offices and community businesses. Public schools may also be required to close or be placed on a delayed start schedule. Roads can be damaged and closed, causing safety and evacuation issues.

Standing water can cause damage to crops, roads, foundations, and electrical circuits. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, loss of environmental resources, and economic impacts.

Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;

- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the hazard profile discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Insurance Coverage, Claims Paid, and Repetitive Losses

Standard property insurance does not include flood coverage because of the relatively high risk. The National Flood Insurance Program (NFIP) provides flood insurance to residents in those communities that participate in the NFIP. Federal financial assistance requires the purchase of flood insurance for structures located within a 100-year floodplain – a requirement that affects nearly all mortgages financed through commercial lending institutions. Flood insurance is also recommended for all structures protected by levees, even if not mapped within a floodplain.

The City of Plymouth joined the National Flood Insurance Program (NFIP) on December 1, 1990. The City does not participate in the CRS program. NFIP data indicates that as of March 2, 2020, there were no flood insurance policies in force in the City with $0 of coverage. There have been no historical claims for flood losses. NFIP data further indicates that there are no repetitive loss (RL) and no severe repetitive loss buildings in the City.

Based on this analysis of insurance coverage, the City has values at risk to the 1% annual chance and greater floods. Of the 7 improved parcels within the 1% annual chance flood zone, none of those parcels maintain flood insurance. This can be seen on Table D-25.

Table D-25 City of Plymouth – Percentage of Policy Holders to Improved Parcels in the 1% Annual Chance Floodplain

Jurisdiction	Improved Parcels in SFHA (1% Annual Chance) Floodplain*	Insurance Policies in the SFHA (1% Annual Chance) Floodplain	Percentage of 1% Annual Chance Floodplain Parcels Currently Insured
City of Plymouth	7	0	0.0%

Source: FEMA DFIRM 1/20/2016, Amador County 2024 Parcel/Assessor Data, NFIP CIS data.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City of Plymouth include the following:

- Climate change is likely to exacerbate future flood conditions and associated impacts and vulnerability of the County to 1% and 0.2% annual chance flooding.
- Future population growth should be considered, as having more or less people in a community affects the overall hazard vulnerability to the City. Population growth in the City of Plymouth has continued to slowly increase; however, additional growth within 1% and 0.2% annual chance floodplains would place additional populations at risk to flood. Additional population growth would likely bring continued diversity to the Ciy. Vulnerable population groups could face disproportionate effects from flooding and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions and the location and severity of future flood events. Given the future development plans for the City that includes a new Hilton Hotel and 234 single family units with ADUs, both with portions being built in the 1% annual chance floodplains; new development could add an additional 655 residents and additional hotel occupants to the 1% annual chance floodplain. This would generally increase the vulnerability of the City to this hazard; although any increases should be limited as only a portion of the new development areas actually fall within the 1% annual chance floodplain.
- Land use planning should be proactive to address future hazard conditions. Locating new development, structures and critical facilities and infrastructure within or near areas of flood risk may put additional development at risk. As shown on Figure D-166, future development occurring within a portion of the City's 1% annual chance floodplain consists of one commercial development, a Hilton Hotel, and one residential development comprised of 234 new units of single family residents with ADUs. Collectively this new construction adds an additional 165 acres of developed land within the City within the 1% annual chance flood zone. Ensuring that regulatory requirements, such as building codes, are updated and followed will help reduce future impacts to this hazard. This new development would generally increase the vulnerability of the City to this hazard; although any increases should be limited as only a portion of the new development areas actually fall within the 1% annual chance floodplain as shown in Figure D-16 as a result of the size of parcels and the hazard analysis methodology.

Future Development

The potential for flooding may increase as floodwaters are channeled due to land development. Such changes can exacerbate flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. Floodplain modeling and master planning should be based on built out property use to ensure that all new development remains safe from future flooding. While local floodplain management, stormwater management, and water quality regulations and policies address these changes on a site-by-site basis, their cumulative effects can have a negative impact on the overall floodplain.

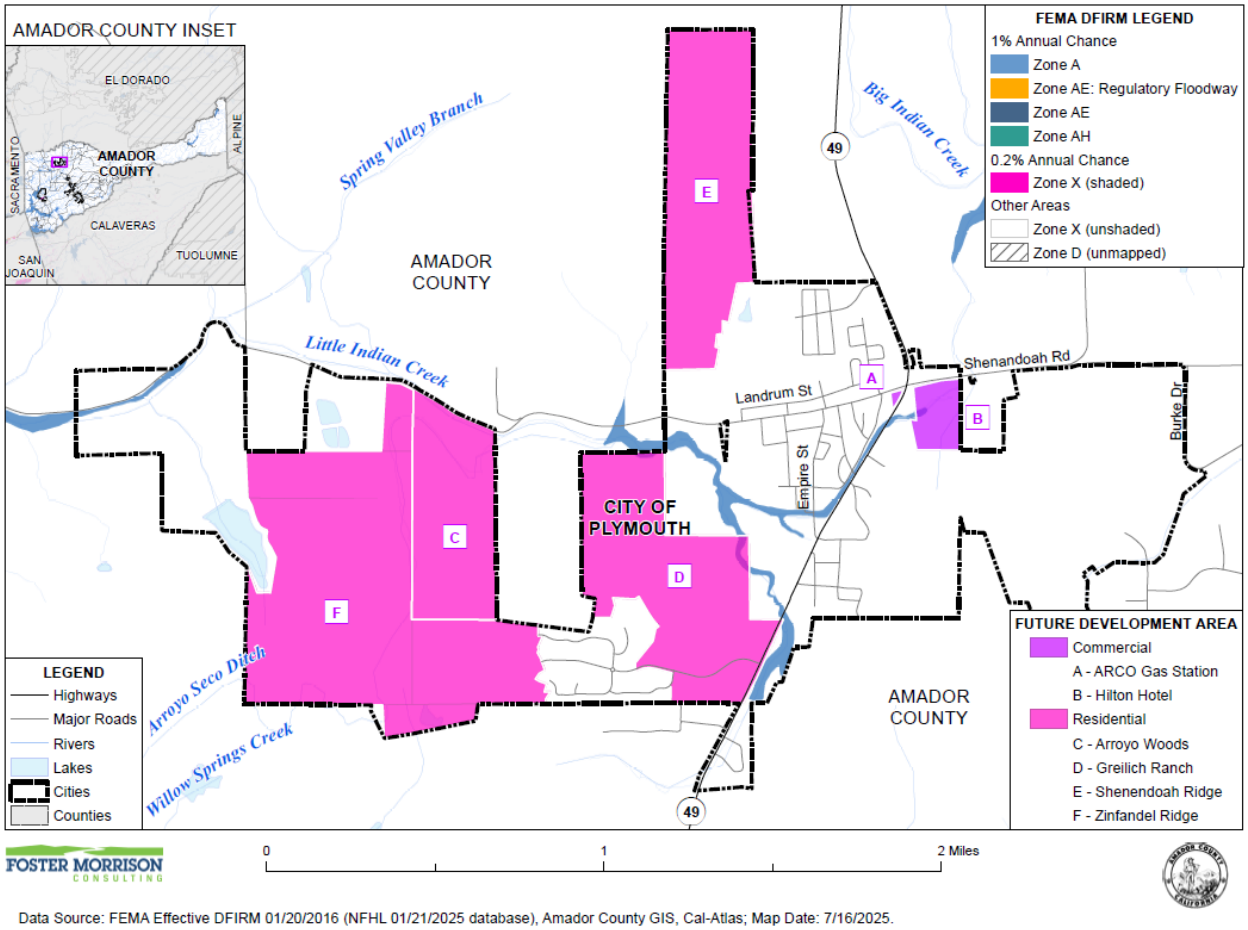
The City enforces its floodplain management ordinance. The City's floodplain ordinance should be updated to ensure new development within floodplains is adequately protected. More detail on the specifics of the floodplain ordinance can be found in the Capability section below.

Future development areas and their vulnerability to 1% and 0.2% annual chance flood are discussed further in the below GIS analysis.

GIS Analysis

The City provided six future development areas which were used as the basis for the inventory of future development for the City. This area were mapped in GIS. Utilizing the future development area spatial layer, the parcel polygon data was intersected to determine the future development areas within each DFIRM flood zone. Figure D-16 shows the locations of the future development area overlayed on the DFIRM flood zones. Some of these sites lie inside of the mapped DFIRM 1% annual chance flood zone; as shown on Table D-26.

Figure D-16 City of Plymouth – Future Development Areas in FEMA DFIRM Flood Zones



Data Source: FEMA Effective DFIRM 01/20/2016 (NFHL 01/21/2025 database), Amador County GIS, Cal-Atlas; Map Date: 7/16/2025.

Table D-26 City of Plymouth – Future Development Parcels and Acres in FEMA DFIRM Flood Zones

Flood Zone /Site/Map ID - Future Development"	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
1% Annual Chance Flood Hazard						
Zone A						
B - Hilton Hotel	1	0	1	4.21	0	4.21
D - Greilich Ranch	1	1	0	161	161	0
Zone A Total	**2**	**1**	**1**	**165.21**	**161**	**4.21**
1% Annual Chance Flood Hazard Total	**2**	**1**	**1**	**165.21**	**161**	**4.21**
Other Areas						
Zone X (unshaded)						
A - ARCO Gas Station	1	1		1.91	1.91	0
C - Arroyo Woods	1	0	1	0	0	0
E - Shenendoah Ridge	1	0	1	147	0	147
F - Zinfandel Ridge	5	0	5	365	0	365
Zone X (unshaded) Total	8	1	7	513.91	1.91	512
Other Areas Total	**8**	**1**	**7**	**513.91**	**1.91**	**512**
Grand Total	**10**	**2**	**8**	**679.12**	**162.91**	**516.21**

Source: FEMA DFIRM 1/20/2016, City of Plymouth

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Occasional
Vulnerability–Medium

Hazard Profile

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the City during the rainy season from

November through April. Prolonged heavy rainfall (including that from atmospheric river events) contributes to a large volume of runoff resulting in high peak flows of moderate duration.

Location and Extent

The City of Plymouth is subject to localized flooding throughout the City. Areas prone to localized flooding are included in Table D-27 below. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the City vary by location. Flood durations in the City tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the City tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

Past Occurrences

Disaster Declaration History

There have been no state or federal disaster declarations from localized floods. There would most likely have been localized flood events during the disaster declarations from flood as shown in the previous 1%/0.2% annual chance flood section.

NCDC Events

The NCDC occurrences of localized flooding are included in the 1% and 0.2% annual chance flood hazard profile above where past flood events were noted.

City of Plymouth Events

In January 2023, there were road closures due to extreme rainfall on parts of HWY 49 and Old Sacramento Rd between Spring Valley Rd and Latrobe Rd.

Climate Change and Localized Flood

It is likely that climate change will increase the chance of future occurrence as well as future impacts from localized flood. More information on future impacts to the City can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Even if average annual rainfall may decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century, increasing the likelihood of overwhelming stormwater systems built to historical rainfall averages. This makes localized flooding more likely.

Vulnerability to Localized Flood

Flood vulnerability and their impacts vary by location and severity of any given flood event and will likely only affect certain areas of the City during specific times. Based on the risk assessment, it is evident that floods will continue to have potentially significant impacts to certain areas of the City. However, while flooding can cause significant impacts, depending on the duration and volume of precipitation and the

drainage in any given area, many of the floods in the City are minor, localized flood events that are more of a nuisance than a disaster.

Many areas of the City are at some measure of vulnerability to localized flooding. An assessment of a community's vulnerability to localized flooding begins with an understanding of local exposure to localized flooding. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Historically, the City has been affected by flooding of streams and creeks occurring during heavy rain and storm (including atmospheric river) events. Additional development in the City and in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff and contributes to localized flooding occurring in areas throughout the City. Atmospheric river events have further compounded this issue. The lack of or inadequate drainage infrastructure in the City contributes to localized flooding issues.

The City tracks localized flooding areas. Affected localized flood areas identified by the City of Plymouth are summarized in Table D-27.

Table D-27 City of Plymouth – List of Localized Flooding Problem Areas

Road Name	Flooding	Pavement Deterioration	Washouts	High Water/ Creek Crossing	Landslides/ Mudslides	Debris	Downed Trees
Old Sac Rd	Yes	Yes	No	Yes	No	Yes	Yes
Hwy 49/49er Park	Yes	No	No	No	No	No	No
Empire St/Hwy 49	Yes	No	No	No	No	No	No

Source: City of Plymouth

Assets at Risk

Assets at risk from localized flood include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

People and populations (including vulnerable populations) are traditionally not highly vulnerable to localized flooding, but their structures and contents can be at risk. Localized flooding may also cause transportation issues as roads and lanes are impacted or closed and affect the ability for people to travel throughout the City.

Structures

Structures in areas with localized flooding can be affected if floodwaters intrude into the structure. Structures in low lying areas, or those with basements can be at greater risk. Buildings with older foundations that are prone to water intrusion are also at greater risk. Once water finds its way into a structure, it tends to continue to do so until the path that brings water into a structure is mitigated. Structures can also be damaged by trees that have become uprooted and fall during rain and storm events. Large trees falling onto structures can cause significant damage.

Critical Facilities and Infrastructure

Localized flooding, while often more of a nuisance, can cause damage to critical facilities and infrastructure during a heavy rain and storm event. Any facility that experiences localized flooding can be impacted. Utilities and other critical infrastructure can all be affected, causing interruptions in service until repairs can be made. For example, water and wastewater systems can be vulnerable to heavy rains and flood events. Rainfall creates a high water table, surging streams and creeks, and saturates soil. Infiltration of stormwater into water and wastewater systems may occur and presents a threat to public health and safety, when the infrastructure is no longer able to meet operational needs and local demands. Other critical facilities such as roads, bridges and other transportation facilities can also experience localized flooding causing road closures and other impacts until storm waters recede. This can result in extended road closures requiring alternate routes.

Natural, Historic, and Cultural Resources

Natural resource assets may have some vulnerabilities to localized flood during major storm events, but can benefit from floodwaters, often by design. Many parks and green spaces are designed to take overflow water and release it into the underlying soils and natural areas. Wetlands areas in the City actually help reduce the risk of flooding, as they can absorb excess rainfall that would have to be drained away from impervious surfaces. Flooding can provide many benefits to the natural environment, including recharging wetlands and groundwater, increasing fish production, creating wildlife habitat, and rejuvenating soil fertility. These smaller localized flooding events often provide more benefits to the environment in comparison to negative impacts associated with large flood events. Historic and cultural resources may be at some measure of vulnerability if they are located in areas subject to repeated localized flooding.

Impacts from Localized Flood

Primary concerns associated with stormwater flooding include impacts to infrastructure that provide a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services. Standing water can cause damage to crops, roads, and foundations. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Life safety issues from localized flooding would be more limited. The amount and type of damage or flooding that occurs varies from year to year and from storm to storm, depending on the quantity of precipitation and runoff.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City of Plymouth include the following:

- Climate change is likely to exacerbate future heavy rain conditions and associated impacts and vulnerability of the City to localized flood.
- Population growth in the City of Plymouth has continued to slowly increase. Additional population growth would likely bring continued diversity to the City. This can also impact the vulnerable populations, like low-income individuals and households living in areas that are typically more hazardous. Vulnerable population groups such as low-income individuals and households living in flood prone areas could face disproportionate effects from localized flood and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions and location of future hazard events. Given the future development plans for the City that include a new Hilton Hotel and 437 single and multifamily units, new development could add an additional 1223 residents and additional hotel occupants to the City. This would likely increase the vulnerability of the City to this hazard.
- Land use planning should be proactive to address future hazard conditions. Development in more urban areas causes an increase in peak flow and stormwater runoff. The City has large areas identified for developed in the next five years. Such growth will consume previously undeveloped acres, and the impacts may overwhelm existing drainage and flood control facilities. Locating new development, structures and critical facilities and infrastructure within or near areas of localized flooding risk may put additional development at risk. However, City building codes are in effect to reduce this risk and should be updated as necessary to continue to address future localized flood conditions. Depending on the location of new development and adherence to protective building codes, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the City to this hazard. However, future development occurring in the City consists of 2 commercial developments, with one being a new hotel and 4 residential developments comprised of 437 new units of both single and multifamily uses. Collectively this new construction adds an additional 679 acres of developed land within the City. Given the number of new units and land associated with these developments, it is likely that this new development will increase the impacts and vulnerability of the City to this hazard.

The City will need to be proactive to ensure that increased development has proper siting and drainage for stormwaters. The risk of localized flooding to future development can also be minimized by accurate

recordkeeping of repetitive localized storm activity. Mitigating the root causes of the localized stormwater flooding will reduce future risks of losses.

Severe Weather: Extreme Heat

Likelihood of Future Occurrence–Highly Likely
Vulnerability–High

Hazard Profile

According to FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and lasts for several weeks. Heat kills by taxing the human body beyond its abilities. In extreme heat and high humidity, evaporation is slowed, and the body must work extra hard to maintain a normal temperature." Most heat disorders occur because the victim has been overexposed to heat or has over-exercised for his or her age and physical condition. Older adults, young children, those who are sick or overweight, and those that work or recreate outdoors are more likely to experience heat exhaustion or succumb to extreme heat.

In addition to the risks faced by citizens of the City, there are risks to the built environment from extreme heat. While extreme heat on its own does not usually affect structures, extreme heat during times of drought can cause wildfire risk to heighten. Extreme heat can lead to interruptions in power, power outages, and when combined with high winds, to PSPS events, creating significant issues in the City. Plymouth has numerous old structures and unmaintained structures within the City limits which are more susceptible to fire than the average structure.

Location and Extent

Heat is a regional phenomenon and affects the whole of the City. Heat emergencies are often slower to develop, taking several days of continuous, oppressive heat before a significant or quantifiable impact is seen. Heat waves do not strike victims immediately, but rather their cumulative effects slowly affect general and vulnerable populations and communities. Heat waves do not generally cause damage or elicit the immediate response of floods, fires, earthquakes, or other more "typical" disaster scenarios. The City experiences temperatures in excess of 100°F during the summer and fall months. The temperature moves to 105-110°F in rather extreme situations.

The NWS has in place a system to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color (green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Section 4.3.3 of the Base Plan.

Past Occurrences

Disaster Declaration History

There have been no federal or state disaster declarations from extreme heat.

NCDC Events

The NCDC data shows 124 extreme heat incidents for Amador County since 1993, some of which likely affected the City.

City of Plymouth Events

The City Planning Team note that since extreme heat is a regional phenomenon, events that affected the County also affected the City. Those past occurrences were shown in the Base Plan in Section 4.2.2.

Climate Change and Extreme Heat

The 2021 CAS (as well as the 2024 Draft CAS), citing a California Energy Commission study, states that "over the past 15 years, heat waves have claimed more lives in California than all other declared disaster events combined." This study shows that California is getting warmer, leading to an increased frequency, magnitude, and duration of heat waves. These factors may lead to increased mortality from excessive heat.

As temperatures increase, California and Amador County will face increased risk of death from dehydration, heat stroke, heat exhaustion, heart attack, stroke and respiratory distress caused by extreme heat. According to the 2021 CAS (as well as the 2024 Draft CAS) report and the 2023 State of California Hazard Mitigation Plan, by 2100, hotter temperatures are expected throughout the state, with projected increases of 3-5.5°F (under a lower emissions scenario) to 8-10.5°F (under a higher emissions scenario). These changes could lead to an increase in deaths related to extreme heat in Amador County.

Vulnerability to Severe Weather: Extreme Heat

Extreme heat is becoming more frequent, intense, longer lasting and geographically widespread. Extreme heat occurs on an annual basis in the County and the City. In recent years, compounded by climate change conditions, summer months continue to get a bit hotter. The whole of the City is at some measure of vulnerability to extreme heat. An assessment of a community's vulnerability to extreme heat begins with an understanding of local exposure to extreme heat. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The City is concerned that extreme heat will drive the wildfire hazard. In addition, individuals below the poverty level may be at increased risk to extreme heat if use of air conditioning is not available or affordable. This is especially true of homeless people and the transient population.

Assets at Risk

Assets at risk from extreme heat include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations within the City are vulnerable to extreme heat, but it generally affects people spending large amounts of time outside or without means of cooling indoor structures. During extended periods of high temperatures, extreme heat may overload the demands for electricity to run air conditioners and can present health concerns to individuals. When interruptions in power occur during extreme heat, the risk of heat related illnesses and deaths increases. Extreme heat is a significant concern to vulnerable populations. The unhoused; individuals who exercise or train outdoors; outdoor workers; individuals that lack the resources to afford heat; and the young, old, or medically fragile individuals that are more susceptible to heat related impacts. In addition to vulnerable populations, pets and livestock are at risk to extreme heat conditions.

Structures

Extreme heat normally does not generally impact structures, but individuals working in structures may be affected during periods of extended heat, especially in structures that might not be equipped with air conditioning or other means of cooling. The City noted that extreme heat has caused interruptions to power in the past. Also depending on the structure, sensitive contents such as IT equipment can be impacted, especially if a power outage occurs.

Critical Facilities and Infrastructure

Depending on their type and function, critical facilities and infrastructure can also be affected by extreme heat. Interruptions in power caused by extreme heat can lead to system failures. Schools without air conditioning may have to close or operate on a reduced schedule.

Natural, Historic, and Cultural Resources

Natural resource assets, including those located in City park areas, may be vulnerable during periods of extreme heat. These include turfed areas; landscapes, City trees, wildlife and habitat areas, and wetlands and marsh lands. Recently, trees were lost in areas of the City that were weakened by drought and extreme heat. Extreme heat may also cause drought-like conditions, contributing to other issues. For example, several weeks of extreme heat increases evapotranspiration and reduces moisture content in vegetation, leading to higher wildfire vulnerability in the region for that time period, even if the rest of the season is relatively moist. Historic and cultural resources are not expected to be affected by extreme heat.

Impacts from Severe Weather: Extreme Heat

The City experiences temperatures in excess of 100°F during the summer and fall months. The temperature moves to 105-110°F in rather extreme situations. During these times, drought conditions may worsen, and the City may see an increase in dry fuels. Also, power outage and PSPS events may occur during these times as well. Health issues are a primary concern with this hazard, especially to vulnerable populations, although economic impacts can also be an issue.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for City include the following:

- Climate change is likely to exacerbate future extreme heat conditions and associated impacts and vulnerability of the City.
- Future population growth should be considered, as having more or less people in a community affects the overall hazard vulnerability to the City. Population is expected to continue to increase for the City and, as such, the vulnerability to this hazard may increase, specifically affecting growing vulnerable populations as the senior citizen population continues to reside in and age within the communities of the City. Along with this, low income and the unhoused population are at risk to extreme heat which can put strain on emergency services and shelters. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions. Given the future development plans for the City that include a new Hilton Hotel and 437 single and multifamily units, new development could add an additional 1223 residents and additional hotel occupants to the City. This would likely increase the vulnerability of the City to this hazard.
- Land use planning should be proactive to address future hazard conditions. The City has large areas that may be built out in the next five years. However, City building codes are in effect to reduce this risk and should be updated as necessary to continue to address future extreme heat conditions. Due to adherence to protective building codes, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the City to this hazard. However, future development occurring in the City consists of 2 commercial developments, with one being a new hotel and 4 residential developments comprised of 437 new units of both single and multifamily uses. Collectively this new construction adds an additional 679 acres of developed land within the City. Given the number of new units and land associated with these developments, it is likely that this new development will increase the impacts and vulnerability of the City to this hazard.

Future development of new buildings in the City will likely not be affected by extreme heat. Extreme heat is more likely to affect vulnerable populations. Vulnerability to extreme heat will increase as the average age of the population shifts. It is encouraged that nursing homes and elder care facilities have emergency

plans or backup power to address power failure during times of extreme heat and in the event of a PSPS. Low-income residents and unhoused populations are also more vulnerable and should be considered in future growth plans for the City. Cooling centers for these populations should be utilized when necessary. Plymouth City Hall is the area's cooling center.

Severe Weather: Heavy Rains and Storms

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

Storms in the City occur annually and are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the City falls mainly in the fall, winter, and spring months. Wind often accompanies these storms; hail and lightning are rare in the City.

Location and Extent

Heavy rain events occur on a regional basis. Rains and storms can occur in any location of the City. All portions of the City are at risk to heavy rains and storms. Most of the severe rains occur during the fall, winter, and spring months in the City as discussed below (with problem flooding areas associated with heavy rains and storms shown in Table D-27 in the Flood: Localized Stormwater section). There is no scale by which heavy rains and severe storms are measured. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Hail and lightning are rarer in the City and Amador County. Duration of severe storms in the City can range from minutes to hours to days. Information on precipitation extremes can be found in Section 4.3.4 of the Base Plan.

Past Occurrences

Disaster Declaration History

According to historical hazard data, severe weather, including heavy rains and storms, is an annual occurrence in the City. This contributes to many of the federal disaster declarations related to flooding. Disaster declarations from flooding are shown on Table D-28.

Table D-28 Amador County – State and Federal Disaster Declarations from Flood (Heavy Rain and Storms) 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	22	1950, 1955, 1958 (twice), 1959, 1963, 1964, 1969, 1980, 1982, 1986, 1995 (twice), 1997, 2006 (twice), 2017 (twice), 2019, 2021, 2023 (twice)	20	1950, 1955, 1958, 1962, 1963, 1964, 1969, 1986, 1995 (twice), 1997, 1998, 2006 (twice), 2017 (twice), 2019, 2023 (three)

Source: Cal OES, FEMA

NCDC Events

The NCDC data recorded 114 hail, heavy rain, and winter weather incidents for Amador County since 1950. Winter weather events tend to be rain in the lower elevations of the County, while snow falls in the upper elevations.

City of Plymouth Events

The City noted the following events:

December 27, 2022 – A severe storm impacted the City of Plymouth, causing a declaration to be made on January 14, 2023. This event caused issues for the wastewater treatment plant including pumps and sprinklers costing the City $53,611 to repair the damage. Along with this, debris removal was necessary and cost the City $12,939.

Climate Change and Heavy Rains and Storms

It is likely that climate change will increase the chance of future occurrence as well as future impacts from heavy rains and storms. More information on future impacts to the City can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

According to the 2021 CAS (as well as the 2024 Draft CAS), while average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is unlikely that hail will become more common in Amador County and the City of Plymouth. The amount of lightning is not projected to change.

Cal-Adapt noted that, on average, the projections show little change in total annual precipitation in California. Furthermore, among several models, precipitation projections do not show a consistent trend during the next century. Cal-Adapt modeled scenarios are shown in Section 4.3.4 of the Base Plan.

Vulnerability to Heavy Rain and Storms

Heavy rain and severe storms are the most frequent type of severe weather occurrences in the City. These events can cause both significant and localized flooding. Flooding can be worse during times where the

ground is already saturated. Wind often accompanies these storms and has caused damage in the past. Hail and lightning are rare in the City, but also can cause damage, with lightning occasionally igniting wildfires.

The whole of the City is at some measure of vulnerability to heavy rain and storms. An assessment of a community's vulnerability to heavy rains and storms begins with an understanding of local exposure to heavy rain and storms. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The City noted that heavy rains and storms are a common occurrence in the City, with most storm events causing temporary issues within the City such as impacts to roads, tree damage, and the occasional power outage. The City also noted that heavy rains and storms cause localized flooding in the City. The problem areas area shown on Table D-27 above.

Assets at Risk

Assets at risk from heavy rain and storms include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations (including vulnerable populations) in the City have some measure of risk to heavy rains and storms. Those populations that work or recreate outside and unhoused individuals are more vulnerable to impacts from heavy storm events. Heavy rains and storms occur every year and do not generally cause significant adverse impacts to individuals; it is the secondary hazard, flooding, which poses the biggest impact to people. Populations at risk to flooding resulting from heavy rains and storm events include those who live in floodplains (discussed in further detail in the Flood: 1%/0.2% Annual Chance section above) and those who live in and near localized flooding areas (discussed in further detail in the Flood: Localized Stormwater Flooding section above).

Structures

Structures in the City have some risk to heavy rains and storms. Structures built to modern building codes are built to withstand heavy rains and storms (including high winds and lightning). During a heavy storm, localized flooding may cause water intrusion into buildings from the outside. Trees can be downed causing impacts to structures. Older homes and buildings may be at increased risk to heavy rains and storms. Power outages during severe storm events can occur, impacting the use of structures until the power is back online.

Critical Facilities and Infrastructure,

Heavy rain and storms can affect critical facilities and infrastructure during large events. Power outages may occur taking facilities offline. High winds can down power lines and trees impacting facilities. Water intrusion into facilities and infrastructure can impact operations. City roads, streets, and bridges can be impacted resulting in closures restricting traffic flow in the City. In certain areas, large storms can cause erosion and localized landslides which can impact facilities. Many critical facilities are built to modern design standards that take heavy rains and storms into account when siting and building these structures, and others may need to be retrofitted to better withstand these events.

Natural, Historic, and Cultural Resources

Large rain and storm events and associated flooding can affect natural, historic, and cultural resources. Silt and sediment can damage natural areas. Trees can be uprooted and downed by high winds. Extended periods of rainfall can erode natural banks along waterways and degrade soil stability for terrestrial species. While some natural systems can be adversely impacted during these large storms, heavy rain events can also provide benefits. Groundwater and wetland areas can be recharged and water supplies replenished. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to structures affected by large storm events, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged, and lost during extreme rain and storm and events.

Impacts from Heavy Rain and Storms

Impacts from heavy rains and storms include damage to property, critical facilities and infrastructure, and the natural landscape. This includes: erosion; downed trees; damaged utility structures and infrastructure; power outages; road damage and blockages; and even lightning strikes to critical infrastructure and people. Lightning can also cause wildfires and urban fires to occur. Landsliding and erosion occur when the soil on slopes becomes oversaturated and fails. Climate change may cause these impacts to worsen.

Actual damage associated with the primary effects of severe storms and heavy rains has been somewhat limited. It is the secondary hazards caused by these severe weather events, such as floods and erosion that would likely have the greatest impact.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City include the following:

- Climate change is likely to exacerbate future heavy rain and storm conditions and associated impacts and vulnerability of the City to flooding.
- Population is expected to maintain its slow increase for the City of Plymouth; however, the vulnerability may change depending on changes to the makeup of more vulnerable populations. Certain vulnerable populations, such as the unhoused, could experience disproportional effects from this hazard. and should be addressed as the City continues to grow. Thus, changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions and the location of future rain and flood events. Given the future development plans for the City that include a new Hilton Hotel and 437 single and multifamily units, new development could add an additional 1223 residents and additional hotel occupants to the City. This would likely increase the vulnerability of the City to this hazard.
- Land use planning should be proactive to address future hazard conditions. The City has six developments that may occur in the next five years that would cover sizable portions of the City. Changes in land use may also amplify the impacts of heavy rains and storms, as additional impervious surfaces can cause additional runoff and localized flooding throughout the City. Building codes in the City ensure that new development is built to current building standards, which should reduce the risk to future development in the City from heavy rains and storms. However, future development occurring in the City consists of 2 commercial developments, with one being a new hotel and 4 residential developments comprised of 437 new units of both single and multifamily uses. Collectively this new construction adds an additional 679 acres of developed land within the City. Given the number of new units and land associated with these developments, it is likely that this new development will increase the impacts and vulnerability of the City to this hazard.

Building codes in the City ensure that new development is built to current building standards, which should reduce the risk to future development in the City from heavy rains and storms. New critical facilities such as communications towers and others should be built to withstand hail damage, lightning, and thunderstorm winds. With adherence to development standards, future losses to new development should be minimal. Changes in land use may also amplify the impacts of heavy rains and storms, as additional impervious surfaces can cause additional runoff and localized flooding throughout the City.

Wildfire (with smoke and air quality)

Likelihood of Future Occurrence–Likely
Vulnerability–Extremely High

Hazard Profile

Wildland fire and the risk of a conflagration is an ongoing concern for the City of Plymouth. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of fire regimes. Wildland fires affect grass, forest, and brushlands, as well as structures. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern.

Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. These weather conditions can result in red flag (e.g., fire weather) days and can result in PSPS events in the City. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas. There is also the concern of wildfires occurring in these more remote, forested areas that, under certain weather conditions, can extend into areas not generally considered at a high risk to wildfire. Smoke and air quality also become an issue, both from fires occurring inside and outside of the Amador County Planning Area and the City.

Wildfire Smoke and Air Quality

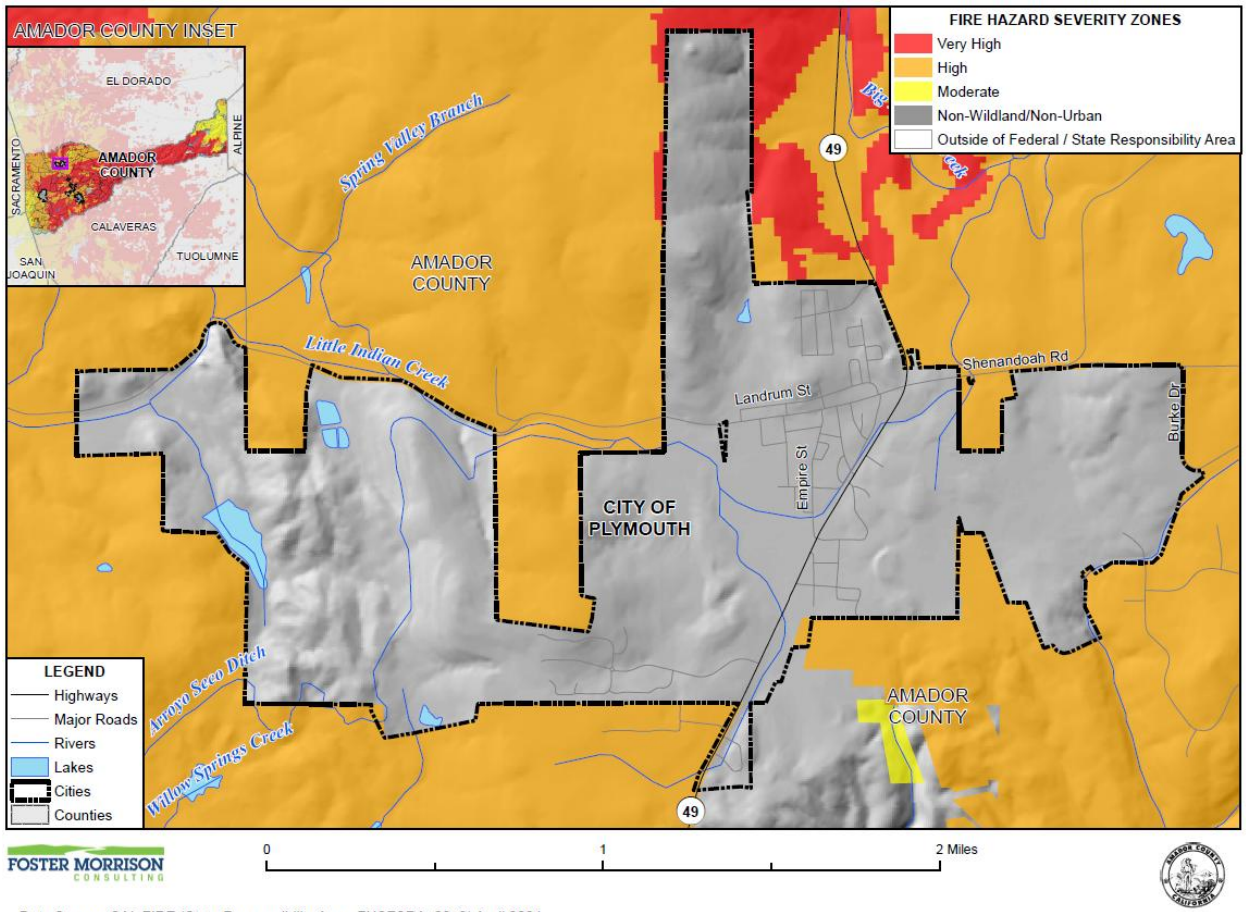
Smoke from wildfires is made up of gas and particulate matter, which can be easily observed in the air. Air quality standards have been established to protect human health with the pollutant referred to as PM2.5 which consists of particles 2.5 microns or less in diameter. These smaller sizes of particles are responsible for adverse health effects because of their ability to reach the lower regions of the respiratory tract.

Wildfire smoke can have negative effects to those who live in or near a fire burn area. Smoke and air pollution from wildfires can be a severe health hazard. Significant wildfires occurring in both Amador County and nearby northern California communities since the 2020 LHMP Update have created significant air pollution affecting area residents. This was the case during the 2021 Caldor Fire, as well as others that affected the nearby areas.

Location and Extent

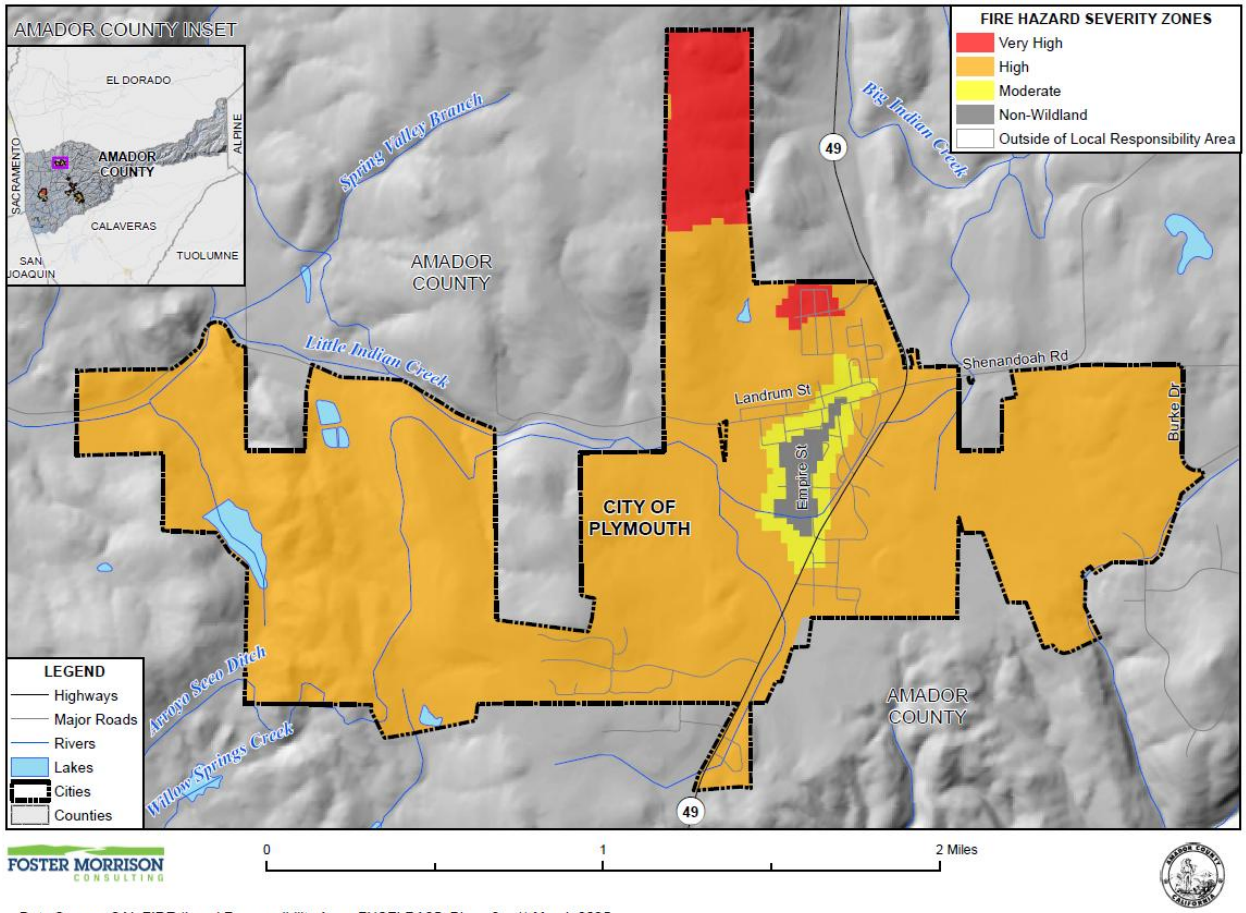
Wildfire can affect all areas of the City. CAL FIRE has estimated that the risk varies across the City and has created maps showing risk variance. Following the methodology described in Section 4.3.15 of the Base Plan, wildfire maps for the City of Plymouth were created. Figure D-17 shows the CAL FIRE Federal Responsibility Areas (FRA) and State Responsibility Areas (SRA) and their associated Fire Hazard Severity Zones (FHSZ) in the City. Figure D-18 shows the CAL FIRE Local Responsibility Areas (LRA) and their associated Fire Hazard Severity Zones (FHSZ) in the City. As shown on the maps, FHSZs within the City range from Non-Wildland to Very High, with most of the City mapped into the High and Very High FHZSx as shown in the new LRA mapping.

Figure D-17 City of Plymouth – CAL FIRE SRA/FRA Fire Hazard Severity Zones



Data Source: CAL FIRE (State Responsibility Area: FHSZSRA_23_3) April 2024,
CAL FIRE (Federal Responsibility Area: Draft c3fhszl06_1) September 2007,
Amador County GIS, Cal-Atlas; Map Date: 3/12/2025.

Figure D-18 City of Plymouth – CAL FIRE LRA Fire Hazard Severity Zones



Data Source: CAL FIRE (Local Responsibility Area: FHSZLRA25_Phase3_v1) March 2025, Amador County GIS, Cal-Atlas; Map Date: 3/10/2025.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time or may have durations lasting for a week or more. Geographical FHSZ extents in the SRA/FRA are shown in Table D-29, while extents in the LRA are shown on Table D-30.

Table D-29 City of Plymouth – CAL FIRE SRA/FRA Fire Hazard Severity Zone Geographical Extents

Fire Responsibility Area/ Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
SRA						
Very High	0.3	0.02%	0.02	0.003%	0.3	0.03%
High	9	0.5%	2	0.3%	7	0.6%
SRA Total	**9**	**0.5%**	**2**	**0.3%**	**7**	**0.7%**

Fire Responsibility Area/ Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Plymouth Total	**9**	**0.5%**	**2**	**0.3%**	**7**	**0.7%**

Source: CAL FIRE

Table D-30 City of Plymouth – CAL FIRE LRA Fire Hazard Severity Zone Geographical Extents

Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Very High	105	6%	8	1%	98	9%
High	1,519	89%	558	93%	961	87%
Moderate	46	3%				
Non-Wildland	22	1%	9	1%	13	1%
Outside of LRA Responsibility Area	5.7	0.3%	1.1	0.2%	4.6	0.4%
Plymouth Total	**1,698**	**100%**	**600**	**100%**	**1,098**	**100%**

Source: CAL FIRE

Past Occurrences

Disaster Declaration History

There has been three state and two federal disaster declarations due to fire, as shown in Table D-31.

Table D-31 Amador County – State and Federal Wildfire Disaster Declarations 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	3	1961 (unnamed), 2015 (Summer 2015 Fires), 2021 (Caldor Fire)	2	2016 (Butte Fire), 2021 (Caldor Fire)

Source: Cal OES, FEMA

NCDC Events

The NCDC has tracked 50 wildfire events in the County dating back to 1993.

City of Plymouth Events

Fire is a significant concern to the City of Plymouth. Historic fires have occurred in and around the County for decades. Significant historical fires in the Plymouth area include:

- The **1961 Fire** was actually 2 fires which started on the same day. The second fire started on Dry Creek on September 2nd. Strong winds carried it past Plymouth in the surrounding unincorporated area. Four injuries were recorded and large agricultural losses. At that time, the wine tourism aspect of Plymouth did not exist, and Plymouth fortunately did not have the extensive losses that many other areas of the county suffered from this fire.
- The **2014 Sand Fire** affected the City. The fire burned from July 25, 2014 to August 2, 2014. The fire burned 67 structures outside the City Limits. 20 of these were residences and 47 were outbuildings. 1,200 residences (not all located in the City) were evacuated. The Arroyo Ditch suffered extensive damage. The waterway is still not functional since the wildfires. Air quality suffered, and tourism declined during this time.
- The **2021 Caldor Fire**, while starting in El Dorado County, impacted the City in various ways. This was the second largest fire in El Dorado County, other than the Dixie fire. Due to the direction of the wind, Plymouth was under a Red Flag Warning as well as decreased air quality from the smoke. Along with that, in August, portions of the City were placed under an Evacuation Warning since the fire was so large including impacts to business activity. The event caused water pulls for fire during a period of drought for the County. The Amador County Fairgrounds activated as firefighter basecamp & animal relocation station. Ongoing evacuation watch for alerts-the small community of Grizzly Flats was devastated by the fire and only 30 miles away, at one point fire was moving towards Plymouth.
- The **2022 Electra Fire** did not affect the City in terms of its burned area, but it greatly impacted the City due to hazardous air quality.

Climate Change and Wildfire

It is likely that climate change will increase the chance of future occurrence as well as future impacts from wildfire. More information on future impacts to the City can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Warmer temperatures can exacerbate drought conditions. Drought often kills plants and trees, which serve as fuel for wildfires. Warmer temperatures could increase the number of wildfires and pest outbreaks, such as the western pine beetle. Cal-Adapt's wildfire tool predicts the potential increase in the amount of burned areas for the year 2090-2099, as compared to recent (2010) conditions. This is shown in Section 4.3.15 of the Base Plan. Based on this model, Cal-Adapt predicts that wildfire risk in Amador County will increase moderately at the end of the century. However, wildfire models can vary depending on the parameters used. Cal-Adapt does not take landscape and fuel sources into account in their model. In all likelihood, in the Amador County Planning Area, precipitation patterns, high levels of heat, topography, and fuel load will determine the frequency and intensity of future wildfire.

Vulnerability to Wildfire

Risk and vulnerability to the City from wildfire is of significant concern. Wildfires that occur in the City occur from a variety of both natural and manmade causes. The City can be affected both by fires that start on or near City lands as well as those that start elsewhere and move into the City. In addition to burning large areas of land, air quality can be affected in the City by smoke from fires occurring inside the City as well as those from many miles away. As growth continues and populations increase in the City, the potential for wildfires will also increase.

The whole of the City is at some measure of vulnerability to wildfire. An assessment of a community's vulnerability to wildfire begins with an understanding of local exposure to wildfire. This is included in the Local Concerns section below. After that section, assets at risk are discussed.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The City 2009 General Plan Safety Element noted that as a foothills community, Plymouth's rural setting presents a constant threat of wildfire. The fuel load, made up of annual grasses, oaks, and other surface vegetation, is classified as a moderate risk for wild-land urban fires. In addition, the City has a significant threat to fire loss along Main Street due to shared common walls between businesses and the building materials used in construction. Hazardous air quality due to wildfire smoke, acreage containing dead/dry grass and old/dilapidated structures all pose potential risks to the City and surrounding environment.

Assets at Risk

Assets at risk from wildfire include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations are at vulnerable to wildfire. Certain vulnerable populations are at greater risk to the effects of wildfire as well as smoke and air quality issues that wildfires bring. Vulnerable populations include:

- Unhoused
- Infants and children under age five and their caregivers
- Elderly (65 and older)
- Individuals with disabilities
- Individuals' dependent on medical equipment
- Individuals who exercise, recreate, or work outdoors
- Individuals with impaired mobility

To further evaluate the impact to the residential population within the City, the CAL FIRE FHSZ dataset was overlayed on the parcel layer. Those residential parcels that intersect the FHSZs were counted and multiplied by the 2023 Census Bureau average household factors for the City of Plymouth – 2.80. According to this analysis, there is a total population of 0 residents of the City of Plymouth falling within the moderate or higher SRA/FRA FHSZs. This is shown in Table D-32. There is a total population of 1,171 residents of the City of Plymouth falling within the moderate or higher LRA FHSZs, as shown on Table D-33.

Table D-32 City of Plymouth – Improved Residential Parcels and Population by CAL FIRE SRA/FRA Fire Hazard Severity Zone

Jurisdiction	Very High		High		Moderate	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Plymouth	0	0	0	0	0	0

Source: CAL FIRE, Amador County 2024 Parcel/Assessor Data, US Census Bureau American Community Survey 2023 Household Size Estimates.

Table D-33 City of Plymouth – Improved Residential Parcels and Population by CAL FIRE LRA Fire Hazard Severity Zone

Jurisdiction	Very High		High		Moderate	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Plymouth	40	112	331	927	47	132

Source: CAL FIRE, 2024 Amador County Parcel/Assessor's Data, US Census Bureau American Community Survey 2023 Household Size Estimates.

The City noted that the Critical Facilities and Infrastructure section below includes the facilities used by At-Risk populations that are threatened by this hazard. While this is not specific to what special populations reside in the City, it does speak to facilities that area used to serve (portions) of this population.

Structures

All structures in the City have some risk to wildfire. GIS was used to determine the possible impacts of wildfire within the City of Plymouth. The methodology described in Section 4.3.15 of the Base Plan was followed in determining structures and values at risk in both the CAL FIRE's SRA/FRA and LRA Fire Hazard Severity Zone layer. Analysis results for the SRA/FRA in the City of Plymouth are shown in Table D-34, which summarizes total parcel counts, improved parcel counts and their structure values by SRA/FRA FHSZs. Analysis results for the LRA in the City of Plymouth are shown in Table D-35, which summarizes total parcel counts, improved parcel counts and their structure values by SRA/FRA FHSZs.

Table D-34 City of Plymouth – Count and Value of Parcels and Structures by CAL FIRE SRA/FRA Fire Hazard Severity Zone

Fire Hazard Severity Zone/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Values	Total Value
SRA						
High						
Agricultural	0	0	$0	$0	$0	$0
Commercial	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0

Fire Hazard Severity Zone/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Values	Total Value
Miscellaneous	1	0	$0	$0	$0	$0
Residential	1	0	$106,120	$0	$0	$106,120
Unknown	0	0	$0	$0	$0	$0
High Total	**2**	**0**	**$106,120**	$0	$0	**$106,120**
SRA Total	**2**	**0**	**$106,120**	$0	$0	**$106,120**
Plymouth Total	**2**	**0**	**$106,120**	$0	$0	**$106,120**

Source: CAL FIRE, Amador County 2024 Parcel/Assessor Data

Table D-35 City of Plymouth – Count and Value of Parcels and Structures by CAL FIRE LRA Fire Hazard Severity Zone

Fire Hazard Severity Zone/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Values	Total Value
Very High						
Agricultural	1	0	$1,150,000	$0	$0	$1,150,000
Commercial	0	0	$0	$0	$0	$0
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	45	40	$4,789,568	$6,628,450	$3,314,225	$14,732,243
Unknown	0	0	$0	$0	$0	$0
Very High Total	**46**	**40**	**$5,939,568**	**$6,628,450**	**$3,314,225**	**$15,882,243**
High						
Agricultural	11	6	$4,726,107	$1,031,502	$1,031,502	$6,789,111
Commercial	41	32	$14,098,905	$17,272,439	$17,272,439	$48,643,783
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	25	0	$68,342	$0	$0	$68,342
Residential	399	331	$53,784,407	$82,842,182	$41,421,091	$178,047,680
Unknown	6	3	$424,481	$921,665	$0	$1,346,146
High Total	**482**	**372**	**$73,102,242**	**$102,067,788**	**$59,725,032**	**$234,895,062**
Moderate						
Agricultural	0	0	$0	$0	$0	$0
Commercial	16	11	$1,239,614	$2,295,970	$2,295,970	$5,831,554
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	6	0	$491	$0	$0	$491
Residential	53	47	$3,262,052	$4,673,118	$2,336,559	$10,271,729
Unknown	2	0	$0	$0	$0	$0
Moderate Total	**77**	**58**	**$4,502,157**	**$6,969,088**	**$4,632,529**	**$16,103,774**

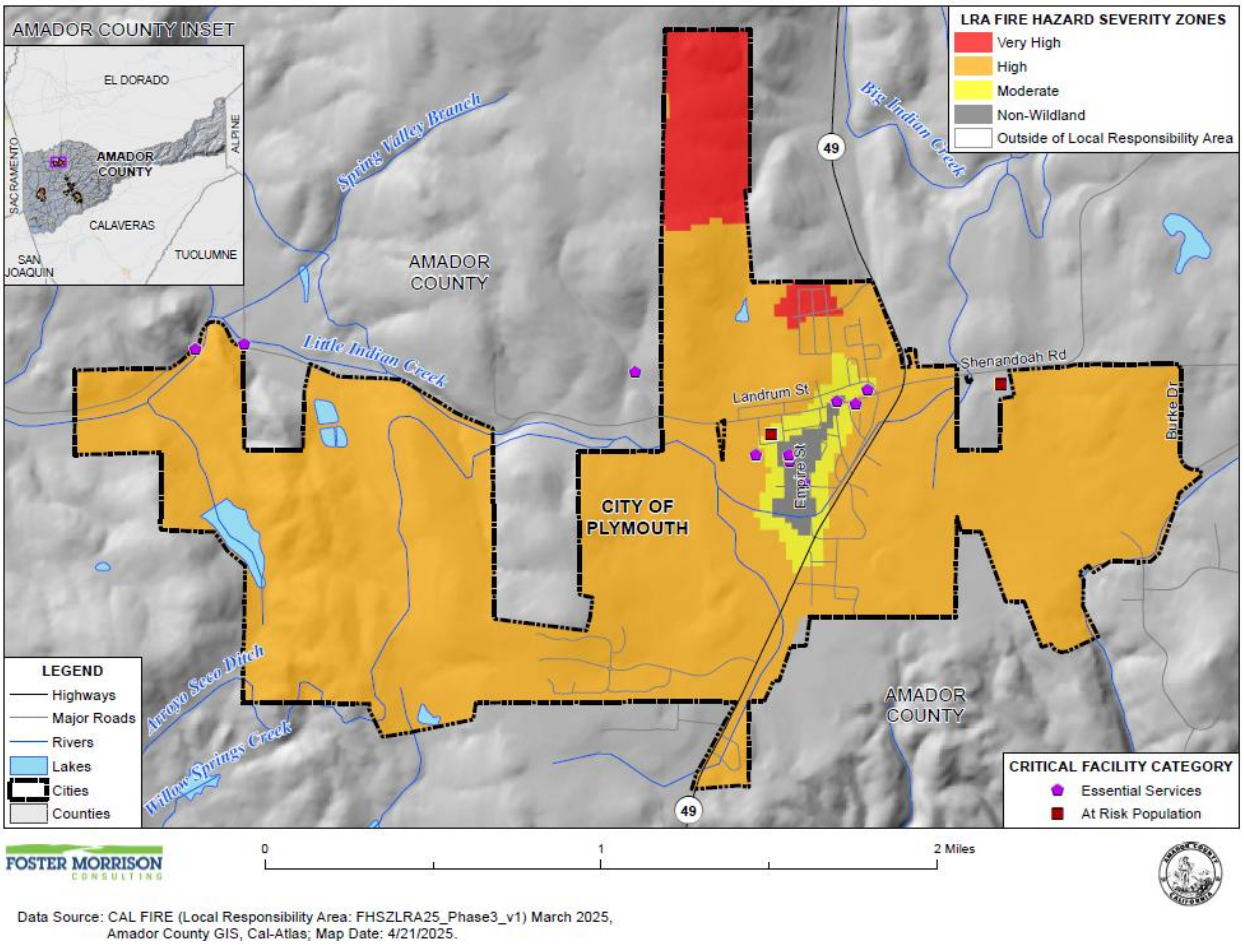
Fire Hazard Severity Zone/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Values	Total Value
Non-Wildland						
Agricultural	0	0	$0	$0	$0	$0
Commercial	3	3	$172,236	$478,630	$478,630	$1,129,496
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	2	0	$0	$0	$0	$0
Residential	15	15	$1,427,160	$2,223,450	$1,111,725	$4,762,335
Unknown	0	0	$0	$0	$0	$0
Non-Wildland Total	**20**	**18**	**$1,599,396**	**$2,702,080**	$1,590,355	$5,891,831
Plymouth Total	**625**	**488**	**$85,143,363**	**$118,367,406**	**$69,262,141**	**$272,772,910**

Source: CAL FIRE, Amador County 2024 Parcel/Assessor Data

Critical Facilities and Infrastructure

Wildfire present a threat to critical facilities and infrastructure. The following analysis discusses critical facilities and infrastructure. A separate analysis was performed on the critical facility inventory in the City to determine which critical facilities fall into each fire hazard severity zone. Using GIS, the SRA/FRA and LRA fire hazard severity zones were overlayed on the critical facility GIS layer. Only LRA fire hazard severity zones intersect the City; as such no SRA/FRA analysis is presented here. Only LRA analysis is presented. This is shown on Figure D-19 for the LRA fire hazard severity zones. Table D-36 details which critical facilities fall in which LRA fire hazard severity zone. Details of critical facility categories, type, name, and address by SRA/FRA and LRA fire hazard severity zones are listed in Appendix F.

Figure D-19 City of Plymouth – Critical Facilities in LRA Fire Hazard Severity Zones



Data Source: CAL FIRE (Local Responsibility Area: FHSZLRA25_Phase3_v1) March 2025, Amador County GIS, Cal-Atlas; Map Date: 4/21/2025.

Table D-36 City of Plymouth – Critical Facilities by Category in LRA Fire Hazard Severity Zones

Fire Hazard Severity Zone	Critical Facility Category	Facility Type	Facility Count
High	Essential Services Facilities	Bridge	1
		Evacuation Shelter	1
		Essential Services Total	**2**
	High Total		**2**
Moderate	Essential Services Facilities	Post Office	1
		Public Administration Building	1
		Essential Services Total	**2**
	At Risk Population	School	1
		At Risk Population Total	**1**
	Moderate Total		**3**
Non-Wildland	Essential Services Facilities	Clinic	1

Fire Hazard Severity Zone	Critical Facility Category	Facility Type	Facility Count
		EMS Station	1
		Fire Station	1
		Library	1
		Essential Services Total	**4**
	Non-Wildland Total		**4**
Plymouth Total			**9**

Source: CGS, City of Plymouth

Natural, Historic, and Cultural Resources

Natural, historic, and cultural resources located within areas at risk to wildfire would be vulnerable. Should a wildfire occur in the City, the impacts to natural, historic and cultural resources could be extensive and include air pollution, contamination from water runoff containing toxic products, and other environmental discharges or releases from burned materials affecting soils, habitat areas, wildlife, and aquatic resources. Historic and cultural resources can be damaged or destroyed and are often more vulnerable due to their older age, construction type, and lack of fire prevention infrastructure such as sprinklers.

Impacts from Wildfire

Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and timber; and loss of recreational opportunities. Out of control wildfires can have catastrophic impacts. Wildfires can cause short-term and long-term disruption to the City. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the City by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the City; smoke and air pollution from wildfires can be a severe health hazard. Smoke impacts may come from wildfires outside the City, as well as from within.

Although the physical damages and casualties arising from wildland-urban interface or conflagration fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate a PSPS which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

The impacts of a fire are felt long after the fire is extinguished. In addition to the loss of property in fires, the loss in vegetation and changes in surface soils alters the environment. When supporting vegetation is burned, hillsides become destabilized and prone to erosion. The burnt surface soils are harder and absorb less water. When winter rains come, this leads to increased runoff, erosion, and landslides in hilly areas.

Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the hazard profile above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City of Plymouth include the following:

- Climate change is likely to exacerbate future wildfire conditions and associated impacts and vulnerability of the City to wildfire.
- Population growth in the City of Plymouth continues to grow slowly. Additional population growth would likely bring continued diversity to the City. Vulnerable population groups could face disproportionate effects from wildfire and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions and future wildfire events. Given the future development plans for the City that includes a new gas station and Hilton Hotel, and 437 single and multi family units, all being developed in High and Very High LRA FHSZs; new development could add an additional 1233 residents and additional hotel occupants to the FHSZs. In fact, this would more than double the existing residential population currently residing in High and Very High FHSZs. This would significantly increase the vulnerability of the City to this hazard.
- Land use planning should be proactive to address future hazard conditions. Locating new development, structures and critical facilities and infrastructure within or near areas of wildfire risk may put additional development at risk. The City has six future commercial and residential development areas planned for the next five years that are located in the High and Very High FHSZs. However, City building codes are in effect to reduce this risk and should be updated as necessary to continue to address future wildfire conditions. Specifically, with the release of the new 2025 LRA mapping for Amador County, wildfire building codes should be updated as required to include enhanced measures to reduce wildfire impacts on new construction, especially in the Very High FHSZ, and including the formal adoption of the new LRA maps. As shown Figure D-21, all six future development areas are occurring within the

new LRA mapping in the High and Very High FHSZs. This new development consists of two commercial developments, a gas station and Hilton Hotel, and four residential developments, comprised of 437 new units of single and multi family residents. Collectively this new construction adds an additional 679 acres of developed land within the City, all located within High to Very High LRA FHSZs. Ensuring that regulatory requirements, such as building codes, are updated and followed will help reduce future impacts to this hazard. However, this new development would significantly increase the vulnerability of the City to this hazard.

Future Development

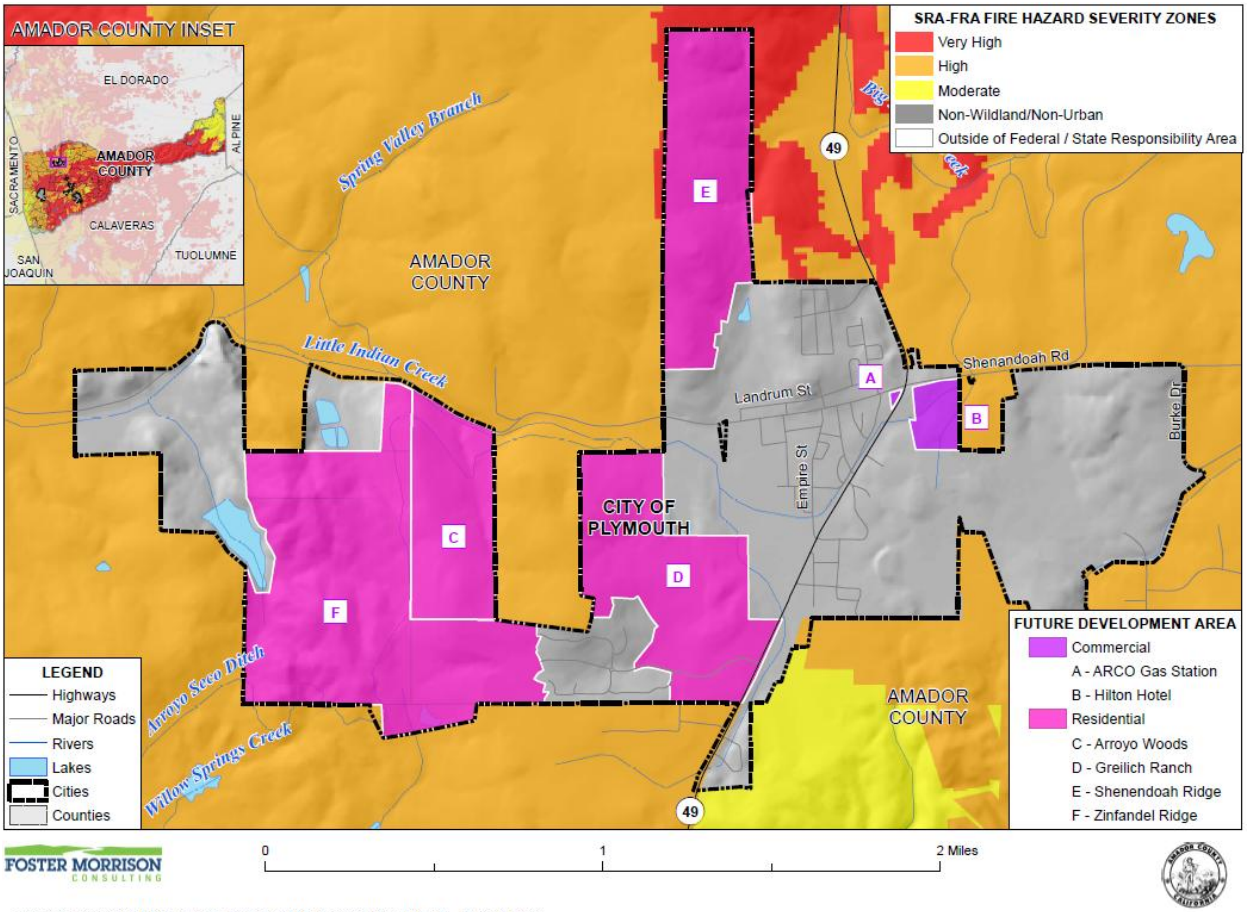
Additional growth and development within moderate or higher fire hazard severity zones in the City would place additional values at risk to wildfire. More vulnerable populations may experience a disproportionate impact from wildfire, and this should be considered as development continues. However, City building codes are in effect and should continue to be updated as appropriate to reduce future impacts. Most all of the City is located in areas of moderate or higher FHSZs; any building in these areas would place additional risk to wildfire.

Future development areas and their vulnerability to wildfire are discussed further in the below GIS analysis.

GIS Analysis

The City provided six future development areas which were used as the basis for the inventory of future development for the City. This area were mapped in GIS. Utilizing the future development area spatial layer, the parcel polygon data was intersected to determine the future development areas within each SRA/FRA and LRA fire hazard severity zone. No facilities fell in the SRA/FRA fire hazard severity zones (as shown on Figure D-20); as such, no tabular analysis is presented. Figure D-21 shows the locations of the future development area overlayed on the LRA fire hazard severity zones. As shown in Table D-37, the future development area falls in the Very High and High LRA fire hazard severity zones.

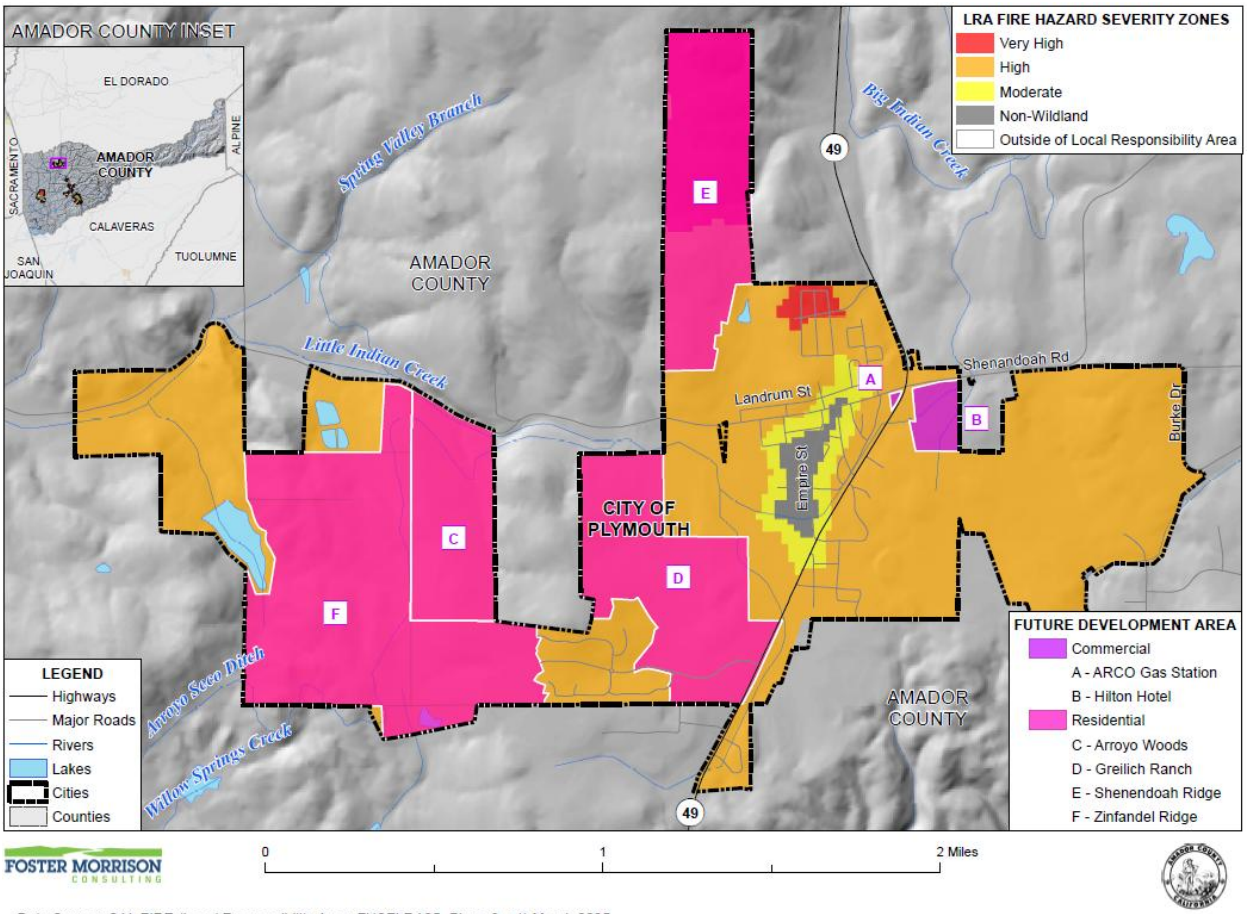
Figure D-20 City of Plymouth – Future Development Areas in CAL FIRE LRA FHSZs



FOSTER MORRISON CONSULTING

Data Source: CAL FIRE (State Responsibility Area: FHSZSRA_23_3) April 2024,
CAL FIRE (Federal Responsibility Area: Draft c3fhszl06_1) September 2007,
Amador County GIS, Cal-Atlas; Map Date: 7/16/2025.

Figure D-21 City of Plymouth – Future Development Areas in CAL FIRE LRA FHSZs



Data Source: CAL FIRE (Local Responsibility Area: FHSZLRA25_Phase3_v1) March 2025, Amador County GIS, Cal-Atlas; Map Date: 7/16/2025.

Table D-37 City of Plymouth – Future Development Parcels and Acres in LRA FHSZs

Fire Hazard Severity Zone /Site/Map ID - Future Development"	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
Very High						
E - Shenendoah Ridge	1	0	1	147	0	147
Very High Total	**1**	**0**	**1**	**147**	**0**	**147**
High						
A - ARCO Gas Station	1	1	0	1.91	1.91	0
B - Hilton Hotel	1	0	1	4.21	0	4.21
C - Arroyo Woods	1	0	1	0	0	0

Fire Hazard Severity Zone /Site/Map ID - Future Development"	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
D - Greilich Ranch	1	1	0	161	161	0
F - Zinfandel Ridge	5	0	5	365	0	365
High Total	**9**	**2**	**7**	**532.12**	**162.91**	**369.21**
Grand Total	**10**	**2**	**8**	**679.12**	**162.91**	**516.21**

Source: CAL FIRE, City of Plymouth

D.5 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

D.5.1. Regulatory Mitigation Capabilities

Table D-38 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the City of Plymouth.

Table D-38 City of Plymouth's Regulatory Mitigation Capabilities

Plans	In Place Y/N	Does the plan address hazards? Can the plan be used to carry out mitigation actions? When was it last updated??
Capital Improvements Plan	Y	Plan addresses hazards and ways to mitigate them. (2019)
Climate Change Adaptation Plan	N	There is no need for a CCAP to be implemented currently
Community Wildfire Protection Plan	Y	Plan addresses hazards and ways to mitigate them (2025)
Comprehensive/Master Plan	Y	Plan addresses hazards and ways to mitigate them. (2014)
Continuity of Operations Plan	N	
Economic Development Plan	Y	Plan addresses hazards and ways to mitigate them (2018)
Land Use Plan	Y	Plan addresses hazards and ways to mitigate them (2018)
Local Emergency Operations Plan	Y	Plan addresses hazards and ways to mitigate them (2016)
Stormwater Management Plan	N	
Transportation Plan	Y	Plan addressed hazards and ways to mitigate them (2021)
Other		

Land Use Planning and Ordinances	Y/N	Is the ordinance an effective way to reduce hazard impacts? Is the ordinance adequately administered and enforced?
Acquisition of land for open space and public recreation use	N	
Building code	Y	2013 CBC
Flood insurance rate maps	N	
Floodplain ordinance	Y	Ordinance is effective, administered, and enforced.
Natural hazard-specific ordinance (stormwater, steep slope, wildfire)	N	
Subdivision ordinance	Y	Ordinance is effective, administered, and enforced.
Zoning ordinance	Y	Ordinance is effective, administered, and enforced.
Other		
How can these capabilities be expanded and improved to reduce risk?		
A CWPP is currently being completed by the Amador Fire District/Fire Safe Council that will include the City of Plymouth. This will reduce risk in the City as the actions of the CWPP are carried out.		

Source: City of Plymouth

City of Plymouth General Plan (2009)

The City of Plymouth General Plan Program serves as the blueprint for future growth and development and provides comprehensive planning for the future. It encompasses what the City is now, and what it intends to be, and provides the overall framework of how to achieve this future condition (see the discussion in Section 4.3.1 Growth and Development Trends).

California Law requires that every City and County in the state have a General Plan. The 2030 City of Plymouth General Plan was adopted in 2009. The General Plan is the most important policy and planning document in the city, and is used by virtually every department. The General Plan is the City's statement of its vision for the future. It contains broad community values and goals, giving a picture of the desired character and quality of development in the County and policies which outline the steps to accomplish those goals.

The General Plan includes a Safety Element that focuses on safety issues to be considered in planning for the present and future development of the City Planning Area. Identified hazards include wildfire, geologic/seismic, flooding, and other natural and man-made hazards (such as hazardous materials). Mitigation-related goals are as follows:

- 9A Use established laws and guidelines to effectively mitigate the impacts of new development and, when appropriate, assess fees to fund mitigation measures.
- 9B Provide appropriate training to adequately manage emergency and disaster situations.
- 9C Provide guidance to citizens regarding their suitable preparation for and response to emergencies.
- 9D Provide for citizen response teams to aid the City and other agencies in providing emergency response services.
- 9E Reduce the loss of life, injury, and property damage due to geological and seismic hazards.

- 9F Discourage development from occurring in areas with increased risk of geological and seismic hazards.
- 9G Maintain an updated emergency response plan to reflect the most current information available regarding the potential risks to persons and property from flooding within the City.
- 9H Provide guidance to citizens regarding their preparation for and response to floods.
- 9I Coordinate with the Fire Chief and the City Engineer to ensure adequate fire protection throughout the community.

Emergency Operations Plan, 2016

The plan is designed to provide a comprehensive, multi-use, emergency management program for the City of Plymouth, in an effort to: lessen the effects of hazards, enhance response during emergencies, provide necessary assistance to citizens, prepare for measures to be taken which will preserve life and minimize damage, and establish a recovery system in order to return the City to normal operations as soon as feasible.

Mitigation Related Ordinances

Emergency Organization and Functions (Chapter 8.07)

The declared purposes of this chapter are to provide for the preparation and carrying out of plans for the protection of persons and property within this City in the event of an emergency; the direction of the emergency functions of this City with all other public agencies, corporations, organizations, and affected private persons.

The Plymouth Disaster Council is hereby created and shall consist of the following:

- The Mayor, who shall be Director.
- A member of the City Council who shall be appointed by the City Council, who shall be Vice-Director.
- Such representative of civic, business, labor, veterans, professional or other organizations having an official emergency responsibility, as may be appointed by the Director with the advice and consent of the City Council.

It shall be the duty of the Plymouth Disaster Council, and it is hereby empowered, to develop and recommend for adoption by the City Council, emergency and mutual aid plans and agreements and such ordinances and resolutions and rules and regulations as are necessary to implement such plans and agreements. The Disaster Council shall meet upon call of the Director or, in his absence from the City or inability to call such meeting, upon call of the Vice-Director.

The Plymouth Disaster Council shall be responsible for the implementation of all parts of the Amador County Emergency Plan which are applicable to this City of Plymouth, which plan shall provide for the effective mobilization of all of the resources of this City, both public and private, to meet any condition constituting a local emergency, state of emergency or state of war emergency; and shall provide for the organization, powers and duties, services, and staff of the emergency organization.

Building and Construction (Title 15)

In accordance with California Government Code Section 50022.2, the following publications are hereby adopted by reference:

Subdivisions (Title 16)

This title is adopted to:

- Establish minimum permissible regulations and standards for the division and subdivision of land, for the design, improvement, and survey data related thereto, and for the physical alteration of the land involved therein, and;
- Provide a guide for owners in the proper division of their land, and to provide for orderly development of the City consistent with the General Plan.

Zoning (Title 19)

The purpose of this chapter is to establish standard procedures necessary for the clear and consistent processing of land use and planning permits and entitlements, as well as to establish procedures necessary for the efficient processing of planning and development applications and requests.

- The 2022 California Building Code based on the 2018 International Building Code, set forth in Title 24, Part 2, Volume 1 and 2 of the California Code of Regulations, as adopted and amended by the California Building Standards Commission, together with the following Appendices: Appendix A (Employee Qualifications), Appendix B (Board of Appeals), Appendix C (Group-U Agricultural Buildings), Appendix D (Fire Districts), Appendix F (Rodent Proofing), Appendix G (Flood-Resistant Construction), Appendix H (Signs), Appendix I (Patio Covers), Appendix J (Grading), Appendix K (Group R3 and R3.1 Occupancies Protected by the Facilities of the Central Valley Flood Protection Program), Appendix L (Earthquake Recording Instrumentation).
- The 2022 California Electrical Code based on the 2020 National Electrical Code, as published by the National Fire Protection Association, and adopted and amended by the California Building Standards Commission in Title 24, Part 3, of the California Code of Regulations.
- The 2022 California Mechanical Code based on the 2021 Uniform Mechanical Code as published by the International Association of Plumbing and Mechanical Officials, and as adopted and amended by the California Building Standards Commission in Title 24, Part 4, of the California Code of Regulations.
- The 2022 California Plumbing Code based on the 2021 Uniform Plumbing Code as published by the International Association of Plumbing and Mechanical Officials, and as adopted and amended by the California Building Standards Commission in Title 24, Part 5, of the California Code of Regulations.
- The 2019 California Administrative Code as adopted and amended by the California Building Standards Commission in the California Building Standards Code. Title 24, Part 1, of the California Code of Regulations.
- The 2019 California Existing Building Code as published by the International Code Council (ICC) and as adopted and amended by the California Building Standards Commission in Title 24, Part 10, of the California Code of Regulations.
- The 2019 California Fire Code as published by the International Code Council (ICC) and as adopted and amended by the California Building Standards Commission in Title 24, Part 9, of the California Code of Regulations.
- The 2019 California Energy Code as published by the International Code Council (ICC) and as adopted and amended by the California Building Standards Commission in Title 24, Part 6, of the California Code of Regulations.

- The 2019 California Referenced Standards Code as published by International Code Council (ICC) and as adopted and amended by the California Building Standards Commission in Title 24, Part 12, of the California Code of Regulations.
- The 2019 California Historical Building Code as published by the International Code Council (ICC) and as adopted and amended by the California Building Standards Commission in Title 24, Part 8, of the California Code of Regulations.
- The 2019 California Residential Code based on the 2018 International Residential Code adopted and amended by the California Building Standards Commission in the California Building Standards Code, Title 24, Part 2.5, of the California Code of Regulations together with the following Appendices: Appendix F (Passive Radon Gas Controls), Appendix H (Patio Covers), Appendix J (Existing Buildings and Structures), Appendix K (Sound Transmission), Appendix O (Automatic Vehicular Gates), Appendix R (Light Straw Clay Construction), Appendix S (Straw Bale Construction), Appendix V (Swimming Pool Safety Act), Appendix W (Areas Protected by the Facilities of the Central Valley Flood Protection Plan), Appendix X (Emergency Housing).
- The 2019 California Green Building Standards Code as published by the International Code Council (ICC) and as adopted and amended by the California Building Standards Commission in Title 24, Part 11, of the California Code of Regulations. (Ord. 2022-07 § 1)

City of Plymouth Flood Damage Prevention Ordinance (Chapter 8.11)

The flood hazard areas of the City are subject to periodic inundation which results in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety and general welfare. These flood losses are caused by the cumulative effect of obstructions in areas of special flood hazards which increase flood heights and velocities, and when inadequately anchored, damage uses in other areas. Uses that are inadequately floodproofed, elevated or otherwise protected from flood damage also contribute to the flood loss.

It is the purpose of this chapter to promote the public health, safety, and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed:

- To protect human life and health;
- To minimize expenditure of public money for costly flood control projects;
- To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- To minimize prolonged business interruptions;
- To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in areas of special flood hazard;
- To help maintain a stable tax base by providing for the second use and development of areas of special flood hazard so as to minimize future flood blight areas;
- To ensure that potential buyers are notified that property is in an area of special flood hazard; and
- To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.
- In order to accomplish its purposes, this chapter includes methods and provisions for:
- Restricting or prohibiting uses which are dangerous to health, safety, and property due to water or erosion hazards, or which result in damaging increases in erosion or flood heights or velocities;
- Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;

- Controlling the alteration of natural floodplains, stream channels, and natural protective barriers, which help accommodate or channel floodwaters;
- Controlling filling, grading, dredging, and other development which may increase flood damage; and
- Preventing or regulating the construction of flood barriers which will unnaturally divert flood waters or which may increase flood hazards in other areas.

This chapter shall apply to all areas of special flood hazards, areas of flood-related erosion hazards and areas of mudslide (i.e., mudflow) hazards within the jurisdiction of the City. A development permit shall be obtained before construction or development begins within any area of special flood hazards, areas of flood-related erosion hazards, or areas of mudslide.

Lands which are located within areas of special flood hazard are areas designated as floodways. Since the floodway is an extremely hazardous area due to the velocity of floodwaters which carry debris, potential projectiles and erosion potential, the following provisions apply:

- Encroachments, including fill, new construction, substantial improvements, and other development are prohibited unless certification by a registered professional engineer or architect is provided demonstrating that the encroachments will not result in any increase in flood levels during the occurrence of the base flood discharge.
- If the previous is satisfied, all new construction and substantial improvements shall comply with all other applicable flood hazard reduction provisions.

This chapter also establishes the base flood elevation and requires new construction or substantial improvements to be located one foot above the base flood elevation.

D.5.2. Administrative/Technical Mitigation Capabilities

Table D-39 identifies the City department(s) responsible for activities related to mitigation and loss prevention in the City of Plymouth.

Table D-39 City of Plymouth's Administrative and Technical Mitigation Capabilities

Administration	In Place Y/N	Describe capability Is coordination effective?
Staff		Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?
Chief Building Official	Y	Contract/Staffing is adequate, trained and coordination is effective
Civil Engineer, including dam and levee safety	Y	Contract/Staffing is adequate, trained and coordination is effective
Community Planner	Y	Contract/Staffing is adequate, trained and coordination is effectiv
Emergency Manager	Y	Mayor
Floodplain Administrator	Y	City Engineer/Matt Ospital from WGA

GIS Coordinator	N	Depend on County for GIS support
Planning Commission	Y	Staffing is adequate, trained and coordination is effective
Other		
Technical	**Y/N**	**Has capability been used to assess/mitigate risk in the past?**
Grant writing	Y	City Manager/ Yes
Hazard data and information	Y	CIRA/City insurance provider/Yes
GIS analysis	Y	Public Works now does GIS marking/analysis in-house
Mutual aid agreements	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Training of additional/new staff is currently implemented for capability improvements as well as risk prevention.		

Source: City of Plymouth

D.5.3. Fiscal Mitigation Capabilities

Table D-40 identifies financial tools or resources that the City could potentially use to help fund mitigation activities.

Table D-40 City of Plymouth's Fiscal Mitigation Capabilities

Funding Resource	In Place Y/N	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	N	Funding resource unavailable at this time
Community Development Block Grant	Y	Voter approval required.
Federal funding programs (non-FEMA)	N	Funding resource unavailable at this time
Fees for water, sewer, gas, or electric services	N	Resource is not capable of funding additional activities/actions at this time
Impact fees for new development	N	Funding resource will depend on approval of future business developments
State funding programs	N	
Stormwater utility fee	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Many options are being explored by the City Finance Director to obtain funding for various issues through state and federal grants.		

Source: City of Plymouth

D.5.4. Mitigation Education, Outreach, and Partnerships

Table D-41 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table D-41 City of Plymouth's Mitigation Education, Outreach, and Partnerships

Program/Organization	In Place Y/N	How widespread are each of these in your community?
Community newsletters	Y	Responsible water use, fire safety, and household preparedness information available to the public and provided in newsletters.
Hazard awareness campaigns (such as Firewise, Storm Ready, Severe Weather Awareness Week, school programs, public events)	Y	Foothill conservancy (environmental protection)
Local news	Y	Widespread
Organizations that interact with underserved and vulnerable communities	N	
Social media	Y	Widespread
How can these capabilities be expanded and improved to reduce risk?		
Amador Fire District/Fire Safe Council is implementing a new CWPP that will include/greatly benefit the City.		

Source: City of Plymouth

D.5.5. Other Mitigation Efforts

The City has many other completed or ongoing mitigation projects/efforts that include the following:

- Plymouth has partnered with the County to identify and mitigate dead and dying trees that pose a hazard to public infrastructure. The services provided are offered at no cost and are covered in part by a grant to Amador County from the State office of Emergency Services.
- The City has worked to provide evacuation routes for each area of the City. In an emergency, response personnel will give directions and instructions for individuals and households to follow. Updates can be received via radio on both an FM and AM channel. Maps of these routes are shown in Figure D-22 and Figure D-23.

Figure D-22 City of Plymouth – Evacuation Routes for the City

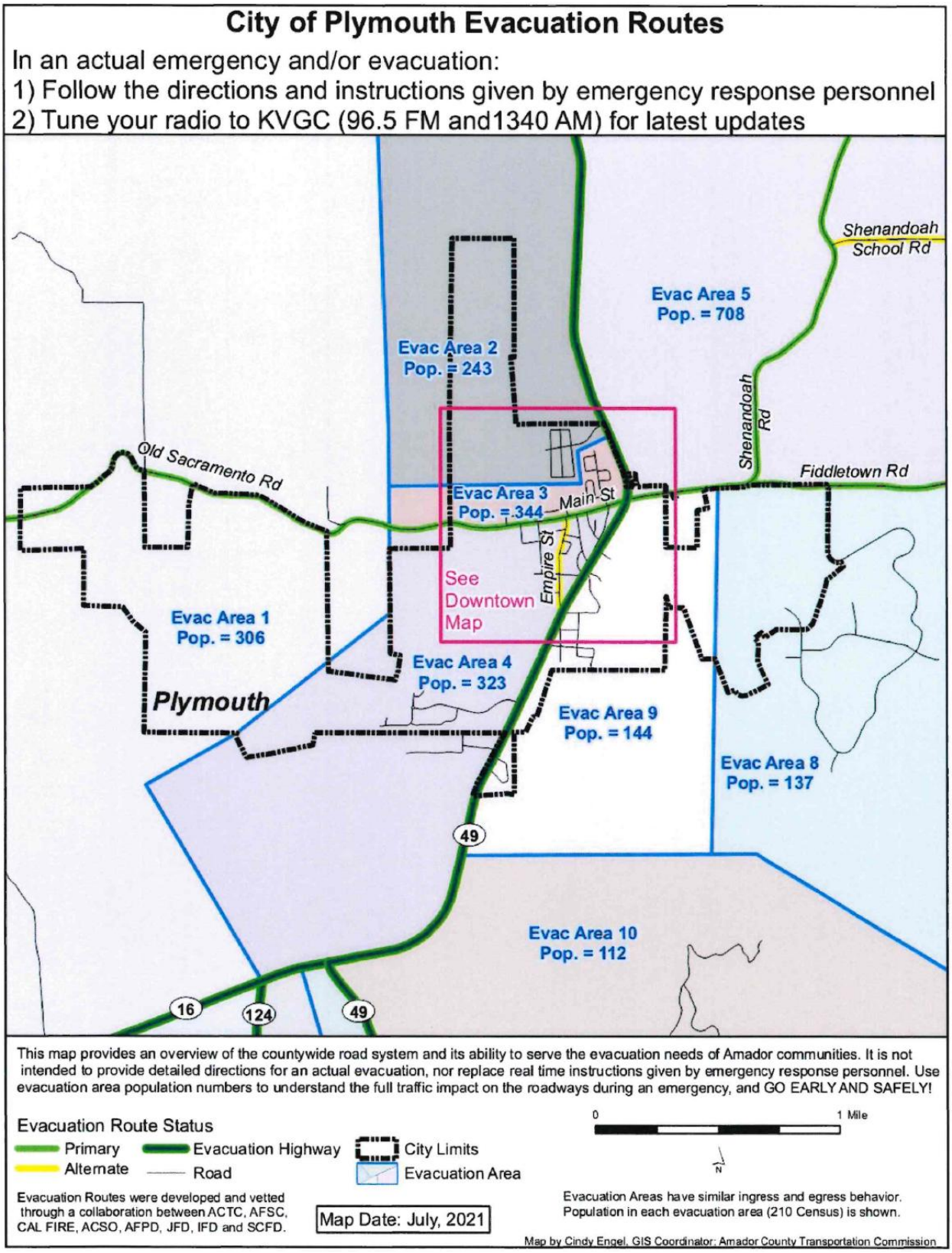
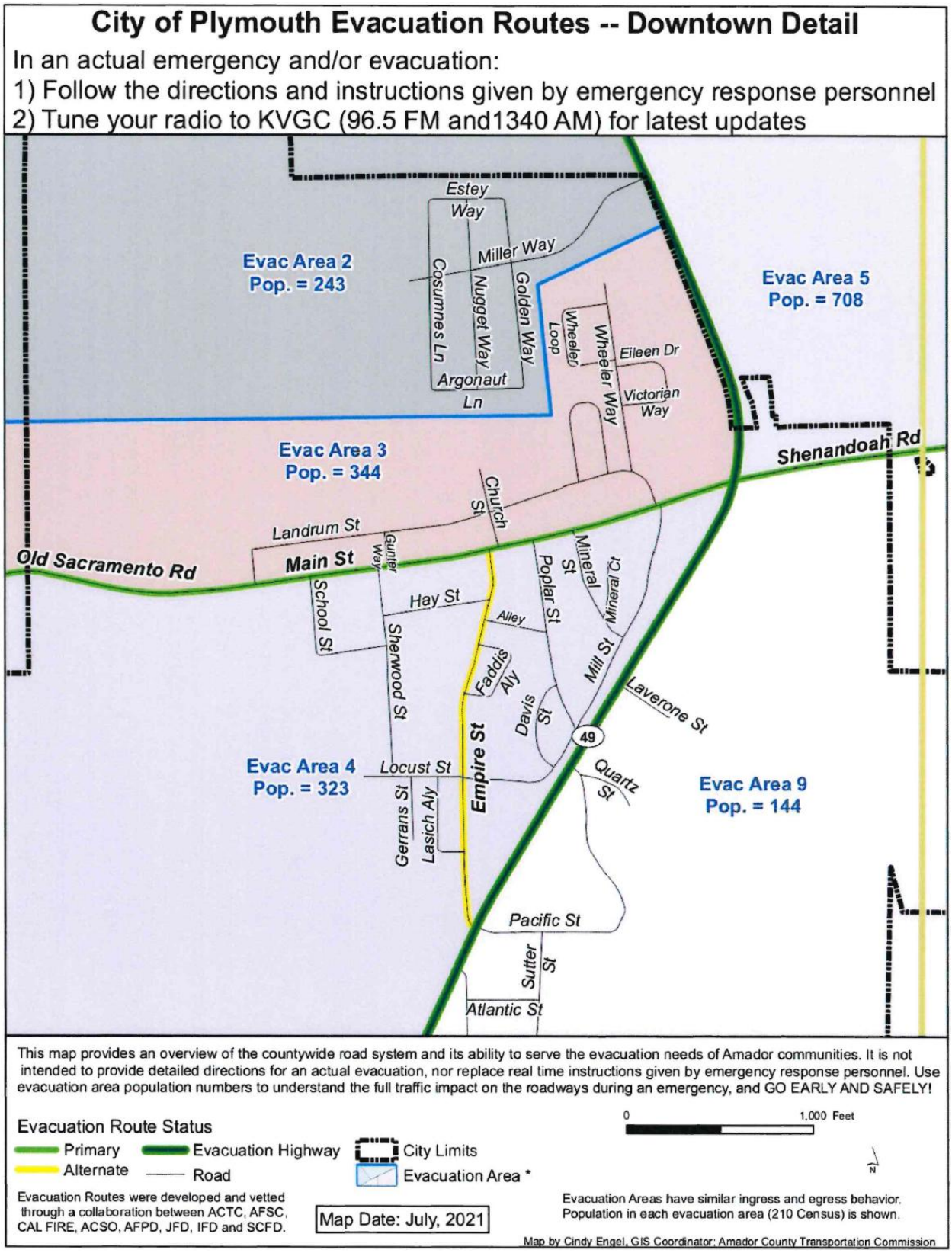


Figure D-23 City of Plymouth – Evacuation Routes for Downtown



A Community Wildfire Emergency Plan is currently being implemented by Amador Fire District/Fire Safe Council that will include the City of Plymouth.

D.6 Mitigation Strategy

D.6.1. Mitigation Goals and Objectives

The City of Plymouth adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

D.6.2. NFIP Mitigation Strategy

The City of Plymouth joined the National Flood Insurance Program (NFIP) on December 1, 1990. As a participant of the NFIP, the City of Plymouth has administered floodplain management regulations that meet the minimum requirements of the NFIP. The management program objective is to protect people and property within the City. The City of Plymouth will continue to comply with the requirements of the NFIP in the future.

In addition, the City of Plymouth actively participates with Amador County to address local NFIP issues through a regional approach. Many of the program activities are the same for the City of Plymouth as for Amador County since participation at the County level includes all local jurisdictions.

The City of Plymouth Public Works (in conjunction with the City's contract engineer) Department provides public outreach activities which include map information services, public awareness, public hazard disclosure, and flood protection information. This information is readily available to the public and consists of current and accurate flood mapping. In addition, the Planning and Engineering Department provides information about our stormwater management program and up-to-date information related to the maintenance of our drainage system.

The NFIP's Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS which are to reduce flood losses, facilitate accurate insurance rating, and promote the awareness of flood insurance. The City of Plymouth is not a current participant in the CRS program.

More information about the floodplain administration in the City of Plymouth can be found in Table D-42.

Table D-42 City of Plymouth Compliance with NFIP

NFIP Topic	Comments
Staff Resources	
Who is responsible for floodplain management in your community? Provide Department/Title. Do they serve any roles other than Community Floodplain Administrator (FPA)?	Matt Ospital/City Engineer and Floodplain Administrator

NFIP Topic	Comments
Is the Community FPA or NFIP Coordinator a Certified Floodplain Manager?	Yes
Is floodplain management an auxiliary function?	Yes
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	Permit review. Inspections. Engineering capabilities.
What are the barriers to running an effective NFIP program in the community, if any?	No barriers currently exist that limits the effectiveness of the NFIP program.
Insurance Summary	
How many NFIP policies are in the community? What is the total premium and coverage?	0 policies in force $0 in premiums $0 in coverage
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	1 paid loss $0.00 in paid losses 0 substantial damage claims
How many structures (residential and non-residential) are exposed to flood risk within the community?	7 structures in 1% annual chance 0 structures in 0.2% annual chance
Are there Repetitive Loss (RL) and Severe Repetitive Loss Properties (SRL) structures in the community?	0 RL properties 0 SRL properties
Describe any areas of flood risk with limited NFIP policy coverage	Zero areas to report
How does the community teach property owners or other stakeholders about the importance flood insurance?	Social Media, local news outlets
What digital sources (like the FEMA Map Service Center, National Flood Hazard Layer) or non-regulatory tools does the community use?	Amador County Sheriff's Office disaster/emergency website/mobile app
Compliance History	
Is the community in good standing with the NFIP?	Y
Are there any outstanding compliance issues (i.e., current violations)?	N
Who is responsible (Department, Title) for making substantial damage/improvement determinations? How does the community identify substantially damaged/improved structures? What is the process to make sure these structures are brought into compliance?	City Building Official/Code Enforcement Officer. The identification/compliance process is completed via inspections/determination of City code compliance.
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	12/17/2013 (CAC) 3/24/2005 (CAV)
Is a CAV or CAC scheduled or needed?	No
Regulation	
When did the community enter the NFIP?	12/1/1990
Are the FIRMs digital or paper?	Digital
Has the community adopted the NFIP minimum floodplain management criteria via local regulation? Date of current local regulation?	Yes, via the City Municipal Code (1/1997)

NFIP Topic	Comments
Has the community adopted the latest effective FIRM? Date adopted?	The latest FIRM adopted by the City was 2/18/2011.
How does the community enforce local floodplain regulations and monitor compliance?	Via permits issued by Floodplain Administrator as well as safety inspections, technical standard enforcement and coordination with the City Building Official to ensure code compliance.
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	Meet. All positions/certifications are filled and met.
How are Letters of Map Change (LOMCs) tracked and compiled?	New DFIRMs are downloaded regularly which include the latest LOMCs, LOMRs, and CLOMRs
Provide an explanation of the permitting process.	City engineer review permit, performs inspection, and ensures floodplain ordinance is enforced.
Community Rating System	
Does the community participate in CRS? If so, what is the community's CRS Class Ranking?	No
What categories and activities provide CRS points and how can the class be improved?	N/A
Does the plan include CRS planning requirements?	N/A

Source: City of Plymouth

D.6.3. Mitigation Actions

The Planning Team for the City of Plymouth identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Climate Change
- Drought & Water shortage (w/ tree mortality)
- Floods: 1%/0.2% annual chance (w/ levee failure)
- Floods: Localized Stormwater
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rain and Storms (Hail, Lightning)
- Wildfire (w/smoke and air quality)

Low priority hazards for mitigation planning include:

- Agricultural Hazards (severe weather/pests/invasive species)
- Avalanche
- Dam Failure
- Earthquake (w/subhazards)
- Landslide, Mudslide, and Debris Flow
- Severe Weather: Extreme Cold, Freeze, and Snow
- Severe Weather: High Winds and Tornados

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Mitigation Actions

The City has put forward the actions as shown in Table D-43. Details of the actions can be found below the table.

Table D-43 City of Plymouth Mitigation Actions

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
City of Plymouth					
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Previous Action	X	X		Prevention
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	Previous Action	X	X	X	Prevention Public Education
Action 3. Develop a Community Wildfire Prevention Plan	New Action	X	X		Prevention Public Education
Action 4. Repairs of Old Sacramento Road to Reduce Flooding and Road Blockage	New Action	X	X	X	Prevention Property Protection Natural Resource Protection
Action 5. Additional Water Tank Storage	Previous Action	X	X		Structural

Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Hazards Addressed: Multi-hazard (Climate Change, Drought & Water shortage (w/ tree mortality), Floods: 1%/0.2% annual chance (w/ levee failure), Floods: Localized Stormwater, Severe Weather: Extreme Heat, Severe Weather: Heavy Rain and Storms (Hail, Lightning), Wildfire (w/smoke and air quality))

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): Local jurisdictional reimbursement for mitigation projects and cost recovery after a disaster is guided by Government Code Section 8685.9 (AB 2140). Specifically, this section requires that each jurisdiction adopt a local hazard mitigation plan (LHMP) in accordance with the federal Disaster Mitigation Act of 2000 as part of the Safety Element of its General Plan. Adoption of the LHMP into the Safety Element of the General Plan may be by reference or incorporation.

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Safety Element of General Plan

Responsible Office/Partners: City of Plymouth Planning Department

Benefits (Losses Avoided): Incorporation of an adopted LHMP into the Safety Element of the General Plan will help jurisdictions maximize the cost recovery potential following a disaster.

Potential Funding (Local Budgets, Grant Funds, etc.): City General Fund

Timeline: Within 5 years.

Priority (H, M, L): High

Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness

Hazards Addressed: Multi-hazard (Climate Change, Drought & Water shortage (w/ tree mortality), Floods: 1%/0.2% annual chance (w/ levee failure), Floods: Localized Stormwater, Severe Weather: Extreme Heat, Severe Weather: Heavy Rain and Storms (Hail, Lightning), Wildfire (w/smoke and air quality))

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): The City and County play a key role in public outreach/education efforts to communicate the potential risk and vulnerability of their community to the effects of natural hazards. A comprehensive multi-hazard public education program will better inform the community of natural hazards of concern and actions the public can take to be better prepared for the next natural disaster event.

Project Description: A comprehensive multi-hazard outreach program will ascertain both broad and targeted educational needs throughout the community. The City will work with the County and other agencies as appropriate to develop timely and consistent annual outreach messages in order to communicate the risk and vulnerability of natural hazards of concern to the community. This includes measures the public can take to be better prepared and to reduce the damages and other impacts from a hazard event. The public outreach effort will leverage and build upon existing mechanisms, and will consider:

- Using a variety of information outlets, including websites, local radio stations, news media, schools, and local, public sponsored events;
- Creating and distributing (where applicable) brochures, leaflets, water bill inserts, websites, and public service announcements;
- Displaying public outreach information in County office buildings, libraries, and other public places and events;
- Developing public-private partnerships and incentives to support public education activities.

Other Alternatives: Continue public information activities currently in place.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Existing City and County outreach programs will be reviewed for effectiveness and leveraged and expanded upon to reach the broader region.

Responsible Office/Partners: City of Plymouth Planning Department in partnership with the County

Benefits (Losses Avoided): Increase residents' knowledge of potential hazards and activities required to mitigate hazards and be better prepared. Protect lives and reduce damages, relatively low cost to implement.

Potential Funding (Local Budgets, Grant Funds, etc.): City General Fund, grant funds (like CA DWR, Cal OESPDM, HMGP, FMA, BRIC, or other sources).

Timeline: Ongoing/Annual public awareness campaign

Project Priority (High, Medium, Low): High

Action 3. Develop a Community Wildfire Prevention Plan

Hazards Addressed: Wildfire, Drought and Water Shortage, Severe Weather: High Winds, and Severe Weather: Extreme Heat

Goals Addressed: 1, 2, 3, 4, 5, 6

Issues/Background: Plymouth is surrounded by unincorporated area, which for the most part is WUI (Wildland Urban Interface). In 2014, the Sand Fire started in this type of area when a vehicle drove "off road" into dry grasses. This fire destroyed 20 residences, 47 outbuildings, burned 4,240 acres and contributed to 2 deaths. Less than 5 miles outside City limits, a big factor that saved the City of approximately 1,000 residents was the direction of the wind. This small City was still greatly impacted, as firefighters made basecamp at the Amador County Fairgrounds and trucks pulled water non-stop from the City hydrants. The population faced unsafe air quality, fear and economic shutdown. Plymouth's businesses rely on tourism brought by the Shenandoah Valley wine industry. This event made it clear that planning and preparation for the next fire was essential to the City's survival.

Project Description:

- Develop and implement a Public Awareness Education Program including defensible space, best practice guidelines, self-preparedness and evacuation knowledge.
- Revise building requirements to ensure new development is using fire resistant materials and strategies and incentivize renovation projects on older buildings to do the same.
- Revise weed abatement code to require 100' defensible space and other responsibility updates.
- Increase Fuel Management efforts focusing on undeveloped parcels, non-resident property owners whose land or property is neglected and WUI areas.

Other Alternatives: None

Existing Planning Mechanisms through which Action Will Be Implemented: N/A

Responsible Office/Partners: Building Department, Code Enforcement, Public Works, Fire Department

Benefits/Losses Avoided): Mitigating future wildfire destruction and damages to both property and lives.

Potential Funding: FEMA Hazard Mitigation Grant Program

Timeline: 2 years

Project Priority: High

Action 4. Repairs of Old Sacramento Road to Reduce Flooding and Road Blockage

Hazards Addressed: Climate Change, Flood: 1% and 0.2% Annual Chance, Floods: Localized Stormwater, Severe Weather Heavy Rains and Storms, Wildfire

Goals Addressed: 1, 2, 3, 4, 6

Issues/Background: Under the LAFCO agreement formed with Amador County to accommodate the Zinfandel Ridge Development, the city now has shared responsibility for Old Sacramento Road. Old Sacramento Road is the only route available to access the city wastewater treatment plant. This road floods during large rainstorms and blocks access to the wastewater treatment plant and the operators cannot get to the plant to maintain it. During wildfire season the road is riddled with potholes and brush. This road is a major exodus for the community and is critical during emergency evacuations such as those created by wildfire.

Project Description:

- Repair or replace road surface
- Modify bridge over Little Indian Creek to allow for fluid and larger flows from storms and widen for better two-way traffic.
- Work on creek to clean out debris so that it does not overflow onto the road.

Other Alternatives: None

Existing Planning Mechanisms through which Action Will Be Implemented: Developer's Agreements

Responsible Office/Partners: Engineering, Public Works, Wastewater/AWA

Benefits/Losses Avoided): Reliable access to the wastewater treatment plant during storms and a clear evacuation route for the community. / Potential loss of wastewater function, equipment failure, and violations would be averted.

Potential Funding: FEMA Hazard Mitigation Grant Program, Developer's Agreements

Timeline: 3 years

Project Priority: High

Action 5. Additional Water Tank Storage

Hazards Addressed: Climate Change, Drought and Water Shortage, Severe Weather Extreme Heat, Wildfire

Goals Addressed: 1, 2, 4, 5, 6

Issues/Background: Plymouth only has room to store 500,000 gallons of potable water and the AWA Pipeline that supplies the tank does not have the treatment capacity to send us more water in real time. In maximum demand summer, seasonal activities, and risks of wildfires; there is not enough water in the system to sustain the community's needs. The City of Plymouth is the crucial point of fire protection for the several smaller communities on this side of Amador County and assists El Dorado County being near the county line and the only water system in the general rural area. Also, being the home to the Amador County Fair which is a firefighters emergency post and animal relocation station during wildfires, adds extra demand to our limited water system. The fairgrounds is used to house the firefighter community and fill the fire trucks during these emergencies.

Recent wildfire incidents in the area have been:

- Caldor Fire 2021
- Sand Fire 2014
- Gold Fire 2004

Project Description: Acquire another 500,000-1,000,000-gallon capacity tank for water storage and emergency backup. Reline the aging tank on site to extend its lifetime.

Other Alternatives: None

Existing Planning Mechanisms through which Action Will Be Implemented: N/A

Responsible Office/Partners: Engineering, Building Department, Public Works, Drinking Water/AWA

Benefits/Losses Avoided): Sufficient water supplies during heatwaves, large events, and wildfires. Potential extensive destruction of property and loss of human life in wildfire situations.

Potential Funding: FEMA Hazard Mitigation Grant Program, Developer's Agreements

Timeline: 3 years

Project Priority: High

City of SUTTER CREEK 1854

Annex E City of Sutter Creek

E.1 Introduction

This Annex details the hazard mitigation planning elements specific to the City of Sutter Creek, a previously participating jurisdiction to the 2020 Amador County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the City. This Annex provides additional information specific to the City of Sutter Creek, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this jurisdiction.

E.2 Planning Process

As described above, the City of Sutter Creek followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Amador County Hazard Mitigation Planning Committee (HMPC), the City formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table E-1. Additional details on Plan participation and City representatives are included in Appendix A.

Table E-1 City of Sutter Creek – Planning Team

Name	Position/Title	How Participated
Tom DuBois	City Manager	Provided past occurrences, risk assessment worksheets, and other supplemental information.
Dan Lafontaine	Public Works Director	Provided past occurrences, risk assessment worksheets, and other supplemental information.
Erin Ventura	City Consulting Planner	Provided supporting documentation.

Coordination with other community planning efforts is paramount to the successful implementation of this LHMP Update. This section provides information on how the City integrated the previously approved 2020 LHMP into existing planning mechanisms and programs. Specifically, the City incorporated into or implemented the 2020 LHMP through other plans and programs shown in Table E-2.

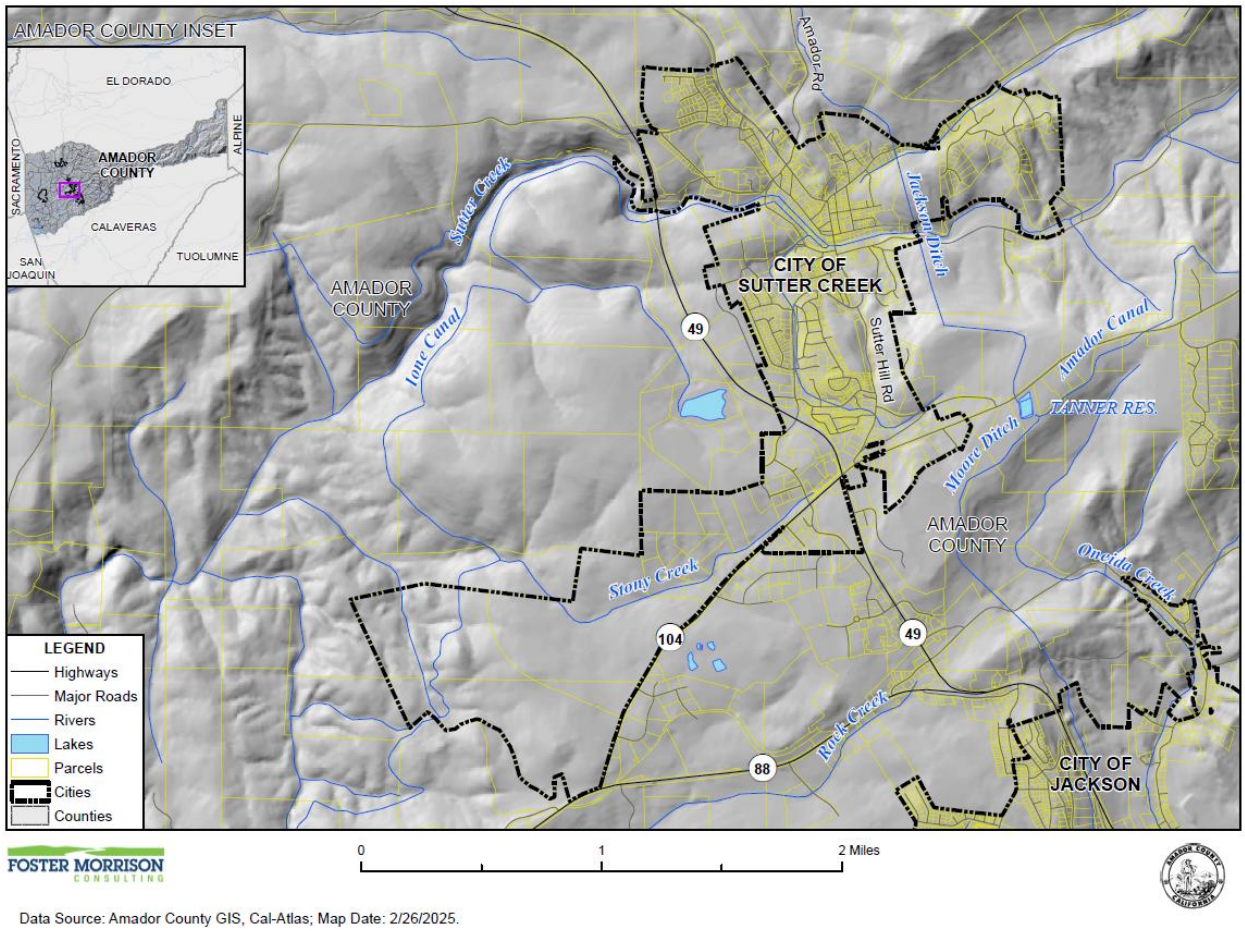
Table E-2 2020 LHMP Incorporation

Planning Mechanism 2020 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
Sewer System Management Plan	Drafted in 2010 and updated in 2015 and 2020. Incorporated portions of the LHMP for rain and storm, flood, and localized flood.

E.3 Community Profile

The community profile for the City of Sutter Creek is detailed in the following sections. Figure E-1 displays a City map and the location of City of Sutter Creek within Amador County.

Figure E-1 City of Sutter Creek



Data Source: Amador County GIS, Cal-Atlas; Map Date: 2/26/2025.

E.3.1. Geography and Climate

The City of Sutter Creek is located in Amador County on the western slope foothills of the Sierra Nevada. The entire City includes the area within present City limits as well as additional contiguous areas which the City believes presently bears relation to its planning. The City and its contiguous area covers approximately 5.25 square miles. Approximately 50% of this total area or 2.5 square miles (approximately 1,580 acres) are within City limits. California's famous "Mother Lode" or "Golden Chain" Highway 49 runs north/south through the City. Downtown Sutter Creek is considered one of the best examples of a historic mining community to be found along this route. The State has registered the City as an historic landmark.

Historically, the City was characterized by a small valley area where the main historic part of the City is located. This valley is surrounded by hills, many parts of which exhibit attractive California oak grassland environment. Annexation of Sutter Hill and Gold Rush Ranch has extended the City into the hills south

and southwest of the valley. The area's vegetation includes pine, oak, and brush lands or chaparral. Elevations range from approximately 1,200 feet above mean sea level (msl) in the historic downtown heart of the City (the valley bottom) to 1,556 feet msl at the Sutter Hill area, a generally commercial and industrial area located at the southern City limits. Sutter Creek itself flows generally from east to west through the City crossing under Old Highway 49 (Main Street) in the historic downtown area. Climate of the City is much like that of valley areas of Amador County.

E.3.2. History

Sutter Creek, a historic gold country town, located in the heart of Amador County, incorporated in 1854. Sutter Creek, known as the "Jewel of the Mother Lode," was named after John Sutter, who sent a party to the area in 1846 in search of timber. His discovery of gold at nearby Coloma triggered the California Gold Rush and Sutter Creek also became a destination for fortune hunters, although Sutter himself only visited the mining camp once. Although plenty of gold was found here, quartz was discovered in 1851 and that became the mainstay of the local economy for many years. In 1932 the Central Eureka mine, discovered in 1869, had reached the 2,300-foot level. By 1939, it was the best paying mine at Sutter Creek.

With the prosperity brought by quartz mining, Sutter Creek became a boom town. Many of the original brick buildings are still standing, as well as some of the mansions built by the wealthier residents. Leland Stanford was one of Sutter Creek's most famous residents.

The mines continued operations until the 1950s. Today, Sutter Creek is a tourist town with many shops and restaurants.

E.3.3. Economy and Tax Base

US Census estimates show economic characteristics for the City of Sutter Creek. These are shown in Table E-3 and Table E-4. Mean household income in the City was $90,158. Median household income in the City was $68,148.

Table E-3 City of Sutter Creek – Civilian Employed Population 16 years and Over

Industry	Estimated Employment	Percent
Agriculture, forestry, fishing and hunting, and mining	60	5.0%
Construction	50	4.3%
Manufacturing	54	4.5%
Wholesale trade	94	7.9%
Retail trade	290	24.4%
Transportation and warehousing, and utilities	0	0.0%
Information	0	0.0%
Finance and insurance, and real estate and rental and leasing	12	1.0%
Professional, scientific, and management, and administrative and waste management services	107	10.8%

Industry	Estimated Employment	Percent
Educational services, and health care and social assistance	167	8.8%
Arts, entertainment, and recreation, and accommodation and food services	193	10.9%
Other services, except public administration	104	7.8%
Public administration	59	5.0%

Source: US Census Bureau American Community Survey 2023 Estimates

Table E-4 City of Sutter Creek – Income and Benefits

Income Bracket	Percent
<$10,000	0.0%
$10,000 – $14,999	4.3%
$15,000 - $24,9999	0.0%
$25,000 – $34,999	11.6%
$35,000 – $49,999	0.0%
$50,000 – $74,999	34.9%
$75,000 – $99,999	16.8%
$100,000 – $149,999	14.4%
$150,000 – $199,999	14.1%
$200,000 or more	4.0%

Source: US Census Bureau American Community Survey 2023 Estimates

Tourism is the largest income generator for the City of Sutter Creek. Tourists are attracted to the City as a historic destination. The City has eleven wine tasting rooms and there are continuous events that attract tourists.

E.4 Risk Assessment

As defined by FEMA, risk is a combination of hazard, vulnerability, and exposure. "It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage."

The City of Sutter Creek risk assessment identifies and profiles relevant hazards and assesses the exposure of lives, property, infrastructure, and the environment to these hazards. The process allows for a better understanding of the City's potential risk and vulnerability to hazards and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

Building on the Community Profile above, a risk assessment was performed for the City utilizing the existing City boundaries. This includes the following sections:

- E.4.1 Assets Inventory and Growth and Development Trends
- E.4.2 Hazard Identification
- E.4.3 Hazard Profiles and Vulnerability to Specific Hazards

E.4.1. Assets Inventory and Growth and Development Trends

This section provides an inventory of the City of Sutter Creek's total assets potentially at risk to hazards and an overview of growth and development trends. This section is broken into two parts:

- **Asset Inventory** – The assets inventory identifies the City of Sutter Creek's total assets, including the people and populations; structures; critical facilities and infrastructure; community lifelines; natural, historic, and cultural resources; and economic assets and community activities of value. This data is not hazard specific, but is representative of total assets within the City, potentially at risk to identified hazards as discussed in Section E.4.3 Hazard Profiles and Vulnerability to Specific Hazards.
- **Growth and Development Trends** – A discussion of growth and development trends in the City, both current and future, is presented.

Assets Inventory

The City's asset inventory is detailed in the following sections:

- People and Populations
- Structures
- Critical Facilities and Infrastructure
- Community Lifelines
- Natural, Historic, and Cultural Resources
- Economic Assets and Community Activities of Value

A discussion of each of these assets follows and serves as the template for the asset discussion for each hazard in Section E.4.3.

People and Populations

The most important asset within any community are the people and populations that reside in the community. This section includes an inventory of past and current populations of the City and also discusses vulnerable populations and underserved communities as a subsection of people and populations located within the City and potentially at risk to hazards. Information from the City, US Census Bureau, California Department of Finance, and other sources as detailed below form the basis of this discussion.

Historic Population Trends and Current Population

Population growth can increase the number of people living in hazard prone areas. The City of Sutter Creek has 2,538 residents, as of January 1, 2025. The City of Sutter Creek has seen growth rates as shown in Table E-5. As shown, the City has grown consistently since 1950, with growth slightly decreasing recently since the 2020 LHMP.

Table E-5 City of Sutter Creek– Population Changes Since 1950

Year	Population	% Change
1950	1,151	–

Year	Population	% Change
1960	1,161	0.9%
1970	1,508	29.9%
1980	1,705	13.1%
1990	1,835	7.6%
2000	2,303	25.5%
2010	2,501	8.6%
2020	2,646	5.8%
2025	2,538	-4.1%

Source: US Census Bureau, California Department of Finance (2025)

Underserved and Vulnerable Populations and Disadvantaged Communities

The City has a socially and economically diverse community, and many residents that are socially or economically disadvantaged or vulnerable due to varying reasons reside within the City. The City and surrounding County are no strangers to large natural disasters which have had a direct impact on the populations of the area. Thus, it is important to consider the potential effects of hazard events and disasters on these more vulnerable populations. Socially vulnerable and disadvantaged communities in the City are discussed by the following sources:

- CDC Social Vulnerability Index
- California Department of Water Resources (CA DWR) Special Populations and Disadvantaged Community Mapping
- FEMA Community Disaster Resilience Zones
- City Planning Team Input

CDC Social Vulnerability Index

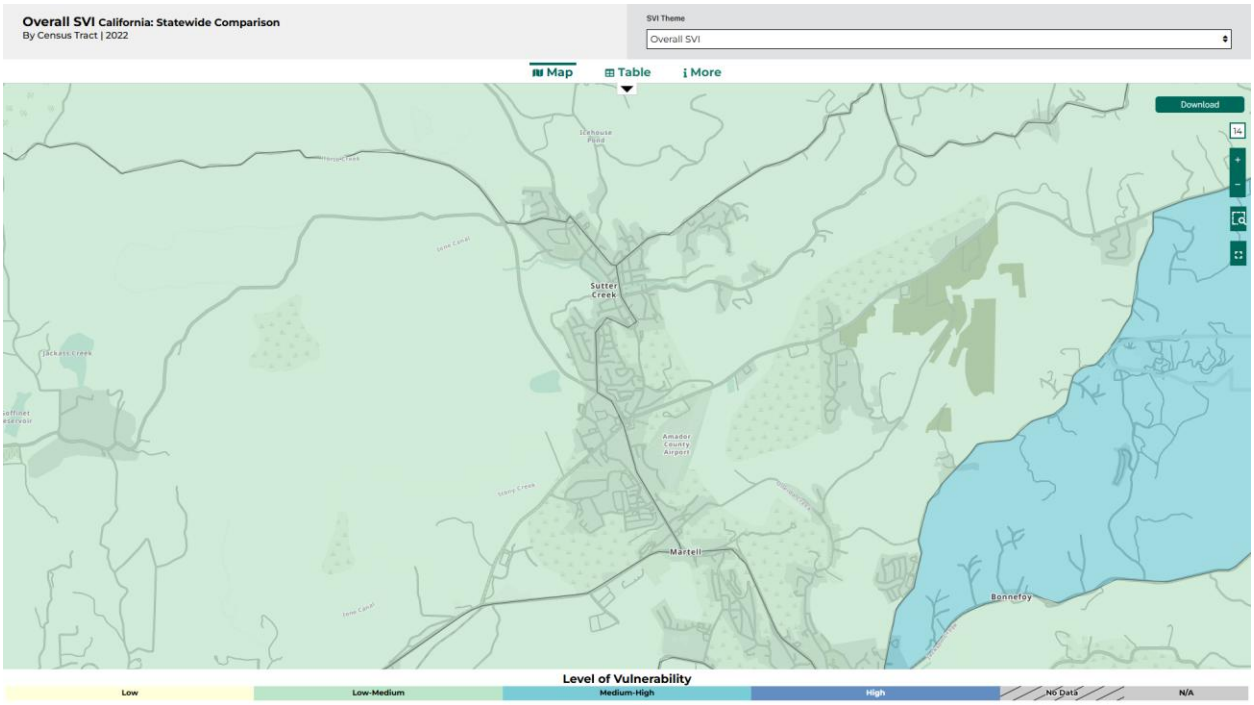
Every community must prepare for and respond to a hazard event, including the range of natural hazards addressed in this Plan, from severe weather extremes to large potentially catastrophic events such as wildfires or earthquakes. A number of factors, including poverty, lack of access to transportation, and crowded housing may weaken a community's ability to prevent human suffering and financial loss in a disaster. These factors are known as social vulnerability.

Social vulnerability refers to the potential negative effects on communities caused by external stresses on human health. Such stresses include natural or human-caused disasters, or disease outbreaks. Reducing social vulnerability can decrease both human suffering and economic loss. The Agency for Toxic Substances and Disease Registry (ATSDR) Geospatial Research, Analysis & Services Program (GRASP) created databases to help emergency response planners and public health officials identify and map communities that will most likely need support before, during, and after a hazardous event. The CDC used these databases to create the CDC Social Vulnerability Index (CDC SVI), which uses 15 U.S. census variables to help local officials identify communities that may need additional support before, during, or after disasters.

CDC SVI uses U.S. Census data to determine the social vulnerability of every census tract. Census tracts are subdivisions of counties for which the Census collects statistical data. The CDC SVI ranks each tract on 15 social factors, including poverty, lack of vehicle access, and crowded housing, and groups them into four related themes. Each tract receives a separate ranking for each of the four themes, as well as an overall ranking. Maps of the four themes for the City are shown in the figures below.

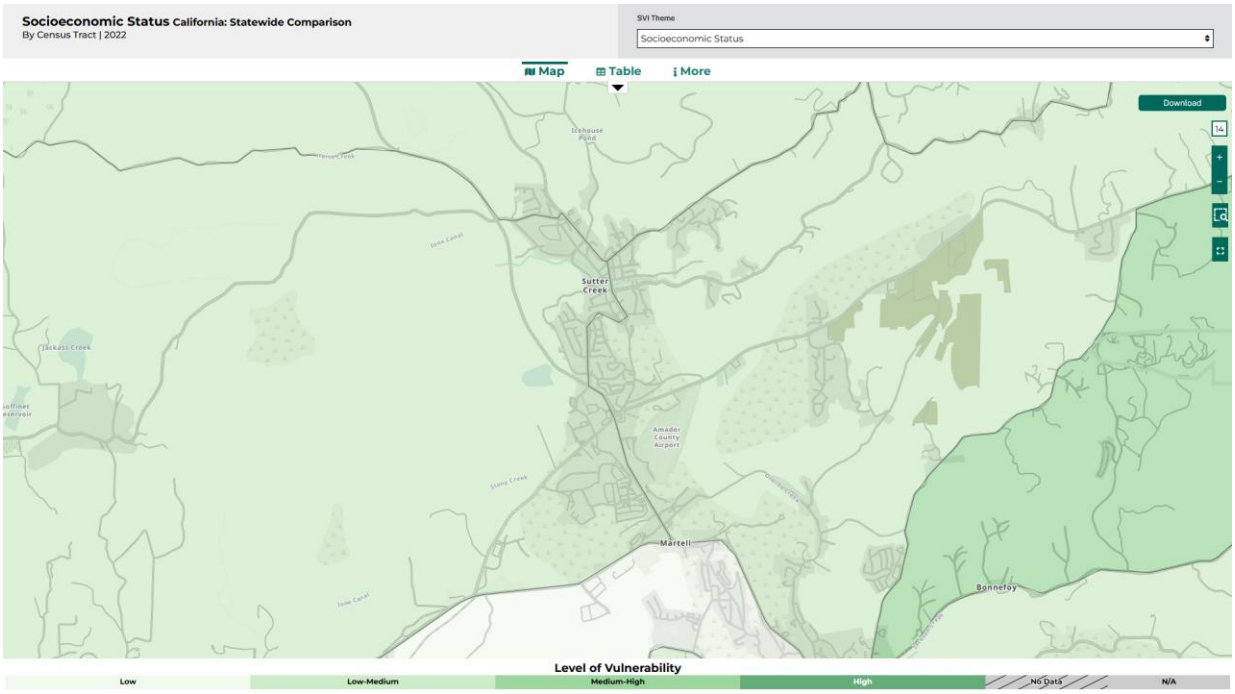
The overall SVI map is shown in Figure E-2; the socioeconomic SVI for the census tracts in and around the City are shown in Figure E-3; the household composition SVI is shown in Figure E-4; the minority and language SVI is shown in Figure E-5; and the housing and transportation SVI is shown in Figure E-6. Overall, the maps indicate that, in general, the City sees little change in social vulnerability regardless of location. As shown, there is very minimal change in each SVI across the City other than in Household Characteristics and Housing Type and Transportation that see slightly more variation.

Figure E-2 City of Sutter Creek – Overall Social Vulnerability



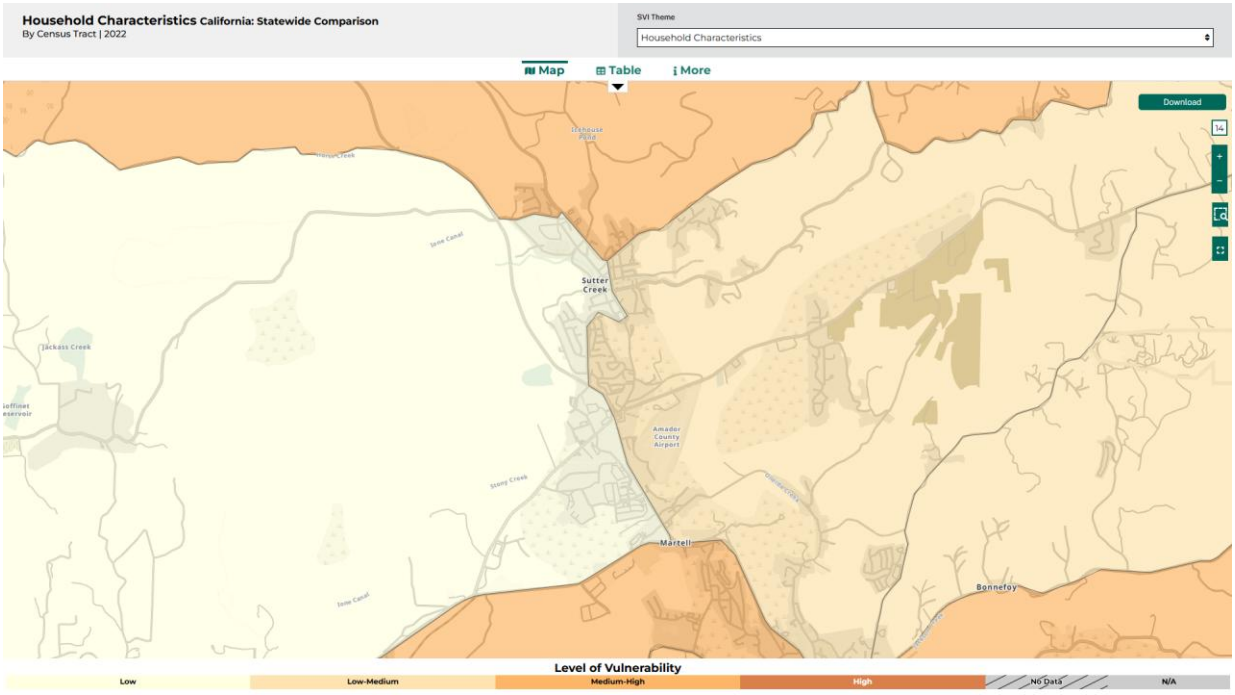
Source: CDC Social Vulnerability Index – map retrieved 12/16/2024
Level of Vulnerability Rating: **Yellow** – Low; **Green** – Low/Medium; **Aqua** – Medium/High; **Blue** – High; **Grey Hatched** – No Data; **Grey** – Not Available

Figure E-3 City of Sutter Creek – Socioeconomic Status Vulnerability



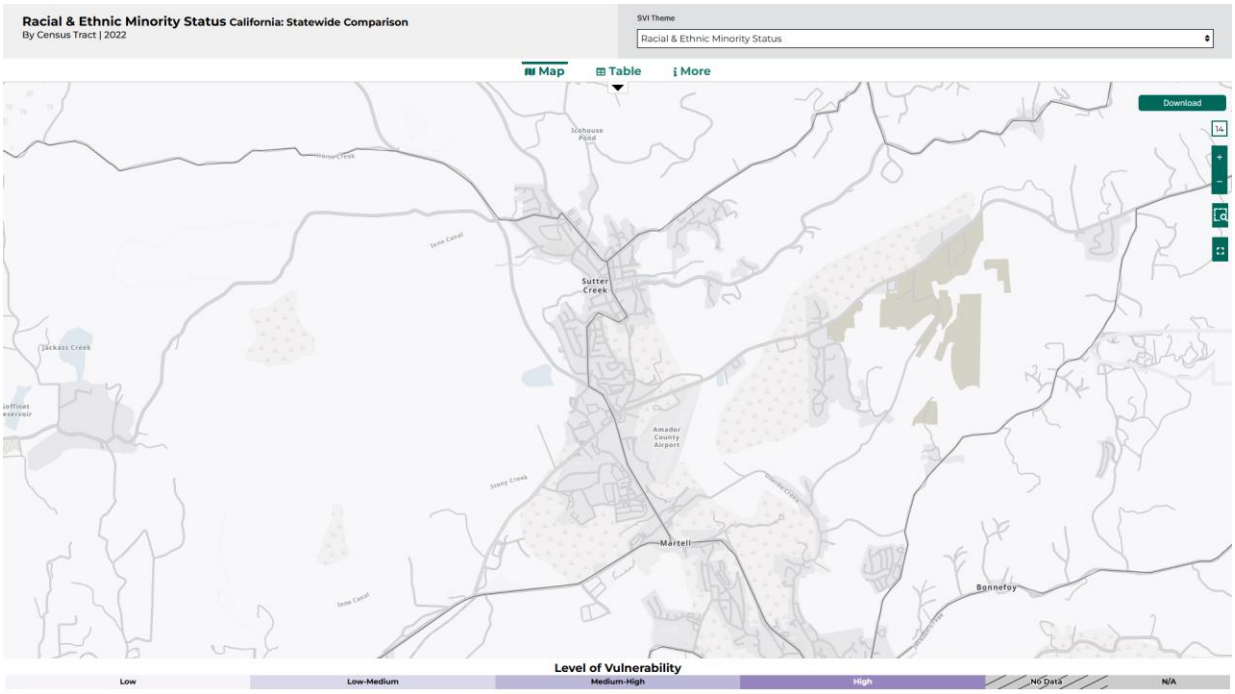
Source: CDC Social Vulnerability Index – map retrieved 12/16/2024
Level of Vulnerability Rating: **Faint Green** – Low; **Light Green** – Low/Medium; **Green** – Medium/High; **Dark Green** – High; **Grey Hatched** – No Data; **Grey** – Not Available

Figure E-4 City of Sutter Creek – Household Characteristics



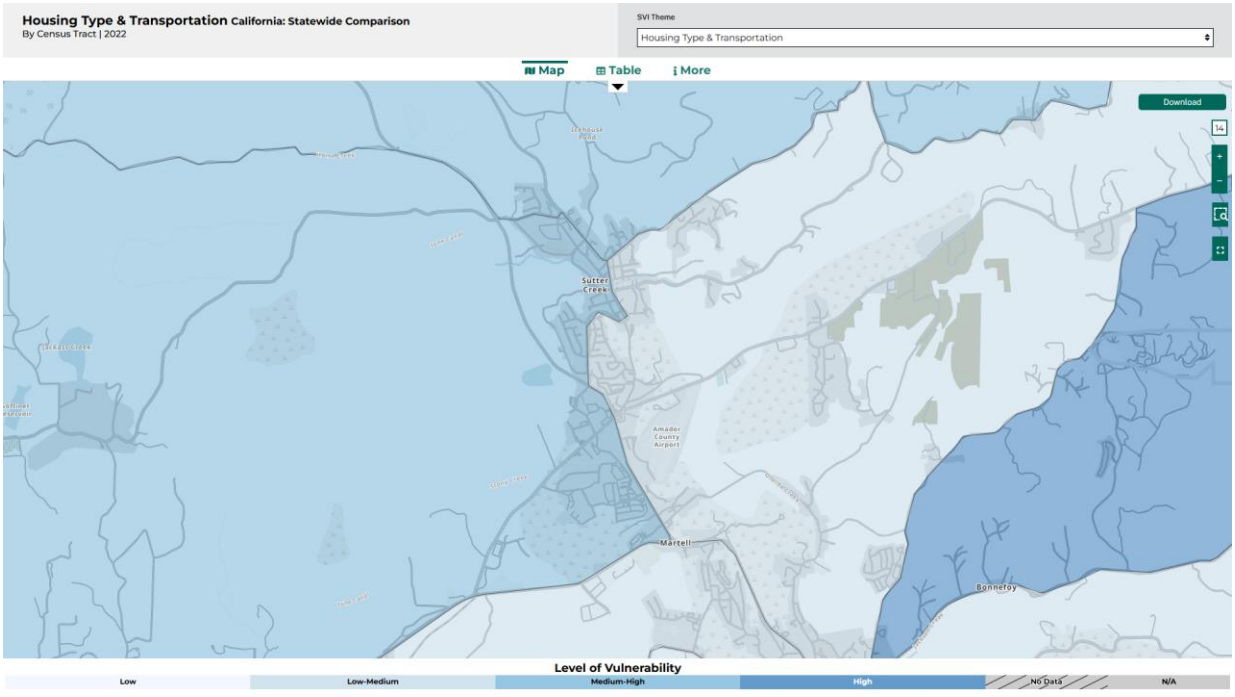
Source: CDC Social Vulnerability Index – map retrieved 12/16/2024
Level of Vulnerability Rating: **Faint Orange** – Low; **Light Orange**– Low/Medium; **Orange** – Medium/High; **Dark Orange** – High; **Grey Hatched** – No Data; **Grey** – Not Available

Figure E-5 City of Sutter Creek – Racial and Ethnic Minority Status



Source: CDC Social Vulnerability Index – map retrieved 12/16/2024
Level of Vulnerability Rating: **Faint Purple** – Low; **Light Purple** – Low/Medium; **Purple** – Medium/High; **Dark Purple** – High; **Grey Hatched** – No Data; **Grey** – Not Available

Figure E-6 City of Sutter Creek – Housing Type and Transportation

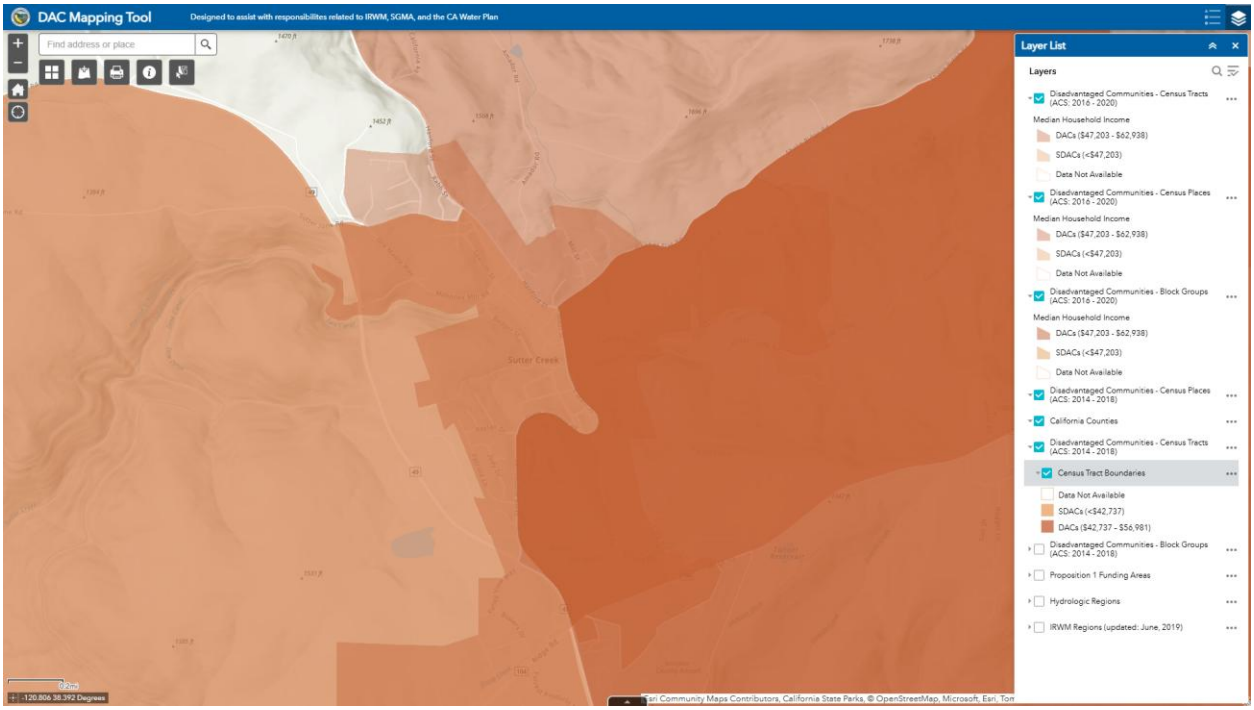


Source: CDC Social Vulnerability Index – map retrieved 12/16/2024
Level of Vulnerability Rating: **Faint Blue** – Low; **Light Blue** – Low/Medium; **Blue** – Medium/High; **Dark Blue** – High; **Grey Hatched** – No Data; **Grey** – Not Available

California DWR Disadvantaged Community Mapping Tool

The State of California's Proposition 1 Disadvantaged Community (DAC) Involvement Program is designated to ensure the involvement of DACs as well as Economically Distressed Areas and Underrepresented Communities, which DWR collectively refers to as DACs. The Cal DWR definition for a Disadvantaged Community is a community with an annual median household income (MHI) that is less than 80% of the Statewide annual MHI (PRC Section 75005(g)), and those census geographies with an annual MHI less than 60% of the Statewide annual MHI are considered "Severely Disadvantaged Communities". Those areas in the City considered disadvantaged are shown in Figure E-7. As shown, much of the City falls in these DAC areas.

Figure E-7 City of Sutter Creek – Disadvantaged Areas

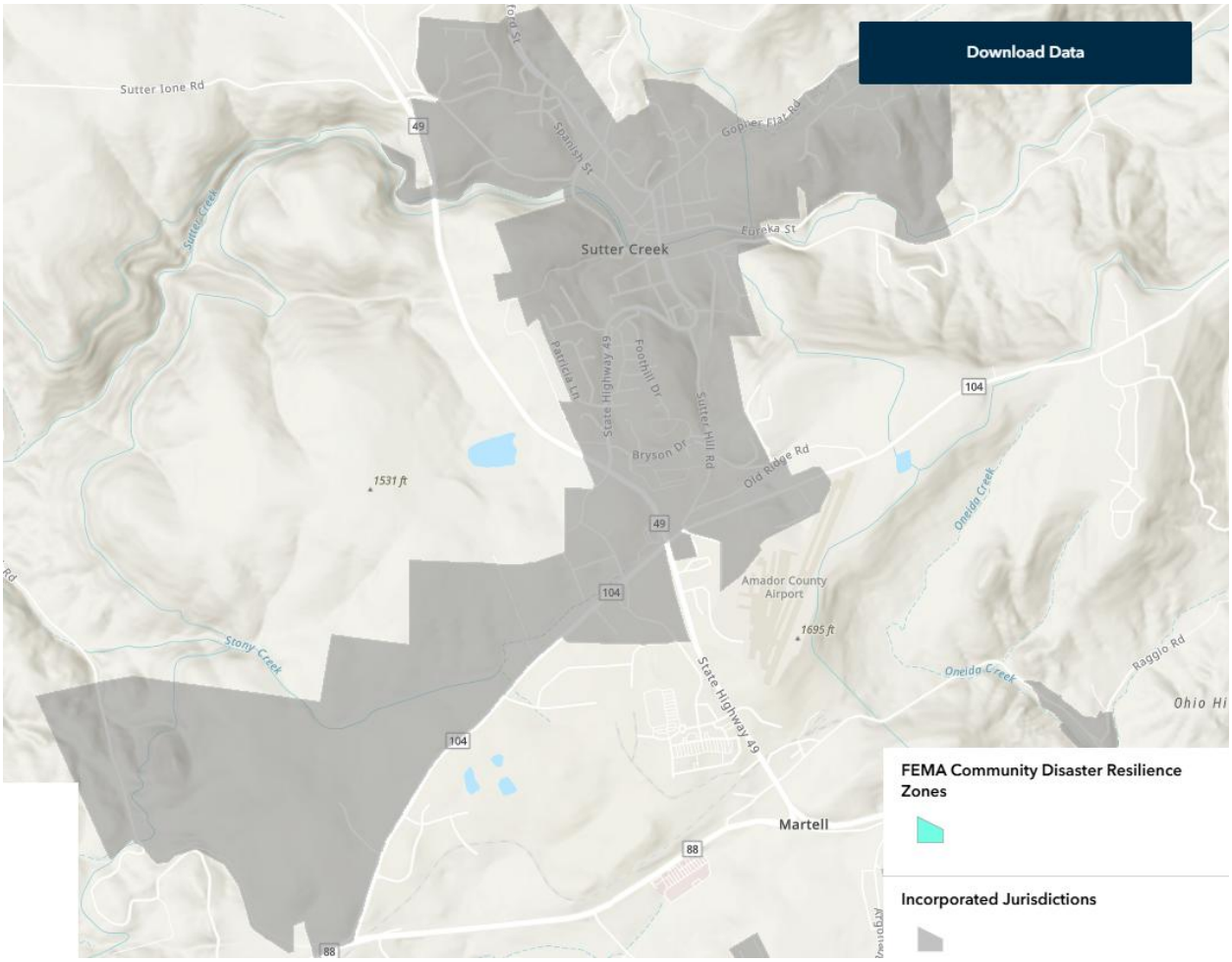


Source: Cal DWR DAC Mapping Tool – retrieved 12/16/2024

FEMA Community Disaster Resilience Zones

Community Disaster Resilience Zones aim to build and strengthen community resilience across the nation by driving federal, public, and private resources to the most at-risk and in-need communities. The Community Disaster Resilience Zones Act uses FEMA's National Risk Index to identify the most at-risk and in-need communities to identify resilience zones. Designated zones will be prioritized for targeted federal support, such as increased cost-share for resilience and mitigation projects, lessening the financial burden on communities to perform resilience-related activities. On September 6, 2023, FEMA announced the initial 483 designations in all 50 states and the District of Columbia. Figure E-8 shows these zones in teal green. As shown, there are no zones near the City limits.

Figure E-8 City of Sutter Creek – FEMA Community Disaster Resilience Zones



Source: FEMA. Map retrieved 12/16/2024

City Planning Team Input

The City has a substantial elderly population. The City is a disadvantaged community with a median household income of $68,148 (71% of California state median household income). The City has one mobile home park that is primarily made up of low-income residents.

City of Sutter Creek Items from the Amador County 2021-2029 Housing Element

The City Planning Team noted that the Amador County 2021-2029 Housing Element discusses special populations in the City. While the Housing Element information can be found in the Base Plan, there are unique elements to the City that are included here. Discussions for seniors, those with disabilities, developmental disabilities, people experiencing homelessness, large households, female headed households, extremely low-income households, and farmworkers were included. These are discussed below.

Seniors

The total population of seniors in Sutter Creek is 779 persons. 279 individuals are homeowners while 244 of this population rent their residence.

Disabled Citizens

The total population of disabled citizens in the City is 9.4% of the population.

People with Developmental Disabilities

Due to the method of gathering data using zip codes, it is estimated that there are a total of >26 individuals with developmental disabilities residing in the City.

People Experiencing Homelessness

The Amador Tuolumne Community Action Agency was contacted for homeless data, and it was found that there were no unsheltered homeless individuals identified in the City on a given night.

Large Households

Large households are defined as 5 or more persons residing in the same home, which only makes up 6.9% of the total households countywide. In the City, 8.3% of this population owned homes with 5 or more people, with 7.6% of the population renting.

Female Headed Households

Female headed households make up 15.1% of the City's population. Of this percentage, 41.3% live below the poverty line.

Farmworkers

The City data shows that 71 persons (6.8%) of 1,046 employed residents work in the agriculture, (also including forestry, fishing, hunting, and mining) industry.

Extremely Low Income

The level of poverty in a jurisdiction often influences the need for housing to accommodate those persons and families in the Very Low and Low-income categories. The U.S. Census Bureau measures poverty by using a set of money income thresholds that vary by family size and composition of who is in poverty. If a family's total income is less than the family's threshold, then that family and every individual in it is considered in poverty. While the overall County experiences a poverty rate of 9.9%, the City has a percentage of individuals and households likely to be living in poverty. In 2019, 15.1% of individuals and families living in the City were living below the poverty level.

Structures

This section inventories the parcels (and associated structures) that make up the built environment of the City. The 2024 Amador County Assessor's data and the associated parcel layer was used as the basis of this inventory. The methodology used to derive the number of total and improved parcels (i.e., those with an improved structure value) and land and improved property values (as well as content replacement values) follows the same methodology detailed in Section 4.2.1 of the Base Plan. This data should only be used as a guideline to overall values in the City, as the information has some limitations. The most significant limitations are created by Proposition 13. With respect to Proposition 13, instead of adjusting property values annually, the values are not adjusted or assessed at fair market value until a property transfer occurs. As a result, overall value information is most likely low and does not reflect current market value of properties within the City. It is also important to note, in the event of a disaster, it is often the value of the infrastructure or improvements to the land that is of concern or at risk. Generally, the land itself is not a loss. However, depending on the type of hazard and impact of any given hazard event, land values may be adversely affected; thus, land values are included as appropriate. Table E-6 shows the Amador County Parcel/Assessor Data land and structure values and content replacement values (e.g., the values at risk) broken down by property use for the City.

Table E-6 City of Sutter Creek – Total Value of Parcels and Structures by Property Use

Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Agricultural	6	2	$1,095,761	$170,670	$170,670	$1,437,101
Commercial	148	109	$25,988,057	$64,766,892	$64,766,892	$155,521,841
Industrial	2	2	$360,603	$882,145	$1,323,218	$2,565,966
Miscellaneous	39	0	$16,077	$0	$0	$16,077
Residential	1,230	1,042	$103,154,497	$262,717,770	$131,358,885	$497,231,152
Unknown	9	5	$3,060,210	$2,802,384	$0	$5,862,594
Sutter Creek Total	**1,434**	**1,160**	**$133,675,205**	**$331,339,861**	**$197,619,665**	**$662,634,731**

Source: 2024 Amador County Parcel/Assessor Data

Critical Facilities and Infrastructure

Beyond just the buildings and structures that comprise the built environment, it is important to identify the critical facilities and infrastructure that are critical for life safety and property protection. This is done for the City of Sutter Creek below.

For purposes of this plan, a critical facility is defined as:

> ***Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.***

A critical facility is classified by the following categories: (1) Essential Services Facilities, (2) At-Risk Populations Facilities, and (3) Hazardous Materials Facilities, as discussed in Section 4.3.1 of the Base Plan.

Note: The Hazardous Materials Facilities, while considered critical facilities for purposes of this Plan Update, are not mapped in this Plan due to the lack of an available GIS layer. In addition to the mapped critical facilities, it should further be noted that additional critical facilities, including infrastructure, utilities, and others have been identified for the City of Sutter Creek and the larger Amador County Planning Area but are not included in the mapping and inventory due to privacy and security concerns.

An inventory of critical facilities in the City of Sutter Creek from Amador County GIS is shown on Figure E-9. Table E-7 gives summary information about the critical facilities in the City. Table E-8 details the facility categories and breaks them down by facility type. Details of critical facility definition, type, name, address, and jurisdiction by hazard zone are listed in Appendix F.

Figure E-9 City of Sutter Creek – Critical Facilities

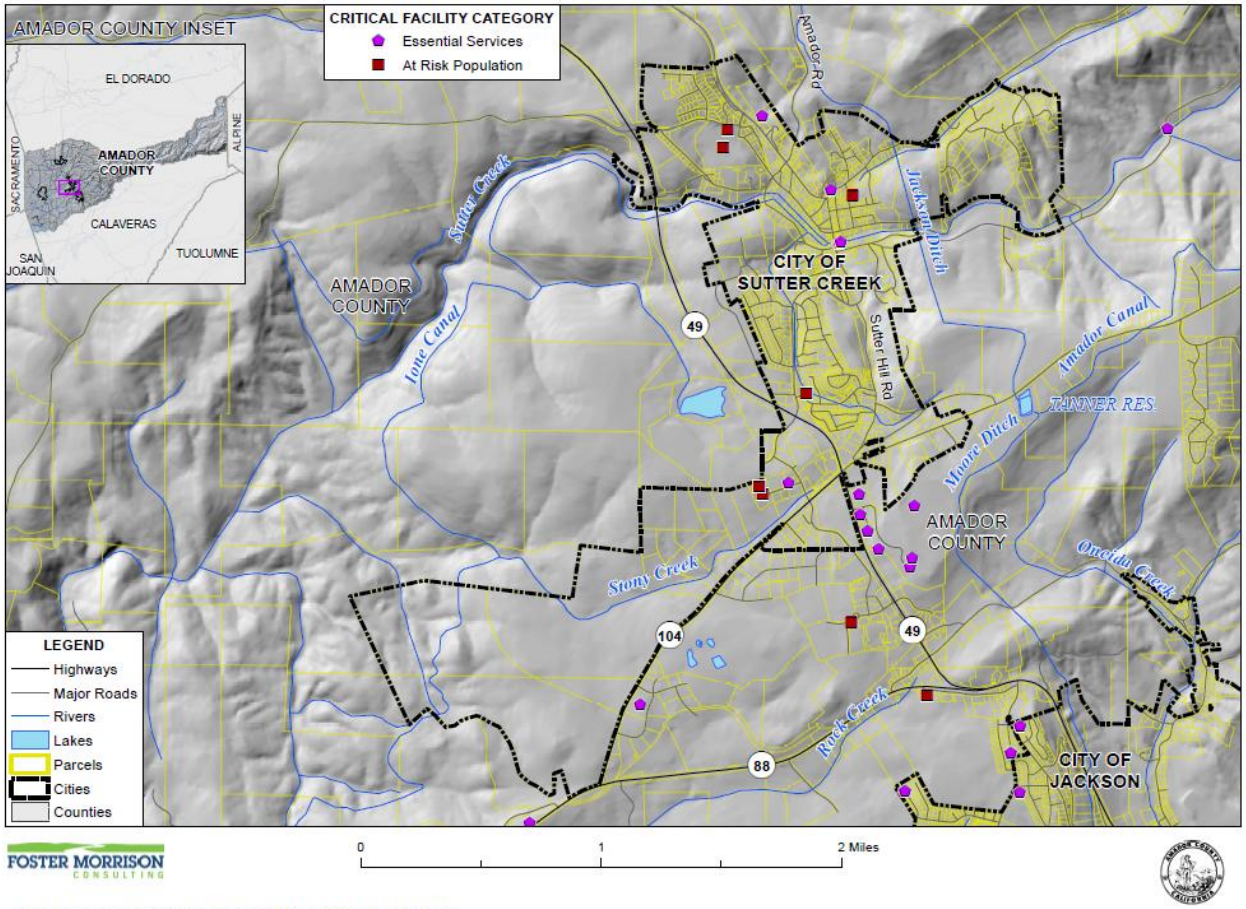


Table E-7 City of Sutter Creek – Critical Facilities by Category

Critical Facility Category	Facility Count
Essential Services Facilities	7

Critical Facility Category	Facility Count
At Risk Population Facilities	6
City of Sutter Creek Total	**13**

Source: Amador County GIS

Table E-8 City of Sutter Creek – Critical Facilities by Category and Type

Critical Facility Category	Critical Facility Type	Facility Count
Essential Services	Community Center	2
	Fire Station	2
	Police Station	1
	Post Office	1
	Public Administration Building	1
	Essential Services Total	**7**
At Risk Population	Residential Care Facility	1
	School	5
	At Risk Population Total	**6**
Sutter Creek Total		**13**

Source: Amador County GIS

Community Lifelines

Assessing the vulnerability of the City of Sutter Creek to natural hazards and disasters also involves reviewing and inventorying the community lifelines in place that could be affected. It is important to include these items in hazard discussions as the continuous operation of critical government and business functions is essential to human health and safety, property protection, and economic security. The importance of community lifelines is discussed below:

- Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function.
- FEMA has developed a method for objectives-based response that prioritizes the rapid stabilization of Community Lifelines after a disaster.
- The integrated network of assets, services, and capabilities that provide lifeline services are used day-to-day to support the recurring needs of the community and enable all other aspects of society to function.
- When disrupted, decisive intervention (e.g., rapid re-establishment or employment of contingency response solutions) is required to stabilize the incident.

Community lifelines, as defined by FEMA, include the following:

- **Safety and Security** – Law Enforcement/Security, Fire Service, Search and Rescue, Government Service, Community Safety
- **Food, Hydration, Shelter** – Food, Water, Shelter, Agriculture
- **Health and Medical –** Medical Care, Public Health, Patient Movement, Medical Supply Chain, Fatality Management

- **Energy –** Power Grid, Fuel
- **Communications** – Infrastructure, Responder Communications, Alerts Warnings and Messages, Finance, 911 and Dispatch
- **Transportation** – Highway/Roadway/Motor Vehicle, Mass Transit, Railway, Aviation, Maritime
- **Hazardous Material –** Facilities, HAZMAT, Pollutants, Contaminants
- **Water Systems** – Potable Water Infrastructure, Wastewater Management

It should be noted that these community lifelines are all in place and functional as part of regular government operations in the Amador County Planning Area serving as a partnership between the cities, local special districts and agencies, and Amador County. Due to its more rural nature, there is an interplay in community lifelines between all jurisdictions in the County. Most all of the City's community lifelines overlap with the Planning Area's. It should also be noted that these lifelines collectively include many of the critical facilities and infrastructure assets inventoried for this LHMP. As such, specific information on these community lifelines in the City and how they may be affected by a hazard event or disaster are discussed collectively for all jurisdictions in the Base Plan.

Natural, Historic, and Cultural Resources

Assessing the vulnerability of the City of Sutter Creek to natural hazards and disasters also involves inventorying the natural, historic, and cultural assets of the area. This step is important for the following reasons:

- Environmental and natural resources add to a community's identity and quality of life. They also help the local economy through agriculture, tourism, and recreation. They support ecosystem services, such as clean air and water.
- Conserving the environment may help people mitigate risk. It can also protect sensitive habitats, develop parks and trails, and build the economy.
- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- If these resources are impacted by a disaster, knowing so ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts are higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.

Natural Resources

The City contains a variety of natural resources. Natural resources are unique to each area, often provide an important function, and are difficult to replace. Should a natural disaster occur, these species, resources, and locations are at risk.

Natural resources of significance to the City include Sutter Creek, open space areas, and the Oak forests found on surrounding hillsides. The City is located in the "upper Sonoran," or "foothill" life zone, a long belt of lands containing similar plants and animals which generally runs at the 200 to 2,000-foot elevation north to south through the Sierra Nevada foothills. This belt is usually characterized by intermingled pine-

oak woodland and brush lands. Brush lands within the planning area are generally less extensive than in other parts of the foothill belt. Some of the City's visually and environmentally sensitive areas contain aspects of the neighboring lower Sonoran zone or great central valley; valley oak, grasslands, riparian areas and wetlands.

Wetlands and their Natural and Beneficial Functions

Wetlands are habitats in which soils are intermittently or permanently saturated or inundated. Wetland habitats vary from rivers to seasonal ponding of alkaline flats and include swamps, bogs, marshes, vernal pools, and riparian woodlands. Wetlands are considered to be waters of the United States and are subject to the jurisdiction of the U.S. Army Corps of Engineers as well as the California Department of Fish and Wildlife (CDFW). Where the waters provide habitat for federally endangered species, the U.S. Fish and Wildlife Service may also have authority.

Wetlands are a valuable natural resource for communities providing beneficial impact to water quality, wildlife protection, recreation, and education, and play an important role in hazard mitigation. Wetlands provide drought relief in water-scarce areas where the relationship between water storage and streamflow regulation is vital and reduce flood peaks and slowly release floodwaters to downstream areas. When surface runoff is dampened, the erosive powers of the water are greatly diminished. Furthermore, the reduction in the velocity of inflowing water as it passes through a wetland helps remove sediment being transported by the water.

Wetlands are often found in floodplains and depressional areas of a watershed. Many wetlands receive and store floodwaters, thus slowing and reducing downstream flow. Wetlands perform a variety of ecosystem functions including food web support, habitat for insects and other invertebrates, fish and wildlife habitat, filtering of waterborne and dry-deposited anthropogenic pollutants, carbon storage, water flow regulation (e.g., flood abatement), groundwater recharge, and other human and economic benefits.

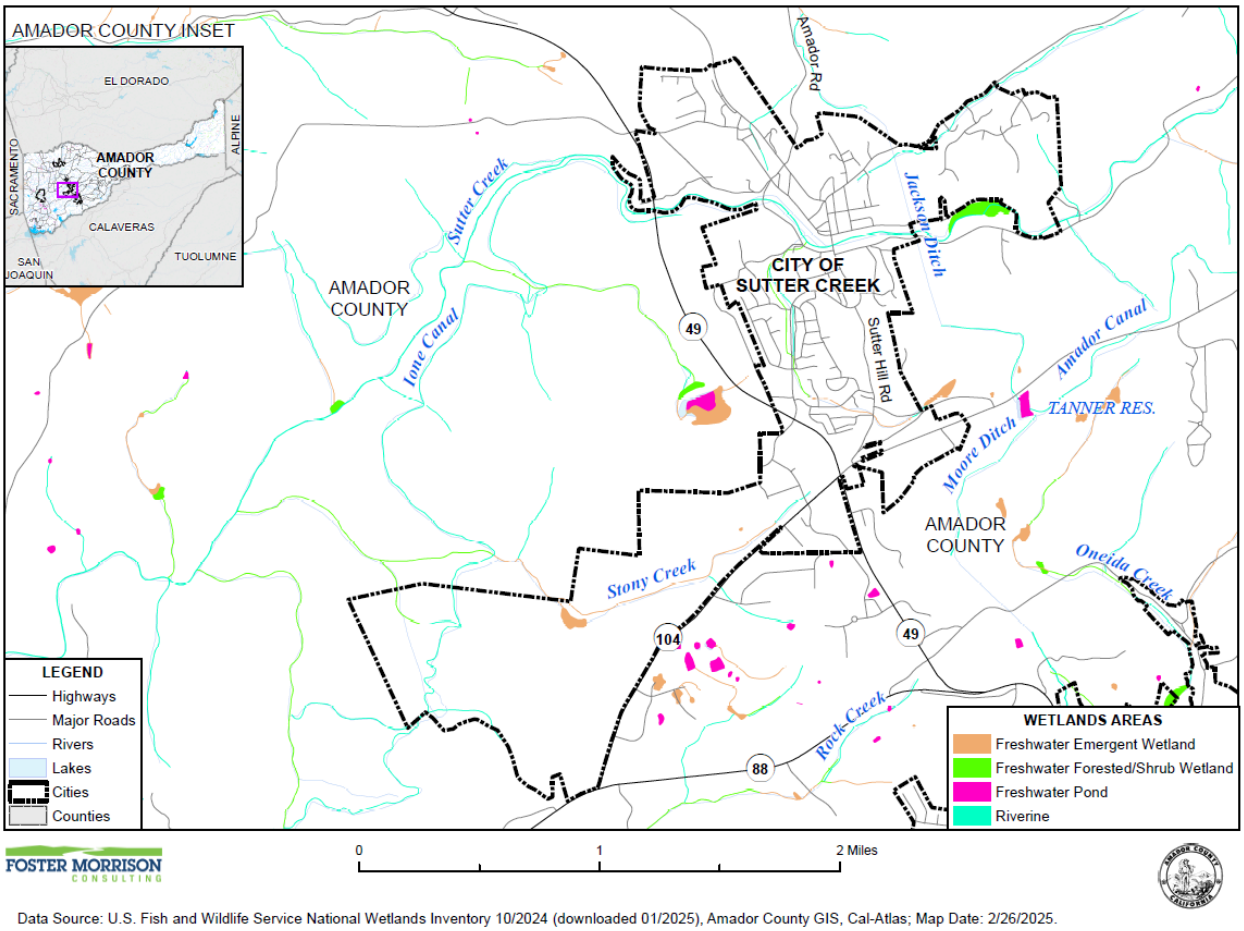
Wetlands, and other riparian and sensitive areas, provide habitat for insects and other invertebrates that are critical food sources to a variety of wildlife species, particularly birds. There are species that depend on these areas during all parts of their lifecycle for food, overwintering, and reproductive habitat. Other species use wetlands and riparian areas for one or two specific functions or parts of the lifecycle, most commonly for food resources. In addition, these areas produce substantial plant growth that serves as a food source to herbivores (wild and domesticated) and a secondary food source to carnivores.

Wetlands slow the flow of water through the vegetation and soil, and pollutants are often held in the soil. In addition, because the water is slowed, sediments tend to fall out, thus improving water quality and reducing turbidity downstream.

These natural floodplain functions associated with the natural or relatively undisturbed floodplain that moderates flooding, such as wetland areas, are critical for maintaining water quality, recharging groundwater, reducing erosion, redistributing sand and sediment, and providing fish and wildlife habitat. Preserving and protecting these areas and associated functions are a vital component of sound floodplain management practices for the City.

Wetlands in the City are shown in Figure E-10 and detailed in Table E-9.

Figure E-10 City of Sutter Creek – Wetlands Areas



Data Source: U.S. Fish and Wildlife Service National Wetlands Inventory 10/2024 (downloaded 01/2025), Amador County GIS, Cal-Atlas; Map Date: 2/26/2025.

Table E-9 City of Sutter Creek – Wetland Types and Acreages

Wetlands Area Type	Wetlands Count	Wetlands Area (in Acres)
Freshwater Emergent Wetland	4	6.92
Freshwater Forested/Shrub Wetland	3	2.42
Freshwater Pond	0	0.0
Lake	0	0.0
Riverine	12	12.59
Sutter Creek Total	**19**	**21.93**

Source: US Fish and Wildlife Service

Historic and Cultural Resources

Historic and cultural resources are difficult to replace. Should a natural disaster occur, these properties and locations can be at risk. The City of Sutter Creek has a stock of historically significant homes, public buildings, and landmarks. The California Department of Parks and Recreation Office of Historic Preservation (OHP) was the primary source of information. OHP administers the National Register of

Historic Places, the California Register of Historical Resources, California Historical Landmarks, and the California Points of Historical Interest programs. Each program has different eligibility criteria and procedural requirements. These requirements are detailed in Section 4.2.1 of the Base Plan. Table E-10 shows 4 historic buildings in the City from the OHP Database.

Table E-10 City of Sutter Creek – Historic Resources

Resource Name (Plaque Number)	National Register	State Landmark	Point of Interest	Date Listed	City/ Community
Sutter Creek (322)		X		7/12/1939	Sutter Creek
Knight's Foundry and Shops (N375)	X			7/1/1975	Sutter Creek
Sutter Creek Grammar School (N456)	X			12/12/1976	Sutter Creek
Knight Foundry (1007)		X		8/21/1992	Sutter Creek

Source: California Department of Parks and Recreation Office of Historic Preservation. Retrieved 12/3/2024.

It should be noted that these lists may not be complete, as they may not include those currently in the nomination process and not yet listed. Additionally, as defined by the California Environmental Quality Act (CEQA) and the National Environmental Policy Act (NEPA), any property over 50 years of age is considered a historic resource and is potentially eligible for the National Register. Thus, in the event that the property is to be altered, or has been altered, as the result of a major federal action, the property must be evaluated under the guidelines set forth by CEQA and NEPA. Structural mitigation projects are considered alterations for the purpose of this regulation.

Economic Assets and Community Activities of Value

Assessing the vulnerability of the City of Sutter Creek to natural hazards and disasters also involves inventorying the economic assets and community activities of value in the City.

Economic Assets

After a disaster, economic resiliency is one of the major drivers of a speedy recovery. Each community has specific economic drivers. These include:

- Primary Economic Sectors
- Major employers
- Commercial Centers

In the City of Sutter Creek, this includes the following:

- Commercial Centers
  - ✓ Auditorium (houses local sports practices for basketball and volleyball)
  - ✓ Community Center
  - ✓ Historic Grammar School (museum and arts council)
  - ✓ Knights Foundry
  - ✓ Baseball Field (baseball and concerts in the park)
- Major employers

- ✓ Ramco (uniform cleaning services)
- ✓ Sweet Pea (septic company)
- ✓ Transportation center
- ✓ Cement Plant.

Note: This inventory of economic assets is only included in this overall asset inventory for the City. To limit redundancy, it is not discussed further in the hazard profiles and vulnerability assessments in Section E.4.3 below. However, depending on the type, location, magnitude and extent of future hazard events and disasters, these City's economic assets may be vulnerable.

Community Activities of Value

Inventorying economic assets in the City and their vulnerability to natural hazards and disasters also involves inventorying activities that have value to the community. This includes activities that are important to a community, like long-standing traditions such as a festival or fair. Some areas rely on seasonal industries to sustain them throughout the year. Many of these activities also provide economic benefits to the City. A hazard event that cancels or shortens these can affect a community's livelihood and can make disaster recovery more difficult or prolonged. This includes activities such as:

- Festivals and Fairs
- Sporting Events
- Tourism
- Local Pools
- Local Splash Pools

The City noted the following community activities of value:

- Las Posadas
- Parade of lights
- Italian Picnic
- Kit Carson Wagon Train
- Car shows (various throughout the year)
- Farmers Markets, one to two various events on Main street per month

Note: This inventory of community activities of value only occurs in this overall asset inventory for the City. To limit redundancy, it is not discussed further in the hazard profiles and vulnerability assessments in Section E.4.3 below. However, depending on the type, location, magnitude and extent of future hazard events and disasters, the City's community activities of value may be vulnerable.

Growth and Development Trends

As part of the planning process, the City looked at changes in growth and development, both current and future, and examined these changes in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability over time.

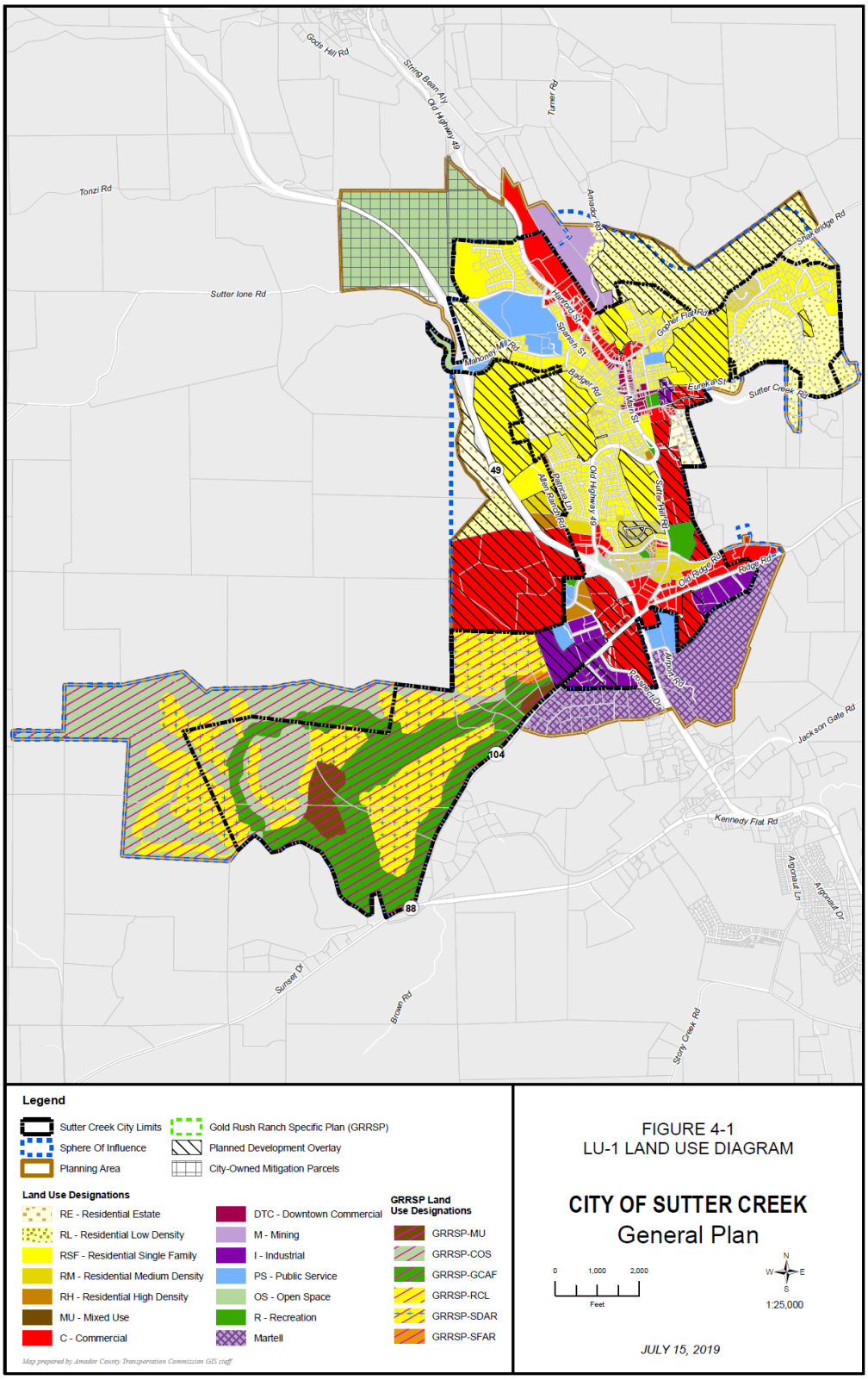
Land Use

State planning law requires that a land use element of a general plan include a statement of the standard population density, building intensity, and allowed uses for the various land use designations in the plan (Government Code Section 65302(a)). The City's land use designations are generally described below and mapped on the Land Use Diagram (Figure E-11). The City of Sutter Creek Municipal Code provides detailed land use and development standards for development.

The Municipal Code works hand in hand with the City's General Plan Land Use Element. The purpose of the Land Use Element is to provide goals, policies, actions diagrams and standards to guide future land use decisions in the City of Sutter Creek. While all elements of the General Plan have equal weight under California law, in some respects this Element is the most far-reaching. It informs all other elements of the General Plan, shaping the future transportation network and the location of future housing sites, and influencing public facility requirements and park and recreation needs. It defines the City's future open space system and responds to natural resource conservation issues and safety hazards. It establishes the basic pattern of development in the City for the next 20-25 years, including land uses and densities, and presents the policies and actions to ensure that future development will enhance the quality of life for all City of Sutter Creek residents.

Future land use for the City of Sutter Creek from the 2019 City of Sutter Creek General Plan Land Use Element is shown on Figure E-11.

Figure E-11 City of Sutter Creek – Land Use Diagram



Source: City of Sutter Creek. Retrieved 6/18/2024

Population Trends and Projections

There are no future City population projections. Amador County as a whole is expected to slowly continue to increase in population. As such, it is assumed that the City may see slow population growth as well.

Development since 2020 Plan

Development has occurred in the City since the last plan. Some of this has occurred in hazard prone areas. The City Planning Department tracked total building permits issued since 2020 for the City. These are tracked by total development, property use type, and hazard risk area. These are shown in Table E-11 and Table E-12. Development has been slow in Sutter Creek over the past 5 years with no new subdivisions. The majority of development has been through infill projects. There are previously planned subdivision that were never completed in the re entitlement phase now.

Table E-11 City of Sutter Creek – Total Development Since 2020

Property Use	2020	2021	2022	2023	2024
Residential	1	3	0	4	0
Commercial	0	0	0	10	0
Industrial	0	0	0	0	0
Other	0	0	0	0	0
Total	**1**	**3**	**0**	**14**	**0**

Source: City of Sutter Creek Planning Department

Table E-12 City of Sutter Creek – Development in Hazard Areas since 2020

Property Use	1% Annual Chance Flood	Levee Protected Area	Wildfire Risk Area[1]	Other
Residential	**0**	1	**0**	**0**
Commercial	**0**	**0**	**0**	**0**
Industrial	**0**	**0**	**0**	**0**
Other	**0**	**0**	**0**	**0**
Total	**0**	**0**	**0**	**0**

Source: City of Sutter Creek Planning Department

[1]Moderate or higher wildfire risk area

Development has occurred in the identified hazard areas. It was completed in accordance with all current and applicable development codes, including floodplain ordinances, wildfire codes, and other applicable standards and should be adequately protected. Thus, with the exception of more people living in the area potentially exposed to natural hazards, this growth should not cause a significant change in vulnerability of the City to identified priority hazards.

Future Development Areas

It is important to review future development plans for the City. Future development should be sited in areas that are away from known hazard risks. If this is not possible, mitigation should be done to ensure that future development is protected against future hazards.

GIS Analysis

The City of Sutter Creek provided five areas in the City expected to see future development. This includes BLA-Rossi, DANCO, Jackson Rancheria Development Corp., TM 2917, and TM 2925. This can be seen in Table E-13. The first column in this table lines up with the areas on Figure E-12. In addition to the mapped areas, the City is planning improvements to the wastewater treatment plant.

Table E-13 City of Sutter Creek Future Development Areas

Site/ Map ID	Site/Location Name	Address	Acres	Future Development Type	Units	Future Development Status	Comments/ Description	Total Improved Acres	Total Unimproved Acres	Comments
A	BLA-Rossi	29 Spanish Street	0.18	Residential	2	Final Map Approved	N/A	1	0	2 units across the 3 parcels
	BLA-Rossi	21 Clean Creek Way	0.18	Residential		Final Map Approved	N/A	1	1	2 units across the 3 parcels
	BLA-Rossi	25 Clean Creek Way	0.23	Residential		Final Map Approved	N/A	1	1	2 units across the 3 parcels
B	DANCO	Valley View at Bowers Road	2.06	Residential	46	Approved	Permanent supportive housing	1	0	Corrected APN based on address location
C	Jackson Rancheria Development Corp.	Ridge Road	1.15	Commercial	N/A	Approved	RV storage lot	1	0	No units provided
	Jackson Rancheria Development Corp.		1.31	Commercial	N/A	Approved	RV storage lot	1	0	No units provided
	Jackson Rancheria Development Corp.		1.16	Commercial	N/A	Approved	RV storage lot	1	0	No units provided

Site/ Map ID	Site/Location Name	Address	Acres	Future Development Type	Units	Future Development Status	Comments/ Description	Total Improved Acres	Total Unimproved Acres	Comments
D	TM 2917	81 Spanish Street	0.59	Residential	2	Final Map Approved	2 lot subdivision	1	1	Corrected APN based on address location
E	TM 2925	381, 383, 385 Sutter Hill Road	1.06	Residential	16 - 29	Final Map Approved	2 lot subdivision in the R-3 zone	1	1	

Source: City of Sutter Creek

These future development areas were provided by the City of Sutter Creek. Using GIS, these areas were mapped. These areas are shown on Figure E-12, and detailed by parcels and acres in Table E-14.

Figure E-12 City of Sutter Creek – Future Development Areas

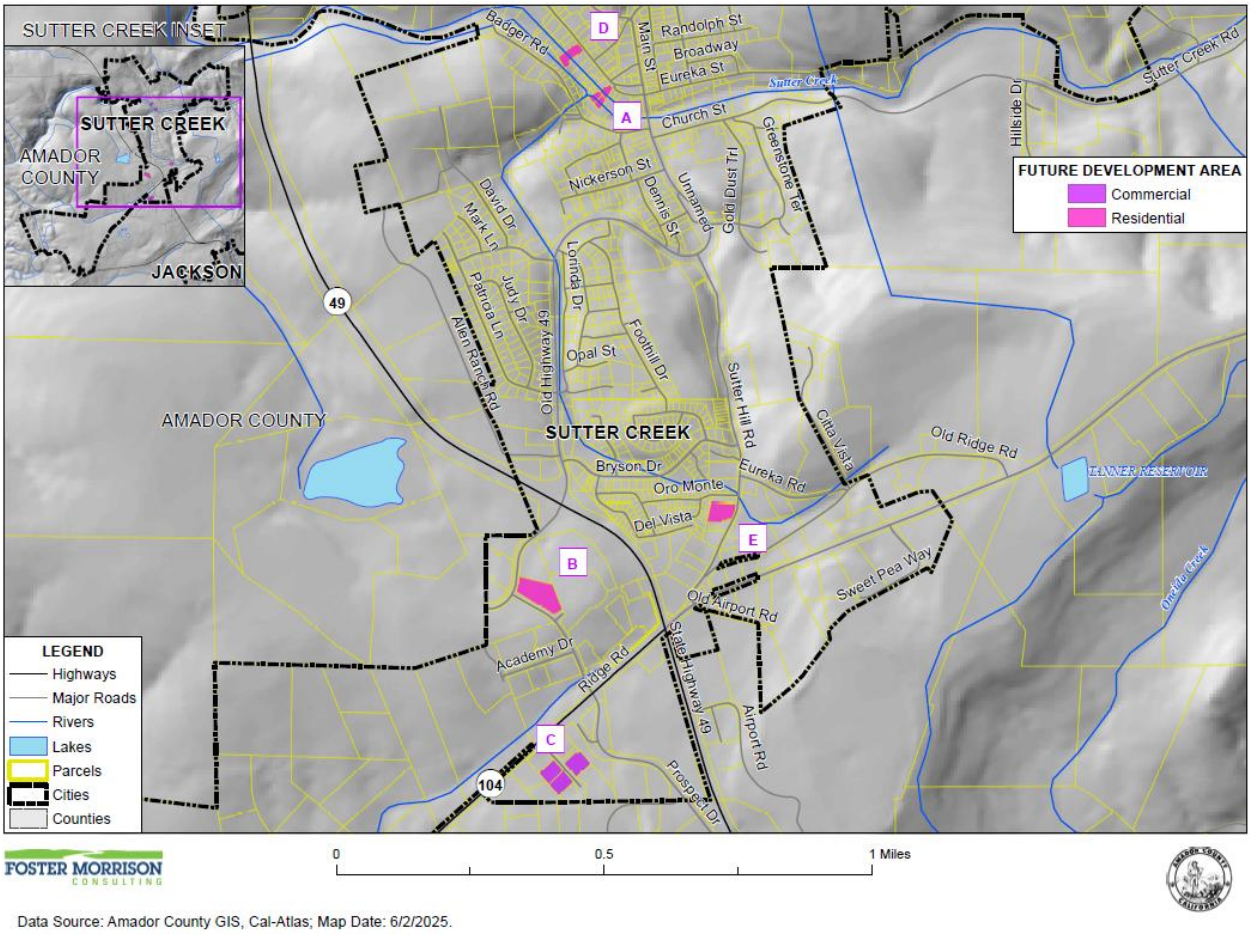


Table E-14 City of Sutter Creek - Future Development Areas with Parcels and Acres

Future Development / Property Use	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
BLA-Rossi						
Residential	3	2	1	0.59	0.41	0.18
BLA-Rossi Total	**3**	**2**	**1**	**0.59**	**0.41**	**0.18**
DANCO						
Residential	1	0	1	2.06	0	2.06
DANCO Total	**1**	**0**	**1**	**2.06**	**0**	**2.06**
Jackson Rancheria Development Corp.						
Commercial	3	0	3	3.62	0	3.62
Jackson Rancheria Development Corp. Total	**3**	**0**	**3**	**3.62**	**0**	**3.62**
TM 2917						
Residential	1	1	0	0.59	0.59	0
TM 2917 Total	**1**	**1**	**0**	**0.59**	**0.59**	**0**
TM 2925						
Residential	1	1	0	1.06	1.06	0
TM 2925 Total	**1**	**1**	**0**	**1.06**	**1.06**	**0**
Grand Total	**9**	**4**	**5**	**7.92**	**2.06**	**5.86**

Source: City of Sutter Creek

E.4.2. Hazard Identification

The City of Sutter Creek identified the hazards that affect the City and summarized their location, extent, likelihood of future occurrence, potential magnitude, and significance specific to the City (see Table E-15). Those hazards identified as a high or medium significance in Table E-15 are considered City of Sutter Creek priority hazards for mitigation planning. Those hazards that occur infrequently or have little or no impact in the City were determined to be of low significance and not considered a priority hazard. Significance was determined based on the hazard profile, focusing on key criteria such as frequency, extent, and resulting damage, including deaths/injuries and property, natural and cultural resources, and economic damage. The ability of a jurisdiction to reduce losses through implementation of existing and new mitigation measures was also considered as to the significance of a hazard. This assessment was used to prioritize those hazards of greatest significance, enabling the City to focus resources where they are most needed.

Table E-15 City of Sutter Creek—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Agricultural Hazards (severe weather/pests/invasive species)	Limited	Likely	Limited	Low	Medium
Avalanche	Limited	Unlikely	Negligible	Low	Medium
Climate Change	Extensive	Likely	Limited	Medium	--
Dam Failure	Limited	Unlikely	Catastrophic	High	Medium
Drought & Water shortage (w/ tree mortality)	Extensive	Likely	Limited	Medium	High
Earthquake (w/subhazards)	Significant	Likely	Catastrophic	High	Low
Floods: 1%/0.2% annual chance (w/ levee failure)	Extensive	Likely	Critical	High	Medium
Floods: Localized Stormwater	Significant	Likely	Critical	High	Medium
Landslide, Mudslide, Debris Flow	Significant	Likely	Critical	Medium	Medium
Severe Weather: Extreme Cold, Freeze, and Snow	Extensive	Unlikely	Limited	Low	Medium
Severe Weather: Extreme Heat	Extensive	Likely	Limited	Medium	High
Severe Weather: Heavy Rains and Storms (Hail, Lightning)	Extensive	Likely	Critical	Medium	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Occasional	Limited	Low	Medium
Wildfire (w/smoke and air quality)	Extensive	Likely	Catastrophic	High	Medium

Geographic Extent

Limited: Less than 10% of planning area

Significant: 10-50% of planning area

Extensive: 50-100% of planning area

Likelihood of Future Occurrences

Highly Likely: Near 100% chance of occurrence in next year, or happens every year.

Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.

Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.

Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Magnitude/Severity

Catastrophic: More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths

Critical: 25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability

Limited: 10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability

Negligible: Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance

Low: Minimal potential impact

Medium: Moderate potential impact

High: Widespread potential impact

Climate Change Influence

Low: Minimal potential impact

Medium: Moderate potential impact

High: Widespread potential impact

E.4.3. Hazard Profiles and Vulnerability to Specific Hazards

This section includes the hazard profiles and vulnerability assessment for hazards ranked of medium or high significance specific to the City of Sutter Creek (as identified in the Significance column of Table E-15) and also includes a hazard profile and vulnerability assessment to the four primary hazards to the State of California: dam failure, earthquake, flood, and wildfire, regardless of the significance ranking by the City. Chapter 4 of the Base Plan provides more detailed information about these hazards and their impacts on the Amador County Planning Area. Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.2 of the Base Plan.

Hazard Profiles and Vulnerability Assessment

Each hazard is profiled in the following format:

- **Hazard Profile** – A hazard profile is included for each hazard. This includes information on:
  - ✓ **Hazard Overview** – A general discussion of the hazard and related issues is detailed here.
  - ✓ **Location** and **Extent** - Location is the geographic area within the City that is affected by the hazard. Extent is the expected range of intensity for each hazard. These are discussed in specific detail for mapped hazards, and in more general detail for those hazards that do not have discrete mapped hazard areas.
  - ✓ **Past Occurrences** – Past occurrences are discussed for each hazard. A discussion of disaster declarations is included in each hazard section. NCDC events are also discussed. Other past occurrences data specific to the City follow the disaster declarations and NCDC events for each hazard.
  - ✓ **Climate Change** – This section contains the effects of climate change (as applicable). The possible influence of climate change on the hazard is discussed.

After the hazard profile, a vulnerability assessment is presented. As part of the vulnerability assessment, an estimate of the vulnerability of the City to each identified hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

After this classification, a general discussion of hazard vulnerabilities occurs. This is done in the following format:

- **Local Concerns** – This includes City provided information on how the City is uniquely affected by or vulnerable to each hazard.
- **Assets at Risk** – A discussion of the assets at risk follows, presented in the same order as in Section E.4.1 above, with a few exceptions. This includes sections on: People and Populations; Structures; Critical Facilities and Infrastructure, and Natural, Historic, and Cultural Resources. These are discussed in specific terms for mapped hazards, and in more general terms for those hazards that are unmapped. Sections on Community Lifelines and Economic Assets and Community Activities of Value are not included in the Sections below, as they are fully covered in Section E.4.1 above and in Chapter 4 of the Base Plan.
- **Impacts** – A discussion on hazard impacts follows. Impacts describe how each hazard can affect the City and its assets. The type and severity of impacts reflect both the potential magnitude of the hazard and the vulnerability of the asset.
- **Future Conditions/Future Development** – A discussion of how future conditions and future development may affect the hazard is also included. This is addressed specifically for mapped hazards, and in more general terms for those hazards that are unmapped.

Power Interruption/Power Failure: A Common Vulnerability of all Hazards

An impact of almost all hazards evaluated as part of this LHMP Update relates to power shortage and/or power failures. The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the U.S. Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power disruptions can be found in Section 4.3 of the Base Plan.

Public Safety Power Shutoff (PSPS)

An intentional disruption type of power shortage/failure event has been recently implemented in California as a result of wildfires starting as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are preparing all Californians for the threat of wildfires and power outages during times of extreme (fire) weather. To help protect customers and communities during extreme fire weather events, electric power may be shut off for public safety in an effort to proactively prevent wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3 of the Base Plan.

In addition to PSPSs, to help prevent wildfires, electric utilities have begun to evolve safety efforts. This includes installing safety settings on powerlines in and around high fire-risk areas. These are known as

Enhanced Powerline Safety Settings (EPSS), and they help prevent falling tree branches, animals and other hazards from starting a wildfire. By stopping ignitions, it helps prevent wildfires from starting and spreading. According to PG&E, if ignitions occur, the size of fires are much smaller due to EPSS. In 2022, there was a 99% decrease in acres impacted by ignitions (as measured by fire size from electric distribution equipment (compared to the 2018-2020 average). This decrease occurred despite dry conditions.

Local Concerns

The City noted that there has been one PSPS event that has affected them. In addition, the Auditorium and the Community Center are essential City facilities that are susceptible to power outages. Neither facility has a backup source of power. The Wastewater Treatment Plant (WWTP) must operate even if power is out to continue essential sewer services. During a severe weather event, the WWTP in the City was impacted for three days. Generators that support the WWTP along with other buildings around the area had to be refilled during this time.

Climate Change

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

Climate change adaptation is a key priority of the State of California. The 2023 State of California Multi-Hazard Mitigation Plan noted that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the State's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

California's Adaptation Planning Guide: Understanding Regional Characteristics (from 2017) has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. The City falls in the North Sierra Region. A map and climate projections for this region are shown in Section 4.3.7 of the Base Plan and include an increase in temperatures, moderate changes in rainfall, and increased risk to wildfire.

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the City of Sutter Creek, the Amador County Planning Area, surrounding counties, and State of California. There is no scale to measure the extent of climate change. Climate change exacerbates other hazards, such as drought, extreme heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known but is feared to be tens to hundreds of years.

Past Occurrences

Disaster Declaration History

Climate change has never been directly linked to any declared disasters.

NCDC Events

NCDC does not track climate change events.

City of Sutter Creek Events

The City noted that climate change is occurring slowly, but there have been items linked with climate change in the City. Since 2020, there has been increased vegetation management, which is thought to be due to climate change. Increased watering and changing of seasons are affecting native plant species.

Vulnerability to Climate Change

The whole of the City is at some measure of vulnerability to climate change. The City Planning Team has concerns that the vulnerability of the City to climate change will continue to increase in the future. An assessment of a community's vulnerability to climate change begins with an understanding of local exposure to climate change. This is included in the Local Concerns section below followed by a discussion of the City's assets at risk and impacts to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The HMCP noted that due to new weather patterns, there's an increased need for vegetation management. Along with this, there has either been too much rain all at once due to atmospheric rivers, or not enough rain that leads to increased fire danger for the City. There is also concern of an increase in atmospheric rivers over the region that can lead to more water in a short period of time leading to localized flooding.

Assets at Risk

Assets at risk from climate change include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

Climate change affects people and populations within a community, especially those climate change issues related to increases in temperature over time. While all populations can be affected by temperature extremes, populations particularly vulnerable include the very old and very young, medically fragile people, people without means of shelter (and air conditioning or heat) or transportation, people who are socially isolated and other vulnerable or underserved populations (as shown in the discussion in Section E.4.1).

Acclimatization to extreme temperatures and other weather extremes may help reduce impacts from these extreme events, such as from heat waves, in the healthy general population but may not be sufficient to protect those with underlying medical conditions.

Structures

Climate change, on its own, does not generally impact structures. However, structures in areas of increased wildfire, flood, or other areas exacerbated by the effects of climate change would be at increased risk, as described throughout this LHMP. More information on how structures may be affected by climate change can be found in Section 4.3.7 of the Base Plan.

Critical Facilities and Infrastructure

As with structures, critical facilities and infrastructure in areas of increased wildfire, flood, or other areas due to the effects of climate change would be at increased risk. Climate change is expected to increase the vulnerability of critical facilities and infrastructure to many natural hazards.

Natural, Historic, and Cultural Resources

The rivers, streams, agricultural areas, and open space areas of the City supports rich biodiversity, including many special-status species and habitat areas. These are all at risk from the effects of climate change. In addition, if heat continues to contribute to changes in wildfire patterns, all areas (on land) of the City are at increased risk from fire – including natural, historic, and cultural resources. Furthermore, as climate change exacerbates the drought hazard, areas of wetlands in the City may be reduced or dry up temporarily, which could damage habitat areas for waterfowl and other species that depend on these areas.

Impacts from Climate Change

The California APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra Region in which the City is part of:

- Increased temperatures
- Reduced precipitation
- Public health – heat and air pollution
- Reduced agricultural productivity (e.g., wine grapes)
- Reduced tourism

In addition to these sources, the 2023 State of California Hazard Mitigation Plan noted that according to California's Fourth Climate Change Assessment, the state will experience the following climate impacts:

- Annual average daily high temperatures are expected to rise by 2.7° F by 2040, 5.8°F by 2070, and 8.8°F by 2100 compared to observed and modeled historical conditions. These changes are statewide averages.
- Heat waves are projected to become longer, more intense, and more frequent.
- Warming temperatures are expected to increase soil moisture loss and lead to drier conditions. Summer dryness may become prolonged, with soil drying beginning earlier in the spring and lasting longer into the fall and winter.

- Droughts are likely to become more frequent and persistent through 2100.
- The strength of the most intense precipitation and storm events affecting California is expected to increase.
- Snowpack levels are projected to decline significantly by 2100 due to reduced snowfall and faster snowmelt.
- Marine layer clouds are projected to decrease.
- Extreme wildfires (i.e., fires larger than 24,710 acres) would occur 50 percent more frequently. The maximum area burned statewide may increase 178 percent by the end of the century.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City include the following:

- As climate change continues to accelerate over time, climate related impacts to the City will continue to increase.
- Climate change can influence population growth in the City over time. While the City is expected to see slow and steady growth, the City could see population fluctuations as a result of climate impacts relative to those experienced in other regions, and these fluctuations are expected to impact demand for housing and other development. While there are currently no formal studies of specific migration patterns expected to impact the City and larger Amador County region, climate-induced migration was recognized within the UNFCCC Conference of Parties Paris Agreement of 2015 and is expected to be the focus of future studies. So, while changes in population and population patterns are not expected to increase the impacts associated with this hazard, climate change may instead influence future population growth in the City which may leave more people vulnerable in the effects of climate change
- Land use planning should be proactive to address future hazard conditions. The increasing severity and frequency of storms and other weather events and natural hazards due to the changing climate should be taken into account while considering land use planning for the City.

Future development considerations should be ongoing and proactive. Ensuring that comprehensive land use planning is conducted, regulatory requirements, such as building codes, are followed, and varying needs for different demographic groups that reside within the County are considered can help to make for a more disaster resilient community.

Dam Failure

Likelihood of Future Occurrence–Unlikely
Vulnerability–Low

Note: Though considered a low vulnerability hazard for the City (due to its location outside of dam inundation areas), the City has a unique relationship to the Henderson, Preston Forebay, Preston, and Flushing dams. Of the first three dams, Henerson and Preston dam are both High Hazard (HH) dams and Preston Forebay is a Low Hazard (LH) dam. These three dams are owned by another entity, but the City is responsible for all maintenance and repairs to the dams. These dams are located downstream of the City limits and the City's Wastewater Treatment Plant (WWTP) heading towards Ione. In addition, the Flushing dam, with an unknown hazard classification, is a small dam located within the City limits and primarily functions to keep debris from entering Sutter Creek.

In 2025, at Henderson Dam, the City has an underdrain project estimated to be around $750,000 to fix the face of the dam. For this reason, dam failure is profiled here.

Hazard Profile

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any given year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped or fail. Overtopping is the primary cause of earthen dam failure in the United States.

Dam failure is a natural disaster from two perspectives. First, the inundation from released waters resulting from dam failure is related to naturally occurring floodwaters. Second, a total dam failure would most probably happen as a consequence of the natural disaster triggering the event, such as an earthquake.

Location and Extent

An inventory map of dams located within Amador County was shown in Section 4.3.9 in the Base Plan. Dams with an available mapped inundation area within the City of Sutter Creek are not shown as none intersect with the City.

There is no scale with which to measure dam failure. However, FEMA and CA DWR Division of Safety of Dams (DSOD) assign hazard potential classifications to dams within the State that provides information on the potential impact should a dam fail. The following two factors are considered when assigning hazard ratings: existing land use and land use controls (zoning) downstream of the dam. FEMA categorizes the downstream hazard potential into three categories in increasing severity: Low, Significant, and High. DSOD adds a fourth category of Extremely High. Dams are classified in these four categories that identify the potential hazard to life and property. These were discussed in more detail in Section 4.3.9 of the Base Plan.

While a dam may fill slowly with runoff from winter storms, a dam break has a very quick speed of onset. The duration of dam failure is generally not long – only as long as it takes to empty the reservoir of water the dam held back. For dam overtopping, the speed of onset is somewhat slower than that of a dam break, and the duration is longer (as evidenced in the 2017 Oroville Dam spillway event). The City would be affected for as long as the flood waters from the dam failure took to drain downstream.

As described above, the following dams of concern to the Sutter Creek, based on the City's maintenance responsibilities for these dams, include: Henderson (HH), Preston Forebay (LH), Preston Dam (HH), and Flushing Dam (unknown classification). All but the Flushing Dam are located outside of the City limits.

Geographic flood extent from the DSOD dam inundation areas is not shown as no inundation areas intersect with the City. Also, as low hazard dams, the Preston Forebay and Flushing Dams do not have available inundation mapping.

Past Occurrences

Disaster Declaration History

There have been no state or federal disaster declarations for dam failure in Amador County.

NCDC Events

The NCDC does not contain any dam failure events for Amador County.

City of Sutter Creek Events

While there have been no dam failure incidents, there have been some past issues with the Flushing Dam. A severe storm event occurred between 12/27/2022 and 01/31/2023, causing damage and necessitating debris removal on the Flushing Dam. Flushing Dam is a small dam on Sutter Creek that holds debris from entering Sutter Creek. During the incident period, a severe storm deposited debris throughout Sutter Creek. Debris include vegetative debris on public rights-of ways throughout the City of Sutter Creek. This debris found its way to Flushing Dam. The City removed debris from the Flushing Dam with an excavator with masticator head that was used for the grinding. There was no equipment staged in the water.

Climate Change and Dam Failure

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with dam failure. More information on future impacts to the City can be found below and in the Future Conditions/Future Development section of the Vulnerability Assessment below.

The 2023 California State Hazard Mitigation Plan noted that modeling described in California's Fourth Climate Change Assessment projects less frequent but more extreme daily precipitation. Year-to-year precipitation will become more volatile, and the number of dry years will increase by mid-century. As the climate continues to warm, atmospheric rivers will carry more moisture, and extreme precipitation may increase. Climate model projections show a tendency for the northern part of the State to become wetter. Increases in both precipitation and heat causing snow melt in areas upstream of dams could increase the

potential for dam failure and uncontrolled releases in Amador County. However, the City, located outside of inundation areas, should not be affected by these changes.

Vulnerability to Dam Failure

The vulnerability of the City to dam failure flooding would vary depending on which dam fails and the nature and extent of the dam failure and associated flooding. An assessment of a community's vulnerability to dam failure begins with an understanding of local exposure to dam failure. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

While City is not located within the dam inundation areas as detailed in the Base Plan, the City's concerns related to dams are a result of the City being responsible for maintenance and repair of the Henderson, Preston Forebay and Preston Dam as detailed below.

Henderson Dam. Located outside of the City limits and on Sutter Creek below the City's WWTP, Henderson Dam is a concern due primarily because of the volume of sludge that could potentially spill into the freshwater dam directly below Henderson. The 20-inch diameter low-level outlet pipe of the Henderson Dam has no bottom and has lost all structural integrity. The pipe must be replaced per DSOD. Cal DSOD has mandated that the pipe be replaced and the City slip line the outlet to the Henderson dam in the 2025 calendar year.

Preston Dam. This dam located outside of the City limits and also on Sutter Creek is directly upstream from the Cal Fire Academy and the City of Ione. A dam failure on this dam would impact both the Academy and Ione and their respective populations.

Flushing Dam. Along with these larger dams, Flushing Dam is a small dam on Sutter Creek that holds debris from entering into the river system. A failure or issue with this dam could impact natural resources in the City including the creek and associated habitat areas.

Assets at Risk

Assets at risk from dam failure include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. However, as no dam inundation areas intersect with the City of Sutter Creek, City assets are not likely to be impacted by a dam failure event; thus no further discussion of assets at risk to the Sutter Creek is included.

Impacts from Dam Failure

While impacts from dam failure flooding can be extensive and widespread and include loss of life and injury, flooding and damage to property and structures, damage to critical facilities and infrastructure, loss

of natural resources, and all other flood related impacts, the City has no area in the mapped dam inundation areas, thus should not experience these types of impacts. The City's primary concern is for those dams it has the responsibility to maintain, including the three dams located outside of the City (Henderson, Preston Forebay, and Preston Dams, as well as the smaller Flushing dam located within the City. Specific impacts associated with these dams as previously described, include the inundation of downstream areas such as the CAL FIRE Academy and City of Ione and impacts to Sutter Creek and other natural resources affected by debris releasing from the Flushing dam.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the Climate Change and Dam Failure discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City include the following:

- Climate change is likely to exacerbate future rain and storm conditions and associated impacts and vulnerability of the City to dam failure.
- There are no dam inundation areas in the City; as such changes in population and population patterns will likely not increase the impacts and vulnerability of the City to this hazard.
- Land use planning should be proactive to address future hazard conditions. Given that there are no dam inundation areas in the City, future land use conditions are expected to be unaffected.

Future Development

Given the location of dams in the Amador County Planning Area, future dam failure events are unlikely to affect the City. Further, future development inside the City limits will not likely affect the vulnerability of the City to dam failure.

Drought & Water Shortage

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

Drought and water shortage are complex issues involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area's usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water supply is the most significant issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. Drought has also affected tree mortality in the area in the past. As the population in the area continues to grow, so will the demand for water.

Tree Mortality and Drought

One of the specific impacts of drought in the City of Sutter Creek and the Amador County Planning Area is the increased risk to trees from beetle kill and other insects, pathogens and parasites, and other tree mortality and die back issues. Drought weakens trees and makes them more susceptible to insect infestation and other pathogens. Insects, such as bark beetles and others, frequently attack trees weakened by drought, disease, injuries, or other factors that may stress the tree. These insects and other pathogens can contribute to the decline and eventual death of trees throughout the City. The tree mortality and dieback problems are a high priority because of the issue of hazardous trees and an increased wildfire hazard. In addition to an increase in wildfire fuels, hazardous trees can fall onto structures causing damage and a result in a reduction on the tree canopy within the City that provides relief during extreme heat days.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the City and County is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme Drought
- D4 – Exceptional Drought

The Amador County Planning Area, including the City of Sutter Creek, has been in and out of drought since 2014. Over the last five years since the 2020 LHMP, drought conditions have ranged from none to exceptional. Drought conditions are expected to continue to be cyclical in nature depending on the year." Current drought conditions in the City are shown in Section 4.3.10 of the Base Plan.

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time (which does not usually affect water shortages) or for longer periods (which may challenge water supplies). Should a drought last for a long period of time, water shortage becomes a larger issue.

According to the Amador Water Agency (AWA) 2024-2025 Annual Water Supply & Demand Assessment Shortage Report, the Agency has a significant surplus of water supply above current and projected demands. The Amador Water System (AWS) water supply is a pre-1914 water right that has never been curtailed in the most severe single-year or a multiple-year drought. In addition, while the water supply associated with the Central Amador Water Project (CAWP) was temporarily curtailed during recent drought years, the significant storage volume in the Lower Bear Reservoir has allowed previous water supply demands to be met, and are expected to be met in the future, even in dry years. In addition, the total well capacity for the portion of both systems reliant on groundwater are larger than current and projected demands.

Past Occurrences

Disaster Declaration History

There have been 2 state and 1 federal disaster declarations for Amador County. This can be seen in Table E-16. Additionally, there have been 16 USDA Secretarial Disaster Declarations from drought in the County.

Table E-16 Amador County –State and Federal Drought Disaster Declarations 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	2	1976, 2015	1	1977

Source: Cal OES, FEMA

NCDC Events

There have been 249 NCDC drought events in Amador County since 1993. These most likely had some impact on the City.

City of Sutter Creek Events

Based on historical information, the occurrence of drought in California, including the City of Sutter Creek, is cyclical, driven by weather patterns. Section 4.3.10 of the Base Plan notes that five droughts have occurred in the past 86 years. Drought has occurred in the past and will occur in the future.

Climate Change and Drought and Water Shortage

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with drought and water shortage. More information on future impacts to the City can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate scientists studying California find that drought conditions are likely to become more frequent and persistent over the 21st century due to climate change. The experiences of California during recent years underscore the need to examine more closely the state's water storage, distribution, management, conservation, and use policies. The 2021 Climate Adaptation Study (CAS) (as well as the 2024 Draft CAS) stresses the need for public policy development addressing long term climate change impacts on water supplies. The CAS notes that climate change is likely to significantly diminish California's future water

supply, stating that: California must change its water management and uses because climate change will likely create greater competition for limited water supplies needed by the environment, agriculture, and cities.

A 2018 report from the Public Policy Institute of California noted that thousands of Californians – mostly in rural, small, disadvantaged communities – already face acute water scarcity, contaminated groundwater, or complete water loss. Climate change would make these effects worse.

Cal Adapt scenarios for modeled future drought scenarios were shown in Section 4.3.10 of the Base Plan.

Vulnerability to Drought and Water Shortage

Based on historical information, the occurrence of drought and water shortage in California, including the City, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. The vulnerability of the City of Sutter Creek to drought may vary and include reduction in water supply, turf losses, impacts to natural resources, and an increase in dry fuels and tree dieback.

The whole of the City is at some measure of vulnerability to drought and water shortage. An assessment of a community's vulnerability to drought and water shortage begins with an understanding of local exposure to drought. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Tree Mortality

On Sutter Hill Road there are a number of trees that are dying on the hillside and falling onto the road in varying stages. Hoskins ranch has lost a few large Oak trees where the roots dried up due to drought conditions and toppled in the field. This can cause potential issues if a wildfire were to affect the City. While the City has changed much of the local landscaping to native, drought tolerant plants to reduce water consumption, drought remains a concern for the City.

Water Shortage

According to the HMPC, the City and Amador County has access to large quantities of water through its groundwater as well as surface water. However, it was noted that the cost of water to the City has increased significantly. In the Amador Regional Sanitation Authority disposal system, secondary wastewater has been promised to the farmers and in times of drought, the City must haul water to the farms for livestock troughs. This situation occurs when drought conditions exist at considerable cost to the City.

The City of Sutter Creek is looking to provide recycled water to a newly proposed development that would include residential housing, commercial properties, a hotel and resort, and a golf course in the Southwest portion of Sutter Creek. The recycled water would come from a new pipeline from the WWTP to the development.

Assets at Risk

Assets at risk from drought and water shortage include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

The people and populations of the City are not directly affected by drought; although, their turfed areas, trees, and other water dependent resources can all be affected. In extreme drought conditions, however, residents and other populations within the City may be vulnerability to drought and water shortage issues. Water quality can be impacted causing health problems, especially to vulnerable populations. Drought and water shortage can lead to an increase in wildfires threatening City residents. Water shortages can have an effect on all of the population in the City, but often have a greater effect on the unhoused and other vulnerable populations that may be unable to access clean drinking water during shortages. During periods of drought as the costs of water usage may increase, especially during mandated conservation times, those who are economically disadvantaged may be unable to afford the increased costs of potable water.

Structures

Structures have a limited vulnerability to drought and water shortage. It is the secondary hazard of drought (wildfire) which causes risks to structures. Drought can also stress trees, causing die off. These trees may fall on structures adjacent to them.

Critical Facilities and Infrastructure

Most critical facilities and infrastructure have a limited vulnerability to drought and water shortage. Should drought conditions be severe enough to cause water shortage reliability issues, some facilities and infrastructure may be affected. Water and wastewater systems may be impacted during times of reduced water supply and need to employ contingencies to remain functional and fully operational. Other water dependent systems may also be adversely affected. Further, the secondary hazard of drought (increased potential for spread of urban fires and wildfire) can pose a significant risk to critical facilities and infrastructure. Sufficient water supply for firefighting can also be an issue. Drought can also stress trees, causing die off. These trees may fall on critical infrastructure adjacent to them and impact power lines and other utilities.

Natural, Historic, and Cultural Resources

Drought and water shortage can have a significant impact on natural resources. Water levels in reservoirs and lakes may be reduced and a loss of wetlands and coastal marsh areas may occur. Severe drought conditions can contribute to an increase in erosion of soils and lead to poor soil quality. Further, all of the

trees in the City are at risk to drought impacts and a reduction in water supply. These trees provide a wealth of social and environmental benefits to City residents and visitors, from shade and beauty to air quality, carbon reduction and stormwater management. Drought can devastate crops and dry out pastures, dry out forests and critical habitat areas, and reduce food and water available for wildlife and livestock, the latter detailed above as a specific concern to the City. Additionally, drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. It is unlikely that drought and water shortage would have a significant impact on historic and cultural resources in the City.

Impacts from Drought and Water Shortage

The vulnerability of the City to drought is City-wide, but impacts may vary and include reduction in water supply and an increase in dry fuels. The potential for a reduction in water supply during drought conditions generally leads to both mandated and voluntary conservations measures during extended droughts. During these times, the costs of water can also increase. Also of concern, the increased dry fuels, fuel loads, and tree mortality events associated with drought conditions can result in an increased fire danger. In areas of extremely dry fuels, the intensity and speed of fires can be significant. Water supply and flows for fire suppression can also be an issue during extended droughts. Drought can also lead to turf losses and cause tree die off within the City.

Other qualitative impacts associated with drought in the City are those related to water intensive activities such as municipal usage, commerce, tourism, and recreation use. With more precipitation likely falling as rain instead of snow in the Sierra's, and warmer temperatures causing decreased snowfall to melt faster and earlier, water supply is likely to become more unreliable. In addition, drought and water shortage is predicted to become more common. This means less water available for use over the long run, and additional challenges for water supply reliability, especially during periods of extended drought.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the hazard profile discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City of Sutter Creek include the following:

- Climate change is likely to exacerbate future drought conditions and associated impacts and vulnerability of the City to drought and water shortage.
- Future population growth should be considered as having more or less people in a community affects the overall hazard vulnerability to the City. Population growth in the City has recently slowed. According to the HMPC, the City and Amador County has access to large quantities of water through its groundwater as well as surface water. However, any future population growth in the City will add additional pressure to water companies during periods of drought and water shortage. Water companies will need to continue to plan for and add infrastructure capacity for population growth. As the

population grows, the nature and makeup of populations will shift and change along with it. Vulnerable and underserved populations, such as those with low incomes and the unhoused that might not always have access to clean water, will need to be considered as future development continues, since they may experience a disproportionate impact from drought and water shortage. Potential population growth will be a challenge not only with regard to the City's water access for agricultural production, but state- and nation-wide with regard to food production. Should the City see a growth in population, it will increase the vulnerability and impacts to the County from this hazard.

- Land use planning should be proactive to address future hazard conditions. As the City continues to grow, more cropland may be taken out of production to provide housing to accommodate for population growth. As the areas adjacent to the City's agricultural lands are reduced, it seems likely that there would be less of a competing demand for water. However, more development will also require an increase in water supply and associated infrastructure. Changes in land use and development may or may not increase the impacts and associated vulnerabilities of the City to this hazard depending on where and how this future growth occurs.

As the population in the area continues to grow, so will the demand for water. The Amador Water Agency (AWA) provides water to the City through reliable surface water sources. However, population growth in the City will continue to increase the demand for water. Ongoing planning will be needed by the City and AWA to account for population growth and increased water demands.

Earthquake

Likelihood of Future Occurrence–Occasional (minor)/ Likely (major)
Vulnerability–High

Hazard Profile

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction.

Location and Extent

Since earthquakes are regional events, the whole of the City is at risk to earthquake. The City of Sutter Creek, Amador County, and surrounding areas have some level of risk from seismic and geologic hazards. Faults in and around the City were shown in Section 4.3.11 of the Base Plan. These include the Carson Range, Great Valley, and Rogers-Hayward Creek faults. A significant seismic event on any of these major faults could cause damage in the City of Sutter Creek.

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales, as discussed in Section 4.3.11 of the Base Plan.

Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. The City is located in an area where earthquakes of some magnitude occur, so both magnitude and intensity of earthquakes are expected to remain low to moderate. Seismic shaking maps for the area in Section 4.3.11 of the Base Plan show Amador County and the City fall within a low to moderate shake risk.

Past Occurrences

Disaster Declaration History

There has been no state or federal disaster declarations in Amador County from earthquake.

NCDC Events

The NCDC does not track earthquake events.

City of Sutter Creek Events

As shown in the Base Plan, no disaster declarations have occurred in the County due to earthquake. The City noted that small earthquakes have occurred in the City, but none have caused any significant damage or impacts to the population, property, or related closures.

Climate Change and Earthquake

Climate change is unlikely to increase earthquake frequency or strength. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Vulnerability to Earthquake

The combination of plate tectonics and associated California coastal mountain range building geology generates earthquakes as a result of the periodic release of tectonic stresses Earthquake vulnerability is primarily based on population and the built environment. Urban areas in high seismic hazard zones are the most vulnerable, while uninhabited areas are less vulnerable. The primary impacts of concern are life safety and property damage. Although several faults are in and near the Amador County Planning Area and the City, seismic hazard mapping indicates that the City has low to moderate seismic hazard potential. There is the potential for the City and Amador County Planning Area to be subject to some level of moderate seismic shaking. Some degree of structural damage due to stronger seismic shaking could be expected.

Earthquake shaking can also cause liquefaction to occur. Areas with loose soil and high water tables are at risk from liquefaction. There are limited areas in and near the City prone to liquefaction.

The whole of the City is at some measure of vulnerability to earthquake. An assessment of a community's vulnerability to earthquakes begins with an understanding of local exposure to earthquakes. This is included in the Local Concerns section below. After that section, assets at risk are discussed.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The Uniform Building Code (UBC) identifies four seismic zones in the United States. The zones are numbered one through four, with Zone 4 representing the highest level of seismic hazard. The UBC establishes more stringent construction standards for areas within Zones 3 and 4. All of California lies within either Zone 3 or Zone 4. The City of Sutter Creek is located within Zone 3.

The biggest concern/vulnerability is any non-reinforced masonry structures within the City of Sutter Creek, especially given the number of historic and older structures located within the City. The City of Sutter Creek faces a significant and unmitigated risk from potential seismic events. A moderate to large earthquake poses an imminent danger of widespread structural damage to residential and commercial buildings, especially those constructed prior to the integration and strengthening of seismic standards into local building codes.. This vulnerability is exacerbated by the potential for secondary hazards including landslides, fire following earthquake, and other secondary affects.

Assets at Risk

Many assets in the City are at risk to ground shaking and other earthquake related impacts. Assets at risk from earthquake include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All people and populations are at risk from earthquake events. Those at heightened risk include:

- The unsheltered
- Infants and children under age five and their caregivers
- Elderly (65 and older)
- Individuals with disabilities
- Individuals dependent on medical equipment
- Individuals with impaired mobility

The greatest risk to people and populations from earthquake is death and injury. More information on people and populations at risk to earthquake shaking events can be seen in the Hazus scenarios developed

for this LHMP. More information on the Hazus scenarios and how the County is affected is included in Section 4.3.11 of the Base Plan.

Structures

All structures in the City are vulnerable to earthquakes, depending on the severity and location of the event. The Hazus scenarios conducted for the entire Amador County Planning Area show how structures may be affected.

Critical Facilities and Infrastructure

Earthquake and its related hazards present risks to the City. Earthquakes can damage critical facilities and infrastructure that provide vital services to the City. Damage to critical facilities from the Hazus earthquake scenarios for the Amador County Planning Area, including the City of Sutter Creek, are presented in the Hazus analysis in Section 4.3.11 of the Base Plan. Given the nature of earthquake events causing significant ground shaking among other issues, those critical facilities and infrastructure that include underground components such as water and wastewater facilities would be uniquely vulnerable to damaging earthquakes.

Natural, Historic, and Cultural Resources

The 2023 State Hazard Mitigation Plan noted that environmental problems from earthquakes can be numerous. It is possible for earthquakes to reroute streams, which can change the water quality, possibly damaging habitat and feeding areas. Streams fed by groundwater and/or springs may dry up because of changes in underlying geology. Another threat to the environment from earthquakes is the potential release of hazardous materials into the natural environment causing contamination that can be difficult to contain. Historical and cultural resources are at risk, often due to their age and construction types. The Hazus scenarios in Section 4.3.11 of the Base Plan and included below are relatively silent on the vulnerability to natural, historic, and cultural resources, but impacts to these resources could be long lasting.

Impacts from Earthquake

Earthquakes can strike without warning and cause dramatic changes to the landscape of an area that can have devastating impacts on the built environment. The greatest impact is to life safety of the City of Sutter Creek residents and visitors. Other impacts to the City could include damages to infrastructure such as roads, bridges, and dams; damages and loss of services to utilities and critical infrastructure, including those related to gas, power, water, wastewater and communication systems; damages to structures and other development; and possible loss of life and injuries.

Earthquakes can also cause failure of dams, levees, and reservoirs. Facilities and land downslope from dams or water reservoirs or behind levees might be subject to flooding, if the dams, reservoirs, or levees fail as a result of an earthquake. The City has locations with significant flood risk that include facilities downslope from dams or reservoirs that could be affected by a significant earthquake event.

Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;

- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City of Sutter Creek include the following:

- Climate change is likely to have no effect on future earthquake conditions and associated impacts and vulnerability of the City.
- Population growth in the City of Sutter Creek has recently slowed. Any additional growth in the City would place additional populations at risk to earthquake. Additional population growth would likely bring continued diversity to the City. Vulnerable population groups could face disproportionate effects from an earthquake and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions and the location and severity of future earthquake events.
- Land use planning should be proactive to address future hazard conditions. There are five areas the City is planning to develop over the next five years. However, City building codes are in effect to reduce structure damage, including damage to critical facilities and infrastructure, and should be updated as necessary to continue to address future earthquake conditions. Depending on the location of new development and adherence to protective building codes, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the City to this hazard.

Although new growth and development corridors would fall in the area affected by earthquake, given the limited chance of major earthquake and the building codes in effect, development in areas prone to earthquakes will continue to occur. The City enforces the state building code, which mandates construction techniques that minimize seismic hazards. Future development in the City is subject to these building codes and land use planning.

Flood: 1%/0.2% Annual Chance

Likelihood of Future Occurrence–Occasional (1%)/Unlikely (0.2%)
Vulnerability–High

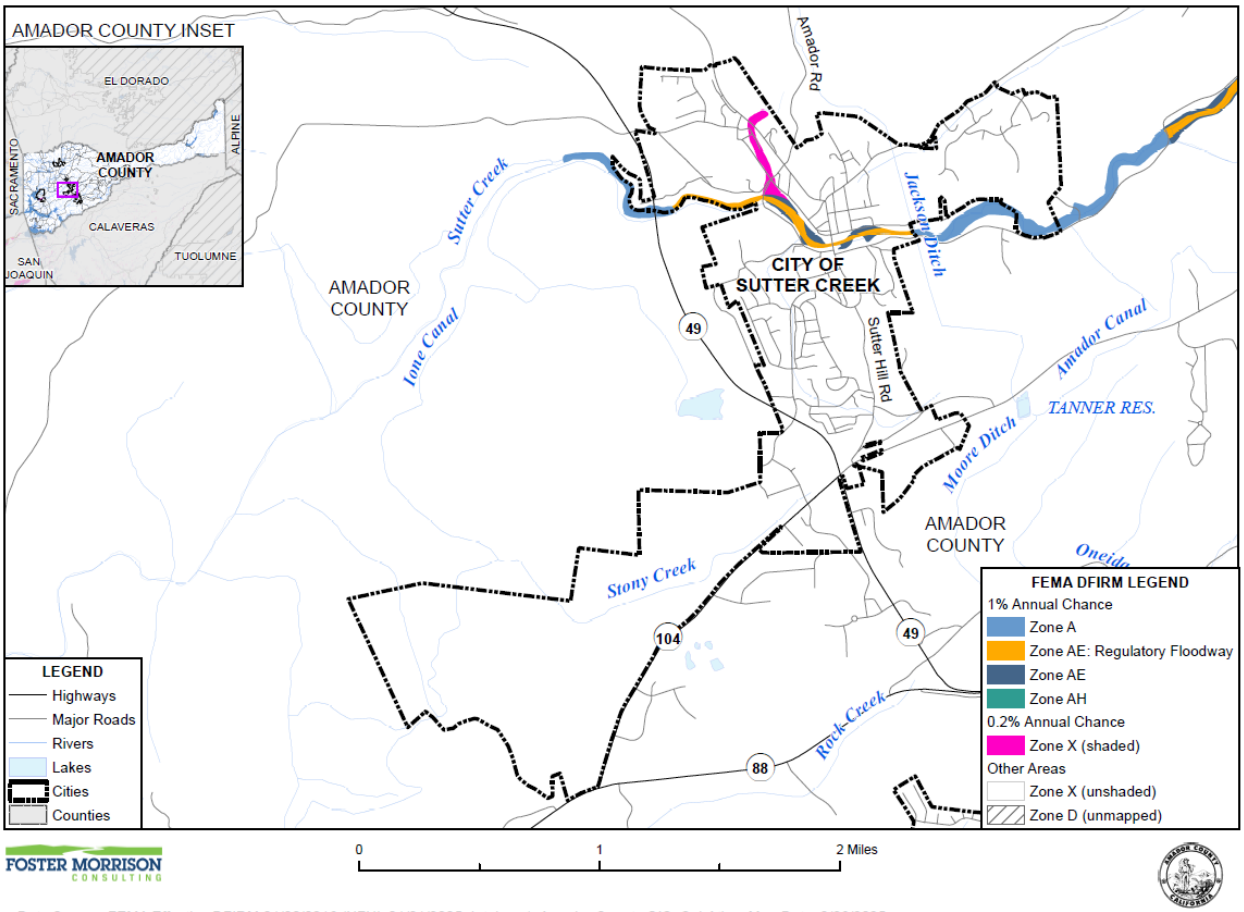
Hazard Profile

This hazard analyzes the FEMA DFIRM 1% and 0.2% annual chance floods. These tend to be the larger floods that can occur in the City and have caused damage in the past. Flooding can be a significant problem in the City. Historically, the City has been at risk to flooding primarily during the winter and spring months when river systems in the City swell with heavy rainfall and snowmelt runoff. The City has also been at risk during atmospheric river flood events. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures located throughout the Amador County Planning Area and the City of Sutter Creek. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage. Flooding has occurred both within the 1% and 0.2% annual chance floodplains and in other localized areas in the City.

Location and Extent

The City of Sutter Creek has areas located in the 1% and 0.2% annual chance flood zones. This is seen in Figure E-13.

Figure E-13 City of Sutter Creek – FEMA DFIRM Flood Zones



Data Source: FEMA Effective DFIRM 01/20/2016 (NFHL 01/21/2025 database), Amador County GIS, Cal-Atlas; Map Date: 2/26/2025.

Table E-17 details the DFIRM mapped flood zones located within the City.

Table E-17 City of Sutter Creek– DFIRM Flood Hazard Zones

Flood Zone	Description	Present in City of Sutter Creek
A	1% annual chance flooding: No base flood elevations provided	X
AE	1% annual chance flooding: Base flood elevations provided	X
AE Regulatory Floodway	1% annual chance flood: Regulatory floodway; Base flood elevations provided	X
AH	1% annual chance flood areas of shallow flooding between one to three feet deep. Regulatory floodway; Base flood elevations provided	
Shaded X	0.2% annual chance flooding: The areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood	X
X (unshaded)	No flood hazard	X

Source: FEMA DFIRM 1/20/2016

Additionally, flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the City vary, depending on the nature and extent of a flood event; specific depths are unknown. Flood durations in the City tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Flooding in the City tends to have a shorter speed of onset, due to the amount of water that flows through the City.

Geographical flood extents for the City from the FEMA DFIRMs are shown in Table E-18.

Table E-18 City of Sutter Creek – Geographical DFIRM Flood Zone Extents

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
1% Annual Chance Flood Hazard						
Agricultural	0	0	$0	$0	$0	$0
Commercial	9	8	$1,159,921	$2,547,399	$2,547,399	$6,254,719
Industrial	1	1	$191,587	$400,831	$601,247	$1,193,665
Miscellaneous	8	0	$1,231	$0	$0	$1,231
Residential	84	64	$7,882,242	$16,052,563	$8,026,282	$31,961,087
Unknown						
1% Annual Chance Flood Hazard Total	**102**	**73**	**$9,234,981**	**$19,000,793**	**$11,174,927**	**$39,410,701**
0.2% Annual Chance Flood Hazard						
Agricultural	0	0	$0	$0	$0	$0
Commercial	2	2	$912,841	$4,152,457	$4,152,457	$9,217,755
Industrial	0		$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	21	16	$1,532,761	$3,384,645	$1,692,323	$6,609,729
Unknown	1	1	$100,918	$481,299		$582,217
0.2% Annual Chance Flood Hazard Total	**24**	**19**	**$2,546,520**	**$8,018,401**	**$5,844,780**	**$16,409,701**
Other Areas						
Agricultural	6	2	$1,095,761	$170,670	$170,670	$1,437,101
Commercial	137	99	$23,915,295	$58,067,036	$58,067,036	$140,049,367
Industrial	1	1	$169,016	$481,314	$721,971	$1,372,301
Miscellaneous	31	0	$14,846	$0	$0	$14,846
Residential	1,125	962	$93,739,494	$243,280,562	$121,640,281	$458,660,337
Unknown	8	4	$2,959,292	$2,321,085	$0	$5,280,377
Other Areas Total	**1,308**	**1,068**	**$121,893,704**	**$304,320,667**	**$180,599,958**	**$606,814,329**

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Sutter Creek Total	**1,434**	**1,160**	**$133,675,205**	**$331,339,861**	**$197,619,665**	**$662,634,731**

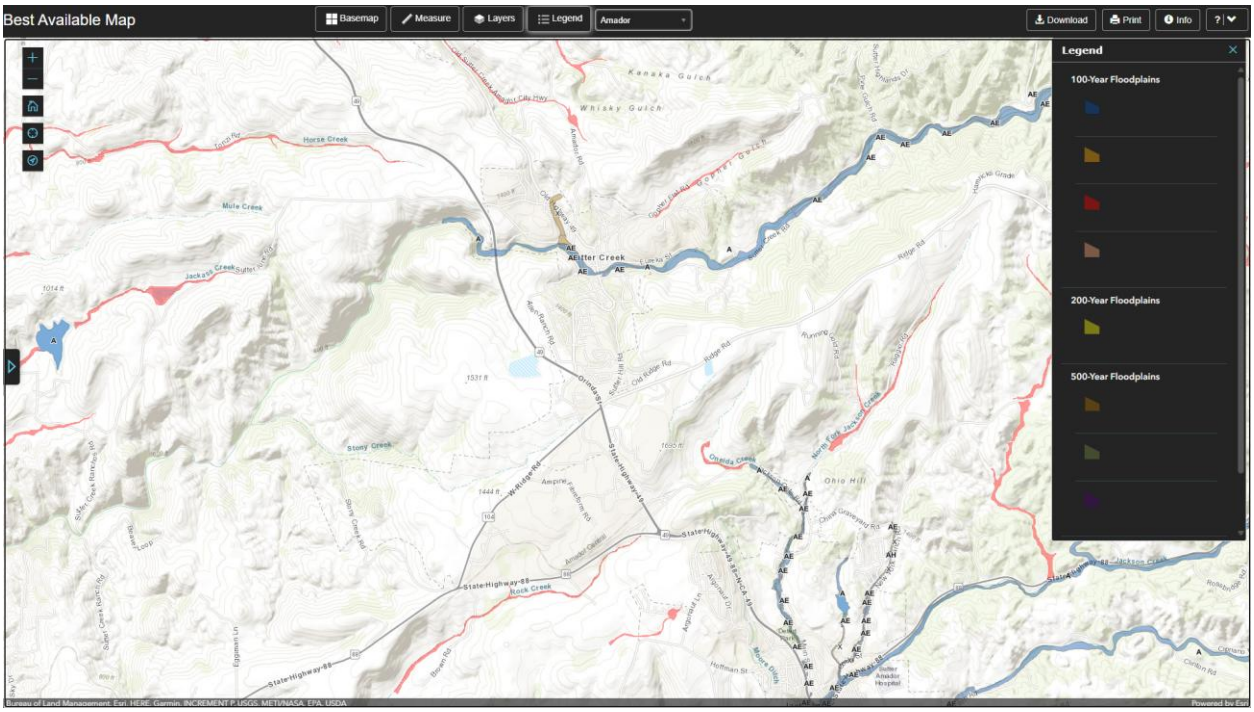
Source: FEMA DFIRM 1/20/2016

California Department of Water Resources Best Available Maps (BAM)

The FEMA regulatory maps provide just one perspective on flood risks in the City. Senate Bill 5 (SB 5), enacted in 2007, authorized the California DWR to develop the Best Available Maps (BAM) displaying 100- and 200-year floodplains for areas located within the Nevada-San Joaquin (SAC-SJ) Valley watershed. This effort was completed by DWR in 2008. DWR has expanded the BAM to cover all counties in the State and to include 500-year floodplains.

Different than the FEMA DFIRMs which have been prepared to support the NFIP and reflect only the 100-year event risk, the BAMs are provided for informational purposes and are intended to reflect current 100-, 200-(as applicable), and 500-year event risks using the best available data. The 100-year floodplain limits on the BAM are a composite of multiple 100-year floodplain mapping sources. It is intended to show all currently identified areas at risk for a 100-year flood event, including FEMA's 100-year floodplains. The BAM are comprised of different engineering studies performed by FEMA, Corps, and DWR for assessment of potential 100-, 200-, and 500-year floodplain areas. These studies are used for different planning and/or regulatory applications, and for each flood frequency may use varied analytical and quality control criteria depending on the study type requirements. The value in the BAMs is that they provide a bigger picture view of potential flood risk to the City than that provided in the FEMA DFIRMs. The BAM map for the City of Sutter Creek is shown in Figure E-14.

Figure E-14 City of Sutter Creek – Best Available Map



Source: California DWR
Legend explanation: **Blue** - FEMA 100-Year, **Orange** – Local 100-Year (developed from local agencies), **Red** – DWR 100-year (Awareness floodplains identify the 100-year flood hazard areas using approximate assessment procedures.), **Pink** – USACE 100-Year (2002 Sac and San Joaquin River Basins Comp Study), **Yellow** – USACE 200-Year (2002 Sac and San Joaquin River Basins Comp Study), **Tan** – FEMA 500-Year, Grey – Local 500-Year (developed from local agencies), **Purple** – USACE 500-Year (2002 Sac and San Joaquin River Basins Comp Study).

Past Occurrences

Disaster Declaration History

A list of state and federal disaster declarations for Amador County from flooding is shown on Table E-19. These events also likely affected the City to some degree.

Table E-19 Amador County – State and Federal Disaster Declarations from Flood 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	22	1950, 1955, 1958 (twice), 1959, 1963, 1964, 1969, 1980, 1982, 1986, 1995 (twice), 1997, 2006 (twice), 2017 (twice), 2019, 2021, 2023 (twice)	20	1950, 1955, 1958, 1962, 1963, 1964, 1969, 1986, 1995 (twice), 1997, 1998, 2006 (twice), 2017 (twice*), 2019, 2023 (three)

Source: Cal OES, FEMA

NCDC Events

The NCDC tracks flooding events for the County. Events have been tracked for flooding since 1993. Amador County has seen 43 events. These events most likely had some impact on the City.

City of Sutter Creek Events

The City noted that the following events had damages to the City:

1980

Records of flows in Sutter Creek indicate that in 1980 almost 7,000 cubic feet per second (CFS) passed through the City in the channel that accommodates an average annual 32.4 CFS. County Emergency Services Coordinator Mary Culver has commented that this may have been close to a 100-year flood occurrence in the City. The Oak Knolls Subdivision Draft EIR suggests that 8,750 CFS would constitute a 100-year flood occurrence. A comparison of the flood hazard safety area shown on Map 2-3 with existing development on lots in the area suggest that serious property damage and a threat to public health and safety will likely exist in the event of a 100-year flood occurrence. The 1980 storm did not flood buildings in the City. Damage was most severe east of the City where bridges and some roads were destroyed by Sutter Creek and its tributaries. In normal rainfall situations, some tributaries in the planning area cause flooding problems such as those occurring at the Badger Street Bridge. Such problems should be considered in the Master Drainage Plan called for in the Public Services and Facilities Element.

January 1997

Severe winter storms caused flooding city wide. Landslides and debris flows also resulted from the excess rains. Historic rock wall and pedestrian bridge failure and damage to adjacent residences were impacts felt by the city. Garages, basements, and carports flooded city wide. The City Hall and library were flooded. The sewer plant and collection lines were flooded and incurred damages. The Gopher Flat Road width was reduced by 25% for approximately 250 feet and significant cut bank sloughing; storm drain conduits plugged with debris. Spanish Street, Mahoney Mill Road, Church Street, Sutter Hill Road, Gold Strike Court, and Bryson Drive were all flooded.

2006

Severe winter storms caused flooding city wide. Landslides and debris flows also resulted from the excess rains. Bank failures, driveway flooding, and minor structure damages impacted the city. Flooding caused damages in the City Hall basement. In addition, the sewer plant was inundated with debris, as were storm drain facilities and street surfaces city wide. Similar damages occurred in 1996.

2016 & 2017

In October 2016, the City had 8 inches of rain in a 48-hour period causing flash flooding. In January and February of 2017, 8 inches of rain causing severe mudslides and flooding. The City had damage to the basement at City Hall. In addition, the sewer plant was inundated with debris, as were storm drain facilities and street surfaces city wide.

2022/2023

The parking lot and Auditorium flooded during a January 2023 weather event. This caused the loss of documents and records in the Auditorium. Many rooms in the basement experienced water damage and mold that needed to be abated.

Numerous atmospheric river events led to overwhelming runoff into Sutter Creek. Heavy rains swelled creek leading to fast and high current that eroded fill and armoring at bend in creek at base of waste treatment plant. Increased current and flow eroded fill and riprap armoring along embankment at bend in creek at waste treatment facility. The Armor wall to the WWTP was compromised during rising creek waters causing a flood condition that took out part of the armor wall.

WWTP Armor Wall Dec 2022 to Jan 2023, Heavy rains swelled creek leading to fast and high current that eroded fill and armoring at bend in creek at base of WWTP. In Aug 2024, the Armor wall was reinforced protecting the WWTP.

Local Culverts washed out from Dec 2022 to Jan 2023, Heavy rains caused localized flooding on Eureka Rd and Gold Strike Court culverts to wash out and roads to collapse. Both culverts were replaced, and the roads were repaired in April 2024.

Flushing Dam debris removal from Dec 2022 to Jan 2023, A severe storm deposited debris into the face of the flushing dam. City contractor removed 2 tons of vegetation debris from the waterway.

Climate Change and Flood

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with flood. More information on future impacts to the City can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

According to the 2021 CAS (as well as the 2024 Draft CAS), climate change may affect flooding in California, the Amador County Planning Area, and the City of Sutter Creek. While average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is possible that average soil moisture and runoff could decline, however, due to increasing temperature, evapotranspiration rates, and spacing between rainfall events. Reduced snowpack and increased number of intense rainfall events are likely to put additional pressure on water infrastructure which could increase the chance of flooding associated with breaches or failures of flood control structures such as levees and dams. Cal Adapt future precipitation projections were shown in Section 4.3.4.

Vulnerability to Flood: 1% and 0.2% Annual Chance

Floods have been a part of the City's historical past and will continue to be so in the future. During winter months, long periods of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread structural and property damage. Predominantly, the effects of 1% and 0.2% annual chance flooding are generally confined to areas near the waterways of the City. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat.

The whole of the City is at some measure of vulnerability to floods. An assessment of a community's vulnerability to flood begins with an understanding of local exposure to flood. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The City of Sutter Creek 2019 General Plan Safety Element noted concern for the flooding of Sutter Creek (as well as its main tributaries in the planning area) has increased as new development removes natural vegetation and compacts and covers over soils, thereby increasing the rate at which storm runoff reaches these drainage courses. This impact involves developments in the 49+ square mile drainage area of Sutter Creek outside of the planning area as well as those that may be constructed inside of the planning area.

The primary concern with flooding occurs along Sutter Creek. The parking lot of the City Hall/Auditorium floods and when that occurs the auditorium floods as the basement is below the parking lot elevation. The auditorium houses historical documents and City records. They have been raised off the ground but were damaged recently in the 2023 storms. The houses and businesses along the creek are also susceptible to flooding due to their proximity to the creek and lack of elevation on the north side of the creek. Along with

this, there has been a sewer pipe that was in the creek that became exposed when the bank was washed away from localized flooding in Sutter creek.

The historic Foundry building in town experienced significant erosion under one of its buildings next to the creek. During the 2023 storm the flood water rose so high that it eroded the bank and foundation which undercut the historic Foundry building.

Assets at Risk

Assets at risk from flood include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All people and populations located in the 1% and 0.2% annual chance floodplains are at some risk to flooding. Certain vulnerable populations located within areas prone to flooding may be at increased risk to this hazard, especially during a large event with minimal advance notice. These vulnerable populations include: the unsheltered, those with limited mobility, and those that lack the resources to leave the area.

City residents that live in the 1% and 0.2% annual chance floodplains are often the most vulnerable. Not only are the residents at risk, but their homes and contents are all at risk, compounding the impacts associated with significant hazard events. To further evaluate the impact to the City of Sutter Creek's residential population residing within these hazard areas, the DFIRM flood zones were overlayed on the parcel layer. Those residential parcels that intersect the flood zones were counted and multiplied by the 2023 Census Bureau average household factors for the City of Sutter Creek – 2.07. According to this analysis, there is a total population of 132 and 33 residents of the City at risk to flooding in the 1% and 0.2% annual chance floodplains, respectively. This is shown in Table E-20.

Table E-20 City of Sutter Creek – Improved Residential Parcels and Population by Summary FEMA DFIRM Flood Zone

Jurisdiction	1% Annual Chance		0.2% Annual Chance	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Sutter Creek	64	132	16	33

Source: FEMA DFIRM 1/20/2016, Amador County 2024 Parcel/Assessor Data, US Census Bureau American Community Survey 2023 Household Size Estimates.

The City noted that the Critical Facilities and Infrastructure section below includes the facilities used by At-Risk populations that are threatened by this hazard. While this is not specific to what special populations reside in the City, it does speak to facilities that area used to serve (portions) of this population.

Structures

Certain structures in the City are at risk of DFIRM flooding and primarily include those structures located within the 1% and 0.2% annual chance floodplains. GIS was used to determine the possible impacts of

flooding on parcels and structures within the City of Sutter Creek. The methodology described in Section 4.3.11 of the Base Plan was followed in determining structures and values at risk to the 1% (100-year) and 0.2% (500-year) annual chance flood event. Table E-21 is a summary table for the City of Sutter Creek. Parcel counts, land and improved values (i.e., those with a structure improvement on the parcel), estimated content replacement values, and total values in the City are shown for the 1% and 0.2% annual chance flood zones, as well as for those properties that fall outside of the mapped FEMA DFIRM flood zones. Table E-22 breaks down Table E-21 and shows the same analysis further broken out by detailed FEMA flood zone and property use.

Table E-21 City of Sutter Creek – Count and Value of Parcels and Structures in Summary DFIRM Flood Zone

Flood Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
1% Annual Chance Flood Hazard	102	73	$9,234,981	$19,000,793	$11,174,927	$39,410,701
0.2% Annual Chance Flood Hazard	24	19	$2,546,520	$8,018,401	$5,844,780	$16,409,701
Other Areas	1,308	1,068	$121,893,704	$304,320,667	$180,599,958	$606,814,329
Total	**1,434**	**1,160**	**$133,675,205**	**$331,339,861**	**$197,619,665**	**$662,634,731**

Source: FEMA DFIRM 1/20/2016, Amador County 2024 Parcel/Assessor Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Table E-22 City of Sutter Creek – Count and Values of Parcels and Structures by Detailed DFIRM Flood Zone and Property Use

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
1% Annual Chance Flood Hazard						
Agricultural	0	0	$0	$0	$0	$0
Commercial	9	8	$1,159,921	$2,547,399	$2,547,399	$6,254,719
Industrial	1	1	$191,587	$400,831	$601,247	$1,193,665
Miscellaneous	8	0	$1,231	$0	$0	$1,231
Residential	84	64	$7,882,242	$16,052,563	$8,026,282	$31,961,087
Unknown						
1% Annual Chance Flood Hazard Total	**102**	**73**	**$9,234,981**	**$19,000,793**	**$11,174,927**	**$39,410,701**
0.2% Annual Chance Flood Hazard						
Agricultural	0	0	$0	$0	$0	$0
Commercial	2	2	$912,841	$4,152,457	$4,152,457	$9,217,755
Industrial	0		$0	$0	$0	$0

Flood Zone / Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
Miscellaneous	0	0	$0	$0	$0	$0
Residential	21	16	$1,532,761	$3,384,645	$1,692,323	$6,609,729
Unknown	1	1	$100,918	$481,299		$582,217
0.2% Annual Chance Flood Hazard Total	**24**	**19**	**$2,546,520**	**$8,018,401**	**$5,844,780**	**$16,409,701**
Other Areas						
Agricultural	6	2	$1,095,761	$170,670	$170,670	$1,437,101
Commercial	137	99	$23,915,295	$58,067,036	$58,067,036	$140,049,367
Industrial	1	1	$169,016	$481,314	$721,971	$1,372,301
Miscellaneous	31	0	$14,846	$0	$0	$14,846
Residential	1,125	962	$93,739,494	$243,280,562	$121,640,281	$458,660,337
Unknown	8	4	$2,959,292	$2,321,085	$0	$5,280,377
Other Areas Total	**1,308**	**1,068**	**$121,893,704**	**$304,320,667**	**$180,599,958**	**$606,814,329**
Sutter Creek Total	**1,434**	**1,160**	**$133,675,205**	**$331,339,861**	**$197,619,665**	**$662,634,731**

Source: FEMA DFIRM 1/20/2016, Amador County 2024 Parcel/Assessor Data

*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Table E-23 summarizes Table E-22 and shows City of Sutter Creek loss estimates and improved values at risk by FEMA 1% and 0.2% annual chance flood zones. According to Table E-22 and Table E-23, the City of Sutter Creek has 73 parcels and $30.2 million of structure and contents values or values in the 1% annual chance flood zone, and 19 improved parcels and $13.9 million of structure and contents values in the 0.2% annual chance flood zone. These values can be refined a step further. Applying the 20 percent damage factor as previously described in Section 4.3.11 of the Base Plan, there is a 1% chance in any given year of a flood event causing $6 million in damage and a 0.2% chance in any given year of a flood event causing $2.8 million in damage in the City of Sutter Creek. The loss ratio of 0.087% indicates that flood losses for 1% annual chance flooding would be minor and the City would be able recover. The loss ratio of 0.04% indicates that flood losses for 0.2% annual chance flooding would be relatively minor and the City would be able to recover.

Table E-23 City of Sutter Creek – Flood Loss Estimates

Flood Zone	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value	Loss Estimate	Loss Ratio
1% Annual Chance Flood Hazard	102	73	$9,234,981	$19,000,793	$11,174,927	$30,175,720	$6,035,144	0.087%
0.2% Annual Chance Flood Hazard	24	19	$2,546,520	$8,018,401	$5,844,780	$13,863,181	$2,772,636	0.040%
Total	**126**	**92**	**$11,781,501**	**$27,019,194**	**$17,019,707**	**$44,038,901**	**$8,807,780**	**0.001%**

Source: FEMA DFIRM 1/20/2016, Amador County 2024 Parcel/Assessor Data

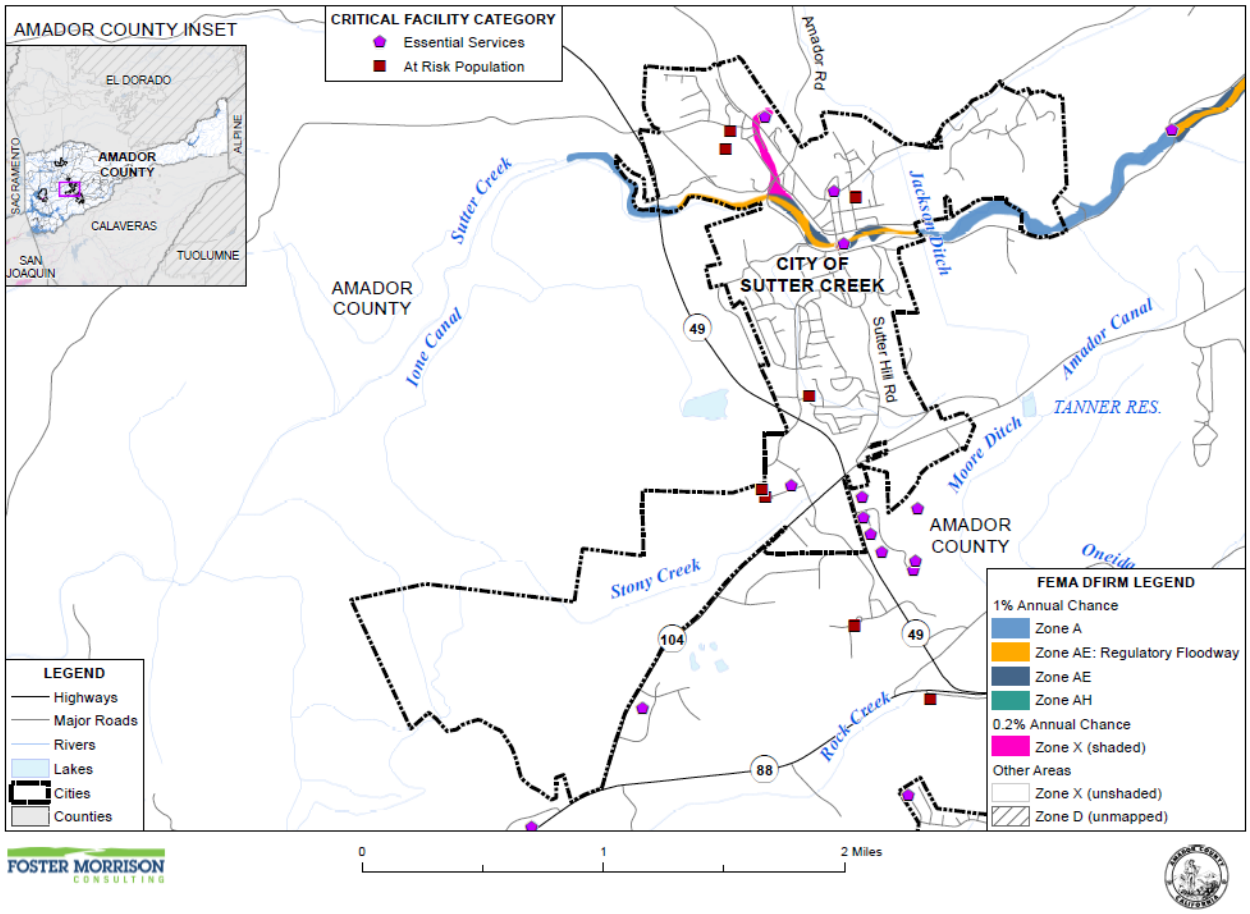
*With respect to improve parcels within the floodplain, the actual structures on the parcels may not be located within the actual floodplain, may be elevated and or otherwise outside of the identified flood zone

**This parcel count only includes those parcels in the 0.2% annual chance flood zone, exclusive of the 1% annual chance flood zone. The 0.2% annual chance flood, in actuality, also includes all parcels in the 1% annual chance flood zone.

Critical Facilities and Infrastructure

1% and 0.2% annual chance flooding present a threat to critical facilities and infrastructure. The following analysis discusses critical facilities and infrastructure. A separate analysis was performed on the critical facility inventory in the City to determine which critical facilities fall into each FEMA DFIRM flood zone. Using GIS, the FEMA DFIRM flood zones were overlayed on the critical facility GIS layer. This is shown on Figure E-18 for the FEMA DFIRM flood zones. Table E-43 details which critical facilities fall in which FEMA DFIRM flood zones. Details of critical facility categories, type, name, and address by FEMA DFIRM flood zones are listed in Appendix F.

Figure E-15 City of Sutter Creek – Critical Facilities in FEMA DFIRM Flood Zones



Data Source: FEMA Effective DFIRM 01/20/2016 (NFHL 01/21/2025 database), Amador County GIS, Cal-Atlas; Map Date: 4/21/2025.

Table E-24 City of Sutter Creek – Critical Facilities by Category and Type in FEMA DFIRM Flood Zones

Flood Zone	Critical Facility Category / Critical Facility Type	Facility Count
1% Annual Chance Flood Hazard		
Zone AE: Regulatory Floodway	**Essential Services**	
	Fire Station	1
	Police Station	1
	Essential Services Total	**2**
	Zone AE: Regulatory Floodway Total	**2**
1% Annual Chance Flood Hazard Total		**2**
0.2% Annual Chance Flood Hazard		
Zone X (shaded)	**Essential Services**	
	Fire Station	1
	Essential Services Total	**1**
	Zone X (shaded) Total	**1**

Flood Zone	Critical Facility Category / Critical Facility Type	Facility Count
0.2% Annual Chance Flood Hazard Total		**1**
Other Areas		
Zone X (unshaded)	**Essential Services**	
	Community Center	2
	Post Office	1
	Public Administration Building	1
	Essential Services Total	**4**
	At Risk Population	
	Residential Care Facility	1
	School	5
	At Risk Population Total	6
	Zone X (unshaded) Total	**10**
Other Areas Total		**10**
Sutter Creek Total		**13**

Source: FEMA DFIRM 1/20/2016, City of Sutter Creek

Natural, Historic, and Cultural Resources

Large flood events can affect natural, historic, and cultural resources. There are a number of ways floodwaters can impact natural resources and the environment. Wildlife habitats can be destroyed by floodwaters. Contaminated floodwater can pollute rivers and habitats. Silt and sediment can destroy natural areas. Riverbanks and natural levees can be eliminated as rivers reach bankfull capacity. Rivers can be widened, and deposition can increase downstream. Trees can be uprooted by high-velocity water flow. Plants that survive the initial flood may die due to being inundated with water. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to structures within the flooded areas, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged and lost during extreme flood events. Any of these that fall in the flood zones shown on Figure E-13 would be vulnerable.

Impacts from Flood: 1% and 0.2% Annual Chance

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Large flood events, including those associated with 1% and 0.2% annual chance floods, can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. People may be swept away in floodwaters, causing injuries or deaths. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Structures can be damaged directly from floodwaters and can also be damaged from trees falling as a result of water-saturated soils. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or

destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services causing power outages. The interruption of power causes major problems and can result in the closure of governmental offices and community businesses. Public schools may also be required to close or be placed on a delayed start schedule. Roads can be damaged and closed, causing safety and evacuation issues.

Standing water can cause damage to crops, roads, foundations, and electrical circuits. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, loss of environmental resources, and economic impacts.

Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the hazard profile discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed further below.

Insurance Coverage, Claims Paid, and Repetitive Losses

Standard property insurance does not include flood coverage because of the relatively high risk. The National Flood Insurance Program (NFIP) provides flood insurance to residents in those communities that participate in the NFIP. Federal financial assistance requires the purchase of flood insurance for structures located within a 100-year floodplain – a requirement that affects nearly all mortgages financed through commercial lending institutions. Flood insurance is also recommended for all structures protected by levees, even if not mapped within a floodplain.

The City of Sutter Creek joined the National Flood Insurance Program (NFIP) on September 24, 1987. The City does not participate in the CRS program. NFIP data indicates that as of March 2, 2020, there were 7 flood insurance policies in force in the City with $1,731,300 of coverage. There have been 11 historical claims for flood losses totaling $53,469.09. Of these, 5 were in A zones and 6 were in B, C, or X zones. 9 of the claims were for pre-FIRM structures, while 2 were for post-FIRM structures in the B, C, or X zone. NFIP data further indicates that there is 1 repetitive loss (in a B, C, or X zone) and no severe repetitive loss buildings in the City. This repetitive loss building is a single family dwelling. There have been no substantial damage claims since 1978.

Based on this analysis of insurance coverage, the City has values at risk to the 1% annual chance and greater floods. Of the 73 improved parcels within the 1% annual chance flood zone, 7 of those parcels maintain flood insurance. This can be seen on Table E-25.

Table E-25 City of Sutter Creek – Percentage of Policy Holders to Improved Parcels in the 1% Annual Chance Floodplain

Jurisdiction	Improved Parcels in SFHA (1% Annual Chance) Floodplain*	Insurance Policies in the SFHA (1% Annual Chance) Floodplain	Percentage of 1% Annual Chance Floodplain Parcels Currently Insured
City of Sutter Creek	73	7	9.6 %

Source: FEMA DFIRM 1/20/2016, Amador County 2024 Parcel/Assessor Data, NFIP CIS data.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City of Sutter Creek include the following:

- Climate change is likely to exacerbate future flood conditions and associated impacts and vulnerability of the County to 1% and 0.2% annual chance flooding.
- Future population growth should be considered, as having more or less people in a community affects the overall hazard vulnerability to the City. Population growth in the City of Sutter Creek has recently slowed; however, additional growth within the levee protected areas of the County and other 1% and 0.2% annual chance floodplains would place additional populations at risk to flood. Additional population growth would likely bring continued diversity to the County. Vulnerable population groups could face disproportionate effects from flooding and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions and the location of future flood events.
- Land use planning should be proactive to address future hazard conditions. Of the five developments planned over the next five years (as shown in Figure E-16), two have areas that would be near the floodplain. Locating new development, structures and critical facilities and infrastructure within or near areas of flood risk may put additional development at risk. However, City building codes and the City's floodplain ordinance are in effect to reduce this risk and should be updated as necessary to continue to address future flood conditions. As such, future development is not expected in increase the vulnerability of the City to flood.

Future Development

The potential for flooding may increase as floodwaters are channeled due to land development. Such changes can exacerbate flooding problems inside and outside of natural floodplains by altering or confining natural drainage channels. Floodplain modeling and master planning should be based on built out property use to ensure that all new development remains safe from future flooding. While local floodplain management, stormwater management, and water quality regulations and policies address these changes on a site-by-site basis, their cumulative effects can have a negative impact on the overall floodplain.

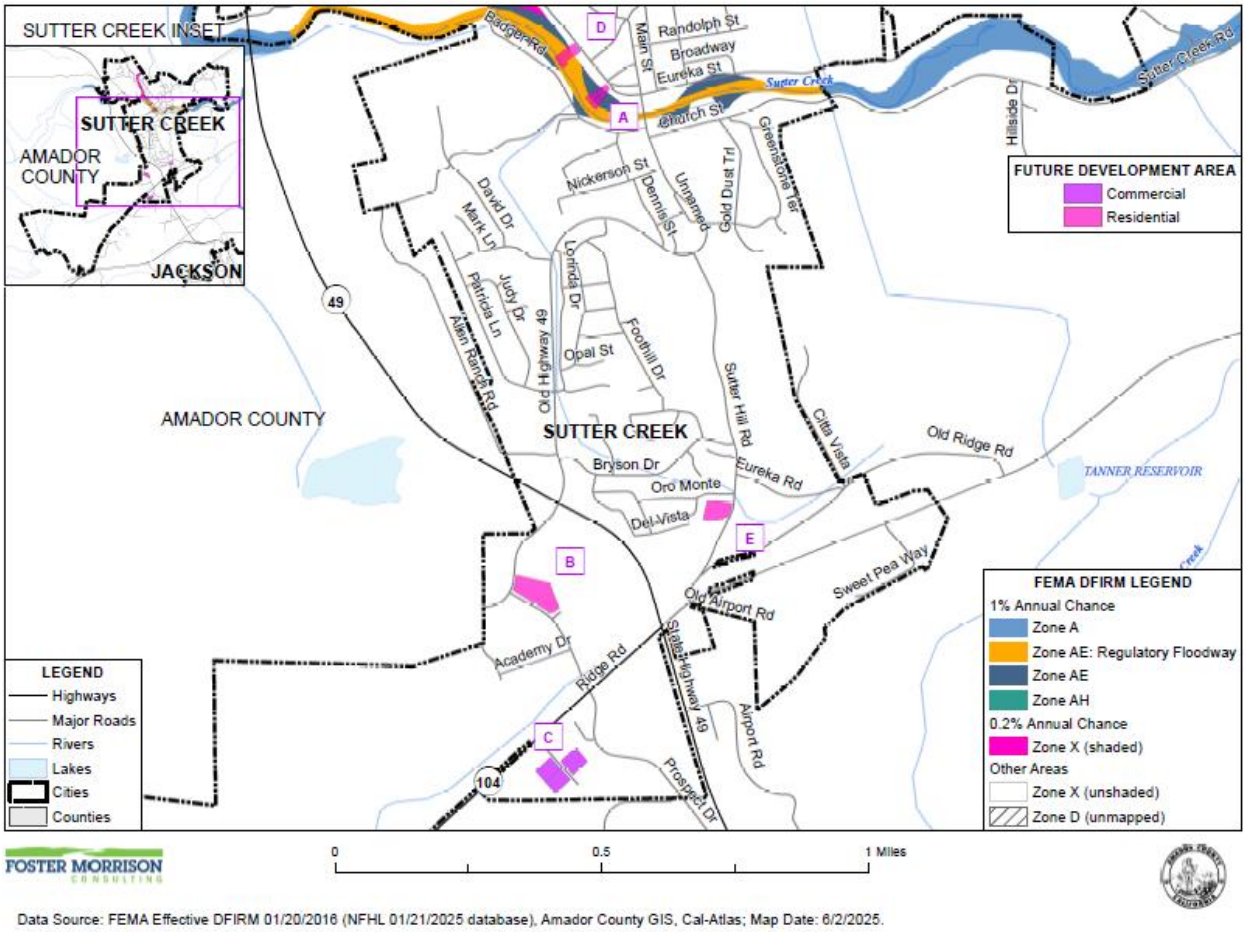
The City enforces its floodplain management ordinance. The City's floodplain ordinance should be updated to ensure new development within floodplains is adequately protected. More detail on the specifics of the floodplain ordinance can be found in the Capability section below.

Future development areas and their vulnerability to 1% and 0.2% annual chance flood are discussed further in the below GIS analysis.

GIS Analysis

The City provided future development areas which were used as the basis for the inventory of future development for the City. These areas were mapped in GIS. Utilizing the future development area spatial layer, the parcel polygon data was intersected to determine the future development areas within each DFIRM flood zone. Figure E-16 shows the locations of the future development area overlayed on the DFIRM flood zones. Some of these future development areas fall within the mapped flood areas as shown on Table E-26.

Figure E-16 City of Sutter Creek – Future Development Areas in FEMA DFIRM Flood Zones



Data Source: FEMA Effective DFIRM 01/20/2016 (NFHL 01/21/2025 database), Amador County GIS, Cal-Atlas; Map Date: 6/2/2025.

Table E-26 City of Sutter Creek – Future Development Area Acres and Parcels in FEMA DFIRM Flood Zones

Flood Zones/ Future Development	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
1% Annual Chance Flood Hazard						
Zone AE						
BLA-Rossi	1	1	0	0.23	0.23	0
Zone AE Total	**1**	**1**	**0**	**0.23**	**0.23**	**0**
Zone AE: Regulatory Floodway						
BLA-Rossi	2	1	1	0.36	0.18	0.18
TM 2917	1	1	0	0.59	0.59	0
Zone AE: Regulatory Floodway Total	**3**	**2**	**1**	**0.95**	**0.77**	**0.18**
1% Annual Chance Flood Hazard Total	**4**	**3**	**1**	**1.18**	**1.00**	**0.18**
Other Areas						
Zone X (unshaded)						
DANCO	1	0	1	2.06	0	2.06
Jackson Rancheria Development Corp.	3	0	3	3.62	0	3.62
TM 2925	1	1		1.06	1.06	0
Zone X (unshaded) Total	**5**	**1**	**4**	**6.74**	**1.06**	**5.68**
Other Areas Total	**5**	**1**	**4**	**6.74**	**1.06**	**5.68**
Grand Total	**9**	**4**	**5**	**7.92**	**2.06**	**5.86**

Source: FEMA DFIRM 1/20/2016, City of Sutter Creek

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the City during the rainy season from November through April. Prolonged heavy rainfall (including that from atmospheric river events) contributes to a large volume of runoff resulting in high peak flows of moderate duration.

Location and Extent

The City of Sutter Creek is subject to localized flooding throughout the City. Areas prone to localized flooding are included in Table E-27 below. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the City vary by location. Flood durations in the City tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the City tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

Past Occurrences

Disaster Declaration History

There have been no state or federal disaster declarations from localized floods. There would most likely have been localized flood events during the disaster declarations from flood as shown in the previous 1%/0.2% annual chance flood section.

NCDC Events

The NCDC occurrences of localized flooding are included in the 1% and 0.2% annual chance flood hazard profile above where past flood events were noted.

City of Sutter Creek Events

The City noted that the times of flooding and localized flooding have coincided. These were discussed in the Past Occurrences Section of the Flood:100-/500-Year section above. In addition to those events, the following events occurred"

2022 – New Year's Eve 2022 Flooding (December 31, 2022): A powerful atmospheric river event brought heavy rainfall to Northern California, causing significant rises in Sutter Creek (the waterway) that runs behind City Hall. This event was part of a broader series of storms between December 31, 2022, and March 25, 2023, which affected multiple regions of California, resulting in at least 22 fatalities and widespread property damage. Sutter Creek experienced significant flooding during the atmospheric river event, which

caused Sutter Creek (the waterway) to rise to unprecedented levels, flooding homes and businesses like "Simply Bubbles" on Main Street.

2023 - Karsand tributary bank eroded away back to the road which is now falling into the creek. Previous bank stabilization measures have failed in the 2023 storm event. There was also culvert da Eureka Road (a 45' by 26" culvert) and Gold Strike Court (a 102' by 38" culvert). These culverts were damaged and had to be replaced. In addition, debris was removed, areas were backfilled, and armoring was done to reduce future risk. Over $218,000 in costs were incurred to replace these culverts. Another culvert that had to be repaired on Gopher flat. The grizzly had debris fill up the grate from upstream of the creek and cause creek flow to bypass the underdrain and run over Cole Street which nearly caused water damage to downstream properties. The face of the grate had to have the debris removed to allow water to flow through the grate and under Cole St.

In addition, the City noted that the City Auditorium floods almost every year. The basement double doors of the Auditorium are roughly 6-feet from the bottom of Sutter Creek and when the creek flows to its maximum level during storms water enters the parking lot and then drains into the basement. In 2023, a significant amount of water got into the basement and the sump pumps could not keep up. There were many rooms that experienced water damage and many historic records were damaged/destroyed. The City has since added more sump pumps and have backups on hand in case they fail but the amount of water that enters is typically too much to handle during a storm.

Climate Change and Localized Flood

It is likely that climate change will increase the chance of future occurrence as well as future impacts from localized flood. More information on future impacts to the City can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Even if average annual rainfall may decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century, increasing the likelihood of overwhelming stormwater systems built to historical rainfall averages. This makes localized flooding more likely.

Vulnerability to Localized Flood

Flood vulnerability and their impacts vary by location and severity of any given flood event and will likely only affect certain areas of the City during specific times. Based on the risk assessment, it is evident that floods will continue to have potentially significant impacts to certain areas of the City. However, while flooding can cause significant impacts, depending on the duration and volume of precipitation and the drainage in any given area, many of the floods in the City are minor, localized flood events that are more of a nuisance than a disaster.

Many areas of the City are at some measure of vulnerability to localized flooding. An assessment of a community's vulnerability to localized flooding begins with an understanding of local exposure to localized flooding. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Historically, the City has been affected by flooding of streams and creeks occurring during heavy rain and storm (including atmospheric river) events. Additional development in the City and in the watersheds of these streams affects both the frequency and duration of damaging floods through an increase in stormwater runoff and contributes to localized flooding occurring in areas throughout the City. The lack of or inadequate drainage infrastructure in the City contributes to localized flooding issues.

Over the years culverts have clogged from silt and sediment, organic debris, vegetation and "volunteer" trees. Clogged culverts contribute to obstructed water flow leading to water backing up and causing localized flooding and can damage property, roads and surrounding areas. When water cannot pass efficiently it can erode the surrounding embankments, roads and walkways compromising infrastructure integrity. One area that experiences regular flooding is the Auditorium building and parking lot. As the creek backs up water is diverted to the Auditorium parking lot and filters into the basement of the Auditorium.

The City tracks localized flooding areas. Affected localized flood areas identified by the City of Sutter Creek are summarized in Table E-27.

Table E-27 City of Sutter Creek – List of Localized Flooding Problem Areas

Area Name	Flooding	Pavement Deterioration	Washout	High Water	Landslide/ Mudslide	Debris	Downed Trees
Eureka Rd	X	X	X	X		X	X
Spanish Street		X					
Broad Street/Gopher Flat		X				X	
Bryson	X	X	X	X		X	
Gold Strike Ct	X	X	X	X		X	
Cemetery	X	X	X		X	X	

Source: City of Sutter Creek

Localized flooding, outside of the 100-year floodplain, also occurs due to drainage problems that restrict flows in the following areas:

- Bryson Drive undercrossing
- Bryson Creek Drainage near Badger Street, David Drive and Raylan Drive
- 300 Handford at Lincoln
- Gopher Gulch Creek along Gopher Flat Road between Manor Court and Sutter Creek
- Sutter Creek Cemetery and Mahoney Mill Road
- Oro Madre Road drainage between Oro Madre and Amador High School
- China Gulch drainage between the Sutter Creek Fire Hall and Badger Street
- Drainage on Fiefield Alley behind Belotti's and Skunk Hollow gulch near Greenstone Terrace

- Sutter Hill Rd at Oro Monte road intersection sink hole
- Drainage from the Amador airport and Old Sutter Hill Road

The City of Sutter Creek does not have a Storm Water Master Plan to address storm water issues and plan for capital improvements.

Assets at Risk

Assets at risk from localized flood include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

People and populations (including vulnerable populations) are traditionally not highly vulnerable to localized flooding, but their structures and contents can be at risk. Localized flooding may also cause transportation issues as roads and lanes are impacted or closed and affect the ability for people to travel throughout the City.

Structures

Structures in areas with localized flooding can be affected if floodwaters intrude into the structure. Structures in low lying areas, or those with basements can be at greater risk. Buildings with older foundations that are prone to water intrusion are also at greater risk. Once water finds its way into a structure, it tends to continue to do so until the path that brings water into a structure is mitigated. Structures can also be damaged by trees that have become uprooted and fall during rain and storm events. Large trees falling onto structures can cause significant damage.

Critical Facilities and Infrastructure

Localized flooding, while often more of a nuisance, can cause damage to critical facilities and infrastructure during a heavy rain and storm event. Any facility that experiences localized flooding can be impacted. Utilities and other critical infrastructure can all be affected, causing interruptions in service until repairs can be made. For example, water and wastewater systems can be vulnerable to heavy rains and flood events. Rainfall creates a high water table, surging streams and creeks, and saturates soil. Infiltration of stormwater into water and wastewater systems may occur and presents a threat to public health and safety, when the infrastructure is no longer able to meet operational needs and local demands. Other critical facilities such as roads, bridges and other transportation facilities can also experience localized flooding causing road closures and other impacts until storm waters recede. This can result in extended road closures requiring alternate routes.

Natural, Historic, and Cultural Resources

Natural resource assets may have some vulnerabilities to localized flood during major storm events, but can benefit from floodwaters, often by design. Many parks and green spaces are designed to take overflow water and release it into the underlying soils and natural areas. Wetlands areas in the City actually help reduce the risk of flooding, as they can absorb excess rainfall that would have to be drained away from

impervious surfaces. Flooding can provide many benefits to the natural environment, including recharging wetlands and groundwater, increasing fish production, creating wildlife habitat, and rejuvenating soil fertility. These smaller localized flooding events often provide more benefits to the environment in comparison to negative impacts associated with large flood events. Historic and cultural resources may be at some measure of vulnerability if they are located in areas subject to repeated localized flooding.

Impacts from Localized Flood

Primary concerns associated with stormwater flooding include impacts to infrastructure that provide a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services. Standing water can cause damage to crops, roads, and foundations. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Life safety issues from localized flooding would be more limited. The amount and type of damage or flooding that occurs varies from year to year and from storm to storm, depending on the quantity of precipitation and runoff.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City of Sutter Creek include the following:

- Climate change is likely to exacerbate future heavy rain conditions and associated impacts and vulnerability of the City to localized flood.
- Population growth in the City of Sutter Creek has recently slowed. Additional population growth would likely bring continued diversity to the City. This can also impact the vulnerable populations, like low-income individuals and households living in areas that are typically more hazardous. Vulnerable population groups such as low-income individuals and households living in flood prone areas could face disproportionate effects from localized flood and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions and the location of future flood events.
- Land use planning should be proactive to address future hazard conditions. The City has five areas it is planning to see development in the next five years. Development in more urban areas causes an increase in peak flow and stormwater runoff. Such growth will consume previously undeveloped acres, and the impacts may overwhelm existing drainage and flood control facilities. Locating new development, structures and critical facilities and infrastructure within or near areas of localized

flooding risk may put additional development at risk. However, City building codes are in effect to reduce this risk and should be updated as necessary to continue to address future localized flood conditions. Depending on the location of new development and adherence to protective building codes, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the City to this hazard.

The City will need to be proactive to ensure that increased development has proper siting and drainage for stormwaters. The risk of localized flooding to future development can also be minimized by accurate recordkeeping of repetitive localized storm activity. Mitigating the root causes of the localized stormwater flooding will reduce future risks of losses.

Landslide, Mudslide, and Debris Flow

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

Like its earthquake-generating faults, California's mountainous terrain is a consequence of dynamic geologic processes in operation as the North American Plate grinds past the Pacific Plate. According to the CGS, a landslide is a general term for a variety of mass-movement processes that generate a down-slope movement of mud, soil, rock, and/or vegetation. Landslides are classified into many different types based on form and type of movement. They range from slow-moving rotational slumps and earth flows, which can slowly distress structures but are less threatening to personal safety, to fast-moving rock avalanches and debris flows that are a serious threat to structures and have been responsible for most fatalities during landslide events. For the purposes of this LHMP Update, the term landslide includes mudslides, debris flows, and rockfalls that tend to occur suddenly; as well as hillside erosion, which is a similar process that tends to occur on smaller scales and more gradually but can exacerbate landslide events.

Landslides, debris flows and mudslides are closely related to flooding, as both processes are related to precipitation, runoff, and the saturation of ground by water. In addition, landslides, mud flows, and debris flows can occur on small, steep stream channels and are often mistaken for floods. However, landslide events may be much more destructive than floods because of their higher densities, high debris loads, and high velocities.

Soil erosion is another common form of soil instability. Erosion is a function of soil type, slope, rainfall intensity, and groundcover. It accounts for a loss in many dollars of valuable soil, is aesthetically displeasing, and often induces even greater rates of erosion and sedimentation. Sedimentation is simply the accumulation of soil as a result of erosion. Construction activities often contribute greatly to erosion and sedimentation. Besides being a pollutant in its own right, sediment acts as a transport medium for other pollutants, especially nutrients, pesticides, and heavy metals, which adhere to the eroded soil particles. As the sediment drains into watercourses, the combination of these pollutants adversely affects water quality.

Natural conditions that contribute to landslide, mudslides, debris flows, hillside and streambank erosion, include the following:

- Degree of slope
- Water (heavy rain, river flows, or wave action)
- Unconsolidated soil or soft rock and sediments
- Lack of vegetation (no stabilizing root structure)
- Previous wildfires and other forest disturbances (discussed in the Wildfire section below)
- Road building, excavation, and grading
- Earthquake

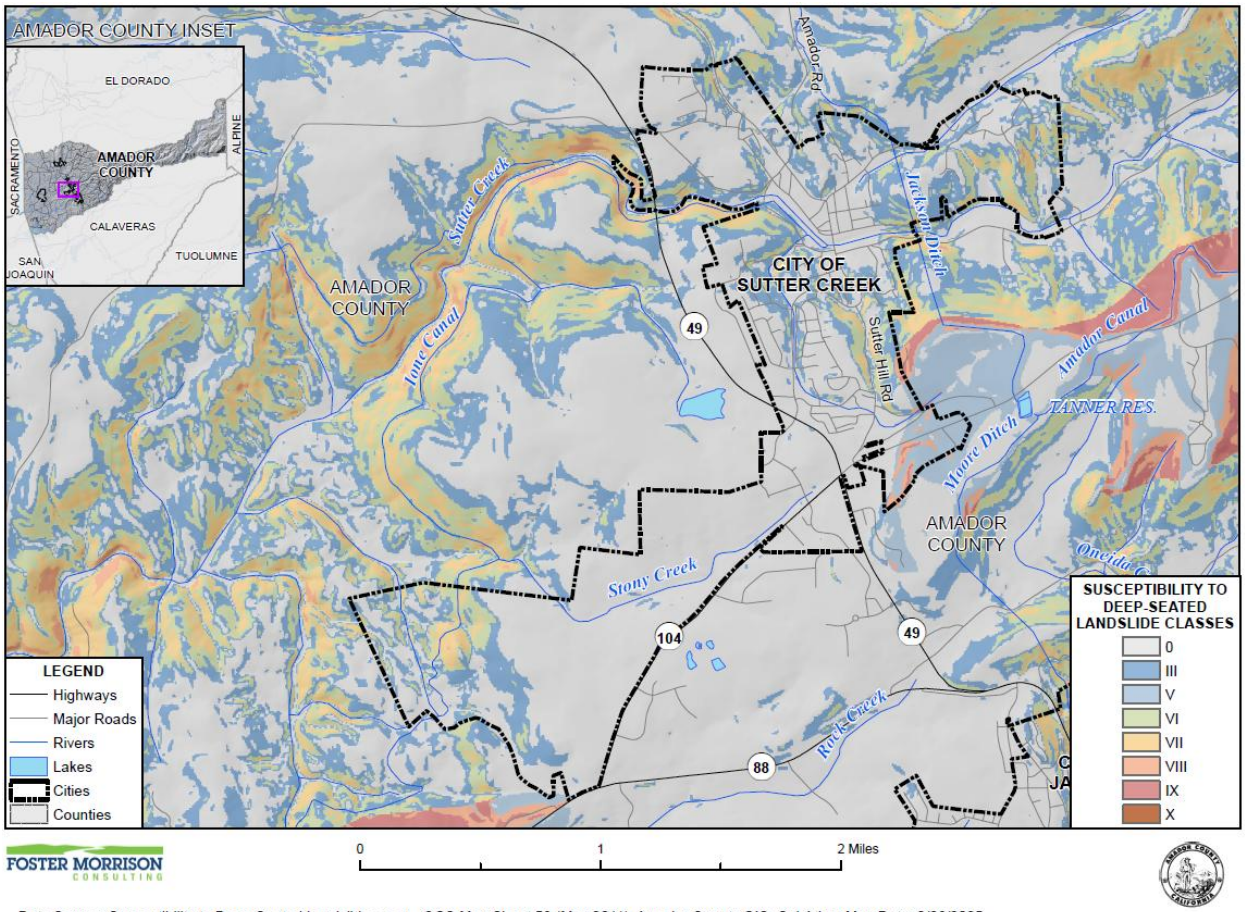
The 2023 California State Hazard Mitigation Plan noted that more than one third of California is mountainous terrain that generally trends parallel to the coast, forming a barrier that captures moisture from offshore storms originating in the Gulf of Alaska and Mexico. Steep topography, weak rocks, heavy winter rains, and occasional earthquakes all lead to slope failures more frequently than would otherwise occur under gravity alone. This is true in the sloped areas bordering the City to the east where the topography is characterized by rolling hills and ridges.

Location and Extent

Landslides can occur in areas with steep slopes and weak soils. It can also occur in areas where erosion has previously occurred. Both winter storms (precipitation-induced) and earthquake triggered landslides tend to occur in or near places that have experienced previous landslides. However, landslides may also occur in other locations over time. Landslides and debris flows may also occur in fire burn scar areas.

Figure E-17 shows the CGS areas at susceptible to deep-seated landslides. The legend on Figure E-17 shows the susceptibility scale (from 0-X with 0 being the least and X being the most susceptible) that the CGS uses to show the susceptibility of landslides. It is a primarily a combination of slope class and rock strength. Geographic extents of these classes are shown on Table E-28. According to the 2023 State Hazard Mitigation Plan, the susceptibility classes were further categorized into Very High (susceptibility class X) and High (susceptibility classes VII, VIII, & IX) for exposure analysis. The rest of the classes were not categorized. CGS mapping indicates that the eastern portions of the City and surrounding area are at high to very high susceptibility areas for landslides. This can be seen in the darker orange and red colors. The speed of onset of landslide is often short, especially in past landslide areas as well as in post-wildfire burn scar areas, but it can also take years for a slope to fail. Landslide duration is usually short, though digging out and repairing landslide areas can take some time.

Figure E-17 City of Sutter Creek – Susceptibility to Deep-Seated Landslides



Data Source: Susceptibility to Deep-Seated Landslides map - CGS Map Sheet 58 (May 2011), Amador County GIS, Cal-Atlas; Map Date: 2/26/2025.
https://gis.data.ca.gov/maps/08d18656a0194881a7e0f95fde19f08c/explore?location=37.559285%2C-122.059821%2C11.00

Table E-28 City of Sutter Creek – Susceptibility to Deep-Seated Landslide Geographical Extents by Class

Susceptibility to Deep-Seated Landslide Class	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
0	1,164	68%	546	72%	618	65%
III	315	18%	134	18%	181	19%
V	33	2%	9	1%	23	2%
VI	137	8%	57	7%	80	8%
VII	48	3%	14	2%	34	4%
VIII	10	0.6%	2	0.2%	8	0.9%
IX	2	0.1%	0	0.01%	2	0.2%
X	0	0.0%	0	0.0%	0	0.0%
Sutter Creek Total	**1,709**	**100%**	**762**	**100%**	**947**	**100%**

Source: CGS

Past Occurrences

Disaster Declarations

There have been no disaster declarations associated with solely landslides in Amador County; however, as shown in Table E-29, there have been 9 state and 10 federal disaster declarations for flood which included landslides as a component.

Table E-29 Amador County – Federal and State Disaster Declarations Summary 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (events that included landslide)	9	1995 (twice), 2006 (twice), 2017 (twice), 2019, 2023 (twice)	10	1995 (twice), 2006 (twice), 2017 (twice), 2019, 2023 (three)

Source: Cal OES, FEMA. Retrieved March 2025.

NCDC Events

The NCDC contains no records for landslides in Amador County, but there was one record for debris flow. This was not known to affect the City.

City of Sutter Creek Past Occurrences

The City Planning Team noted the following past occurrences of landslides:

- In **2017**, during two peak storm events, unreinforced mine tailings began to cause a mudslide onto Old Highway 49 causing a pile up of debris into the roadway. Smaller mudslides on Gopher Flat also occurred. Worley at Main Street: 2017-2018 storms caused the hillside to fall onto main street. Road was dug out and ultra block installed as temporary fix. After 3-5 years ultra block was removed and Jute netting and Rice waddle were installed until vegetation returned to the hillside. Natural vegetation is impeding erosion currently.
- In **2022** Worley Street, debris from houses above during storms in 2022 had water and mud debris slide into lower house garage and block safe passage into lower residence. City installed curtain drain along road and connected it to existing DI to prevent further erosion. Problem has been solved
- In **2023** on the Karsan Tributary – Storm in Dec 2023 caused high tributary flows which washed out the South bank of the tributary. Some road has fallen into the tributary. Currently monitoring road to see if any further bank erosion is occurring. Currently erosion is being controlled, need to reinforce south bank and road. Crestview Drainage on Meadow Crest – Sept 2023 Homeowner called City about drainage issues. No drainage was provided from upper development and too much flow was entering the residence on 310 Gopher Flat. City investigated and determined that the existing drainage pipe was too small and had be compromised. In fall of 2024, the City installed a 100 LF of new 18-inch pipe and 30 LF of 24-inch pipe, two new DI's and 2 DI's.
- **2020 to 2023** – Pump Station Debris – Over time dirt from unfinished road washed down into pump station vault. Vault was not above storm flows which would allow storm flow to enter pump station. Debris was removed and vault lip is now above storm flows. Issue solved for next 10 years, possible issue if high storm flows return, monitor debris accumulation and remove as necessary. Pump station vault needs to be lifted.

Climate Change and Landslide and Debris Flows

According to the 2021 CAS (as well as the 2024 Draft CAS), climate change may result in precipitation extremes (i.e., wetter wet periods and drier dry periods). More information on precipitation increases can be found in Section 4.3.4 of the Base Plan. While total average annual rainfall may decrease only slightly, rainfall is predicted to occur in fewer, more intense precipitation events. The combination of a generally drier climate in the future, which will increase the chance of drought and wildfires, and the occasional extreme downpour is likely to cause more mudslides, landslides, and debris flows.

Vulnerability from Landslide

Portions of the City are at some measure of vulnerability to landslide. This is true when atmospheric river or heavy rain and storm events occur. An assessment of a community's vulnerability to landslide begins with an understanding of local exposure to landslide. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The HMPC noted that the Karsand tributary has a road that is falling into Sutter creek. The Karsan tributary which collects storm drain flows from approximately one third of the storm flows from the South side of Sutter Creek. The tributary has caused a landslide on the South bank of the tributary which has begun to erode Karsan Dr. The road on the south side of the tributary is falling into the creek. Previous stabilization has failed.

Assets at Risk

Assets at risk from landslide include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations located within areas of landslide susceptibility, especially in the High to Very High hazard areas (i.e., Classes VII to X) are at some vulnerability to landslide. This includes those people residing in these landslide potential areas as well as those that might reside or work within the landslide run out areas. People residing in these areas may also be cut off from transportation routes if roads and streets providing a means of ingress and egress are impacted. Certain vulnerable populations may be at greater risk due to the often sudden onset of a landslide event and include: the unsheltered, those with limited mobility, and those that lack the resources to leave the area.

City residents that live in the High and Very High landslide susceptibility areas are often the most vulnerable, but those who live in in the landslide run out areas (which are not mapped) are also vulnerable. Not only are the residents at risk, but their homes and contents are all at risk, compounding the impacts

associated with significant hazard events. To further evaluate the impact to the City's residential population residing within these hazard areas, an analysis was conducted of those who physically reside in the mapped landslide susceptibility areas. The CGS Susceptibility to Deep-Seated Landslide maps were overlayed on the parcel layer and linked to the assessor data. Those residential parcel polygons that intersect the High or Very High risk areas (Class VII or higher) were counted and multiplied by the 2023 Census Bureau average household factors for Sutter Creek – 2.07. Analysis results are shown in Table E-30. According to this analysis, there is a total population of 221 residents of the City at high or very high risk to landslides.

Table E-30 City of Sutter Creek – Improved Residential Parcels and Population in Susceptibility to Deep-Seated Landslides - Classes VII, VIII, IX, and X

Deep Seated Landslide Class/Jurisdiction	Improved Residential Parcels	Population
VII		
Sutter Creek	62	128
VIII		
Sutter Creek	0	0
IX		
Sutter Creek	1	2
X		
Sutter Creek	0	0
Total	63	130

Source: CGS, Amador County 2024 Parcel/Assessor Data, US Census Bureau American Community Survey 2023 Household Size Estimates.

The City noted that the Critical Facilities and Infrastructure section below includes the facilities used by At-Risk populations that are threatened by this hazard. While this is not specific to what special populations reside in the City, it does speak to facilities that area used to serve (portions) of this population.

Structures

Landslides can affect the built environment of the City and those structures located within the High to Very High hazard areas (i.e., Classes VII to X) are especially vulnerable, as are the structures located within the landslide run out areas. The CGS Deep-Seated Landslide layer was overlaid with the City parcel (structure) layer in GIS and linked to the assessor data. The mapped landslide susceptibility areas are shown on Figure E-17. Table E-31 summarizes parcel counts, land and improved values (i.e., those with a structure improvement on the parcel), estimated content replacement values, and total values in the City for landslide susceptibility areas. Table E-32 shows the same analysis further broken out by property use.

Table E-31 City of Sutter Creek – Count and Value of Parcels and Structures Susceptible to Deep-Seated Landslide Classes

Susceptibility to Deep-Seated Landslide Class	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Total Value
0	744	634	$72,757,839	$184,632,211	$120,864,415	$378,254,465
III	367	303	$29,373,095	$77,110,330	$39,376,477	$145,859,902
V	3	2	$575,072	$736,206	$700,166	$2,011,444
VI	199	155	$17,159,592	$47,724,542	$26,224,294	$91,108,428
VII	100	62	$10,397,559	$20,672,537	$10,336,269	$41,406,365
VIII	11	2	$1,262,463	$48,045	$48,045	$1,358,553
IX	10	2	$2,149,585	$415,990	$70,000	$2,635,575
Sutter Creek Total	**1,434**	**1,160**	**$133,675,205**	**$331,339,861**	**$197,619,665**	**$662,634,731**

Source: CGS, Amador County 2024 Parcel/Assessor Data

Table E-32 City of Sutter Creek – Count and Value of Parcels and Structures in Deep-Seated Landslide Classes by Property Use

Susceptibility to Deep-Seated Landslide Class/Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Estimated Contents Value
0						
Agricultural	1	1	$22,308	$78,085	$78,085	$178,478
Commercial	107	87	$19,877,872	$56,579,901	$56,579,901	$133,037,674
Industrial	1	1	$169,016	$481,314	$721,971	$1,372,301
Miscellaneous	16	0	$1,231	$0	$0	$1,231
Residential	615	543	$50,571,272	$126,968,915	$63,484,458	$241,024,645
Unknown	4	2	$2,116,140	$523,996	$0	$2,640,136
0 Total	**744**	**634**	**$72,757,839**	**$184,632,211**	**$120,864,415**	**$378,254,465**
III						
Commercial	22	15	$2,045,221	$2,843,360	$2,843,360	$7,731,941
Industrial	1	1	$191,587	$400,831	$601,247	$1,193,665
Miscellaneous	11		$7,342	$0	$0	$7,342
Residential	331	285	$26,751,464	$71,863,741	$35,931,871	$134,547,076
Unknown	2	2	$377,481	$2,002,398	$0	$2,379,879
III Total	**367**	**303**	**$29,373,095**	**$77,110,330**	**$39,376,477**	**$145,859,902**
V						
Commercial	2	1	$488,078	$664,126	$664,126	$1,816,330
Residential	1	1	$86,994	$72,080	$36,040	$195,114
VI Total	**3**	**2**	**$575,072**	**$736,206**	**$700,166**	**$2,011,444**

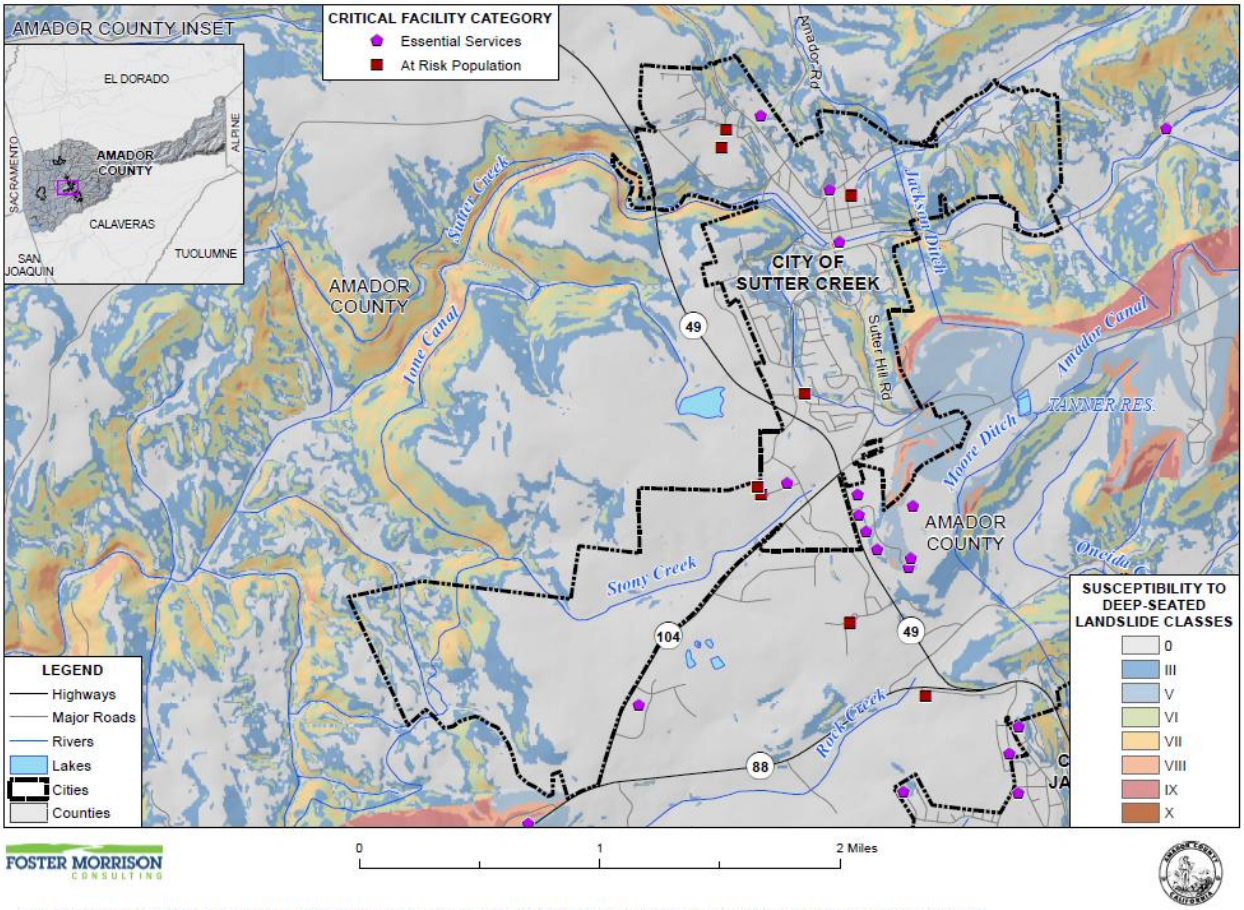
Susceptibility to Deep-Seated Landslide Class/Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Value	Estimated Contents Value
VI						
Agricultural	1	1	$187,404	$92,585	$92,585	$372,574
Commercial	5	4	$1,021,943	$4,631,460	$4,631,460	$10,284,863
Miscellaneous	7	**0**	$7,186	$0	$0	$7,186
Residential	186	150	$15,943,059	$43,000,497	$21,500,249	$80,443,805
VI Total	**199**	**155**	**$17,159,592**	**$47,724,542**	**$26,224,294**	**$91,108,428**
VII						
Agricultural	3	0	$755,536	$0	$0	$755,536
Commercial	1	0	$219,799	$0	$0	$219,799
Miscellaneous	5	0	$318	$0	$0	$318
Residential	91	62	$9,421,906	$20,672,537	$10,336,269	$40,430,712
VII Total	**100**	**62**	**$10,397,559**	**$20,672,537**	**$10,336,269**	**$41,406,365**
VIII						
Agricultural	1	0	$130,513	$0	$0	$130,513
Commercial	6	2	$1,088,957	$48,045	$48,045	$1,185,047
Residential	4	0	$42,993	$0	$0	$42,993
VIII Total	**11**	**2**	**$1,262,463**	**$48,045**	**$48,045**	**$1,358,553**
IX						
Commercial	5	0	$1,246,187	$0	$0	$1,246,187
Residential	2	1	$336,809	$140,000	$70,000	$546,809
Unknown	3	1	$566,589	$275,990	$0	$842,579
IX Total	**10**	**2**	**$2,149,585**	**$415,990**	**$70,000**	**$2,635,575**
Sutter Creek Total	**1,434**	**1,160**	**$133,675,205**	**$331,339,861**	**$197,619,665**	**$662,634,731**

Source: CGS, Amador County 2024 Parcel/Assessor Data

Critical Facilities and Infrastructure

Landslides present a threat to both critical facilities and infrastructure. The following analysis discusses critical facilities and infrastructure. A separate analysis was performed on the critical facility inventory in the City to determine which critical facilities fall into each deep-seated landslide class. Using GIS, the deep-seated landslide classes were overlayed on the critical facility GIS layer. This is shown on Figure E-18 for the deep-seated landslide classes. Table E-33 summarizes Table E-34 details which critical facilities fall within which landslide class. Details of critical facility categories, type, name, and address by deep-seated landslide class are listed in Appendix F.

Figure E-18 City of Sutter Creek – Critical Facilities in Deep-Seated Landslide Classes



Data Source: Susceptibility to Deep-Seated Landslides map - CGS Map Sheet 58 (May 2011), Amador County GIS, Cal-Atlas; Map Date: 4/21/2025.
https://gis.data.ca.gov/maps/08d18656a0194881a7e0f95fde19f08c/explore?location=37.559285%2C-122.059821%2C11.00

Table E-33 City of Sutter Creek– Critical Facilities by Category in Deep-Seated Landslide Classes

Jurisdiction / Susceptibility to Deep-Seated Landslide Class / Critical Facility Category	Facility Count
0	
Essential Services	6
At Risk Population	6
0 Total	**12**
III	
Essential Services	1
At Risk Population	0
III Total	**1**
Sutter Creek Total	**13**

Source: CGS, City of Sutter Creek

Table E-34 City of Sutter Creek – Critical Facilities by Category and Type in Deep-Seated Landslide Classes

Susceptibility to Deep-Seated Landslide Class	Critical Facility Category	Facility Type	Facility Count
0	Essential Services Facilities	Community Center	2
		Fire Station	2
		Police Station	1
		Public Administration Building	1
		Essential Services Total	**6**
	At Risk Population	Residential Care Facility	1
		School	5
		At Risk Population Total	**6**
	0 Total		
III	Essential Services Facilities	Post Office	1
		Essential Services Total	**1**
	III Total		**1**
City of Sutter Creek Total			**13**

Source: CGS, City of Sutter Creek

Natural, Historic, and Cultural Resources

Landslides can affect natural, historic, and cultural resources that lie in the landslide area, or the landslide run out area. Landslides can destroy large tracts of forest and open space areas, destroy wildlife habitat, and remove productive soils and vegetation from slopes. It can also fill in waterways, impact water quality, and potentially affect flooding potential. Natural resources that fall in the High or Very High susceptibility areas shown on Figure E-17 would be most vulnerable, as well as those in the run-out areas. As shown on the map, this would include a relatively small area of the City, since most of this occurs in the in the undeveloped portion of the City.

Impacts from Landslide

Any type of landslide may result in damages or complete destruction of buildings in their path, as well as deaths and injuries. Landslides can cause road blockages by depositing debris on road surfaces or road damage if the road surface itself slides downhill. Utility lines and pipes are also prone to breakage in slide areas. Large landslides can collapse into water bodies, causing seiches. Landslides can relocate river channels. Landslides and debris flows can also impact water quality and the storage capacity of surface water reservoirs used to store potable water.

Landslides, debris flows, and mud flows impacts vary by location and severity of any given event and will likely only affect certain areas of the City susceptible to landslide. Based on the risk assessment, there is limited potential for significant landslides to occur in the City. Most, but not all, of the historic landslides in the City have been minor, localized events that are more of a nuisance than a disaster. Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the hazard profile above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City include the following:

- Climate change is likely to exacerbate future landslide, mudslide, and debris flow conditions and associated impacts and vulnerability of the City to landslide.
- Population growth in the City has recently slowed; however, additional growth within the areas at risk to deep-seated landslides in the City would place additional populations at risk. Additional population growth would likely bring continued diversity to the City. Vulnerable population groups could face disproportionate effects from a landslide and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions and the location of future landslide events.
- Land use planning should be proactive to address future hazard conditions. Locating new development, structures and critical facilities and infrastructure within or near areas of landslide risk may put additional development at risk. The City has five areas that may see development over the next five years. These are all in lower risk areas. In addition, City building codes are in effect to reduce this risk and should be updated as necessary to continue to address future landslide conditions. It should be noted that most of the growth in the City is occurring in areas outside the landslide risk areas. Thus, depending on the location of new development and adherence to protective building codes, changes in

land use and development may or may not increase the impacts and associated vulnerabilities of the City to this hazard.

Future Development

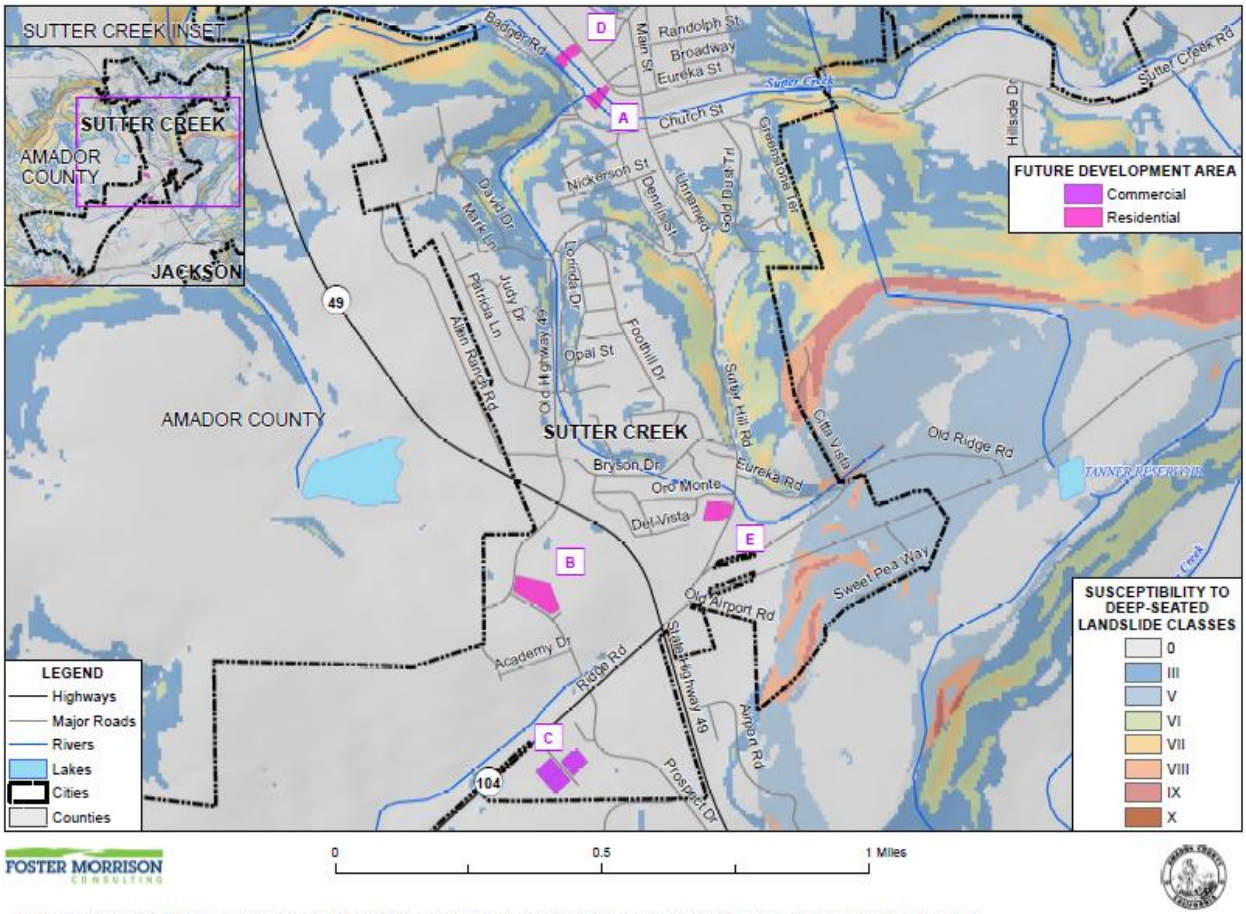
Additional growth and development within moderate or higher deep-seated landslide susceptibility classes in the City would place additional values at risk to landslide. More vulnerable populations may experience a disproportionate impact from landslide, and this should be considered as development continues.

Future development areas and their vulnerability to landslides are discussed further in the below GIS analysis.

GIS Analysis

The City provided future development areas which were used as the basis for the inventory of future development for the City. These areas were mapped in GIS. Utilizing the future development area spatial layer, the parcel polygon data was intersected to determine the future development areas within each deep-seated landslide class. Figure E-19 shows the locations of the future development area overlayed on the deep-seated landslide classes. These lie in the III deep-seated landslide class, as shown in Table E-35.

Figure E-19 City of Sutter Creek – Future Development Areas in Deep Seated Landslide Classes



Data Source: Susceptibility to Deep-Seated Landslides map - CGS Map Sheet 58 (May 2011), Amador County GIS, Cal-Atlas; Map Date: 6/2/2025.

Table E-35 City of Sutter Creek – Future Development Parcels and Acres in Deep Seated Landslide Classes

Susceptibility to Deep-Seated Landslide Class / Future Development	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
III						
BLA-Rossi	3	2	1	0.59	0.41	0.18
DANCO	1	0	1	2.06	0	2.06
Jackson Rancheria Development Corp.	3	0	3	3.62	0	3.62
TM 2917	1	1	0	0.59	0.59	0

TM 2925	1	1	0	1.06	1.06	0
III Total	**9**	**4**	**5**	**7.92**	**2.06**	**5.86**

Source: CGS, City of Sutter Creek

Severe Weather: Extreme Heat

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

According to FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and lasts for several weeks. Heat kills by taxing the human body beyond its abilities. In extreme heat and high humidity, evaporation is slowed, and the body must work extra hard to maintain a normal temperature." Most heat disorders occur because the victim has been overexposed to heat or has over-exercised for his or her age and physical condition. Older adults, young children, those who are sick or overweight, and those that work or recreate outdoors are more likely to experience heat exhaustion or succumb to extreme heat.

In addition to the risks faced by citizens of the City, there are risks to the built environment from extreme heat. While extreme heat on its own does not usually affect structures, extreme heat during times of drought can cause wildfire risk to heighten. Extreme heat can lead to interruptions in power, power outages, and when combined with high winds, to Public Safety Power Shutdown (PSPS) events, creating significant issues in the City.

Location and Extent

Heat is a regional phenomenon and affects the whole of the City. Heat emergencies are often slower to develop, taking several days of continuous, oppressive heat before a significant or quantifiable impact is seen. Heat waves do not strike victims immediately, but rather their cumulative effects slowly affect general and vulnerable populations and communities. Heat waves do not generally cause damage or elicit the immediate response of floods, fires, earthquakes, or other more "typical" disaster scenarios. The City experiences temperatures in excess of 100°F during the summer and fall months. The temperature moves to 105-110°F in rather extreme situations.

The NWS has in place a system to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color (green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Section 4.3.3 of the Base Plan.

Past Occurrences

Disaster Declaration History

There have been no federal or state disaster declarations from extreme heat.

NCDC Events

The NCDC data shows 124 extreme heat incidents for Amador County since 1993, some of which likely affected the City.

City of Sutter Creek Events

The City Planning Team noted that since extreme heat is a regional phenomenon, events that affected the County also affected the City. Those past occurrences were shown in the Base Plan in Section 4.2.2.

Climate Change and Extreme Heat

The 2021 CAS (as well as the 2024 Draft CAS), citing a California Energy Commission study, states that "over the past 15 years, heat waves have claimed more lives in California than all other declared disaster events combined." This study shows that California is getting warmer, leading to an increased frequency, magnitude, and duration of heat waves. These factors may lead to increased mortality from excessive heat.

As temperatures increase, California and Amador County will face increased risk of death from dehydration, heat stroke, heat exhaustion, heart attack, stroke and respiratory distress caused by extreme heat. According to the 2021 CAS (as well as the 2024 Draft CAS), report and the 2023 State of California Hazard Mitigation Plan, by 2100, hotter temperatures are expected throughout the state, with projected increases of 3-5.5°F (under a lower emissions scenario) to 8-10.5°F (under a higher emissions scenario). These changes could lead to an increase in deaths related to extreme heat in Amador County.

Vulnerability to Severe Weather: Extreme Heat

Extreme heat is becoming more frequent, intense, longer lasting and geographically widespread. Extreme heat occurs on an annual basis in the County and the City. In recent years, compounded by climate change conditions, summer months continue to get a bit hotter. The whole of the City is at some measure of vulnerability to extreme heat. An assessment of a community's vulnerability to extreme heat begins with an understanding of local exposure to extreme heat. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

During drought and extreme heat periods the City of Sutter Creek gets hot due to its lowland location. The City noted that the population of elderly and individuals below the poverty level are the most vulnerable to

extreme temperatures. Students attending schools built before modern climate control systems were a necessity or those lacking working HVAC systems are at risk during extreme heat events. Nursing homes, elder care facilities and their residents are especially vulnerable to extreme heat events if power outages occur and air conditioning is not available. In addition, individuals below the poverty level may be at increased risk to extreme heat if use of air conditioning is not available or affordable. This is especially true of homeless people and the transient population.

Assets at Risk

Assets at risk from extreme heat include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations within the City are vulnerable to extreme heat, but it generally affects people spending large amounts of time outside or without means of cooling indoor structures. During extended periods of high temperatures, extreme heat may overload the demands for electricity to run air conditioners and can present health concerns to individuals. When interruptions in power occur during extreme heat, the risk of heat related illnesses and deaths increases. Extreme heat is a significant concern to vulnerable populations. The unhoused; individuals who exercise or train outdoors; outdoor workers; individuals that lack the resources to afford heat; and the young, old, or medically fragile individuals that are more susceptible to heat related impacts. In addition to vulnerable populations, pets and livestock are at risk to extreme heat conditions.

Structures

Extreme heat normally does not generally impact structures, but individuals working in structures may be affected during periods of extended heat, especially in structures that might not be equipped with air conditioning or other means of cooling. The City noted that extreme heat has caused interruptions to power in the past. Also depending on the structure, sensitive contents such as IT equipment can be impacted, especially if a power outage occurs.

Critical Facilities and Infrastructure

Depending on their type and function, critical facilities and infrastructure can also be affected by extreme heat. Interruptions in power caused by extreme heat can lead to system failures. Schools without air conditioning may have to close or operate on a reduced schedule.

Natural, Historic, and Cultural Resources

Natural resource assets, including those located in City park and open space areas, may be vulnerable during periods of extreme heat. These include turfed areas; landscapes, City trees, wildlife and habitat areas, and wetlands and marsh lands. Recently, trees were lost in areas of the City that were weakened by drought and extreme heat. Extreme heat may also cause drought-like conditions, contributing to other issues. For example, several weeks of extreme heat increases evapotranspiration and reduces moisture content in vegetation, leading to higher wildfire vulnerability in the region for that time period, even if the rest of the season is relatively moist. Historic and cultural resources are not expected to be affected by extreme heat.

Impacts from Severe Weather: Extreme Heat

The City experiences temperatures in excess of 100°F during the summer and fall months. The temperature moves to 105-110°F in rather extreme situations. During these times, drought conditions may worsen, and the City may see an increase in dry fuels. Also, power outage and PSPS events may occur during these times as well. Health issues are a primary concern with this hazard, especially to vulnerable populations, although economic impacts can also be an issue.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for City include the following:

- Climate change is likely to exacerbate future extreme heat conditions and associated impacts and vulnerability of the City.
- Future population growth should be considered, as having more or less people in a community affects the overall hazard vulnerability to the City. Population growth in the City of Sutter Creek has recently slowed. Any additional growth in the City would place additional populations at risk to earthquake. As such, the vulnerability to this hazard is expected to decrease. However, any future low income and the unhoused population are at risk to extreme heat which can put strain on emergency services and shelters. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions and the nature and intensity of future extreme heat events.
- Land use planning should be proactive to address future hazard conditions. The City has five areas where growth is expected over the next five years. City building codes are in effect to reduce this risk and should be updated as necessary to continue to address future extreme heat conditions. Due to adherence to protective building codes, changes in land use and development will likely not increase the impacts and associated vulnerabilities of the City to this hazard.

Future development of new buildings in the City will likely not be affected by extreme heat. Extreme heat is more likely to affect vulnerable populations. Vulnerability to extreme heat will increase as the average age of the population shifts. It is encouraged that nursing homes and elder care facilities have emergency plans or backup power to address power failure during times of extreme heat and in the event of a PSPS. Low-income residents and unhoused populations are also more vulnerable and should be considered in future growth plans for the City. Cooling centers for these populations should be utilized when necessary.

Severe Weather: Heavy Rains and Storms

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

Storms in the City occur annually and are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the City falls mainly in the fall, winter, and spring months. Wind often accompanies these storms; hail and lightning are rare in the City.

Location and Extent

Heavy rain events occur on a regional basis. Rains and storms can occur in any location of the City. All portions of the City are at risk to heavy rains and storms. Most of the severe rains occur during the fall, winter, and spring months in the City as discussed below (with problem flooding areas associated with heavy rains and storms shown in Table E-27 in the Flood: Localized Stormwater section). There is no scale by which heavy rains and severe storms are measured. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Hail and lightning are rarer in the City and Amador County. Duration of severe storms in the City can range from minutes to hours to days. Information on precipitation extremes can be found in Section 4.3.4 of the Base Plan.

Past Occurrences

Disaster Declaration History

According to historical hazard data, severe weather, including heavy rains and storms, is an annual occurrence in the City. This contributes to many of the federal disaster declarations related to flooding. Disaster declarations from flooding are shown on Table E-36.

Table E-36 Amador County – State and Federal Disaster Declarations from Flood (Heavy Rain and Storms) 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	22	1950, 1955, 1958 (twice), 1959, 1963, 1964, 1969, 1980, 1982, 1986, 1995 (twice), 1997, 2006 (twice), 2017 (twice), 2019, 2021, 2023 (twice)	20	1950, 1955, 1958, 1962, 1963, 1964, 1969, 1986, 1995 (twice), 1997, 1998, 2006 (twice), 2017 (twice), 2019, 2023 (three)

Source: Cal OES, FEMA

NCDC Events

The NCDC data recorded 114 hail, heavy rain, and winter weather incidents for Amador County since 1950. Winter weather events tend to be rain in the lower elevations of the County, while snow falls in the upper elevations.

City of Sutter Creek Events

The HMPC noted an extreme rain event in 2023: Impacts included localized flooding resulting in FEMA damage claims and included trees and branch debris coming down in high winds. The City noted that heavy rains and storms are an annual occurrence. Other events causing issues are listed in the Past Occurrences section of the Flood: 1%/0.2% Annual Chance and Flood: Localized Stormwater Flooding discussions above.

Climate Change and Heavy Rains and Storms

It is likely that climate change will increase the chance of future occurrence as well as future impacts from heavy rains and storms. More information on future impacts to the City can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

According to the 2021 CAS (as well as the 2024 Draft CAS), while average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is unlikely that hail will become more common in Amador County and the City of Sutter Creek. The amount of lightning is not projected to change.

Cal-Adapt noted that, on average, the projections show little change in total annual precipitation in California. Furthermore, among several models, precipitation projections do not show a consistent trend during the next century. Cal-Adapt modeled scenarios are shown in Section 4.3.4 of the Base Plan.

Vulnerability to Heavy Rain and Storms

Heavy rain and severe storms are the most frequent type of severe weather occurrences in the City. These events can cause both significant and localized flooding. Flooding can be worse during times where the ground is already saturated. Wind often accompanies these storms and has caused damage in the past. Hail and lightning are rare in the City, but also can cause damage, with lightning occasionally igniting wildfires.

The whole of the City is at some measure of vulnerability to heavy rain and storms. An assessment of a community's vulnerability to heavy rains and storms begins with an understanding of local exposure to heavy rain and storms. This is included in the Local Concerns section below followed by a discussion of the City's Assets at Risk to this hazard.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The City noted that when large storms drop substantial quantities of water, the river nearby becomes a hazard to the population and structures of the City. This flooding can cause issues for the WWTP along with the Auditorium that stores important documents and information. Local storm drains are not equipped to accommodate increased rainfall which can cause other areas to experience localized flooding.

Concerns at Gopher Flat and Cole Street, as a grizzly (vertically slotted grate) gets clogged from trees and debris washed down from upstream tributary; flow enters under roadway at Cole Street and follows Gopher Flat down to Sutter Creek. Regular maintenance is needed to keep the grizzly clear all winter.

There are concerns on the Karsan Tributary – All of uptown (uphill) flows are captured at Raylan Drive and flow down into Karsan through Allen Ranch Road. High flows could wash out Badger Street.

There are also concerns regarding Sutter Creek debris caught at Flushing Dam approximately 1500 feet upstream of auditorium. City regularly clears logs at the dam to allow them to flow downstream. During high storm events flows are too high to clear area safely.

The City also noted that heavy rains and storms cause localized flooding in the City. The problem areas area shown on Table E-27 above.

Assets at Risk

Assets at risk from heavy rain and storms include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations (including vulnerable populations) in the City have some measure of risk to heavy rains and storms. Those populations that work or recreate outside and unhoused individuals are more vulnerable to impacts from heavy storm events. Heavy rains and storms occur every year and do not generally cause significant adverse impacts to individuals; it is the secondary hazard, flooding, which poses the biggest impact to people. Populations at risk to flooding resulting from heavy rains and storm events include those who live in floodplains (discussed in further detail in the Flood: 1%/0.2% Annual Chance section above) and those who live in and near localized flooding areas (discussed in further detail in the Flood: Localized Stormwater Flooding section above).

Structures

Structures in the City have some risk to heavy rains and storms. Structures built to modern building codes are built to withstand heavy rains and storms (including high winds and lightning). During a heavy storm, localized flooding may cause water intrusion into buildings from the outside. Trees can be downed causing impacts to structures. Older homes and buildings may be at increased risk to heavy rains and storms. Power outages during severe storm events can occur, impacting the use of structures until the power is back online.

Critical Facilities and Infrastructure,

Heavy rain and storms can affect critical facilities and infrastructure during large events. Power outages may occur taking facilities offline. High winds can down power lines and trees impacting facilities. Water intrusion into facilities and infrastructure, such as water and wastewater facilities, can impact operations. City roads, streets, and bridges can be impacted resulting in closures restricting traffic flow in the City. In certain areas, large storms can cause erosion and localized landslides which can impact facilities. Many critical facilities are built to modern design standards that take heavy rains and storms into account when siting and building these structures, and others may need to be retrofitted to better withstand these events.

Natural, Historic, and Cultural Resources

Large rain and storm events and associated flooding can affect natural, historic, and cultural resources. Silt and sediment can damage natural areas. Trees can be uprooted and downed by high winds. Extended periods of rainfall can erode natural banks along waterways and degrade soil stability for terrestrial species. While some natural systems can be adversely impacted during these large storms, heavy rain events can also provide benefits. Groundwater and wetland areas can be recharged and water supplies replenished. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to structures affected by large storm events, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged, and lost during extreme rain and storm and events.

Impacts from Heavy Rain and Storms

Impacts from heavy rains and storms include damage to property, critical facilities and infrastructure, and the natural landscape. This includes: erosion; downed trees; damaged utility structures and infrastructure; power outages; road damage and blockages; and even lightning strikes to critical infrastructure and people. Lightning can also cause wildfires and urban fires to occur. Landsliding and erosion occur when the soil on slopes becomes oversaturated and fails. Climate change may cause these impacts to worsen.

Actual damage associated with the primary effects of severe storms and heavy rains has been somewhat limited. It is the secondary hazards caused by these severe weather events, such as floods, landslides, and erosion that would likely have the greatest impact.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City include the following:

- Climate change is likely to exacerbate future heavy rain and storm conditions and associated impacts and vulnerability of the City to flooding.
- Population growth in the City of Sutter Creek has recently slowed; however, the vulnerability may change depending on changes to the makeup of more vulnerable populations. Certain vulnerable populations, such as the those who work or spend extended periods outdoors, could experience disproportional effects from this hazard. and should be addressed as the City continues to grow. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions and the nature and intensity of future storm events.
- Land use planning should be proactive to address future hazard conditions. The City has five areas where growth is expected over the next five years. Changes in land use in these and other future areas may also amplify the impacts of heavy rains and storms, as additional impervious surfaces can cause additional runoff and localized flooding throughout the City.

Building codes in the City ensure that new development is built to current building standards, which should reduce the risk to future development in the City from heavy rains and storms. New critical facilities such as communications towers and others should be built to withstand hail damage, lightning, and thunderstorm winds. With adherence to development standards, future losses to new development should be minimal. Changes in land use may also amplify the impacts of heavy rains and storms, as additional impervious surfaces can cause additional runoff and localized flooding throughout the City.

Wildfire (with smoke and air quality)

Likelihood of Future Occurrence–Likely
Vulnerability–Extremely High

Hazard Profile

Wildland fire and the risk of a conflagration is an ongoing concern for the City of Sutter Creek. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of fire regimes. Wildland fires affect grass, forest, and brushlands, as well as structures. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern.

Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. These weather conditions can result in red flag (e.g., fire weather) days, and can result in PSPS events in the City. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urbanized areas. There is also the concern of wildfires occurring in these more remote, forested areas that under certain weather conditions, can extend into areas not generally considered at a high risk to wildfire. Smoke and air quality also become an issue, both from fires occurring inside and outside of the Amador County Planning Area and the City.

Wildfire Smoke and Air Quality

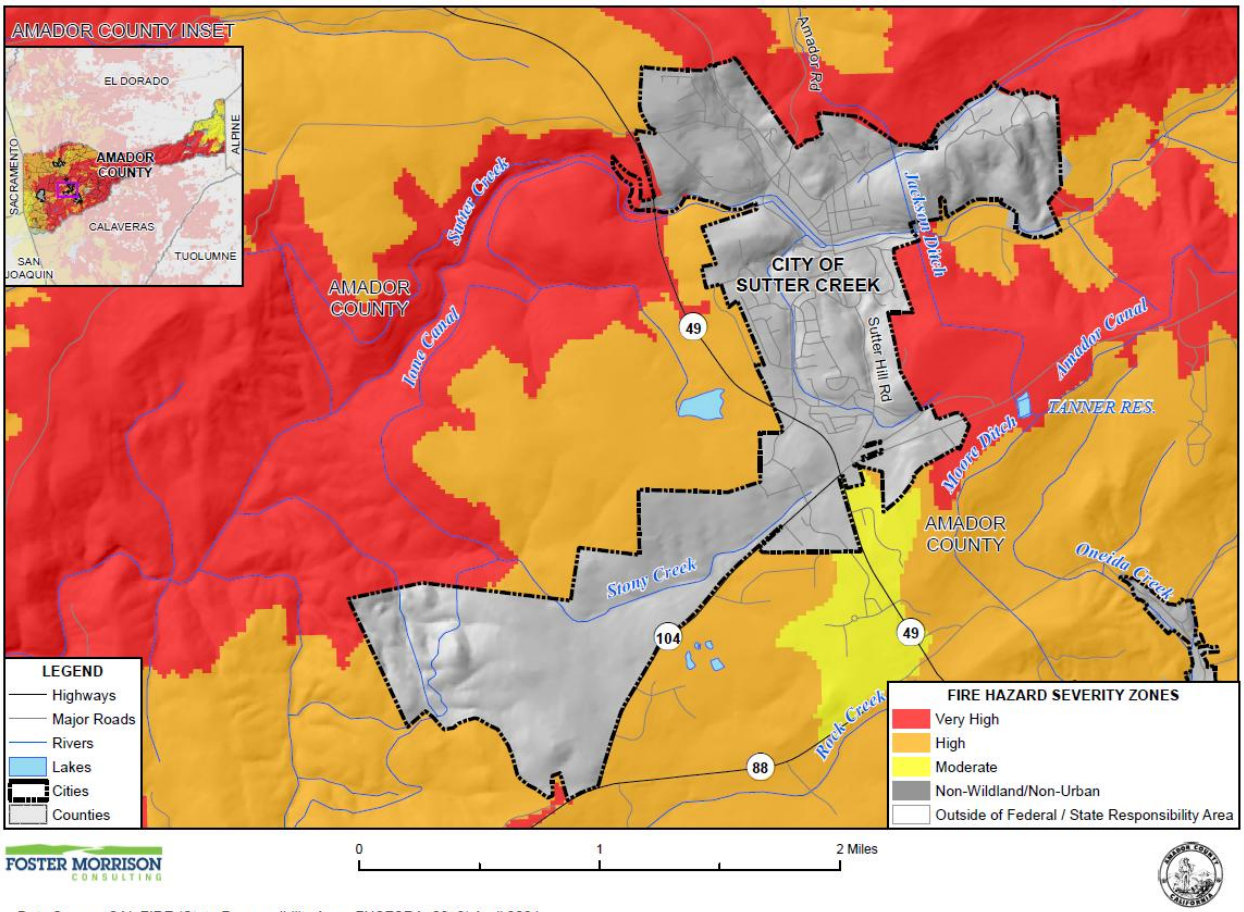
Smoke from wildfires is made up of gas and particulate matter, which can be easily observed in the air. Air quality standards have been established to protect human health with the pollutant referred to as PM2.5 which consists of particles 2.5 microns or less in diameter. These smaller sizes of particles are responsible for adverse health effects because of their ability to reach the lower regions of the respiratory tract.

Wildfire smoke can have negative effects to those who live in or near a fire burn area. Smoke and air pollution from wildfires can be a severe health hazard. Significant wildfires occurring in both Amador County and nearby northern California communities since the 2020 LHMP Update have created significant air pollution affecting area residents. This was the case during the 2021 Caldor Fire, as well as others that affected the nearby areas.

Location and Extent

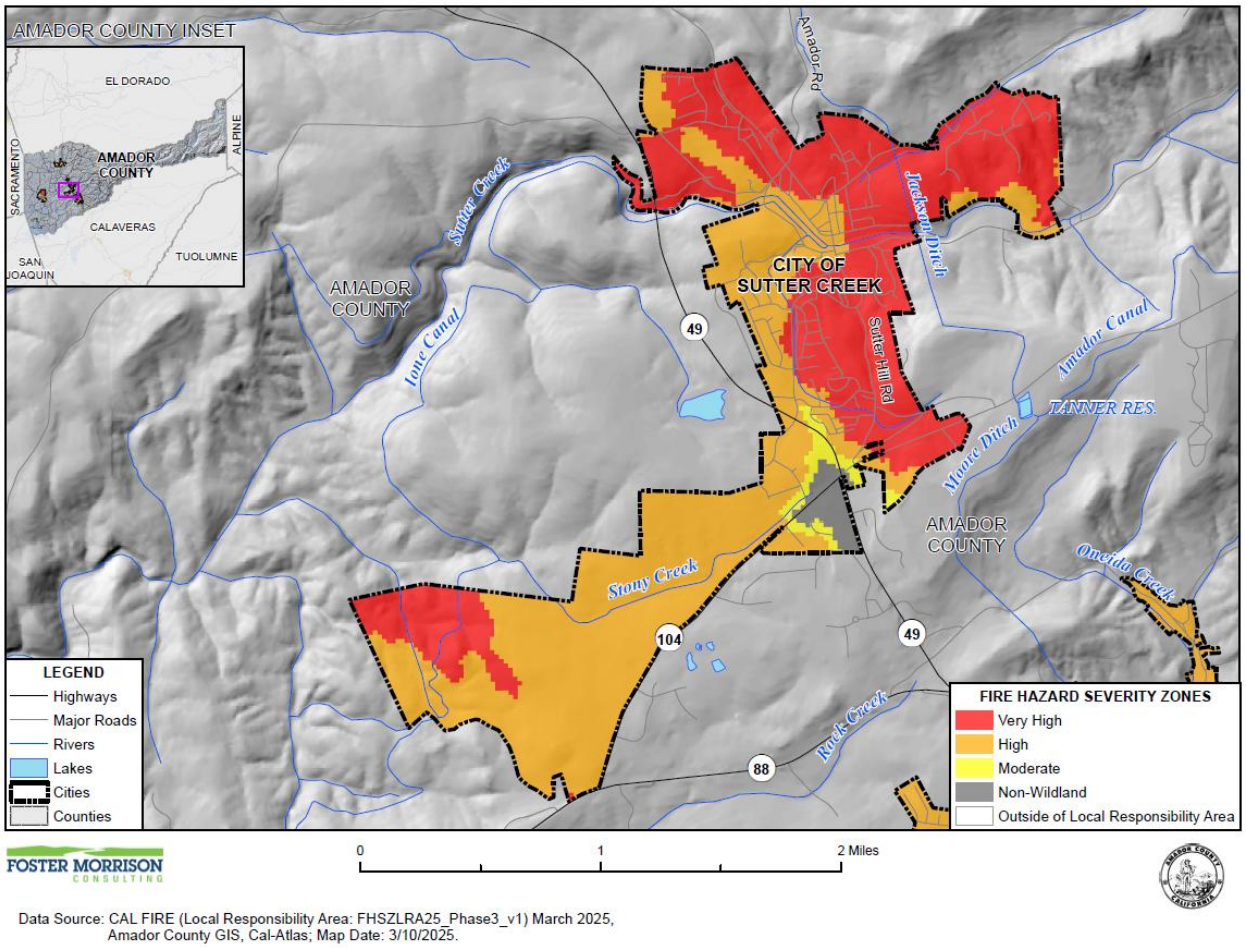
Wildfire can affect all areas of the City. CAL FIRE has estimated that the risk varies across the City and has created maps showing risk variance. Following the methodology described in Section 4.3.15 of the Base Plan, wildfire maps for the City of Sutter Creek were created. Figure E-20 shows the CAL FIRE State Responsibility Areas (SRA) and Federal Responsibility Areas (FRA) and their associated Fire Hazard Severity Zones (FHSZ) in the City. Figure E-21 shows the CAL FIRE Local Responsibility Areas (LRA) and their associated Fire Hazard Severity Zones (FHSZ) in the City. As shown on the maps, FHSZs within the City range from non-wildland to Very High.

Figure E-20 City of Sutter Creek – CAL FIRE SRA/FRA Fire Hazard Severity Zones



Data Source: CAL FIRE (State Responsibility Area: FHSZSRA_23_3) April 2024,
CAL FIRE (Federal Responsibility Area: Draft c3fhszl06_1) September 2007,
Amador County GIS, Cal-Atlas; Map Date: 3/12/2025.

Figure E-21 City of Sutter Creek – CAL FIRE LRA Fire Hazard Severity Zones



Data Source: CAL FIRE (Local Responsibility Area: FHSZLRA25_Phase3_v1) March 2025, Amador County GIS, Cal-Atlas; Map Date: 3/10/2025.

Wildfires tend to be measured in structure damages, injuries, and loss of life as well as acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time or may have durations lasting for a week or more. Geographical FHSZ extents in the FRA/SRA are shown in Table E-37, while extents in the LRA are shown on Table E-38.

Table E-37 City of Sutter Creek – CAL FIRE SRA/FRA Fire Hazard Severity Zone Geographical Extents

Fire Responsibility/ Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
SRA						
Very High	5	0.3%	2	0.2%	3	0.4%
High	2	0.1%	0.6	0.1%	2	0.2%
Moderate	0.4	0.02%	0.3	0.04%	0.1	0.01%
SRA Total	**8**	**0.5%**	**3**	**0.4%**	**5**	**0.6%**

Fire Responsibility/ Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Sutter Creek Total	**8**	**0.5%**	**3**	**0.4%**	**5**	**0.6%**

Source: CAL FIRE

Table E-38 City of Sutter Creek – CAL FIRE LRA Fire Hazard Severity Zone Geographical Extents

Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Very High	780	46%	357	47%	423	45%
High	857	50%	368	48%	489	52%
Moderate	34	2%	0	0.0%	0	0.0%
Non-Wildland	34	2%	21	3%	13	1%
Outside of LRA Responsibility Area	4.2	0.2%	1.1	0.1%	3.2	0.3%
Sutter Creek Total	**1,709**	**100%**	**762**	**100%**	**947**	**100%**

Source: CAL FIRE

Past Occurrences

Disaster Declaration History

There has been three state and two federal disaster declarations due to fire, as shown in Table E-39.

Table E-39 Amador County – State and Federal Wildfire Disaster Declarations 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	3	1961 (unnamed), 2015 (Summer 2015 Fires), 2021 (Caldor Fire)	2	2016 (Butte Fire), 2021 (Caldor Fire)

Source: Cal OES, FEMA

NCDC Events

The NCDC has tracked 50 wildfire events in the County dating back to 1993.

City of Sutter Creek Events

A list of state and federal disaster declarations for Amador County from wildfire is shown on Table E-39. These events also likely affected the City to some degree.

Climate Change and Wildfire

It is likely that climate change will increase the chance of future occurrence as well as future impacts from wildfire. More information on future impacts to the City can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Warmer temperatures can exacerbate drought conditions. Drought often kills plants and trees, which serve as fuel for wildfires. Warmer temperatures could increase the number of wildfires and pest outbreaks, such as the western pine beetle. Cal-Adapt's wildfire tool predicts the potential increase in the amount of burned areas for the year 2090-2099, as compared to recent (2010) conditions. This is shown in Section 4.3.15 of the Base Plan. Based on this model, Cal-Adapt predicts that wildfire risk in Amador County will increase moderately at the end of the century. However, wildfire models can vary depending on the parameters used. Cal-Adapt does not take landscape and fuel sources into account in their model. In all likelihood, in the Amador County Planning Area, precipitation patterns, high levels of heat, topography, and fuel load will determine the frequency and intensity of future wildfire.

Vulnerability to Wildfire

Risk and vulnerability to the City from wildfire is of significant concern. Wildfires that occur in the City occur from a variety of both natural and manmade causes. The City can be affected both by fires that start on or near City lands as well as those that start elsewhere and move into the City. In addition to burning large areas of land, air quality can be affected in the City by smoke from fires occurring inside the City as well as those from many miles away. As growth continues and populations increase in the City, the potential for wildfires will also increase.

The whole of the City is at some measure of vulnerability to wildfire. An assessment of a community's vulnerability to wildfire begins with an understanding of local exposure to wildfire. This is included in the Local Concerns section below. After that section, assets at risk are discussed.

Local Concerns

The City has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Sutter Creek is not immune to numerous types of grass and brush fires and any one of them may accelerate into an urban interface wildfire. Such a situation could lead to evacuation of large portions of the population and the potential for significant loss of personal property, structures, and open space areas. The natural fuels available in or near the City vary greatly in the rate and intensity of burning. Fires in heavy brush and stands of trees burn with great intensity but more slowly than in dry grass and leaves. Dense fuels will propagate fire better than sparse fuels. The City of Sutter Creek borders are surrounded by open dry grassland making the residential areas vulnerable to the threat of wildfire. Internally there are areas of the City that are overgrown with dead and fallen trees and organic material that needs to be removed to prevent wildfire propagation through the City

The General Plan Safety Element also noted that that most of the downtown historic district can be considered an urban fire hazard area. This is because of common walls, building materials, and the lack of adequate fire protection standards when the area was built. A major fire in the area could destroy a block of buildings or more.

The City noted that during periods of wildfire, smoke settles in Sutter Creek, which causes school and sports closures. It also affects elderly and sensitive population with respiratory issues related to poor air quality.

The City has passed an ordinance to remove fire debris and or to create a fire break on residents property. The City has worked to clear dense vegetation areas throughout town including the Mine head site which is a known area of vegetation overgrowth. The City is working with CAL FIRE to clear dense vegetation along roads. The ordinance allows the City to hire clearing crews for lots deemed with excessive vegetation growth. Vegetation management is a considerable expense to the City that is occurring every year around town.

Assets at Risk

Assets at risk from wildfire include people and populations; structures; critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations are vulnerable to wildfire. Certain vulnerable populations are at greater risk to the effects of wildfire as well as smoke and air quality issues that wildfires bring. Vulnerable populations include:

- Unhoused
- Infants and children under age five and their caregivers
- Elderly (65 and older)
- Individuals with disabilities
- Individuals' dependent on medical equipment
- Individuals who exercise, recreate, or work outdoors
- Individuals with impaired mobility

To further evaluate the impact to the residential population within the City, the CAL FIRE FHSZ dataset was overlayed on the parcel layer. Those residential parcels that intersect the FHSZs were counted and multiplied by the 2023 Census Bureau average household factors for the City of Sutter Creek – 2.07. According to this analysis, there is a total population of 0 residents of the City of Sutter Creek falling within the moderate or higher SRA/FRA FHSZs. This is shown in Table E-40. There is a total population of 2,156 residents of the City of Sutter Creek falling within the moderate or higher LRA FHSZs, as shown on Table E-41.

Table E-40 City of Sutter Creek – Improved Residential Parcels and Population by CAL FIRE SRA/FRA Fire Hazard Severity Zone

Jurisdiction	Very High		High		Moderate	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Sutter Creek	0	0	0	0	0	0

Source: CAL FIRE, Amador County 2024 Parcel/Assessor Data, US Census Bureau American Community Survey 2023 Household Size Estimates.

Table E-41 City of Sutter Creek – Improved Residential Parcels and Population by CAL FIRE LRA Fire Hazard Severity Zone

Jurisdiction	Very High		High		Moderate	
	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk	Improved Residential Parcels	Population at Risk
Sutter Creek	773	1,600	263	544	6	12

Source: CAL FIRE, 2024 Amador County Parcel/Assessor's Data, US Census Bureau American Community Survey 2023 Household Size Estimates.

The City noted that the Critical Facilities and Infrastructure section below includes the facilities used by At-Risk populations that are threatened by this hazard. While this is not specific to what special populations reside in the City, it does speak to facilities that are used to serve (portions) of this population.

Structures

All structures in the City have some risk to wildfire. GIS was used to determine the possible impacts of wildfire within the City of Sutter Creek. The methodology described in Section 4.3.15 of the Base Plan was followed in determining structures and values at risk in both the CAL FIRE's SRA/FRA and LRA Fire Hazard Severity Zone layer. Analysis results for the SRA/FRA in the City of Sutter Creek are not shown since this layer doesn't intersect with the City. Analysis results for the LRA in the City of Sutter Creek are shown in Table E-42, which summarizes total parcel counts, improved parcel counts and their structure values by FHSZs.

Table E-42 City of Sutter Creek – Count and Value of Parcels and Structures by CAL FIRE LRA Fire Hazard Severity Zone

Fire Hazard Severity Zone/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Values	Total Value
Very High						
Agricultural	5	1	$1,073,453	$92,585	$92,585	$1,258,623
Commercial	51	37	$7,463,137	$12,231,981	$12,231,981	$31,927,099
Industrial	1	1	$191,587	$400,831	$601,247	$1,193,665
Miscellaneous	29		$14,846	$0	$0	$14,846

Fire Hazard Severity Zone/ Property Use	Total Parcel Count	Improved Parcel Count	Total Land Value	Improved Structure Value	Estimated Contents Values	Total Value
Residential	900	773	$74,211,158	$202,493,519	$101,246,760	$377,951,437
Unknown	5	3	$754,063	$1,038,941	$0	$1,793,004
Very High Total	**991**	**815**	**$83,708,244**	**$216,257,857**	**$114,172,572**	**$414,138,673**
High						
Agricultural	1	1	$22,308	$78,085	$78,085	$178,478
Commercial	81	64	$14,676,502	$43,905,948	$43,905,948	$102,488,398
Industrial	1	1	$169,016	$481,314	$721,971	$1,372,301
Miscellaneous	9	0	$1,231	$0	$0	$1,231
Residential	318	263	$28,634,367	$59,956,232	$29,978,116	$118,568,715
Unknown	4	2	$2,306,147	$1,763,443	$0	$4,069,590
High Total	**414**	**331**	**$45,809,571**	**$106,185,022**	**$74,684,120**	**$226,678,713**
Moderate						
Agricultural	0	0	$0	$0	$0	$0
Commercial	13	8	$3,298,072	$8,628,963	$8,628,963	$20,555,998
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	1	0	$0	$0	$0	$0
Residential	10	6	$308,972	$268,019	$134,010	$711,001
Unknown	0	0	$0	$0	$0	$0
Moderate Total	**24**	**14**	**$3,607,044**	**$8,896,982**	**$8,762,973**	**$21,266,999**
Non-Wildland						
Agricultural	0	0	$0	$0	$0$0	$0
Commercial	3	0	$550,346	$0		$550,346
Industrial	0	0	$0	$0	$0	$0
Miscellaneous	0	0	$0	$0	$0	$0
Residential	2	0	$0	$0	$0	$0
Unknown	0	0	$0	$0	$0	$0
Non-Wildland Total	**5**	0	**$550,346**	$0	$0	**$550,346**
Sutter Creek Total	**1,434**	**1,160**	**$133,675,205**	**$331,339,861**	**$197,619,665**	**$662,634,731**

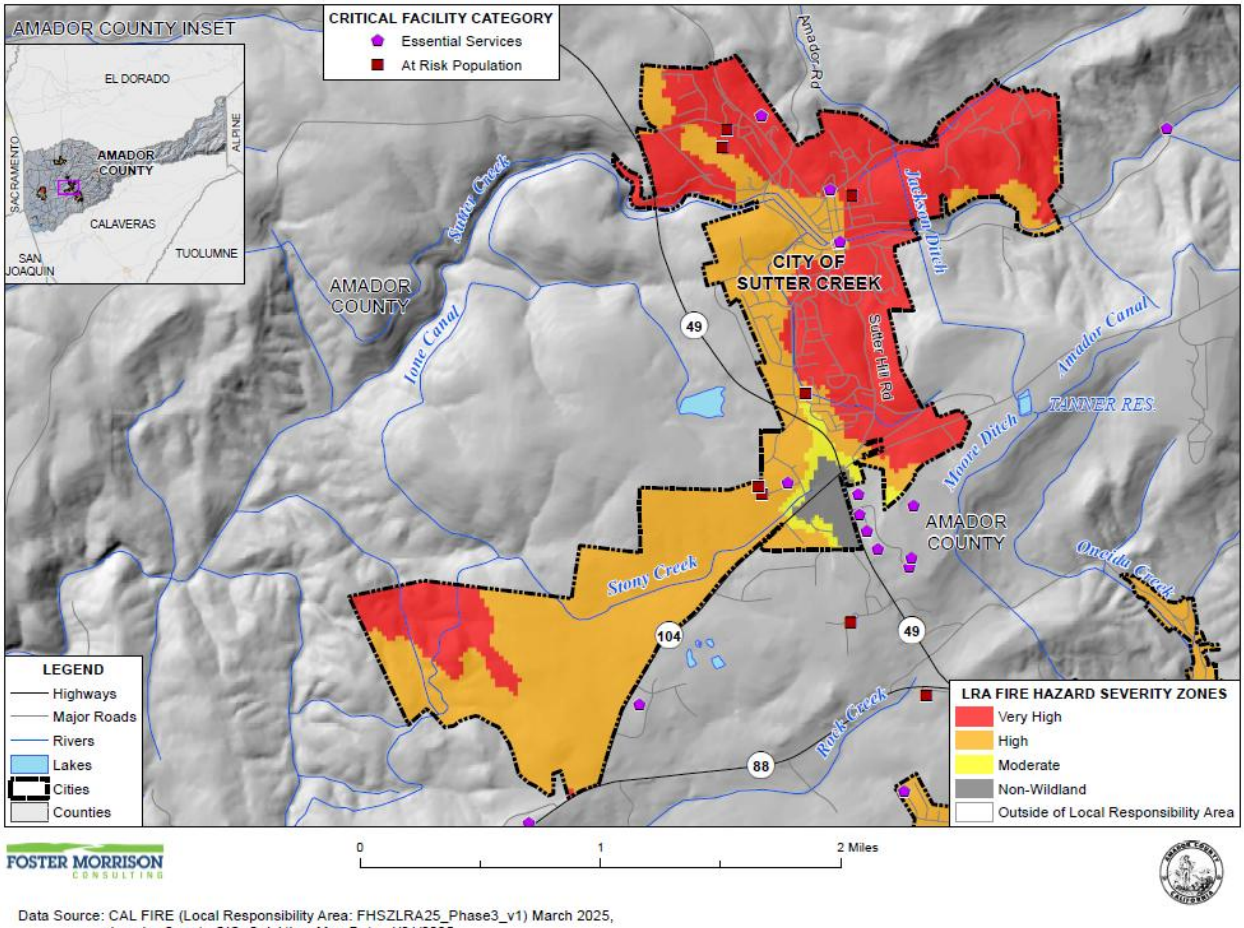
Source: CAL FIRE, Amador County 2024 Parcel/Assessor Data

Critical Facilities and Infrastructure

Wildfire present a threat to critical facilities and infrastructure. The following analysis discusses critical facilities and infrastructure. A separate analysis was performed on the critical facility inventory in the City to determine which critical facilities fall into each fire hazard severity zone. Using GIS, the SRA/FRA and

LRA fire hazard severity zones were overlayed on the critical facility GIS layer. Only LRA fire hazard severity zones intersect the City; as such no SRA/FRA analysis is presented here. Only LRA analysis is presented. This is shown on Figure E-18 for the LRA fire hazard severity zones. Table E-43 details which critical facilities fall in which LRA fire hazard severity zone. Details of critical facility categories, type, name, and address by LRA fire hazard severity zones are listed in Appendix F.

Figure E-22 City of Sutter Creek – Critical Facilities in LRA Fire Hazard Severity Zones



Data Source: CAL FIRE (Local Responsibility Area: FHSZLRA25_Phase3_v1) March 2025, Amador County GIS, Cal-Atlas; Map Date: 4/21/2025.

Table E-43 City of Sutter Creek – Critical Facilities by Category in LRA Fire Hazard Severity Zones

Fire Hazard Severity Zone	Critical Facility Category	Facility Type	Facility Count
Very High	Essential Services Facilities	Fire Station	1
		Post Office	1
		Essential Services Total	**2**
	At Risk Population	School	3
		At Risk Population Total	**3**
	Very High Total		**5**

Fire Hazard Severity Zone	Critical Facility Category	Facility Type	Facility Count
High	Essential Services Facilities	Community Center	2
		Fire Station	1
		Police Station	1
		Public Administration Building	1
		Essential Services Total	**5**
	At Risk Population	Residential Care Facility	1
		School	2
		At Risk Population Total	**3**
	High Total		**8**
Sutter Creek Total			**13**

Source: CGS, City of Sutter Creek

Natural, Historic, and Cultural Resources

Natural, historic, and cultural resources located within areas at risk to wildfire would be vulnerable. Should a wildfire occur in the City, the impacts to natural, historic and cultural resources could be extensive and include air pollution, contamination from water runoff containing toxic products, and other environmental discharges or releases from burned materials affecting soils, habitat areas, wildlife, and aquatic resources. Historic and cultural resources can be damaged or destroyed and are often more vulnerable due to their older age, construction type, and lack of fire prevention infrastructure such as sprinklers.

Impacts from Wildfire

Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and timber; and loss of recreational opportunities. Out of control wildfires can have catastrophic impacts. Wildfires can cause short-term and long-term disruption to the City. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the City by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the City; smoke and air pollution from wildfires can be a severe health hazard. Smoke impacts may come from wildfires outside the City, as well as from within.

Although the physical damages and casualties arising from wildland-urban interface or conflagration fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate a PSPS which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. In addition,

catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

The impacts of a fire are felt long after the fire is extinguished. In addition to the loss of property in fires, the loss in vegetation and changes in surface soils alters the environment. When supporting vegetation is burned, hillsides become destabilized and prone to erosion. The burnt surface soils are harder and absorb less water. When winter rains come, this leads to increased runoff, erosion, and landslides in hilly areas.

Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values

Impacts to identified assets at risk to this hazard and the overall vulnerability of the City may be affected in the future by climate change (which was discussed in the hazard profile above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the City of Sutter Creek include the following:

- Climate change is likely to exacerbate future wildfire conditions and associated impacts and vulnerability of the City to wildfire.
- Population growth in the City of Sutter Creek has recently slowed. Additional population growth would likely bring continued diversity to the City. Vulnerable population groups could face disproportionate effects from wildfire and should be planned for. Changes in population and population patterns may or may not increase the impacts and vulnerability of the City to this hazard depending on the location and nature of growth and continued planning for future hazard conditions and the location, magnitude, and severity of future wildfire events.
- Land use planning should be proactive to address future hazard conditions. Locating new development, structures and critical facilities and infrastructure within or near areas of wildfire risk may put additional development at risk. The City has five areas where growth is expected over the next five years. These are located in the High and Very High FHSZs. However, City building codes are in effect to reduce this risk and should be updated as necessary to continue to address future wildfire conditions. Specifically, with the release of the new 2025 LRA mapping for Amador County, wildfire building

codes should be updated as required to include enhanced measures to reduce wildfire impacts on new construction, and including the formal adoption of the new LRA maps. It should be noted that most of the growth in the City is occurring in areas of high and very high fire hazard severity zones. Thus, depending on the location of new development and adherence to protective building codes, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the City to this hazard. It should also be noted that once new building codes are adopted for LRA, it should reduce vulnerability on new construction especially in the higher hazard zones.

Future Development

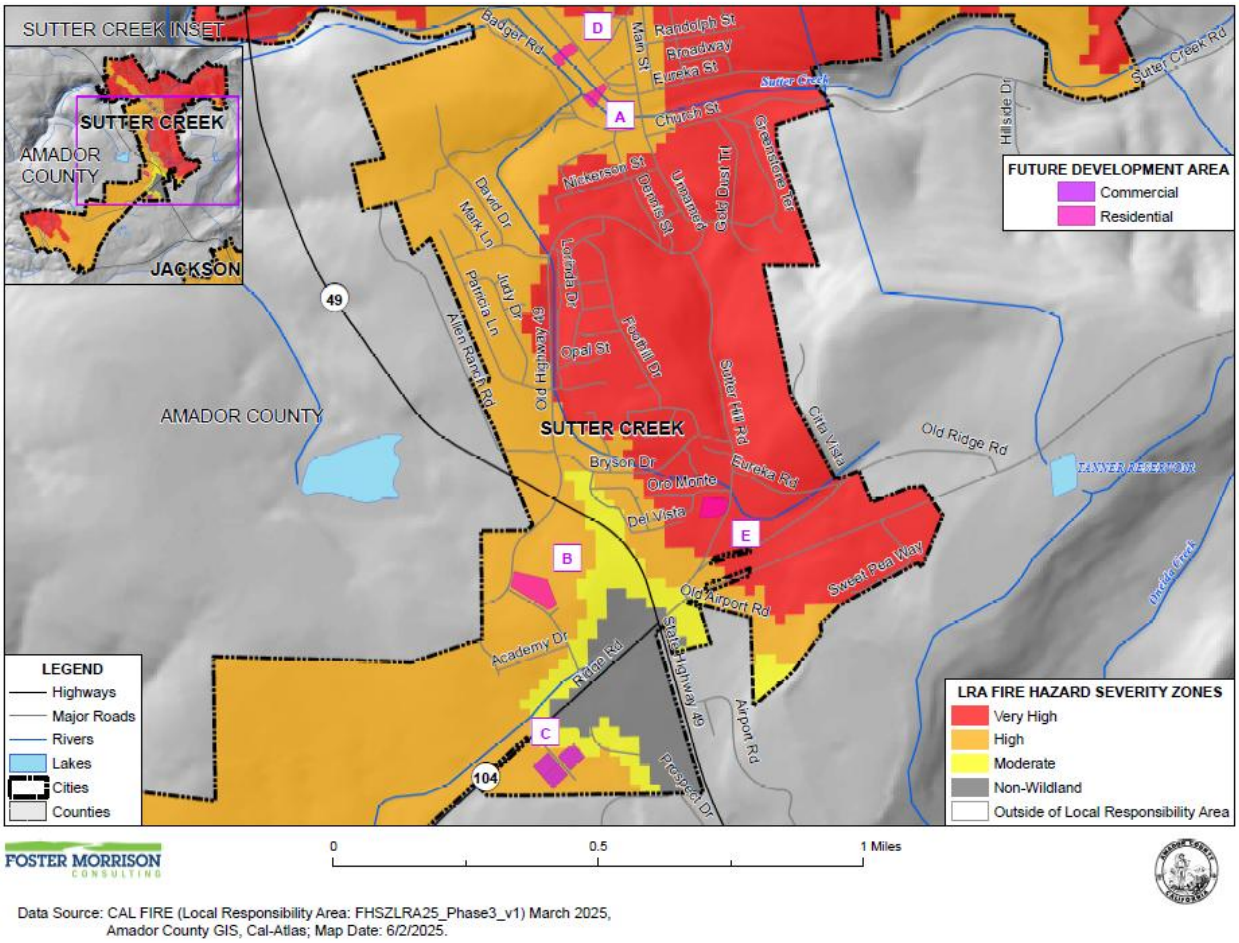
Additional growth and development within moderate or higher fire hazard severity zones in the City would place additional values at risk to wildfire. More vulnerable populations may experience a disproportionate impact from wildfire, and this should be considered as development continues. However, City building codes are in effect and should continue to be updated as appropriate to reduce future impacts.

Future development areas and their vulnerability to wildfire are discussed further in the below GIS analysis.

GIS Analysis

The City provided future development areas which were used as the basis for the inventory of future development for the City. These areas were mapped in GIS. Utilizing the future development area spatial layer, the parcel polygon data was intersected to determine the future development areas within each LRA fire hazard severity zone. No facilities fell in the SRA/FRA fire hazard severity zones. Figure E-23 shows the locations of the future development area overlayed on the LRA fire hazard severity zones. As shown in Table E-44, the future development areas falls within areas of High and Very High fire hazard severity zones.

Figure E-23 City of Sutter Creek – Future Development Areas in LRA Fire Hazard Severity Zones



Data Source: CAL FIRE (Local Responsibility Area: FHSZLRA25_Phase3_v1) March 2025, Amador County GIS, Cal-Atlas; Map Date: 6/2/2025.

Table E-44 City of Sutter Creek – Future Development Parcels and Acres in LRA Fire Hazard Severity Zones

Fire Hazard Severity Zone/ Future Development	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
Very High						
TM 2925	1	1	0	1.06	1.06	0
Very High Total	**1**	**1**	**0**	**1.06**	**1.06**	**0**
High						
BLA-Rossi	3	2	1	0.59	0.41	0.18
DANCO	1	0	1	2.06	0	2.06

Fire Hazard Severity Zone/ Future Development	Total Parcel Count	Improved Parcel Count	Unimproved Parcel Count	Total Acres	Total Improved Acres	Total Unimproved Acres
Jackson Rancheria Development Corp.	3	0	3	3.62	0	3.62
TM 2917	1	1	0	0.59	0.59	0
High Total	**8**	**3**	**5**	**6.86**	**1.00**	**5.86**
Grand Total	**9**	**4**	**5**	**7.92**	**2.06**	**5.86**

Source: CAL FIRE, City of Sutter Creek

E.5 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

E.5.1. Regulatory Mitigation Capabilities

Table E-45 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the City of Sutter Creek.

Table E-45 City of Sutter Creek's Regulatory Mitigation Capabilities

Plans	In Place Y/N	Does the plan address hazards? Can the plan be used to carry out mitigation actions? When was it last updated??
Capital Improvements Plan	Y	Yes, Yes, the CIP was updated this year and was adopted by the city council on Feb 18, 2025.
Climate Change Adaptation Plan	N	
Community Wildfire Protection Plan	N	
Comprehensive/Master Plan	Y	Yes, Yes, Yes. 2019
Continuity of Operations Plan	N	
Economic Development Plan	N	
Land Use Plan	Y	General plan element, Yes, Yes, 2019
Local Emergency Operations Plan	Y	Yes, Yes, Early in 2024
Stormwater Management Plan	N	
Transportation Plan	Y	General plan element, Yes, Yes, 2019

Other	Y	Sewer System Management Plan was last updated in July of 2020. It addresses hazards and can be used to carry out mitigation actions.
Land Use Planning and Ordinances	**Y/N**	**Is the ordinance an effective way to reduce hazard impacts? Is the ordinance adequately administered and enforced?**
Acquisition of land for open space and public recreation use	N	
Building code	Y	Yes
Flood insurance rate maps	N	
Floodplain ordinance	Y	Yes
Natural hazard-specific ordinance (stormwater, steep slope, wildfire)	N	Wildfire needs improvement
Subdivision ordinance	Y	Yes, Yes
Zoning ordinance	Y	Yes, we are currently updating it.
Other		
How can these capabilities be expanded and improved to reduce risk?		
The City is seeking to incorporate some of the above into our development standards which are currently underway.		

Source: City of Sutter Creek

City of Sutter Creek General Plan (2019)

The City of Sutter Creek General Plan Program serves as the blueprint for future growth and development and provides comprehensive planning for the future. It encompasses what the City is now, and what it intends to be, and provides the overall framework of how to achieve this future condition (see the discussion in Section 4.3.1 Growth and Development Trends).

The General Plan includes a Safety Element that focuses on safety issues to be considered in planning for the present and future development of the City Planning Area. Identified hazards include wildfire, geologic/seismic, flooding, and other natural hazards. Mitigation-related actions and objective summaries are as follows:

Earthquakes

Objective S-1.1: To minimize possible threat to life or property due to earthquakes.

- Policy S-1.1.1: State building code requirements pertaining to earthquake safety for seismic Zone 3 shall be applied to new construction and remodeling projects that require a building permit.

Other Geologic Hazards

Objective S-1.2: To minimize possible threat to life or property due to geological hazards such as soils related damage or hazards and mine-related hazards.

- Policy S-1.2.1: Site-specific soils investigations will be required for construction projects when and wherever there is concern for soils-related hazards.
- Policy S-1.2.2: Development proposals involving the creation of more than four lots, parcels, or units shall be required to investigate the potential for mine collapse and other mine-related hazards in parts of the City known or suspected of being underlain by mine shafts, drifts, or vents.
- Policy S-1.2.3: Mine hazards such as vent, drift, or shaft openings should be plugged, covered, fenced, signed, and/or otherwise managed to protect public health and safety.
- Policy S-1.2.4: Site-specific soils investigations will be required to evaluate the health risk from proposed projects within or adjacent to mine waste materials. Schools, day care centers, hospitals, and residential subdivisions should not be located in areas where hazardous materials are present in mine waste materials.
- Policy S-1.2.5: Records concerning mining activities within the planning area should be collected and maintained at City Hall for reference and use by the City and developers.

Flooding and Dam Failure

Objective S-1.3: To minimize possible threat to life or property due to flooding.

- Policy S-1.3.1: Building and planning permit applications proposing improvements within the FEMA/FIRM map Zones 'A' or 'AE' shall comply with the City's flood plain management ordinance.
- Policy S-1.3.2: The City of Sutter Creek and County of Amador should require new development projects within the Sutter Creek drainage area to control peak flow runoff such that post-development discharge rates are not greater than pre-development discharge rates, ensuring new development does not significantly add to flooding hazards.
- Policy S-1.3.3: The County of Amador should give the City of Sutter Creek the opportunity to review development projects within the Sutter Creek drainage area to ensure flood hazards within the City are not increased.
- Policy S-1.3.4: Reduce the extent of flooding that threatens existing developed areas within the City.

Wildland and Urban Fires

Objective S-1.4: To minimize possible threat to life or property due to wildland and urban fires.

- Policy S-1.4.1: The Sutter Creek Fire District shall be asked by the City to review development plans, land division projects, and planned developments to ensure compliance with fire suppression and prevention requirements.
- Policy S-1.4.2: New development shall ensure there is sufficient water supply and facilities for fire suppression units in the event of a wildland fire.
- Policy S-1.4.3: Looped water systems shall be installed within new developments, where feasible, and new water systems shall provide for adequate pressure and volumes at each hydrant installed.
- Policy S-1.4.4: In new developments there shall be sufficient access for emergency vehicles and evacuation of residents. Two or more routes of access should be provided, preferably on different sides of the development.
- Policy S-1.4.5: Roads in wildland fire areas shall be well marked and homes shall have addresses in plain view.
- Policy S-1.4.6: New roadways shall comply with City standards.
- Policy S-1.4.7: Vehicular access shall be provided to within 150 feet of a structure.
- Policy S-1.4.8: Buildings in urban-wildland interface areas shall comply with California Department of Forestry and Fire Protection recommendations on defensible space.

- Policy S-1.4.9: Property owners in the Main Street Historic District should become organized to plan for and fund a program to reduce or eliminate the threat of urban fire.

Evacuation and Emergency Preparedness

Objective S-1.5: To minimize possible threat to life or property through evacuation and emergency preparedness.

- Policy S-1.5.1: The County Office of Emergency Services should complete an upgrade of the County's Emergency Management Plan making the document more usable by jurisdictions involved.
- Policy S-1.5.2: Coordinated interagency emergency drills should be conducted on a regular basis, especially in hazard areas identified in this plan.
- Policy S-1.5.3: Major developments and large commercial or industrial activities should have their own emergency plans and periodic drills.

Mitigation Related Ordinances

Buildings and Construction (Sutter Creek Code Title 15)

The following codes are adopted by the City.

- The 2019 California Building Standards Administrative Code contained in Part 1 of Title 24 of the California Code of Regulations is hereby adopted by reference as the Building Standards Administrative Code of the City of Sutter Creek.
- The 2019 California Building Code contained in Part 2 of Title 24 of the California Code of Regulations, including Appendix C (Group U—Agricultural Building), Appendix H (Signs), Appendix I (Patio Covers) and Appendix J (Grading) is hereby adopted by reference as the Building Code of the City of Sutter Creek.
- The 2019 California Residential Building Code contained in Part 2.5 of Title 24 of the California Code of Regulations, is hereby adopted by reference as the Residential Building Code of the City of Sutter Creek.
- The 2019 California Electrical Code contained in Part 3 of Title 24 of the California Code of Regulations, including Article 89, is hereby adopted by reference as the Electrical Code of the City of Sutter Creek.
- The 2019 California Mechanical Code contained in Part 4 of Title 24 of the California Code of Regulations, is hereby adopted by reference as the Mechanical Code of the City of Sutter Creek.
- The 2019 California Plumbing Code contained in Part 5 of Title 24 of the California Code of Regulations, is hereby adopted as the Plumbing Code of the City of Sutter Creek.
- The 2019 California Energy Code contained in Part 6 of Title 24 of the California Code of Regulations, including Appendix 1-A is hereby adopted by reference as the Energy Code of the City of Sutter Creek.
- The 2019 California Historical Building Code contained in Part 8 of Title 24 of the California Code of Regulations is hereby adopted by reference as the Historical Building Code of the City of Sutter Creek.
- The 2019 California Fire Code contained in Part 9 of Title 24 of the California Code of Regulations, is hereby adopted as the Fire Code of the City of Sutter Creek.
- The 2019 California Existing Building Code contained in Part 10 of Title 24 of the California Code of Regulations, is hereby adopted by reference as the Existing Building Code of the City of Sutter Creek.

- The 2019 California Green Building Standards Code contained in Part 11 of Title 24 of the California Code of Regulations is hereby adopted by reference as the Green Building Standards Code of the City of Sutter Creek.
- The 2019 California Referenced Standards Code contained in Part 12 of Title 24 of the California Code of Regulations is hereby adopted by reference as the Referenced Standards Code of the City of Sutter Creek.
- The 2018 International Property Maintenance Code as published by the International Code Council and referenced in Title 24, Part 2, of the California Building Code is hereby adopted by reference as the Property Maintenance Code of the City of Sutter Creek.
- The 1997 Uniform Code for the Abatement of Dangerous Buildings, published by the International Conference of Building Officials, is hereby adopted by reference as the Dangerous Buildings Code of the City of Sutter Creek.

The above-identified codes in this Section 15.04.010 (hereinafter collectively referred to as the "Building Codes") are adopted for the purpose of prescribing regulations for the erection, construction, modification, repair, maintenance, demolition, use and occupancy of buildings and structures. One copy of each of the Building Codes shall be maintained for use and examination of the public in the office of the building official.

Zoning (Sutter Creek Code Title 18)

An official land use zoning ordinance for the city is adopted and established to assist in implementing the General Plan, to serve the public health, safety, comfort, convenience and general welfare, to provide for the economic and social advantages resulting from an orderly planned use of land resources, and to encourage, guide and provide a definite plan for the future growth and development of the city.

Subdivisions (Sutter Creek Code Title 17)

This title is adopted:

- To establish minimum permissible regulations and standards for the division and subdivision of land, for the design, improvement, and survey data related thereto, and for the physical alteration of the land involved therein, and;
- To provide a guide for owners in the proper division of their land, and to provide for orderly development of the city consistent with the general plan.

Floodplain Management (Title 15, Chapter 15.20)

The flood hazard areas of the city are subject to periodic inundation which results in loss of life and property, health and safety hazards, disruption of commerce and governmental services, extraordinary public expenditures for flood protection and relief, and impairment of the tax base, all of which adversely affect the public health, safety and general welfare.

These flood losses are caused by the cumulative effect of obstructions in areas of special flood hazards which increase flood heights and velocities, and when inadequately anchored, damage uses in other areas. Uses that are inadequately floodproofed, elevated or otherwise protected from flood damage also contribute to the flood loss.

It is the purpose of this chapter to promote the public health, safety and general welfare, and to minimize public and private losses due to flood conditions in specific areas by provisions designed:

- To protect human life and health;
- To minimize expenditure of public money for costly flood control projects;
- To minimize the need for rescue and relief efforts associated with flooding and generally undertaken at the expense of the general public;
- To minimize prolonged business interruptions;
- To minimize damage to public facilities and utilities such as water and gas mains, electric, telephone and sewer lines, streets and bridges located in areas of special flood hazard;
- To help maintain a stable tax base by providing for the sound use and development of areas of special flood hazard so as to minimize future flood blight areas;
- To ensure that potential buyers are notified that property is in an area of special flood hazard; and
- To ensure that those who occupy the areas of special flood hazard assume responsibility for their actions.

In order to accomplish its purposes, this chapter includes methods and provisions for:

- Restricting or prohibiting uses which are dangerous to health, safety and property due to water or erosion hazards, or which result in damaging increases in erosion or flood heights or velocities;
- Requiring that uses vulnerable to floods, including facilities which serve such uses, be protected against flood damage at the time of initial construction;
- Controlling the alteration of natural floodplains, stream channels, and natural protective barriers, which help accommodate or channel floodwaters;
- Controlling fill, grading, dredging and other development which may increase flood damage; and
- Preventing or regulating the construction of flood barriers which will unnaturally divert floodwaters or which may increase flood hazards in other areas.

This chapter shall apply to all areas of special flood hazards, areas of flood-related erosion hazards and areas of mudslide (i.e., mudflow) hazards within the jurisdiction of Sutter Creek

Storm Drainage (Title 17, Chapter 17.16.170)

Storm drainage falls under the subdivision zoning ordinance. When developing subdivisions in the City:

- The subdivider shall dedicate a right-of-way for storm drainage purposes conforming substantially with the lines of any natural water course or channel, stream, or creek that traverses the subdivision. All storm drain improvements shall be in accordance with city Improvement Standards.
- The planning commission may require adequate fencing or other protection of all ditches and streams.
- In cases where drainage facilities are necessary on an area-wide basis to permit safe, healthful and convenient development of the area, the subdivider may be required to pay a pro rata share of such facilities' cost, as determined by the city council.

E.5.2. Administrative/Technical Mitigation Capabilities

Table E-46 identifies the City department(s) responsible for activities related to mitigation and loss prevention in the City of Sutter Creek.

Table E-46 City of Sutter Creek's Administrative and Technical Mitigation Capabilities

Administration	In Place Y/N	Describe capability Is coordination effective?
Staff		**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official	Y	Yes, Yes, Yes
Civil Engineer, including dam and levee safety	Y	Yes, Yes, Yes
Community Planner	N	
Emergency Manager	N	
Floodplain Administrator	N	
GIS Coordinator	N	
Planning Commission	Y	Yes, Yes, Yes
Other		
Technical	**Y/N**	**Has capability been used to assess/mitigate risk in the past?**
Grant writing	Y	The City has hired a consultant to assist with Grant writing
Hazard data and information	N	
GIS analysis	Y	The City has GIS of the sewer system and uses it regularly to identify sewer lines that need to be cleaned or repaired when a spill occurs.
Mutual aid agreements	Y	The City has service contracts with local contractors in the case of emergencies
Other		
How can these capabilities be expanded and improved to reduce risk?		
Additional enforcement for education of and enforcement of fire fuel mitigation efforts would assist in reducing fire risks. Working on fuel mitigation ordinance.		

Source: City of Sutter Creek

E.5.3. Fiscal Mitigation Capabilities

Table E-47 identifies financial tools or resources that the City could potentially use to help fund mitigation activities.

Table E-47 City of Sutter Creek's Fiscal Mitigation Capabilities

Funding Resource	In Place Y/N	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	

Funding Resource	In Place Y/N	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Community Development Block Grant	N	
Federal funding programs (non-FEMA)	N	
Fees for water, sewer, gas, or electric services	Y	Yes, the City collects sewer fees
Impact fees for new development	Y	Yes
State funding programs	Y	SRF Planning grant for new WWTP, can apply for construction grant
Stormwater utility fee	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
There is too much administrative overhead to receive grant funding making it extremely cumbersome for small jurisdictions to be competitive without having to hire additional staff. The City has hired a consultant to look for grant opportunities in Jan 2025.		

Source: City of Sutter Creek

E.5.4. Mitigation Education, Outreach, and Partnerships

Table E-48 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table E-48 City of Sutter Creek's Mitigation Education, Outreach, and Partnerships

Program/Organization	In Place Y/N	How widespread are each of these in your community?
Community newsletters	Y	We continually place information in our monthly newsletters.
Hazard awareness campaigns (such as Firewise, Storm Ready, Severe Weather Awareness Week, school programs, public events)	N	
Local news	Y	Monthly newsletter, regional newspaper, radio station in Jackson
Organizations that interact with underserved and vulnerable communities	N	
Social media	Y	City has a website that is updated as needed
How can these capabilities be expanded and improved to reduce risk?		
The City lacks staffing to do many of these activities. Additional money is needed to expand staffing.		

Source: City of Sutter Creek

E.5.5. Other Mitigation Efforts

The City engages in the following mitigation efforts:

- Earthquake – Compliance with Building Codes for Earthquake Safety
- Floods: Localized Stormwater – continuous cleaning of storm drain inlets and system.
- Landslide, Mudslide, Debris Flow – Bank stabilization, natural vegetation
- Wildfire – Aggressive fire fuel mitigation program including education and enforcement.

Examples of this include:

- Landslides
  - ✓ Worley at Main Street: 2017-2018 storms caused the hillside to fall onto main street. Road was dug out and ultra block installed as temporary fix. After 3-5 years ultra block was removed and Jute netting and Rice waddle were installed until vegetation returned to the hillside. Natural vegetation impeding erosion currently.
  - ✓ Worley Street, debris from houses above during storms in 2022 had water and mud debris slide into lower house garage and block safe passage into lower residence. City installed curtain drain along road and connected it to existing DI to prevent further erosion. Problem has been solved.
- Wildfires
  - ✓ Yearly vegetation management of City owned properties.
  - ✓ Fire break being installed around Minehead site. This has taken over 30 days of clearing over the past two years.
- Dam Failure
  - ✓ Obtained permit to fix underdrain for Henderson Reservoir. Repair currently underway.
- Floods
  - ✓ Removed debris from Flushing Dam.
  - ✓ Reinforced WWTP flood wall with rip rap
  - ✓ Reinstalled Eureka St crossing with new storm drain and tunnel
  - ✓ Crestview Drainage on Meadow Crest – Sept 2023 Homeowner called City about drainage issues. No drainage was provided from upper development and too much flow was entering the residence on 310 Gopher Flat. City investigated and determined that the existing drainage pipe was too small and had been compromised. In fall of 2024, the City installed a 100 LF of new 18-inch pipe and 30 LF of 24-inch pipe, two new DI's and 2 DI's. Problem has been solved.

E.6 Mitigation Strategy

E.6.1. Mitigation Goals and Objectives

The City of Sutter Creek adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

E.6.2. NFIP Mitigation Strategy

The City of Sutter Creek joined the National Flood Insurance Program (NFIP) on September 24, 1987. As a participant of the NFIP, the City of Sutter Creek has administered floodplain management regulations that meet the minimum requirements of the NFIP. The management program objective is to protect people and property within the City. The City of Sutter Creek will continue to comply with the requirements of the NFIP in the future.

In addition, the City of Sutter Creek actively participates with Amador County to address local NFIP issues through a regional approach. Many of the program activities are the same for the City of Sutter Creek as for Amador County since participation at the County level includes all local jurisdictions.

The City of Sutter Creek Planning Department provides public outreach activities which include map information services, public awareness, public hazard disclosure, and flood protection information. This information is readily available to the public and consists of current and accurate flood mapping. In addition, the Planning and Engineering Department provides information about our stormwater management program and up-to-date information related to the maintenance of our drainage system.

The NFIP's Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. As a result, flood insurance premium rates are discounted to reflect the reduced flood risk resulting from the community actions meeting the three goals of the CRS which are to reduce flood losses, facilitate accurate insurance rating, and promote the awareness of flood insurance. The City of Sutter Creek is not a current participant in the CRS program.

More information about the floodplain administration in the City of Sutter Creek can be found in Table E-49.

Table E-49 City of Sutter Creek Compliance with NFIP

NFIP Topic	Comments
Staff Resources	
Who is responsible for floodplain management in your community? Provide Department/Title. Do they serve any roles other than Community Floodplain Administrator (FPA)?	Building Inspector (Larry White), Serves as the City building inspector
Is the Community FPA or NFIP Coordinator a Certified Floodplain Manager?	No
Is floodplain management an auxiliary function?	Yes
Provide an explanation of NFIP administration services (e.g., permit review, GIS, education or outreach, inspections, engineering capability)	Permit review
What are the barriers to running an effective NFIP program in the community, if any?	Funding
Insurance Summary	
How many NFIP policies are in the community? What is the total premium and coverage?	7 policies $9,872 in premiums $1,538,000 in coverage
How many claims have been paid in the community? What is the total amount of paid claims? How many of the claims were for substantial damage?	16 paid losses. $112,809.14 in paid claims 0 substantial damage claims
How many structures (residential and non-residential) are exposed to flood risk within the community?	73 structures in 1% annual chance 19 structures in 0.2% annual chance

NFIP Topic	Comments
Are there Repetitive Loss (RL) and Severe Repetitive Loss Properties (SRL) structures in the community?	0 RL or SRL
Describe any areas of flood risk with limited NFIP policy coverage	No known areas with limited NFIP coverage.
How does the community teach property owners or other stakeholders about the importance of flood insurance?	Owners are taught to apply for permits, hire a local surveyor, go get outside help
What digital sources (like the FEMA Map Service Center, National Flood Hazard Layer) or non-regulatory tools does the community use?	FEMA.gov/flood-maps
Compliance History	
Is the community in good standing with the NFIP?	Y
Are there any outstanding compliance issues (i.e., current violations)?	N
Who is responsible (Department, Title) for making substantial damage/improvement determinations? How does the community identify substantially damaged/improved structures? What is the process to make sure these structures are brought into compliance?	Building Inspector is responsible. He determines substantially damages structures. Measures can be used to bring these structures into compliance.
When was the most recent Community Assistance Visit (CAV) or Community Assistance Contact (CAC)?	5/17/2011 (CAV) 10/5/2017 (CAC)
Is a CAV or CAC scheduled or needed?	No
Regulation	
When did the community enter the NFIP?	8/24/1987
Are the FIRMs digital or paper?	Digital
Has the community adopted the NFIP minimum floodplain management criteria via local regulation? Date of current local regulation?	Adopted per ordinance
Has the community adopted the latest effective FIRM? Date adopted?	15.20.060 - Basis for establishing the areas of special flood hazard. The areas of special flood hazard identified by the Federal Insurance Administration (FIA) of the Federal Emergency Management Agency (FEMA) in the Flood Insurance Study (FIS) dated September 24, 1990, and the Flood Insurance Rate Map (FIRM), dated September 28, 1990, and all subsequent amendments and/or revisions, are adopted by reference and declared to be a part of this chapter. This Flood Insurance Study (FIS) and attendant mapping is the minimum area of applicability of this chapter and may be supplemented by studies for other areas which allow implementation of this chapter, and which are recommended to the city council by the floodplain administrator. The study and Flood Insurance Rate Maps (FIRMs) are on file at (Address: City Hall/Administration Building/Planning Department/Public Works, etc.). (Ord. 252 §3.2, 1991)

NFIP Topic	Comments
How does the community enforce local floodplain regulations and monitor compliance?	Through Building permits to improvements to buildings
Do floodplain development regulations meet or exceed FEMA or State minimum requirements? If so, in what ways?	Meet.
How are Letters of Map Change (LOMCs) tracked and compiled?	New DFIRMs are downloaded regularly which include the latest LOMCs, LOMRs, and CLOMRs
Provide an explanation of the permitting process.	Applicants submit building plans for review and approval. They are examined by our Building Inspector who reviews and approves for compliance with the Zoning Code and Building Code.
Community Rating System	
Does the community participate in CRS? If so, what is the community's CRS Class Ranking?	No
What categories and activities provide CRS points and how can the class be improved?	N/A
Does the plan include CRS planning requirements?	N/A

Source: City of Sutter Creek

E.6.3. Mitigation Actions

The Planning Team for the City of Sutter Creek identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Climate Change
- Dam Failure
- Drought & Water shortage (w/tree mortality)
- Earthquake (w/subhazards)
- Floods: 1%/0.2% annual chance (w/levee failure)
- Floods: Localized Stormwater
- Landslide, Mudslide, and Debris Flow
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rain and Storms (Hail, Lightning)
- Wildfire (w/smoke and air quality)

Low priority hazards for mitigation planning include:

- Agricultural Hazards (severe weather/pests/invasive species)
- Avalanche
- Severe Weather: Extreme Cold, Freeze, and Snow
- Severe Weather: High Winds and Tornados

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five-year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Mitigation Actions

The City has put forward the actions as shown in Table E-50. Details of the actions can be found below the table.

Table E-50 City of Sutter Creek Mitigation Actions

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
City of Sutter Creek					
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Previous Action	X	X		Prevention
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	Previous Action	X	X		Prevention Public Education
Action 3. Auditorium, Community Center, and WWTP Backup Power Generators	New Action	X	X		Structural
Action 4. Development of Walking Paths, Native Tree Protection, and Native Tree Species Planting	Previous Action	X	X		Prevention Property Protection Natural Resource Protection
Action 5. Henderson Underdrain	New Action	X	X		Structural
Action 6. Recycled Water System for New Development	New Action	X	X		Structural
Action 7. Early EQ Warning Program	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 8. Sutter Creek Excavation/Annual Cleaning Projects	Previous Action	X	X	X	Prevention Property Protection Natural Resource Protection

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 9. Stormwater Masterplan Development and Implementation	Previous Action	X	X	X	Prevention Property Protection Natural Resource Protection
Action 10. Culvert Cleaning Projects	Previous Action	X	X	X	Prevention Property Protection Natural Resource Protection
Action 11. Karsan Drive Tributary Slope and Road Stabilization	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 12. Cooling Center/Severe Weather Center	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 13. Vegetation Management Enforcement and Perimeter Wildfire Protection Fuel break	Previous Action	X	X		Prevention Property Protection Natural Resource Protection

Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan

Hazards Addressed: Multi-hazard (Agricultural Hazards (severe weather/pests/invasive species), Avalanche, Climate Change, Dam Failure, Drought & Water shortage (w/ tree mortality), Earthquake (w/subhazards), Floods: 1%/0.2% annual chance (w/ levee failure), Floods: Localized Stormwater, Landslide, Mudslide, Debris Flow, Severe Weather: Extreme Cold, Freeze, and Snow, Severe Weather: Extreme Heat, Severe Weather: Heavy Rains and Storms (Hail, Lightning), Severe Weather: High Winds and Tornadoes, Wildfire (w/smoke and air quality))

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): Local jurisdictional reimbursement for mitigation projects and cost recovery after a disaster is guided by Government Code Section 8685.9 (AB 2140). Specifically, this section requires that each jurisdiction adopt a local hazard mitigation plan (LHMP) in accordance with the federal Disaster Mitigation Act of 2000 as part of the Safety Element of its General Plan. Adoption of the LHMP into the Safety Element of the General Plan may be by reference or incorporation.

Other Alternatives: No action

Existing Planning Mechanisms through which Action will be Implemented: Safety Element of General Plan

Responsible Office/Partners: City of Sutter Creek Planning Department

Benefits (Losses Avoided): Incorporation of an adopted LHMP into the Safety Element of the General Plan will help jurisdictions maximize the cost recovery potential following a disaster.

Potential Funding (Local Budgets, Grant Funds, etc.): Local budgets like the City General Fund

Timeline: As soon as possible. Likely within 5 years.

Priority (H, M, L): High

Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness

Hazards Addressed: Multi-hazard (Agricultural Hazards (severe weather/pests/invasive species), Avalanche, Climate Change, Dam Failure, Drought & Water shortage (w/ tree mortality), Earthquake (w/subhazards), Floods: 1%/0.2% annual chance (w/ levee failure), Floods: Localized Stormwater, Landslide, Mudslide, Debris Flow, Severe Weather: Extreme Cold, Freeze, and Snow, Severe Weather: Extreme Heat, Severe Weather: Heavy Rains and Storms (Hail, Lightning), Severe Weather: High Winds and Tornadoes, Wildfire (w/smoke and air quality))

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): The City and County play a key role in public outreach/education efforts to communicate the potential risk and vulnerability of their community to the effects of natural hazards. A comprehensive multi-hazard public education program will better inform the community of natural hazards of concern and actions the public can take to be better prepared for the next natural disaster event.

Project Description: A comprehensive multi-hazard outreach program will ascertain both broad and targeted educational needs throughout the community. The City will work with the County and other agencies as appropriate to develop timely and consistent annual outreach messages in order to communicate the risk and vulnerability of natural hazards of concern to the community. This includes measures the public can take to be better prepared and to reduce the damages and other impacts from a hazard event. The public outreach effort will leverage and build upon existing mechanisms, and will consider:

- Using a variety of information outlets, including websites, local radio stations, news media, schools, and local, public sponsored events;
- Creating and distributing (where applicable) brochures, leaflets, water bill inserts, websites, and public service announcements;
- Displaying public outreach information in County office buildings, libraries, and other public places and events;
- Developing public-private partnerships and incentives to support public education activities.

Other Alternatives: Continue public information activities currently in place.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Existing City and County outreach programs will be reviewed for effectiveness and leveraged and expanded upon to reach the broader region.

Responsible Office/Partners: City of Sutter Creek Planning Department in partnership with the County

Benefits (Losses Avoided): Increase residents' knowledge of potential hazards and activities required to mitigate hazards and be better prepared. Protect lives and reduce damages, relatively low cost to implement.

Potential Funding (Local Budgets, Grant Funds, etc.): Local budgets or City General Fund, grant funds (like CA DWR, Cal OESPDM, HMGP, FMA, BRIC, or other sources).

Timeline: Ongoing/Annual public awareness campaign

Project Priority (High, Medium, Low): High

Action 3. Auditorium, Community Center, and WWTP Backup Power Generators

Hazards Addressed: Multi-Hazard (Climate Change, Dam Failure, Drought & Water shortage, Earthquake, Floods: 1%/0.2% annual chance, Floods: Localized Stormwater, Landslide, Mudslide, and Debris Flow, Severe Weather: Extreme Heat, Severe Weather: Heavy Rain and Storms (Wind, Hail, Lightning), Wildfire)

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): The Auditorium and the Community Center are essential City facilities that are susceptible to power outages. Neither facility has a backup source of power. The WWTP must operate even if power is out to continue essential sewer services. Currently the WWTP has a non-compliant air board generator.

Project Description: Identify all essential City Facilities which currently have or do not have fixed generators or generators that are out of compliance with current air regulations. Consult, design, and install fixed air board compliant generators.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: Currently none

Responsible Office/Partners: City of Sutter Creek Planning Department

Benefits (Losses Avoided): Improves resilience of City services when power outages or public safety power shut events are implemented by PG&E.

Potential Funding (Local Budgets, Grant Funds, etc.): City General Fund, Cost estimates are estimated at $350,000.

Timeline: Next 5 years

Project Priority (High, Medium, Low): High

Action 4. Development of Walking Paths, Native Tree Protection, and Native Tree Species Planting

Hazards Addressed: Multi-Hazard (Climate Change, Drought, Extreme Heat, Severe Weather, and Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): To reduce our carbon footprint, safe walking spaces are needed that encourage walking as a mode of travel. Walking in and around Sutter Creek can be difficult without paths and shaded spaces during the hotter months. During drought and extreme heat periods the City of Sutter Creek gets hot due to its lowland location.

Project Description: The project would develop walking paths in and around Sutter Creek with native tree planting that would provide shade.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: Safety Element of the General Plan, Subdivision ordinance, Landscape Ordinance

Responsible Office/Partners: City of Sutter Creek Planning Department

Benefits (Losses Avoided): Reduction in energy consumption, reduction in carbon footprint

Potential Funding (Local Budgets, Grant Funds, etc.): City General Fund, Parks grants, CDBG, Urban forestry Grants, community sponsorship

Timeline: Ongoing and annually reviewed as funding is available.

Action 5. Henderson Underdrain

Hazards Addressed: Dam Failure (Henderson Reservoir)

Goals Addressed: 1, 2, 4, 6

Issue/Background (Problem Statement): The 20-inch diameter low-level outlet pipe of the Henderson Dam has no bottom and has lost all structural integrity. The pipe must be replaced per Division of Dam Safety (DSOD).

Project Description: The work generally includes 1. Slip lining of existing 20-inch concrete outlet pipe using 16-inch DR-17 HDPE pipe for approximately 170 LF total and grouting the annulus between the host pipe and the slip lined pipe. 2, Removal and replacement of approximately 965 LF of 20-inch AC Concrete

pipe with 16-inch DR17 HDPE. 3. Removal and replacement of approximately 100 LF of 20-inch AC Concrete pipe with 24-inch DR17 HDPE. 4. Field verification of post0installation conditions using a rover with a tilt and pan CCTV.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: Alternatively, the jurisdiction may collect an annual remotely operated vehicle (ROV) video inspection along with an engineer's evaluation to prove that the pipe is not further deteriorating.

Responsible Office/Partners: City of Sutter Creek Planning Department (uses reservoir for wastewater disposal), California Department of General Services (owner of the Reservoir), Amador Regional Sanitation Authority (Lessee), Division of Dam Safety (Regulatory body)

Benefits (Losses Avoided): Improves the structural integrity of the Dam face reducing the chance of

Potential Funding (Local Budgets, Grant Funds, etc.): City General Fund, CWSRF funding has been applied for. FEMA HHPD. Budget is approximately $750,000 for the repair

Timeline: Fall of 2025 or Fall of 2026 (dependent on weather and ability to lower reservoir volume)

Project Priority (High, Medium, Low): High

Action 6. Recycled Water System for New Development

Hazards Addressed: Drought and Water Storage

Goals Addressed: 1, 2, 4, 6

Issue/Background (Problem Statement): The City of Sutter Creek is looking to provide recycled water to a newly proposed development that would include residential housing, commercial properties, a hotel and resort, and a golf course in the Southwest portion of Sutter Creek. The recycled water would come from a new pipeline from the WWTP to the development.

Project Description: The current WWTP produces secondary treated wastewater. The City has produced an RFP for a tertiary wastewater plant. With tertiary treated water being produced a pipeline would be built to transfer water from the WWTP up to the new development for land application on the golf course and purple pipe within the development.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: Internal City departments

Responsible Office/Partners: City of Sutter Creek Planning Department, developers, AWA (possibly)

Benefits (Losses Avoided): The new pipeline would allow for reduced use of water from AWA sources thus reducing the burden on water storage systems

Potential Funding (Local Budgets, Grant Funds, etc.): FEMA, City General Fund, CWSRF Recycled Water, budget estimated in the millions of dollars

Timeline: Dependent on funding. Within 5 years if funding is available.

Project Priority (High, Medium, Low): Medium

Action 7. Early EQ Warning Program (Cal OES)

Hazards Addressed: Earthquake

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background (Problem Statement): The City of Sutter Creek faces a significant and unmitigated risk from potential seismic events. A moderate to large earthquake poses an imminent danger of widespread structural damage to residential and commercial buildings. This vulnerability is exacerbated by the potential for secondary hazards including landslides. The current lack of comprehensive public awareness could result in significant loss of life and severe injuries.

Project Description: The City is participating in an Earthquake Earth Warning (EEW) Datacasting Receiver Pilot Program through Cal OES powered by ShakeAlert with television towers located throughout California. Once these receivers are installed, they will provide EEW alerts, giving individuals crucial seconds to take proactive actions such as Drop, Cover and Hold On. This will be especially beneficial with limited or no cellular network reception or broadband access. Although most of Amador County is covered by television networks, cellular reception is spotty in Sutter Creek. The project will assess the viability of the sensors and if successful install throughout town to alert residents.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: The City has signed up for the pilot program which includes two receivers that will be positioned around town.

Responsible Office/Partners: City of Sutter Creek Planning Department

Benefits (Losses Avoided): Provides precious seconds to minutes for individuals to take protective actions to prevent and or reduce injuries and loss of life

Potential Funding (Local Budgets, Grant Funds, etc.): City General Fund, Cal OES grant

Timeline: Next 2 years

Project Priority (High, Medium, Low): High

Action 8. Sutter Creek Excavation/Annual Cleaning Projects

Hazards Addressed: Flood, Localized Flood, Severe Weather: Heavy Rains and Storms

Goals Addressed: 1, 2, 4, 6

Issue/Background (Problem Statement): Over the years Sutter Creek has become clogged from silt and sediment, organic debris, vegetation and "volunteer" trees. Clogged creeks contribute to obstructed water flow leading to water backing up and causing localized flooding and can damage property, roads and surrounding areas. When water cannot pass efficiently it can erode the surrounding embankments, roads and walkways compromising infrastructure integrity. As the creek backs up water is diverted to the Auditorium parking lot and filters into the basement of the Auditorium.

Project Description: The City will clear blockages including but not limited to silt and debris, remove root balls and small saplings under three feet in height. The projects are to be done in the Creek. A plan was also developed to raise and/or fortify the auditorium parking lot but funds were not available.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: The City has received a 5-year fish and game permit to conduct cleaning of the culverts in town.

Responsible Office/Partners: City of Sutter Creek Public Works

Benefits (Losses Avoided): Reduce the changes of localized flooding, localized landslides, and infrastructure destruction

Potential Funding (Local Budgets, Grant Funds, etc.): City General Fund, project estimated at $1.2M for Bank stabilization and $400,000 for basin upgrade

Timeline: Next 5 years

Project Priority (High, Medium, Low): High

Action 9. Stormwater Masterplan Development and Implementation

Hazards Addressed: Flood, Localized Flood, Severe Weather: Heavy Rains and Storms

Goals Addressed: 1, 2, 4, 6

Issue/Background (**Problem Statement**): The City of Sutter Creek does not have a Storm Water Master Plan to address storm water issues and plan for capital improvements.

Project Description: A Storm Water Master Plan will be developed to address storm water issues in the City of Sutter Creek and will also address development in the City's Sphere of Influence which identifies future areas of residential, commercial, and industrial growth.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: Internal City departments

Responsible Office/Partners: City of Sutter Creek Public Works

Benefits (Losses Avoided): A new Storm Water Master Plan will identify improvements to the current storm water collection system and improve drainage which will reduce localized flooding on the creek that runs through town resulting from heavy rains.

Potential Funding (Local Budgets, Grant Funds, etc.): FEMA HMA grants, CA DWR grants, City General Fund.

Timeline: Dependent on Funding. Desired as soon as possible or inside the lifecycle of this LHMP Update.

Project Priority (High, Medium, Low): High

Action 10. Culvert Cleaning Projects

Hazards Addressed: Flood, Localized Flood, Severe Weather: Heavy Rains and Storms

Goals Addressed: 1, 2, 4, 6

Issue/Background (Problem Statement): Over the years culverts have clogged from silt and sediment, organic debris, vegetation and "volunteer" trees. Clogged culverts contribute to obstructed water flow leading to water backing up and causing localized flooding and can damage property, roads and surrounding areas. When water cannot pass efficiently it can erode the surrounding embankments, roads and walkways compromising infrastructure integrity.

Project Description: The City will clear blockages including but not limited to silt and debris, remove root balls and small saplings under three feet in height. The projects are to be done around town in various culverts including "The Grizzly", "The big ditch" and many other local culverts that feed Sutter Creek.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: The City has received a 5-year fish and game permit to conduct cleaning of the culverts in town.

Responsible Office/Partners: City of Sutter Creek Public Works

Benefits (Losses Avoided): Reduce the changes of localized flooding, localized landslides, and infrastructure destruction

Potential Funding (Local Budgets, Grant Funds, etc.): City General Fund

Timeline: Next 5 years

Project Priority (High, Medium, Low): Medium

Action 11. Karsan Drive Tributary Slope and Road Stabilization

Hazards Addressed: Landslide, Mudslide, Debris Flow

Goals Addressed: 1, 2, 4, 6

Issue/Background (Problem Statement): The Karsan tributary which collects storm drain flows from approximately one third of the storm flows from the South side of Sutter Creek, The tributary has caused a landslide on the South bank of the tributary which has begun to erode Karsan Dr.

Project Description: The south slope of the Karsan tributary has eroded. Temporary slope stabilization efforts have started to fall into the tributary. The slope needs to be stabilized, and the road needs to be repaired once a stable surface has been created. The tributary needs to be expanded to handle the increased flows to protect the road.

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: Existing road surface is being monitored to gauge rate of landslide. Tributary is cleared annually to reduce debris in the tributary and allow more flow. A permit has been obtained from Fish and Game to remove saplings and root balls from the tributary.

Responsible Office/Partners: City of Sutter Creek Public Works

Benefits (Losses Avoided): Improves stormwater flow from the south third of town into Sutter Creek. Karsan Drive is the only access road for approximately 10 houses. This is the only route in an emergency.

Potential Funding (Local Budgets, Grant Funds, etc.): City General Fund. Project is estimated at approximately $200,000 for the repair

Timeline: Planning is underway but budget does not exist to begin the repairs yet. It is hoped to be completed inside of 5 years.

Project Priority (High, Medium, Low): High

Action 12. Cooling Center/Severe Weather Center

Hazards Addressed: Severe Weather: Extreme Heat

Goals Addressed: 1, 2, 3, 4, 6

Issue/Background (Problem Statement): The City of Sutter Creek is disadvantaged and has a large vulnerable population (elderly) that without a cooling/extreme weather center is susceptible to a cascade of negative impacts including but not limited to exacerbated health risks and mortality, socioeconomic disparities and increased heat-related illnesses.

Project Description: The City has identified the Auditorium and the community center as critical infrastructure that could be used as a cooling/extreme weather centers. Upgrades to the HVAC and backup power would be needed to both buildings to make them suitable as cooling/extreme weather centers for the residents

Other Alternatives: None

Existing Planning Mechanism(s) through which Action Will Be Implemented: The City has identified critical infrastructure and deficiencies needed to upgrade the infrastructure to cooling/extreme weather centers.

Responsible Office/Partners: City of Sutter Creek Planning Department

Benefits (Losses Avoided): Protecting vulnerable populations of exacerbated health risks and mortality

Potential Funding (Local Budgets, Grant Funds, etc.): City General Fund, upgrade project budget estimated at $500,000

Timeline: Next 5 years

Project Priority (High, Medium, Low): High

Action 13. Vegetation Management Enforcement and Perimeter Wildfire Protection Fuel Break

Hazards Addressed: Wildfire

Goals Addressed: 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): the City of Sutter Creek borders are surrounded by open dry grassland making the residential areas vulnerable to the threat of wildfire. Internally there are areas of the City that are overgrown with dead and fallen trees and organic material that needs to be removed to prevent wildfire propagation through the City.

Project Description: The project would provide for establishment of perimeter firebreaks surrounding the City. The project would also identify areas of town that are overgrown and in need of vegetation management including but not limited to the Mine head site, Sutter Hill Road and out Eureka St. The project would include the initial clearing and annual ongoing maintenance of the fire break, the fuel reduction projects, and fuel mitigation enforcement on private properties.

Other Alternatives: Currently the City contracts with CalFire to obtain crews to reduce vegetation around town.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Safety Element of the General Plan

Responsible Office/Partners: Public works department, CalFire, Sutter Creek Fire Protection District

Benefits (Losses Avoided): Residential Fire Protection and limiting loss of life

Potential Funding (Local Budgets, Grant Funds, etc.): FEMA HMA grants, City General Fund, CalFire, budget estimated around 1M dollars and annually approximately 500K

Timeline: Ongoing and annual.

Project Priority (High, Medium, Low): High

Annex F Amador Water Agency

F.1 Introduction

This Annex details the hazard mitigation planning elements specific to the Amador Water Agency (AWA or Agency), a previously participating jurisdiction to the 2020 Amador County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the Agency. This Annex provides additional information specific to the AWA, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this jurisdiction.

F.2 Planning Process

As described above, the AWA followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Amador County Hazard Mitigation Planning Committee (HMPC), the Agency formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table F-1. Additional details on Plan participation and Agency representatives are included in Appendix A.

Table F-1 AWA – Planning Team

Name	Position/Title	How Participated
Rick Ferriera	Operations Manager	Coordinated effort and led internal efforts. Attended HMPC meetings
Lucas Carthew	Assistant Engineer	Researched data and submitted information. Attended HMPC meetings
Antero Acierto	Mapping/GIS	Attended HMPC meetings
Brandt Cook		Attended HMPC meetings

Coordination with other community planning efforts is paramount to the successful implementation of this LHMP Update. This section provides information on how the Agency integrated the previously approved 2020 LHMP into existing planning mechanisms and programs. Specifically, the Agency incorporated into or implemented the 2020 LHMP through other plans and programs shown in Table F-2.

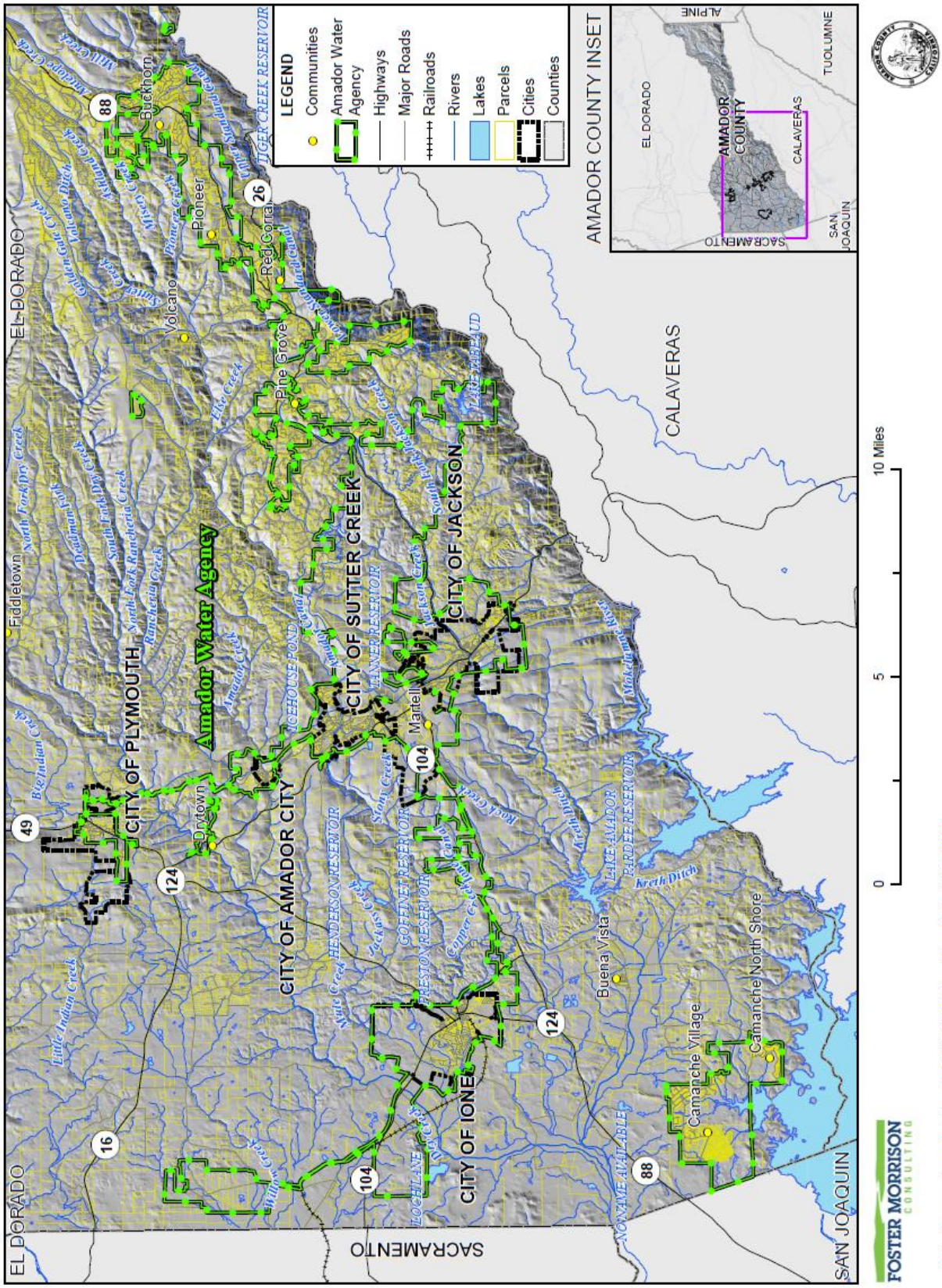
Table F-2 2020 LHMP Incorporation

Planning Mechanism Previous LHMP Was Incorporated or Implemented Through	Details
2020 AWA Water Master Plan	The 2020 AWA Water Master Plan was completed in tandem with the previous LHMP. The data used to compile the previous LHMP AWA Annex was also used in the creation of the 2020 AWA Water Master Plan. This Plan created a 20-year Capital Improvement Plan prioritizing AWA projects to complete, with natural hazard mitigation incorporated into the decision-making process. AWA intends to have the 2025 AWA Water Master Plan completed by the time the 2025 LHMP is adopted.
2022 AWA Wastewater Master Plan	The 2022 AWA Wastewater Master Plan was completed in tandem with the previous LHMP. The data used to compile the previous LHMP AWA Annex was also used in the creation of the 2022 AWA Wastewater Master Plan. This Plan created a 20-year Capital Improvement Plan prioritizing AWA projects to complete, with natural hazard mitigation incorporated into the decision-making process. AWA intends to have the 2025 AWA Wastewater Master Plan completed by the time the 2025 LHMP is adopted.
2020 Water Shortage Contingency Plan	The previous LHMP was included as Appendix C to the 2020 Water Shortage Contingency Plan
2020 Urban Water Management Plan	The previous LHMP was included as Appendix C to the 2020 Urban Water Management Plan.
2022 AWA Tanner & Ione WTP Capacity Study	The 2022 AWA Tanner & Ione WTP Capacity Study was completed following the 2020 AWA Water Master Plan and utilized a large percentage of the same data used in the previous LHMP.
2024 Annual Water Supply & Demand Assessment Shortage Report	The 2024 Annual Water Supply & Demand Assessment Shortage Report was completed using data from the 2020 AWA Water Master Plan and the 2022 AWA Tanner & Ione WTP Capacity Study, both of which utilized the same or a large percentage of the same data from the previous LHMP.

F.3 Community Profile

The community profile for the AWA is detailed in the following sections. Figure F-1 displays an Agency map and the location of AWA and its Service Area within Amador County. Figure F-2 shows who the AWA provides water to, while Figure F-3 shows the AWA wastewater systems.

Figure F-1 AWA



F.3.1. Overview and Background

In 1959, the AWA was formed for the purpose of providing water and wastewater services to the residents of Amador County. The AWA is the main water supplier for the western portion of Amador County. The Agency has two sources of water: surface water and groundwater. Surface water accounts for approximately 94% of total supply. AWA is the primary supplier of water to Amador County. The Amador Water Agency owns and operates 11 small community wastewater systems.

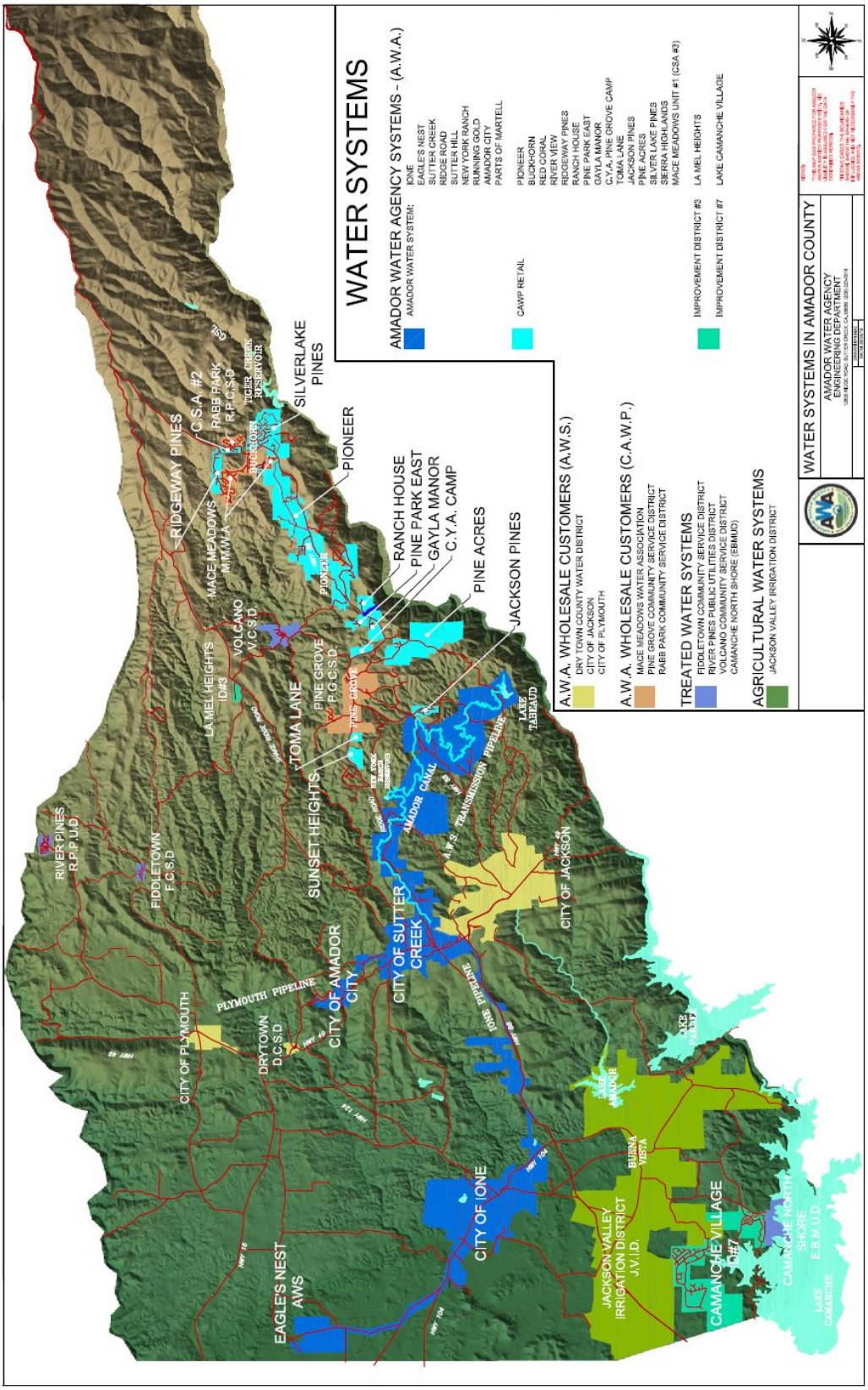
The primary source of consumptive water is the Mokelumne River which is supplied from rainfall and snowmelt from the Sierra Mountain Range. This water is diverted from the Tiger Creek afterbay or Lake Tabeaud forebay and then either it gravity flows or is pumped to AWA treatment plants. The Agency's two main water systems are the Amador Water System (AWS) and the Central Amador Water Project System (CAWP). The Agency supplies drinking water to the communities of Jackson, Ione, Sutter Creek, Amador City, Drytown, Plymouth, the communities along the Highway 88 corridor, and the Lake Camanche and LaMel Heights areas. The agency is located on Ridge Road in Sutter Creek; however, their assets are located throughout the County and beyond. The geography and climate of the Agency are the same as that of the County, which was discussed in the Base Plan.

Water Sources and System

The North Fork of the Mokelumne River, located in the California Sierra Nevada Mountains, is the primary source for the CAWP system, the AWS, and the PG&E Tiger Creek Powerhouse system. Water supplied from rainfall and snowmelt is stored in Tiger Creek Afterbay and gravity feeds to the PG&E Tiger Creek Powerhouse Memcor Plant where it is treated and serves the PG&E Conference Center. Water from the Tiger Creek Afterbay is gravity fed via the Gravity Supply Line to the Buckhorn Water Treatment Plant where it is treated and ready for use by Agency customers in Pine Grove, Pine Acres, Sunset Heights, Fairway Pines, Jackson Pines, Pioneer, Gayla Manor, Ranch House Estates, Toma Lane, Sierra Highlands, Silver Lake Pines, Ridgeway Pines, Rabb Park, and Mace Meadows. Water from the Mokelumne River is also stored in Lake Tabeaud and conveyed by pipeline to the Tanner Water Treatment Plant where it is treated for use by the customers of Jackson, Sutter Creek, Amador City, Drytown, and Plymouth. The Ione Pipeline transports raw water from the Tanner Reservoir to the Ione Water Treatment Plant where it is treated for use by customers of Ione. The Agency's La Mel Heights customers get their water from a pair of wells located in the La Mel Heights Subdivision and Lake Camanche residents get their water from four wells located in the Lake Camanche area.

The Agency's five potable water distribution systems and a description of the areas they serve are presented below. Figure F-2 shows the location of these systems.

Figure F-2 AWA – Water Systems



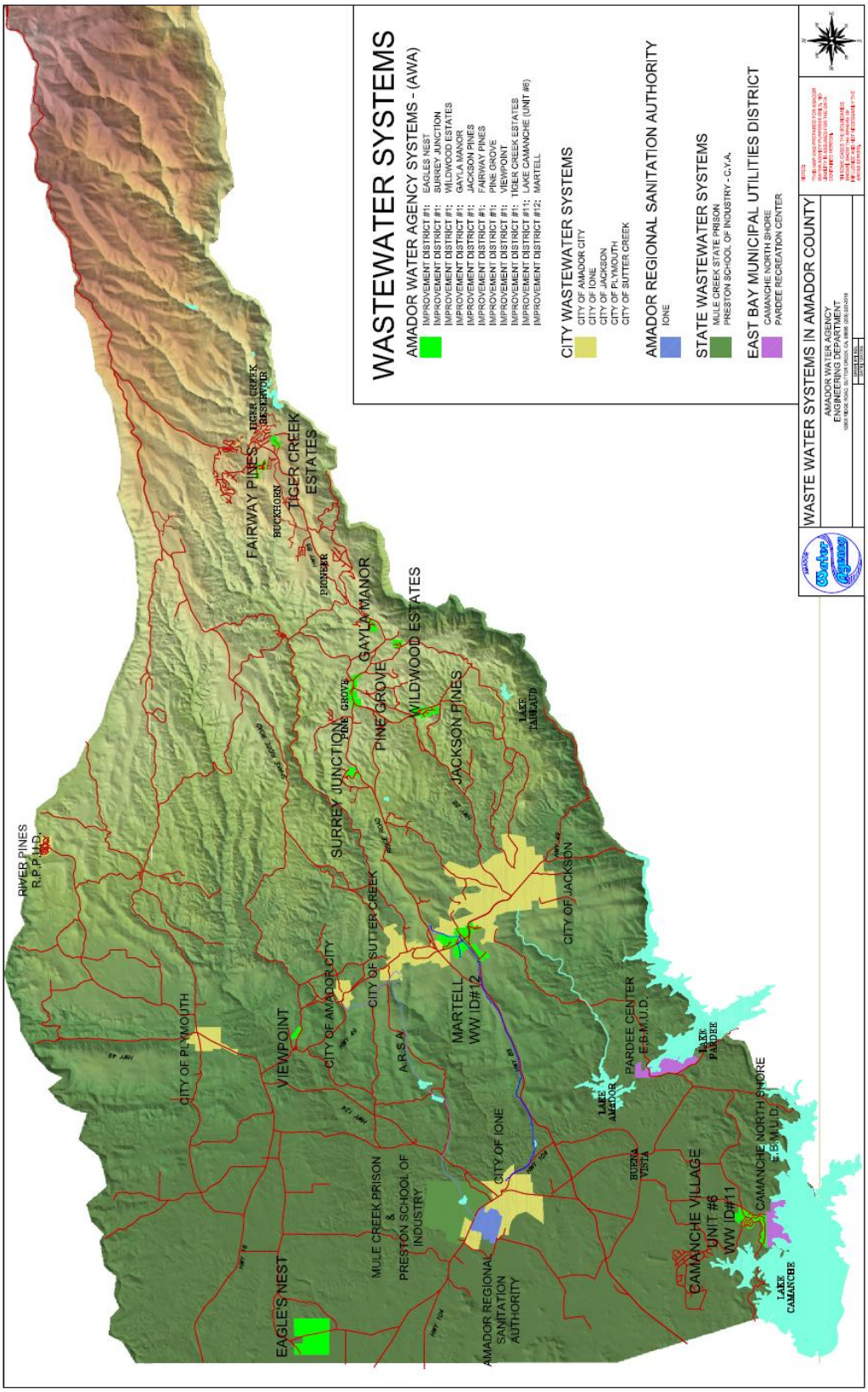
Source: 2020 AWA Urban Water Management Plan

- The Amador Water System (AWS) is made up of two distribution and WTP systems:
  - ✓ The AWS-Tanner system serves the town of Sutter Creek, Amador City, the unincorporated area of Martell, and the wholesale customers of the City of Jackson, City of Plymouth, and Drytown. The source of water for this system is Lake Tabeaud. From the lake, water is conveyed to the Tanner WTP by a gravity pipeline system. The Tanner WTP is located just outside of Sutter Creek by the Westover Field Amador County Airport. The Agency's headquarters are also located adjacent to the Tanner WTP site. In addition to supplying the Tanner WTP, water from this raw water supply line also supplies water for seasonal irrigation of vineyards and pastures.
  - ✓ The AWS-Ione system serves the City of Ione and the State-owned Mule Creek Correctional Facility. The source of water for this system is also Lake Tabeaud. Water is diverted from the Tanner facility and conveyed by a gravity pipeline system down to the Ione Reservoir and from there to the Ione WTP. There are multiple raw water customers served off the raw water gravity line from the Tanner WTP to the Ione WTP.
- The Central Amador Water Project (CAWP) system serves unincorporated developments in the upcountry (higher elevations in the more mountainous/forested areas) portion of the County. This system is the composite of several smaller systems being combined over the past decades. This system also provides water to the wholesale customers of First Mace Meadow Water Association Inc. (Mace Meadows) and Pine Grove Community Service District (Pine Grove). The source of water for this system is water from the Tiger Creek Regulating Reservoir which is conveyed to the Buckhorn WTP by a gravity pipeline system. There is a potential large raw water user on the CAWP gravity raw water pipeline system (golf course) that may use raw water for irrigation. The timing of the golf course making this connection and using raw water is unknown at this time and has the potential to not occur.
- The Lake Camanche Village (CAM) system serves a large development in the southwest corner of the County near the north shore of Lake Camanche. This system is also located in the unincorporated area of the County. The source of water for this system is four groundwater wells.
- The La Mel Heights (LaMel) system is the smallest of the systems owned by the Agency. This system serves a small development of about 55 homes in the unincorporated County area. The source of water for this system is two groundwater wells. This system is located slightly northwest of Volcano near the center of the County.

Wastewater System

The Amador Water Agency (AWA) wastewater systems are comprised of one WWTP near Lake Camanche along with an associated conventional collection system, one WWTP serving a portion of the Gayla Manor system, nine community septic and leach field systems (including both STEF and STEP systems), and one conventional conveyance-only system in Martell which collects and transports raw wastewater to the Sutter Creek WWTP.

Figure F-3 AWA – Wastewater Systems



Source: 2020 AWA Urban Water Management Plan

F.4 Risk Assessment

As defined by FEMA, risk is a combination of hazard, vulnerability, and exposure. "It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage."

The AWA risk assessment identifies and profiles relevant hazards and assesses the exposure of lives, property, infrastructure, and the environment to these hazards. The process allows for a better understanding of the Agency's potential risk and vulnerability to hazards and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

Building on the Community Profile above, a risk assessment was performed for the Agency. This includes the following sections:

- F.4.1 Assets Inventory and Growth and Development Trends
- F.4.2 Hazard Identification
- F.4.3 Hazard Profiles and Vulnerability to Specific Hazards

F.4.1. Assets Inventory and Growth and Development Trends

This section provides an inventory of the AWA's total assets potentially at risk to hazards and an overview of growth and development trends. This section is broken into two parts:

- **Asset Inventory** – The assets inventory identifies the AWA's total assets, including the people and populations; structures; critical facilities and infrastructure; community lifelines; natural, historic, and cultural resources; and economic assets and community activities of value. This data is not hazard specific, but is representative of total assets within the Agency, potentially at risk to identified hazards as discussed in Section F.4.3 Hazard Profiles and Vulnerability to Specific Hazards.
- **Growth and Development Trends** – A discussion of growth and development trends in the Agency, both current and future, is presented.

Assets Inventory

The Agency's asset inventory is detailed in the following sections:

- People and Populations
- Structures
- Critical Facilities and Infrastructure
- Community Lifelines
- Natural, Historic, and Cultural Resources
- Economic Assets and Community Activities of Value

A discussion of each of these assets follows and serves as the template for the asset discussion for each hazard in Section F.4.3.

People and Populations

The most important asset within any community are the people and populations that reside in the community. People and populations in the Agency include both Agency staff and workers as well as those populations located within Agency boundaries and served by the Agency. This section includes an inventory of past and current populations of the Agency and also discusses vulnerable populations and underserved communities as a subsection of people and populations located within the Agency and potentially at risk to hazards. Information from the Agency and other sources as detailed below form the basis of this discussion.

Historic Population Trends and Current Population

The most important asset within any community are the people and populations that reside in the Agency which include both Agency staff and workers and those populations served by AWA. The Amador Water Agency is one of the major employers in Amador County and currently employs a work force of about 47 staff who are challenged to meet the growing service demands of a diverse county of 568 square miles, ranging in elevation from 200 to 9,000 feet and including 5 cities and unincorporated Amador County.

Special and Vulnerable Populations

The population in the Amador Water Agency's jurisdiction is significantly people of White descent, with a much smaller percentage of Hispanic or Latino. Migrant workers, non-English speaking, elderly, disabled, and low-income populations are present in the Agency's jurisdiction. The Agency has implemented SB-998 which provides assistance to its special populations in regards to their water and wastewater bills. Special and vulnerable populations in the Agency include:

- Elderly – 27.2% of AWA Service Area population (US Census data). This population is severely impacted by wildfire, extreme heat, droughts, and flood hazards within AWA Service Areas due to mobility issues and those with medical hydration requirements.
- Disabled – 17% of AWA Service Area population (2023 California Report for County-Level Data: Prevalence, University of New Hampshire, Institute on Disability). Similar to the elderly population, this population is severely impacted by wildfire, extreme heat, droughts, and flood hazards within AWA Service Areas due to mobility issues and those with medical hydration requirements.
- Low Income – Roughly 80% of the population in the AWA Service Area is in a disadvantaged community (Department of Water Resources Mapping Tool, Disadvantaged Communities – Census Tracts (ACS:2016 – 2020)). Low-income residents may live in older or less stable housing with older plumbing systems more susceptible to damage from wildfires, extreme winds, storms, freezes, floods, or earthquakes. A significant portion of AWA water and wastewater infrastructure was installed over 40 years ago, with some infrastructure still in use being over 100 years old. (from the 2020 AWA Water Master Plan)

All of these populations reside in Moderate, High or Very High State Responsibility Area Fire Hazard Severity Zones (FHSZ), according to CAL FIRE maps. This includes all of the Tanner, Ione, Camanche, La Mel, CAWP, and Tiger Creek Water Systems. Additionally, a large percentage of AWA customers live in Wildland Urban Interface intermix and interface zones, according to the U.S. Forest Service.

Structures and Critical Facilities

This section considers the AWA's assets at risk, with a focus on key Agency assets such as critical facilities, infrastructure, and other Agency assets and their values. With respect to Agency assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

> ***Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.***

Table F-3 lists critical facilities and other Agency assets identified by the Agency Planning Team as important to protect in the event of a disaster. AWA's physical assets, valued at over $541 million, consist of the buildings and infrastructure to support the Agency's operations.

Table F-3 AWA Critical Facilities, Infrastructure, and Other Agency Assets

Service Area	Facility Type	Facility Name	Replacement Value	Which Hazards Pose Risk
AWS/Ione	Pump Station	Prison Station & backwash tanks	$1,615,906	Wildfires, Climate Change, Severe Weather, High Winds
AWS/Ione	WTP	Ione WTP	$17,778,741	Wildfires, Climate Change, Severe Weather, High Winds, Drought, Water Shortage
AWS/ Ione	Tank	Prison Tank, welded steel, Telemetry	$2,532,153	Wildfires, Climate Change, Severe Weather, High Winds
AWS/ Ione	Tank	Wildflower Tank	$2,532,153	Wildfires, Climate Change, Severe Weather, High Winds
AWS/ Ione	Transmission Line	Ione Transmission Line - ITL	$24,050,388	Wildfires, Climate Change, Landslide, Seismic, Debris Flow
AWS/ Ione	Distribution Pipelines	AWS-Ione Distribution Pipelines	$73,920,000	Wildfires, Climate Change, Severe Weather, Drought, Water Shortage, Landslide
AWS/Sutter Creek	AWA	Tanner WTP Building, Trailer & Shop	$25,722,485	Wildfires, Climate Change, Severe Weather, High Winds
AWS/ Sutter Creek	Backwash Facility	Backwash Recycling System & Controls	$5,222,789	Wildfires, Climate Change, Severe Weather, High Winds
AWS/Sutter Creek	Pump Station	Ridge Pump Station	$368,122	Wildfires, Climate Change, Severe Weather, High Winds

Service Area	Facility Type	Facility Name	Replacement Value	Which Hazards Pose Risk
AWS/Sutter Creek	Pump Station	Canal Bypass Pump Station	$562,909	Wildfires, Climate Change, Severe Weather, High Winds
AWS/Sutter Creek	Pump Station	Trent Pump Station	$442,085	Wildfires, Climate Change, Severe Weather, High Winds
AWS/Sutter Creek	Pump Station	Airport Pump Station	$381,563	Wildfires, Climate Change, Severe Weather, High Winds
AWS/Sutter Creek	Supply Pump	Lake Tabeaud Canal Supply	$167,780	Wildfires, Climate Change, Severe Weather, High Winds
AWS/Sutter Creek	Canal	Flumes	$385,808	Wildfires, Climate Change, Severe Weather, High Winds, Drought, Water Shortage, Landslide/Debris
AWS/Sutter Creek	Tank	Trent Ridge Tank, bolted steel	$306,628	Wildfires, Climate Change, Severe Weather, High Winds
AWS/Sutter Creek	WTP	Tanner WTP Yard	$1,330,874	Wildfires, Climate Change, Severe Weather, High Winds
AWS/Sutter Creek	WTP	Tanner Reservoir	$340,658	Wildfires, Climate Change, Severe Weather, High Winds, Drought, Water Shortage
AWS/Sutter Creek	Transmission Line	Amador Transmission Line - ATL	$24,050,388	Wildfires, Climate Change, Severe Weather, Drought, Water Shortage, Landslide/Debris Flow
AWS/Sutter Creek	Transmission Line	Plymouth Pipeline	$14,366,241	Wildfires, Climate Change, Severe Weather, Drought, Water Shortage, Landslide/Debris Flow
AWS/Sutter Creek	Building & Controls	Amador Transmission Line - ATL	$401,422	Wildfires, Climate Change, Severe Weather, High Winds
AWS/ Sutter Creek	Hydroelectric Plant	Tanner Hydro	$2,333,991	Wildfires, Climate Change, Severe Weather, High Winds
AWS/Sutter Creek	Building	Administration Building	$2,538,404	Wildfires, Climate Change, Severe Weather, High Winds

Service Area	Facility Type	Facility Name	Replacement Value	Which Hazards Pose Risk
AWS/Sutter Creek	Building	Storage Building	$46,920	Wildfires, Climate Change, Severe Weather, High Winds
AWS/ Sutter Creek	Plant	Cummings fixed generator	$113,571	Wildfires, Climate Change, Severe Weather, High Winds
AWS/ Sutter Creek	Distribution Pipelines	AWS-Tanner Distribution Pipelines	$102,432,000	Wildfires, Climate Change, Severe Weather, Drought, Water Shortage, Landslide
Camanche	Lift Station	Lift Station A	$468,079	Wildfires, Climate Change, Severe Weather, Flooding, High Winds
Camanche	Lift Station	Lift Station B	$468,079	Wildfires, Climate Change, Severe Weather, Flooding, High Winds
Camanche	Lift Station	Lift Station C	$672,663	Wildfires, Climate Change, Severe Weather, Flooding, High Winds
Camanche	Lift Station	Lift Station D	$722,046	Wildfires, Climate Change, Severe Weather, Flooding, High Winds
Camanche	Pump	Well #10	$391,467	Wildfires, Climate Change, Severe Weather, High Winds
Camanche	Tank	12A, 12b Wood Storage Tank	$1,837,716	Wildfires, Climate Change, Severe Weather, High Winds
Camanche	Tank	#6 Storage Tank, wood	$312,110	Wildfires, Climate Change, Severe Weather, High Winds
Camanche	Tank	Well #9 Storage, wood	$467,939	Wildfires, Climate Change, Severe Weather, High Winds
Camanche	Tank	Tank #10, redwood	$391,467	Wildfires, Climate Change, Severe Weather, High Winds
Camanche	Tank #9	Telemetry	$17,179	Wildfires, Climate Change, Severe Weather, High Winds
Camanche	Tank	Tank #8, redwood	$126,465	Wildfires, Climate Change, Severe Weather, High Winds
Camanche	Tank/Booster Pump	Tank 8, bolted steel	$332,653	Wildfires, Climate Change, Severe Weather, High Winds

Service Area	Facility Type	Facility Name	Replacement Value	Which Hazards Pose Risk
Camanche	Warehouse	Camanche Warehouse	$1,230,578	Wildfires, Climate Change, Severe Weather, High Winds
Camanche	Well	Well #12	$1,682,890	Wildfires, Climate Change, Severe Weather, High Winds, Drought, Water Shortage
Camanche	Well #12	CAT fixed generator	$198,148	Wildfires, Climate Change, Severe Weather, High Winds
Camanche	Well	Well #6	$338,162	Wildfires, Climate Change, Severe Weather, High Winds, Drought, Water Shortage
Camanche	Well	Well #14	$188,722	Wildfires, Climate Change, Severe Weather, High Winds, Drought, Water Shortage
Camanche	Well	Well #9	$90,790	Wildfires, Climate Change, Severe Weather, High Winds, Drought, Water Shortage
Camanche	WWTP	Camanche WWTP	$17,294,902	Wildfires, Climate Change, Severe Weather, High Winds
Camanche	Well #9 Generator	Cummings Fixed	$87,453	Wildfires, Climate Change, Severe Weather, High Winds
Camanche	Distribution Pipelines	AWS-Camanche Distribution Pipelines	$29,568,000	Wildfires, Climate Change, Severe Weather, Drought, Water Shortage, Landslide
CAWP system	Buckhorn WTP	Buckhorn WTP	$10,451,901	Wildfires, Climate Change, Severe Weather, High Winds, Drought, Water Shortage, Landslide/Debris Flow
CAWP system	Transmission Line	Gravity Supply Line - GSL	$13,721,347	Wildfires, Climate Change, Severe Weather, Drought, Water Shortage, Landslide/Debris Flow
CAWP System	Backwash	Backwash Recycling	$3,061,318	Wildfires, Climate Change, Severe Weather, High Winds
CAWP system	Storage Shed	Storage Shed	$46,920	Wildfires, Climate Change, Severe Weather, High Winds

Service Area	Facility Type	Facility Name	Replacement Value	Which Hazards Pose Risk
CAWP system	Tank	Madrone Tank, bolted steel	$181,714	Wildfires, Climate Change, Severe Weather, High Winds
CAWP system	Tank	Frank's Tank, welded steel	$166,012	Wildfires, Climate Change, Severe Weather, High Winds
CAWP system	Tank	CSA 2 Tank 1, wood	$110,715	Wildfires, Climate Change, Severe Weather, High Winds
CAWP system	Building	GSL Regulator Building – Tiger Creek	$778,651	Wildfires, Climate Change, Severe Weather, High Winds
CAWP system	Tank	Jackson Pines, bolted steel, telemetry	$351,212	Wildfires, Climate Change, Severe Weather, High Winds
CAWP system	Tank	Mace Meadows #5 Tank, bolted steel, telemetry	$300,150	Wildfires, Climate Change, Severe Weather, High Winds
CAWP system	Tank	Sunset Heights Tank, welded steel	$156,965	Wildfires, Climate Change, Severe Weather, High Winds
CAWP system	Tank	Mace Meadows #3, bolted steel, Telemetry	$356,105	Wildfires, Climate Change, Severe Weather, High Winds
CAWP system	Tank	Mace Meadows #4, bolted steel, Telemetry	$356,105	Wildfires, Climate Change, Severe Weather, High Winds
CAWP system	Tank	Alpine Tank #2, welded steel	$447,383	Wildfires, Climate Change, Severe Weather, High Winds
CAWP system	Tank	Tank A Storage Tank, welded steel	$2,672,265	Wildfires, Climate Change, Severe Weather, High Winds
CAWP system	Tank	Tank A Storage Tank, welded steel	$2,672,265	Wildfires, Climate Change, Severe Weather, High Winds
CAWP System	Storage Shed	Building & Equipment	$51,858	Wildfires, Climate Change, Severe Weather, High Winds
CAWP System	Plant	CAT fixed generator	$303,970	Wildfires, Climate Change, Severe Weather, High Winds
CAWP System	Tiger Creek Regulator	Generac fixed generator	$61,135	Wildfires, Climate Change, Severe Weather, High Winds

Service Area	Facility Type	Facility Name	Replacement Value	Which Hazards Pose Risk
CAWP System	Distribution Pipelines	CAWP Distribution Pipelines	$126,720,000	Wildfires, Climate Change, Severe Weather, Drought, Water Shortage, Landslide
Eagles Nest	Chlorine Station	Eagles Nest Chlorine Station	$44,345	Wildfires, Climate Change, Severe Weather, High Winds
Gayla Manor	WWTP	Gayla Manor WWTP	$331,213	Wildfires, Climate Change, Severe Weather, High Winds, Seismic, Dam Failure
La Mel Heights	Pump Station	La Mel Heights Pump Station & Generator	$917,915	Wildfires, Climate Change, Severe Weather, High Winds, Drought
La Mel Heights	Tank	La Mel Heights Tank, bolted steel	$267,403	Wildfires, Climate Change, Severe Weather, High Winds
La Mel	Distribution Pipelines	La Mel Distribution Pipelines	$2,112,000	Wildfires, Climate Change, Severe Weather, Drought, Water Shortage, Landslide
Martell	Lift Station	Martell Lift Stations	$1,723,973	Wildfires, Climate Change, Severe Weather, Flooding, High Winds
Martell	Lift Station	Wal-Mart Lift Station	$339,708	Wildfires, Climate Change, Severe Weather, Flooding, High Winds
Martell	Lift Station	Kmart Lift Station	$500,044	Wildfires, Climate Change, Severe Weather, Flooding, High Winds
Martell	Lift Station	Lift Station 1	$741,878	Wildfires, Climate Change, Severe Weather, Flooding, High Winds
Martell	Lift Station	Lift Station 2	$1,008,274	Wildfires, Climate Change, Severe Weather, Flooding, High Winds
Martell	Lift Station	Ford fixed generator	$114,106	Wildfires, Climate Change, Severe Weather, Flooding, High Winds
Martell	Lift Station	Sierra West Lift Station	$1,034,497	Wildfires, Climate Change, Severe Weather, Flooding, High Winds
Martell	Lift Station	General fixed generator	$87,610	Wildfires, Climate Change, Severe Weather, Flooding, High Winds

Service Area	Facility Type	Facility Name	Replacement Value	Which Hazards Pose Risk
Martell	Lift Station	Amador Central List Station	$909,901	Wildfires, Climate Change, Severe Weather, Flooding, High Winds
Martell	Lift Station	General fixed generator	$103,671	Wildfires, Climate Change, Severe Weather, Flooding, High Winds
Mt Crossman	Pump Station	Mt. Crossman Pump Station	$816,883	Wildfires, Climate Change, Severe Weather, High Winds
Mt Crossman	Pump Station	CAT fixed generator	$69,933	Wildfires, Climate Change, Severe Weather, High Winds
Pine Acres	Pump Station	Pine Acres Pump Station	$306,773	Wildfires, Climate Change, Severe Weather , High Winds
Pine Acres	Tank	Pine Acres tank, welded steel	$665,888	Wildfires, Climate Change, Severe Weather , High Winds
Pine Acres	Tank	Pine Acres tank, welded steel	$828,402	Wildfires, Climate Change, Severe Weather, High Winds
Ranch House	Pump Station	Ranch House Pump Station	$67,206	Wildfires, Climate Change, Severe Weather, High Winds
Ranch House	Tank	Ranch House Tank, bolted steel	$676,386	Wildfires, Climate Change, Severe Weather, High Winds
Raven Rd	Vault	Raven Rd Vault Pit A & B Tank Site	$168,719	Wildfires, Climate Change, Severe Weather, High Winds
Ridge Rd	Lift Station	Ridge Lift Station	$270,555	Wildfires, Climate Change, Severe Weather, Flooding, High Winds
Ridgeway Pines	Tank	Ridgeway Pines Tank, Welded Steel	$464,245	Wildfires, Climate Change, Severe Weather, High Winds
Ridgeway Pines	Tank	Ridgeway Pines Tank, Bolted Steel	$267,403	Wildfires, Climate Change, Severe Weather, High Winds
Rocky Lane	Pressure Regulating Station	Rocky Lane Pressure Sta.	$47,872	Wildfires, Climate Change, Severe Weather, High Winds
Silver Lake Pines	Pump Station	SLP Pump Station	$1,691,064	Wildfires, Climate Change, Severe Weather, Flooding, High Winds

Service Area	Facility Type	Facility Name	Replacement Value	Which Hazards Pose Risk
Tiger Creek	Pump Station	Tiger Creek Pump Station	$1,252,066	Wildfires, Climate Change, Severe Weather, Flooding, High Winds
		TOTAL	**$541,629,408**	

Source: AWA

Community Lifelines

Assessing the vulnerability of the AWA to natural hazards and disasters also involves reviewing and inventorying the community lifelines in place that could be affected. It is important to include these items in hazard discussions as the continuous operation of critical government and business functions is essential to human health and safety, property protection, and economic security. The importance of community lifelines is discussed below:

- Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function.
- FEMA has developed a method for objectives-based response that prioritizes the rapid stabilization of Community Lifelines after a disaster.
- The integrated network of assets, services, and capabilities that provide lifeline services are used day-to-day to support the recurring needs of the community and enable all other aspects of society to function.
- When disrupted, decisive intervention (e.g., rapid re-establishment or employment of contingency response solutions) is required to stabilize the incident.

Community lifelines, as defined by FEMA, include the following:

- **Safety and Security** – Law Enforcement/Security, Fire Service, Search and Rescue, Government Service, Community Safety
- **Food, Hydration, Shelter** – Food, Water, Shelter, Agriculture
- **Health and Medical –** Medical Care, Public Health, Patient Movement, Medical Supply Chain, Fatality Management
- **Energy –** Power Grid, Fuel
- **Communications** – Infrastructure, Responder Communications, Alerts Warnings and Messages, Finance, 911 and Dispatch
- **Transportation** – Highway/Roadway/Motor Vehicle, Mass Transit, Railway, Aviation, Maritime
- **Hazardous Material –** Facilities, HAZMAT, Pollutants, Contaminants
- **Water Systems** – Potable Water Infrastructure, Wastewater Management

It should be noted that these community lifelines are all in place and functional as part of regular government operations in the Amador County Planning Area serving as a partnership between the cities, local special districts and agencies, and Amador County. Due to its more rural nature, there is an interplay in community lifelines between all jurisdictions in the County. Most all of the Agency's community lifelines overlap with the County Planning Area's. It should also be noted that these lifelines collectively include many of the critical facilities and infrastructure assets inventoried for this LHMP, including those

assets owned by the Agency. As such, specific information on these community lifelines in the Agency and how they may be affected by a hazard event or disaster are discussed collectively for all jurisdictions in the Base Plan.

Natural, Historic, and Cultural Resources

Assessing the vulnerability of the AWA to natural hazards and disasters also involves inventorying the natural, historic, and cultural assets of the area. This step is important for the following reasons:

- Environmental and natural resources add to a community's identity and quality of life. They also help the local economy through agriculture, tourism, and recreation. They support ecosystem services, such as clean air and water.
- Conserving the environment may help people mitigate risk. It can also protect sensitive habitats, develop parks and trails, and build the economy.
- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- If these resources are impacted by a disaster, knowing so ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts are higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.

Natural Resources

AWA has a variety of natural resources of value to the Agency. These natural resources parallels that of Amador County Planning Area as a whole. Information can be found in Section 4.2.1 of the Base Plan and the jurisdictional annexes for the cities.

Historic and Cultural Resources

AWA has a variety of historic and cultural resources of value to the Agency. These historic and cultural resources parallels that of Amador County Planning Area as a whole. Information can be found in Section 4.2.1 of the Base Plan.

Economic Assets and Community Activities of Value

Assessing the vulnerability of the AWA to natural hazards and disasters also involves inventorying the economic assets and community activities of value in the Agency.

Economic Assets

After a disaster, economic resiliency is one of the major drivers of a speedy recovery. Each community has specific economic drivers. Economic assets for the County were discussed in Section 4.2.1 of the Base Plan and are assumed to be the same or similar for the Agency. In addition to these, the Agency noted specific economic assets in the Agency. This includes:

- All Customers and Businesses – All AWA water, wastewater, and wholesale residential, commercial and industrial customers within AWA Service Areas are the primary economic assets for AWA.
- AWA Water Treatment Plants – All AWA water treatment plants (WTPs) are primary economic drivers for the Agency. This includes the Buckhorn, Tanner, Ione, La Mel and Camanche water treatment plants. This includes all transmission, treatment, distribution, and electrical and communication equipment used to properly operate the WTPs.
- Raw Supply Water Pipelines – Four AWA transmission pipelines supplying raw (untreated) water to the Buckhorn, Tanner, and Ione WTPs, respectively:
  - ✓ The Gravity Supply Line (GSL)
  - ✓ The Amador Water System Transmission Pipeline (AWSTP)
  - ✓ The Upper Ione Transmission Line (ITL)
  - ✓ The Lower Ione Transmission Line
- Tiger Creek Regulator (PG&E owned and operated)– single point of water intake for the entire AWA Central Amador Water Project (CAWP) water system for all customers from Pioneer to Sunset Heights and Jackson Pines, including Pine Grove.
- Lake Tabeaud (PG&E owned and operated)– single point of water intake for the entire AWA Tanner and Ione water systems for all customers in Sutter Creek, Martell, Jackson, Plymouth, Drytown, Amador City and Ione.

Note: This inventory of economic assets is only included in this overall asset inventory for the Agency. To limit redundancy, it is not discussed further in the hazard profiles and vulnerability assessments in Section F.4.3 below. However, depending on the type, location, magnitude and extent of future hazard events and disasters, the Agency's economic assets may be vulnerable.

Community Activities of Value

Inventorying economic assets in the Agency and their vulnerability to natural hazards and disasters also involves inventorying activities that have value to the community. This includes activities that are important to a community, like long-standing traditions such as a festival or fair or other activities that bring money into the communities such as sports tournaments and other recreational activities. Community Activities of Value for the County were discussed in Section 4.2.1 of the Base Plan and are assumed to be the same or similar for the Agency.

Note: This inventory of community activities of value only occurs in this overall asset inventory for the Agency. To limit redundancy, it is not discussed further in the hazard profiles and vulnerability assessments in Section F.4.3 below. However, depending on the type, location, magnitude and extent of future hazard events and disasters, the Agency's community activities of value may be vulnerable.

Growth and Development Trends

As part of the planning process, the Agency looked at changes in growth and development, both current and future, and examined these changes in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability over time. In addition to evaluating population growth and expansion in the AWA Service Area, this inventory section details future AWA development plans and projects that are likely to occur over the next five years covered by this 2025 LHMP. For the Agency, this generally includes the following:

- Plans for expansion or building out of the Agency's Service Area, including new service hookups, and other Agency functions related to where the Agency will be expanding services. This is discussed in the Population Trends and Projections: AWA Service Area section below.
- Construction/development projects related to adding new Agency facilities, infrastructure, land acquisition, etc. This is discussed in the Future Development section below.

Population Trends and Projections: AWA Service Area

The Agency tracks population trends in its water and wastewater Service Area as it plans for future expansions of its Service Area. Current population and Service Area expansion projections from the most recent AWA Water Master Plan are shown in Figure F-4, while the current population and Service Area expansion projections from the most recent AWA Wastewater Master Plan are shown in Figure F-5. This data includes information on Equivalent Dwelling Unit requirements to determine future wastewater service expansion needs of the Agency.

Figure F-4 AWA – Water Growth Projections by City and Unincorporated Area

City / Area	Water System	Name	Type	Acres	EDUs[3]	People
Amador City[1]	AWS - Tanner	*Amador City Infill*	Residential	-	2	4
Jackson[1]		*City of Jackson*	Wholesale		541	1,271
Plymouth[1]		*City of Plymouth*	Wholesale		435	1,022
Unincorporated County		*Along Ridge Road*	Residential	-	30	70
Sutter Creek		*Valley View Way and Bowers Road*	Residential	28	163	383
		Near Walgreens	Commercial	9	-	-
		Martell Commercial	Commercial	435	-	-
				Total	**1,171**	**2,751**
Ione	AWS - Ione	*Castle Park MHP (Golden Gate Estates)*	Residential	-	5	12
		Eagles Nest Pipeline	Residential	-	7	16
		Edgebrook Area	Residential	-	5	12
		Wildflower Unit 1	Residential	8.3	47	110
		Wildflower Unit 5	Residential	13	14	33
		Castle Oaks Village 10	Residential	19	76	178
		Castle Oaks Town Center	Commercial	15	116	0
		Waterman Ranch, Amador Ranch, Red Barn Investors	Residential	108	375	881
		Ringer Ranch & CFD No. 1 Remainder	Residential	132	592	1,391
		US Mine	Residential	41	120	282
		Castle Inn	Residential	0.2	6	14
		Gold Village 1 and 2	Residential	23	117	275
		401 Waterman Apartments/Castle Ridge	Residential	8.7	255	599
				Total	**1,735**	**3,803**
Unincorporated County	La Mel	*La Mel Infill*[2]	Residential	-	4	9
	CAM	*CAM Infill*[2]	Residential	-	77	182
	CAWP	*Pine Grove Bluffs*	Residential	-	38	89
		Peterson Ranch	Residential	-	17	40
		Pine Acres North	Residential	-	98	230
		CAWP Infill[2]	Residential	-	131	309
				Total	**365**	**859**
				Total Growth Served by AWA	**4,249**	**9,711**

1) No specific growth areas developed. Growth assigned to wholesale delivery point or spread across existing junctions.

2) Infill spread across existing model junctions.

3) EDUs = equivalent dwelling units.

Source: 2025 AWA Water Master Plan

Figure F-5 AWA – Wastewater Flow Growth Projections for Equivalent Dwelling Units (EDUs)

System	No. of WW EDUs				Average Daily Flow Projections, ADF (gpd)				Peak Hour Flow Projections, PHF (gpm)			
	2021 Base Yr	2031 10-Yr	2041 20-Yr	20-Yr Change	2021 Base Yr	2031 10-Yr	2041 20-Yr	20-Yr Change	2021 Base Yr	2031 10-Yr	2041 20-Yr	20-Yr Change
Eagles Nest	9	9	9	0	1,590	1,590	1,590	0	4.4	4.4	4.4	0.0
Surrey Junction	8	8	8	0	1,240	1,240	1,240	0	3.4	3.4	3.4	0.0
Wildwood Estates	34	35	36	2	2,570	2,770	2,970	400	7.1	7.7	8.3	1.2
Gayla Manor[1]	80	80	80	0	7,620	7,620	7,620	0	21.2	21.2	21.2	0.0
Viewpoint	4	4	4	0	530	530	530	0	1.5	1.5	1.5	0.0
Fairway Pines/Mace Meadows	66	69	69	3	10,260	10,860	10,860	600	28.5	30.2	30.2	1.7
Jackson Pines[1]	76	79	80	4	9,060	9,660	9,860	800	25.2	26.8	27.4	2.2
Tiger Creek Estates	5	5	5	0	200	200	200	0	0.6	0.6	0.6	0.0
Pine Grove												
Residential	14	15	15	1	2,800	3,000	3,000	200	7.8	8.3	8.3	0.5
Commercial/Non-Res.	70	85	104	34	7,730	10,730	14,530	6,800	21.5	29.8	40.4	18.9
Subtotal	84	100	119	35	10,530	13,730	17,530	7,000	29.3	38.1	48.7	19.4
Camanche												
Residential	338	338	338	0	46,080	46,080	46,080	0	128.0	128.0	128.0	0.0
Commercial/Non-Res.	9	9	9	0	0	0	0	0	0.0	0.0	0.0	0.0
Subtotal	347	347	347	0	46,080	46,080	46,080	0	128.0	128.0	128.0	0.0
Martell												
Residential	51	53	53	2	10,200	10,600	10,600	400	28.3	29.4	29.4	1.1
Commercial/Non-Res.	561	684	834	273	56,220	80,820	110,820	54,600	156.2	224.5	307.8	151.6
Subtotal	612	737	887	275	66,420	91,420	121,420	55,000	184.5	253.9	337.2	152.7
Total Base Projections	**1,325**	**1,473**	**1,644**	**319**	**156,100**	**185,700**	**219,900**	**63,800**	**433.7**	**515.8**	**610.9**	**177.2**
Potential Additional Growth												
Martell: Wicklow Way (Low)	0	228	685	685	0	45,600	137,000	137,000	0.0	126.7	380.6	380.6
Martell: Wicklow Way (High)	0	320	960	960	0	64,000	192,000	192,000	0.0	177.8	533.3	533.3
Total w/Additional Growth (Low)	**1,325**	**1,701**	**2,329**	**1,004**	**156,100**	**231,300**	**356,900**	**200,800**	**433.7**	**642.5**	**991.5**	**557.8**
Total w/Additional Growth (High)	**1,325**	**1,793**	**2,604**	**1,279**	**156,100**	**249,700**	**411,900**	**255,800**	**433.7**	**693.6**	**1,144.2**	**710.5**

[1] Gayla Manor is currently built-out at 80 EDUs; assume no additional growth. Jackson Pines is projected to reach buildout of 80 EDUs in Year 2035; assumed no additional growth beyond buildout.

Source: 2021 AWA Wastewater Master Plan

Development since 2020 Plan

The Agency has seen development in Service Area since 2020. Changes in numbers of service connections can be seen in Table F-4. AWA noted that these new service connections were located in identified hazard areas throughout the Amador County Planning Area, as shown on Table F-5.

Table F-4 Total Development Since 2020 (# of Service Connections)

Account Types	2020	2021	2022	2023	2024
Residential	7082	7305	7333	7362	7385
Commercial	439	425	422	424	424
Industrial	0	1	1	0	0
Agriculture/Landscape	1	24	24	24	24
Wholesale/Other	8	8	8	8	8
Total	**7,530**	**7,763**	**7,788**	**7,818**	**7,841**

Source: Amador Water Agency

*Table F-5 Development in Hazard Areas since 2020 (Service Connections)**

Property Use	Moderate or Higher Fire Hazard Severity Zones	1% Annual Chance Flood	Landslide Potential Areas	Drought and Water Shortage
Residential	X	X	X	X
Commercial	X	X	X	X
Industrial	X	X	X	X
Landscape	X	X	X	X
Wholesale/Other	X	X	X	X
Total	–	–	–	–

Source: Amador Water Agency

*the X in the table indicate that there was development in those areas. AWA has no way to tally the number of service connections in each zone due to data limitations.

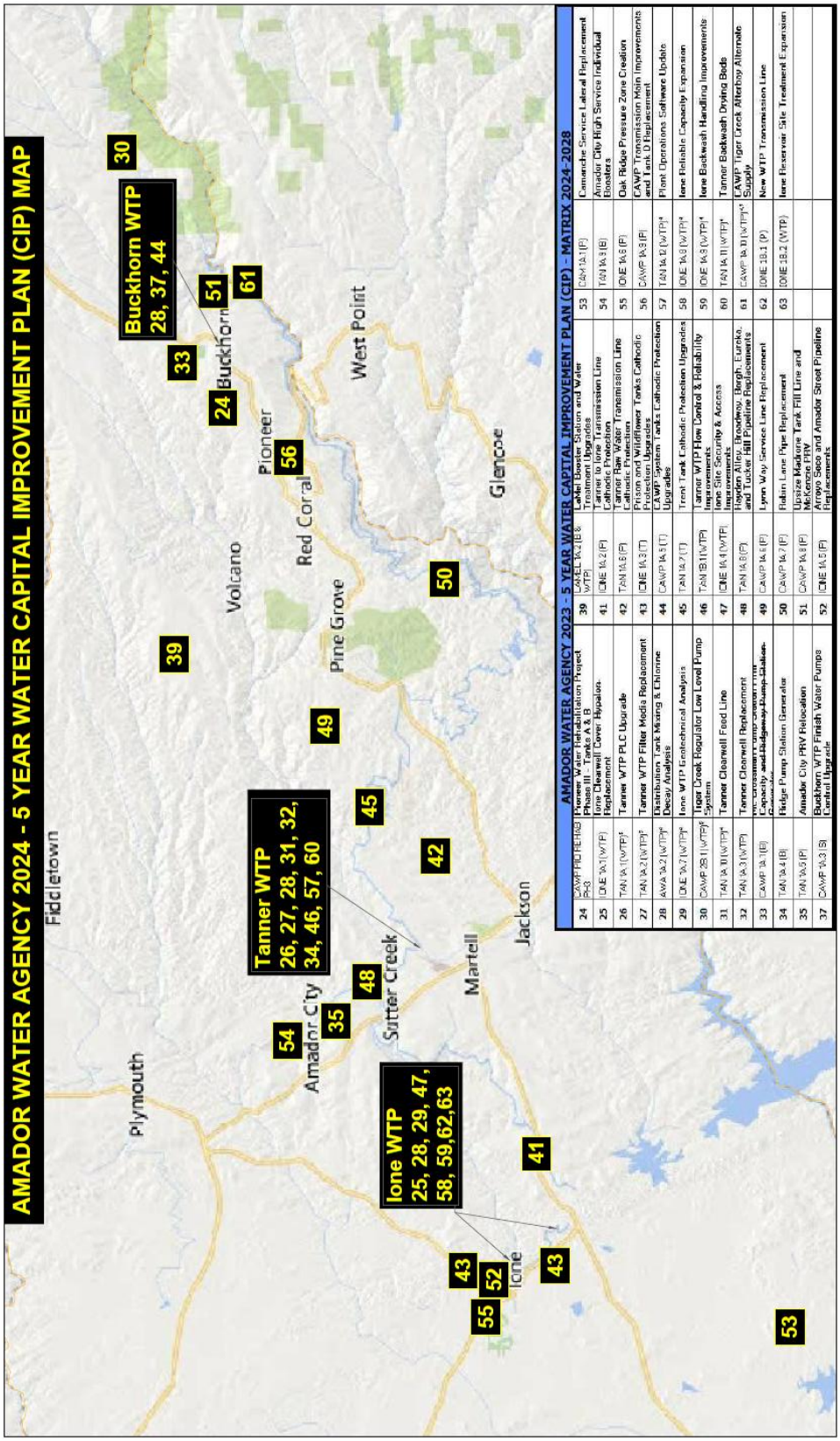
Future Development

It is important to review future development plans for the Agency. Depending on the type of asset, future development should be sited in areas that are away from known hazard risks. If this is not possible, mitigation should be done to ensure that future development is protected against future hazards.

Water Treatment Future Development: Assets and Projects

The AWA noted their 2024 Capital Improvements Program has numerous projects planned for the next five years. Projects include development and acquisition of new assets, facility expansions and improvements, as well as a variety of water projects to maximize AWA operations. These are shown on Figure F-6 and detailed in Table F-6 for water service updates and upgrades. These areas were not supplied in GIS, as such no tabular analysis by hazard was performed.

Figure F-6 AWA Water Future Growth - Assets and Projects



AMADOR WATER AGENCY 2023 - 5 YEAR WATER CAPITAL IMPROVEMENT PLAN (CIP) - MATRIX 2024-2028									
24	CAWP HIGHLIGHTS P-3	Pioneer Water Rehabilitation Project Phase III - Tanks A & B	39	CAWP 1A.4 (E & WTP)	Label Booster Station and Water Treatment Upgrades	53	CAWP 1A.1 (P)	Camanche Service Lateral Replacement
25	IONE 1A.1 (WTP)	Ione Clearwell Cover Hypalon Replacement	41	IONE 1A.2 (P)	Tanner to Ione Transmission Line Parallel Pipeline	54	TAN 1A.3 (E)	Amador City High Service Individual Boosters
26	TAN 1A.1 (WTP)[1]	Tanner WTP PLC Upgrade	42	TAN 1A.6 (P)	Tanner Raw Water Transmission Line Cathodic Protection	55	IONE 1A.6 (P)	Oak Ridge Pressure Zone Creation
27	TAN 1A.2 (WTP)[2]	Tanner WTP Filter Media Replacement	43	IONE 1A.3 (T)	Prison and Wildflower Tanks Cathodic Protection Upgrades	56	CAWP 1A.3 (P)	CAWP Transmission Main Improvements and Tank D Replacement
28	AWA 3A.2 (WTP)[3]	Distribution Tank Mixing & Chlorine Decay Analysis	44	CAWP 1A.5 (T)	CAWP System Tanks Cathodic Protection Upgrades	57	TAN 1A.12 (WTP)[4]	Plant Operations Software Update
29	IONE 3A.2 (WTP)[3]	Ione WTP Geotechnical Analysis	45	TAN 1A.7 (T)	Trend Tank Cathodic Protection Upgrades	58	IONE 1A.3 (WTP)[4]	Ione Reliable Capacity Expansion
30	CAWP 2B.1 (WTP)[3]	Tiger Creek Regulator Low Level Pump System	46	TAN 1B.1 (WTP)	Tanner WTP Flow Control & Reliability Improvements	59	IONE 1A.3 (WTP)[4]	Ione Backwash Handling Improvements
31	TAN 1A.10 (WTP)[4]	Tanner Clearwell Feed Line	47	IONE 1A.4 (WTP)	Ione Site Security & Access Improvements	60	TAN 1A.11 (WTP)[4]	Tanner Backwash Drying Beds
32	TAN 1A.3 (WTP)	Tanner Clearwell Replacement	48	TAN 1A.8 (P)	Hayden Alley, Broadway, Bergh, Eureka, and Tucker Hill Pipeline Replacements	61	CAWP 1A.11 (WTP)[4]	CAWP Tiger Creek Afterbay Alternate Supply
33	CAWP 3A.1 (E)	Buckhorn Pump Station Capacity and Efficiency Improvements	49	CAWP 1A.6 (P)	Lyon Way Service Line Replacement	62	IONE 3B.1 (P)	New WTP Transmission Line
34	TAN 3A.4 (E)	Ridge Pump Station Generator	50	CAWP 1A.7 (P)	Robin Lane Pipe Replacement	63	IONE 3B.2 (WTP)	Ione Reservoir Site Treatment Expansion
35	TAN 3A.5 (P)	Amador City PRV Relocation	51	CAWP 1A.8 (P)	Upsize Madrone Tank Fill Line and McKenzie PRV			
37	CAWP 1A.3 (S)	Buckhorn WTP Finish Water Pumps Control Upgrade	52	IONE 1A.5 (P)	Arroyo Seco and Amador Street Pipeline Replacements			

Source: 2024 AWA 5-Year Water Capital Improvement Plan

Table F-6 AWA Water Future Growth - Assets and Projects

Agency Ranking	Project ID#1	Project Name
Priority 1A Improvements (2021-2025)		
1	AWA 1A.1 (WTP)	Tanner and Ione Treatment Plant Capacity Study
2	IONE 1A.1 (WTP)	Ione Clearwell Cover Hypalon Replacement
3	TAN 1A.1 (WTP)5	Tanner WTP PLC Upgrade
4	TAN 1A.2 (WTP)5	Tanner WTP Filter Media Replacement
5	AWA 1A.2 (WTP)	Distribution Tank Mixing & Chlorine Decay Analysis
6	IONE 1A.7 (WTP)	Ione WTP Geotechnical Analysis
7	TAN 1A.10 (WTP)	Tanner Clearwell Feed Line (Not Required if TAN 1A.3 is Completed)
8	TAN 1A.3 (WTP)	Tanner Clearwell Replacement
9	CAWP 1A.1 (B)	Mt. Crossman Pump Station Firm Capacity and Ridgeway Pump Station Generator
10	TAN 1A.4 (B)	Ridge Pump Station Generator
11	TAN 1A.5 (P)	Amador City PRV Relocation
12	CAWP 1A.2 (WTP)5	Buckhorn Membrane Replacement
13	CAWP 1A.3 (S)	Buckhorn WTP Finish Water Pumps Control Upgrade
14	LAMEL 1A.1 (WTP)5	LaMel Air Stripper Pilot
15	LAMEL 1A.2 (B & WTP)	LaMel Booster Station and Water Treatment Upgrades
16	CAWP 1A.4 (P)	Tank C Service Area Individual PRV Installation
17	IONE 1A.2 (P)	Tanner to Ione Transmission Line Cathodic Protection
18	TAN 1A.6 (P)	Tanner Raw Water Transmission Line Cathodic Protection
19	IONE 1A.3 (T)	Prison and Wildflower Tanks Cathodic Protection Upgrades
20	CAWP 1A.5 (T)	CAWP System Tanks Cathodic Protection Upgrades
21	TAN 1A.7 (T)	Trent Tank Cathodic Protection Upgrades
22	TAN 1B.1 (WTP)	Tanner WTP Flow Control & Reliability Improvements
23	IONE 1A.4 (WTP)	Ione Site Security & Access Improvements
24	TAN 1A.8 (P)	Hayden Alley, Broadway, Borgh, Eureka, and Tucker Hill Pipeline Replacements
25	CAWP 1A.6 (P)	Lynn Way Service Line Replacement
26	CAWP 1A.7 (P)	Robin Lane Pipe Replacement
27	CAWP 1A.8 (P)	Upsize Madrone Tank Fill Line and McKenzie PRV
28	IONE 1A.5 (P)	Arroyo Seco and Amador Street Pipeline Replacements
29	CAM 1A.1 (P)	Camanche Service Lateral Replacement
30	TAN 1A.9 (B)	Amador City High Service Individual Boosters
31	IONE 1A.6 (P)	Oak Ridge Pressure Zone Creation
32	CAWP 1A.9 (P)	CAWP Transmission Main Improvements and Tank D Replacement

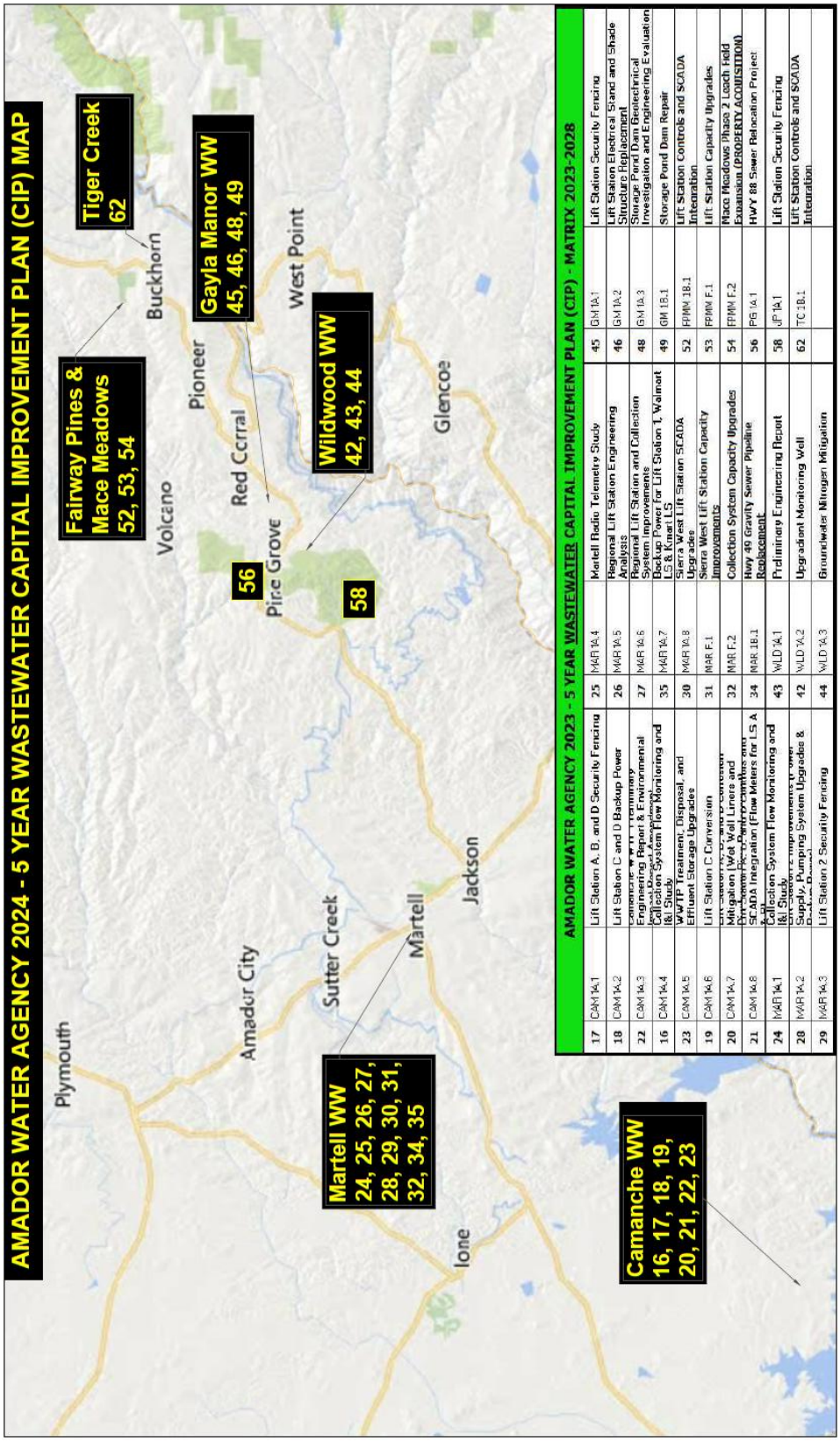
Agency Ranking	Project ID#1	Project Name
33	TAN 1A.12 (WTP)	Plant Operations Software Update
34	IONE 1A.8 (WTP)	Ione Reliable Capacity Expansion
35	IONE 1A.9 (WTP)	Ione Backwash Handling Improvements
36	TAN 1A.11 (WTP)	Tanner Backwash Drying Beds
Priority 1B Improvements (2025-2030)		
1	IONE 1B.1 (P)	New WTP Transmission Line
2	IONE 1B.2 (WTP)	Ione Reservoir Site Treatment Expansion
3	TAN 1B.2 (WTP)	Tanner Pump Station Improvements
4	CAWP 1B.1 (B)	Replacement of the McKenzie PS; Pine Needle, Meadowbrook and Guili Firm Capacity Upgrades; Toma Ln PS Improvements
5	CAWP 1B.2 (T)	Replace Ranch House Tank
6	CAWP 1B.3 (T)	Replace Jackson Pines Tank

Source: AWA 2024 5-Year Water Capital Improvement Plan

Wastewater Treatment Future Development: Assets and Projects

The AWA noted their Capital Improvements Program has numerous projects planned for the next five years. Projects include development and acquisition of new assets, facility expansions and improvements, as well as a variety of wastewater projects to maximize AWA operations. These are shown on Figure F-7 and detailed in Table F-8 for wastewater service updates and upgrades. These areas were not supplied in GIS, as such no tabular analysis by hazard was performed.

Figure F-7 AWA Wastewater Future Growth - Assets and Projects



AMADOR WATER AGENCY 2023 - 5 YEAR WASTEWATER CAPITAL IMPROVEMENT PLAN (CIP) - MATRIX 2023-2028									
17	CAM 1A.1	Lift Station A, B, and D Security Fencing	25	MAR 1A.4	Martell Radio Telemetry Study	45	GM 1A.1	Lift Station Security Fencing
18	CAM 1A.2	Lift Station C and D Backup Power	26	MAR 1A.5	Regional Lift Station Engineering Analysis	46	GM 1A.2	Lift Station Electrical Stand and Shade Structure Replacement
22	CAM 1A.3	Engineering Report & Environmental	27	MAR 1A.6	Regional Lift Station and Collection System Improvements	48	GM 1A.3	Storage Pond Dam Geotechnical Investigation and Engineering Evaluation
16	CAM 1A.4	Collection System Flow Monitoring and	35	MAR 1A.7	Backup Power for Lift Station 1, Walmart Lift Station	49	GM 1B.1	Storage Pond Dam Repair
23	CAM 1A.5	WWTP Treatment, Disposal, and Effluent Storage Upgrades	30	MAR 1A.8	Sierra West Lift Station SCADA Upgrades	52	FPMM 1B.1	Lift Station Controls and SCADA Integration
19	CAM 1A.6	Lift Station C Conversion	31	MAR F.1	Sierra West Lift Station Capacity Improvements	53	FPMM F.1	Lift Station Capacity Upgrades
20	CAM 1A.7	Lift Station C and D Conversion Mitigation (Wet Well Liners and	32	MAR F.2	Collection System Capacity Upgrades	54	FPMM F.2	Mace Meadows Phase 2 Leach Field Expansion (PROPERTY ACQUISITION)
21	CAM 1A.8	SCADA Integration (Flow Meters for LS A	34	MAR 1B.1	Hwy 49 Gravity Sewer Pipeline Replacement	56	PG 1A.1	HWY 88 Sewer Relocation Project
24	MAR 1A.1	Collection System Flow Monitoring and I&I Study	43	WLD 1A.1	Preliminary Engineering Report	58	JP 1A.1	Lift Station Security Fencing
28	MAR 1A.2	Supply, Pumping System Upgrades &	42	WLD 1A.2	Upgradient Monitoring Well	62	TC 1B.1	Lift Station Controls and SCADA Integration
29	MAR 1A.3	Lift Station 2 Security Fencing	44	WLD 1A.3	Groundwater Nitrogen Mitigation			

Source: 2024 AWA 5-Year Wastewater Capital Improvement Plan

Table F-7 AWA Wastewater Future Growth - Assets and Projects

CIP Item No.(1)	System	Project Name	Fiscal Year(s)
Near Term CIP (1-5 YRS): FY 22/23 - FY 26/27			
16	Camanche	Collection System Flow Monitoring and I&I Study	2023
17	Camanche	Lift Station A, B, and D Security Fencing	2022
18	Camanche	Lift Station C and D Backup Power	2022
19	Camanche	Lift Station C Conversion	2023
20	Camanche	Lift Station A, B, and D Corrosion Mitigation (Wet Well Liners and Discharge Pipe Replacement)	2024
21	Camanche	Lift Station A, B, and D Controls and SCADA Integration (Flow Meters for LS A & B)	2024
22	Camanche	WWTP Preliminary Engineering Report & Environmental Impact Report Amendment	2022
23	Camanche	WWTP Treatment, Disposal, and Effluent Storage Upgrades	2023-2026
24	Martell	Collection System Flow Monitoring and I&I Study	2022
25	Martell	Martell Radio Telemetry Study	2023
26	Martell	Regional Lift Station Engineering Analysis	2023
27	Martell	Regional Lift Station and Collection System Improvements	2024
28	Martell	Lift Station 2 Improvements	2022
29	Martell	Lift Station 2 Security Fencing	2022
30	Martell	Sierra West Lift Station SCADA Upgrades	2026
35	Martell	Backup Power for Lift Station 1, Walmart LS, Kmart LS (3)	2025
42	Wildwood Estates	Upgradient Monitoring Well	2024
43	Wildwood Estates	Preliminary Engineering Report	2022
44	Wildwood Estates	Groundwater Nitrogen Mitigation	2023
45	Gayla Manor	Lift Station Security Fencing	2022
46	Gayla Manor	Lift Station Electrical Stand and Shade Structure Replacement	2023
48	Gayla Manor	Storage Pond Dam Geotechnical Investigation and Engineering Evaluation	2026
55	Buckhorn WTP	Buckhorn WTP Discharge Related Improvements (4)	2024
58	Jackson Pines	Lift Station Security Fencing	2024
56	Pine Grove	HWY 88 Sewer Relocation Project	2022
15	All Systems	Trailer-Mounted Portable Generator (All Systems)	2022
1-6	All Systems	Repair and Replacement Budget	2022-2027
7-11	All Systems	Preventative Maintenance Budget	2022-2027
12	All Systems	Sewer Budget Analysis and Rate Review (Every 5 YRS)	2026

CIP Item No.(1)	System	Project Name	Fiscal Year(s)
13	All Systems	SSMP Updates (Every 5 YRS)	2026
Long Term CIP (6-10 YRS): FY 27/28 - FY 31/32			
34	Martell	Hwy 49 Gravity Sewer Pipeline Replacement (5)	2027
36	Martell	Kmart Lift Station I&I Repairs (3)	2028
37	Martell	LS 1 Parallel Force Main (3)	2028
38	Martell	Flow Meters, Controls and SCADA Integration for LS 1, LS 2, Walmart LS, and Kmart LS (3)	2028
47	Gayla Manor	WWTP Controls and SCADA Integration	2029
49	Gayla Manor	Storage Pond Dam Repair	2027
52	Fairway/Mace	Lift Station Controls and SCADA Integration	2027
59	Jackson Pines	Flow Meters at Lift Stations A & B	2029
60	Jackson Pines	Lift Stations Controls and SCADA Integration	2029
62	Tiger Creek	Lift Station Controls and SCADA Integration	2027
1-6	All Systems	Repair and Replacement Budget	2027-2032
7-11	All Systems	Preventative Maintenance Budget	2027-2032
12	All Systems	Sewer Budget Analysis and Rate Review (Every 5 YRS)	2031
13	All Systems	SSMP Updates (Every 5 YRS)	2031
14	All Systems	Sewer Master Plan Updates (Every 10 YRS)	2031
Future / Developer Driven Improvements (2022-2041)			
31	Martell	Sierra West Lift Station Capacity Improvements	2027
32	Martell	Collection System Capacity Upgrades	2027
33	Martell	Capacity Purchase from Sutter Creek WWTP	2037
53	Fairway/Mace	Lift Station Capacity Upgrades	2027
54	Fairway/Mace	Mace Meadows Phase 2 Leach Field Expansion	2027
57	Pine Grove	Pine Grove Phase 2 Leach Field Expansion & Additional Monitoring Wells	2031

Source: AWA 2024 5-Year Wastewater Capital Improvement Plan

F.4.2. Hazard Identification

The AWA identified the hazards that affect the Agency and summarized their location, extent, likelihood of future occurrence, potential magnitude, and significance (or priority of a hazard) specific to the Agency.

Those hazards identified as a high or medium significance in Table F-8 are considered AWA priority hazards for mitigation planning. Those hazards that occur infrequently or have little or no impact in the Agency were determined to be of low significance and not considered a priority hazard. Significance was determined based on the hazard profile, focusing on key criteria such as frequency, extent, and resulting damage, including deaths/injuries and property, natural and cultural resources, and economic damage. The ability of a jurisdiction to reduce losses through implementation of existing and new mitigation measures

was also considered as to the significance of a hazard. This assessment was used to prioritize those hazards of greatest significance, enabling the Agency to focus resources where they are most needed.

Table F-8 AWA—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Agricultural Hazards (severe weather/pests/invasive species)	Extensive	Likely	Critical	Medium	High
Avalanche	Limited	Unlikely	Negligible	Low	Medium
Climate Change	Extensive	Highly Likely	Critical	High	--
Dam Failure	Extensive	Unlikely	Catastrophic	Medium	Medium
Drought & Water shortage (w/ tree mortality)	Extensive	Likely	Catastrophic	High	High
Earthquake (w/subhazards)	Significant	Likely	Critical	Medium	Low
Floods: 1%/0.2% annual chance (w/ levee failure)	Significant	Occasional	Critical	Medium	Medium
Floods: Localized Stormwater	Significant	Likely	Limited	Medium	Medium
Landslide, Mudslide, Debris Flow	Limited	Likely	Critical	High	Medium
Severe Weather: Extreme Cold, Freeze, and Snow	Significant	Likely	Limited	Medium	Medium
Severe Weather: Extreme Heat	Extensive	Likely	Limited	Medium	High
Severe Weather: Heavy Rains and Storms (Hail, Lightning)	Extensive	Likely	Critical	Medium	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Likely	Limited	Medium	Low
Wildfire (w/smoke and air quality)	Extensive	Likely	Catastrophic	High	High

Geographic Extent

Limited: Less than 10% of planning area

Significant: 10-50% of planning area

Extensive: 50-100% of planning area

Likelihood of Future Occurrences

Highly Likely: Near 100% chance of occurrence in next year, or happens every year.

Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.

Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.

Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Magnitude/Severity

Catastrophic: More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths

Critical: 25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability

Limited: 10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability

Negligible: Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance

Low: Minimal potential impact

Medium: Moderate potential impact

High: Widespread potential impact

Climate Change Influence

Low: Minimal potential impact

Medium: Moderate potential impact

High: Widespread potential impact

F.4.3. Hazard Profiles and Vulnerability to Specific Hazards

This section includes the hazard profiles and vulnerability assessment for hazards ranked of medium or high significance specific to the AWA (as identified in the Significance column of Table F-8). This section focuses on where and how the Agency is affected by their priority hazards. Chapter 4 of the Base Plan provides more detailed information about these hazards and their impacts on the Amador County Planning Area. Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.2 of the Base Plan.

Hazard Profiles and Vulnerability Assessment

Each hazard is profiled in the following format:

- **Hazard Profile** – A hazard profile is included for each hazard. This includes information on:
  - ✓ **Hazard Overview** – A general discussion of the hazard and related issues is detailed here.
  - ✓ **Location** and **Extent** – Location is the geographic area within the Agency that is affected by the hazard. Extent is the expected range of intensity for each hazard. These are discussed in specific detail for mapped hazards, and in more general detail for those hazards that do not have discrete mapped hazard areas.
  - ✓ **Past Occurrences** – Past occurrences are discussed for each hazard. A discussion of disaster declarations is included in each hazard section. NCDC events are also discussed. Other past occurrences data specific to the Agency follow the disaster declarations and NCDC events for each hazard.
  - ✓ **Climate Change** – This section contains the effects of climate change (as applicable). The possible influence of climate change on the hazard is discussed.

After the hazard profile, a vulnerability assessment is presented. As part of the vulnerability assessment, an estimate of the vulnerability of the Agency to each identified hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

After this classification, a general discussion of hazard vulnerabilities occurs. This is done in the following format:

- **Local Concerns** – This includes Agency provided information on how the Agency is uniquely affected by or vulnerable to each hazard.
- **Assets at Risk** – A discussion of the assets at risk follows, presented in the same order as in Section F.4.1 above, with a few exceptions. This includes sections on: People and Populations; Structures and Critical Facilities and Infrastructure; and Natural, Historic, and Cultural Resources. These are discussed in specific terms for mapped hazards, and in more general terms for those hazards that are unmapped. Sections on Community Lifelines and Economic Assets and Community Activities of Value are not included in the Sections below, as they are fully covered in Section F.4.1 above and Chapter 4 of the Base Plan.
- **Impacts** – A discussion on hazard impacts follows. Impacts describe how each hazard can affect the Agency, its assets, and the ability to provide continued and reliable services. The type and severity of impacts reflect both the potential magnitude of the hazard and the vulnerability of the asset.
- **Future Conditions/Future Development** – A discussion of how future conditions and future development may affected the hazard is also included. This is addressed specifically for mapped hazards, and in more general terms for those hazards that are unmapped.

Power Interruption/Power Failure: A Common Vulnerability of all Hazards

An impact of almost all hazards evaluated as part of this LHMP Update relates to power shortage and/or power failures. The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the U.S. Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power disruptions can be found in Section 4.3 of the Base Plan.

Public Safety Power Shutoff (PSPS)

An intentional disruption type of power shortage/failure event has been recently implemented in California as a result of wildfires starting as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are preparing all Californians for the threat of wildfires and power outages during times of extreme (fire) weather. To help protect customers and communities during extreme fire weather events, electric power may be shut off for public safety in an effort to proactively prevent wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3 of the Base Plan.

In addition to PSPSs, to help prevent wildfires, electric utilities have begun to evolve safety efforts. This includes installing safety settings on powerlines in and around high fire-risk areas. These are known as Enhanced Powerline Safety Settings (EPSS), and they help prevent falling tree branches, animals and other hazards from starting a wildfire. By stopping ignitions, it helps prevent wildfires from starting and spreading. According to PG&E, if ignitions occur, the size of fires are much smaller due to EPSS. In 2022,

there was a 99% decrease in acres impacted by ignitions (as measured by fire size from electric distribution equipment (compared to the 2018-2020 average). This decrease occurred despite dry conditions.

Local Concerns

The Agency was affected by a PSPS event on September 7-8, 2020. This event caused AWA temporary electrical generators to be moved in order to keep critical infrastructure running in the affected areas around Pioneer and Pine Grove.

Agricultural Hazards (Severe Weather/Pests/Invasive Species)

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

Farming and related agricultural industries are not only important to Amador County's economy, but they also play a central role in the way of life of County residents and help define the character of the County. Agriculture has always been an integral part of Amador County and has continually grown and changed along with the County. Agriculture in the County can be affected by a variety of natural hazards. This Agricultural Hazard focuses on severe weather, as well as native and invasive species (insects, pests and weeds), all which can significantly affect the agricultural industry in the County. This hazard does not address pest and plants that cause impacts to human health, as those issues are addressed in other planning mechanisms in the County.

Agricultural losses occur on an annual basis and are often associated with severe weather events, including heavy rains, floods, heat, and drought and issues associated with insects, pests, agricultural diseases, and invasive species. Invasive species are organisms that are introduced into an area beyond their natural range and become a pest in the new environment. The 2023 State of California Multi-Hazard Mitigation Plan attributes most of the agricultural disasters statewide to drought, freeze, and insect infestations. Other agricultural hazards include fires, crop and livestock disease, insects, and noxious weeds.

Location and Extent

Agricultural hazards, including issues associated with severe weather as well as nuisance insects, pests and weeds, occur throughout the County where lands are used for farming, grazing, timber production, and other agricultural uses. The larger County has large swaths of agricultural lands. Areas of the County, such as the incorporated communities and higher elevations of the County, contain fewer agricultural lands, and are thus not as greatly affected by agricultural hazards. In the Amador Planning Area, a notable exception is the wine industry where some of the incorporated communities include businesses and vineyards related to wine production. While cities and special districts may not always be directly affected, they are indirectly affected economically when agricultural losses occur.

There is no scale that measures agricultural hazards. Agriculture in the County is at risk to many hazards: severe weather, as well as native and invasive insects, pests and weeds. Each of these has a different duration and speed of onset. Some, such as freeze, can have a short onset and a short duration. Drought

can have a long onset and long duration. Agricultural hazards like nuisance pests and weeds can have short or long onset, and short or long durations. All agricultural losses can have a significant impact on affected communities.

Past Occurrences

Disaster Declaration History

There are no state or federal disaster declarations issued by Cal OES or FEMA. There have been 20 USDA Secretarial Disaster Declarations for the County since 2012 (as shown in the Past Occurrences in Section 4.3.6 of the Base Plan). 16 were from drought, 2 were from freeze, and 2 were from other severe weather events.

NCDC Events

The NCDC does not track agricultural events.

AWA Events

The AWA has a Taste and Odor (T&O) Monitoring Program that tracks events. In the summers of 2016 and 2017, the number of complaints regarding T&O in the City of Ione spiked with many people noting earthy/musky flavors in the water, thought to be attributed to algae blooms. Algae blooms were not observed at the Ione Reservoir prior to 2016. These events caused AWA to flush large portions of distribution water mains, water storage tanks, and modify the method in which water is transported from the Ione Reservoir to the Ione Water Treatment Plant. This caused several days of work for operators to combat the taste & odor issues, and many thousands of gallons of water to be flushed. Another occurrence of taste and odor issues caused by geosmin was in 2018. In 2019, Tanner Raw Reservoir Samples indicated geosmin levels were above historical high levels. Since 2020 no major T&O events have occurred.

Climate Change and Agricultural Hazards

According to the CAS, addressing climate change in agriculture will encompass reducing vulnerability through adapting to the ongoing and predicted impacts of climate. Agriculture in California is vulnerable to predicted impacts of climate change, including less reliable water supplies, increased temperatures, and increased pests.

The 2023 California State Hazard Mitigation Plan noted that California farmers contend with a wide range of crop-damaging pests and pathogens. Continued climate change is likely to alter the abundance and types of many pests, lengthen pests' breeding season, and increase pathogen growth rates. It also noted that change in climate can directly impact crop growth through new temperature patterns and northward shifts of pests and disease. Additionally, longer growing seasons may enable pest species to complete more reproductive cycles, which can increase severity of infestations.

Finally, the 2023 State Plan noted that temperature is not the only climatic influence on pests. For example, some insects are unable to cope in extreme drought, while others cannot survive in extremely wet conditions. Furthermore, while warming speeds up the life cycles of many insects, suggesting that pest

problems could increase, some insects may grow more slowly as elevated carbon dioxide levels decrease the protein content of the leaves on which they feed.

Vulnerability to Agricultural Hazards (Severe Weather/Pests/Invasive Species)

According to historical hazard data, both severe weather affecting agriculture and insects, pests, and weeds are an annual occurrence in the Agency. If left unchecked, severe weather, and agricultural pests and weeds can threaten native species, biodiversity, ecosystem services, recreation, water resources, agricultural and forest production, cultural resources, economies and property values, public safety, and infrastructure.

An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to the AWA. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect the entire Agency. These sections include assets at risk, impacts, and how future conditions and development can be affected by this hazard.

Local Concerns

The Agency has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Primary concern is invasive species by cyanobacteria (blue-green algae) producing geosmin in supply water. Geosmin causes taste and odor issues in potable waters. AWA does have a Taste and Odor Monitoring Program in response to previous taste and odor issues. Additionally, the Agency is concerned about providing continuous and reliable water for irrigation.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

People and populations in the Agency include both Agency staff and workers as well as those populations located within Agency boundaries and served by the Agency. Agricultural hazards have a minimal effect on people and populations in the Agency, including Agency staff and vulnerable populations. However, damage to crops from both severe weather and invasive and nuisance insects, pests, and weeds can cause significant increases in food prices and food insecurity among low-income communities. In addition, algae blooms that develop in water bodies can produce geosmin which causes taste and odor issues in the water.

Structures and Critical Facilities and Infrastructure

Structures and critical facilities and infrastructure in the Agency, including their owned assets, may be affected by agricultural hazards. Structures and the severe weather that affect crops in the County are discussed in other sections of this annex. Regarding nuisance species, some species can impact vegetation and can result in stream bank instability, erosion, and increased sedimentation, impacting ground

stabilization and possibly causing foundation issues for nearby structures. If species cause trees and other vegetation to die, there is an increased risk of damage to roadways, powerlines, and buildings, and increased risk to wildfire. Some nuisance plants have been shown to destabilize soil due to high densities and shallow root systems, negatively impacting nearby buildings and septic systems. Other nuisance plant species have been known to clog culverts and streams, increasing flooding risk. Additionally, soil that becomes unstable due to decaying vegetation can impact critical facilities that are built on or around these soils.

As shown in Table F-3, no AWA facilities are thought to be at direct risk from agricultural hazards.

Natural, Historic, and Cultural Resources

Natural resources can be affected by agricultural hazards. Natural, historic, and cultural resources and the severe weather that affect crops in the County are discussed in other sections of this annex. Negative impacts of nuisance species to natural resources include the following:

- Loss of wildlife habitat and reduced wildlife numbers;
- Loss of native plant species;
- Reduced livestock grazing capacity;
- Increased soil erosion and topsoil loss;
- Diminished water quality and fish habitat.

Impacts from Agricultural Hazards: (Severe Weather/Pests/Invasive Species)

The consequences of agricultural disasters to the Agency and larger Amador County include ruined plant crops, dead livestock, ruined feed and agricultural equipment, monetary loss, job loss, and possible multi-year effects (i.e., trees might not produce if damaged, loss of markets, food shortages, increased prices, possible spread of disease to people, and loss or contamination of animal products). Overall, any type of severe agricultural disaster can have significant economic impacts on both the agricultural community, the AWA, and the entire Amador County Planning Area. They can also cause significant increases in food prices to the consumer due to shortages. Under some conditions, insects that have been present and relatively harmless can become hazardous. For example, severe drought conditions can weaken trees and make them more susceptible to destruction from insect attacks. Other potential impacts to the Agency include impacts to water quality.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the Agency may be affected in the future by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the AWA include the following:

- Climate change is likely to exacerbate future agricultural hazards and associated impacts and vulnerability of the Agency.
- While population projections for the area served by the Agency show additional expected growth, these anticipated future changes in population are expected to be relatively small, which limits additional impacts to the Agency. The Agency noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.
- It is unknown how changes in land use and development will affect agricultural hazards in the Agency's Service Area, but it is unlikely that projected changes will increase the vulnerability of the Agency to this hazard AWA planning efforts are in effect to reduce this risk and should be updated as necessary to continue to address future agricultural hazard conditions.

Future development in the Agency is not likely to have an impact on agricultural hazards in Amador County except to the extent that agricultural lands are taken out of production as new development occurs reducing available land for agricultural uses, including those related to farming, timber production and grazing. Further, with additional development in the Agency, there may be additional competition for water resources thus possibly impacting the Agency's ability to serve the water needs of the agricultural industry in the County.

Climate Change

Likelihood of Future Occurrence–Highly Likely
Vulnerability–High

Hazard Profile

Climate change adaptation is a key priority of the State of California. The 2023 State of California Multi-Hazard Mitigation Plan noted that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the State's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

California's Adaptation Planning Guide: Understanding Regional Characteristics (from 2017) has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. The Agency falls in the North Sierra Region. A map and climate projections for this region are shown in Section 4.3.7 of the Base Plan and include an increase in temperatures, moderate changes in rainfall, and increased risk to wildfire.

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the AWA, the Amador County Planning Area, surrounding counties, and State of California. There is no scale to measure the extent of climate change. Climate change exacerbates other hazards, such as drought, extreme heat, flooding,

wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known but is feared to be tens to hundreds of years.

Past Occurrences

Disaster Declaration History

Climate change has never been directly linked to any declared disasters.

NCDC Events

NCDC does not track climate change events.

AWA Events

In Amador County and the Agency, the HMPC noted that each year it seems to get a bit warmer and snow seems to start at higher levels. The impacts AWA has experienced from climate change are linked with other hazards, specifically in regards to droughts, water shortages and wildfires. This includes:

- Dam failure due to increasing severity of storms and heavy precipitation (2019-2020, 2021-2022, 2022-2023)
- Drought and water shortages due to increasing severity of droughts and mega-droughts
- 1%/0.2% chance floods due to increasing severity of storms and heavy precipitation (2019-2020, 2021-2022, 2022-2023)
- Localized stormwater flooding due to increasing severity of storms and heavy precipitation (2019-2020, 2021-2022, 2022-2023)
- Landslide, mudslide and debris flow due to increasing severity of storms and heavy precipitation (2019-2020, 2021-2022, 2022-2023)
- Severe cold weather storms, heavy precipitation and high wind (2019-2020, 2021-2022, 2022-2023)
- Extreme heat - The National Oceanic and Atmospheric Administration (NOAA) reported that summer 2024 was the hottest summer in California in the last 130 years.
- Wildfires threatening extensive damages to AWA infrastructure (2021 Caldor Fire, 2022 Electra Fire, 2023 Carbon Fire)

The storms in 2023 were particularly impacting causing widespread damages across the County and specifically to the AWA Administrative Office, two water storage tanks in the Camanche Service Area, the Camanche Wastewater Storage Pond, Ione Water Treatment Plant (electrical poles, water filters, ancillary electrical equipment, and water treatment plant roof)

Vulnerability to Climate Change

The whole of the Agency is at some measure of vulnerability to climate change. The Agency Planning Team has concerns that the vulnerability of the Agency to climate change will continue to increase in the future. An assessment of a community's vulnerability to climate change begins with an understanding of local exposure to climate change. This is included in the Local Concerns section below followed by a discussion of the Agency's assets at risk, and impacts to this hazard.

Local Concerns

The Agency has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The concerns AWA from climate change are linked with other hazards, specifically in regards to droughts, water shortages and wildfires as detailed in the past occurrences section above. The Agency has many plans that take climate change into account in the Agency. This includes:

- 2020 AWA Water Master Plan Study and 2025 Water Master Plan Study Update
- 2022 AWA Wastewater Master Plan
- 2022 AWA Tanner & Ione WTP Capacity Study
- 2020 Water Shortage Contingency Plan
- 2020 Urban Water Management Plan
- 2024 Annual Water Supply & Demand Assessment Shortage Report
- 2025 Water Capital Improvement Plan
- 2025 Wastewater Capital Improvement Plan

Assets at Risk

Assets at risk from this hazard include people and populations served; structures and critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

Climate change affects people and populations within a community, especially those climate change issues related to increases in temperature over time. While all populations can be affected by temperature extremes, populations particularly vulnerable include the very old and very young, medically fragile people, people without means of shelter (and air conditioning or heat) or transportation, people who are socially isolated and other vulnerable or underserved populations (as shown in the discussion in Section F.4.1). Acclimatization to extreme temperatures and other weather extremes may help reduce impacts from these extreme events, such as from heat waves, in the healthy general population but may not be sufficient to protect those with underlying medical conditions.

Structures and Critical Facilities and Infrastructure

Climate change, on its own, does not generally impact structures. However, structures in areas of increased wildfire, drought, extreme heat, or flood areas exacerbated by the effects of climate change would be at increased risk, as described throughout this LHMP. Due to the slow onset of climate change, many structures in the Agency are expected to undergo improvements and adapt over time to a new climate normal.

Natural, Historic, and Cultural Resources

The rivers, streams, agricultural areas, and open space areas of the Agency supports rich biodiversity, including many special-status species and habitat areas. These are all at risk from the effects of climate

change. In addition, if heat continues to contribute to changes in wildfire patterns, all areas (on land) of the Agency are at increased risk from fire – including natural, historic, and cultural resources. Extreme heat conditions also contribute to algae blooms. Higher temperatures cause the water to become more stagnant, which, along with sunlight and nutrients, creates ideal conditions for blooms to form and persist. Furthermore, as climate change exacerbates the drought hazard, areas of wetlands in the Agency may be reduced or dry up temporarily, which could damage habitat areas for waterfowl and other species that depend on these areas.

Impacts from Climate Change

The California APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra Region in which the Agency is part of:

- Increased temperatures
- Reduced precipitation
- Public health – heat and air pollution
- Reduced agricultural productivity (e.g., wine grapes)
- Reduced tourism

In addition to these sources, the 2023 State of California Hazard Mitigation Plan noted that according to California's Fourth Climate Change Assessment, the state will experience the following climate impacts:

- Annual average daily high temperatures are expected to rise by 2.7°F by 2040, 5.8°F by 2070, and 8.8°F by 2100 compared to observed and modeled historical conditions. These changes are statewide averages.
- Heat waves are projected to become longer, more intense, and more frequent.
- Warming temperatures are expected to increase soil moisture loss and lead to drier conditions. Summer dryness may become prolonged, with soil drying beginning earlier in the spring and lasting longer into the fall and winter.
- Droughts are likely to become more frequent and persistent through 2100.
- The strength of the most intense precipitation and storm events affecting California is expected to increase.
- Snowpack levels are projected to decline significantly by 2100 due to reduced snowfall and faster snowmelt.
- Marine layer clouds are projected to decrease.
- Extreme wildfires (i.e., fires larger than 24,710 acres) would occur 50 percent more frequently. The maximum area burned statewide may increase 178 percent by the end of the century.

The Agency noted that fire hazard severity zones have become more widespread with the recent 2025 CAL FIRE Fire Hazard Severity Zone Maps adding significant portions of AWA customers into the High and Very High Fire Hazard Severity Zones. This may be attributed in part, to climate change.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the Agency may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the Agency include the following:

- As climate change continues to accelerate over time, climate-related impacts to the Agency will continue to increase.
- While population projections for the area served by the Agency show additional expected growth, these anticipated future changes in population are expected to be relatively small, which is unlikely to affect this hazard and associated impacts to the Agency. The Agency may add staff, but this number would be small. The Agency noted it has no control over population changes in its Service Area, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the Agency are expected to be limited in the near future and thus are not likely to affect climate change impacts to the Agency. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the Agency to this hazard.

In addition, climate change can influence development in the Agency over time. The Agency could see population fluctuations as a result of climate impacts relative to those experienced in other regions, and these fluctuations are expected to impact demand for housing and other development. While there are currently no formal studies of specific migration patterns expected to impact the Agency, climate-induced migration was recognized within the UNFCCC Conference of Parties Paris Agreement of 2015 and is expected to be the focus of future studies.

Climate change will influence future development in the Agency overtime as wildfires become more prevalent and AWA facilities will have to be replaced by CMU concrete block walls and metal roofs instead of wood structures. AWA facilities around Lake Camanche and the City of Ione will have increased hot summers that will require more air conditioning demands to keep chemicals and electrical equipment safe. In La Mel, the Water Treatment Plant/Pump Station was recently retrofitted to be fire resistant.

Dam Failure

Likelihood of Future Occurrence–Unlikely
Vulnerability–Extremely High

Hazard Profile

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any given year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped or fail. Overtopping is the primary cause of earthen dam failure in the United States.

Dam failure is a natural disaster from two perspectives. First, the inundation from released waters resulting from dam failure is related to naturally occurring floodwaters. Second, a total dam failure would most probably happen as a consequence of the natural disaster triggering the event, such as an earthquake.

Location and Extent

An inventory map of dams located within Amador County was shown in Section 4.3.9 in the Base Plan. Dams with an inundation area within the AWA are shown on Figure F-8. The Agency owns the Ione Canal Dam, the Gayla Manor wastewater storage pond dam, and the Lake Camanche wastewater storage pond dam, all of which are low hazard dams. The primary risk from these low hazard dams involves property and potential environmental damage.

There is no scale with which to measure dam failure. However, FEMA and CA DWR Division of Safety of Dams (DSOD) assign hazard potential classifications to dams within the State that provides information on the potential impact should a dam fail. The following two factors are considered when assigning hazard ratings: existing land use and land use controls (zoning) downstream of the dam. FEMA categorizes the downstream hazard potential into three categories in increasing severity: Low, Significant, and High. DSOD adds a fourth category of Extremely High. Dams are classified in these four categories that identify the potential hazard to life and property. These were discussed in more detail in Section 4.3.9 of the Base Plan.

While a dam may fill slowly with runoff from winter storms, a dam break has a very quick speed of onset. The duration of dam failure is generally not long – only as long as it takes to empty the reservoir of water the dam held back. For dam overtopping, the speed of onset is somewhat slower than that of a dam break, and the duration is longer (as evidenced in the 2017 Oroville Dam spillway event). The Agency would be affected for as long as the flood waters from the dam failure took to drain downstream.

Geographic flood extent from the DSOD dam inundation areas is shown on Figure F-8 for extremely high hazard dams and Figure F-9 and Table F-10 for high hazard dams.

Figure F-8 AWA – Extremely High Hazard Dam Inundation Areas

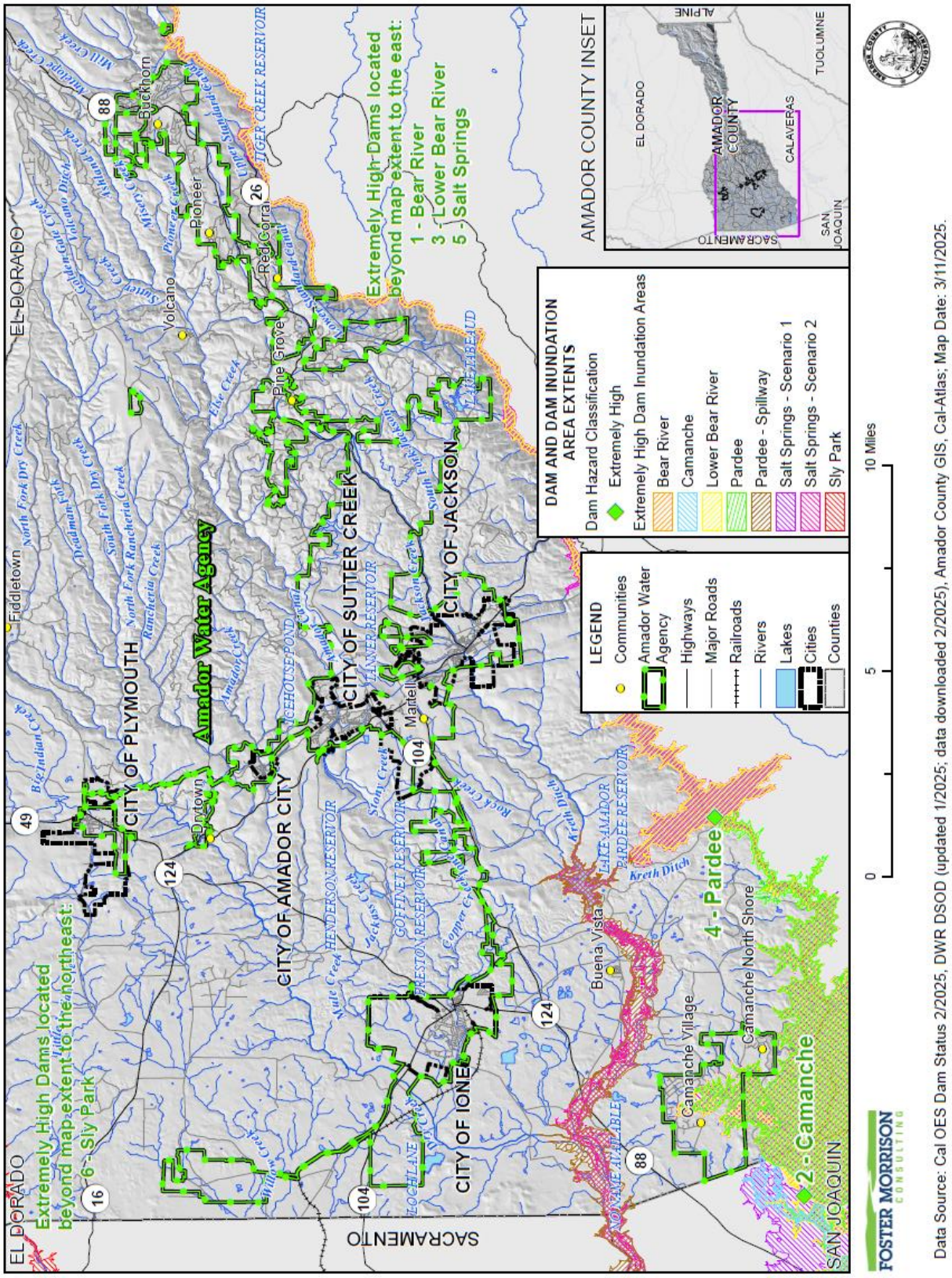


Table F-9 AWA – Extremely High Hazard Dam Inundation Areas Geographical Extents

AWA Jurisdiction/ Dam Inundation Area	Total Acres	% of Total Acres*	Improved Acres	% of Total Improved Acres*	Unimproved Acres	% of Total Unimproved Acres*
Unincorporated Amador County						
Bear River	760	2.0%	28	0.1%	732	4.1%
Lower Bear River	760	2.0%	28	0.1%	732	4.1%
Pardee	470	1.2%	5	0.02%	466	2.6%
Salt Springs - Scenario 1	857	2.3%	50	0.3%	806	4.5%
Salt Springs - Scenario 2	25	0.1%	6	0.0%	19	0.1%

Source: Cal OES, DSOD, Amador County GIS

*This represents the percentage of the total of AWA's Planning Area. It is not a percentage of each jurisdiction served by the AWA.

Figure F-9 AWA – High Hazard Dam Inundation Areas

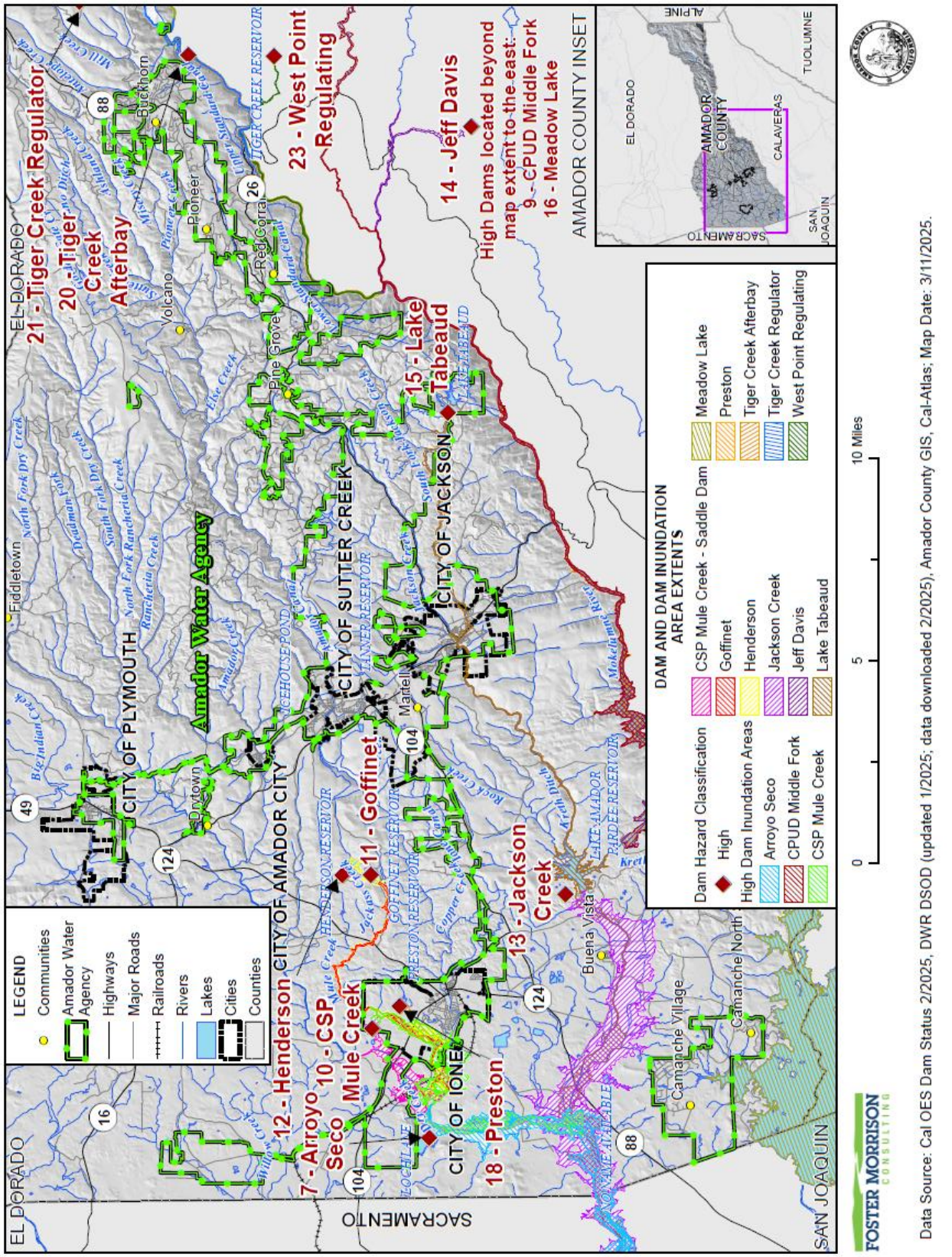


Table F-10 AWA – High Hazard Dam Inundation Areas Geographical Extents

AWA Jurisdiction/ Dam Inundation Area	Total Acres	% of Total Acres*	Improved Acres	% of Total Improved Acres*	Unimproved Acres	% of Total Unimproved Acres*
Ione						
CSP Mule Creek - Saddle Dam	44	0.1%	0	0.0%	44	0.2%
Goffinet	123	0.3%	18	0.1%	0	0.0%
Jackson						
Lake Tabeaud	68	0.2%	31	0.2%	0	0.0%
Unincorporated Amador County						
CSP Mule Creek	53	0.1%	45	0.2%	8	0.04%
CSP Mule Creek - Saddle Dam	191	0.5%	186	0.9%	5	0.03%
Lake Tabeaud	135	0.4%	119	0.6%	3	0.01%
Preston	18	0.05%	14	0.1%	0	0.0%
Henderson	23	0.1%	18	0.1%	4	0.02%
Goffinet	11	0.03%	9	0.04%	0	0.0%
Meadow Lake	73	0.2%	1	0.003%	0	0.0%
Tiger Creek Regulator	10	0.03%	0	0.0%	0.02	0.0001%
Tiger Creek Afterbay	1	0.004%	1	0.01%	10	0.1%
West Point Regulating	0.3	0.001%	0.2	0.001%	0.01	0.0001%

Source: Cal OES, DSOD, Amador County GIS

*This represents the percentage of the total of AWA's Planning Area. It is not a percentage of each jurisdiction served by the AWA.

Past Occurrences

Disaster Declaration History

There have been no state or federal disaster declarations for dam failure in Amador County.

NCDC Events

The NCDC does not contain any dam failure events for Amador County.

AWA Events

The Agency noted no dam failure occurrences that have affected the Agency.

Climate Change and Dam Failure

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with dam failure. More information on future impacts to the Agency can be found below and in the Future Conditions/Future Development section of the Vulnerability Assessment below.

The 2023 California State Hazard Mitigation Plan noted that modeling described in California's Fourth Climate Change Assessment projects less frequent but more extreme daily precipitation. Year-to-year precipitation will become more volatile, and the number of dry years will increase by mid-century. As the climate continues to warm, atmospheric rivers will carry more moisture, and extreme precipitation may increase. Climate model projections show a tendency for the northern part of the State to become wetter. Increases in both precipitation and heat causing snow melt in areas upstream of dams could increase the potential for dam failure and uncontrolled releases in Amador County and the Agency.

Vulnerability to Dam Failure

The vulnerability of the Agency to dam failure flooding would vary depending on which dam fails and the nature and extent of the dam failure and associated flooding. An assessment of a community's vulnerability to dam failure begins with an understanding of local exposure to dam failure. This is included in the Local Concerns section below followed by a discussion of the Agency's Assets at Risk to this hazard.

Local Concerns

The Agency has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The Agency owns the Ione Reservoir Dam, Ione Canal Dam, the Gayla Manor wastewater storage pond dam, and the Lake Camanche wastewater storage pond dam, all of which are low hazard dams. The primary risk from these low hazard dams involves property and potential environmental damage. If a dam failure hazard event occurs it will be a medium-level significance to affected areas below each dam.

In addition to the three dams owned by AWA, AWA also is concerned with seven PG&E owned and operated dams which store AWA raw (untreated) supply water. These dams include the Upper Blue Lake dam, the Lower Blue Lake Dam, the Twin Lake Dam, the Meadow Lake Dam, the Salt Springs Reservoir Dam, the Lower Bear River Reservoir Dam, and the Tiger Creek Afterbay Dam.

The recently completed Ione Hydro facility depends on the Ione Reservoir to contain the discharged water for future use at the Ione Water Treatment Plant. If the dam fails, the water would be wasted down the natural drainage and not captured for future potable water treatment. Dam failure would also inundate the future site of the new Ione Reservoir Water Treatment Plant. Careful consideration of treatment plant layout will be needed to correct for this potential risk.

Assets at Risk

Assets at risk from this hazard include people and populations served; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All people and populations (including both Agency staff and the population served by the Agency) located in dam inundation areas are vulnerable to dam failure. Certain vulnerable populations may be at increased risk to dam failure, especially during a large event with minimal advance notice. These vulnerable populations may include: the unhoused, those with limited mobility, and those that lack the resources to leave the area.

Structures and Critical Facilities and Infrastructure

Some structures and critical facilities and infrastructure in the Agency have some measure of risk to dam failure. Dam failure flooding can affect the built environment of the Agency. Structures in dam inundation areas are at risk and depending on flood depths, can range from slight damage to totally inundated.

As shown in Table F-3, there are multiple structures in the AWA at risk from dam failure.

Natural, Historic, and Cultural Resources

A major dam failure event and associated flooding could have a devastating impact on the Agency. Large flood events can affect all natural, historic, and cultural resources that lie in the dam inundation areas. There are a number of ways floodwaters associated with a dam failure event can impact natural resources and the environment: Wildlife habitats can be destroyed by floodwaters. Contaminated floodwater can pollute rivers and habitats. Silt and sediment can destroy natural areas. Riverbanks and natural levées can be eliminated as rivers reach bankfull capacity. Rivers can be widened, and deposition can increase downstream. Trees can be uprooted by high-velocity water flow. Plants that survive the initial flood may die due to being inundated with water. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to these structures within the inundated areas, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged, and lost during extreme dam failure flood events.

Impacts from Dam Failure

Impacts to the Agency from dam failure flooding could be extensive and widespread and include loss of life and injury, flooding and damage to property and structures, damage to critical facilities and infrastructure, loss of natural resources, and all other flood related impacts. Additionally, mass evacuations may be necessary and compounded by impacts to transportation systems and infrastructure. Economic losses to the Agency and Amador County Planning Area can also be significant.

Other impacts associated with dam failure include landslides, bank erosion, and destruction of habitat. Dam failures can cause downstream flooding and can transport large volumes of sediment and debris and contaminants from the floodwaters. Other environmental impacts can include contamination from septic

system failures and releases of contaminants from hazardous materials facilities, contamination of potable water supplies; changes in configurations of streams; loss of wildlife habitats; and degradation of wetlands. A large dam failure event could have significant and catastrophic impacts.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the Agency may be affected in the future by climate change (which was discussed in the Climate Change and Dam Failure discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the Agency include the following:

- Climate change is likely to exacerbate future rain and storm conditions and associated impacts and vulnerability of the Agency to dam failure.
- While population projections for the area served by the Agency show additional expected growth, these anticipated future changes in population are expected to be relatively small, which limits additional impacts to the Agency. The Agency may add staff, but this number would be small. Additional growth within the dam inundation areas of the Agency would place additional populations at risk to dam failure. The Agency noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.
- Land use planning should be proactive to address future hazard conditions. Locating new development, structures, and critical facilities and infrastructure within or near areas of dam failure risk may put additional development at risk. Depending on the location of new development and adherence to protective building codes, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the Agency to this hazard.

Future Development

Future dam failure events may occur in the Agency. Although new growth and development may fall in the area flooded by a dam failure, given the limited potential of total dam failure and the large area that a dam failure would affect, development in the dam inundation area will continue to occur. Dam failure would also inundate the future site of a new Ione Reservoir Water Treatment Plant.

Drought & Water Shortage

Likelihood of Future Occurrence–Likely
Vulnerability–High

Hazard Profile

Drought and water shortage are complex issues involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area's usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water supply is the most significant issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. Drought has also affected tree mortality in the area in the past. As the population in the area continues to grow, so will the demand for water.

Tree Mortality and Drought

One of the specific impacts of drought in the Amador County Planning Area, which can also affect AWA, is the increased risk to trees from beetle kill and other insects, pathogens and parasites, and other tree mortality and die back issues. Drought weakens trees and makes them more susceptible to insect infestation and other pathogens. Insects, such as bark beetles and others, frequently attack trees weakened by drought, disease, injuries, or other factors that may stress the tree. These insects and other pathogens can contribute to the decline and eventual death of trees throughout the Agency. The tree mortality and dieback problems are a high priority because of the issue of hazardous trees and an increased wildfire hazard. In addition to an increase in wildfire fuels, hazardous trees can fall onto structures causing damage and a result in a reduction on the tree canopy within the Agency that provides relief during extreme heat days.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the Agency and County is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme Drought
- D4 – Exceptional Drought

The Amador County Planning Area, including the AWA, has been in and out of drought since 2014. Over the last five years since the 2020 LHMP, drought conditions have ranged from none to exceptional. Drought conditions are expected to continue to be cyclical in nature depending on the year." Current drought conditions in the Agency are shown in Section 4.3.10 of the Base Plan.

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time (which does not usually affect water shortages) or for longer periods (which may challenge water supplies). Should a drought last for a long period of time, water shortage becomes a larger issue.

According to the AWA2024-2025 Annual Water Supply & Demand Assessment Shortage Report, the Agency has a significant surplus of water supply above current and projected demands. The Amador Water System (AWS) water supply is a pre-1914 water right that has never been curtailed in the most severe single-year or a multiple-year drought. In addition, while the water supply associated with the Central Amador Water Project (CAWP) was temporarily curtailed during recent drought years, the significant storage volume in the Lower Bear Reservoir has allowed previous water supply demands to be met, and are expected to be met in the future, even in dry years. In addition, the total well capacity for the portion of both systems reliant on groundwater are larger than current and projected demands.

Past Occurrences

Disaster Declaration History

There have been 2 state and 1 federal disaster declarations for Amador County. This can be seen in Table F-11. Additionally, there have been 16 USDA Secretarial Disaster Declarations from drought in the County.

Table F-11 Amador County –State and Federal Drought Disaster Declarations 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	2	1976, 2015	1	1977

Source: Cal OES, FEMA

NCDC Events

There have been 249 NCDC drought events in Amador County since 1993. These most likely had some impact on the Agency.

AWA Events

Based on historical information, the occurrence of drought in California, including the AWA, is cyclical, driven by weather patterns. Section 4.3.10 of the Base Plan notes that five droughts have occurred in the past 86 years. Drought has occurred in the past and will occur in the future. The Agency also noted that:

- The recent drought period saw an increase in infrastructure breaks **(from 2015 – 2017**) within the water distribution systems.
- **In 2021**, the Governor of California declared a state of drought emergency to exist in most counties in California, including Amador County, and by executive order called for a 15% voluntary reduction in water use statewide. While the Governor of California declared a drought in 2021 and called for a 15% voluntary reduction in water use statewide, the water supply stored in the mountain reservoirs was never diminished to a point each year that AWA was concerned the water supply to the water treatment plants would run out. In August 2021, Amador Water Agency received orders from the State Water Resources

Control Board curtailing most pre- and post-1914 water rights, which stopped Amador Water Agency's ability to draw water from the Mokelumne River which is the single source of water for approximately 94% of AWA water customers. These orders significantly impacted AWA as AWA was then only authorized to use the limited stored water in the mountain reservoirs. This limited AWAs ability to produce potable water as there was no end date associated with the curtailment at the time. Following the Governor's drought declaration, AWA Board of Directors issued Resolution No. 2021-10 declaring a water shortage in Amador County and the surrounding region, implemented voluntary and mandatory conservation measures and created six water supply shortage stages. Each stage targeted water usage reductions throughout all AWA systems. Two additional AWA Resolutions were issued in 2022 (2022-03 and 2022-09).

- Droughts and the following water conservation measures impact AWAs revenue as less water is utilized by residential, commercial and industrial customers throughout all AWA systems. **In 2024** the AWA Board of Directors declared a water shortage emergency to exist in the Ione Water Treatment Plant Service Area under Resolution No. 2024-02.

Climate Change and Drought and Water Shortage

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with drought and water shortage. More information on future impacts to the Agency can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate scientists studying California find that drought conditions are likely to become more frequent and persistent over the 21st century due to climate change. The experiences of California during recent years underscore the need to examine more closely the state's water storage, distribution, management, conservation, and use policies. The 2021 CAS stresses the need for public policy development addressing long term climate change impacts on water supplies. The CAS notes that climate change is likely to significantly diminish California's future water supply, stating that: California must change its water management and uses because climate change will likely create greater competition for limited water supplies needed by the environment, agriculture, and cities.

A 2018 report from the Public Policy Institute of California noted that thousands of Californians – mostly in rural, small, disadvantaged communities – already face acute water scarcity, contaminated groundwater, or complete water loss. Climate change would make these effects worse.

Cal Adapt scenarios for modeled future drought scenarios were shown in Section 4.3.10 of the Base Plan.

Vulnerability to Drought and Water Shortage

Based on historical information, the occurrence of drought and water shortage in California, including the Agency, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. The vulnerability of the AWA to drought may vary and include reduction in water supply, turf losses, impacts to natural resources, and an increase in dry fuels and tree dieback.

The whole of the Agency is at some measure of vulnerability to drought and water shortage. An assessment of a community's vulnerability to drought and water shortage begins with an understanding of local exposure to drought. This is included in the Local Concerns section below followed by a discussion of the Agency's Assets at Risk to this hazard.

Local Concerns

The Agency has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

According to the AWA 2024-2025 Annual Water Supply & Demand Assessment Shortage Report, the Agency has a significant surplus of water supply above current and projected demands. The Amador Water System water supply is a pre-1914 water right that has never been curtailed in the most severe single-year or a multiple-year drought. In addition, while the water supply associated with the Central Amador Water Project was temporarily curtailed during recent drought years, the significant storage volume in the Lower Bear Reservoir has allowed previous water supply demands to be met, and are expected to be met in the future, even in dry years. The total well capacity for the portion of both systems reliant on groundwater are larger than current and projected demands.

Surface water accounts for approximately 94% of the Agency's total water supply. Surface water is the sole supply source for both the Amador Water System and the Central Amador Water Project and is obtained from the Mokelumne River watershed. The Agency's main water supply is the Mokelumne River, a snow- and rain-fed river originating in the Sierra Nevada. The Mokelumne River watershed is a relatively narrow and steep watershed located northeast of the Sacramento-San Joaquin Delta on the western slope of the Sierra Nevada. The watershed, upstream of Camanche Dam, covers an area of 627 square miles and extends from Highland Peak (elevation 10,934 feet above sea level) near the crest of the Sierra Mountains to Camanche Reservoir (elevation 235 feet above sea level) located in the lower western foothills near Clements.

Annual precipitation (rainfall and snowfall) in the Mokelumne River Watershed, and thus river runoff, is extremely variable in Northern California. Within a year, precipitation is highly seasonal with most precipitation normally occurring between November and May and very little occurring between late spring and fall. Peak flows in the Mokelumne River normally occur during winter storms or during the spring snow-melt season from March through June. River flows decrease to a minimum in late summer or fall.

Amador County has a varying range of temperature and precipitation. The Sierra Nevada foothill areas experience hot, dry summers and mild winters. The higher elevations, about 5,000 feet, experience long and severe winters accompanied by heavy snowfall. The Agency is the main water purveyor for the western portion of Amador County. The Agency has the legal jurisdiction to serve water throughout Amador County

Relatively high water losses have been historically attributed to the Agency's raw water ditch conveyance and delivery system, specifically the Amador Canal and Ione Canal. The new Amador Transmission Pipeline, completed in July 2007, replaced the majority of the conveyance requirement for the canal by

constructing a 30-inch pipeline between Lake Tabeaud and the Tanner Reservoir. The new pipeline mitigates for water historically lost during conveyance through the Amador Canal, lowering effective system demand and allowing the Agency to more efficiently use its water entitlements. Also, by eliminating canal losses, the Agency has been able to better identify residential, commercial and industrial losses.

Agency operational experience during normal, dry and multiple dry year conditions, such as 1988 to 1994, indicates that the spring runoff will continue to fill PG&E reservoirs to near capacity. These reservoirs form the head of both the AWS and CAWP surface water diversions. Even during unusually severe droughts, such as occurred in 1976/1977, and the prolonged drought of 1988 to 1994, the PG&E storage capacity and the priority of the water rights for such storage enables PG&E to deliver the full annual contract entitlements to the Agency. For the limited groundwater sources utilized by the Agency, the firm yield determined at the time of well installation indicates that the supply is consistent for normal, dry or multiple dry years. Climatic change is not considered to be a factor in the Agency's water supply reliability.

The original La Mel Heights groundwater well has been run continuously through a variety of seasonal and climatic conditions and has continued to produce a steady yield. The Agency also operates a second well in the La Mel Heights area to provide additional supply as well as to provide redundancy.

The Agency has completed a Groundwater Sustainability Study for the Lake Camanche Village Service Area, as directed by the State Department of Public Health (CDPH). To date, the water Cosumnes Sub-basin that supplies Lake Camanche Village has supplied sufficient water, but it should be noted that the Agency did not receive ownership of the system until 2001, therefore supply data for dry and multiple dry years is not available. With the existing four (4) wells and the requirement to be able to take the largest producing well (well 14) offline, there is limited ability to extend services.

There is potential for a huge impact in the Lake Camanche Village area as 2 of the 4 groundwater drinking water wells cannot be utilized because of contamination. It is difficult to find good producing groundwater wells in the area, but AWA may be able to work with EBMUD for production from their south shore membrane water treatment facility.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

The people and populations (both staff and those served by the Agency) of the Agency are not directly affected by general drought conditions; although, their turfed areas, trees, and other water dependent resources can all be affected. In extreme drought conditions, however, residents and other populations within the Agency may be vulnerable to drought and water shortage issues. Water quality can be impacted causing health problems, especially to vulnerable populations where access to clean water supplies can be more challenging. Water shortages can have an effect on all of the populations in the Agency, but often have a greater effect on the unhoused and other vulnerable populations that may be unable to access and afford clean drinking water during shortages. During periods of drought as the costs of water usage may

increase, those who are economically disadvantaged may be unable to afford the increased costs of potable water.

Structures and Critical Facilities and Infrastructure

Most Agency structures, critical facilities, and infrastructure have a limited vulnerability to drought and water shortage. Should drought conditions be severe enough to cause water shortage reliability issues, some facilities and infrastructure may be affected. Water and wastewater systems (like those of the Agency) may be impacted during times of reduced water supply and need to employ contingencies to remain functional and fully operational. Other water dependent systems may also be adversely affected. Further, the secondary hazard of drought (increased potential for spread of urban fires and wildfire) can pose a significant risk to Agency facilities. Drought can also stress trees, causing die off. These trees may fall on critical infrastructure adjacent to them and impact power lines and other utilities.

As shown in Table F-3, there are multiple structures in the AWA at risk from drought.

Natural, Historic, and Cultural Resources

Drought and water shortage can have a significant impact on natural resources. Water levels in reservoirs and lakes may be reduced and a loss of wetlands and coastal marsh areas may occur. Severe drought conditions can contribute to an increase in erosion of soils and lead to poor soil quality. Water quality can also be diminished in periods of drought. Further, all of the trees in the Agency are at risk to drought impacts and a reduction in water supply. These trees provide a wealth of social and environmental benefits to Agency residents and visitors, from shade and beauty to air quality, carbon reduction and stormwater management. Drought can devastate crops and dry out pastures, dry out forests and critical habitat areas, and reduce food and water available for wildlife and livestock. Additionally, drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. It is unlikely that drought and water shortage would have a significant impact on historic and cultural resources in the Agency.

Impacts from Drought and Water Shortage

The vulnerability of the Agency to drought is Agency-wide, but impacts may vary and include reduction in water supply and quality and an increase in dry fuels. The potential for a reduction in water supply during drought conditions generally leads to both mandated and voluntary conservations measures during extended droughts. During these times, the costs of water can also increase. Also of concern, the increased dry fuels, fuel loads, and tree mortality events associated with drought conditions can result in an increased fire danger. In areas of extremely dry fuels, the intensity and speed of fires can be significant. Water supply and flows for fire suppression can also be an issue during extended droughts. Drought can also lead to turf losses and cause tree die off within the Agency.

Other qualitative impacts associated with drought in the Agency are those related to water intensive activities such as municipal usage, commerce, tourism, and recreation use. With more precipitation likely falling as rain instead of snow in the Sierra's, and warmer temperatures causing decreased snowfall to melt faster and earlier, water supply is likely to become more unreliable. In addition, drought and water shortage

is predicted to become more common. This means less water available for use over the long run, and additional challenges for water supply reliability, especially during periods of extended drought.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the Agency may be affected in the future by climate change (which was discussed in the hazard profile discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the AWA include the following:

- Climate change is likely to exacerbate future drought conditions and associated impacts and vulnerability of the Agency to drought and water shortage.
- While population projections for the area served by the Agency show additional expected growth, these anticipated future changes in population are expected to be relatively small, which is unlikely to affect this hazard and associated impacts to the Agency. The Agency may add staff, but this number would be small. The Agency noted it has no control over population changes in its Service Area, it merely reacts to them by providing additional (or reduced) services.
- It is unknown how changes in land use and development will affect drought and water shortage in the Agency's Service Area. The Agency conducts water supply planning to ensure a continued water supply to address future drought conditions.

The Agency has access to large quantities of water through its groundwater supply. However, population growth in the Agency will add additional pressure to the AWA as a water company during periods of drought and water shortage.

Earthquake

Likelihood of Future Occurrence–Likely (minor)/ Unlikely (major)
Vulnerability–High

Hazard Profile

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas, communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction.

Location and Extent

Since earthquakes are regional events, the whole of the Agency is at risk to earthquake. The AWA, Amador County, and surrounding areas have some level of risk from seismic and geologic hazards. Faults in and around the Agency were shown in Section 4.3.11 of the Base Plan. These include the Carson Range, Great Valley, and Rogers-Hayward Creek faults. A significant seismic event on any of these major faults could cause damage in the AWA.

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales, as discussed in Section 4.3.11 of the Base Plan.

Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. The Agency is located in an area where earthquakes of some magnitude occur, so both magnitude and intensity of earthquakes are expected to remain moderate. Seismic shaking maps for the area in Section 4.3.11 of the Base Plan show Amador County and the Agency fall within a low to moderate shake risk.

Past Occurrences

Disaster Declaration History

There has been no state or federal disaster declarations in Amador County from earthquake.

NCDC Events

The NCDC does not track earthquake events.

AWA Events

AWA has experienced three moderately sized earthquakes within a 250-mile radius of its Service Area in the last 5 years:

- **July 8, 2021** – 6.0 magnitude earthquake Antelope Valley, CA (50 miles from AWA facilities),
- **December 5, 2024** – 7.0 magnitude earthquake Mendocino, CA (240 miles from AWA facilities), and
- **December 9, 2024** – 5.7 magnitude earthquake Parker Butte, NV (90 miles from AWA facilities).

No damage was reported to AWA facilities during any of these earthquakes, however each one was felt in AWA Service Areas.

Climate Change and Earthquake

Climate change is unlikely to increase earthquake frequency or strength. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Vulnerability to Earthquake

The combination of plate tectonics and associated California coastal mountain range building geology generates earthquakes as a result of the periodic release of tectonic stresses Earthquake vulnerability is primarily based on population and the built environment. Urban areas in high seismic hazard zones are the most vulnerable, while uninhabited areas are less vulnerable. The primary impacts of concern are life safety and property damage. Although several faults are in and near the Amador County Planning Area, seismic hazard mapping indicates that the Agency has low to moderate seismic hazard potential. There is the potential for the Agency and Amador County Planning Area to be subject to some level of moderate seismic shaking. Some degree of structural damage due to stronger seismic shaking could be expected.

Earthquake shaking can also cause liquefaction to occur. Areas with loose soil and high water tables are at risk from liquefaction. There are limited areas in and near the Agency prone to liquefaction.

The whole of the Agency is at some measure of vulnerability to earthquake. An assessment of a community's vulnerability to earthquakes begins with an understanding of local exposure to earthquakes. This is included in the Local Concerns section below. After that section, assets at risk are discussed.

Local Concerns

The Agency has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Earthquakes are common in California and a large earthquake would have a devastating effect on AWA older facilities that are not up to current Seismic Code from the building requirements. The primary concerns for AWA regarding earthquake hazards are damages to underground and aboveground piping, tanks, pump stations, water treatment plants, communication and electrical equipment, and personnel safety. As the ground shifts, it may cause massive breaks to the piping underground, or cause structures aboveground to become unstable or even damaged. This loss of operability would take a very significant amount of time for AWA to repair or recover from.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All people and populations (both Agency staff and those residing in the Agency Service Area) are at risk from earthquake shaking and associated hazards. Those at heightened risk include:

- The unsheltered
- Infants and children under age five and their caregivers
- Elderly (65 and older)
- Individuals with disabilities

- Individuals dependent on medical equipment
- Individuals with impaired mobility

The greatest risk to people and populations from earthquake is death and injury. More information on people and populations at risk to earthquake shaking events can be seen in the Hazus scenarios developed for this LHMP. More information on the Hazus scenarios and how the County is affected is included in Section 4.3.11 of the Base Plan.

Structures and Critical Facilities and Infrastructure

All structures and critical facilities and infrastructure in the Agency are vulnerable to earthquakes, depending on the severity and location of the event. The Hazus scenarios conducted for the entire Amador County Planning Area show how structures may be affected. Given the nature of earthquake events causing significant ground shaking among other issues, those critical facilities and infrastructure that include underground components such as water and wastewater facilities would be uniquely vulnerable to damaging earthquakes.

As shown in Table F-3, there are multiple structures in the AWA at risk from earthquake.

Natural, Historic, and Cultural Resources

The 2023 State Hazard Mitigation Plan noted that environmental problems from earthquakes can be numerous. It is possible for earthquakes to reroute streams, which can change the water quality, possibly damaging habitat and feeding areas. Streams fed by groundwater and/or springs may dry up because of changes in underlying geology. Another threat to the environment from earthquakes is the potential release of hazardous materials into the natural environment causing contamination that can be difficult to contain. Historical and cultural resources are at risk, often due to their age and construction types. The Hazus scenarios in Section 4.3.11 of the Base Plan and included below are relatively silent on the vulnerability to natural, historic, and cultural resources, but impacts to these resources could be long lasting.

Impacts from Earthquake

Earthquakes can strike without warning and cause dramatic changes to the landscape of an area that can have devastating impacts on the built environment. The greatest impact is to life safety of the AWA staff, residents and visitors. Other impacts to the Agency could include damages to infrastructure such as roads, bridges, and dams; damages and loss of services to utilities and critical infrastructure, including those related to gas, power, water, wastewater and communication systems; damages to structures and other development; and possible loss of life and injuries.

Earthquakes can also cause failure of dams, levees, and reservoirs. Facilities and land downslope from dams or water reservoirs might be subject to flooding, if the dams, reservoirs, or other flood control structures fail as a result of an earthquake. The Agency has locations with flood risk that include facilities downslope from dams or reservoirs that could be affected by a significant earthquake event.

Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values

Impacts to identified assets at risk to this hazard and the overall vulnerability of the Agency may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the AWA include the following:

- As discussed in the hazard profile section, climate change is not anticipated to affect this hazard over time.
- While population projections for the area served by the Agency show additional expected growth, these anticipated future changes in population are expected to be relatively small, which is unlikely to affect this hazard and associated impacts to the Agency. The Agency may add staff, but this number would be small. The Agency noted it has no control over population changes in its Service Area, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development are expected to be limited in the near future and thus are not likely to affect earthquake and associated impacts to the Agency. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the Agency to this hazard. With adherence to development standards, future losses to new development should be minimal.

Although new growth and development would fall in the area affected by earthquake, given the limited chance of major earthquake and the building codes in effect, development in areas prone to earthquakes will continue to occur. The Agency enforces the state building code, which mandates construction techniques that minimize seismic hazards. Future development in the Agency is subject to these building codes and land use planning.

Flood: 1%/0.2% Annual Chance

Likelihood of Future Occurrence–Occasional (1%)/Unlikely (0.2%)
Vulnerability–High

Hazard Profile

This hazard analyzes the FEMA DFIRM 1% and 0.2% annual chance floods. These tend to be the larger floods that can occur in the Agency and have caused damage in the past. Flooding can be a significant

problem in the Agency. Historically, the Agency has been at risk to flooding primarily during the winter and spring months when river systems in the Agency swell with heavy rainfall and snowmelt runoff. The Agency has also been at risk during atmospheric river flood events. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures located throughout the Amador County Planning Area and the AWA. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage. Flooding has occurred both within the 1% and 0.2% annual chance floodplains and in other localized areas in the Agency.

Location and Extent

The AWA has areas located in the 1% and 0.2% annual chance flood zones. This is seen in Figure F-10.

Figure F-10 AWA – FEMA DFIRM Flood Zones

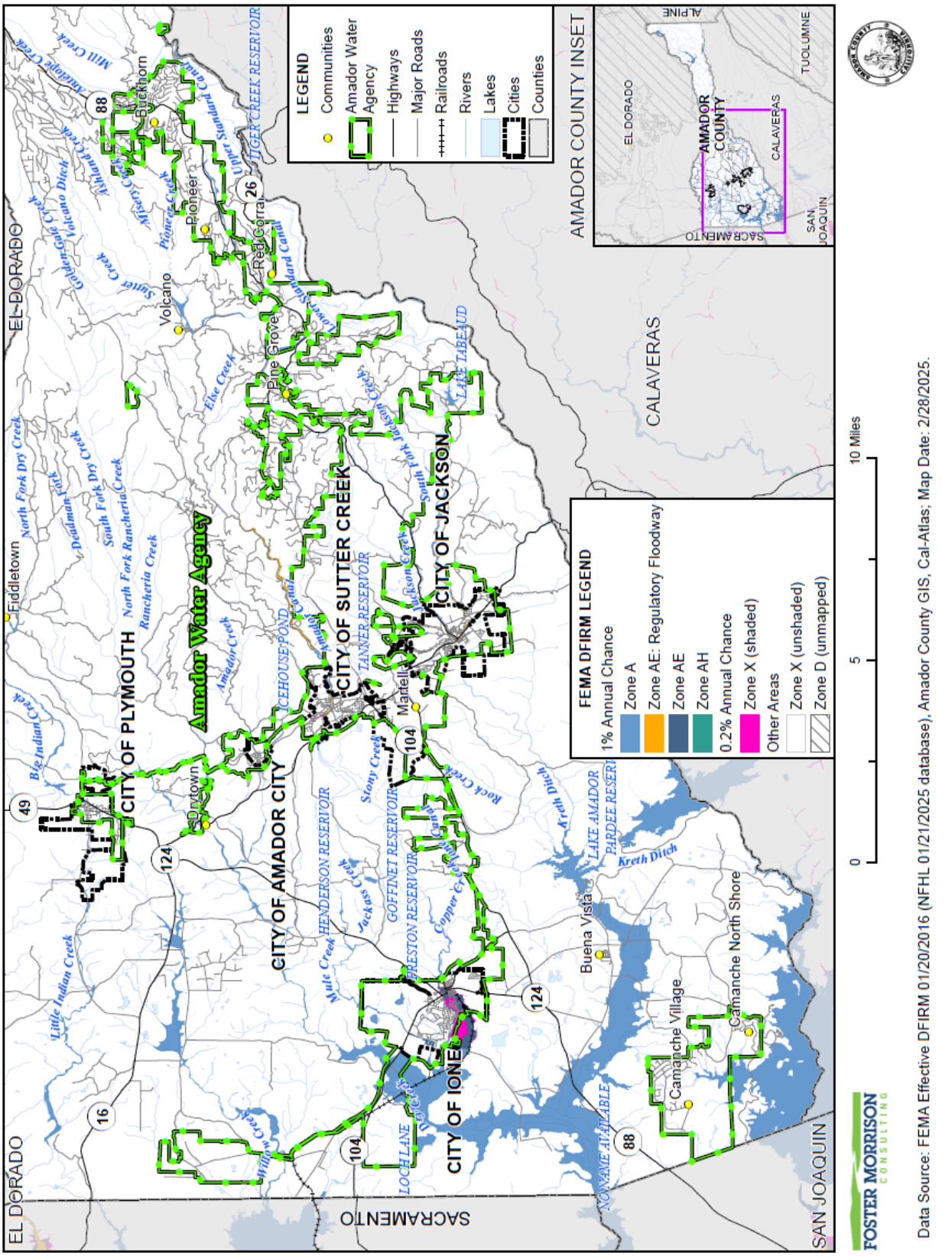


Table F-12 details the DFIRM mapped flood zones located within the Agency.

Table F-12 AWA– DFIRM Flood Hazard Zones

Flood Zone	Description	Present in Agency
A	1% annual chance flooding: No base flood elevations provided	X
AE	1% annual chance flooding: Base flood elevations provided	X
AE Regulatory Floodway	1% annual chance flood: Regulatory floodway; Base flood elevations provided	X
AH	1% annual chance flood areas of shallow flooding between one to three feet deep. Regulatory floodway; Base flood elevations provided	X
Shaded X	0.2% annual chance flooding: The areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood	X
X (unshaded)	Area of minimal flood hazard	X

Source: FEMA DFIRM 1/20/2016

Additionally, flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the Agency vary, depending on the nature and extent of a flood event; specific depths are unknown. Flood durations in the Agency tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Flooding in the Agency tends to have a shorter speed of onset, due to the amount of water that flows through the Agency.

Geographical flood extents for the Agency from the FEMA DFIRMs are shown in Table F-13.

Table F-13 AWA – Geographical DFIRM Flood Zone Extents

AWA Jurisdiction/Flood Zone	Total Acres	% of Total Acres*	Improved Acres	% of Total Improved Acres*	Unimproved Acres	% of Total Unimproved Acres*
Amador City						
1% Annual Chance Flood Hazard	0	0.0%	0	0.0%	0	0.0%
0.2% Annual Chance Flood Hazard	0	0.0%	0	0.0%	0	0.0%
Other Areas	165	0.4%	49	0.2%	116	0.6%
Amador City Total	**165**	**0.4%**	**49**	**0.2%**	**116**	**0.6%**
Ione						
1% Annual Chance Flood Hazard	251	0.7%	68	0.3%	183	1.0%
0.2% Annual Chance Flood Hazard	108	0.3%	76	0.4%	31	0.17%
Other Areas	2,601	6.9%	546	2.8%	2,055	11.4%
Ione Total	**2,960**	**7.8%**	**690**	**3.5%**	**2,270**	**12.6%**

AWA Jurisdiction/Flood Zone	Total Acres	% of Total Acres*	Improved Acres	% of Total Improved Acres*	Unimproved Acres	% of Total Unimproved Acres*
Jackson						
1% Annual Chance Flood Hazard	97	0.3%	41	0.2%	57	0.31%
0.2% Annual Chance Flood Hazard	4	0.01%	2	0.01%	2	0.0%
Other Areas	1,852	4.9%	697	3.5%	1,155	6.4%
Jackson Total	**1,953**	**5.2%**	**740**	**3.7%**	**1,214**	**6.7%**
Plymouth						
1% Annual Chance Flood Hazard	18	0.05%	3	0.01%	16	0.09%
0.2% Annual Chance Flood Hazard	0	0.0%	0	0.0%	0	0.0%
Other Areas	549	1.4%	264	1.3%	285	1.6%
Plymouth Total	**567**	**1.5%**	**267**	**1.3%**	**300**	**1.7%**
Sutter Creek						
1% Annual Chance Flood Hazard	27	0.07%	15	0.07%	12	0.07%
0.2% Annual Chance Flood Hazard	9	0.02%	5	0.02%	5	0.03%
Other Areas	1,209	3.2%	527	2.7%	682	3.8%
Sutter Creek Total	**1,245**	**3.3%**	**546**	**2.8%**	**699**	**3.9%**
Unincorporated Amador County						
1% Annual Chance Flood Hazard	672	1.8%	427	2.2%	245	1.4%
0.2% Annual Chance Flood Hazard	4	0.01%	2	0.01%	2	0.01%
Other Areas	30,334	80.0%	17,114	86.3%	13,220	73.2%
Unincorporated Amador County Total	**31,009**	**81.8%**	**17,543**	**88.4%**	**13,466**	**74.5%**
Grand Total	**37,900**	**100.0%**	**19,835**	**100.0%**	**18,065**	**100.0%**

Source: FEMA DFIRM 1/20/2016

*This represents the percentage of the total of AWA's Planning Area. It is not a percentage of each jurisdiction served by the AWA.

Past Occurrences

Disaster Declaration History

A list of state and federal disaster declarations for Amador County from flooding is shown on Table F-14. These events also likely affected the Agency to some degree.

Table F-14 Amador County – State and Federal Disaster Declarations from Flood 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	22	1950, 1955, 1958 (twice), 1959, 1963, 1964, 1969, 1980, 1982, 1986, 1995 (twice), 1997, 2006 (twice), 2017 (twice), 2019, 2021, 2023 (twice)	20	1950, 1955, 1958, 1962, 1963, 1964, 1969, 1986, 1995 (twice), 1997, 1998, 2006 (twice), 2017 (twice), 2019, 2023 (three)

Source: Cal OES, FEMA

NCDC Events

The NCDC tracks flooding events for the County. Events have been tracked for flooding since 1993. Amador County has seen 43 events. These events most likely had some impact on the Agency.

AWA Events

The Agency noted that the following events had effects and damages to the Agency:

In **2005**, the north side of Ridge Road near Sutter Creek failed. A landslide took out 300 feet of water supply ditch. This supply fed 6 cities/towns. The area was affected for one week. No towns were out of water due to the conservation, stored reserves of water and quick action. No one was completely out of water. Primary water supply is now delivered via pipeline.

The AWA noted that flooding affected the Agency in **February of 2017**. Flooding and heavy rains eroded an embankment at the Preston Pump Station. The erosion extended up to and underneath the pump slab, threatening the stability of the structure. The Agency removed the building, pumps, and pump station from the AWA system. The AWA was granted $377,841 in HMGP funds to replace the pumps and structure.

In addition to the Preston Pump Station, the Amador Canal was damaged near Highway 88. The earth foundation supporting the berm is steep (45° angle). When the supporting earth became saturated, the berm lost support. AWA lowered the water in the canal to reduce pressure on the damaged berm. The AWA was granted $769,920 by FEMA and Cal OES to repair the damages. $12,000 in damages were sustained by the Agency.

Flooding at Mace Meadows on **2/6/2017** created runoff that twice overtopped the AWA Mace Meadow Pump Station. Once floodwaters overtopped the station, 2 60 horsepower electric pumps and contactor switches were burned out. This caused almost $12,000 in damages. On the same day, heavy rains and discharge from a nearby culvert inundated Eggiman Lane, which AWA uses as an easement for pipe access. When the road was washed away, it exposed a 6" pipeline. 480' of pipe was damaged as a result. $50,915 in damages was sustained by the Agency.

Climate Change and Flood

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with flood. More information on future impacts to the Agency can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

According to the CAS, climate change may affect flooding in California, the Amador County Planning Area, and the AWA. While average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is possible that average soil moisture and runoff could decline, however, due to increasing temperature, evapotranspiration rates, and spacing between rainfall events. Reduced snowpack and increased number of intense rainfall events are likely to put additional pressure on water infrastructure which could increase the chance of flooding associated with breaches or failures of flood control structures such as levees and dams. Cal Adapt future precipitation projections were shown in Section 4.3.4.

Vulnerability to Flood: 1% and 0.2% Annual Chance

Floods have been a part of the Agency's historical past and will continue to be so in the future. During winter months, long periods of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread structural and property damage. Predominantly, the effects of 1% and 0.2% annual chance flooding are generally confined to areas near the waterways of the Agency. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat.

The whole of the Agency is at some measure of vulnerability to floods. An assessment of a community's vulnerability to flood begins with an understanding of local exposure to flood. This is included in the Local Concerns section below followed by a discussion of the Agency's Assets at Risk to this hazard.

Local Concerns

The Agency has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

AWA is traversed by several stream systems and is at risk to 1% and 0.2% floods. Additionally, AWA does have three wastewater lift stations in Martell in the DWR 100-Year floodplain delineation, part of the California Department of Water Resources (DWR) Best Available Maps (BAM) Floodplain Awareness program. These lift stations have all been subject to the same effects of the 1%/0.2% flooding events since 2020. These flooding events overload the lift stations as rainwater rapidly infiltrates into the wastewater system. Other concerns from flooding are impacts or losses to or of AWA infrastructure.

The root cause of flood issues is too much rain in narrow drainage areas with poor diversion. Specifically the Camanche and Martell Area Wastewater Lift Stations are most impacted by this as they fall within a flood area known to DWR to be a flood risk

Assets at Risk

Assets at risk from this hazard include people and populations served; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All people and populations (both Agency staff and those in the Service Area) located in the 1% and 0.2% annual chance floodplains are at some risk to flooding. Certain vulnerable populations located within areas prone to flooding may be at increased risk to this hazard, especially during a large event with minimal advance notice. These vulnerable populations include: the unhoused, those with limited mobility, and those that lack the resources to leave the area.

Agency staff and residents that live in the 1% and 0.2% annual chance floodplains are often the most vulnerable. Not only are the residents at risk, but their homes and contents are all at risk, compounding the impacts associated with significant hazard events.

Structures and Critical Facilities

Certain structures in the Agency are at risk of DFIRM flooding and primarily include those structures located within the 1% and 0.2% annual chance floodplains. Agency assets listed in Table F-3 would be at risk to flooding.

Flooding presents a threat to threat to both critical facilities and infrastructure, as well as community lifelines. Critical infrastructure plays an immensely important role in our communities. As previously noted, communities rely on roads, rail corridors, and related biking and pedestrian routes for transportation, and on water infrastructure for drinking water, wastewater service, and draining streets of rainwater. Damage to any one of these systems can threaten public safety, wreak havoc on daily life, impact properties far from flood zones, and result in economic impacts that cascade throughout California.

Natural, Historic, and Cultural Resources

Large flood events can affect natural, historic, and cultural resources. There are a number of ways floodwaters can impact natural resources and the environment. Wildlife habitats can be destroyed by floodwaters. Contaminated floodwater can pollute rivers and habitats. Water quality issues can occur. Silt and sediment can destroy natural areas. Riverbanks and natural levees can be eliminated as rivers reach bankfull capacity. Rivers can be widened, and deposition can increase downstream. Trees can be uprooted by high-velocity water flow. Plants that survive the initial flood may die due to being inundated with water. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to structures within the flooded areas, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged and lost during extreme flood events. Any of these that fall in the flood zones shown on Figure F-10 would be vulnerable.

Impacts from Flood: 1% and 0.2% Annual Chance

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Large flood events, including those associated with 1% and 0.2% annual chance floods, can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. People may be swept away in floodwaters, causing injuries or deaths. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Structures can be damaged directly from floodwaters and can also be damaged from trees falling as a result of water-saturated soils. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services causing power outages. The interruption of power causes major problems and can result in the closure of governmental offices and community businesses. Roads can be damaged and closed, causing safety and evacuation issues.

Standing water can cause damage to crops, roads, foundations, and electrical circuits. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, loss of environmental resources, and economic impacts.

Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values

Impacts to identified assets at risk to this hazard and the overall vulnerability of the Agency may be affected in the future by climate change (which was discussed in the hazard profile discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the AWA include the following:

- As discussed in the hazard profile section, climate change is anticipated to exacerbate this hazard over time.
- While population projections for the area served by the Agency show additional expected growth, these anticipated future changes in population are expected to be relatively small, which is unlikely to affect this hazard and associated impacts to the Agency. The Agency may add staff, but this number would be small. The Agency noted it has no control over population changes in its Service Area, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the Agency are expected to be limited in the near future and thus are not likely to affect flooding and associated impacts to the Agency. Additional development traditionally leads to additional flooding. Adherence to protective building codes for new development should assist in limiting future impacts and associated vulnerabilities of the Agency to this hazard.

Future Development

Future development in the AWA may be built in the floodplain, as long as it conforms to the standards of the floodplain ordinance. The County and each City enforce their floodplain management ordinance on areas inside the Agency. More detail on the specifics of the floodplain ordinance can be found in Section 4.4.1 of the Base Plan as well as in the City annexes. New AWA facilities and assets will be sited in such a way as to reduce the risk from flooding to the AWA.

Flood: Localized Stormwater Flooding

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

Flooding occurs in areas other than the FEMA mapped 1% and 0.2% annual chance floodplains. Flooding may be from drainages not studied by FEMA, lack of or inadequate drainage infrastructure, or inadequate maintenance. Localized, stormwater flooding occurs throughout the Agency and the Amador County Planning Area, especially during the rainy season from November through April. Prolonged heavy rainfall (including that from atmospheric river events) contributes to a large volume of runoff resulting in high peak flows of moderate duration.

Location and Extent

The AWA is subject to localized flooding throughout the Agency. Areas prone to localized flooding are included in Table F-15 below. Flood extents are usually measured in areas affected, velocity of flooding, and depths of flooding. Expected flood depths in the Agency vary by location. Flood durations in the Agency tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Localized flooding in the Agency tends to have a shorter speed of onset, especially when antecedent rainfall has soaked the ground and reduced its capacity to absorb additional moisture.

Past Occurrences

Disaster Declaration History

There have been no state or federal disaster declarations specific to localized floods. There would most likely have been localized flood events during the 22 state and 20 federal disaster declarations for flood events, including heavy rains and storms, as shown in the previous 1%/0.2% annual chance flood section.

NCDC Events

The NCDC occurrences of localized flooding are included in the 1% and 0.2% annual chance flood hazard profile above where past flood events were noted. These include 43 flood related events for the entire County Planning Area.

AWA Events

The AWA noted that flooding affected the Agency in **February of 2017**. Flooding and heavy rains eroded an embankment at the Preston Pump Station. The erosion extended up to and underneath the pump slab, threatening the stability of the structure. The Agency removed the building, pumps, and pump station from the AWA system. The AWA was granted $377,841 in HMGP funds to replace the pumps and structure.

In addition to the Preston Pump Station, the Amador Canal was damaged near Highway 88. The earth foundation supporting the berm is steep (45° angle). When the supporting earth became saturated, the berm lost support. AWA lowered the water in the canal to reduce pressure on the damaged berm. The AWA was granted $769,920 by FEMA and Cal OES to repair the damages. $12,000 in damages were sustained by the Agency.

Flooding at Mace Meadows on **2/6/2017** created runoff that twice overtopped the AWA Mace Meadow Pump Station. Once floodwaters overtopped the station, 2 60 horsepower electric pumps and contactor switches were burned out. This caused almost $12,000 in damages. On the same day, heavy rains and discharge from a nearby culvert inundated Eggiman Lane, which AWA uses as an easement for pipe access. When the road was washed away, it exposed a 6" pipeline. 480' of pipe was damaged as a result. $50,915 in damages was sustained by the Agency.

In 2023, localized stormwater flooding occurred at the Eagle's Nest Leach Field which limited the operability of the leach field. Additional localized stormwater flooding occurred in the Martell area around Rock Creek where AWA Martell Wastewater Lift Stations 1 &2, and Kmart Lift Station are located. This area is known by DWR to be an area prone to flooding in the DWR 100-Year floodplain delineation, part of the California Department of Water Resources (DWR) Best Available Maps (BAM) Floodplain Awareness program. This caused the lift stations to run continuously for long periods of time, unnecessarily wearing out the lifespan of, and risking damage to, the lift station infrastructure.

The root cause of flood issues is too much rain in narrow drainage areas with poor diversion. Specifically the Camanche and Martell Area Wastewater Lift Stations are most impacted by this as they fall within a flood area known to DWR to be a flood risk.

Climate Change and Localized Flood

It is likely that climate change will increase the chance of future occurrence as well as future impacts from localized flood. Atmospheric river events, occurring in recent years, is thought to be attributed to climate change and reflect storms of greater volume and intensity. More information on future impacts to the Agency can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Even if average annual rainfall may decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century, increasing the likelihood of overwhelming stormwater systems built to historical rainfall and storm averages. This makes localized flooding more likely.

Vulnerability to Localized Flood

Flood vulnerability and their impacts vary by location and severity of any given flood event and will likely only affect certain areas of the Agency during specific times. Based on the risk assessment, it is evident that floods will continue to have potentially significant impacts to certain areas of the Agency. However, while flooding can cause significant impacts, depending on the duration and volume of precipitation and the drainage in any given area, many of the floods in the Agency are minor, localized flood events that are more of a nuisance than a disaster.

Many areas of the Agency are at some measure of vulnerability to localized flooding. An assessment of a community's vulnerability to localized flooding begins with an understanding of local exposure to localized flooding. This is included in the Local Concerns section below followed by a discussion of the Agency's Assets at Risk to this hazard.

Local Concerns

The Agency has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The primary concern is damage to infrastructure and inability to operate and access equipment and systems as needed. The Eagle's Nest Wastewater Leach Field can become saturated and localized flooding can occur during heavy storms preventing proper operation of the system. Other concerns from localized flooding are impacts or losses to or of AWA infrastructure. In 2005, the north side of Ridge Road near Sutter Creek failed. A landslide took out 300 feet of water supply ditch. This supply fed 6 cities/towns. The area was affected for one week. No towns were out of water due to the conservation, stored reserves of water and quick action. No one was completely out of water. Primary water supply is now delivered via pipeline. In February of 2017, flooding and heavy rains eroded an embankment at the Preston Pump Station. The erosion extended up to and underneath the pump slab, threatening the stability of the structure. The Agency removed the building, pumps, and pump station from the AWA system. The AWA was granted $377,841 in HMGP funds to replace the pumps and structure. In addition to the Preston Pump Station, the Amador Canal was damaged near Highway 88. The earth foundation supporting the berm is steep (45° angle). When the supporting earth became saturated, the berm lost support. AWA lowered the water in the canal to reduce pressure on the damaged berm. The AWA was granted $769,920 by FEMA and Cal OES

to repair the damages. $12,000 in damages were sustained by the Agency. Flooding at Mace Meadows on 2/6/2017 created runoff that twice overtopped the AWA Mace Meadow Pump Station. Once floodwaters overtopped the station, 2 60 horsepower electric pumps and contactor switches were burned out. This caused almost $12,000 in damages. On the same day, heavy rains and discharge from a nearby culvert inundated Eggiman Lane, which AWA uses as an easement for pipe access. When the road was washed away, it exposed a 6" pipeline. 480' of pipe was damaged as a result. $50,915 in damages was sustained by the Agency.

The Agency tracks localized flooding areas. Affected localized flood areas identified by the AWA are summarized in Table F-15.

Table F-15 AWA – List of Localized Flooding Problem Areas

Area Name	Flooding	Pavement Deterioration	Washout	High Water	Landslide/ Mudslide	Debris	Downed Trees
LaMel Heights	X	X	X	X	X	X	X
Tanner	X	X	X	X	X	X	X
Buckhorn/CAWP	X	X	X	X	X	X	X
Ione	X	X	X	X	X	X	X
Lake Camanche	X	X	X	X	X	X	X
PG & E at Tiger Creek	X	X	X	X	X	X	X

Source: AWA

Assets at Risk

Assets at risk from this hazard include people and populations served; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All Agency staff and populations served (including vulnerable populations) are traditionally not highly vulnerable to localized flooding, but their structures and contents can be at risk. Localized flooding may also cause transportation issues as roads and lanes are impacted or closed and affect the ability for people to travel throughout the Agency.

Structures and Critical Facilities and Infrastructure

Structures and critical facilities and infrastructure in areas with localized flooding can be affected if floodwaters intrude into the structure. Structures in low lying areas, or those with basements can be at greater risk. Buildings with older foundations that are prone to water intrusion are also at greater risk. Once water finds its way into a structure, it tends to continue to do so until the path that brings water into a structure is mitigated. Structures can also be damaged by trees that have become uprooted and fall during rain and storm events. Large trees falling onto structures can cause significant damage.

As shown in Table F-3, there are structures in the AWA at risk from localized flood.

Natural, Historic, and Cultural Resources

Natural resource assets may have some vulnerabilities to localized flood during major storm events, but can benefit from floodwaters, often by design. Many parks and green spaces are designed to take overflow water and release it into the underlying soils and natural areas. Wetlands areas in the Agency actually help reduce the risk of flooding, as they can absorb excess rainfall that would have to be drained away from impervious surfaces. Flooding can provide many benefits to the natural environment, including recharging wetlands and groundwater, increasing fish production, creating wildlife habitat, and rejuvenating soil fertility. These smaller localized flooding events often provide more benefits to the environment in comparison to negative impacts associated with large flood events. Historic and cultural resources may be at some measure of vulnerability if they are located in areas subject to repeated localized flooding.

Impacts from Localized Flood

Primary concerns associated with stormwater flooding include impacts to infrastructure that provide a means of ingress and egress throughout the community. Ground saturation can result in instability, collapse, or other damage to trees, structures, roadways and other critical Agency infrastructure. Objects can also be buried or destroyed through sediment deposition. Floodwaters can break utility lines and interrupt services to Agency facilities. Standing water can cause damage to crops, roads, and foundations of Agency facilities. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, losses of environmental resources, and certain health hazards.

Life safety issues from localized flooding would be more limited. The amount and type of damage or flooding that occurs varies from year to year and from storm to storm, depending on the quantity of precipitation and runoff.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the Agency may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the AWA include the following:

- As discussed in the hazard profile section, climate change is anticipated to exacerbate this hazard over time.
- While population projections for the area served by the Agency show additional expected growth, these anticipated future changes in population are expected to be relatively small, which is unlikely to affect this hazard and associated impacts to the Agency. The Agency may add staff, but this number would be small. The Agency noted it has no control over population changes in its Service Area, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the Agency are expected to be limited in the near future and thus are not likely to affect flooding and associated impacts to the Agency. Additional development

traditionally leads to additional flooding. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the Agency to this hazard.

The Agency noted that post-construction runoff impact occurs by changing the natural hydrology of a land area through the creation of new impervious surfaces during development. Increased impervious surfaces interrupts the natural cycle of gradual percolation of water through vegetation and soil by altering the timing and quantity of peak flows. Instead, water is collected from surfaces such as asphalt and concrete and routed to drainage systems where large volumes of runoff quickly flow to the nearest receiving waterway. The effects of this process include stream bank scouring, bank erosion and downstream flooding, which often lead to a loss of aquatic life and damage to property. The risk of stormwater/localized flooding to the Agency, including future development, can be minimized by accurate recordkeeping of repetitive localized storm activity. Mitigating the root causes of the localized stormwater or choosing not to develop in areas that often are subject to localized flooding will reduce future risks of losses due to stormwater/localized flooding. Future development in the Agency will add to the drainage issues already faced by the Agency, unless adequate drainage facilities are installed in new development locations.

Landslide, Mudslide, and Debris Flow

Likelihood of Future Occurrence–Likely
Vulnerability–High

Hazard Profile

Like its earthquake-generating faults, California's mountainous terrain is a consequence of dynamic geologic processes in operation as the North American Plate grinds past the Pacific Plate. According to the CGS, a landslide is a general term for a variety of mass-movement processes that generate a down-slope movement of mud, soil, rock, and/or vegetation. Landslides are classified into many different types based on form and type of movement. They range from slow-moving rotational slumps and earth flows, which can slowly distress structures but are less threatening to personal safety, to fast-moving rock avalanches and debris flows that are a serious threat to structures and have been responsible for most fatalities during landslide events. For the purposes of this LHMP Update, the term landslide includes mudslides, debris flows, and rockfalls that tend to occur suddenly; as well as hillside erosion, which is a similar process that tends to occur on smaller scales and more gradually but can exacerbate landslide events.

Landslides, debris flows and mudslides are closely related to flooding, as both processes are related to precipitation, runoff, and the saturation of ground by water. In addition, landslides, mud flows, and debris flows can occur on small, steep stream channels and are often mistaken for floods. However, landslide events may be much more destructive than floods because of their higher densities, high debris loads, and high velocities.

Soil erosion is another common form of soil instability. Erosion is a function of soil type, slope, rainfall intensity, and groundcover. It accounts for a loss in many dollars of valuable soil, is aesthetically displeasing, and often induces even greater rates of erosion and sedimentation. Sedimentation is simply the accumulation of soil as a result of erosion. Construction activities often contribute greatly to erosion

and sedimentation. Besides being a pollutant in its own right, sediment acts as a transport medium for other pollutants, especially nutrients, pesticides, and heavy metals, which adhere to the eroded soil particles. As the sediment drains into watercourses, the combination of these pollutants adversely affects water quality.

Natural conditions that contribute to landslide, mudslides, debris flows, hillside and streambank erosion, include the following:

- Degree of slope
- Water (heavy rain, river flows, or wave action)
- Unconsolidated soil or soft rock and sediments
- Lack of vegetation (no stabilizing root structure)
- Previous wildfires and other forest disturbances (discussed in the Wildfire section below)
- Road building, excavation, and grading
- Earthquake

The 2023 California State Hazard Mitigation Plan noted that more than one third of California is mountainous terrain that generally trends parallel to the coast, forming a barrier that captures moisture from offshore storms originating in the Gulf of Alaska and Mexico. Steep topography, weak rocks, heavy winter rains, and occasional earthquakes all lead to slope failures more frequently than would otherwise occur under gravity alone.

Location and Extent

Landslides can occur in areas with steep slopes and weak soils. It can also occur in areas where erosion has previously occurred. Both winter storms (precipitation-induced) and earthquake triggered landslides tend to occur in or near places that have experienced previous landslides. However, landslides may also occur in other locations over time. Landslides may also occur in fire burn scar areas.

Figure F-11 shows the CGS areas at susceptible to deep-seated landslides. The legend on Figure F-11 shows the susceptibility scale (from 0-X with 0 being the least and X being the most susceptible) that the CGS uses to show the susceptibility of landslides. It is a primarily a combination of slope class and rock strength. Geographic extents of these classes are shown on Table F-16. According to the 2023 State Hazard Mitigation Plan, the susceptibility classes were further categorized into Very High (susceptibility class X) and High (susceptibility classes VII, VIII, & IX) for exposure analysis. The rest of the classes were not categorized. CGS mapping indicates that portions of the Agency and surrounding area are at high to very high susceptibility areas for landslides. This can be seen in the darker orange and red colors. The speed of onset of landslide is often short, especially in past landslide areas as well as in post-wildfire burn scar areas, but it can also take years for a slope to fail. Landslide duration is usually short, though digging out and repairing landslide areas can take some time.

Figure F-11 AWA – Susceptibility to Deep-Seated Landslides

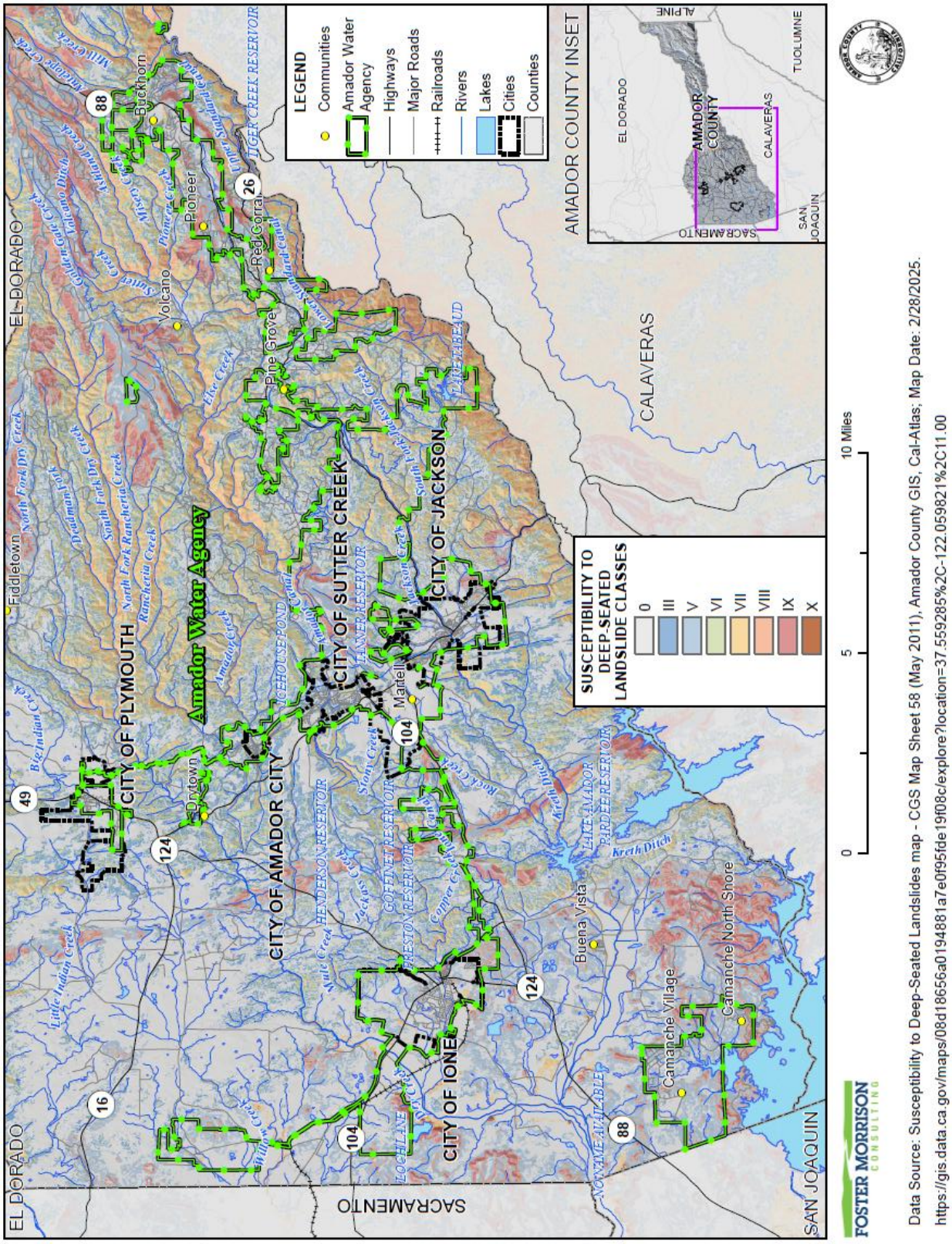


Table F-16 AWA – Susceptibility to Deep-Seated Landslide Geographical Extents by Class

AWA Jurisdiction / Susceptibility to Deep-Seated Landslide Class	Total Acres	% of Total Acres*	Improved Acres	% of Total Improved Acres*	Unimproved Acres	% of Total Unimproved Acres*
Amador City						
0	34	0.009%	13	0.008%	21	0.009%
III	57	0.01%	21	0.01%	36	0.02%
V	0	0.0%	0	0.0%	0	0.0%
VI	59	0.02%	16	0.009%	43	0.02%
VII	43	0.01%	9	0.005%	34	0.02%
VIII	5	0.001%	2	0.001%	3	0.001%
IX	0	0.0%	0	0.0%	0	0.0%
X	0	0.0%	0	0.0%	0	0.0%
Amador City Total	**198**	**0.05%**	**61**	**0.04%**	**137**	**0.06%**
Ione						
0	2,023	0.52%	507	0.30%	1,516	0.69%
III	134	0.03%	0	0.00002%	134	0.06%
V	570	0.15%	126	0.07%	444	0.20%
VI	60	0.02%	0	0.0%	60	0.03%
VII	102	0.03%	35	0.02%	68	0.03%
VIII	59	0.02%	16	0.009%	44	0.02%
IX	25	0.006%	6	0.004%	18	0.008%
X	0	0.0%	0	0.0%	0	0.0%
Ione Total	**2,973**	**0.77%**	**690**	**0.41%**	**2,283**	**1.04%**
Jackson						
0	1,569	0.40%	561	0.33%	1,009	0.46%
III	419	0.11%	132	0.08%	287	0.13%
V	61	0.02%	30	0.02%	31	0.01%
VI	145	0.04%	38	0.02%	107	0.05%
VII	70	0.02%	12	0.01%	57	0.03%
VIII	33	0.01%	8	0.00%	25	0.01%
IX	3	0.001%	1	0.0005%	3	0.00%
X	0	0.0%	0	0.0%	0	0.0%
Jackson Total	**2,302**	**0.59%**	**782**	**0.47%**	**1,520**	**0.69%**
Plymouth						
0	1,271	0.33%	572	0.34%	698	0.32%

AWA Jurisdiction / Susceptibility to Deep-Seated Landslide Class	Total Acres	% of Total Acres*	Improved Acres	% of Total Improved Acres*	Unimproved Acres	% of Total Unimproved Acres*
III	267	0.07%	26	0.02%	240	0.11%
V	0	0.0%	0	0.0%	0	0.0%
VI	124	0.03%	1	0.001%	124	0.06%
VII	34	0.009%	0	0.0%	34	0.02%
VIII	1	0.0004%	0	0.0%	1	0.001%
IX	0	0.0%	0	0.0%	0	0.0%
X	0	0.0%	0	0.0%	0	0.0%
Plymouth Total	**1,698**	**0.44%**	**600**	**0.36%**	**1,098**	**0.50%**
Sutter Creek						
0	1,164	0.30%	546	0.33%	618	0.28%
III	315	0.08%	134	0.08%	181	0.08%
V	33	0.008%	9	0.006%	23	0.01%
VI	137	0.04%	57	0.03%	80	0.04%
VII	48	0.01%	14	0.008%	34	0.02%
VIII	10	0.00%	2	0.001%	8	0.004%
IX	2	0.0005%	0	0.0001%	2	0.001%
X	0	0.0%	0	0.0%	0	0.0%
Sutter Creek Total	**1,709**	**0.44%**	**762**	**0.45%**	**947**	**0.43%**
Unincorporated Amador County						
0	140,569	36%	77,398	46%	63,170	29%
III	54,223	14%	25,575	15%	28,647	13%
V	35,424	9%	14,510	9%	20,914	10%
VI	42,155	11%	17,541	10%	24,614	11%
VII	47,138	12%	15,997	10%	31,141	14%
VIII	36,230	9%	8,611	5%	27,619	13%
IX	23,505	6%	5,578	3%	17,927	8%
X	137	0.04%	21	0.01%	116	0.1%
Unincorporated Amador County Total	**379,381**	**98%**	**165,231**	**98%**	**214,150**	**97%**
Grand Total	**388,260**	**100%**	**168,125**	**100%**	**220,134**	**100%**

Source: CGS

*This represents the percentage of the total of AWA's Planning Area. It is not a percentage of each jurisdiction served by the AWA.

Past Occurrences

Disaster Declarations

There have been no disaster declarations associated with just landslides in Amador County; however, as shown in Table F-17, there have been 9 state and 10 federal disaster declarations for flood (including heavy rains and storms) which included landslides as a component.

Table F-17 Amador County – Federal and State Disaster Declarations Summary 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (events that included landslide)	9	1995 (twice), 2006 (twice), 2017 (twice), 2019, 2023 (twice)	10	1995 (twice), 2006 (twice), 2017 (twice), 2019, 2023 (three)

Source: Cal OES, FEMA. Retrieved March 2025.

NCDC Events

The NCDC contains no records for landslides in Amador County, but there was one record for debris flow. This was not known to affect the Agency.

AWA Past Occurrences

In **2005**, the north side of Ridge Road near Sutter Creek failed. A landslide took out 300 feet of water supply ditch. This supply fed 6 cities/towns. The area was affected for one week. No towns were out of water due to the conservation, stored reserves of water and quick action. No one was completely out of water. Primary water supply is now delivered via pipeline.

The AWA noted that flooding affected the Agency in February of **2017**. Flooding and heavy rains eroded an embankment at the Preston Pump Station. The erosion extended up to and underneath the pump slab, threatening the stability of the structure. The Agency removed the building, pumps, and pump station from the AWA system. The AWA was granted $377,841 in HMGP funds to replace the pumps and structure.

In addition to the Preston Pump Station, the Amador Canal was damaged near Highway 88. The earth foundation supporting the berm is steep (45° angle). When the supporting earth became saturated, the berm lost support. AWA lowered the water in the canal to reduce pressure on the damaged berm. The AWA was granted $769,920 by FEMA and Cal OES to repair the damages. $12,000 in damages were sustained by the Agency.

Flooding at Mace Meadows on **2/6/2017** created runoff that twice overtopped the AWA Mace Meadow Pump Station. Once floodwaters overtopped the station, 2 60-horsepower electric pumps and contactor switches were burned out. This caused almost $12,000 in damages. On the same day, heavy rains and discharge from a nearby culvert inundated Eggiman Lane, which AWA uses as an easement for pipe access. When the road was washed away, it exposed a 6" pipeline. 480' of pipe was damaged as a result. $50,915 in damages was sustained by the Agency.

AWA has had multiple small landslides/hillside erosions on canals which washout portions of canal embankments requiring continuous maintenance and repairs since 2020. In **October 2021**, the Tanner Water Treatment Plant experienced an inability to produce potable water due to fluctuating quality of intake water coming from Lake Tabeaud suspected to be caused by debris flow. The treatment operations became so disrupted that wholesale water delivery was terminated temporarily to the towns of Plymouth and Jackson for several hours to prevent the AWA clearwell cover from being damaged, prompting the City of Plymouth to issue a CodeRed alert to immediately conserve water. The location of the debris flow was never determined, but the debris was determined to be an inundation of moss, and was suspected to be caused by a landslide or mudslide of some kind due to the heavy rains in that month.

Climate Change and Landslide and Debris Flows

According to the 2021 CAS, climate change may result in precipitation extremes (i.e., wetter wet periods and drier dry periods). More information on precipitation increases can be found in Section 4.3.4 of the Base Plan. While total average annual rainfall may decrease only slightly, rainfall is predicted to occur in fewer, more intense precipitation events. The combination of a generally drier climate in the future, which will increase the chance of drought and wildfires, and the occasional extreme downpour is likely to cause more mudslides, landslides, and debris flows.

Vulnerability from Landslide

Portions of the Agency are at some measure of vulnerability to landslide. This is true when atmospheric rivers or heavy rain and storm events occur. An assessment of a community's vulnerability to landslide begins with an understanding of local exposure to landslide. This is included in the Local Concerns section below followed by a discussion of the Agency's Assets at Risk to this hazard.

Local Concerns

The Agency has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Land/mudslides, and debris flow occur at various times throughout the year, there are several areas of concern unique to the Agency. Historically the Agency has been at risk for the above referenced events, primarily during the winter and spring months when waterways swell due to heavy rainfall. These events may produce hazards in multiple areas of the Agency, and can cause an impact to their canals, tanks, pipelines, treatment plants, private roadways, and pump stations. Historically the Agency has suffered loss or financial burden due to past events. Overall vulnerability to land/mudslides in the Agency is low to moderate but the Agency continues to monitor known areas at risk with the intent to minimize the impact to customers.

The main concerns AWA has regarding landslides, mudslides, hillside erosion and debris flow are severe or complete disruption to supply water to the three main AWA water treatment plants. This ranges from complete disconnection of supply water to or from the Lake Tabeaud or the Tiger Creek Regulator, or causing excessive debris flow which overloads the water treatment plants ability to reliably produce potable

water , or damage to the PG&E canals and infrastructure which supply the water to the aforementioned Lake and Regulator.

Assets at Risk

Assets at risk from this hazard include people and populations served; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations (both Agency staff and the population served) located within areas of landslide susceptibility, especially in the High to Very High hazard areas (i.e., Classes VII to X) are at some vulnerability to landslide. This includes those people residing in these landslide potential areas as well as those that might reside or work within the landslide run out areas. People residing in these areas as well as Agency staff may also be cut off from transportation routes if roads and streets providing a means of ingress and egress are impacted. Certain vulnerable populations may be at greater risk due to the often sudden onset of a landslide event and include: the unsheltered, those with limited mobility, and those that lack the resources to leave the area.

Agency staff and residents that live in the High and Very High landslide susceptibility areas are often the most vulnerable, but those who live in in the landslide run out areas (which are not mapped) are also vulnerable.

Structures and Critical Facilities and Infrastructure

Landslides can affect the built environment of the Agency and those structures and critical facilities located within the High to Very High hazard areas (i.e., Classes VII to X) are especially vulnerable, as are the structures located within the landslide run out areas. As shown in Table F-3, there are multiple structures in the AWA at risk from landslide, mudslide, or debris flow.

Natural, Historic, and Cultural Resources

Landslides can affect natural, historic, and cultural resources that lie in the landslide area, or the landslide run out area. Landslides can destroy large tracts of forest and open space areas, destroy wildlife habitat, and remove productive soils and vegetation from slopes. It can also fill in waterways, impact water quality, and potentially affect flooding potential. Natural resources that fall in the High or Very High susceptibility areas shown on Figure F-11 would be most vulnerable, as well as those in the run-out areas. As shown on the map, this would include a relatively small area of the developed area Agency, since most of this occurs in the less developed areas of the Agency.

Impacts from Landslide

Any type of landslide may result in damages or complete destruction of buildings in their path, as well as deaths and injuries. Landslides can cause road blockages by depositing debris on road surfaces or road damage if the road surface itself slides downhill. Utility lines and pipes are also prone to breakage in slide areas. Large landslides can collapse into water bodies, causing seiches. Landslides can relocate river

channels. Landslides and debris flows can also impact water quality and the storage capacity of surface water reservoirs used to store potable water.

Landslides, debris flows, and mud flows impacts vary by location and severity of any given event and will likely only affect certain areas of the Agency susceptible to landslide. Based on the risk assessment, there is limited potential for significant landslides to occur in the Agency. Most, but not all, of the historic landslides in the Agency have been minor, localized events that are more of a nuisance than a disaster. Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility; and
- Significant economic impact (jobs, sales, tax revenue) to the community.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the Agency may be affected in the future by climate change (which was discussed in the hazard profile above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the Agency include the following:

- Climate change is likely to exacerbate future landslide, mudslide, and debris flow conditions and associated impacts and vulnerability of the Agency to landslide.
- While population projections for the area served by the Agency show additional expected growth, these anticipated future changes in population are expected to be relatively small, which limits additional landslide impacts to the Agency. The Agency noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.
- It is unknown how changes in land use and development will affect landslide in the Agency. Building that occurs in the VI or higher deep seated landslide classes may increase risk to additional lands and Agency assets. County building codes are in effect to reduce this risk and should be updated as necessary to continue to address future landslide or erosion conditions.

Future Development

Additional growth and development within moderate or higher deep-seated landslide susceptibility classes in the Agency would place additional values at risk to landslide. New Agency facilities will take landslide into account when siting new facilities.

Severe Weather: Extreme Cold, Freeze, and Snow

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

According to the National Weather Service (NWS) and the Western Regional Climate Center (WRCC), extreme cold often accompanies a winter storm or is left in its wake. Snow can occur during these events. Prolonged exposure to cold can cause frostbite or hypothermia and can be life-threatening. Infants and the elderly are most susceptible, as are the unhoused, and outdoor workers. Pipes may freeze and burst in homes or buildings that are poorly insulated or without heat. Freezing temperatures can cause significant damage to the agricultural industry.

Location and Extent

Due to size of the County and changes in elevation (i.e., from approximately 250 feet to almost 10,000 feet above mean sea level (msl)) and climate, weather conditions can vary greatly across the County. The Agency falls in western Amador County, which is predominantly below an elevation of 2,000 feet above msl, is generally below the snowfall line, and includes the land to the west (including all incorporated communities). According to the WRCC, in western Amador County monthly average minimum temperatures from November through April range from the upper-30s to mid-50s. The lowest recorded daily extreme was 20°F on December 20, 1998. In a typical year, minimum temperatures fall below 32°F on 5.2 days with no days falling below 0°F. The CAWP, La Mel, and Tiger Creek systems get snow and freezing weather and the lower elevations can get freezing weather.

Past Occurrences

Disaster Declaration History

The County has had no past federal and one past state (2007) disaster declarations for extreme cold and freeze. There have been two freeze events in 2022 that resulted in USDA disaster declarations.

NCDC Events

The NCDC data shows 575 extreme cold, freeze, and snow incidents for Amador County since 1993, some of which likely affected the Agency.

AWA Events

The Agency noted that freeze and winter storm is a regional phenomenon; events that affected the lower elevations of the County also affected the Agency. Those past occurrences were shown in the Base Plan in Section 4.2.5.

There have been past events that have affected the Agency. In **2003** a severe winter storm affected most of Pioneer. Downed power lines were widely reported. There were multiple road closures. The power outage

associated with this storm affected the Agency's ability to run the Buckhorn water treatment plant and pump stations that pump the water to the required Service Areas. AWA personnel had to move portable generators to critical infrastructure that had lost power. During snow and freezing events, the Agency is unable to recycle backwash water at the Buckhorn plant due to the drying beds freezing. Snow and icy conditions make it difficult to access treatment plants, pump stations, and other critical infrastructure needed to remain in service.

While extreme cold, snow, and freezing weather are a common occurrence during the winter months, the Agency could not recall specific events resulting in notable damages since the 2020 LHMP.

Climate Change and Extreme Cold, Freeze, and Snow

According to the CAS, freezing spells and snow are likely to become less frequent in California as climate temperatures increase; if emissions increase, freezing events could occur only once per decade in large portion of the State by the second half of the 21st century. According to a California Natural Resources Report in 2014, it was determined that while fewer freezing spells would decrease cold related health effects, too few freezes could lead to increased incidence of disease as vectors and pathogens do not die off.

Vulnerability to Extreme Cold, Freeze, and Snow

Extreme cold and freeze events happen in the Agency each year. Snow can occur, but it is rare. Cold and freeze can impact both structures and populations in the Planning Area. The whole of the Agency and County Planning Area has some measure of vulnerability to extreme cold and freeze.

An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to Agency. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect the Agency. These sections include assets at risk, impacts, and how future development and future conditions can be affected by this hazard.

Local Concerns

The Agency has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The Agency experiences temperatures below 32 degrees during the winter months. The temperature moves to the teens in rather extreme situations, especially in the upper elevations of the Agency. While it is rare for buildings to be affected directly by freeze, damages to pipes that feed building can be damaged during periods of extreme cold. The Agency is unable to recycle backwash water at the Buckhorn plant due to the drying beds freezing. Extreme cold and freeze can affect critical facilities and infrastructure, down trees, break pipes, and can be a life safety issue. Meter readers are unable to read meters. Increase in customer calls for broken and frozen pipes. Frozen distribution pipes lead to no water calls and breaks. When extreme cold is coupled with high winds or ice storms, power lines may be downed, resulting in an interruption of utilities and critical services. Occasionally, winter storms with snow and ice can affect the Agency. Snow load on facility roofs cause damage. Heat tape added to eaves of roofs to keep snow load to a minimum.

Transportation networks, communications, and utilities infrastructure are the most vulnerable physical assets in the Agency. Snow and icy conditions make it difficult to access the facilities The ability for the Agency to continue to operate during periods of winter storm and freeze is paramount.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All Agency staff and population the Agency serve are at some vulnerability to extreme cold, freeze, and snow. Some employees may face a risk while working outdoors. All populations served by the Agency are vulnerable to extreme cold and freeze, but this hazard generally affects people spending large amounts of time outside (including Agency staff). Prolonged exposure to cold can cause frostbite or hypothermia and can be life-threatening. Vulnerable populations to cold and freeze include the unhoused; individuals who exercise or train outdoors; outdoor workers; individuals that lack the resources to afford heat; and the young, old, or medically fragile individuals that are more susceptible to cold related impacts. In addition to vulnerable populations, pets and livestock are at risk to freeze and cold. Since snow is rare, its effect on people and populations are minimal.

Structures and Critical Facilities and Infrastructure

Structures and critical facilities and infrastructure in the Agency have some measure of risk from extreme cold and freeze. Buildings can be affected directly by freeze, pipes that feed buildings can be damaged during periods of extreme cold and cause water damage and other related impacts to a structure. Structures can also be damaged by downed trees during freeze and winter storm events. Snowfall can occur, but it is usually not heavy enough to damage structures. Transportation networks, communications, and utilities infrastructure are the most vulnerable physical assets in the Agency. Infrastructure such as roads, highways, and bridges can become slippery, causing accidents and road closures.

As shown in Table F-3, there are structures in the AWA at risk from extreme cold, freeze, and snow.

Natural, Historic, and Cultural Resources

Depending on how low the temperatures go and the duration of an extreme cold and freeze event, natural resources in the Agency may be affected. During periods of freeze, trees in the Agency may be damaged. This is especially true if a freeze occurs during a winter storm with winds and precipitation. Other natural resources like wildlife may be at risk during a period of freeze. While it is rare for historic buildings to be affected directly by freeze, damages to pipes that feed historic buildings can be damaged during periods of extreme cold and cause additional impacts to the structures. Snow is relatively rare and is unlikely to affect natural, historic, or cultural facilities.

Impacts from Severe Weather: Extreme Cold, Freeze, and Snow

Extreme cold and freeze can affect critical facilities and infrastructure, down trees, break pipes, and can be a life safety issue. Transportation networks, communications, and utilities infrastructure are often the most vulnerable physical assets in the Agency. Infrastructure such as roads and utilities are at risk to freezing temperatures and snow, causing failures and hazardous road conditions. When extreme cold is coupled with high winds, snows, and freezing storms, power lines may be downed, resulting in power outages and an interruption of utilities and critical services. During periods of extremely low or prolonged cold temperatures, other impacts to the Agency can include interruption in business and school activities.

The elderly, the young, and those experiencing medical issues are often more vulnerable to temperature extremes, but anyone can be affected. Exposure to cold temperatures can cause hypothermia and frostbite. Those exercising or recreating outdoors, outdoor workers, and the unhoused may be at a higher risk.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the Agency may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on these factors for the Agency include the following:

- Climate change is unlikely to exacerbate extreme cold, freeze, and snow and their associated impacts to the Agency.
- While population projections for the area served by the Agency show additional expected growth, these anticipated future changes in population are expected to be relatively small, which limits additional extreme cold, freeze, and snow impacts to the Agency. The Agency noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development are expected to be limited in the near future and thus are not likely to affect extreme cold and freeze and associated impacts to the Agency. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the Agency to this hazard.

Future development built to code should be able to withstand extreme cold and freeze. Pipes at risk of freezing should be mitigated by either burying or insulating them from freeze as new facilities are improved or added. Current Amador County codes provide such provisions for new construction. New wells and appurtenances will be built inside insulated buildings, reducing the risk of loss of potable water due to frozen pipes.

Severe Weather: Extreme Heat

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

According to FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and lasts for several weeks. Heat kills by taxing the human body beyond its abilities. In extreme heat and high humidity, evaporation is slowed, and the body must work extra hard to maintain a normal temperature." Most heat disorders occur because the victim has been overexposed to heat or has over-exercised for his or her age and physical condition. Older adults, young children, those who are sick or overweight, and those that work or recreate outdoors are more likely to experience heat exhaustion or succumb to extreme heat.

In addition to the risks faced by populations of the Agency, there are risks to the built environment from extreme heat. While extreme heat on its own does not usually affect structures, extreme heat during times of drought can cause wildfire risk to heighten. Extreme heat can lead to interruptions in power, power outages, and when combined with high winds, to Public Safety Power Shutdown (PSPS) events, creating significant issues in the Agency.

Location and Extent

Extreme heat events occur on a regional basis. Extreme heat can occur in any location of the Agency. Extreme heat occurs throughout the Agency primarily during the summer months.

The NWS has in place a system to initiate alert procedures (advisories or warnings) when extreme heat is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. The NWS HeatRisk forecast provides a quick view of heat risk potential over the upcoming seven days. The heat risk is portrayed in a numeric (0-4) and color (green/yellow/orange/red/magenta) scale which is similar in approach to the Air Quality Index (AQI) or the UV Index. This can be seen in Section 4.3.3 of the Base Plan.

Past Occurrences

Disaster Declaration History

There have been no federal or state disaster declarations from extreme heat.

NCDC Events

The NCDC data shows 124 extreme heat incidents for Amador County since 1993, some of which likely affected the Agency.

AWA Events

The Agency Planning Team note that since extreme heat is a regional phenomenon, events that affected the County also affected the Agency. Those past occurrences were shown in the Base Plan in Section 4.2.2.

Extreme heat and high winds can cause Public Safety Power Shutoff (PSPS) events, causing issues to buildings in the Agency. The Agency was affected by a PSPS event on **September 7-8, 2020**. This event caused AWA electrical generators to be moved in order to keep critical infrastructure running in the affected areas around Pioneer and Pine Grove, leading to a loss of revenue.

The **2015 Butte Fire, 2021 Caldor Fire and 2022 Electra Fire** were all exacerbated by extreme heat. Extreme heat events also impact customers during droughts as water conservation measures reduce the water available for cooling. This was evident during the droughts from **2007-2009, 2012-2017, and 2020-2023**.

Climate Change and Extreme Heat

The California Climate Adaptation Strategy (CAS), citing a California Energy Commission study, states that "over the past 15 years, heat waves have claimed more lives in California than all other declared disaster events combined." This study shows that California is getting warmer, leading to an increased frequency, magnitude, and duration of heat waves. These factors may lead to increased mortality from excessive heat.

As temperatures increase, California and Amador County will face increased risk of death from dehydration, heat stroke, heat exhaustion, heart attack, stroke and respiratory distress caused by extreme heat. According to the 2013 California Climate Adaptation Study (CAS) report and the 2023 State of California Hazard Mitigation Plan, by 2100, hotter temperatures are expected throughout the state, with projected increases of 3-5.5°F (under a lower emissions scenario) to 8-10.5°F (under a higher emissions scenario). These changes could lead to an increase in deaths related to extreme heat in Amador County.

Vulnerability to Severe Weather: Extreme Heat

Extreme heat is becoming more frequent, intense, longer lasting and geographically widespread. Extreme heat occurs on an annual basis in the County and the Agency. In recent years, compounded by climate change conditions, summer months continue to get a bit hotter. The whole of the Agency is at some measure of vulnerability to extreme heat. An assessment of a community's vulnerability to extreme heat begins with an understanding of local exposure to extreme heat. This is included in the Local Concerns section below followed by a discussion of the Agency's Assets at Risk to this hazard.

Local Concerns

The Agency has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Extreme heat affects the Agency's ability to perform operation and maintenance. Additional need to purchase stand-by generator equipment, increasing costs in fuel and manpower to keep equipment fueled

and running. The generators are required during a PSPS to run the following facilities such as Pump Stations, Sewer Lift Stations, Water and Wastewater Treatment Plants, Administration offices and Communication systems such as radio, landlines and cell phones. It does have an effect to adequately supply water for fire protection during severe heat and wind events.

In addition, a wildfire is exacerbated when combined with extreme heat, drought, and climate change. A wildfire is the most eminent hazard to all AWA Service Areas.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All Agency staff and population the Agency serve are at some vulnerability to extreme heat. Those Agency employees that work outdoors or inside facilities without proper cooling systems are likely to be most affected by extreme heat conditions.

Extreme heat can also affect air quality conditions making certain populations more vulnerable to heat related issues. All populations served by the Agency are vulnerable to extreme heat, but it generally affects people spending large amounts of time outside or without means of cooling indoor structures. During extended periods of high temperatures, extreme heat may overload the demands for electricity to run air conditioners and can present health concerns to individuals. When interruptions in power occur during extreme heat, the risk of heat related illnesses and deaths increase. Extreme heat is a significant concern to vulnerable populations. The unhoused; individuals who exercise or train outdoors; outdoor workers (like Agency staff); individuals that lack the resources to afford heat; and the young, old, or medically fragile individuals are more susceptible to heat related impacts. In addition to vulnerable populations, pets and livestock are at risk to extreme heat conditions.

Structures and Critical Facilities and Infrastructure

Extreme heat normally does not generally impact structures and critical facilities and infrastructure, but individuals working in structures may be affected during periods of extended heat, especially in structures that might not be equipped with air conditioning or other means of cooling. The Agency noted that extreme heat has caused interruptions to power in the past. Also depending on the structure, sensitive contents such as IT equipment can be impacted, especially if a power outage occurs.

As shown in Table F-3, there are structures in the AWA at risk from extreme heat.

Natural, Historic, and Cultural Resources

Natural resource assets, including those located in Agency, may be vulnerable during periods of extreme heat. These include turfed areas; landscapes, Agency trees, wildlife and habitat areas, and wetlands and marsh lands. Recently, trees were lost in areas of the Agency that were weakened by drought and extreme heat. Extreme heat may also cause drought-like conditions, contributing to other issues. For example,

several weeks of extreme heat increases evapotranspiration and reduces moisture content in vegetation, leading to higher wildfire vulnerability in the region for that time period, even if the rest of the season is relatively moist. Extreme heat can also contribute to an increase in algae blooms which has affected AWA operations in the past. Historic and cultural resources are not expected to be affected by extreme heat.

Impacts from Severe Weather: Extreme Heat

The Agency experiences temperatures in excess of 100°F during the summer and fall months. The temperature moves to 105-110°F in rather extreme situations. During these times, drought conditions may worsen, and the Agency may see an increase in dry fuels. Also, power outage and PSPS events may occur during these times as well. Health issues are a primary concern with this hazard, especially to vulnerable populations, although economic impacts can also be an issue.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the Agency may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for Agency include the following:

- As discussed in the hazard profile section, climate change is anticipated to exacerbate this hazard over time.
- While population projections for the area served by the Agency show additional expected growth, these anticipated future changes in population are expected to be relatively small, which is unlikely to affect this hazard and associated impacts to the Agency. The Agency may add staff, but this number would be small. The Agency noted it has no control over population changes in its Service Area, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the Agency are expected to be limited in the near future and thus are not likely to affect heat and associated impacts to the Agency. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the Agency to this hazard.

Future development in the Agency will take extreme heat into account. In the event of grid-tied power outages, a reliable backup power source must be included in development plans. Additionally, implementing energy efficiency and conservation efforts to reduce stress on electricity systems during heat waves.

Severe Weather: Heavy Rains and Storms

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

Storms in the Agency occur annually and are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the Agency falls mainly in the fall, winter, and spring months. Wind often accompanies these storms; hail and lightning are rare in the Agency.

Location and Extent

Heavy rain events occur on a regional basis. Rains and storms can occur in any location of the Agency. All portions of the Agency are at risk to heavy rains and storms. Most of the severe rains occur during the fall, winter, and spring months in the Agency as discussed below (with problem flooding areas associated with heavy rains and storms shown in Table F-15 in the Flood: Localized Stormwater section). There is no scale by which heavy rains and severe storms are measured. Magnitude of storms is measured often in rainfall and damages. The speed of onset of heavy rains can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Hail and lightning are rarer in the Agency and Amador County. Duration of severe storms in the Agency can range from minutes to hours to days. Information on precipitation extremes can be found in Section 4.3.4 of the Base Plan.

Past Occurrences

Disaster Declaration History

According to historical hazard data, severe weather, including heavy rains and storms, is an annual occurrence in the Agency. This contributes to many of the federal disaster declarations related to flooding. Disaster declarations from flooding, including heavy rains and storms, are shown on Table F-18.

Table F-18 Amador County – State and Federal Disaster Declarations from Flood (Heavy Rain and Storms) 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	22	1950, 1955, 1958 (twice), 1959, 1963, 1964, 1969, 1980, 1982, 1986, 1995 (twice), 1997, 2006 (twice), 2017 (twice), 2019, 2021, 2023 (twice)	20	1950, 1955, 1958, 1962, 1963, 1964, 1969, 1986, 1995 (twice), 1997, 1998, 2006 (twice), 2017 (twice), 2019, 2023 (three)

Source: Cal OES, FEMA

NCDC Events

The NCDC data recorded 114 hail, heavy rain, and storm incidents for Amador County since 1950. Winter weather events tend to be rain in the lower elevations of the County, while snow falls in the upper elevations.

AWA Events

According to historical hazard data, severe weather, including heavy rains and storms, is an annual occurrence in the Agency. This is the cause of many of the federal disaster declarations related to flooding.

The AWA noted that flooding affected the Agency in February of **2017**. Flooding and heavy rains eroded an embankment at the Preston Pump Station. The erosion extended up to and underneath the pump slab, threatening the stability of the structure. The Agency removed the building, pumps, and pump station from the AWA system. The AWA was granted $377,841 in HMGP funds to replace the pumps and structure.

In addition to the Preston Pump Station, the Amador Canal was damaged near Highway 88. The earth foundation supporting the berm is steep (45° angle). When the supporting earth became saturated, the berm lost support. AWA lowered the water in the canal to reduce pressure on the damaged berm. The AWA was granted $769,920 by FEMA and Cal OES to repair the damages. $12,000 in damages were sustained by the Agency.

Flooding at Mace Meadows **on 2/6/2017** created runoff that twice overtopped the AWA Mace Meadow Pump Station. Once floodwaters overtopped the station, 2 60 horsepower electric pumps and contactor switches were burned out. This caused almost $12,000 in damages. On the same day, heavy rains and discharge from a nearby culvert inundated Eggiman Lane, which AWA uses as an easement for pipe access. When the road was washed away, it exposed a 6" pipeline. 480' of pipe was damaged as a result. $50,915 in damages was sustained by the Agency.

In **Late December 2022 to mid-January 2023,** the severe storms caused widespread damages across the county and specifically to the AWA Administrative Office roof and AC units ($25,200), AWA Operations Shop Building ($81,277), two water storage tanks in the Camanche Service Area ($135,000), the Camanche Wastewater Storage Pond, and the Ione Water Treatment Plant ($25,000 for electrical poles, water filters, ancillary electrical equipment, and water treatment plant roof). These costs do not include the 400 regular man-hours and 132 overtime man-hours AWA personnel spent to repair the impacts of these storms.

Climate Change and Heavy Rains and Storms

It is likely that climate change will increase the chance of future occurrence as well as future impacts from heavy rains and storms. More information on future impacts to the Agency can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

According to the CAS, while average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is unlikely that hail will become more common in Amador County and the AWA. The amount of lightning is not projected to change.

Cal-Adapt noted that, on average, the projections show little change in total annual precipitation in California. Furthermore, among several models, precipitation projections do not show a consistent trend during the next century. Cal-Adapt modeled scenarios are shown in Section 4.3.4 of the Base Plan.

Vulnerability to Heavy Rain and Storms

Heavy rain and severe storms are the most frequent type of severe weather occurrences in the Agency. These events can cause both significant and localized flooding. Flooding can be worse during times where the ground is already saturated. Wind often accompanies these storms and has caused damage in the past. Hail and lightning are rare in the Agency, but also can cause damage, with lightning occasionally igniting wildfires.

The whole of the Agency is at some measure of vulnerability to heavy rain and storms. An assessment of a community's vulnerability to heavy rains and storms begins with an understanding of local exposure to heavy rain and storms. This is included in the Local Concerns section below followed by a discussion of the Agency's Assets at Risk to this hazard.

Local Concerns

The Agency has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Heavy rains impact access to AWA facilities due to landslides**,** downed trees, and flooding. Power outages affect communication and increases labor costs to fuel and maintain generators. Heavy rains and storms affect AWA's ability to maintain wastewater ponds which leads to spills which lead to potential notices of violations and fines from regulatory agencies. The Agency also noted that heavy rains and storms cause localized flooding in the Agency. The problem areas are shown on Table F-15 above.

Impacts to Agency operations associated with the primary effects of heavy rains and storms, such as infiltration and inflow, is an ongoing issue. Dilution of sewage decreases the efficiency of treatment and may cause sewage volumes to exceed design capacity.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All Agency staff and population the Agency serve are at some vulnerability to heavy rains and storms. Those Agency employees that work outdoors would be affected to a limited extent by this hazard. All populations served by the Agency have some measure of risk to heavy rains and storms. Those populations that work or recreate outside and unhoused individuals are more vulnerable to impacts from heavy storm events. Heavy rains and storms occur every year and do not generally cause significant adverse impacts to individuals; it is the secondary hazard, flooding, which poses the biggest impact to people.

Structures and Critical Facilities and Infrastructure

Agency facilities and structures have some risk to heavy rains and storms. Heavy rain and storms can affect critical facilities and infrastructure during large events. Structures built to modern building codes are built to withstand heavy rains and storms (including thunderstorm winds and lightning); older structures may be more vulnerable. During a heavy storm, localized flooding may cause water intrusion into buildings from the outside. Trees can be downed causing impacts to structures. Older homes and buildings may be at increased risk to heavy rains and storms. Power outages during severe storm events can occur, impacting the use of structures until the power is back online. Local roads, streets, and bridges can be impacted resulting in closures restricting traffic flow in the Agency. In certain areas, large storms can cause erosion and localized landslides which can impact affected facilities.

As shown in Table F-3, there are multiple structures in the AWA at risk from heavy rains and storms and associated flooding.

Natural, Historic, and Cultural Resources

Large rain and storm events and associated flooding can affect natural, historic, and cultural resources. Silt and sediment can damage natural areas. Trees can be uprooted and downed by high winds. Extended periods of rainfall can erode natural banks along waterways and degrade soil stability for terrestrial species. Water quality issues can also occur. While some natural systems can be adversely impacted during these large storms, heavy rain events can also provide benefits. Groundwater and wetland areas can be recharged and water supplies replenished. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to structures affected by large storm events, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged, and lost during extreme rain and storm and events.

Impacts from Heavy Rain and Storms

Impacts from heavy rains and storms include damage to property, critical facilities and infrastructure, and the natural landscape. This includes: erosion; downed trees; damaged utility structures and infrastructure; power outages; road damage and blockages; and even lightning strikes to critical infrastructure and people. Lightning can also cause wildfires and urban fires to occur. Landsliding and erosion occur when the soil on slopes becomes oversaturated and fails. Climate change may cause these impacts to worsen.

Actual damage associated with the primary effects of severe storms and heavy rains has been somewhat limited. It is the secondary hazards caused by these severe weather events, such as floods and erosion that would likely have the greatest impact.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the Agency include the following:

- As discussed in the hazard profile section, climate change is anticipated to exacerbate this hazard over time.
- While population projections for the area served by the Agency show additional expected growth, these anticipated future changes in population are expected to be relatively small, which is unlikely to affect this hazard and associated impacts to the Agency. The Agency may add staff, but this number would be small. The Agency noted it has no control over population changes in its Service Area, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the Agency are expected to be limited in the near future and thus are not likely to affect heavy rains and storm and associated impacts to the Agency. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the Agency to this hazard.

Future development will require review of storm drainage and watershed flows to prevent and protect AWA water and wastewater infrastructure. New Agency facilities follow state and local building codes which should reduce the risk to future development in the Agency from heavy rains and storms. New critical facilities should be built to withstand hail damage, lightning, and thunderstorm winds. Changes in land use may also amplify the impacts of heavy rains and storms, as additional impervious surfaces can cause additional runoff and localized flooding throughout the Agency.

Severe Weather: High Winds and Tornado

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

High winds, as defined by the NWS glossary, are sustained wind speeds of 40 mph or greater lasting for 1 hour or longer, or winds of 58 mph or greater for any duration. High winds can cause significant property damage, threaten public safety, and have adverse economic impacts from business closures and power loss. High winds, when combined with high temperatures and low humidity can also lead to PSPS events. Winds can also drive fires in and near the Agency.

Portions of the Agency are also located in or near a special wind hazard region, which is a result of foehn winds. A foehn wind is a type of dry down-slope wind that occurs in the lee (downwind side) of a mountain range. Winds of this type are called "snow-eaters" for their ability to make snow melt or sublimate rapidly. These types of winds are also associated with the rapid spread of wildfires, making some regions which experience these winds particularly fire prone.

Tornadoes are rotating columns of air marked by a funnel-shaped downward extension of a cumulonimbus cloud whirling at destructive speeds of up to 300 mph, usually accompanying a thunderstorm. Tornadoes

form when cool, dry air sits on top of warm, moist air. Tornadoes are the most powerful storms that exist. Tornadoes, though rare, can affect areas of the Agency, primarily during the rainy season in the late fall, winter, and early spring.

Location and Extent

The entire Agency is subject to significant, non-tornadic (straight-line), winds. Each area of the Agency is at risk to high winds. Magnitude of winds is measured often in speed and damages. These events are often part of a heavy rain and storm event but can occur outside of storms. The speed of onset of winds can be short, but accurate weather prediction mechanisms often let the public know of upcoming events. Duration of winds in California is often short, ranging from minutes to hours. The Beaufort scale is an empirical 12 category scale that relates wind speed to observed conditions at sea or on land. Its full name is the Beaufort Wind Force Scale. The Beaufort Scale was shown in Section 4.3.5 of the Base Plan.

Tornadoes, while rare, can occur at any location in the Agency. Prior to February 1, 2007, tornado intensity was measured by the Fujita (F) scale. This scale was revised and is now the Enhanced Fujita scale. Both scales are sets of wind estimates (not measurements) based on damage. The new scale (EF) provides more damage indicators (28) and associated degrees of damage, allowing for more detailed analysis and better correlation between damage and wind speed. It is also more precise because it considers the materials affected and the construction of structures damaged by a tornado. The F Scale and EF Scale are shown in Section 4.3.5 of the Base Plan.

Past Occurrences

Disaster Declarations

There have been no federal or state disaster declarations in the County for winds and tornadoes.

NCDC Events

The NCDC data recorded 160 high wind, 3 funnel cloud, and 0 tornado incidents for Amador County since 1950. Many of these wind events likely affected the Agency.

AWA Past Occurrences

Extreme heat and high winds can cause Public Safety Power Shutoff (PSPS) events, causing issues to buildings in the Agency. The Agency was affected by a PSPS event on **September 7-8, 2020**. This event caused AWA temporary electrical generators to be moved in order to keep critical infrastructure running in the affected areas around Pioneer and Pine Grove.

In late **December 2022 to mid-January 202**3, the severe storms, including high winds, caused widespread damages across the county and specifically to the AWA Administrative Office roof and AC units ($25,200), AWA Operations Shop Building ($81,277), two water storage tanks in the Camanche Service Area ($135,000), the Camanche Wastewater Storage Pond, and the Ione Water Treatment Plant ($25,000 for electrical poles, water filters, ancillary electrical equipment, and water treatment plant roof). These costs

do not include the 400 regular man-hours and 132 overtime man-hours AWA personnel spent to repair the impacts of these storms. Some of this can be seen in Figure F-12.

Figure F-12 AWA - Damages during2022/2023 Storm Event

Source: AWA

Many other minor events that have created access problem by blocking roads due to fallen trees, downed power lines, roof damage to tanks and buildings.

Climate Change and High Winds and Tornado

According to the CAS, while average annual rainfall may increase or decrease slightly, the intensity of individual thunderstorm events is likely to increase during the 21st century. This may bring stronger thunderstorm winds. The CAS does not discuss non-thunderstorm winds or tornadoes.

Vulnerability to Severe Weather: High Wind and Tornadoes

The Agency is subject to potentially destructive high winds and tornadoes. High winds are common throughout the area and can happen during most times of the entire year and outside of a severe storm event. Tornadoes are rare. High winds and tornadoes can be a significant public safety and economic concern. The whole of the Agency is at some measure of vulnerability to wind and tornadoes.

An assessment of a community's vulnerability to high winds begins with an understanding of local exposure to wind and tornadoes. This is included in the Local Concerns section below followed by a discussion of the Agency's Assets at Risk to this hazard.

Local Concerns

The Agency has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The Agency is in or adjacent to a special wind hazard region, which is a result of foehn winds. This snow-removing ability is caused not only by warmer temperatures, but also the low relative humidity of the air mass coming over the mountain(s). They are also associated with the rapid spread of wildfires, making some regions which experience these winds particularly fire prone. Burn patterns of almost all historic large wildfires in the larger County indicate they occurred during foehn winds.

Specifically, AWA noted that high winds impact access to its facilities due to downed trees. Power outages affect communication and increases labor costs to fuel and maintain generators. High winds that cause power outages also affect the ability to supply water and keep wastewater systems operational. Occasionally high winds result in direct damage to tanks and buildings (primarily roofs) of the Agency.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All Agency staff and population the Agency serve are at some vulnerability to high winds and tornadoes. Certain vulnerable populations are at the greatest risk to the effects of high winds and tornadoes. These include:

- The unsheltered.
- Citizens who reside in mobile homes.
- Citizens in buildings with no tornado shelter or below ground floors.
- Those with access and functional needs.
- The medically fragile experiencing power outages as a result of wind events.
- Those working or caught outdoors during a wind or tornado event.

Structures and Critical Facilities and Infrastructure

All structures and critical facilities and infrastructure in the Agency have some measure of risk from high wind and tornadoes. Though rare, a tornado could cause damage to virtually all facilities in the tornado touchdown path. This would affect homes, businesses, commercial property, as well as government and critical facilities. During a wind or tornado event, facilities and infrastructure can be damaged, power lines in the Agency can also be damaged by falling trees caused by wind. High winds are a cause for PSPS events to be declared, causing power outages to occur. High winds and tornadoes could cause sparks from electric wires and other sources, which could lead to wildfire ignition. Once ignited, high winds can also cause wildfires to rapidly spread and become out of control. High wind conditions can cause wildfires to move into more urban areas destroying structures and whole subdivisions, as seen in recent wildfire events in the West.

As shown in Table F-3, there are multiple structures in the AWA at risk from high winds and tornadoes.

Natural, Historic, and Cultural Resources

Natural resources, such as trees, are vulnerable to winds. Increased streambank erosion can occur during periods of high water and high winds. High wave action during significant wind events can impact marsh lands and habitat areas. Soil erosion can also occur during high winds. Most all natural, historic, or cultural resources are at risk to tornadoes. Tornadoes can tear apart habitats, causing fragmentation across ecosystems and can damage and destroy historic structures and cultural resources.

Impacts from Severe Weather: High Winds and Tornado

Wind and tornadoes can cause damage to property and loss of life. While most tornado damage is caused by violent winds, the majority of injuries and deaths generally result from flying debris. Property damage can include damage to buildings, fallen trees, and power lines. Local industries may also be damaged or destroyed. Access roads and streets may be blocked by debris, delaying necessary emergency response. Winds can push automobiles off roads, damage roofs and structures, cause power outages, and cause secondary damage due to flying debris and hazardous trees. High winds can also contribute to the spread and intensity of wildfires. High winds during periods of high water can cause impacts to and streambanks from accelerated erosion. Climate change may affect this hazard and cause winds to increase in velocity and more tornadoes to affect the Agency.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the County may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the Agency include the following:

- Climate change is likely to exacerbate future wind conditions and associated impacts and vulnerability of the County. Climate change is not likely to affect future tornado conditions.
- While population projections for the area served by the Agency show additional expected growth, these anticipated future changes in population are expected to be relatively small, which limits additional impacts to the Agency. The Agency noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.
- Land use planning should be proactive to address future hazard conditions. Building codes in the County ensure that new development is built to current building standards to withstand high winds, which should reduce the risk to future development in the County from high winds and tornadoes. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the Agency to this hazard. Changes in land use and increased development may amplify the impacts of high winds and tornadoes, as additional structures in the County increase the number of buildings at risk to high winds and tornadoes.

The Agency relies on the County to enforce the local building codes which includes standards for new development to minimize damage from windstorms. New Agency facilities are built to state and local codes. New critical facilities and infrastructure should also consider adding backup power systems to limit impacts associated with power outages.

Wildfire (with smoke and air quality)

Likelihood of Future Occurrence–Likely
Vulnerability–Extremely High

Hazard Profile

Wildland fire and the risk of a conflagration is an ongoing concern for the AWA. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of fire regimes. Wildland fires affect grass, forest, and brushlands, as well as structures. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern.

Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. These weather conditions can result in red flag (e.g., fire weather) days and can result in PSPS events in the Agency. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires can also occur in more populated, urban areas. There is also the concern of wildfires occurring in these more remote, forested areas that under certain weather conditions, can extend into areas not generally considered at a high risk to wildfire. Smoke and air quality also become an issue, both from fires occurring inside and outside of the Amador County Planning Area and the Agency.

Wildfire Smoke and Air Quality

Smoke from wildfires is made up of gas and particulate matter, which can be easily observed in the air. Air quality standards have been established to protect human health with the pollutant referred to as PM2.5 which consists of particles 2.5 microns or less in diameter. These smaller sizes of particles are responsible for adverse health effects because of their ability to reach the lower regions of the respiratory tract.

Wildfire smoke can have negative effects to those who live in or near a fire burn area. Smoke and air pollution from wildfires can be a severe health hazard. Significant wildfires occurring in both Amador County and nearby northern California communities since the 2020 LHMP Update have created significant air pollution affecting area residents. This was the case during the 2021 Caldor Fire, as well as others that affected the nearby areas.

Location and Extent

Wildfire can affect all areas of the Agency. CAL FIRE has estimated that the risk varies across the Agency and has created maps showing risk variance. Following the methodology described in Section 4.3.15 of the Base Plan, wildfire maps for the AWA were created. Figure F-13 shows the CAL FIRE Federal Responsibility Areas (FRA) and State Responsibility Areas (SRA) and their associated Fire Hazard Severity Zones (FHSZ) in the Agency. Figure F-14 shows the CAL FIRE Local Responsibility Areas (LRA) and their associated Fire Hazard Severity Zones (FHSZ) in the Agency. As shown on the maps, FHSZs within the Agency range from Urban Unzoned to Very High.

Figure F-13 AWA – CAL FIRE SRA/FRA Fire Hazard Severity Zones

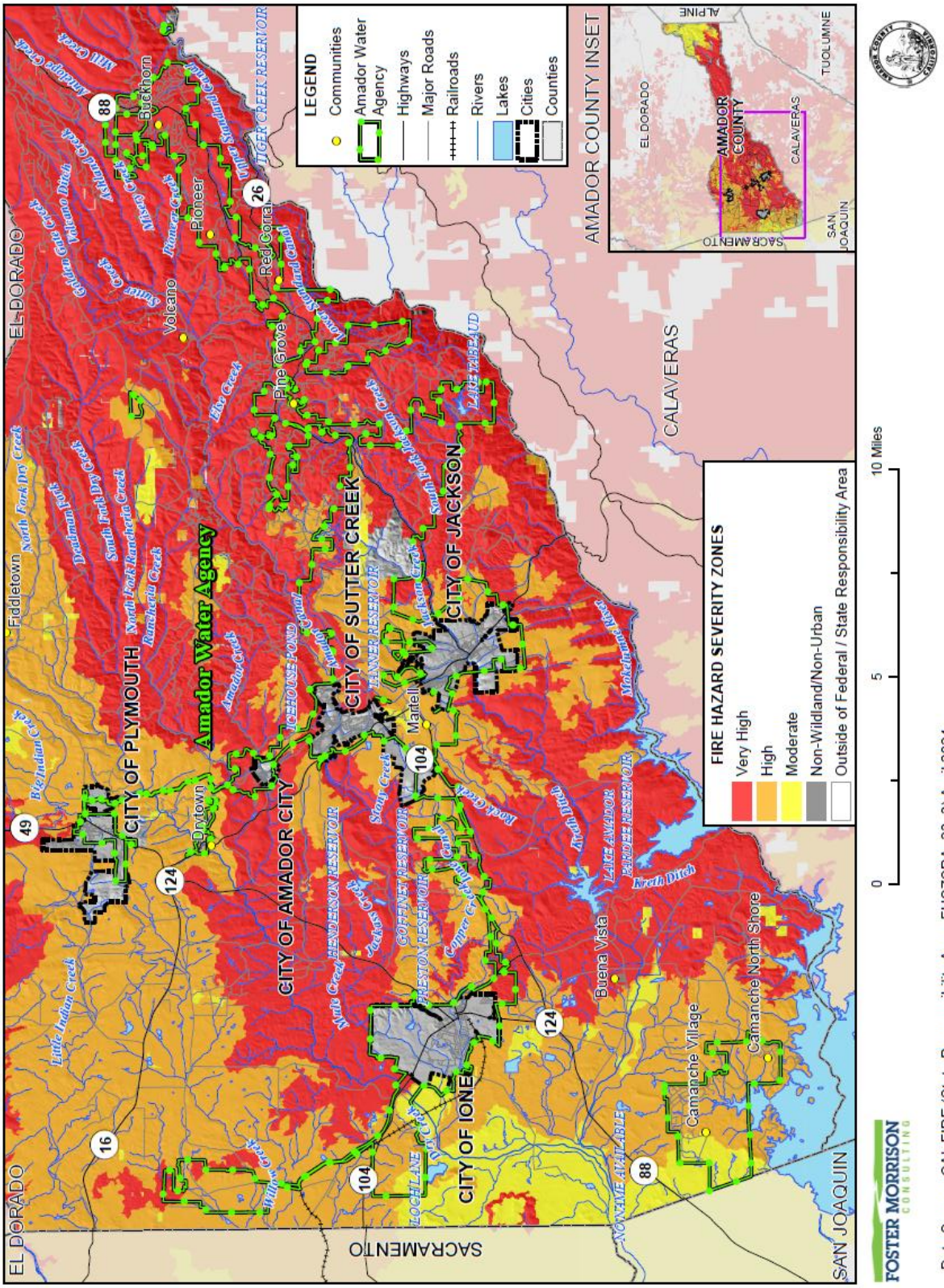
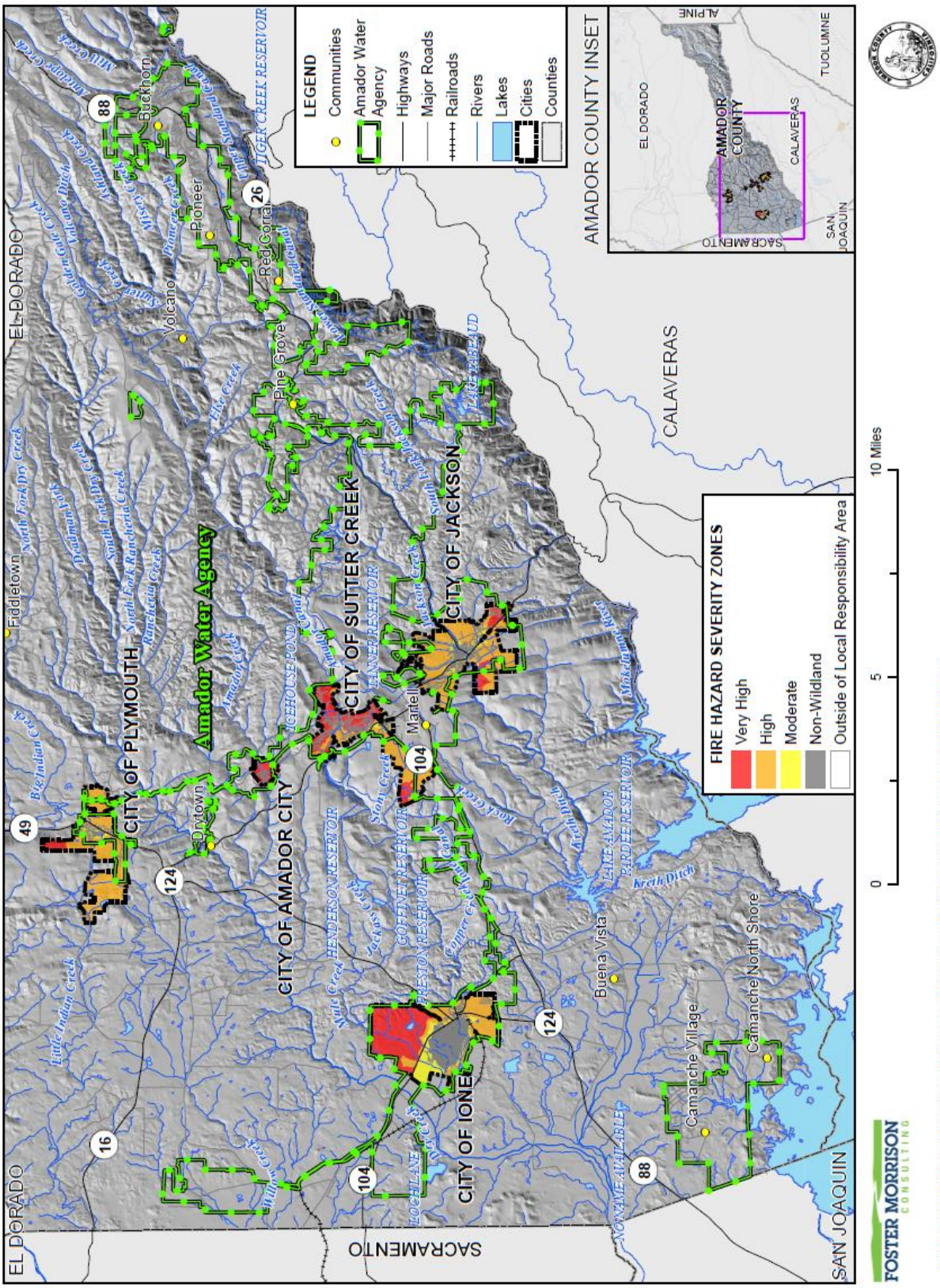


Figure F-14 AWA – CAL FIRE LRA Fire Hazard Severity Zones



Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time or may have durations lasting for a week or more. Geographical FHSZ extents in the SRA/FRA are shown in Table F-19, while extents in the LRA are shown on Table F-20.

Table F-19 AWA – CAL FIRE SRA/FRA Fire Hazard Severity Zone Geographical Extents

AWA Jurisdiction/Fire Responsibility/ /Fire Hazard Severity Zones	Total Acres	% of Total Acres*	Improved Acres	% of Total Improved Acres*	Unimproved Acres	% of Total Unimproved Acres*
Amador City						
SRA						
Very High	0.3	0.001%	0.1	0.001%	0.2	0.00%
SRA Total	**0.3**	**0.001%**	**0.1**	**0.001%**	**0.2**	**0.00%**
Amador City Total	**0.3**	**0.001%**	**0.1**	**0.001%**	**0.2**	**0.00%**
Ione						
SRA						
Very High	0.3	0.0009%	0.003	0.00002%	0.3	0.002%
High	2	0.01%	0.1	0.0003%	2	0.01%
Moderate	1	0.0019%	1	0.003%	0.2	0.001%
SRA Total	**3**	**0.01%**	**1**	**0.003%**	**3**	**0.02%**
Ione Total	**3**	**0.01%**	**1**	**0.003%**	**3**	**0.02%**
Jackson						
SRA						
Very High	0.3	0.001%	0.1	0.0003%	0.3	0.001%
High	8	0.02%	3	0.015%	5	0.03%
SRA Total	**9**	**0.02%**	**3**	**0.015%**	**6**	**0.03%**
Jackson Total	**9**	**0.02%**	**3**	**0.015%**	**6**	**0.03%**
Plymouth						
SRA						
High	4	0.01%	1	0.003%	3	0.02%
SRA Total	4	0.01%	1	0.003%	3	0.02%
Plymouth Total	4	0.01%	1	0.003%	3	0.02%
Sutter Creek						
SRA						
Very High	4	0.01%	2	0.009%	2	0.01%
High	2	0.004%	0.4	0.002%	1	0.01%

AWA Jurisdiction/Fire Responsibility/ /Fire Hazard Severity Zones	Total Acres	% of Total Acres*	Improved Acres	% of Total Improved Acres*	Unimproved Acres	% of Total Unimproved Acres*
Moderate	0.4	0.001%	0.3	0.001%	0.1	0.001%
SRA Total	**6**	**0.02%**	**2**	**0.012%**	**4**	**0.02%**
Sutter Creek Total	**6**	**0.02%**	**2**	**0.012%**	**4**	**0.02%**
Unincorporated Amador County						
FRA						
Very High	215	0.57%	35	0.176%	180	1.00%
High	3	0.01%	0.003	0.000%	3	0.02%
Moderate	1,381	3.64%	77	0.389%	1,303	7.21%
FRA Total	**1,598**	**4.22%**	**112**	**0.566%**	**1,486**	**8.22%**
SRA						
Very High	15,394	40.62%	10,089	50.865%	5,306	29.37%
High	12,134	32.02%	6,420	32.366%	5,714	31.63%
Moderate	1,853	4.89%	906	4.569%	947	5.24%
SRA Total	**29,381**	**77.52%**	**17,415**	**87.800%**	**11,966**	**66.24%**
Unincorporated Amador County Total	**30,979**	**81.74%**	**17,527**	**88.366%**	**13,452**	**74.47%**
Grand Total	**31,002**	**81.80%**	**17,534**	**88.400%**	**13,468**	**74.55%**

Source: CAL FIRE

*This represents the percentage of the total of AWA's Planning Area. It is not a percentage of each jurisdiction served by the AWA.

Table F-20 AWA – CAL FIRE LRA Fire Hazard Severity Zone Geographical Extents

AWA Jurisdiction/ Fire Hazard Severity Zones	Total Acres	% of Total Acres*	Improved Acres	% of Total Improved Acres*	Unimproved Acres	% of Total Unimproved Acres*
Amador City						
Very High	165	0.4%	49	0.2%	116	0.6%
High	0	0.0%	0	0.0%	0	0.0%
Moderate	0	0.0%	0	0.0%	0	0.0%
Non-Wildland	0	0.0%	0	0.0%	0	0.0%
Outside of LRA Responsibility Area	0.3	0.001%	0.1	0.001%	0.2	0.001%
Amador City Total	**165**	**0.4%**	**49**	**0.2%**	**116**	**0.6%**

AWA Jurisdiction/ Fire Hazard Severity Zones	Total Acres	% of Total Acres*	Improved Acres	% of Total Improved Acres*	Unimproved Acres	% of Total Unimproved Acres*
Ione						
Very High	1,113	2.9%	3	0.02%	1,110	6.1%
High	906	2.4%	197	1.0%	708	3.9%
Moderate	398	1.1%	218	1.1%	181	1.0%
Non-Wildland	526	1.4%	271	1.4%	255	1.4%
Outside of LRA Responsibility Area	16.1	0.04%	0.7	0.003%	15.4	0.1%
Ione Total	**2,960**	**7.8%**	**690**	**3.5%**	**2,270**	**12.6%**
Jackson						
Very High	159	0.4%	58	0.3%	102	0.6%
High	1,555	4.1%	554	2.8%	1,001	5.5%
Moderate	126	0.3%	73	0.4%	52	0.3%
Non-Wildland	109	0.3%	53	0.3%	56	0.3%
Outside of LRA Responsibility Area	4.7	0.01%	1.9	0.01%	2.8	0.02%
Jackson Total	**1,953**	**5.2%**	**740**	**3.7%**	**1,214**	**6.7%**
Plymouth						
Very High	8	0.02%	6	0.03%	2	0.01%
High	491	1.3%	228	1.2%	263	1.5%
Moderate	46	0.1%	24	0.1%	22	0.1%
Non-Wildland	22	0.1%	9	0.0%	13	0.1%
Outside of LRA Responsibility Area	0.3	0.001%	0.2	0.001%	0.1	0.0003%
Plymouth Total	**567**	**1.5%**	**267**	**1.3%**	**300**	**1.7%**
Sutter Creek						
Very High	676	1.8%	356	1.8%	320	1.8%
High	498	1.3%	154	0.8%	344	1.9%
Moderate	34	0.1%	15	0.1%	19	0.1%
Non-Wildland	34	0.1%	21	0.1%	13	0.1%
Outside of LRA Responsibility Area	3.1	0.01%	0.8	0.004%	2.3	0.01%
Sutter Creek Total	**1,245**	**3.3%**	**546**	**2.8%**	**699**	**3.9%**
Unincorporated Amador County						
Very High	3	0.01%	1	0.01%	1	0.01%
High	10	0.03%	3	0.02%	7	0.04%

AWA Jurisdiction/ Fire Hazard Severity Zones	Total Acres	% of Total Acres*	Improved Acres	% of Total Improved Acres*	Unimproved Acres	% of Total Unimproved Acres*
Moderate	0.7	0.002%	0.6	0.003%	0.1	0.0005%
Non-Wildland	0.4	0.001%	0.0	0.0001%	0.4	0.002%
Outside of LRA Responsibility Area	30,994	81.8%	17,537	88.4%	13,457	74.5%
Unincorporated Amador County Total	**31,008**	**81.8%**	**17,542**	**88.4%**	**13,466**	**74.5%**
Grand Total	**37,898**	**100.0%**	**19,833**	**100.0%**	**18,065**	**100.0%**

Source: CAL FIRE

*This represents the percentage of the total of AWA's Planning Area. It is not a percentage of each jurisdiction served by the AWA.

Past Occurrences

Disaster Declaration History

There has been three state and two federal disaster declarations due to fire, as shown in Table F-21.

Table F-21 Amador County – State and Federal Wildfire Disaster Declarations 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	3	1961 (unnamed), 2015 (Summer 2015 Fires), 2021 (Caldor Fire)	2	2016 (Butte Fire), 2021 (Caldor Fire)

Source: Cal OES, FEMA

NCDC Events

The NCDC has tracked 50 wildfire events in the County dating back to 1993.

AWA Events

AWA noted the following events that affected the Agency:

In **2007**, a wildfire occurred twenty miles east of Pioneer. Roads were closed and forested areas damaged. There was an increase in water turbidity, but it was manageable even with the short loss of power.

2015 Butte Fire FEMA 5111-FM, FEMA ID: 000-UYUB9-00 CAL OES ID 005-91001 While AWA did not lose any facilities due to the Butte fire, extensive resources were used to mobilize generators for power outages, provide water to non-agency customers who could not operate their wells. The Agency provided water to animals in need and kept staff on-call to keep an eye on the fire development. Staff kept Agency facilities secure from vandalism.

The **2021** Caldor Fire was the third-largest and second-most-destructive of the 2021 season in California, and is the seventeenth-largest and sixteenth-most destructive in recorded California history. 221,835 acres burned, 1,003 structures were destroyed, and forced the evacuation of more than 50,000 residents in the area. This fire started only 10 miles north of AWA facilities. No damage to AWA infrastructure or customers.

The **2022** Electra Fire burned much of the same area as the previous 2015 Butte Fire. The Butte Fire grew to 70,868 acres, destroyed 877 homes and businesses and damaged 44 more—as well as lead to the deaths of two people. By contrast, the Electra Fire burned 4,478 acres. Both fires burned to within a hundred feet of AWA facilities. Hundreds of AWA customers in the AWA Buckhorn Water System Service Area were forced to evacuate; the fire burned within a couple hundred feet of AWA infrastructure.

Climate Change and Wildfire

It is likely that climate change will increase the chance of future occurrence as well as future impacts from wildfire. More information on future impacts to the Agency can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Warmer temperatures can exacerbate drought conditions. Drought often kills plants and trees, which serve as fuel for wildfires. Warmer temperatures could increase the number of wildfires and pest outbreaks, such as the western pine beetle. Cal-Adapt's wildfire tool predicts the potential increase in the amount of burned areas for the year 2090-2099, as compared to recent (2010) conditions. This is shown in Section 4.3.15 of the Base Plan. Based on this model, Cal-Adapt predicts that wildfire risk in Amador County will increase moderately at the end of the century. However, wildfire models can vary depending on the parameters used. Cal-Adapt does not take landscape and fuel sources into account in their model. In all likelihood, in the Amador County Planning Area, precipitation patterns, high levels of heat, topography, and fuel load will determine the frequency and intensity of future wildfire.

Vulnerability to Wildfire

Risk and vulnerability to the Agency from wildfire is of significant concern. Wildfires that occur in the Agency occur from a variety of both natural and manmade causes. The Agency can be affected both by fires that start on or near Agency lands as well as those that start elsewhere and move into the Agency. In addition to burning large areas of land, air quality can be affected in the Agency by smoke from fires occurring inside the Agency as well as those from many miles away. As growth continues and populations increase in the Agency, the potential for wildfires will also increase.

The whole of the Agency is at some measure of vulnerability to wildfire. An assessment of a community's vulnerability to wildfire begins with an understanding of local exposure to wildfire. This is included in the Local Concerns section below. After that section, assets at risk are discussed.

Local Concerns

The Agency has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Wildfires remain the highest priority hazard and the hazard with the greatest potential for catastrophic loss to AWA. As seen recently in Los Angeles with the Palisades Fire, Eaton Fire, and Hurst Fire, AWA remains concerned that a wildfire in the AWA Service Areas will cause widespread devastation to AWA infrastructure, systems and customers. Wildfires melt plastic piping in buildings causing carcinogenic chemical contamination that cannot be removed unless complete overhauls of the distribution systems are completed. This can lead to a loss of potable water to disadvantaged populations for months at a time.

While no AWA infrastructure has been lost to these fires, extensive resources have been used to mobilize generators for power outages, provide water to non-agency customers who could not operate their wells, particularly during the Butte Fire. The Agency provided water to animals in need at emergency evacuation locations and kept staff on-call to keep an eye on the fire development. In addition to the wildfire, the smoke and air quality due to wildfires have cause numerous respiratory issues during the events, affecting AWA operators throughout all Service Areas.

Impacts to the Agency include potential loss of water availability for fire suppression and/or consumption. Wastewater treatment can also be rendered inoperable when wildfire eliminates the availability of electricity. All wastewater equipment have generators, however, the water distribution equipment does not. Without backup electricity generation, water and wastewater cannot be conveyed. Water quality will also suffer if water treatment functionality is compromised. The economic impact alone to the Agency including the loss of function of buildings and infrastructure and the cost of reacting to these fires is a major concern.

Assets at Risk

Assets at risk from this hazard include people and populations served; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations (both Agency staff and Service Area populations) are at some vulnerability to wildfire. Certain vulnerable populations are at greater risk to the effects of wildfire as well as smoke and air quality issues that wildfires bring. Vulnerable populations include:

- Unhoused
- Infants and children under age five and their caregivers
- Elderly (65 and older)
- Individuals with disabilities
- Individuals' dependent on medical equipment
- Individuals who exercise, recreate, or work outdoors
- Individuals with impaired mobility

Structures and Critical Facilities and Infrastructure

All structures in the Agency have some risk to wildfire. Wildfire presents a threat to critical facilities and infrastructure. As shown in Table F-3, there are multiple structures in the AWA at risk from wildfire.

Natural, Historic, and Cultural Resources

Natural, historic, and cultural resources located within areas at risk to wildfire would be vulnerable. Should a wildfire occur in the Agency, the impacts to natural, historic and cultural resources could be extensive and include air pollution, water quality issues, contamination from water runoff containing toxic products, and other environmental discharges or releases from burned materials affecting soils, habitat areas, wildlife, and aquatic resources. Debris and runoff from burned areas can affect reservoirs and rivers in the Agency. Historic and cultural resources can be damaged or destroyed and are often more vulnerable due to their older age, construction type, and lack of fire prevention infrastructure such as sprinklers.

Impacts from Wildfire

Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and timber; and loss of recreational opportunities. Out of control wildfires can have catastrophic impacts. Wildfires can cause short-term and long-term disruption to the Agency. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the Agency by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the Agency; smoke and air pollution from wildfires can be a severe health hazard. Smoke impacts may come from wildfires outside the Agency, as well as from within.

Although the physical damages and casualties arising from wildland-urban interface or conflagration fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate a PSPS which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

The impacts of a fire are felt long after the fire is extinguished. In addition to the loss of property in fires, the loss in vegetation and changes in surface soils alters the environment. When supporting vegetation is burned, hillsides become destabilized and prone to erosion. The burnt surface soils are harder and absorb less water. When winter rains come, this leads to increased runoff, erosion, and landslides in hilly areas.

Impacts to the Agency include potential loss of water availability for fire suppression and/or consumption. Wastewater treatment can also be rendered inoperable when wildfire eliminates the availability of electricity. All wastewater equipment have generators, however, the water distribution equipment does not. Without backup electricity generation, water and wastewater cannot be conveyed. Water quality will also suffer if water treatment functionality is compromised. The economic impact alone to the Agency including the loss of function of buildings and infrastructure and the cost of reacting to these fires is a major concern.

Wildfire smoke can also have negative effects to those who live in or near a fire burn area. Smoke and air pollution from wildfires can be a severe health hazard. Significant wildfires occurring in nearby northern California communities since the previous LHMP have created significant air pollution affecting area residents. Agency residents have been affected by wildfire smoke and poor air quality, from fires both within the County and from those much further away.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the Agency may be affected in the future by climate change (which was discussed in the hazard profile above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the AWA include the following:

- Climate change is likely to exacerbate future wildfire conditions and associated impacts and vulnerability of the Agency to wildfire.
- While population projections for the area served by the Agency show additional expected growth, these anticipated future changes in population are expected to be relatively small, which limits additional impacts to the Agency. The Agency noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the Agency are occurring within the AWA Service Area and thus could increase associated wildfire impacts to the Agency. Additional development traditionally leads to additional fires. However, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the Agency to this hazard. The Agency will take wildfire into account when siting new facilities. Fire hydrants, defensible space, well production, water storage, and distribution should all be considered for future development. New facilities will be built to the most current California Building standards for wildfire.

Future Development

Additional growth and development within moderate or higher fire hazard severity zones in the Agency would place additional values at risk to wildfire. However, County building codes are in effect and should continue to be updated as appropriate to reduce future impacts. In order to reduce risk for future development, AWA is seeking to:

- Ensure all facilities are kept cleared of debris and adequate fire protection.
- Improve the ability to deliver adequate fire flows by designing pump stations and distribution systems with fire flow protections.

- Design tanks to be built with concrete or steel instead of redwood.
- Install stand-by power at all facilities to ensure fire flow protection.

F.5 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

F.5.1. Regulatory Mitigation Capabilities

Table F-22 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the AWA.

Note: The Agency does not have the authority to regulate land use and development within its jurisdiction. Authority for promulgating and enforcing zoning, land use, and development requirements falls to counties and incorporated communities. As such development within the Agency's jurisdictional boundaries will conform to the zoning and land use development ordinances and building codes of the county or incorporated community in which the Agency is located.

Table F-22 AWA's Regulatory Mitigation Capabilities

Plans	In Place Y/N	Does the plan address hazards? Can the plan be used to carry out mitigation actions? When was it last updated??
Capital Improvements Plan	Y	The plan addresses hazards and can be used to carry out mitigation actions. It was last updated in 2025.
Climate Change Adaptation Plan	Y	The plan addresses hazards and can be used to carry out mitigation actions. It was last updated in 2020.
Community Wildfire Protection Plan	N	
Comprehensive/Master Plan	Y	The plan addresses hazards and can be used to carry out mitigation actions. It was last updated in 2020/2022. A new water/wastewater master plans intended to be updated in late 2025.
Continuity of Operations Plan	N	
Economic Development Plan	N	
Land Use Plan	N	
Local Emergency Operations Plan	Y	The plan addresses hazards and can be used to carry out mitigation actions. It was last updated in 2024.
Stormwater Management Plan	N	
Transportation Plan	N	

Other	Y	Amador Water Agency Water Code addresses hazards and can be used to carry out mitigation. The Code was last updated in 2022. The Water shortage Contingency Plan addresses hazards and can be used to carry out mitigation. It is dated 2021, but has portions that are updated yearly.
Land Use Planning and Ordinances	**Y/N**	**Is the ordinance an effective way to reduce hazard impacts? Is the ordinance adequately administered and enforced?**
Acquisition of land for open space and public recreation use	N/A	
Building code	Y	Yes, yes
Flood insurance rate maps	N/A	
Floodplain ordinance	N/A	
Natural hazard-specific ordinance (stormwater, steep slope, wildfire)	N/A	
Subdivision ordinance	N/A	
Zoning ordinance	N/A	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Continued refinement of Agency capabilities will be pursued to reduce risk from future hazard events.		

Source: AWA

F.5.2. Administrative/Technical Mitigation Capabilities

Table F-23 identifies the Agency department(s) responsible for activities related to mitigation and loss prevention in the AWA.

Table F-23 AWA's Administrative and Technical Mitigation Capabilities

Administration	**In Place Y/N**	**Describe capability Is coordination effective?**
Staff		**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official	N	Amador County
Civil Engineer, including dam and levee safety	Y	Civil Engineer services procured through on-call contracts
Community Planner	N	Amador County
Emergency Manager	Y	Staff needs more Hazard Mitigation training and better coordination between Agencies.
Floodplain Administrator	N	Amador County

GIS Coordinator	Y	Staff needs more Hazard Mitigation training and better coordination between Agencies.
Planning Commission	N	Amador County
Other		
Technical	**Y/N**	**Has capability been used to assess/mitigate risk in the past?**
Grant writing	Y	AWA has procured a grant consultant to assist in grant writing and administration.
Hazard data and information	Y	Previous HMGP grants procured and completed or in -progress.
GIS analysis	Y	Staff needs more Hazard Mitigation training and better coordination between Agencies.
Mutual aid agreements	Y	Jackson Valley Irrigation Agency; WARN; City of Plymouth; River Pines PUD
Other		
How can these capabilities be expanded and improved to reduce risk?		
More education and training on hazard mitigation and hazard related issues.		

Source: AWA

F.5.3. Fiscal Mitigation Capabilities

Table F-24 identifies financial tools or resources that the Agency could potentially use to help fund mitigation activities.

Table F-24 AWA's Fiscal Mitigation Capabilities

Funding Resource	In Place Y/N	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	Yes. Hazard mitigation and capital replacement projects. Yes.
Community Development Block Grant	Y	
Federal funding programs (non-FEMA)	Y	
Fees for water, sewer	Y	
Capacity fees for new development	Y	
State funding programs	Y	
Stormwater utility fee	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
These capabilities can be expanded with additional staffing to manage and inspect projects, and with grants and grant writing.		

Source: AWA

F.5.4. Mitigation Education, Outreach, and Partnerships

Table F-25 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table F-25 AWA's Mitigation Education, Outreach, and Partnerships

Program/Organization	In Place Y/N	How widespread are each of these in your community?
Community newsletters	Y	With bill inserts
Hazard awareness campaigns (such as Firewise, Storm Ready, Severe Weather Awareness Week, school programs, public events)	Y	AWA participates in public outreach events and school programs
Local news	Y	As needed
Organizations that interact with underserved and vulnerable communities	Y	County of Amador
Social media	Y	As needed
How can these capabilities be expanded and improved to reduce risk?		
Additional programs can help educate customers and will help improve preparedness response.		

Source: AWA

F.5.5. Other Mitigation Efforts

The Agency has many other completed or ongoing mitigation efforts that include the following:

- Funding was received in 2018 from FEMA to replace 4 redwood tanks with 3 fire resistant (steel tanks).
- Long Term Water Needs Study 2017
- Integrated Regional Water Management Plan Update 2018
- Central Amador Water Project (CAWP) Environmental Impact Report 2017
- Urban Water Management Plan 2015; and Master Water Plan (draft).
- 2020 AWA Water Master Plan Study and 2025 Water Master Plan Study Update
- 2022 AWA Wastewater Master Plan
- 2022 AWA Tanner & Ione WTP Capacity Study
- 2020 Water Shortage Contingency Plan
- 2020 Urban Water Management Plan
- 2024 Annual Water Supply & Demand Assessment Shortage Report
- 2025 Water Capital Improvement Plan
- 2025 Wastewater Capital Improvement Plan

F.6 Mitigation Strategy

F.6.1. Mitigation Goals and Objectives

The AWA adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

F.6.2. NFIP Mitigation Strategy

The Agency does not participate in the NFIP, as it is not an eligible participant. Many of the Agency's projects work to reduce impacts from flood events thus furthering the objectives of the NFIP.

F.6.3. Mitigation Actions

The Planning Team for the AWA identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Ag Hazards: Severe Weather/Invasive Species (Pests and Weeds)
- Climate Change
- Dam Failure
- Drought & Water shortage
- Earthquake
- Floods: 1%/0.2% annual chance
- Floods: Localized Stormwater
- Landslide, Mudslide, and Debris Flow
- Severe Weather: Extreme Cold and Freeze
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rain and Storms (Wind, Hail, Lightning)
- Severe Weather: High Winds and Tornados
- Wildfire

Low priority hazards for mitigation planning include:

- Avalanche

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Mitigation Actions

The Agency has put forward the actions as shown in Table F-26. Details of the actions can be found below the table.

Table F-26 AWA Mitigation Actions

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Amador Water Agency					
Action 1. AWA Tank Flexibility Connectors	New Action	X	X		Structural
Action 2. Camanche WWTP Treatment, Disposal, and Effluent Storage Upgrades	New Action	X	X	X	Structural Property Protection Natural Resource Protection
Action 3. CAWP Transmission Main Improvements and Tank D Replacement	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 4. CAWP Tiger Creek Afterbay Alternate Supply	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 5. Ione WTP Backwash Handling Improvements	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 6. Tanner Clearwell Replacement	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 7. Tanner WTP Backwash Drying Beds	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 8. Tank Replacement/ Tank Repair	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 9. Amador and Ione Water Systems Taste and Odor Mitigation	Previous Action	X	X		Structural Property Protection Natural Resource Protection
Action 10. Replacement of Two Hypalon Lined and Covered Tanks with New Tanks	Previous Action	X	X		Structural Property Protection Natural Resource Protection

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 11. Mt. Crossman Main Area Tank for Upper CAWP System	Previous Action	X	X		Structural Property Protection Natural Resource Protection
Action 12. Martell Regional Lift Station and Collection System Improvements	New Action	X	X	X	Structural Property Protection Natural Resource Protection
Action 13. Mace Meadows Pump Station Flooding	New Action	X	X	X	Structural Property Protection Natural Resource Protection
Action 14. Water Treatment Plant Raw Water Bypasses	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 15. Upgrade Fire Pumps	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 16. Tanner WTP Flow Control and Reliability Improvements	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 17. Ione Reliability Capacity Expansion and Site Security	New Action	X	X		Structural Property Protection Natural Resource Protection

Note: Mitigation actions shall be consistent with the approved AWA mitigation planning studies, reports, and plans previously adopted.

Action 1. AWA Tank Flexibility Connectors

Hazards Addressed: Earthquake

Goals Addressed : 1, 2, 3, 4, 6

Issue/Background (Problem Statement): AWA has experienced three moderately sized earthquakes within a 250-mile radius of its Service Area in the last 5 years. July 8, 2021 - 6.0 magnitude earthquake Antelope Valley (50 miles from AWA facilities), December 5, 2024 - 7.0 magnitude earthquake Mendocino CA (240 miles from AWA facilities), and December 9, 2024 - 5.7 magnitude earthquake in Nevada (90 miles from AWA facilities). No damage was reported to AWA facilities during any of these earthquakes, however each one was felt in AWA Service Areas. As AWA has 38 tanks and reservoirs with connections susceptible to damage from seismic shifts at connection points to these tanks, seismic retrofits are prudent.

Project Description: Identify and retrofit tanks and reservoir inlet and outlet connections with seismic resistant connections.

Other Alternatives: Continue with the risk of earthquakes causing inadequate fire flow to protect against wildfire and causing massive drinking water shortages throughout all AWA water systems.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

- 2020 AWA Water Master Plan Study, and 2025 Water Master Plan Study Update
- 2022 AWA Tanner & Ione WTP Capacity Study
- 2020 Water Shortage Contingency Plan
- 2020 Urban Water Management Plan
- 2024 Annual Water Supply & Demand Assessment Shortage Report

Responsible Office/Partners: AWA Operations Manager and Board

Benefits (Losses Avoided): Estimated at $2,000,000 over proposed timeline

Potential Funding (Local Budgets, Grant Funds, etc.): State and federal grants, FEMA HMA funds, AWA general fund

Timeline: 1-5 years

Project Priority (High, Medium, Low): Medium

Action 2. Camanche WWTP Treatment, Disposal, and Effluent Storage Upgrades

Hazards Addressed: Severe Weather (High Winds)/ Severe Weather (Extreme Cold/ Flooding: Localized Stormwater/Floods: 1%/0.2% annual chance (w/ levee failure)/Dam Failure/Multi-Hazard

Goals Addressed : 1, 2, 3, 4, 6

Issue/Background (Problem Statement): The Camanche Village is located six miles south of the City of Ione along the northern shore of Lake Camanche. The Camanche Village wastewater system is made up of wastewater collection, treatment, and disposal infrastructure. The current Camanche WWTP consists of a manually screened headworks, a partially mixed aerated treatment pond, followed by two settling ponds then into a disinfection channel. After disinfection, the treated effluent is stored in a 6.3-million-gallon storage pond, where it is then pumped to the 12-acre spray field for disposal by irrigation. Additional connections have been prohibited due to the State Cease & Desist Order No. R5-2003-0126 and Growth Moratorium as the current wastewater effluent storage and disposal pond is at its limit. During winter months with heavy winds, heavy storms localized flooding and cold temperatures, the spray fields become ineffective at disposing of the treated wastewater effluent. This, coupled with in inflow and infiltration stormwater into the storage pond, overloads the system and risks dam failure to the Camanche WWTP Storage Pond Dam.

Project Description: The best option to mitigate the hazards at the Camanche WWTP is to construct new aerated ponds and dispose of all treated effluent offsite. This option involves the construction of a new package treatment system with offsite disposal.

Other Alternatives: Continue with the risk of wildfires coupled with extreme heat, severe winds and/or severe storms overloading AWA water distribution and storage systems to protect against wildfire and house fires.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

- 2022 AWA Wastewater Master Plan (planned to be updated in 2025)
- 2022 AWA Sewer System Management Plan (SSMP)

Responsible Office/Partners: AWA Operations Manager and Board

Benefits (Losses Avoided): Estimated at $5,000,000 over proposed timeline

Potential Funding (Local Budgets, Grant Funds, etc.): State and federal grants, FEMA HMA funds, AWA general fund

Timeline: 1-5 years

Project Priority (High, Medium, Low): Medium

Action 3. CAWP Transmission Main Improvements and Tank D Replacement

Hazards Addressed: Drought/Wildfire/Extreme Heat/Severe Wind/Multi-Hazard

Goals Addressed : 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): Tank D is located between Red Corral and Pioneer, is in poor condition and needs immediate replacement. Severe winds could destroy the tank by toppling trees on neighboring properties. The tank is also undersized for the current drinking water and fire suppression storage requirements of the system, threatening water shortages and loss of wildfire defense. The Riverview area served off the CAWP transmission main frequently experiences low pressure or loss of service when downstream tanks are filling from the CAWP main. Fire flows can also be non-existent depending on flows in the CAWP main filling the tank or downstream tanks.

Project Description: The best option to mitigate the hazards to Ione WTP backwash system is to abandon the current Tank D, water piping to connect to the Riverview distribution system and the CAWP main, and construct a new, appropriately sized Tank D with associated appurtenances, controls, backup generator, etc., at a higher elevation to provide gravity supply to the Riverview area and existing Tank D Service Area. The Tank location and property has already been secured for this project.

Other Alternatives: Continue with the risk of wildfires, extreme heat, severe wind and climate change causing water shortages and creating a water system situation with inadequate fire flow to protect against wildfire and house fires.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

- 2020 AWA Water Master Plan Study, and 2025 Water Master Plan Study Update
- 2022 AWA Tanner & Ione WTP Capacity Study
- 2020 Water Shortage Contingency Plan
- 2020 Urban Water Management Plan
- 2024 Annual Water Supply & Demand Assessment Shortage Report

Responsible Office/Partners: AWA Operations Manager and Board

Benefits (Losses Avoided): Estimated at $6,000,000 over proposed timeline

Potential Funding (Local Budgets, Grant Funds, etc.): State and federal grants, FEMA HMA funds, AWA general fund

Timeline: 1-5 years

Project Priority (High, Medium, Low): High

Action 4. CAWP Tiger Creek Afterbay Alternate Supply

Hazards Addressed: Drought & Water Supply/Landslide/Debris/Wildfire/Multi-Hazard

Goals Addressed : 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): The Buckhorn WTP raw water is supplied by the Gravity Supply Line (GSL), which starts at the Tiger Creek Regulator Reservoir (Regulator) and flows through a 20-inch and 24-inch pipeline for approximately 6.6 miles to the Buckhorn WTP. The Regulator is primarily filled by an approximately 15-mile long canal/flume system which conveys water from the Salt Springs Reservoir. The Regulator is also filled from Tiger Creek, but flows from this source are less than the canal/flume system. The canal/flume system consists of a combination of open channel, elevated flumes, closed conduit, and tunnels through steep mountainous terrain which makes the system vulnerable to landslides, wildfire, debris flows or other natural disasters. Damage or failure of this system would likely result in an extended water system outage due to the steep terrain and extensive construction required to fix a failure. System failure would leave the entire CAWP system without a water supply for the duration of the outage. For this reason, a redundant raw water supply source is recommended for the Buckhorn WTP.

Project Description: The Tiger Creek Afterbay Reservoir (Afterbay) is located southwest of the Regulator and is filled directly from the Mokelumne River which makes it independent of the canal/flume system filling the Regulator. This Project is to build 2 new pump stations as an alternative water supply to the Buckhorn WTP from the Tiger Creek Afterbay for Hazard Mitigation including associated backup generator and all other associated infrastructure.

Other Alternatives: Continue with the risk of wildfire, landslide, or debris destroying the canals and flumes feeding the Tiger Creek Regulator causing inadequate fire flow to protect against wildfire and causing massive drinking water shortages.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

- 2020 AWA Water Master Plan Study, and 2025 Water Master Plan Study Update
- 2022 AWA Tanner & Ione WTP Capacity Study
- 2020 Water Shortage Contingency Plan
- 2020 Urban Water Management Plan
- 2024 Annual Water Supply & Demand Assessment Shortage Report
- Tiger Creek Alternate Supply Project Preliminary Engineering Report (Tiger Creek PER)

Responsible Office/Partners: AWA Operations Manager and Board

Benefits (Losses Avoided): Estimated at $10,000,000 over proposed timeline

Potential Funding (Local Budgets, Grant Funds, etc.): State and federal grants, FEMA HMA funds, AWA general fund

Timeline: 1-5 years

Project Priority (High, Medium, Low): Medium

Action 5. Ione WTP Backwash Handling Improvements

Hazards Addressed: Drought and Water Supply / Climate Change / Extreme Heat/ Wildfire / Multi-Hazard

Goals Addressed : 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): In 2022, AWA had a consultant prepare the AWS-Tanner and AWS-Ione Water Treatment Plant Capacity Study which expanded upon the 2020 Water Master Plan Study to assess the conditions and process capacities of the WTPs, identify operational and expansion challenges related to treatment processes, evaluate improvement alternatives to improve reliable capacity, and identify existing natural hazards at each location with associated projects for their mitigation. In 2022, AWA Board of Directors declared a Water Shortage Emergency and Enacting Mandatory Conservation Measures (Res. No. 2022-03) for Amador County. In 2024, AWA Board of Directors declared a Water Shortage Emergency in the Ione Water Treatment Plant Service Area (Res. No. 2024-02) due to a number of issues. Specifically, during peak maximum demand days brought on by recent extreme heat, changes in climate, and nearby wildfire suppression efforts, the Ione Water Treatment Plant (WTP) cannot maintain treatment operations during these times. Modifications are required in the Ione WTP backwash processes and infrastructure, valving and electrical systems in order to allow the Ione WTP to operate at or below the permitted reliable capacity of the WTP during peak maximum demand days.

Project Description: The best option to mitigate the hazards to Ione WTP backwash system is to install a 6" backwash waste pipeline with associated valving, controls, and other appurtenances from the Ione WTP approximately 1.3 miles south to an offsite disposal property to provide reliable water for wildfires and house fires, as well as during water shortage events.

Other Alternatives: Continue with the risk of wildfires, extreme heat and climate change causing water shortages through the entire AWS-Ione water system restricting AWA's ability to provide reliable water to protect against wildfire and house fires and provide drinking water.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

- 2020 AWA Water Master Plan Study, and 2025 Water Master Plan Study Update
- 2022 AWA Tanner & Ione WTP Capacity Study
- 2020 Water Shortage Contingency Plan
- 2020 Urban Water Management Plan
- 2024 Annual Water Supply & Demand Assessment Shortage Report

Responsible Office/Partners: AWA Operations Manager and Board

Benefits (Losses Avoided): Estimated at $15,000,000 over proposed timeline

Potential Funding (Local Budgets, Grant Funds, etc.): State and federal grants, FEMA HMA funds, AWA general fund

Timeline: 1-5 years

Project Priority (High, Medium, Low): High

Action 6. Tanner Clearwell Replacement

Hazards Addressed: Drought and Water Shortage; Earthquake; Wildfire

Goals Addressed : 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): The state has required AWA to remove all hypalon liners during improvements of facilities. With the Butte Fire, AWA became acutely aware of the extreme hazard of having storage facilities upcountry in the wildfire prone areas along Highway 88, especially AWA Hypalon lined and covered tanks.

The Tanner Clearwell is located at the Tanner Water Treatment Plant (WTP) adjacent to the Agency's headquarters. This is a half ground-level and half above ground storage facility with an aged Hypalon cover that has passed its useful life. Although the clearwell is approximately 15 feet deep, the minimum clearwell level is 8.4 feet (total water level depth); if the water level descends below 8.4 feet there is a risk of damaging the Hypalon cover and compromising the clearwell. Additional damage to the western slope of the clearwell from earthquakes or to the Hypalon cover from wildfires are also hazard risks.

The Hypalon liners have worked well over the years but they can potentially introduce contaminants into the potable water and will melt into the water during a wildfire. The state is not allowing any new potable water storage with Hypalon covers.

Project Description: Construct a new clearwell for hazard mitigation.

Other Alternatives: Continue with the risk of wildfire or earthquake destroying the clearwell and introducing toxins into the drinking water or causing drinking water shortages in the system.

Existing Planning Mechanism(s) through which Action Will Be Implemented: 2020 AWA Water Master Plan Study, and 2025 Water Master Plan Study Update; 2022 AWA Tanner & Ione WTP Capacity Study; 2020 Water Shortage Contingency Plan; 2020 Urban Water Management Plan; 2024 Annual Water Supply & Demand Assessment Shortage Report

Responsible Office/Partners: AWA Operations Manager and Board

Benefits (Losses Avoided): Estimated at $15,000,000 over proposed timeline

Potential Funding (Local Budgets, Grant Funds, etc.): State and federal grants, FEMA HMA funds, AWA general fund

Timeline: 1-5 years

Project Priority (High, Medium, Low): High

Action 7. Tanner WTP Backwash Drying Beds

Hazards Addressed: Climate Change, Drought and Water Supply, Extreme Heat, Wildfire

Goals Addressed : 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): In 2022, AWA had a consultant prepare the AWS-Tanner and AWS-Ione Water Treatment Plant Capacity Study which expanded upon the 2020 Water Master Plan Study to assess the conditions and process capacities of the WTPs, identify operational and expansion challenges related to treatment processes, evaluate improvement alternatives to improve reliable capacity, and identify existing natural hazards at each location with associated projects for their mitigation. In 2022, AWA Board of Directors declared a Water Shortage Emergency and Enacting Mandatory Conservation Measures (Res. No. 2022-03) for Amador County. During peak maximum demand days brought on by recent extreme heat, changes in climate, and nearby wildfire suppression efforts, the Tanner Water Treatment Plant (WTP) cannot maintain treatment operations during these times. Modifications are required in the Tanner WTP backwash processes and infrastructure, valving and electrical systems in order to allow the Tanner WTP to operate at or below the permitted reliable capacity of the WTP during peak maximum demand days.

Project Description: The best option to mitigate the hazards to Tanner WTP backwash is to install backwash drying beds, install new valves, piping, and treatment controls, bringing all subsurface valves above ground level where feasible, and all associated appurtenances for the WTP to provide reliable water for wildfires and house fires, as well as during water shortage events.

Other Alternatives: Continue with the risk of wildfires, extreme heat and climate change causing water shortages through the entire AWS-Tanner water system restricting AWA's ability to provide reliable water to protect against wildfire and house fires and provide drinking water.

Existing Planning Mechanism(s) through which Action Will Be Implemented: 2020 AWA Water Master Plan Study, and 2025 Water Master Plan Study Update; 2022 AWA Tanner & Ione WTP Capacity Study; 2020 Water Shortage Contingency Plan; 2020 Urban Water Management Plan; 2024 Annual Water Supply & Demand Assessment Shortage Report

Responsible Office/Partners: AWA Operations Manager and Board

Benefits (Losses Avoided): Estimated at $15,000,000 over proposed timeline

Potential Funding (Local Budgets, Grant Funds, etc.): State and federal grants, FEMA HMA funds, AWA general fund

Timeline: 1-5 years

Project Priority (High, Medium, Low): High

Action 8. Tank Replacement/ Tank Repair

Hazards Addressed: Severe Weather (Extreme Cold/ Severe Storms / Severe Wind); Severe Weather (High Winds); Wildfire

Goals Addressed : 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): In late December 2022 to mid-January 2023, the severe storms caused widespread damages across the county and specifically to two water storage tanks in the Camanche Service Area ($135,000) and the Camanche Wastewater Storage Pond. The old redwood tanks had Hypalon liners installed in 2013 to reduce the leaking. Hypalon is subject to melting during exposure from wildfires which can damage or contaminate drinking water systems. These costs do not include the regular and overtime man-hours AWA personnel spent to repair the impacts of these storms.

The Camanche Village is located six miles south of the City of Ione along the northern shore of Lake Camanche. The Camanche water system has five operational storage tanks, four of which are old redwood tanks.

Project Description: The best option to mitigate the hazards to these old redwood tanks is to construct new welded steel or concrete tanks hardened against wildfires and extreme storm/weather/cold events, with all associated appurtenances.

Other Alternatives: Continue with the risk of wildfires, severe winds and/or severe storms/cold conditions destroying AWA water storage tanks to protect against wildfire and house fires and provide drinking water.

Existing Planning Mechanism(s) through which Action Will Be Implemented: 2020 AWA Water Master Plan Study, and 2025 Water Master Plan Study Update; 2022 AWA Tanner & Ione WTP Capacity Study; 2020 Water Shortage Contingency Plan; 2020 Urban Water Management Plan; 2024 Annual Water Supply & Demand Assessment Shortage Report

Responsible Office/Partners: AWA Operations Manager and Board

Benefits (Losses Avoided): Estimated at $5,000,000 over proposed timeline

Potential Funding (Local Budgets, Grant Funds, etc.): State and federal grants, FEMA HMA funds, AWA general fund

Timeline: 1-5 years

Project Priority (High, Medium, Low): Medium

Action 9. Amador and Ione Water Systems Taste and Odor Mitigation

Hazards Addressed: Agricultural Hazard (invasive species)

Goals Addressed : 1, 2, 3, 4, 6

Issue/Background (Problem Statement): Historically, the Ione reservoir has always experienced increased odors (and as a result taste issues) during the spring / summer transition. In 2004 an AWA construction crew replaced the single pipeline intake with a manifold reservoir intake of 4 pipes. This retrofit eliminated short circuiting in the reservoir, improved reservoir circulation overall, and reduced issues associated with Taste and Odor in the community. In 2005 the 960 cubic feet of Granular Activated Carbon (GAC) in the filters at the Ione Water Treatment Plant was replaced. This work effort all but eliminated taste and odor complaints from the community. In 2016 and 2017, the Ione WTP had its first Taste and Odor (T&O) incidents since replacing the GAC filter media, starting on June 10, 2016 and July 10, 2017. Typically, Ione T&O events occur in the summer months when the weather turns extremely hot, warming reservoirs, and creating perfect conditions for algae and other organisms to grow. T&O events occur naturally throughout the world and are not exclusive to the Amador County region. Many solutions have been attempted at many different locations; however the most effective method is a continuous monitoring program whereby T&O events are caught before they become a major nuisance to the customers which we serve.

In the summers of 2016 and 2017, the number of complaints regarding T&O in the City of Ione spiked with many people noting earthy/musky flavors in the water. Samples were also taken from the Tanner Raw Reservoir with negligible results. The negligible results at the Tanner Raw Reservoir indicated a problem localized to the Ione Reservoir. Algae blooms were not observed at the Ione Reservoir in 2016 or 2017. A full spectrum analysis of cyanobacteria in the Ione Reservoir was performed on July 14th, 2017, and revealed no detectable cyanobacteria present in the Ione Reservoir, Ione WTP raw influent, nor in the Ione WTP treated effluent.

In 2019, Tanner Raw Reservoir Samples indicated geosmin levels were above historical high levels, indicating the source may be farther upstream than originally believed.

Project Description: Investigate cause(s) of geosmin production. Design solutions to mitigate geosmin production, or geosmin effects.

Other Alternatives: Continue with Taste and Odor Monitoring Program in place.

Existing Planning Mechanism(s) through which Action Will Be Implemented: 2020 AWA Water Master Plan Study, and 2025 Water Master Plan Study Update; 2022 AWA Tanner & Ione WTP Capacity Study; 2020 Water Shortage Contingency Plan; 2020 Urban Water Management Plan; 2024 Annual Water Supply & Demand Assessment Shortage Report

Responsible Office/Partners: AWA Operations Manager and Board

Benefits (Losses Avoided): Estimated at $500,000 over proposed timeline

Potential Funding (Local Budgets, Grant Funds, etc.): State and federal grants, FEMA HMA funds, AWA general fund

Timeline: 3-5 years

Project Priority (High, Medium, Low): Medium

Action 10. Replacement of Two Hypalon Lined and Covered Tanks with New Tanks

Hazards Addressed: Drought and Water Shortage; Wildfire

Goals Addressed : 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): The state has required AWA to remove all hypalon liners during improvements of facilities. With the Butte Fire, AWA became acutely aware of the extreme hazard of having storage facilities upcountry in the wildfire prone areas along Highway 88, especially AWA Hypalon lined and covered tanks.

AWA's 2020 Water Master Plan Study and 2025 Water Master Plan Study Update shows that the Ranch House Hypalon Lined and Covered 750,000-gallon potable water storage tank is oversized and should be 250,000 gallons. The Hypalon liner covers an earthen base and also covers the water on top.

The 125,000-gallon Jackson Pines tank also has a Hypalon lined earthen floor and water cover.

The Hypalon liners have worked well over the years but they can potentially introduce contaminants into the potable water and will melt into the water during a wildfire. The state is not allowing any new potable water storage with Hypalon covers.

Project Description: Replace Two Hypalon Lined and Covered Tanks with Two New Welded Steel Tanks for Wildfire Hazard Mitigation

Other Alternatives: Continue with the risk of wildfire destroying the tanks and introducing toxins into the drinking water.

Existing Planning Mechanism(s) through which Action Will Be Implemented: 2020 AWA Water Master Plan Study, and 2025 Water Master Plan Study Update; 2022 AWA Tanner & Ione WTP Capacity Study; 2020 Water Shortage Contingency Plan; 2020 Urban Water Management Plan; 2024 Annual Water Supply & Demand Assessment Shortage Report

Responsible Office/Partners: AWA Operations Manager and Board

Benefits (Losses Avoided): Estimated at $3,000,000 over proposed timeline

Potential Funding (Local Budgets, Grant Funds, etc.): State and federal grants, FEMA HMA funds, AWA general fund

Timeline: 1-5 years

Project Priority (High, Medium, Low): High

Action 11. Mt. Crossman Main Area Tank for Upper CAWP System

Hazards Addressed: Drought & Water Shortage, Extreme Heat; Severe Wind, Wildfire

Goals Addressed : 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): AWAs CAWP water system has been built on many smaller developments being rolled into one by Amador County and AWA where critically small pipelines exist and multiple small potable water tanks do not provide the necessary fire flow during a wildfire or house fire event. The combined storage capacity of the tanks in the Upper CAWP System does not meet minimum storage requirements needed for peak maximum days to supply fire suppression water and drinking water. The proposed Mt Crossman Tank will be placed at a central location, hardened against wildfires and severe wind, elevated on top of a hill, and sized to meet at least minimum storage requirements for the system.

Project Description: Build one principal partially buried concrete water tank for the Upper CAWP System for Wildfire Hazard Mitigation including associated pump station, backup generator, and all other associated infrastructure.

Other Alternatives: Continue with the risk of wildfires coupled with extreme heat, severe winds and/or severe storms destroying multiple tanks with inadequate fire flow to protect against wildfire and house fires.

Existing Planning Mechanism(s) through which Action Will Be Implemented: 2020 AWA Water Master Plan Study, and 2025 Water Master Plan Study Update; 2022 AWA Tanner & Ione WTP Capacity Study; 2020 Water Shortage Contingency Plan; 2020 Urban Water Management Plan; 2024 Annual Water Supply & Demand Assessment Shortage Report

Responsible Office/Partners: AWA Operations Manager and Board

Benefits (Losses Avoided): Estimated at $3,500,000 over proposed timeline

Potential Funding (Local Budgets, Grant Funds, etc.): State and federal grants, FEMA HMA funds, AWA general fund

Timeline: 2-5 years

Project Priority (High, Medium, Low): Medium

Action 12. Martell Regional Lift Station and Collection System Improvements

Hazards Addressed: Floods: 1%/0.2% annual chance (w/ levee failure); Flooding: Localized Stormwater; Severe Weather (Heavy Rains and Storms)

Goals Addressed : 1, 2, 3, 4, 6

Issue/Background (Problem Statement): The Martell Lift Station 2 collection system currently uses four (4) pump stations to collect and pump effluent to Sutter Hill for treatment and disposal at the Sutter Creek WWTP. The Walmart Lift Station collects flows from Walmart and pumps up hill to Lift Station 2. The Kmart Lift Station, collects flows from Kmart and also pumps up hill to Lift Station 2. Lift Station 1 collections flows via gravity from the Lift Station 1 collection area and pumps all flows up hill to Lift Station 2. In addition to these flows, Lift Station 2 collects flows via gravity from the Lift Station 2 collection area, and pumps all flows up hill to Sutter Hill. This area is known by the California Department of Water Resources to be an area prone to flooding in the DWR 100-Year floodplain delineation, part of the California Department of Water Resources (DWR) Best Available Maps (BAM) Floodplain Awareness program. This causes the lift stations to run continuously for long periods of time, unnecessarily wearing out the lifespan of, and risking damage to, the lift station infrastructure.

Project Description: The best option to mitigate the hazards is to construct a single lift station with back up power generator and associated appurtenances outside of the flood area that consolidates all collection system gravity flow to then be pumped to Sutter Hill.

Other Alternatives: Continue with the risk of flooding and overloading AWA Martell wastewater collection system to protect against loss of sanitary wastewater services to AWA customers during extreme storms, heavy rains and extreme cold hazards.

Existing Planning Mechanism(s) through which Action Will Be Implemented: 2022 AWA Wastewater Master Plan (planned to be updated in 2025); 2022 AWA Sewer System Management Plan (SSMP)

Responsible Office/Partners: AWA Operations Manager and Board

Benefits (Losses Avoided): Estimated at $5,000,000 over proposed timeline

Potential Funding (Local Budgets, Grant Funds, etc.): State and federal grants, FEMA HMA funds, AWA general fund

Timeline: 1-5 years

Project Priority (High, Medium, Low): Medium

Action 13. Mace Meadows Pump Station Flooding

Hazards Addressed: Flooding: 1% and 0.2% Annual Chance; Flooding: Localized Flooding

Goals Addressed : 1, 2, 3, 4, 6

Issue/Background (Problem Statement): AWAs Buckhorn Water treatment plant discharges its recycle wastewater to the Mace Meadows pond that is then pumped for use onto a Golf Course. The pump station is located in a meadow area and has taken on water several times damaging electrical equipment or floods the building making it unsafe to operate. During atmospheric rivers and server rain events like in 2017 the pump station was flooded, and electrical equipment was damage.

Project Description: Build a new pump station with 2 ea. 60 horsepower pumps with new piping to new location above the meadow at a higher elevation.

Other Alternatives: Continue with the risk of flooding damaging or destroying electrical switch gear, pumps, and motors.

Existing Planning Mechanism(s) through which Action Will Be Implemented: 2022 AWA Wastewater Master Plan (planned to be updated in 2025); 2022 AWA Sewer System Management Plan (SSMP)

This has been an ongoing historical problem that cause unsafe operations and prevents the agency from properly disposing of its treatment plant wastewater.

Responsible Office/Partners: AWA Operations Manager and Board

Benefits (Losses Avoided): Estimated at $225,000 over proposed timeline

Potential Funding (Local Budgets, Grant Funds, etc.): State and federal grants, FEMA HMA funds, AWA general fund

Timeline: 1-5 years

Project Priority (High, Medium, Low): Medium

Action 14. Water Treatment Plant Raw Water Bypasses

Hazards Addressed: Drought & Water Shortage; Extreme Heat; Severe Weather: High Winds; Wildfire

Goals Addressed : 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): As evidenced in the recent 2025 Palisades Fire, firefighting suppression demands for water during a wildfire can easily exceed the ability of a water distribution and storage system to provide adequate pressures and flows. Also, when wildfires burn and melt plastic water lines in homes and the water system loses pressure/flows, dangerous chemicals are leached into the water distribution system requiring complete massive and costly replacement of the entire water distribution system as seen during the 2017 Tubbs Fire.

Many portions of the entire AWA water system has been built on many smaller developments being rolled into one by Amador County and AWA where critically small pipelines exist and multiple small potable water tanks do not provide the necessary fire flow during a wildfire or house fire event. During wildfires, the treated water storages may not be able to keep up with fire fighting demands and risk loss of all drinking water and firefighting water to the distribution system. The Buckhorn Water Treatment Plant (WTP),

Tanner WTP and Ione WTP all have raw water inlets and treated water outlets that if modified slightly, could provide an emergency supply of raw water to the distribution system in order to maintain continuous fire suppression water. When no longer needed, the bypasses could be disconnected and the system easily and cheaply disinfected per the respective AWA WTP Operations Plans.

Project Description: Modify each AWA WTP with an emergency raw water bypass from inlet to outlet to maintain fire suppression water in the distribution system, along with all associated appurtenances, backup generators and emergency fuel supplies.

Other Alternatives: Continue with the risk of wildfires coupled with extreme heat, severe winds and/or severe storms overloading AWA water distribution and storage systems to protect against wildfire and house fires.

Existing Planning Mechanism(s) through which Action Will Be Implemented: 2020 AWA Water Master Plan Study, and 2025 Water Master Plan Study Update; 2022 AWA Tanner & Ione WTP Capacity Study; 2020 Water Shortage Contingency Plan; 2020 Urban Water Management Plan; 2024 Annual Water Supply & Demand Assessment Shortage Report; Tiger Creek Alternate Supply Project Preliminary Engineering Report (Tiger Creek PER); Buckhorn WTP Operations Plan; Tanner WTP Operations Plan; Ione WTP Operations Plan

Responsible Office/Partners: AWA Operations Manager and Board

Benefits (Losses Avoided): Estimated at $5,000,000 over proposed timeline

Potential Funding (Local Budgets, Grant Funds, etc.): State and federal grants, FEMA HMA funds, AWA general fund

Timeline: 1-5 years

Project Priority (High, Medium, Low): Medium

Action 15. Upgrade Fire Pumps

Hazards Addressed: Wildfire

Goals Addressed : 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): AWAs CAWP water system has several facilities that are old and inadequate for current fire pumping equipment. AWA must deliver water to fight wildfires at the required flow.

Project Description: Replace and upsize two fire pump installations.

Other Alternatives: Continue with the risk of wildfire destroying multiple tanks and houses with unavailable fire flow because of inadequate pumping.

Existing Planning Mechanism(s) through which Action Will Be Implemented: 2020 AWA Water Master Plan Study, and 2025 Water Master Plan Study Update; 2022 AWA Tanner & Ione WTP Capacity Study; 2020 Water Shortage Contingency Plan; 2020 Urban Water Management Plan; 2024 Annual Water Supply & Demand Assessment Shortage Report

AWA has consistently added pumps dedicated to fire flow as facilities are upgraded as funding becomes available.

Responsible Office/Partners: AWA Operations Manager and Board

Benefits (Losses Avoided): Estimated at $500,000 over proposed timeline

Potential Funding (Local Budgets, Grant Funds, etc.): State and federal grants, FEMA HMA funds, AWA general fund

Timeline: 1-5 years

Project Priority (High, Medium, Low): Medium

Action 16. Tanner WTP Flow Control and Reliability Improvements

Hazards Addressed: Climate Change, Drought and Water Supply; Extreme Heat; Wildfire

Goals Addressed : 1, 2, 3, 4, 5, 6

Issue/Background (Problem Statement): In 2022, AWA had a consultant prepare the AWS-Tanner and AWS-Ione Water Treatment Plant Capacity Study which expanded upon the 2020 Water Master Plan Study to assess the conditions and process capacities of the WTPs, identify operational and expansion challenges related to treatment processes, evaluate improvement alternatives to improve reliable capacity, and identify existing natural hazards at each location with associated projects for their mitigation. In 2022, AWA Board of Directors declared a Water Shortage Emergency and Enacting Mandatory Conservation Measures (Res. No. 2022-03) for Amador County. During peak maximum demand days brought on by recent extreme heat, changes in climate, and nearby wildfire suppression efforts, the Tanner Water Treatment Plant (WTP) cannot maintain treatment operations during these times. Modifications are required in the Tanner WTP treatment and backwash processes and infrastructure, valving and electrical systems in order to allow the Tanner WTP to operate at or below the permitted reliable WTP capacity during peak maximum demand days.

Project Description: The best option to mitigate the hazards to Tanner WTP is to install new valves, piping, and treatment controls, bringing all subsurface valves above ground level where feasible,

adding a third reclaim backwash tank, and all associated appurtenances for the WTP to provide reliable water for wildfires and house fires, as well as during water shortage events.

Other Alternatives: Continue with the risk of wildfires, extreme heat and climate change causing water shortages through the entire AWS-Tanner water system restricting AWA's ability to provide reliable water to protect against wildfire and house fires and provide drinking water.

Existing Planning Mechanism(s) through which Action Will Be Implemented: 2020 AWA Water Master Plan Study, and 2025 Water Master Plan Study Update; 2022 AWA Tanner & Ione WTP Capacity Study; 2020 Water Shortage Contingency Plan; 2020 Urban Water Management Plan; 2024 Annual Water Supply & Demand Assessment Shortage Report

Responsible Office/Partners: AWA Operations Manager and Board

Benefits (Losses Avoided): Estimated at $15,000,000 over proposed timeline

Potential Funding (Local Budgets, Grant Funds, etc.): State and federal grants, FEMA HMA funds, AWA general fund

Timeline: 1-5 years

Project Priority (High, Medium, Low): High

Action 17. Ione Reliability Capacity Expansion and Site Security

Hazards Addressed: Drought & Water Shortage; Landslide

Goals Addressed : 1, 2, 3, 4, 6

Issue/Background (Problem Statement): In 2022, AWA had a consultant prepare the AWS-Tanner and AWS-Ione Water Treatment Plant Capacity Study which expanded upon the 2020 Water Master Plan Study to assess the conditions and process capacities of the WTPs, identify operational and expansion challenges related to treatment processes, evaluate improvement alternatives to improve reliable capacity, and identify existing natural hazards at each location with associated projects for their mitigation. In 2022, AWA Board of Directors declared a Water Shortage Emergency and Enacting Mandatory Conservation Measures (Res. No. 2022-03) for Amador County. In 2024, AWA Board of Directors declared a Water Shortage Emergency in the Ione Water Treatment Plant Service Area (Res. No. 2024-02) due to a number of issues, including the location of the Ione WTP being on an unstable hill prone to erosion and landslides, risking damage to major components. The WTP clearwell has a Hypalon lined earthen floor and water cover. The Hypalon liner has worked well over the years but can potentially introduce contaminants into the potable water and will melt into the water during a wildfire. The State is not allowing any new potable water storage with Hypalon covers. Further, the Ione WTP does not have the reliable capacity to provide the drinking water and fire flow needed during peak days. Additionally, site security and access improvements are needed at each WTP.

Project Description: Repair and/or replace deteriorating and capacity constrained facilities at and around the existing Ione WTP and improve site security & access. Stabilize the existing Ione WTP site from further erosion/landslides/settling, repair clarifier launder, replace clearwell Hypalon cover, and install other appurtenances as required.

Other Alternatives: Continue with the risk of landslides or erosion and wildfire destroying the Ione WTP and associated clearwell causing inadequate fire flow to protect against wildfire and causing massive drinking water shortages.

Existing Planning Mechanism(s) through which Action Will Be Implemented: 2020 AWA Water Master Plan Study, and 2025 Water Master Plan Study Update; 2022 AWA Tanner & Ione WTP Capacity Study; 2020 Water Shortage Contingency Plan; 2020 Urban Water Management Plan; 2024 Annual Water Supply & Demand Assessment Shortage Report

Responsible Office/Partners: AWA Operations Manager and Board

Benefits (Losses Avoided): Estimated at $15,000,000 over proposed timeline

Potential Funding (Local Budgets, Grant Funds, etc.): State and federal grants, FEMA HMA funds, AWA general fund

Timeline: 1-5 years

Project Priority (High, Medium, Low): High

Annex G Jackson Valley Irrigation District

G.1 Introduction

This Annex details the hazard mitigation planning elements specific to the Jackson Valley Irrigation District (JVID or District), a previously participating jurisdiction to the 2020 Amador County Local Hazard Mitigation Plan (LHMP) Update. This Annex is not intended to be a standalone document but appends to and supplements the information contained in the Base Plan document. As such, all sections of the Base Plan, including the planning process and other procedural requirements apply to and were met by the District. This Annex provides additional information specific to the JVID, with a focus on providing additional details on the planning process, risk assessment, and mitigation strategy for this jurisdiction.

G.2 Planning Process

As described above, the JVID followed the planning process detailed in Chapter 3 of the Base Plan. In addition to providing representation on the Amador County Hazard Mitigation Planning Committee (HMPC), the District formulated their own internal planning team to support the broader planning process requirements. Internal planning participants, their positions, and how they participated in the planning process are shown in Table G-1. Additional details on Plan participation and District representatives are included in Appendix A.

Table G-1 JVID – Planning Team

Name	Position/Title	How Participated
Steven Fredrick	General Manager	Provided Background and Project information. Attended meetings.

Coordination with other community planning efforts is paramount to the successful implementation of this LHMP Update. This section provides information on how the District integrated the previously approved 2020 LHMP into existing planning mechanisms and programs. Specifically, the District incorporated into or implemented the 2020 LHMP through other plans and programs shown in Table G-2.

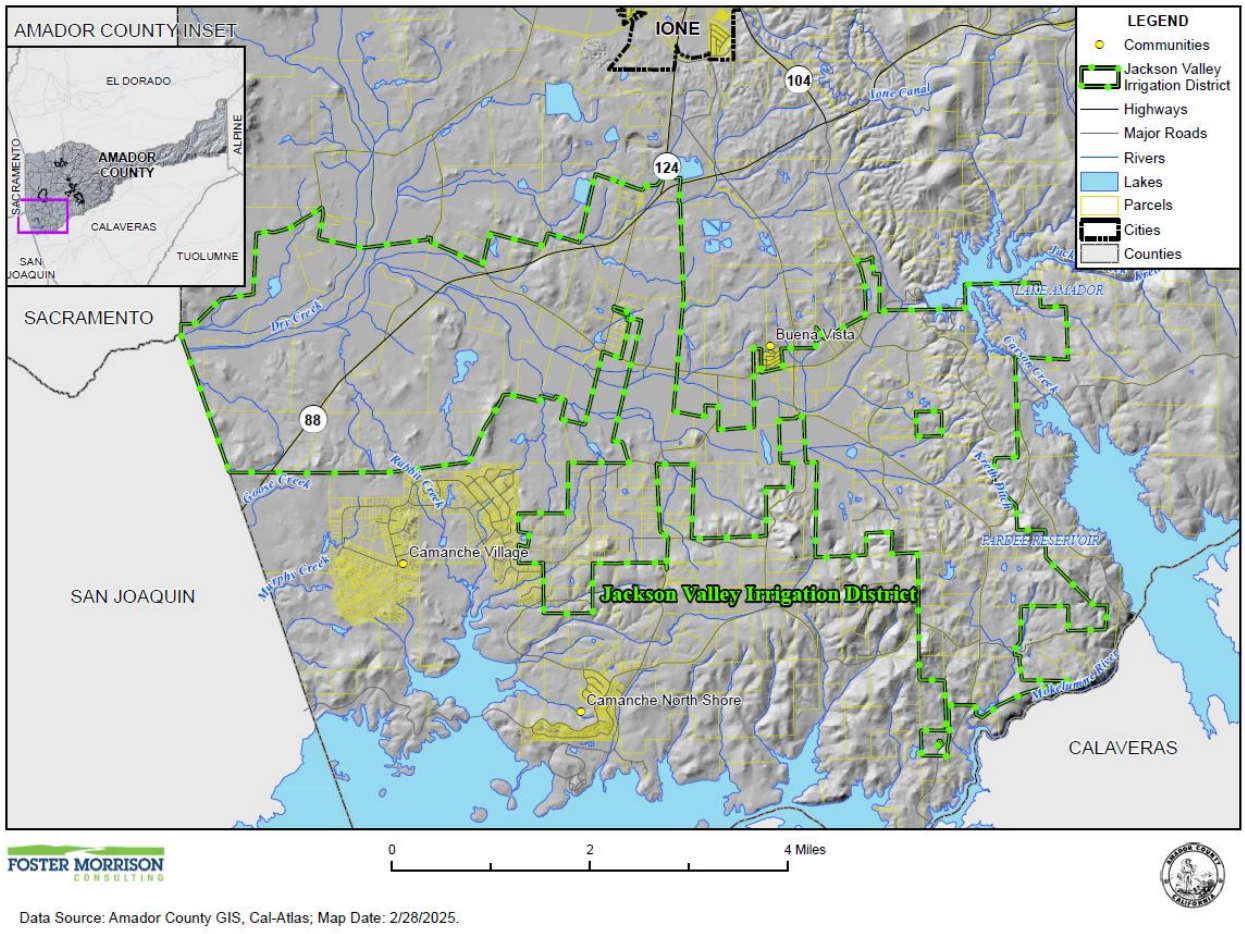
Table G-2 2020 LHMP Incorporation

Planning Mechanism 2020 LHMP Was Incorporated/Implemented In.	Details: How was it incorporated?
–	No hazard or mitigation related planning was completed by the District since 2020.

G.3 Community Profile

The community profile for the JVID is detailed in the following sections. Figure G-1 displays a District map and the location of JVID Service Area within Amador County.

Figure G-1 JVID



G.3.1. Overview and Background

JVID provides wholesale water supply, distribution of raw water to irrigation, industrial and domestic users, distribution of bottled water to domestic users, and hydroelectric power generation. JVID has an agreement with a private company to operate the Lake Amador recreation facilities. Its recreation concessionaire operates domestic water treatment and wastewater services at Lake Amador.

JVID was formed in October of 1956 as an independent special district to provide irrigation services to the Jackson Valley area. The principal act that governs the District is the Irrigation District Law. The principal act empowers such districts to provide water "for any beneficial use" and may do any act to put to any beneficial use any water under its control. In addition, irrigation districts may provide water-related drainage services and, under certain circumstances, electric and wastewater services. Districts must apply

and obtain LAFCO approval to exercise those services authorized by the principal act but not already provided by the district in 2000 (i.e., latent powers).

The JVID boundary is located in southwestern Amador County, west of the Pardee Reservoir and east of the Amador-San Joaquin County line. Lake Amador is located within the northeast portion of the District. Communities in the vicinity of JVID include Buena Vista and the Buena Vista Rancheria, Camanche Village and Camanche North Shore. The boundary of JVID encompasses the residential community of Buena Vista Estates. The District has a boundary area of approximately 13,665 acres (21 square miles). Records of the District's boundary history include four annexations and three detachments.

G.4 Risk Assessment

As defined by FEMA, risk is a combination of hazard, vulnerability, and exposure. "It is the impact that a hazard would have on people, services, facilities, and structures in a community and refers to the likelihood of a hazard event resulting in an adverse condition that causes injury or damage."

The JVID risk assessment identifies and profiles relevant hazards and assesses the exposure of lives, property, infrastructure, and the environment to these hazards. The process allows for a better understanding of the District's potential risk and vulnerability to hazards and provides a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

Building on the Community Profile above, a risk assessment was performed for the District. This includes the following sections:

- G.4.1 Assets Inventory and Growth and Development Trends
- G.4.2 Hazard Identification
- G.4.3 Hazard Profiles and Vulnerability to Specific Hazards

G.4.1. Assets Inventory and Growth and Development Trends

This section provides an inventory of the JVID's total assets potentially at risk to hazards and an overview of growth and development trends. This section is broken into two parts:

- **Asset Inventory** – The assets inventory identifies the JVID's total assets, including the people and populations; structures; critical facilities and infrastructure; community lifelines; natural, historic, and cultural resources; and economic assets and community activities of value. This data is not hazard specific, but is representative of total assets within the District, potentially at risk to identified hazards as discussed in Section G.4.3 Hazard Profiles and Vulnerability to Specific Hazards.
- **Growth and Development Trends** – A discussion of growth and development trends in the District, both current and future, is presented.

Assets Inventory

The District's asset inventory is detailed in the following sections:

- People and Populations

- Structures
- Critical Facilities and Infrastructure
- Community Lifelines
- Natural, Historic, and Cultural Resources
- Economic Assets and Community Activities of Value

A discussion of each of these assets follows and serves as the template for the asset discussion for each hazard in Section G.4.3.

People and Populations

The most important asset within any community are the people and populations that reside in the community. People and populations in the District include both District staff and workers as well as those populations located within District boundaries and served by the District. This section includes an inventory of past and current populations of the District and also discusses vulnerable populations and underserved communities as a subsection of people and populations located within the District and potentially at risk to hazards. Information from the District and other sources as detailed below form the basis of this discussion.

Historic Population Trends and Current Population

The most important asset within any community are the people and populations that reside in the District which include both Agency staff and workers and those populations served by JVID. The District provides services to roughly 1,000 full-time residents. The general make up a JVID's service territory is mostly farmer, ranchers with some disadvantaged and low-income populations.

Special and Vulnerable Populations

There is a 210 home mobile/ modular home community (The Oaks Community) that is in the District's Service Area. In addition, there are 4 full time employees with JVID.

Structures and Critical Facilities

This section considers the JVID's assets at risk, with a focus on key District assets such as critical facilities, infrastructure, and other District assets and their values. With respect to District assets, the majority of these assets are considered critical facilities as defined for this Plan. Critical facilities are defined for this Plan as:

> ***Any facility, including without limitation, a structure, infrastructure, property, equipment or service, that if adversely affected during a hazard event may result in severe consequences to public health and safety or interrupt essential services and operations for the community at any time before, during and after the hazard event.***

Table G-3 lists critical facilities and other District assets identified by the District Planning Team as important to protect in the event of a disaster. JVID's physical assets, valued at over $90 million, consist of the buildings and infrastructure to support the District's operations.

Table G-3 JVID Critical Facilities, Infrastructure, and Other District Assets

Name of Asset	Facility Type	Replacement Value	Which Hazards Pose Risk
Jackson Creek Dam	Earth Fill Reservoir Storage	$65,000,000	Earthquake, Dam Failure, Wildfire
Transmission, Piping, Outlet Works	Water Transmission	$15,000,000	Earthquake, Dam Failure, Freezing, Wildfire
Spillway	Water / Flood releases	$2,000,000	Flood, Wildfire
Power House	Power Generation	$2,000,000	Dam Failure, Drought, Wildfire
Irrigation Pump Station	Water Transmission	$250,000	Flood (Levee Failure), Wildfire
Water Treatment Plant	Domestic Water Production	$5,000,000	Dam Failure, Drought, Severe Weather, Wildfire
Admin Office and Shop	Governmental Administration	$1,200,000	Earthquake, Drought, Severe Weather, Agriculture Hazards, Wildfire
Total		**$90,450,000**	

Source: JVID

Community Lifelines

Assessing the vulnerability of the JVID to natural hazards and disasters also involves reviewing and inventorying the community lifelines in place that could be affected. It is important to include these items in hazard discussions as the continuous operation of critical government and business functions is essential to human health and safety, property protection, and economic security. The importance of community lifelines is discussed below:

- Lifelines are the most fundamental services in the community that, when stabilized, enable all other aspects of society to function.
- FEMA has developed a method for objectives-based response that prioritizes the rapid stabilization of Community Lifelines after a disaster.
- The integrated network of assets, services, and capabilities that provide lifeline services are used day-to-day to support the recurring needs of the community and enable all other aspects of society to function.
- When disrupted, decisive intervention (e.g., rapid re-establishment or employment of contingency response solutions) is required to stabilize the incident.

Community lifelines, as defined by FEMA, include the following:

- **Safety and Security** – Law Enforcement/Security, Fire Service, Search and Rescue, Government Service, Community Safety
- **Food, Hydration, Shelter** – Food, Water, Shelter, Agriculture
- **Health and Medical –** Medical Care, Public Health, Patient Movement, Medical Supply Chain, Fatality Management
- **Energy –** Power Grid, Fuel

- **Communications** – Infrastructure, Responder Communications, Alerts Warnings and Messages, Finance, 911 and Dispatch
- **Transportation** – Highway/Roadway/Motor Vehicle, Mass Transit, Railway, Aviation, Maritime
- **Hazardous Material –** Facilities, HAZMAT, Pollutants, Contaminants
- **Water Systems** – Potable Water Infrastructure, Wastewater Management

It should be noted that these community lifelines are all in place and functional as part of regular government operations in the Amador County Planning Area serving as a partnership between the cities, local special districts and agencies, and Amador County. Due to its more rural nature, there is an interplay in community lifelines between all jurisdictions in the County. Most all of the District's community lifelines overlap with the Planning Area's. It should also be noted that these lifelines collectively include many of the critical facilities and infrastructure assets inventoried for this LHMP, including those assets owned by the District. As such, specific information on these community lifelines in the City and how they may be affected by a hazard event or disaster are discussed collectively for all jurisdictions in the Base Plan.

Natural, Historic, and Cultural Resources

Assessing the vulnerability of the JVID to natural hazards and disasters also involves inventorying the natural, historic, and cultural assets of the area. This step is important for the following reasons:

- Environmental and natural resources add to a community's identity and quality of life. They also help the local economy through agriculture, tourism, and recreation. They support ecosystem services, such as clean air and water.
- Conserving the environment may help people mitigate risk. It can also protect sensitive habitats, develop parks and trails, and build the economy.
- The community may decide that these types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- If these resources are impacted by a disaster, knowing so ahead of time allows for more prudent care in the immediate aftermath, when the potential for additional impacts are higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- Natural resources can have beneficial functions that reduce the impacts of natural hazards, such as wetlands and riparian habitat, which help absorb and attenuate floodwaters.

Natural Resources

JVID has a variety of natural resources of value to the District. These natural resources parallels that of Amador County Planning Area as a whole. Information can be found in Section 4.2.1 of the Base Plan and the jurisdictional annexes for the cities.

Historic and Cultural Resources

JVID has a variety of historic and cultural resources of value to the District. These historic and cultural resources parallels that of Amador County Planning Area as a whole. Information can be found in Section 4.2.1 of the Base Plan.

Economic Assets and Community Activities of Value

Assessing the vulnerability of the JVID to natural hazards and disasters also involves inventorying the economic assets and community activities of value in the District.

Economic Assets

After a disaster, economic resiliency is one of the major drivers of a speedy recovery. Each community has specific economic drivers. Economic assets for the County were discussed in Section 4.2.1 of the Base Plan and are assumed to be the same or similar for the District.

The economic assets in JVID revolve around the reservoir and what it's able to provide. These include recreational activities such as camping, fishing and boating. Water from the reservoir is used for farming, aquaculture, hydrogeneration, biomass power generation and additionally water for potable use for the community.

Note: This inventory of economic assets is only included in this overall asset inventory for the District. To limit redundancy, it is not discussed further in the hazard profiles and vulnerability assessments in Section G.4.3 below. However, depending on the type, location, magnitude and extent of future hazard events and disasters, these District's economic assets may be vulnerable.

Community Activities of Value

Inventorying economic assets in the District and their vulnerability to natural hazards and disasters also involves inventorying activities that have value to the community. This includes activities that are important to a community, like long-standing traditions such as a festival or fair or other activities that bring money into the communities such as sports tournaments and other recreational activities. Community Activities of Value for the County were discussed in Section 4.2.1 of the Base Plan and are assumed to be the same or similar for the District.

Growth and Development Trends

As part of the planning process, the District looked at changes in growth and development, both current and future, and examined these changes in the context of hazard-prone areas, and how the changes in growth and development affect loss estimates and vulnerability over time. In addition to evaluating population growth and expansion in the JVID Service Area, this inventory section details future JVID development plans and projects that are likely to occur over the next five years covered by this 2025 LHMP. For Districts, this generally includes the following:

- Plans for expansion or build out of the District's Service Area, including new service hookups, and other District functions related to where the District will be expanding services. This is discussed in the Population Trends and Projections: JVID Service Area section below.
- Construction/development projects related to adding new District facilities, infrastructure, land acquisition, etc. This is discussed in the Future Development section below.

Population Trends and Projections: JVID Service Area

Growth trends over the past 5 years have been limited. Plans for future development within the JVID Service Area include two primary expansion projects. The first is from a property owner that is trying to convert a parcel into a 200 space RV park just 1 mile downstream of the reservoir. The property owner is currently going through an EIR with Amador County and have yet to be fully permitted. The second project, the Kreth Line Treated Water Project, will expand JVID's Service Areas approximately 6 miles to connect 25 additional customers to the treated water system.

The District is also conducting conversations with a local Mi-Wuk native American tribe to connect a failing well water system into JVID's Treated water system that will incorporate 12 additional homes. Specific to the District's irrigation water, which includes two systems, a very small treated water system, and irrigation system, there is no talk of expanding this Service Area in the District within the next five years.

Development since 2020 Plan

The District has seen limited growth since 2020. Being a primarily agriculture zone there has not been much growth or development within the District itself or its Service Area. Since the 2020 LHMP, JVID has not added additional facilities. Most of the parcels are 5 acres to 100+ acre parcels that are used for small to large ranching and farming activities. Development in the District Service Area can be seen in Figure G-2. As shown, development has been limited. None of this occurred in hazard zones.

Figure G-2 JVID – Total Development since 2020

Property Use	2020	2021	2022	2023	2024
Residential	2	1	1	0	0
Commercial	0	0	0	0	0
Industrial	1	0	0	0	0
Other	0	0	0	0	0
Total	**3**	**1**	**0**	**0**	**0**

Source: JVID

Future Development

It is important to review future development plans for the District. Depending on the asset, future development should be sited in areas that are away from known hazard risks. If this is not possible, mitigation should be done to ensure that future development is protected against future hazards.

JVID is in the queue for around $6 million project, the Kreth Line Treated Water Project, in partnership with the California Water Boards to extend a treated waterline approximately 6 miles to connect 25 additional customers to the treated water system. This project is estimated to cost $20k - $100k for infrastructure and other required improvements. Additionally, the District has a couple smaller projects replacing irrigation pipeline and valving.

G.4.2. Hazard Identification

The JVID identified the hazards that affect the District and summarized their location, extent, likelihood of future occurrence, potential magnitude, and significance (or priority of a hazard) specific to the District.

Those hazards identified as a high or medium significance in Table G-4 are considered JVID priority hazards for mitigation planning. Those hazards that occur infrequently or have little or no impact in the District were determined to be of low significance and not considered a priority hazard. Significance was determined based on the hazard profile, focusing on key criteria such as frequency, extent, and resulting damage, including deaths/injuries and property, natural and cultural resources, and economic damage. The ability of a jurisdiction to reduce losses through implementation of existing and new mitigation measures was also considered as to the significance of a hazard. This assessment was used to prioritize those hazards of greatest significance, enabling the District to focus resources where they are most needed.

Table G-4 JVID—Hazard Identification Assessment

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Agricultural Hazards (severe weather/pests/invasive species)	Extensive	Likely	Catastrophic	High	Medium
Avalanche	Limited	Unlikely	Negligible	Low	Medium
Climate Change	Significant	Occasional	Limited	Medium	--
Dam Failure	Extensive	Unlikely	Catastrophic	High	Medium
Drought & Water shortage (w/ tree mortality)	Extensive	Likely	Critical	High	High
Earthquake (w/subhazards)	Extensive	Occasional	Limited	Medium	Low
Floods: 1%/0.2% annual chance (w/ levee failure)	Significant	Occasional	Limited	Medium	Medium
Floods: Localized Stormwater	Limited	Likely	Limited	Low	Medium
Landslide, Mudslide, Debris Flow	Limited	Likely	Limited	Low	Medium
Severe Weather: Extreme Cold, Freeze, and Snow	Limited	Occasional	Limited	Medium	Medium
Severe Weather: Extreme Heat	Extensive	Likely	Limited	Low	High
Severe Weather: Heavy Rains and Storms (Hail, Lightning)	Extensive	Likely	Limited	Low	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Likely	Limited	Low	Medium
Wildfire (w/smoke and air quality)	Extensive	Occasional	Critical	Medium	Medium

Geographic Extent
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Likelihood of Future Occurrences
Highly Likely: Near 100% chance of occurrence in next year, or happens every year.
Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.
Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.
Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Magnitude/Severity
Catastrophic: More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths
Critical: 25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability
Limited: 10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability
Negligible: Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance
Low: Minimal potential impact
Medium: Moderate potential impact
High: Widespread potential impact

Climate Change Influence
Low: Minimal potential impact
Medium: Moderate potential impact
High: Widespread potential impact

G.4.3. Hazard Profiles and Vulnerability to Specific Hazards

This section includes the hazard profiles and vulnerability assessment for hazards ranked of medium or high significance specific to the JVID (as identified in the Significance column of Table G-4). This section focuses on where and how the District is affected by their priority hazards. Chapter 4 of the Base Plan provides more detailed information about these hazards and their impacts on the Amador County Planning Area. Methodologies for evaluating vulnerabilities and calculating loss estimates are the same as those described in Section 4.2 of the Base Plan.

Hazard Profiles and Vulnerability Assessment

Each hazard is profiled in the following format:

- **Hazard Profile** – A hazard profile is included for each hazard. This includes information on:
  - ✓ **Hazard Overview** – A general discussion of the hazard and related issues is detailed here.
  - ✓ **Location** and **Extent** – Location is the geographic area within the District that is affected by the hazard. Extent is the expected range of intensity for each hazard. These are discussed in specific detail for mapped hazards, and in more general detail for those hazards that do not have discrete mapped hazard areas.
  - ✓ **Past Occurrences** – Past occurrences are discussed for each hazard. A discussion of disaster declarations is included in each hazard section. NCDC events are also discussed. Other past occurrences data specific to the District follow the disaster declarations and NCDC events for each hazard.
  - ✓ **Climate Change** – This section contains the effects of climate change (as applicable). The possible influence of climate change on the hazard is discussed.

After the hazard profile, a vulnerability assessment is presented. As part of the vulnerability assessment, an estimate of the vulnerability of the District to each identified hazard, in addition to the estimate of risk of future occurrence, is provided in each of the hazard-specific sections. Vulnerability is measured in general, qualitative terms and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential. It is categorized into the following classifications:

- **Extremely Low**—The occurrence and potential cost of damage to life and property is very minimal to nonexistent.
- **Low**—Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**—Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**—Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have occurred in the past.
- **Extremely High**—Very widespread with catastrophic impact.

After this classification, a general discussion of hazard vulnerabilities occurs. This is done in the following format:

- **Local Concerns** – This includes District provided information on how the District is uniquely affected by or vulnerable to each hazard.
- **Assets at Risk** – A discussion of the assets at risk follows, presented in the same order as in Section G.4.1 above, with a few exceptions. This includes sections on: People and Populations; Structures and Critical Facilities and Infrastructure; and Natural, Historic, and Cultural Resources. These are discussed in specific terms for mapped hazards, and in more general terms for those hazards that are unmapped. Sections on Community Lifelines and Economic Assets and Community Activities of Value are not included in the Sections below, as they are fully covered in Section G.4.1 above and Chapter 4 of the Base Plan.
- **Impacts** – A discussion on hazard impacts follows. Impacts describe how each hazard can affect the District, its assets, and the ability to provide continued and reliable services. The type and severity of impacts reflect both the potential magnitude of the hazard and the vulnerability of the asset.
- **Future Conditions/Future Development** – A discussion of how future conditions and future development may affect the hazard is also included. This is addressed specifically for mapped hazards, and in more general terms for those hazards that are unmapped.

Power Interruption/Power Failure: A Common Vulnerability of all Hazards

An impact of almost all hazards evaluated as part of this LHMP Update relates to power shortage and/or power failures. The US power grid crisscrosses the country, bringing electricity to homes, offices, factories, warehouses, farms, traffic lights and even campgrounds. According to statistics gathered by the U.S. Department of Energy, major blackouts are on the upswing. Incredibly, over the past two decades, blackouts impacting at least 50,000 customers have increased 124 percent. The electric power industry does not have a universal agreement for classifying disruptions. Nevertheless, it is important to recognize that different types of outages are possible so that plans may be made to handle them effectively. In addition to blackouts, brownouts can occur. A brownout is an intentional or unintentional drop in voltage in an electrical power supply system. Intentional brownouts are used for load reduction in an emergency. Electric power disruptions can be generally grouped into two categories: intentional and unintentional. More information on types of power disruptions can be found in Section 4.3 of the Base Plan.

Public Safety Power Shutoff (PSPS)

An intentional disruption type of power shortage/failure event has been recently implemented in California as a result of wildfires starting as a result of downed power lines or electrical equipment. This was the case for the Camp Fire in 2018. As a result, California's three largest energy companies (including PG&E), at the direction of the California Public Utilities Commission (CPUC), are preparing all Californians for the threat of wildfires and power outages during times of extreme (fire) weather. To help protect customers and communities during extreme fire weather events, electric power may be shut off for public safety in an effort to proactively prevent wildfire. This is called a PSPS. More information on PSPS criteria can be found in Section 4.3 of the Base Plan.

In addition to PSPSs, to help prevent wildfires, electric utilities have begun to evolve safety efforts. This includes installing safety settings on powerlines in and around high fire-risk areas. These are known as Enhanced Powerline Safety Settings (EPSS), and they help prevent falling tree branches, animals and other hazards from starting a wildfire. By stopping ignitions, it helps prevent wildfires from starting and spreading. According to PG&E, if ignitions occur, the size of fires are much smaller due to EPSS. In 2022,

there was a 99% decrease in acres impacted by ignitions (as measured by fire size from electric distribution equipment (compared to the 2018-2020 average). This decrease occurred despite dry conditions.

Local Concerns

PSPS and power outages are common in the JVID jurisdiction. JVID utilizes propane backup generators at the water treatment plant and JVID administration office.

Agricultural Hazards (Severe Weather/Pests/Invasive Species)

Likelihood of Future Occurrence–Highly Likely
Vulnerability–Medium

Hazard Profile

Farming and related agricultural industries are not only important to Amador County's economy, but they also play a central role in the way of life of County residents and help define the character of the County. Agriculture has always been an integral part of Amador County and has continually grown and changed along with the County. Agriculture in the County can be affected by a variety of natural hazards. This Agricultural Hazard focuses on severe weather, as well as native and invasive species (insects, pests and weeds), all which can significantly affect the agricultural industry in the County. This hazard does not address pest and plants that cause impacts to human health, as those issues are addressed in other planning mechanisms in the County.

Agricultural losses occur on an annual basis and are often associated with severe weather events, including heavy rains, floods, heat, and drought and issues associated with insects, pests, agricultural diseases, and invasive species. Invasive species are organisms that are introduced into an area beyond their natural range and become a pest in the new environment. The 2023 State of California Multi-Hazard Mitigation Plan attributes most of the agricultural disasters statewide to drought, freeze, and insect infestations. Other agricultural hazards include fires, crop and livestock disease, insects, and noxious weeds.

Location and Extent

Agricultural hazards, including issues associated with severe weather as well as nuisance insects, pests and weeds, occur throughout the County where lands are used for farming, grazing, timber production, and other agricultural uses. The larger County has large swaths of agricultural lands. Areas of the County, such as the incorporated communities and higher elevations of the County, contain fewer agricultural lands, and are thus not as greatly affected by agricultural hazards. In the Amador Planning Area, a notable exception is the wine industry where some of the incorporated communities include businesses and vineyards related to wine production. While cities and Districts may not always be directly affected, they are indirectly affected economically when agricultural losses occur.

There is no scale that measures agricultural hazards. Agriculture in the County is at risk to many hazards: severe weather, as well as native and invasive insects, pests and weeds. Each of these has a different duration and speed of onset. Some, such as freeze, can have a short onset and a short duration. Drought can have a long onset and long duration. Agricultural hazards like nuisance pests and weeds can have short

or long onset, and short or long durations. All agricultural losses can have a significant impact on affected communities.

Past Occurrences

Disaster Declaration History

There are no state or federal disaster declarations issued by Cal OES or FEMA. There have been 20 USDA Secretarial Disaster Declarations for the County since 2012 (as shown in the Past Occurrences in Section 4.3.6 of the Base Plan). 16 were from drought, 2 were from freeze, and 2 were from other severe weather events.

NCDC Events

The NCDC does not track agricultural events.

JVID Events

The District noted that agriculture events occur yearly, though with varying levels of damages to a variety of crops. In 2014, a drought occurred where JVID saw reduced water which in consequence reduced crop production in some cases up to 50% due to the lack of water. There was a handful of farming operations that elected not to take water resulting in completely fallowed fields. This caused financial damage to the District as it took nearly two years before those irrigators went back into production because of the drought.

More recently, the District noted damage from the 2023 winter storms caused flood damage to crop areas. Along with this, in November 2024 California Department of Wildlife issued concerns regarding the invasive aquatic species – Golden Mussel. JVID is in the process of mitigating for this new invasive species that should it be found in the District, could take over Lake Amador and cause havoc in the aquatic environment.

Climate Change and Agricultural Hazards

According to the 2021 CAS (as well as the 2024 Draft CAS), addressing climate change in agriculture will encompass reducing vulnerability through adapting to the ongoing and predicted impacts of climate. Agriculture in California is vulnerable to predicted impacts of climate change, including less reliable water supplies, increased temperatures, and increased pests.

The 2023 California State Hazard Mitigation Plan noted that California farmers contend with a wide range of crop-damaging pests and pathogens. Continued climate change is likely to alter the abundance and types of many pests, lengthen pests' breeding season, and increase pathogen growth rates. It also noted that change in climate can directly impact crop growth through new temperature patterns and northward shifts of pests and disease. Additionally, longer growing seasons may enable pest species to complete more reproductive cycles, which can increase severity of infestations.

Finally, the 2023 State Plan noted that temperature is not the only climatic influence on pests. For example, some insects are unable to cope in extreme drought, while others cannot survive in extremely wet

conditions. Furthermore, while warming speeds up the life cycles of many insects, suggesting that pest problems could increase, some insects may grow more slowly as elevated carbon dioxide levels decrease the protein content of the leaves on which they feed.

Vulnerability to Agricultural Hazards (Severe Weather/Pests/Invasive Species)

According to historical hazard data, both severe weather affecting agriculture and insects, pests, and weeds are an annual occurrence in the District. If left unchecked, severe weather, and agricultural pests and weeds can threaten native species, biodiversity, ecosystem services, recreation, water resources, agricultural and forest production, cultural resources, economies and property values, public safety, and infrastructure.

An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to the JVID. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect the entire District. These sections include assets at risk, impacts, and how future conditions and development can be affected by this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

According to the USDA, every year natural disasters, such as droughts, extreme heat and cold, floods, fires, earthquakes, hail, landslides, and tornadoes, challenge agricultural production. Because agriculture relies on the weather, climate, and water availability to thrive, it is easily impacted by natural events and disasters. Given the importance of agriculture to the District and Amador County, agricultural hazards continue to be an ongoing concern. The primary causes of agricultural losses in the District are severe weather events, such as drought, heavy rains, freeze, and extreme heat; insect/pest infestations; and noxious weeds.

JVID's Service Area includes alfalfa, nut trees (walnuts), grapes, vegetables (corn, row crops), and pasture lands. Drought and lack of water is the biggest concern for the District when it comes to operation. Severe weather such as freezing, extreme heat and invasive pests can be hazards that are a concern for perennial crops (trees, grapes) that can have a large investment and be compromised in one season due to the unforeseen hazards. Row crops and pasture lands being more of annual crop is less vulnerable to the long-term impacts of from agriculture hazards but is still a large concern for the District because of the financial impacts to the not only the District but the County as well. As well, the reservoir provides hydrogeneration, aquaculture, and potable water for use in the community. However, the opposite problem can occur, with heavy rains causing potential flooding issues for the District. Additionally, invasive aquatic species can impact recreational activities such as camping, fishing, and boating which provides economic resources for JVID.

Lake Amador does not currently have any threating aquatic invasive species. There is great concern in California regarding the Zebra, Quagga and recently found Golden Mussels in the California Delta. If invasive species were to take residence in Lake Amador it could cause devastating impacts to the operation of valving, piping, and other water transportation mechanisms within JVID's water distribution system. Additionally, other invasive aquatic species may include plants and algae blooms.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

People and populations in the District include both District staff and workers as well as those populations located within District boundaries and served by the District. Agricultural hazards have a minimal effect on people and populations in the District, including District staff and vulnerable populations. However, damage to crops from both severe weather and invasive and nuisance insects, pests, and weeds can cause significant increases in food prices and food insecurity among low-income communities.

Structures and Critical Facilities and Infrastructure

Structures and critical facilities and infrastructure in the District, including their owned assets, may be affected by agricultural hazards. Structures and the severe weather that affect crops in the County are discussed in other sections of this annex. Regarding nuisance species, some species can impact vegetation and can result in stream bank instability, erosion, and increased sedimentation, impacting ground stabilization and possibly causing foundation issues for nearby structures. If species cause trees and other vegetation to die, there is an increased risk of damage to roadways, powerlines, and buildings, and increased risk to wildfire. Some nuisance plants have been shown to destabilize soil due to high densities and shallow root systems, negatively impacting nearby buildings and septic systems. Other nuisance plant species have been known to clog culverts and streams, increasing flooding risk. Additionally, soil that becomes unstable due to decaying vegetation can impact critical facilities that are built on or around these soils.

Structures (from Table G-3) that the District considers at risk from this hazard include the Admin Office and Shop.

Natural, Historic, and Cultural Resources

Natural resources can be affected by agricultural hazards. Natural, historic, and cultural resources and the severe weather that affect crops in the County are discussed in other sections of this annex. Negative impacts of nuisance species to natural resources include the following:

- Loss of wildlife habitat and reduced wildlife numbers;
- Loss of native plant species;
- Reduced livestock grazing capacity;
- Increased soil erosion and topsoil loss;
- Diminished water quality and fish habitat.

Impacts from Agricultural Hazards: (Severe Weather/Pests/Invasive Species)

The consequences of agricultural disasters to the District and larger Amador County include ruined plant crops, dead livestock, ruined feed and agricultural equipment, monetary loss, job loss, and possible multi-year effects (i.e., trees might not produce if damaged, loss of markets, food shortages, increased prices,

possible spread of disease to people, and loss or contamination of animal products). Overall, any type of severe agricultural disaster can have significant economic impacts on both the agricultural community, the JVID, and the entire Amador County Planning Area. With the recent threat of the Golden Mussel, recreation has been restricted in some areas impacting local economies. Ag impacts can also result in significant increases in food prices to the consumer due to shortages. Under some conditions, insects that have been present and relatively harmless can become hazardous. For example, severe drought conditions can weaken trees and make them more susceptible to destruction from insect attacks.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the JVID include the following:

- Climate change is likely to exacerbate future agricultural hazards and associated impacts and vulnerability of the District.
- While population projections for the area served by the District show additional expected growth, these anticipated future changes in population are expected to be relatively small, which limits additional impacts to the District. The District noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.
- It is unknown how changes in land use and development will affect agricultural hazards in the District's Service Area, but it is unlikely that projected changes will increase the vulnerability of the District to this hazard. JVID planning efforts are in effect to reduce this risk and should be updated as necessary to continue to address future agricultural hazard conditions.

Future development in the District is not likely to have an impact on agricultural hazards in Amador County, except to the extent that agricultural lands are taken out of production as new development occurs reducing available land for agricultural uses, including those related to farming, timber production and grazing. Further, with additional development in the District, there may be additional competition for water resources thus possibly impacting the agricultural industry. JVID is always considering building more water storage to mitigate drought and related agricultural concerns but it is extremely expensive in today's environmental and governmental climate.

Climate Change

Likelihood of Future Occurrence–Highly Likely
Vulnerability–High

Hazard Profile

Climate change adaptation is a key priority of the State of California. The 2023 State of California Multi-Hazard Mitigation Plan noted that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the State's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and earlier runoff of both snowmelt and rainwater in the year. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

California's Adaptation Planning Guide: Understanding Regional Characteristics (from 2017) has divided California into 11 different regions based on political boundaries, projected climate impacts, existing environmental setting, socioeconomic factors and regional designations. The District falls in the North Sierra Region. A map and climate projections for this region are shown in Section 4.3.7 of the Base Plan and include an increase in temperatures, moderate changes in rainfall, and increased risk to wildfire.

Location and Extent

Climate change is a global phenomenon. It is expected to affect the whole of the JVID, the Amador County Planning Area, surrounding counties, and State of California. There is no scale to measure the extent of climate change. Climate change exacerbates other hazards, such as drought, extreme heat, flooding, wildfire, and others. The speed of onset of climate change is very slow. The duration of climate change is not yet known but is feared to be tens to hundreds of years.

Past Occurrences

Disaster Declaration History

Climate change has never been directly linked to any declared disasters.

NCDC Events

NCDC does not track climate change events.

JVID Events

Climate change has never been directly linked to any declared disasters. While the District noted that climate change is of concern, no specific impacts of climate change could be recalled. The District and HMPC members noted that the strength of storms does seem to be increasing and the temperatures seem to be getting hotter. The District also noted that the atmospheric river events seem to be getting more intense.

Vulnerability to Climate Change

The whole of the District is at some measure of vulnerability to climate change. The District Planning Team has concerns that the vulnerability of the District to climate change will continue to increase in the future. An assessment of a community's vulnerability to climate change begins with an understanding of local exposure to climate change. This is included in the Local Concerns section below followed by a discussion of the District's assets at risk, and impacts to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Due to the importance of the reservoir to the District, the primary concern of climate change would be an overall reduction in rain production to fill the reservoir resulting in lack of or reduced water supply. The changing environment could cause negative impacts such as availability for consistent water reliability from the small JVID watershed. Hotter or colder weather cycles could force farmers to change crop types and or fallow fields.

Assets at Risk

Assets at risk from this hazard include people and populations served; structures and critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

Climate change affects people and populations within a community, especially those climate change issues related to increases in temperature over time. While all populations can be affected by temperature extremes, populations particularly vulnerable include the very old and very young, medically fragile people, people without means of shelter (and air conditioning or heat) or transportation, people who are socially isolated and other vulnerable or underserved populations (as shown in the discussion in Section G.4.1). Acclimatization to extreme temperatures and other weather extremes may help reduce impacts from these extreme events, such as from heat waves, in the healthy general population but may not be sufficient to protect those with underlying medical conditions.

Structures and Critical Facilities and Infrastructure

Climate change, on its own, does not generally impact structures. However, structures in areas of increased wildfire, drought, extreme heat, or flood areas exacerbated by the effects of climate change would be at increased risk, as described throughout this LHMP. Due to the slow onset of climate change, many structures in the District are expected to undergo improvements and adapt over time to a new climate normal.

Natural, Historic, and Cultural Resources

The rivers, streams, agricultural areas, and open space areas of the District supports rich biodiversity, including many special-status species and habitat areas. These are all at risk from the effects of climate change. In addition, if heat continues to contribute to changes in wildfire patterns, all areas (on land) of the District are at increased risk from fire – including natural, historic, and cultural resources. Furthermore, as climate change exacerbates the drought hazard, areas of wetlands in the District may be reduced or dry up temporarily, which could damage habitat areas for waterfowl and other species that depend on these areas.

Impacts from Climate Change

The California APG: Understanding Regional Characteristics identified the following impacts specific to the North Sierra Region in which the District is part of:

- Increased temperatures
- Reduced precipitation
- Public health – heat and air pollution
- Reduced agricultural productivity (e.g., wine grapes)
- Reduced tourism

In addition to these sources, the 2023 State of California Hazard Mitigation Plan noted that according to California's Fourth Climate Change Assessment, the state will experience the following climate impacts:

- Annual average daily high temperatures are expected to rise by 2.7°F by 2040, 5.8°F by 2070, and 8.8°F by 2100 compared to observed and modeled historical conditions. These changes are statewide averages.
- Heat waves are projected to become longer, more intense, and more frequent.
- Warming temperatures are expected to increase soil moisture loss and lead to drier conditions. Summer dryness may become prolonged, with soil drying beginning earlier in the spring and lasting longer into the fall and winter.
- Droughts are likely to become more frequent and persistent through 2100.
- The strength of the most intense precipitation and storm events affecting California is expected to increase.
- Snowpack levels are projected to decline significantly by 2100 due to reduced snowfall and faster snowmelt.
- Marine layer clouds are projected to decrease.
- Extreme wildfires (i.e., fires larger than 24,710 acres) would occur 50 percent more frequently. The maximum area burned statewide may increase 178 percent by the end of the century.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile section above), changes in population patterns, and changes in land use and development. The influencing effects of these factors on this hazard are discussed further in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the District include the following:

- As climate change continues to accelerate over time, climate related impacts to the District will continue to increase.
- While population projections for the area served by the District show additional expected growth, these anticipated future changes in population are expected to be relatively limited, which is unlikely to affect this hazard and associated impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its Service Area, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be relatively limited in the near future and thus are not likely to affect climate change impacts to the District. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard.

In addition, climate change can influence development in the District over time. The District could see population fluctuations as a result of climate impacts relative to those experienced in other regions, and these fluctuations are expected to impact demand for housing and other development. While there are currently no formal studies of specific migration patterns expected to impact the District, climate-induced migration was recognized within the UNFCCC Conference of Parties Paris Agreement of 2015 and is expected to be the focus of future studies.

Dam Failure

Likelihood of Future Occurrence–Occasional
Vulnerability–Extremely High

Hazard Profile

Dams are manmade structures built for a variety of uses including flood protection, power generation, agriculture, water supply, and recreation. When dams are constructed for flood protection, they are usually engineered to withstand a flood with a computed risk of occurrence. For example, a dam may be designed to contain a flood at a location on a stream that has a certain probability of occurring in any given year. If prolonged periods of rainfall and flooding occur that exceed the design requirements, that structure may be overtopped or fail. Overtopping is the primary cause of earthen dam failure in the United States.

Dam failure is a natural disaster from two perspectives. First, the inundation from released waters resulting from dam failure is related to naturally occurring floodwaters. Second, a total dam failure would most probably happen as a consequence of the natural disaster triggering the event, such as an earthquake.

Location and Extent

An inventory map of dams located within Amador County was shown in Section 4.3.9 in the Base Plan. Dams with an inundation area within the JVID are shown on Figure G-3. JVID owns the Jackson Creek Dam, classified as a High Hazard dam. Information on the dam owned by the District is discussed in the Local Concerns section below.

There is no scale with which to measure dam failure. However, FEMA and CA DWR Division of Safety of Dams (DSOD) assign hazard potential classifications to dams within the State that provides information on the potential impact should a dam fail. The following two factors are considered when assigning hazard ratings: existing land use and land use controls (zoning) downstream of the dam. FEMA categorizes the downstream hazard potential into three categories in increasing severity: Low, Significant, and High. DSOD adds a fourth category of Extremely High. Dams are classified in these four categories that identify the potential hazard to life and property. These were discussed in more detail in Section 4.3.9 of the Base Plan.

While a dam may fill slowly with runoff from winter storms, a dam break has a very quick speed of onset. The duration of dam failure is generally not long – only as long as it takes to empty the reservoir of water the dam held back. For dam overtopping, the speed of onset is somewhat slower than that of a dam break, and the duration is longer (as evidenced in the 2017 Oroville Dam spillway event). The District would be affected for as long as the flood waters from the dam failure took to drain downstream.

Geographic flood extent from the DSOD dam inundation areas is shown on Figure G-3 and Figure G-4, as well as in Table G-5 and Table G-6.

Figure G-3 JVID – Extremely High Hazard Dam Inundation Areas

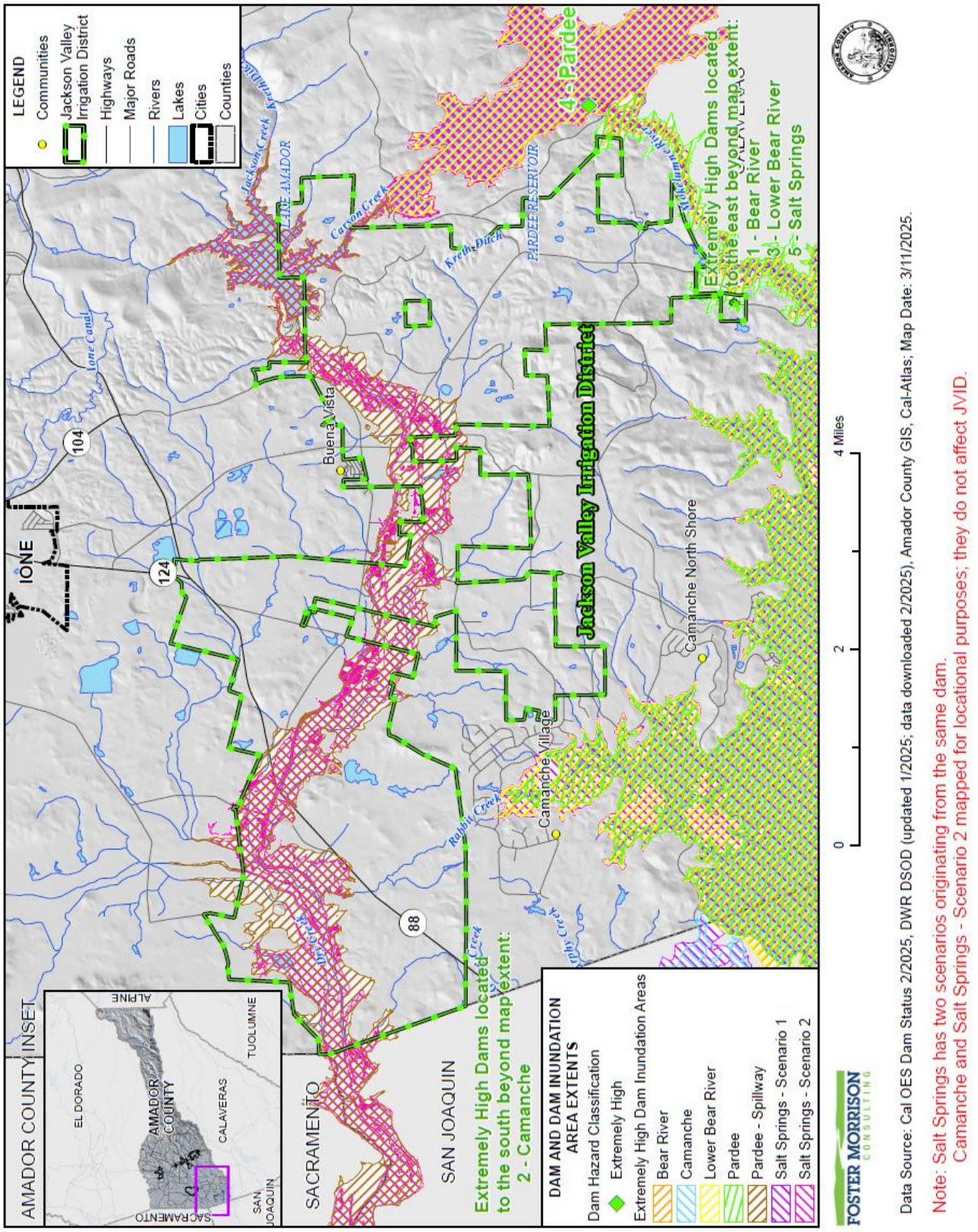


Table G-5 JVID – Extremely High Hazard Dam Inundation Areas Geographical Extents

JVID Jurisdiction/Dam Inundation Area	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Unincorporated Amador County						
Bear River	2	0.01%	0.001	0.00001%	2	0.1%
Lower Bear River	0.001	0.00001%	0.001	0.00001%	-	
Pardee	45	0.3%	30	0.3%	15	0.6%
Pardee - Spillway	2,865	22%	2,359	23%	507	19%
Salt Springs - Scenario 2	1,638	12%	1,400	13%	238	9%

Source: Cal OES, DSOD, Amador County GIS

Figure G-4 JVID – High Hazard Dam Inundation Areas

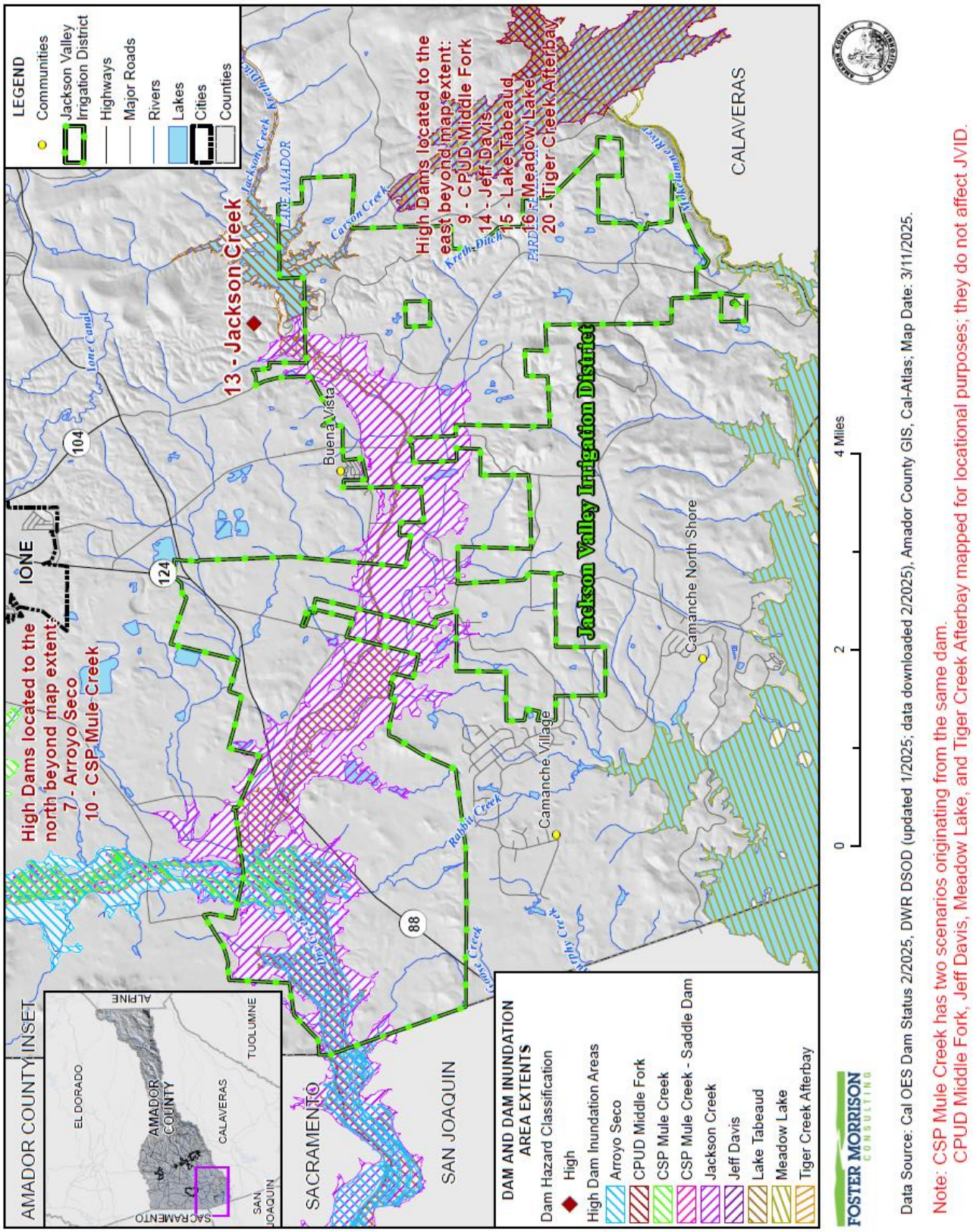


Table G-6 JVID – High Hazard Dam Inundation Areas Geographical Extents

JVID Jurisdiction/Dam Inundation Area	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Unincorporated Amador County						
Bear River	2	0.01%	0.001	0.00001%	2	0.1%
Lower Bear River	0.001	0.00001%	0.001	0.00001%	-	
Pardee	45	0.3%	30	0.3%	15	0.6%
Pardee - Spillway	2,865	22%	2,359	23%	507	19%
Salt Springs - Scenario 2	1,638	12%	1,400	13%	238	9%

Source: Cal OES, DSOD, Amador County GIS

Past Occurrences

Disaster Declaration History

There have been no state or federal disaster declarations for dam failure in Amador County.

NCDC Events

The NCDC does not contain any dam failure events for Amador County.

JVID Events

The District noted no dam failure occurrences that have affected the District. The Jackson Valley Dam and facility are inspected annually by FERC and DSOD as part of an annual inspection, and every five years, JVID is required to do a detailed independent review of the facility to ensure the safety of the dam, which includes an in-depth survey checking for dam movement.

Though no dam failures have occurred form JVID owned and other area dams, in **January and February of 2017**, Jackson Creek Dam suffered erosion in the spillway. 5,000 cfs plus flowed over the Lake Amador Spillway and heavy stormwater runoff on dam face. Considerable erosion took place in our downstream spillway area due to high spill flows from the Jackson Creek. There was also some residual damage to the concrete sill and apron that this event contributed to where some additional concrete reinforcement had to be done to protect the sill from future damage. There was also some superficial erosion to the dam face from stormwater runoff. JVID received Approximately $225,000 of FEMA funding to repair and mitigate the eroded areas that were damaged from the large storm event.

In 2023 during the storm events, JVID activated its EAP high flow and flood warnings from spillway flows from Lake Amador Dam, also known as the Jackson Creek Dam. There was some spillway erosion that took place due to the high flows in 2023 storm events. The damage did not impact the function of the spillway, but it will need to be addressed in the future so that damage does not take place in future events.

Climate Change and Dam Failure

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with dam failure. More information on future impacts to the District can be found below and in the Future Conditions/Future Development section of the Vulnerability Assessment below.

The 2023 California State Hazard Mitigation Plan noted that modeling described in California's Fourth Climate Change Assessment projects less frequent but more extreme daily precipitation. Year-to-year precipitation will become more volatile, and the number of dry years will increase by mid-century. As the climate continues to warm, atmospheric rivers will carry more moisture, and extreme precipitation may increase. Climate model projections show a tendency for the northern part of the State to become wetter. Increases in both precipitation and heat causing snow melt in areas upstream of dams could increase the potential for dam failure and uncontrolled releases in Amador County and the District.

Vulnerability to Dam Failure

The vulnerability of the District to dam failure flooding would vary depending on which dam fails and the nature and extent of the dam failure and associated flooding. An assessment of a community's vulnerability to dam failure begins with an understanding of local exposure to dam failure. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

JVID is the owner of a dam in Amador County. Jackson Creek Dam (aka Lake Amador Dam) is located on Jackson Creek, approximately four miles southeast of Ione, California, and six miles west of Jackson, California, in the foothills of the Sierra Nevada Mountains. Jackson Creek Dam is owned and operated by the Jackson Valley Irrigation District (JVID) for irrigation, recreation, domestic, and power generation purposes and is regulated by both the Federal Energy Regulatory Commission (FERC) and California Division of Safety of Dams (DSOD). The dam is classified as "High Hazard Potential." Construction of the earth-fill dam began in 1964 and was completed in 1965.

Jackson Creek Dam impounds Jackson Creek to form Lake Amador with a reservoir that has an area of 400 acres and a gross storage capacity of 22,000 acre-feet at the normal maximum reservoir level of Elevation (El.) 468.0 feet (USC&GS datum) or the spillway crest level. The reservoir serves the primary function of storing winter and spring runoff and releasing it throughout the year to serve local irrigation commitments downstream along with serving a small amount of domestic water to customers. Generating power is a secondary function and only conducted if ample water exists during the winter and spring.

Figure G-5 Jackson Creek Dam

Source: JVID

If a dam were to fail and cause flooding, the small community of Buena Vista less than 1 miles downstream could see losses of houses and/or lives. It would be very hard for JVID to recover from a dam failure as the costs to rebuild would be insurmountable.

Assets at Risk

Assets at risk from this hazard include people and populations served; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All people and populations (including both District staff and the population served by the District) located in dam inundation areas are vulnerable to dam failure. Certain vulnerable populations may be at increased risk to dam failure, especially during a large event with minimal advance notice. These vulnerable populations may include: the unhoused, those with limited mobility, and those that lack the resources to leave the area.

Structures and Critical Facilities and Infrastructure

Many structures and critical facilities and infrastructure in the District have some measure of risk to dam failure. Dam failure flooding can affect the built environment of the District. Structures in dam inundation areas are at risk and depending on flood depths, can range from slight damage to totally inundated.

According to Table G-3, the Jackson Creek Dam, Transmission, Piping, Outlet Works, Power House, and Water Treatment Plant are at risk to dam failure.

Natural, Historic, and Cultural Resources

A major dam failure event and associated flooding could have a devastating impact on the District. Large flood events can affect all natural, historic, and cultural resources that lie in the dam inundation areas. There are a number of ways floodwaters associated with a dam failure event can impact natural resources and the environment: Wildlife habitats can be destroyed by floodwaters. Contaminated floodwater can pollute rivers and habitats. Silt and sediment can destroy natural areas. Riverbanks and natural levées can be eliminated as rivers reach bankfull capacity. Rivers can be widened, and deposition can increase downstream. Trees can be uprooted by high-velocity water flow. Plants that survive the initial flood may die due to being inundated with water. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to these structures within the inundated areas, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged, and lost during extreme dam failure flood events.

Impacts from Dam Failure

Impacts to the District from dam failure flooding could be extensive and widespread and include loss of life and injury, flooding and damage to property and structures, damage to critical facilities and infrastructure, loss of natural resources, and all other flood related impacts. Levees within the District and surrounding areas may also be damaged or destroyed contributing to the flood waters. Additionally, mass evacuations may be necessary and compounded by impacts to transportation systems and infrastructure. Economic losses to the District and Amador County Planning Area can also be significant.

Other impacts associated with dam failure include landslides, bank erosion, and destruction of habitat. Dam failures can cause downstream flooding and can transport large volumes of sediment and debris and contaminants from the floodwaters. Other environmental impacts can include contamination from septic system failures and releases of contaminants from hazardous materials facilities, contamination of potable water supplies; changes in configurations of streams; loss of wildlife habitats; and degradation of wetlands. A large dam failure event could have significant and catastrophic impacts.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the Climate Change and Dam Failure discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the District include the following:

- Climate change is likely to exacerbate future rain and storm conditions and associated impacts and vulnerability of the District to dam failure.
- While population projections for the area served by the District show additional expected growth, these anticipated future changes in population are expected to be relatively small, which limits additional impacts to the District. The District may add staff, but this number would be small. Additional growth within the dam inundation areas of the District would place additional populations at risk to dam failure. The District noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.
- Land use planning should be proactive to address future hazard conditions. Locating new development, structures, and critical facilities and infrastructure within or near areas of dam failure risk may put additional development at risk. Depending on the location of new development and adherence to protective building codes, changes in land use and development may or may not increase the impacts and associated vulnerabilities of the District to this hazard.

Future Development

Future dam failure events may occur in the District. Although new growth and development may fall in the area flooded by a dam failure, given the limited potential of total dam failure and the large area that a dam failure would affect, development in the dam inundation area will continue to occur. Mitigation measures to educate and inform the public of the potential consequences of a dam failure within the inundation area and the creation of evacuation plans and notification systems should be considered for such an event.

Drought & Water Shortage

Likelihood of Future Occurrence–Likely
Vulnerability–High

Hazard Profile

Drought and water shortage are complex issues involving many factors—it occurs when a normal amount of precipitation and snow is not available to satisfy an area's usual water-consuming activities. Drought can often be defined regionally based on its effects. Drought is different than many of the other natural hazards in that it is not a distinct event and usually has a slow onset. Drought can severely impact a region both physically and economically. Drought affects different sectors in different ways and with varying intensities. Adequate water supply is the most significant issue and is critical for agriculture, manufacturing, tourism, recreation, and commercial and domestic use. Drought has also affected tree mortality in the area in the past. As the population in the area continues to grow, so will the demand for water.

Tree Mortality and Drought

One of the specific impacts of drought in the Amador County Planning Area, that can also affect JVID, is the increased risk to trees from beetle kill and other insects, pathogens and parasites, and other tree mortality and die back issues. Drought weakens trees and makes them more susceptible to insect infestation and other pathogens. Insects, such as bark beetles and others, frequently attack trees weakened by drought, disease, injuries, or other factors that may stress the tree. These insects and other pathogens can contribute to the decline and eventual death of trees throughout the District. The tree mortality and dieback problems are a high priority because of the issue of hazardous trees and an increased wildfire hazard. In addition to an increase in wildfire fuels, hazardous trees can fall onto structures causing damage and a result in a reduction on the tree canopy within the District that provides relief during extreme heat days.

Location and Extent

Drought and water shortage are regional phenomenon. The whole of the District and County is at risk. The US Drought Monitor categorizes drought conditions with the following scale:

- None
- D0 – Abnormally dry
- D1 – Moderate Drought
- D2 – Severe Drought
- D3 – Extreme Drought
- D4 – Exceptional Drought

The Amador County Planning Area, including JVID, has been in and out of drought since 2014. Over the last five years since the 2020 LHMP, drought conditions have ranged from none to exceptional. Drought conditions are expected to continue to be cyclical in nature depending on the year." Current drought conditions in the District are shown in Section 4.3.10 of the Base Plan.

Drought has a slow speed of onset and a variable duration. Drought can last for a short period of time (which does not usually affect water shortages) or for longer periods (which may challenge water supplies). Should a drought last for a long period of time, water shortage becomes a larger issue.

According to the Amador Water Agency (AWA) 2024-2025 Annual Water Supply & Demand Assessment Shortage Report, the Agency has a significant surplus of water supply above current and projected demands. The Amador Water System (AWS) water supply is a pre-1914 water right that has never been curtailed in the most severe single-year or a multiple-year drought. In addition, while the water supply associated with the Central Amador Water Project (CAWP) was temporarily curtailed during recent drought years, the significant storage volume in the Lower Bear Reservoir has allowed previous water supply demands to be met, and are expected to be met in the future, even in dry years. In addition, the total well capacity for the portion of both systems reliant on groundwater are larger than current and projected demands.

Past Occurrences

Disaster Declaration History

There have been 2 state and 1 federal disaster declarations for Amador County. This can be seen in Table G-7. Additionally, there have been 16 USDA Secretarial Disaster Declarations from drought in the County.

Table G-7 Amador County –State and Federal Drought Disaster Declarations 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	2	1976, 2015	1	1977

Source: Cal OES, FEMA

NCDC Events

There have been 249 NCDC drought events in Amador County since 1993. These most likely had some impact on the District.

JVID Events

Based on historical information, the occurrence of drought in California, including the JVID, is cyclical, driven by weather patterns. Section 4.3.10 of the Base Plan notes that five droughts have occurred in the past 86 years. Drought has occurred in the past and will occur in the future.

The District did note that there were large impacts during the 2014 drought event. Information provided from a study on drought impacts to the Amador Water Agency and JVID are discussed below:

> ***In January 2014, the California Department of Public Health (CDPH) announced 17 water agencies and towns in California that were at severe risk of drinking water shortages due to the drought. Based on surveying the State's community water systems, CDPH compiled the list of communities that could face severe impacts within 60 to 100 days of the announcement if no actions were taken to supplement supplies. JVID, which serves 12,800 acres along Jackson Creek owned by farmers and ranchers in Amador County, was included on the list.***
>
> ***JVID provides wholesale water supply; distributes raw water for agricultural irrigation and fish farms, as well as industrial and domestic uses; distributes bottled water to domestic users; and generates hydroelectric power in southwestern Amador County. It serves primarily agricultural and rural customers in the area between Lake Amador and Lake Camanche. JVID provides irrigation water to the farms and ranches in Jackson Valley and is the only source of water for dozens of homes, including those in the Oaks Mobile Home Park in Buena Vista, a severely disadvantaged community with a median household income (MHI) just 52% of California's statewide MHI. The primary agricultural activity in JVID includes alfalfa, walnuts, vineyards, and pasture, and most of the water JVID supplies is used for irrigation. The 2018 Municipal Service Review (MSR) for Amador County states that JVID's surface water use averages 2 acre-***

feet (AF) per acre, per year. Given this estimation, JVID provides about 8,382 AF per year for irrigation uses.

JVID receives most of its water from surface water sources, such as Jackson Creek and the Mokelumne River. JVID has rights to store up to 36,000 AF of flows from Jackson Creek and divert 3,850 AF of flows from the Mokelumne River (but no storage is currently in place). JVID's water rights on the Mokelumne River are subject to reversion and substitution with recycled water, and the flows from Jackson Creek contain 5% wastewater effluent about 30% of the time. The lack of diversity and the unpredictable nature of its water rights leaves JVID's water supply highly vulnerable, especially in light of the current drought.

According to the 2014 MSR for Amador County, JVID is not meeting existing drinking water or agricultural demands for the areas it serves. On January 27, 2014 JVID made a formal request to purchase water from AWA to help offset the shortfall as a result of the severe drought impacts. AWA staff and its Drought Ad Hoc committee met several times and agreed to provide JVID up to 5,000 acre-feet of water this summer and fall to get them through this challenging time and allow the farmers and ranchers to save their growing season.

Farms were affected by the drought, some with fallowed fields; these took several years to go back into production. There was financial damage to the District for lost revenue and the District had to implement emergency rates, purchase water and pull from reserve funds to survive the impacts of the drought.

The District noted no drought events had affected it since the 2020 LHMP. According to the District, there were no droughts of recent concern. The last major drought affecting the District was 2013-2015.

Climate Change and Drought and Water Shortage

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with drought and water shortage. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Climate scientists studying California find that drought conditions are likely to become more frequent and persistent over the 21st century due to climate change. The experiences of California during recent years underscore the need to examine more closely the state's water storage, distribution, management, conservation, and use policies. The 2021 CAS (as well as the 2024 Draft CAS) stresses the need for public policy development addressing long term climate change impacts on water supplies. The CAS notes that climate change is likely to significantly diminish California's future water supply, stating that: California must change its water management and uses because climate change will likely create greater competition for limited water supplies needed by the environment, agriculture, and cities.

A 2018 report from the Public Policy Institute of California noted that thousands of Californians – mostly in rural, small, disadvantaged communities – already face acute water scarcity, contaminated groundwater, or complete water loss. Climate change would make these effects worse.

Cal Adapt scenarios for modeled future drought scenarios were shown in Section 4.3.10 of the Base Plan.

Vulnerability to Drought and Water Shortage

Based on historical information, the occurrence of drought and water shortage in California, including the District, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. The vulnerability of the JVID to drought may vary and include reduction in water supply, turf losses, impacts to natural resources, and an increase in dry fuels and tree dieback.

The whole of the District is at some measure of vulnerability to drought and water shortage. An assessment of a community's vulnerability to drought and water shortage begins with an understanding of local exposure to drought. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Based on historical information, the occurrence of drought in California, including the District, is cyclical, driven by weather patterns. Drought has occurred in the past and will occur in the future. Periods of actual drought with adverse impacts can vary in duration, and the period between droughts can be extended. Although an area may be under an extended dry period, determining when it becomes a drought is based on impacts to individual water users. JVID and its customers are vulnerable to droughts and associated impacts.

Water availability and drought have always been one of the biggest concerns for JVID. Procuring additional water from other nearby watersheds and/or agencies would help protect the District's existing operations and help mitigate future droughts. Additionally, identifying nearby areas to store additional water has also been a priority for JVID.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities and infrastructure; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

The people and populations (both staff and those served by the District) of the District are not directly affected by general drought conditions; although, their turfed areas, trees, and other water dependent resources can all be affected. In extreme drought conditions, however, residents and other populations within the District may be vulnerable to drought and water shortage issues. Water quality can be impacted

causing health problems, especially to vulnerable populations where access to clean water supplies can be more challenging. Water shortages can have an effect on all of the populations in the District, but often have a greater effect on the unhoused and other vulnerable populations that may be unable to access and afford clean drinking water during shortages. During periods of drought as the costs of water usage may increase, those who are economically disadvantaged may be unable to afford the increased costs of potable water.

Structures and Critical Facilities and Infrastructure

Most District structures, critical facilities, and infrastructure have a limited vulnerability to drought and water shortage. Should drought conditions be severe enough to cause water shortage reliability issues, some facilities and infrastructure may be affected. Water systems (like those of the District) may be impacted during times of reduced water supply and need to employ contingencies to remain functional and fully operational. Other water dependent systems may also be adversely affected. Further, the secondary hazard of drought (increased potential for spread of urban fires and wildfire) can pose a significant risk to District facilities. Drought can also stress trees, causing die off. These trees may fall on critical infrastructure adjacent to them and impact power lines and other utilities.

Structures (from Table G-3) that the District considers at risk from this hazard include the Power House, Water Treatment Plan, and Admin Office and Shop.

Natural, Historic, and Cultural Resources

Drought and water shortage can have a significant impact on natural resources. Water levels in reservoirs and lakes may be reduced and a loss of wetlands and coastal marsh areas may occur. Severe drought conditions can contribute to an increase in erosion of soils and lead to poor soil quality. Water quality can also be diminished in periods of drought. Further, all of the trees in the District are at risk to drought impacts and a reduction in water supply. These trees provide a wealth of social and environmental benefits to District residents and visitors, from shade and beauty to air quality, carbon reduction and stormwater management. Drought can devastate crops and dry out pastures, dry out forests and critical habitat areas, and reduce food and water available for wildlife and livestock. Additionally, drought conditions can also cause soil to compact and not absorb water well, potentially making an area more susceptible to flooding. It is unlikely that drought and water shortage would have a significant impact on historic and cultural resources in the District.

Impacts from Drought and Water Shortage

The vulnerability of the District to drought is District-wide, but impacts may vary and include reduction in water supply and quality, and an increase in dry fuels. The potential for a reduction in water supply during drought conditions generally leads to both mandated and voluntary conservations measures during extended droughts. During these times, the costs of water can also increase. Also of concern, the increased dry fuels, fuel loads, and tree mortality events associated with drought conditions can result in an increased fire danger. In areas of extremely dry fuels, the intensity and speed of fires can be significant. Water supply and flows for fire suppression can also be an issue during extended droughts. Drought can also lead to turf losses and cause tree die off within the District.

Other qualitative impacts associated with drought in the District are those related to water intensive activities such as municipal usage, commerce, tourism, and recreation use. With more precipitation likely falling as rain instead of snow in the Sierra's, and warmer temperatures causing decreased snowfall to melt faster and earlier, water supply is likely to become more unreliable. In addition, drought and water shortage is predicted to become more common. This means less water available for use over the long run, and additional challenges for water supply reliability, especially during periods of extended drought.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the JVID include the following:

- Climate change is likely to exacerbate future drought conditions and associated impacts and vulnerability of the District to drought and water shortage.
- While population projections for the area served by the District show additional expected growth, these anticipated future changes in population are expected to be relatively small, which is unlikely to affect this hazard and associated impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its Service Area, it merely reacts to them by providing additional (or reduced) services.
- It is unknown how changes in land use and development will affect drought and water shortage in the District's Service Area. The District conducts water supply planning to ensure a continued water supply to address future drought conditions.

It is important to plan for future development and drought and water shortage issues with conservation efforts and efficient water use. This may include putting in place agreements to purchase more water or to increase storage capacity. The District has access to large quantities of water through its reservoir and ground water supply. However, population growth in the District will add additional pressure to the District during periods of drought and water shortage.

Earthquake

Likelihood of Future Occurrence–Occasional (minor)/ Unlikely (major)
Vulnerability–High

Hazard Profile

An earthquake is caused by a sudden slip on a fault. Stresses in the earth's outer layer push the sides of the fault together. Stress builds up, and the rocks slip suddenly, releasing energy in waves that travel through the earth's crust and cause the shaking that is felt during an earthquake. Earthquakes can cause structural damage, injury, and loss of life, as well as damage to infrastructure networks, such as water, power, gas,

communication, and transportation. Earthquakes may also cause collateral emergencies including dam and levee failures, seiches, hazmat incidents, fires, avalanches, and landslides. The degree of damage depends on many interrelated factors. Among these are: the magnitude, focal depth, distance from the causative fault, source mechanism, duration of shaking, high rock accelerations, type of surface deposits or bedrock, degree of consolidation of surface deposits, presence of high groundwater, topography, and the design, type, and quality of building construction.

Location and Extent

Since earthquakes are regional events, the whole of the District is at risk to earthquake. The JVID, Amador County, and surrounding areas have some level of risk from seismic and geologic hazards. Faults in and around the District were shown in Section 4.3.11 of the Base Plan. These include the Carson Range, Great Valley, and Rogers-Hayward Creek faults. A significant seismic event on any of these major faults could cause damage in the JVID.

The amount of energy released during an earthquake is usually expressed as a magnitude and is measured directly from the earthquake as recorded on seismographs. An earthquake's magnitude is expressed in whole numbers and decimals (e.g., 6.8). Seismologists have developed several magnitude scales, as discussed in Section 4.3.11 of the Base Plan.

Another measure of earthquake severity is intensity. Intensity is an expression of the amount of shaking at any given location on the ground surface. Seismic shaking is typically the greatest cause of losses to structures during earthquakes. The District is located in an area where earthquakes of some magnitude occur, so both magnitude and intensity of earthquakes are expected to remain moderate. Seismic shaking maps for the area in Section 4.3.11 of the Base Plan show Amador County and the District fall within a low to moderate shake risk.

Past Occurrences

Disaster Declaration History

There has been no state or federal disaster declarations in Amador County from earthquake.

NCDC Events

The NCDC does not track earthquake events.

JVID Events

As shown in the Base Plan, no disaster declarations have occurred in the County due to earthquake. The District and HMPC noted no past occurrences of earthquakes that affected the District in any meaningful way.

Climate Change and Earthquake

Climate change is unlikely to increase earthquake frequency or strength. More information on future impacts can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Vulnerability to Earthquake

The combination of plate tectonics and associated California coastal mountain range building geology generates earthquakes as a result of the periodic release of tectonic stresses Earthquake vulnerability is primarily based on population and the built environment. Urban areas in high seismic hazard zones are the most vulnerable, while uninhabited areas are less vulnerable. The primary impacts of concern are life safety and property damage. Although several faults are in and near the Amador County Planning Area, seismic hazard mapping indicates that the District has low to moderate seismic hazard potential. There is the potential for the District and Amador County Planning Area to be subject to some level of moderate seismic shaking. Some degree of structural damage due to stronger seismic shaking could be expected.

Earthquake shaking can also cause liquefaction to occur. Areas with loose soil and high water tables are at risk from liquefaction. There are limited areas in and near the District prone to liquefaction.

The whole of the District is at some measure of vulnerability to earthquake. An assessment of a community's vulnerability to earthquakes begins with an understanding of local exposure to earthquakes. This is included in the Local Concerns section below. After that section, assets at risk are discussed.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

Impacts from earthquake in the District will vary depending on the fault that the earthquake occurs on, the depth of the earthquake strike, and the intensity of shaking. Large events could cause damages to infrastructure, critical facilities, residential and commercial properties, and possible injuries or loss of life. Jackson Creek Dam is vulnerable to an earthquake but according to the District the earthquake must be very large and direct to cause any failure of the dam. According to JVID, there have been engineering studies and reports on dam failure and the Jackson Creek Dam, and all analysis concludes that the facility is at minimal risk for earthquake.

Also a concern to JVID regarding earthquake hazards are damages to underground and aboveground piping, Admin Office and Shop, and personnel safety. As the ground shifts, it may cause massive breaks to the piping underground, or cause structures aboveground to become unstable or even damaged. This could result in loss of operability of the District.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All people and populations (both District staff and those residing in the District Service Area) are at risk from earthquake shaking and associated hazards. Those at heightened risk include:

- The unsheltered
- Infants and children under age five and their caregivers
- Elderly (65 and older)
- Individuals with disabilities
- Individuals dependent on medical equipment
- Individuals with impaired mobility

The greatest risk to people and populations from earthquake is death and injury. More information on people and populations at risk to earthquake shaking events can be seen in the Hazus scenarios developed for this LHMP. More information on the Hazus scenarios and how the County is affected is included in Section 4.3.11 of the Base Plan.

Structures and Critical Facilities and Infrastructure

All structures and critical facilities and infrastructure in the District are vulnerable to earthquakes, depending on the severity and location of the event. The Hazus scenarios conducted for the entire Amador County Planning Area show how structures may be affected. Structures (from Table G-3) that the District considers at risk from this hazard include:

- Dam
- Transmission, Piping, Outlet Works
- Power House
- Water Treatment Plant
- Admin Office and Shop

Natural, Historic, and Cultural Resources

The 2023 State Hazard Mitigation Plan noted that environmental problems from earthquakes can be numerous. It is possible for earthquakes to reroute streams, which can change the water quality, possibly damaging habitat and feeding areas. Streams fed by groundwater and/or springs may dry up because of changes in underlying geology. Another threat to the environment from earthquakes is the potential release of hazardous materials. Historical and cultural resources are at risk, often due to their age and construction types. The Hazus scenarios in Section 4.3.11 of the Base Plan and included below are relatively silent on the vulnerability to natural, historic, and cultural resources, but impacts to these resources could be long lasting.

Impacts from Earthquake

Earthquakes can strike without warning and cause dramatic changes to the landscape of an area that can have devastating impacts on the built environment. The greatest impact is to life safety of the JVID staff, residents and visitors. Other impacts to the District could include damages to infrastructure such as roads, bridges, and dams; damages and loss of services to utilities and critical infrastructure, including those related to gas, power, water, wastewater and communication systems; damages to structures and other development; and possible loss of life and injuries.

Earthquakes can also cause failure of dams, levees, and reservoirs. Facilities and land downslope from dams or water reservoirs might be subject to flooding, if the dams, reservoirs, or other flood control structures fail as a result of an earthquake. The District has areas of its service territory with flood risk that include facilities downslope from dams or reservoirs that could be affected by a significant earthquake event.

Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the JVID include the following:

- As discussed in the hazard profile section, climate change is not anticipated to affect this hazard over time.
- While population projections for the area served by the District show additional expected growth, these anticipated future changes in population are expected to be relatively small, which is unlikely to affect this hazard and associated impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its Service Area, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development are expected to be limited in the near future and thus are not likely to affect earthquake and associated impacts to the District. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard.

Although new growth and development would fall in the area affected by earthquake, given the limited chance of major earthquake and the building codes in effect, development in areas prone to earthquakes will continue to occur. The District enforces the state building code, which mandates construction techniques that minimize seismic hazards. Future development in the District is subject to these building codes and land use planning. Future development within the inundation area of a dam failure, including those owned by the District, could be impacted and mitigation measures and evacuation plans should be in place to ensure the safety of downstream populations.

Flood: 1%/0.2% Annual Chance

Likelihood of Future Occurrence–Occasional (1%)/Unlikely (0.2%)
Vulnerability–High

Hazard Profile

This hazard analyzes the FEMA DFIRM 1% and 0.2% annual chance floods. These tend to be the larger floods that can occur in the District and have caused damage in the past. Flooding can be a significant problem in the District. Historically, the District has been at risk to flooding primarily during the winter and spring months when river systems in the District swell with heavy rainfall and snowmelt runoff. The District has also been at risk during atmospheric river flood events. Normally, storm floodwaters are kept within defined limits by a variety of storm drainage and flood control measures located throughout the Amador County Planning Area and the JVID. Occasionally, extended heavy rains result in floodwaters that exceed normal high-water boundaries and cause damage. Flooding has occurred both within the 1% annual chance floodplains and in other localized areas in the District.

Location and Extent

The JVID has areas located in the 1% annual chance flood zones. This is seen in Figure G-6.

Figure G-6 JVID – FEMA DFIRM Flood Zones

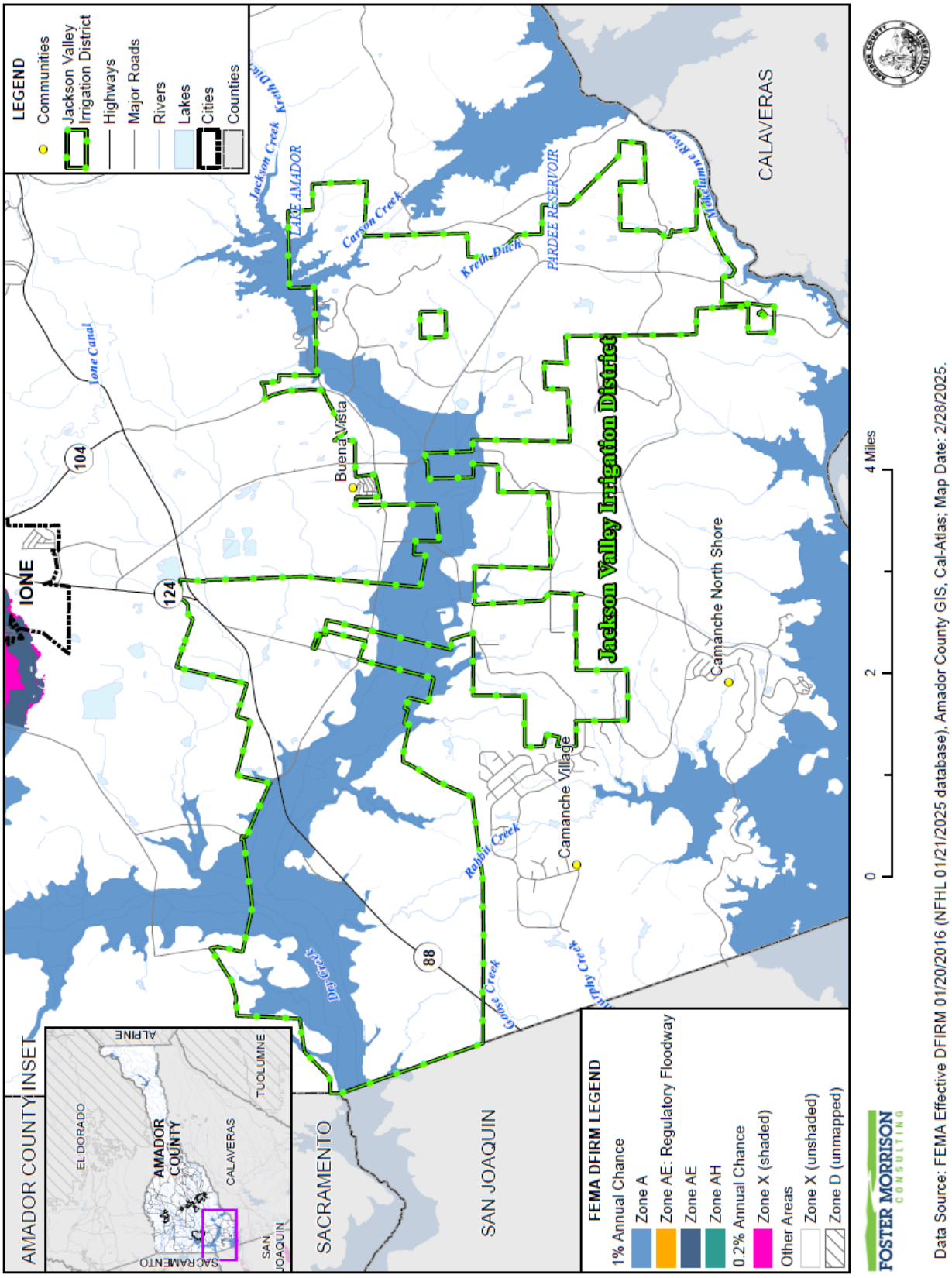


Table G-8 details the DFIRM mapped flood zones located within the District.

Table G-8 JVID– DFIRM Flood Hazard Zones

Flood Zone	Description	Present in District
A	1% annual chance flooding: No base flood elevations provided	X
AE	1% annual chance flooding: Base flood elevations provided	
AE Regulatory Floodway	1% annual chance flood: Regulatory floodway; Base flood elevations provided	
AH	1% annual chance flood areas of shallow flooding between one to three feet deep. Regulatory floodway; Base flood elevations provided	
Shaded X	0.2% annual chance flooding: The areas between the limits of the 1% annual chance flood and the 0.2-percent-annual-chance (or 500-year) flood	
X (unshaded)	Area of minimal flood hazard	X

Source: FEMA DFIRM 1/20/2016

Additionally, flood extents can generally be measured in volume, velocity, and depths of flooding. Expected flood depths in the District vary, depending on the nature and extent of a flood event; specific depths are unknown. Flood durations in the District tend to be short to medium term, or until either the storm drainage system can catch up or flood waters move downstream. Flooding in the District tends to have a shorter speed of onset, due to the amount of water that flows through the District.

Geographical flood extents for the District from the FEMA DFIRMs are shown in Table G-9.

Table G-9 JVID – Geographical DFIRM Flood Zone Extents

JVID Jurisdiction /Flood Zone	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Unincorporated Amador County						
1% Annual Chance Flood Hazard	3,090	23%	2,649	25%	441	16%
0.2% Annual Chance Flood Hazard	0	0.0%	0	0.0%	0	0.0%
Other Areas	10,067	77%	7,807	75%	2,260	84%
Grand Total	**13,157**	**100%**	**10,456**	**100%**	**2,701**	**100%**

Source: FEMA DFIRM 1/20/2016

Past Occurrences

Disaster Declaration History

A list of state and federal disaster declarations for Amador County from flooding is shown on Table G-10. These events also likely affected the District to some degree.

Table G-10 Amador County – State and Federal Disaster Declarations from Flood 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Flood (including heavy rains and storms)	22	1950, 1955, 1958 (twice), 1959, 1963, 1964, 1969, 1980, 1982, 1986, 1995 (twice), 1997, 2006 (twice), 2017 (twice), 2019, 2021, 2023 (twice)	20	1950, 1955, 1958, 1962, 1963, 1964, 1969, 1986, 1995 (twice), 1997, 1998, 2006 (twice), 2017 (twice), 2019, 2023 (three)

Source: Cal OES, FEMA

NCDC Events

The NCDC tracks flooding events for the County. Events have been tracked for flooding since 1993. Amador County has seen 43 events. These events most likely had some impact on the District.

JVID Events

The District noted that the following events had affects and damages to the District:

JVID noted that it seems to be once in every 20 to 30-year event where flows over 5,000 cfs occur. This happened in the floods of **1997**. It will likely happen again in the future.

In **January and February of 2017**, Lake Amador Dam (aka Jackson Creek Dam) suffered erosion in the spillway. Similar to the 1997 floods, 5,000 cfs plus flowed over the Lake Amador Spillway and caused heavy stormwater runoff on the dam face. Considerable erosion took place in JVID's downstream spillway area due to high spill flows from the Jackson Creek. There was also some residual damage to the concrete sill and apron that this event contributed to where some additional concrete reinforcement had to be done to protect the sill from future damage. There was also some superficial erosion to the dam face from stormwater runoff. JVID received Approximately $225,000 of FEMA funding to repair and mitigate the eroded areas that were damaged from the large storm event.

Figure G-7 Spillway Overtopping in 2017

Source: JVID

During the same event, a creek bank/levee failed next to a farmer's field, and the creek jumped its banks and damaged a creek pumping station operated by JVID due to high stream flows. The District had to remove debris, and regrade and replant irrigated pasture field. This impacted farmers but had minimal impact to the District besides having to clean out debris, mud and sand from heavy flows around the pump station. JVID received approximately $75,000 of FEMA funding to repair and mitigate the damaged levee due to damage from the large storm event.

More recently, the storm event in **late 2022 and into early 2023** caused multiple impacts to the District. The impacts include: spillway and reservoir debris removal, Jackson Creek levee damage, damage to a generator, 36" mainline erosion, 18" mainline blowout in Jackson Creek, creation of an emergency bypass line, standpipe debris removal and repair, Dry Creek Crossing pipe damage, pump and equipment replacement, levee and creek restoration, and the use of temporary debris containment buoys. According to JVID, the total cost estimate was over $1,100,000.

Climate Change and Flood

It is likely that climate change will increase the chance of future occurrence as well as future impacts associated with flood. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

According to the 2021 CAS (as well as the 2024 Draft CAS), climate change may affect flooding in California, the Amador County Planning Area, and the JVID. While average annual rainfall may increase or decrease slightly, the intensity of individual rainfall events is likely to increase during the 21st century. It is possible that average soil moisture and runoff could decline, however, due to increasing temperature, evapotranspiration rates, and spacing between rainfall events. Reduced snowpack and increased number of intense rainfall events are likely to put additional pressure on water infrastructure which could increase the chance of flooding associated with breaches or failures of flood control structures such as levees and dams. Cal Adapt future precipitation projections were shown in Section 4.3.4.

Vulnerability to Flood: 1% and 0.2% Annual Chance

Floods have been a part of the District's historical past and will continue to be so in the future. During winter months, long periods of precipitation and the timing of that precipitation are critical in determining the threat of flood, and these characteristics further dictate the potential for widespread structural and property damage. Predominantly, the effects of 1% and 0.2% annual chance flooding are generally confined to areas near the waterways of the District. As waterways grow in size from local drainages, so grows the threat of flood and dimensions of the threat.

The whole of the District is at some measure of vulnerability to floods. An assessment of a community's vulnerability to flood begins with an understanding of local exposure to flood. This is included in the Local Concerns section below followed by a discussion of the District's Assets at Risk to this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

JVID deals with high flows over spillway that can create hillside erosion downstream. During the 2017 storm events the District experienced considerable erosion to the downstream area below the spillway. JVID applied for FEMA funding to add protection to these areas using concrete. During high flows the District also deals with debris such as downed trees and vegetation flowing in the creek channel that plug up culverts and can cause damage to roads. During the stormwater event the District experienced damage to the face of Lake Amador Dam (aka Jackson Creek dam), an earth fill structure were the flows eroded channels in the dam itself. Although damages were primarily superficial, FEMA funded a project to mitigate this damage by installing large rip-rap in the eroded areas to slow down the stormwater runoff and protect the dam face.

In 2019 JVID completed a FEMA funded project to protect 3 large erosion areas just downstream from the concrete sill of the spillway. In 2023 additional damage occurred due to the large storm events in January. This project did not include protecting the area between these erosion areas and concrete sill which varies from 20-50 feet in distance. This area just downstream of the sill could be another area of concern during future heavy spillway flows.

JVID's ability to mitigate some of these issues, is generally limited to efforts to construct and reinforce the Dam's spillway structure with additional concrete and/or rip-rap.

The Jackson Creek has several miles of levees that farmers have built and used for years to contain the creek flows. During heavy flooding conditions of more than 3,000 cfs, historically, there has been heavy damage to these levees and stream banks. These stretches of levees have not been maintained and have experienced issues from burrowing animals, trees, brush, erosion, etc. for many years.

Assets at Risk

Assets at risk from this hazard include people and populations served; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All people and populations (both District staff and those in the Service Area) located in the 1% and 0.2% annual chance floodplains are at some risk to flooding. Certain vulnerable populations located within areas prone to flooding may be at increased risk to this hazard, especially during a large event with minimal advance notice. These vulnerable populations include: the unhoused, those with limited mobility, and those that lack the resources to leave the area.

District residents that live in the 1% and 0.2% annual chance floodplains are often the most vulnerable. Not only are the residents at risk, but their homes and contents are all at risk, compounding the impacts associated with significant hazard events.

Structures and Critical Facilities

Certain structures in the District are at risk of DFIRM flooding and primarily include those structures located within the 1% and 0.2% annual chance floodplains. Structures (from Table G-3) that the District considers at risk from this hazard include the Spillway and Irrigation Pump Station.

Flooding presents a threat to threat to both critical facilities and infrastructure, as well as community lifelines. Critical infrastructure plays an immensely important role in our communities. As previously noted, communities rely on roads, rail corridors, and related biking and pedestrian routes for transportation, and on water infrastructure for drinking water, wastewater service, and draining streets of rainwater. Damage to any one of these systems can threaten public safety, wreak havoc on daily life, impact properties far from flood zones, and result in economic impacts that cascade throughout California.

Natural, Historic, and Cultural Resources

Large flood events can affect natural, historic, and cultural resources. There are a number of ways floodwaters can impact natural resources and the environment. Wildlife habitats can be destroyed by floodwaters. Contaminated floodwater can pollute rivers and habitats. Silt and sediment can destroy natural areas. Riverbanks and natural levees can be eliminated as rivers reach bankfull capacity. Rivers can be widened, and deposition can increase downstream. Trees can be uprooted by high-velocity water flow. Plants that survive the initial flood may die due to being inundated with water. Historic and cultural resources may also be affected. Generally, the impacts are associated with damage to structures within the flooded areas, but other cultural resources such as those associated with Native Americans and old tribal areas can also be disturbed, damaged and lost during extreme flood events. Any of these that fall in the flood zones shown on Figure G-6 would be vulnerable.

Impacts from Flood: 1% and 0.2% Annual Chance

Floods are among the costliest natural disasters in terms of human hardship and economic loss nationwide. Large flood events, including those associated with 1% and 0.2% annual chance floods, can cause substantial damage to structures, landscapes, and utilities as well as life safety issues. People may be swept away in floodwaters, causing injuries or deaths. Floods can be extremely dangerous, and even six inches of moving water can knock over a person given a strong current. During a flood, people can also suffer heart attacks or electrocution due to electrical equipment short outs. Direct impacts, such as drowning, can be limited with adequate warning and public education about what to do during floods. Floodwaters can transport large objects downstream which can damage or remove stationary structures. Structures can be damaged directly from floodwaters and can also be damaged from trees falling as a result of water-saturated soils. Ground saturation can result in instability, collapse, or other damage. Objects can also be buried or destroyed through sediment deposition. Floodwaters can also break utility lines and interrupt services causing power outages. The interruption of power causes major problems and can result in the closure of governmental offices and community businesses. Roads can be damaged and closed, causing safety and evacuation issues.

Standing water can cause damage to crops, roads, foundations, and electrical circuits. Other problems connected with flooding and stormwater runoff include erosion, sedimentation, degradation of water quality, loss of environmental resources, and economic impacts.

Impacts that are not quantified, but can be anticipated in large future events, include:

- Injury and loss of life;
- Commercial and residential structural and property damage;
- Disruption of and damage to public infrastructure, utilities, and services;
- Damage to roads/bridges resulting in loss of mobility;
- Significant economic impact (jobs, sales, tax revenue) to the community; and
- Negative impact on commercial and residential property values

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the JVID include the following:

- As discussed in the hazard profile section, climate change is anticipated to exacerbate this hazard over time.
- While population projections for the area served by the District show additional expected growth, these anticipated future changes in population are expected to be relatively small, which is unlikely to affect this hazard and associated impacts to the District. The District may add staff, but this number would be small. The District noted it has no control over population changes in its Service Area, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development in the District are expected to be limited in the near future and thus are not likely to affect flooding and associated impacts to the District. Additional development traditionally leads to additional flooding. Adherence to protective building codes for new development should assist in limiting future impacts and associated vulnerabilities of the District to this hazard.

Future Development

Future development in the JVID will continue to be built in the floodplain, as long as it conforms to the standards of the floodplain ordinance. The County enforces their floodplain management ordinance on areas inside the District. More detail on the specifics of the floodplain ordinance can be found in Section 4.4.1 of the Base Plan.

Severe Weather: Extreme Cold, Freeze, and Snow

Likelihood of Future Occurrence–Likely
Vulnerability–Medium

Hazard Profile

According to the National Weather Service (NWS) and the Western Regional Climate Center (WRCC), extreme cold often accompanies a winter storm or is left in its wake. Snow can occur during these events. Prolonged exposure to cold can cause frostbite or hypothermia and can be life-threatening. Infants and the elderly are most susceptible, as are the unhoused, and outdoor workers. Pipes may freeze and burst in homes or buildings that are poorly insulated or without heat. Freezing temperatures can cause significant damage to the agricultural industry.

Location and Extent

Due to size of the County and changes in elevation (i.e., from approximately 250 feet to almost 10,000 feet above mean sea level (msl)) and climate, weather conditions can vary greatly across the County. The District falls in western Amador County, which is predominantly below an elevation of 2,000 feet above msl, is generally below the snowfall line, and includes the land to the west (including all incorporated communities). According to the WRCC, in western Amador County monthly average minimum temperatures from November through April range from the upper-30s to mid-50s. The lowest recorded daily extreme was 20°F on December 20, 1998. In a typical year, minimum temperatures fall below 32°F on 5.2 days with no days falling below 0°F. Extreme cold and freeze events occur on a regional basis. Extreme cold can occur in any location of the District. All portions of the District and County are at risk to extreme cold and freeze.

Past Occurrences

Disaster Declaration History

The County has had no past federal and one past state (2007) disaster declarations for extreme cold, freeze, and snow. There have been two freeze events in 2022 that resulted in USDA disaster declarations.

NCDC Events

The NCDC data shows 575 extreme cold, freeze, and snow incidents for Amador County since 1993, some of which likely affected the District.

JVID Events

The District noted that freeze and winter storm is a regional phenomenon; events that affected the lower elevations of the County also affected the District. Those past occurrences were shown in the Base Plan in Section 4.3.2. JVID has experienced a few hard freezes where exposed pipes, pumps, etc. have been destroyed by cracking or freezing, but no specific storm or event could be recalled.

Climate Change and Extreme Cold, Freeze, and Snow

According to the 2021 CAS (as well as the 2024 Draft CAS), freezing spells and snow are likely to become less frequent in California as climate temperatures increase; if emissions increase, freezing events could occur only once per decade in large portion of the State by the second half of the 21st century. According to a California Natural Resources Report in 2014, it was determined that while fewer freezing spells would decrease cold related health effects, too few freezes could lead to increased incidence of disease as vectors and pathogens do not die off.

Vulnerability to Extreme Cold, Freeze, and Snow

Extreme cold and freeze events happen in the District each year. Snow can occur, but it is rare. Cold and freeze can impact both structures and populations in the Planning Area. The whole of the District and County Planning Area has some measure of vulnerability to extreme cold and freeze.

An assessment of a community's vulnerability to this hazard begins with an understanding of local exposure to District. This is included in the Local Concerns section below. After that, vulnerability is discussed in multiple sections that detail how this hazard can affect the District. These sections include assets at risk, impacts, and how future development and future conditions can be affected by this hazard.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The transmission system in the District and other JIVD infrastructure that moves water and is exposed to the freezing, can be at risk. Damage to essential pipe work can cause outages of water for the community for indeterminate amounts of time. PSPS and power outages are also common to JVID. The District utilizes a propane backup generator at the water treatment plant and JVID administration office during these events.

In preparation to heavy freeze conditions, JVID can only temporarily mitigate the problem by installing insulation, heat tape, or heaters in pump station buildings and powerhouse to ensure freezing conditions do not affect District equipment and operations.

Assets at Risk

Assets at risk from this hazard include people and populations; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All District staff and population the District serve are at some vulnerability to extreme cold, freeze, and snow. Some employees may face a risk while working outdoors. All populations served by the District are vulnerable to extreme cold and freeze, but this hazard generally affects people spending large amounts of time outside (including District staff). Prolonged exposure to cold can cause frostbite or hypothermia and

can be life-threatening. Vulnerable populations to cold and freeze include the unhoused; individuals who exercise or train outdoors; outdoor workers; individuals that lack the resources to afford heat; and the young, old, or medically fragile individuals that are more susceptible to cold related impacts. In addition to vulnerable populations, pets and livestock are at risk to freeze and cold. Since snow is rare, its effect on people and populations are minimal.

Structures and Critical Facilities and Infrastructure

Structures and critical facilities and infrastructure in the District have some measure of risk from extreme cold and freeze. Buildings can be affected directly by freeze, pipes that feed buildings can be damaged during periods of extreme cold and cause water damage and other related impacts to a structure. Structures can also be damaged by downed trees during freeze and winter storm events. Snowfall can occur, but it is usually not heavy enough to damage structures. Transportation networks, communications, and utilities infrastructure are the most vulnerable physical assets in the District. Infrastructure such as roads, highways, and bridges can become slippery, causing accidents and road closures. Structures (from Table G-3) that the District considers at risk from this hazard include the Transmission, Piping, Outlet Works, Water Treatment Plant, and Irrigation Pump Station.

Natural, Historic, and Cultural Resources

Depending on how low the temperatures go and the duration of an extreme cold and freeze event, natural resources in the District may be affected. During periods of freeze, trees in the District may be damaged. This is especially true if a freeze occurs during a winter storm with winds and precipitation. Other natural resources like wildlife may be at risk during a period of freeze. While it is rare for historic buildings to be affected directly by freeze, damages to pipes that feed historic buildings can be damaged during periods of extreme cold and cause additional impacts to the structures. Snow is relatively rare and is unlikely to affect natural, historic, or cultural facilities.

Impacts from Severe Weather: Extreme Cold, Freeze, and Snow

Extreme cold and freeze can affect critical facilities and infrastructure, down trees, break pipes, and can be a life safety issue. Transportation networks, communications, and utilities infrastructure are often the most vulnerable physical assets in the District. Infrastructure such as roads and utilities are at risk to freezing temperatures and snow, causing failures and hazardous road conditions. When extreme cold is coupled with high winds, snows, and freezing storms, power lines may be downed, resulting in power outages and an interruption of utilities and critical services. During periods of extremely low or prolonged cold temperatures, other impacts to the District can include interruption in business and school activities.

The elderly, the young, and those experiencing medical issues are often more vulnerable to temperature extremes, but anyone can be affected. Exposure to cold temperatures can cause hypothermia and frostbite. Those exercising or recreating outdoors, outdoor workers, and the unhoused may be at a higher risk.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the Likelihood of Future Occurrence discussion above), changes in population patterns (migration, density, or the makeup of socially vulnerable

populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on these factors for the District include the following:

- Climate change is unlikely to exacerbate extreme cold, freeze, and snow and their associated impacts to the District.
- While population projections for the area served by the District show additional expected growth, these anticipated future changes in population are expected to be relatively small, which limits additional extreme cold, freeze, and snow impacts to the District. The District noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development are expected to be limited in the near future and thus are not likely to affect extreme cold and freeze and associated impacts to the District. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard.

Future development built to code should be able to withstand extreme cold and freeze. Pipes at risk of freezing should be mitigated by either burying or insulating them from freeze as new facilities are improved or added. Current Amador County codes provide such provisions for new construction. New wells and appurtenances will be built inside insulated buildings, reducing the risk of loss of potable water due to frozen pipes.

Wildfire (with smoke and air quality)

Likelihood of Future Occurrence–Highly Likely
Vulnerability–High

Hazard Profile

Wildland fire and the risk of a conflagration is an ongoing concern for the JVID. Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills and mountain areas and subsequent fire control practices have affected the natural cycle of fire regimes. Wildland fires affect grass, forest, and brushlands, as well as structures. Where there is human access to wildland areas the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Historically, the fire season extends from early spring through late fall of each year during the hotter, dryer months; however, in recent years, the risk of wildfire has become a year around concern.

Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, accumulation of vegetation, and high winds. These weather conditions can result in red flag (e.g., fire weather) days, and can result in PSPS events in the District. While wildfire risk has predominantly been associated with more remote forested areas and wildland urban interface (WUI) areas, significant wildfires

can also occur in more populated, urban areas. There is also the concern of wildfires occurring in these more remote, forested areas that under certain weather conditions, can extend into areas not generally considered at a high risk to wildfire. Smoke and air quality also become an issue, both from fires occurring inside and outside of the Amador County Planning Area and the District.

Wildfire Smoke and Air Quality

Smoke from wildfires is made up of gas and particulate matter, which can be easily observed in the air. Air quality standards have been established to protect human health with the pollutant referred to as PM2.5 which consists of particles 2.5 microns or less in diameter. These smaller sizes of particles are responsible for adverse health effects because of their ability to reach the lower regions of the respiratory tract.

Wildfire smoke can have negative effects to those who live in or near a fire burn area. Smoke and air pollution from wildfires can be a severe health hazard. Significant wildfires occurring in both Amador County and nearby northern California communities since the 2020 LHMP Update have created significant air pollution affecting area residents. This was the case during the 2021 Caldor Fire, as well as others that affected the nearby areas.

Location and Extent

Wildfire can affect all areas of the District. CAL FIRE has estimated that the risk varies across the District and has created maps showing risk variance. Following the methodology described in Section 4.3.15 of the Base Plan, wildfire maps for the JVID were created. Figure G-8 shows the CAL FIRE Federal Responsibility Areas (FRA) and State Responsibility Areas (SRA) and their associated Fire Hazard Severity Zones (FHSZ) in the District. Figure G-9 shows the CAL FIRE Local Responsibility Areas (LRA) and their associated Fire Hazard Severity Zones (FHSZ) in the District. As shown on the maps, FHSZs within the District range from Non-Wildland to Very High.

Figure G-8 JVID – CAL FIRE SRA/FRA Fire Hazard Severity Zones

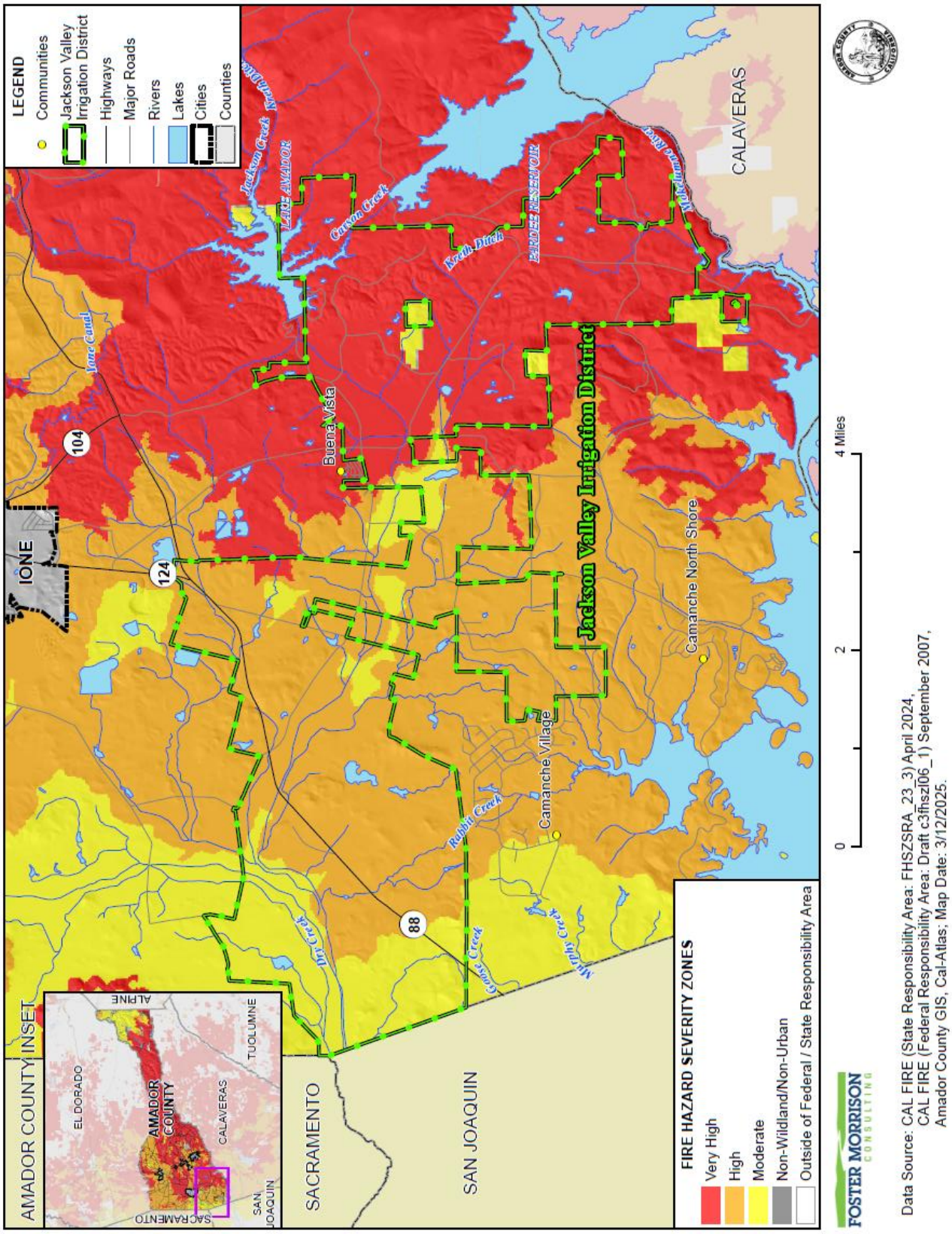
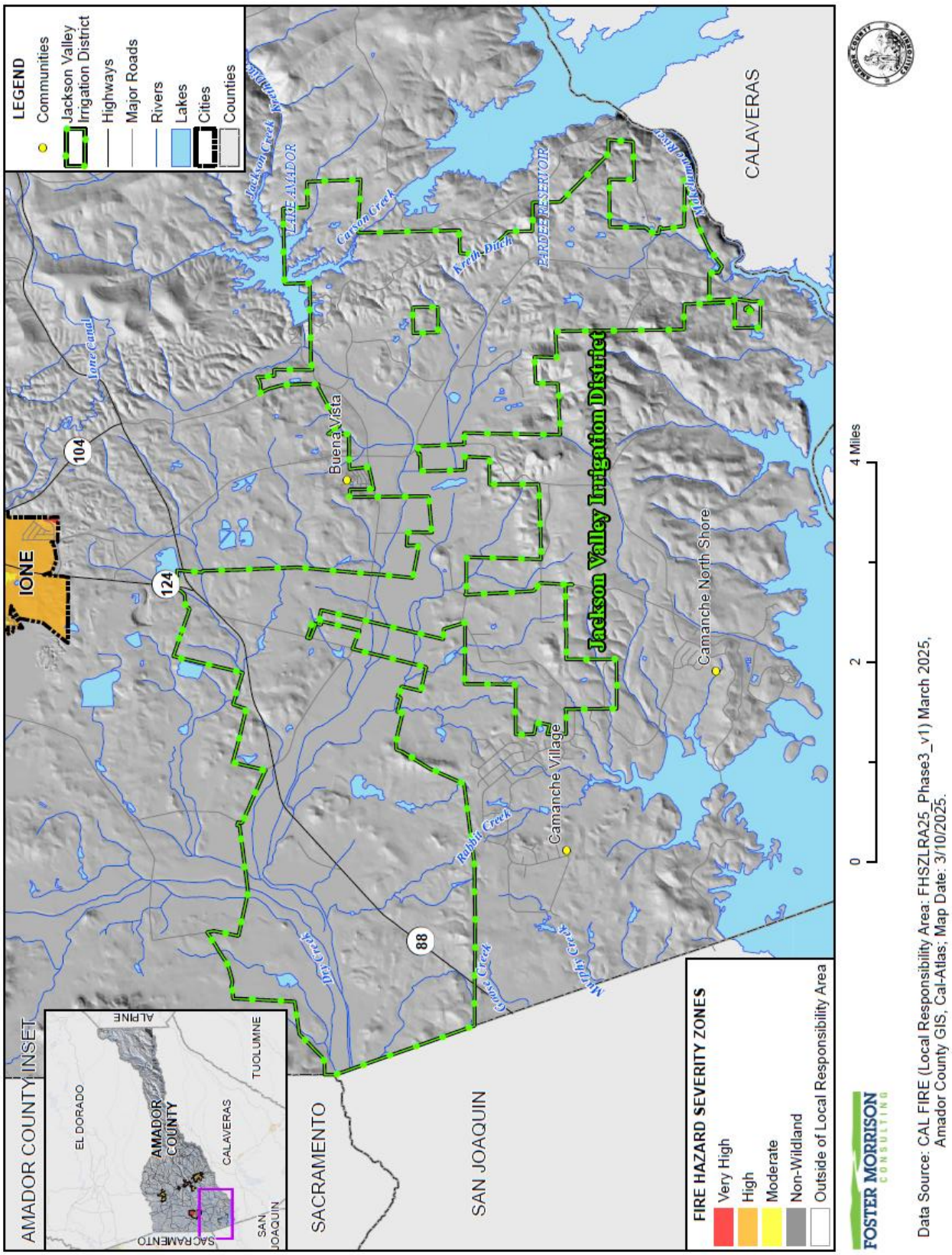


Figure G-9 JVID – CAL FIRE LRA Fire Hazard Severity Zones



Wildfires tend to be measured in structure damages, injuries, and loss of life as well as on acres burned. Fires can have a quick speed of onset, especially during periods of drought or during hot dry summer months. Fires can burn for a short period of time or may have durations lasting for a week or more. Geographical FHSZ extents in the SRA/FRA are shown in Table G-11, while extents in the LRA are shown on Table G-12.

Table G-11 JVID – CAL FIRE SRA/FRA Fire Hazard Severity Zone Geographical Extents

JVID Jurisdiction/ Fire Responsibility/ Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Unincorporated Amador County						
FRA						
Moderate	48.8	0.37%	0.3	0.0024%	48.6	1.8%
FRA Total	48.8	0.37%	0.3	0.0024%	48.6	1.8%
SRA						
Very High	4,953	38%	3,075	29%	1,878	71%
High	5,995	46%	5,487	52%	508	19%
Moderate	2,107	16%	1,893	18%	214	8%
SRA Total	**13,055**	**100%**	**10,456**	**100%**	**2,599**	**98%**
Grand Total	**13,103**	**100%**	**10,456**	**100%**	**2,648**	**100%**

Source: CAL FIRE

Table G-12 JVID – CAL FIRE LRA Fire Hazard Severity Zone Geographical Extents

JVID Jurisdiction /Fire Hazard Severity Zones	Total Acres	% of Total Acres	Improved Acres	% of Total Improved Acres	Unimproved Acres	% of Total Unimproved Acres
Unincorporated Amador County						
Outside of LRA Responsibility Area	13,089	100%	10,442	100%	2,648	100%
Unincorporated Amador County Total	13,089	100%	10,442	100%	2,648	100%
Grand Total	**13,089**	**100%**	**10,442**	**100%**	**2,648**	**100%**

Source: CAL FIRE

Past Occurrences

Disaster Declaration History

There has been three state and two federal disaster declarations due to fire, as shown in Table G-13.

Table G-13 Amador County – State and Federal Wildfire Disaster Declarations 1950-2025

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Fire	3	1961 (unnamed), 2015 (Summer 2015 Fires), 2021 (Caldor Fire)	2	2016 (Butte Fire), 2021 (Caldor Fire)

Source: Cal OES, FEMA

NCDC Events

The NCDC has tracked 50 wildfire events in the County dating back to 1993.

JVID Events

A list of state and federal disaster declarations for Amador County from wildfire is shown on Table G-13. These events also likely affected the District to some degree.

Climate Change and Wildfire

It is likely that climate change will increase the chance of future occurrence as well as future impacts from wildfire. More information on future impacts to the District can be found in the Future Conditions/Future Development section of the Vulnerability Assessment below.

Warmer temperatures can exacerbate drought conditions. Drought often kills plants and trees, which serve as fuel for wildfires. Warmer temperatures could increase the number of wildfires and pest outbreaks, such as the western pine beetle. Cal-Adapt's wildfire tool predicts the potential increase in the amount of burned areas for the year 2090-2099, as compared to recent (2010) conditions. This is shown in Section 4.3.15 of the Base Plan. Based on this model, Cal-Adapt predicts that wildfire risk in Amador County will increase moderately at the end of the century. However, wildfire models can vary depending on the parameters used. Cal-Adapt does not take landscape and fuel sources into account in their model. In all likelihood, in the Amador County Planning Area, precipitation patterns, high levels of heat, topography, and fuel load will determine the frequency and intensity of future wildfire.

Vulnerability to Wildfire

Risk and vulnerability to the District from wildfire is of significant concern. Wildfires that occur in the District occur from a variety of both natural and manmade causes. The District can be affected both by fires that start on or near District lands as well as those that start elsewhere and move into the District. In addition to burning large areas of land, air quality can be affected in the District by smoke from fires occurring inside the District as well as those from many miles away. As growth continues and populations increase in the District, the potential for wildfires will also increase.

The whole of the District is at some measure of vulnerability to wildfire. An assessment of a community's vulnerability to wildfire begins with an understanding of local exposure to wildfire. This is included in the Local Concerns section below. After that section, assets at risk are discussed.

Local Concerns

The District has specific concerns and unique vulnerabilities regarding this hazard. These concerns form a portion of the basis for the mitigation strategy and mitigation actions that seek to reduce risk and vulnerability to this hazard.

The District noted that the powerhouse, water treatment plant, and any exposed water transmission plumbing could be damaged by fire. Overall, wildfire is not a major concern for JVID. JVID has numerous fire hydrants throughout the District, and most all lands are irrigated and not considered high fire risk. The greatest concern of wildfire would be potential crops or land taken out of production or facilities damaged during the event.

It should be noted that JVID is an asset to fire protection by providing fire hydrants thought the District Service Area for fighting local fires. There are 20 hydrants throughout the Service Area that the local fire department can access to fight fires.

Assets at Risk

Assets at risk from this hazard include people and populations served; structures and critical facilities; and natural, historic, and cultural resources. These are discussed in the following sections.

People and Populations

All populations (both District staff and Service Area populations) are at some vulnerability to wildfire. Certain vulnerable populations are at greater risk to the effects of wildfire as well as smoke and air quality issues that wildfires bring. Vulnerable populations include:

- Unhoused
- Infants and children under age five and their caregivers
- Elderly (65 and older)
- Individuals with disabilities
- Individuals' dependent on medical equipment
- Individuals who exercise, recreate, or work outdoors
- Individuals with impaired mobility

Structures and Critical Facilities and Infrastructure

All structures in the District have some risk to wildfire. Wildfire presents a threat to critical facilities and infrastructure. All assets in the District are at risk to wildfire, as shown in Table G-3.

Natural, Historic, and Cultural Resources

Natural, historic, and cultural resources located within areas at risk to wildfire would be vulnerable. Should a wildfire occur in the District, the impacts to natural, historic and cultural resources could be extensive and include air pollution, water quality issues, contamination from water runoff containing toxic products, and other environmental discharges or releases from burned materials affecting soils, habitat areas, wildlife,

and aquatic resources. Debris and runoff from burned areas can affect reservoirs and rivers in the District. Historic and cultural resources can be damaged or destroyed and are often more vulnerable due to their older age, construction type, and lack of fire prevention infrastructure such as sprinklers.

Impacts from Wildfire

Potential impacts from wildfire include loss of life and injuries; damage to structures and other improvements, natural and cultural resources, croplands, and timber; and loss of recreational opportunities. Out of control wildfires can have catastrophic impacts. Wildfires can cause short-term and long-term disruption to the District. Fires can have devastating effects on watersheds through loss of vegetation and soil erosion, which may impact the District by changing runoff patterns, increasing sedimentation, reducing natural and reservoir water storage capacity, and degrading water quality. Fires can also affect air quality in the District; smoke and air pollution from wildfires can be a severe health hazard. Smoke impacts may come from wildfires outside the District, as well as from within.

Although the physical damages and casualties arising from wildland-urban interface or conflagration fires may be severe, it is important to recognize that they also cause significant economic impacts by resulting in a loss of function of buildings and infrastructure. Economic impacts of loss of transportation and utility services may include traffic delays/detours from road and bridge closures and loss of electric power, potable water, and wastewater services. Schools and businesses can be forced to close for extended periods of time. Recently, the threat of wildfire, combined with the potential for high winds, heat, and low humidity, has caused PG&E to initiate a PSPS which can also significantly impact a community through loss of services, business closures, and other impacts associated with loss of power for an extended period. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

The impacts of a fire are felt long after the fire is extinguished. In addition to the loss of property in fires, the loss in vegetation and changes in surface soils alters the environment. When supporting vegetation is burned, hillsides become destabilized and prone to erosion. The burnt surface soils are harder and absorb less water. When winter rains come, this leads to increased runoff, erosion, and landslides in hilly areas.

Impacts to the District include potential loss of water availability for fire suppression and/or consumption. Wastewater treatment can also be rendered inoperable when wildfire eliminates the availability of electricity. All wastewater equipment have generators, however, the water distribution equipment does not. Without backup electricity generation, water and wastewater cannot be conveyed. Water quality will also suffer if water treatment functionality is compromised. The economic impact alone to the District including the loss of function of buildings and infrastructure and the cost of reacting to these fires is a major concern.

Wildfire smoke can also have negative effects to those who live in or near a fire burn area. Smoke and air pollution from wildfires can be a severe health hazard. Significant wildfires occurring in nearby northern California communities since the previous LHMP have created significant air pollution affecting area residents. District residents have been affected by wildfire smoke and poor air quality, from fires both within the County and from those much further away.

Impacts to identified assets at risk to this hazard and the overall vulnerability of the District may be affected in the future by climate change (which was discussed in the hazard profile above), changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. These are discussed in the Future Conditions/Future Development discussion below.

Future Conditions/Future Development

This section provides a discussion of how future conditions will influence or affect the hazard over time and also discusses future development relative to each hazard.

Future Conditions

Future conditions may be affected by climate change, changes in population patterns (migration, density, or the makeup of socially vulnerable populations), and changes in land use and development. Findings on this for the JVID include the following:

- Climate change is likely to exacerbate future wildfire conditions and associated impacts and vulnerability of the District to wildfire.
- While population projections for the area served by the District show additional expected growth, these anticipated future changes in population are expected to be relatively small, which limits additional impacts to the District. The District noted it has no control over population changes, it merely reacts to them by providing additional (or reduced) services.
- Changes in land use and development are occurring within the District Service Area and thus could increase associated wildfire impacts to the District. Additional development traditionally leads to additional fires. In addition, adherence to protective building codes for new development will also assist in limiting future impacts and associated vulnerabilities of the District to this hazard..

The District will take wildfire into account when siting new facilities. Fire hydrants, defensible space, well production, water storage, and distribution should all be considered for future development. New facilities will be built to the most current California Building standards for wildfire.

Future Development

Additional growth and development within moderate or higher fire hazard severity zones in the District would place additional values at risk to wildfire. More vulnerable populations may experience a disproportionate impact from wildfire, and this should be considered as development continues. However, County building codes are in effect in the District and should continue to be updated as appropriate to reduce future impacts.

G.5 Capability Assessment

Capabilities are the programs and policies currently in use to reduce hazard impacts or that could be used to implement hazard mitigation activities. This capabilities assessment is divided into five sections: regulatory mitigation capabilities, administrative and technical mitigation capabilities, fiscal mitigation capabilities, mitigation education, outreach, and partnerships, and other mitigation efforts.

G.5.1. Regulatory Mitigation Capabilities

Table G-14 lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in place in the JVID.

Note: The District does not have the authority to regulate land use and development within its jurisdiction. Authority for promulgating and enforcing zoning, land use, and development requirements falls to counties and incorporated communities. As such development within the District's jurisdictional boundaries will conform to the zoning and land use development ordinances and building codes of the county or incorporated community in which the District is located

Table G-14 JVID's Regulatory Mitigation Capabilities

Plans	In Place Y/N	Does the plan address hazards? Can the plan be used to carry out mitigation actions? When was it last updated??
Capital Improvements Plan	N	
Climate Change Adaptation Plan	N	
Community Wildfire Protection Plan	N	
Comprehensive/Master Plan	N	
Continuity of Operations Plan	N	
Economic Development Plan	N	
Land Use Plan	N	
Local Emergency Operations Plan	Y	JVID has an Emergency Action Plan for Dam Failure
Stormwater Management Plan	N	
Transportation Plan	N	
Other		
Land Use Planning and Ordinances	**Y/N**	**Is the ordinance an effective way to reduce hazard impacts? Is the ordinance adequately administered and enforced?**
Acquisition of land for open space and public recreation use	N	
Building code	N	
Flood insurance rate maps	N	
Floodplain ordinance	N	
Natural hazard-specific ordinance (stormwater, steep slope, wildfire)	N	
Subdivision ordinance	N	
Zoning ordinance	N	
Other		

How can these capabilities be expanded and improved to reduce risk?
JVID has little control over these areas. It depends on the County to enforce or plan for hazard issues. JVID does have EAPs for its dams. It will continue to keep this current, with a focus on mitigation.

Source: JVID

G.5.2. Administrative/Technical Mitigation Capabilities

Table G-15 identifies the District department(s) responsible for activities related to mitigation and loss prevention in the JVID.

Table G-15 JVID's Administrative and Technical Mitigation Capabilities

Administration	In Place Y/N	Describe capability Is coordination effective?
Staff		**Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigation? Is coordination between agencies and staff effective?**
Chief Building Official	N	
Civil Engineer, including dam and levee safety	Y	JVID uses a total of 3 different engineering firms for different purposes.
Community Planner	N	
Emergency Manager	Y	General Manager, trained in hazard mitigation and between agencies.
Floodplain Administrator	N	
GIS Coordinator	N	
Planning Commission	N	
Other		
Technical	**Y/N**	**Has capability been used to assess/mitigate risk in the past?**
Grant writing	Y	JVID General Manager has written and applied for several grants and JVID has used outside help to grant write.
Hazard data and information	N	
GIS analysis	N	
Mutual aid agreements	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Improvement could include more mutual communication between local police and fire officials to teach and talk about what concerns are specifically related to JVID. Such as Dam Failure, high flood flows, droughts, etc. Staff training on hazard mitigation is currently in place, and the District will put additional emphasis in the future to expand capabilities and reduce risk.		

Source: JVID

G.5.3. Fiscal Mitigation Capabilities

Table G-16 identifies financial tools or resources that the District could potentially use to help fund mitigation activities.

Table G-16 JVID's Fiscal Mitigation Capabilities

Funding Resource	In Place Y/N	Has the funding resource been used in past and for what type of activities? Could the resource be used to fund future mitigation actions?
Capital improvements project funding	Y	Small budget to incorporate improvement projects annually
Community Development Block Grant	N	
Federal funding programs (non-FEMA)	Y	JVID has used FEMA and USDA Grants in past.
Fees for water, sewer, gas, or electric services	Y	Water fees are collected by the District
Impact fees for new development	N	
State funding programs	Y	JVID has used Prop. 50 and Prop. 1 water bond grants for projects.
Stormwater utility fee	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		
Using additional grant funds once a project is identified as beneficial could reduce risk. Additional funds could help JVID create drought, and other mitigation plans that they currently don't have access with their limited budget. Creating these plans and implementing them could help protect the public within the jurisdiction.		

Source: JVID

G.5.4. Mitigation Education, Outreach, and Partnerships

Table G-17 identifies education and outreach programs and methods already in place that could be/or are used to implement mitigation activities and communicate hazard-related information.

Table G-17 JVID's Mitigation Education, Outreach, and Partnerships

Program/Organization	In Place Y/N	How widespread are each of these in your community?
Community newsletters	N	
Hazard awareness campaigns (such as Firewise, Storm Ready, Severe Weather Awareness Week, school programs, public events)	N	
Local news	N	
Organizations that interact with underserved and vulnerable communities	N	

Program/Organization	In Place Y/N	How widespread are each of these in your community?
Social media		
How can these capabilities be expanded and improved to reduce risk?		
Possibly adding a JVID Board committee to work with local residents within the inundation area to come up evacuation plans and early warning systems. JVID sends out annual notices to residents within the dam failure inundation area reminding them of the potential risk of a dam failure or extreme flood events.		

Source: JVID

G.5.5. Other Mitigation Efforts

The District has many other completed or ongoing mitigation efforts that include the following:

- JVID is always mitigating for hazards by removing trees, vegetation and debris etc. around facilities and infrastructure to ensure that systems are working properly and as designed.
- JVID's assists in mitigating flood and dam failure issues by reinforcing the Dam's spillway structure with additional concrete and/or rip-rap.
- JVID is an asset to fire protection by providing fire hydrants thought the District Service Area for fighting local fires. There are 20 hydrants throughout the Service Area that the local fire department can access to fight fires.

JVID does own the Jackson Creek dam. The dam and facility are inspected annually by FERC and DSOD, and every five years, JVID is required to do a detailed independent review of the facility to ensure the safety of the dam, which includes an in-depth survey checking for dam movement. In addition, JVID is required to have an Emergency Action Plan as part of the FERC and DSOD operating license. On an annual basis, JVID participates in exercises with local OES services to review and comment called a "tabletop discussion" and reprints the whole document every five years. JVID staff completes daily routines and inspections to collect data on flows, lake levels, observations, etc. for recording. On an annual basis, staff weed eats, sprays, trims trees, etc. to protect the facilities from fire and other hazards. Recent significant projects/activities related to the dam include:

- 2014: Installed a SCADA computer operating system to be able to remotely view system operations through a computer system so staff could better manage the water within the system and log data on an hourly, daily, monthly basis.
- 2014: Installed +- 70 irrigation style water meters to promote water conservation and efficiency on irrigation customers.
- 2016: Installed Guardrail on the crest of the dam to protect the public from driving into the lake or over the edge of the dam. FERC safety requirement.
- 2018: Updated inundation maps as part of the DSOD requirement putting into an electronic GIS format so OES could have a better understanding of the inundation areas for evacuation planning.
- 2018: FEMA/Cal OES project to install rip-rap in the left and right dam groin areas of the dam to prevent face erosion from heavy rains.
- 2018: FEMA/ Cal OES Project to rebuild 300' of the levee at the District Pumping Station on the Jackson Creek due to the 2017 floods.
- 2018: FEMA/ Cal OES Project to repair damage to the spillway plunge pool area from damage caused by the 2017 storms.

- 2019: FEMA/ Cal OES project on the Spillway area to protect three large erosion areas immediately downstream from the concrete sill with concrete from damage caused by the 2017 storms.
- 2019: Paved crest of the dam with new asphalt to protect the crest from the water penetrating the dam vertically.
- 2020: Installed a new seepage monitoring station at the base of the dam to be able to monitor any seepage coming from the groin areas.
- 2020: Public outreach workshops are scheduled with downstream residents within the immediate inundation area to teach the hazards of living downstream of the reservoir and what to do in the event of dam failure.

Public Information Brochure on Dam Failure

Since 2020, JVID has created public outreach brochure that addresses this hazard and what to do if a dam failure were to ever occur. It also discusses the District's Emergency Action Plan that would be activated in the event of dam failure. This can be seen below in Figure G-10and Figure G-11.

Figure G-10 Dam Failure Brochure - Front

Figure G-11 Dam Failure Brochure - Rear

Why am I being contacted?

The Jackson Valley Irrigation District is contacting you as part of our public outreach and responsibility as the owner of the dam. Under the direction of the Federal Energy Regulatory Commission (FERC) and California Department Safety of Dams (DSOD) the two governmental agencies that oversee the safety of the Jackson Creek Dam. Your residence could be impacted in the rare event of a sudden dam failure and resulting flood inundation.

What is an EAP?

An emergency action plan or EAP would be activated in the event of a dam failure or dam related emergency. The EAP is a tool that JVID uses in conjunction with local Emergency Services to address an event. JVID and the local Office of Emergency Services (OES) meet and train annually in exercises to adequately prepare and response to a dam failure and what to do during such an event.

What is JVID doing to Protect us?

The Jackson Creek Dam, the dam that creates Lake Amador, has been identified as a "high" hazard dam in California because of the downstream risk to lives if there were a dam failure. With this distinction there comes much responsibility and many requirements to ensure the safety of everyone around and downstream of the facility. On an annual basis, the dam is inspected by both governmental regulatory agencies: FERC and DSOD, and every five-years JVID is required to hire an independent consulting engineer do an in-depth analysis and report of the facility. FERC and DSOD have determined the dam to be safe. In addition, JVID staff is trained to continuously monitor the dam

What is an inundation zone?

The "inundation zone" is the area downstream of the dam that would be flooded in the event of a failure (breach) or uncontrolled release of water, and is generally much larger than the area for the normal river or stream flood event. The inundation zones for every reservoir in California can be found on the Dept of Water Resources website at https://fmds.water.ca.gov/maps/damim/

for signs that the dam is not working the way it was designed. The most recent inspection determined shows that the dam is in great shape and well maintained. JVID staff is diligent in its operations and is consistently doing maintenance and monitoring to ensure the facility is safe to the downstream public.

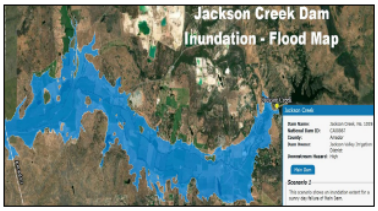
How will I know if there is a dam failure?

The existing tools the JVID and OES have to contact you are the reverse-911 system or Smart911 Emergency Notifications. (you can sign up for Smart911 quickly by accessing the website:https://www.smart911.com/smart911/ref/login.action?pa=amadorgov) This is a system that is used in the event of any emergency. The local OES or Sheriff will call your phone and give you information related to the incident. JVID does have a local high decibel audible alarm that will sound in the event of a dam related emergency, but not everyone downstream may hear it.

Smart911®

Some things to do before or in the event of a dam failure:

- Educate yourself on where the inundation area is. You can do this by going to the DWR website https://fmds.water.ca.gov/maps/damim/
- If you see higher than normal water flows in the creek, move to high ground.
- Heed the warnings by JVID staff and or OES representatives.
- Come up with an evacuation plan and routes for you and your family.
- Inform your family of dam failure flood risks and make sure everyone knows what to do in an emergency.
- Do not try to cross any bridges or roads that may be underwater.



G.6 Mitigation Strategy

G.6.1. Mitigation Goals and Objectives

The JVID adopts the hazard mitigation goals and objectives developed by the HMPC and described in Chapter 5 Mitigation Strategy.

G.6.2. NFIP Mitigation Strategy

The District does not participate in the NFIP, as it is not an eligible participant. Many of the District's projects work to reduce impacts from flood events thus furthering the objectives of the NFIP.

G.6.3. Mitigation Actions

The Planning Team for the JVID identified and prioritized the following mitigation actions based on the risk assessment. Background information and information on how each action will be implemented and administered, such as ideas for implementation, responsible office, potential funding, estimated cost, and

timeline are also included. The following hazards were considered a priority for purposes of mitigation action planning:

- Agricultural Hazards (severe weather/pests/invasive species)
- Climate Change
- Dam Failure
- Drought & Water shortage (w/ tree mortality)
- Earthquake (w/subhazards)
- Floods: 1%/0.2% annual chance (w/ levee failure)
- Severe Weather: Extreme Cold, Freeze, and Snow
- Wildfire (w/smoke and air quality)

Low priority hazards for mitigation planning include:

- Avalanche
- Floods: Localized Stormwater
- Landslide, Mudslide, and Debris Flow
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rain and Storms (Hail, Lightning)
- Severe Weather: High Winds and Tornados

It should be noted that many of the projects submitted by each jurisdiction in Table 5-4 in the Base Plan benefit all jurisdictions whether or not they are the lead agency. Further, many of these mitigation efforts are collaborative efforts among multiple local, state, and federal agencies. In addition, the countywide public outreach action, as well as many of the emergency services actions, apply to all hazards regardless of hazard priority. Collectively, this multi-jurisdictional mitigation strategy includes only those actions and projects which reflect the actual priorities and capacity of each jurisdiction to implement over the next 5-years covered by this plan. It should further be noted, that although a jurisdiction may not have specific projects identified for each priority hazard for the five year coverage of this planning process, each jurisdiction has focused on identifying those projects which are realistic and reasonable for them to implement and would like to preserve their hazard priorities should future projects be identified where the implementing jurisdiction has the future capacity to implement.

Mitigation Actions

The District has put forward the actions as shown in Table G-18. Details of the actions can be found below the table.

Table G-18 JVID Mitigation Actions

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Jackson Valley Irrigation District					
Action 1. Aquatic Invasive Species Monitoring Plan and Decontamination Station	Previous Action	X	X		Natural Resource Protection

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 2. Long Term Water Solutions Analysis Due to Climate Change	Previous Action	X	X		Property Protection Natural Resource Protection
Action 3. Jackson Creek Dam Spillway Apron Extension Project	Previous Action	X	X	X	Structural Property Protection Natural Resource Protection
Action 4. Lake Amador Spillway Rubber Dam Project	Previous Action	X	X	X	Structural Property Protection Natural Resource Protection
Action 5. JVID Water Procurement and Additional Water Storage Study	Previous Action	X	X		Property Protection Natural Resource Protection
Action 6. Jackson Creek Streambank and Levee Maintenance Project	Previous Action	X	X	X	Structural Property Protection Natural Resource Protection
Action 7. Lake Amador Drive Box Culvert Expansion Project	Previous Action	X	X	X	Structural Property Protection Natural Resource Protection

Action 1. Aquatic Invasive Species Monitoring Plan and Decontamination Station

Hazards Addressed: Agricultural Hazards

Goals Addressed: 1, 2, 4, 6

Issue/Background (Problem Statement): Lake Amador does not currently have any threating aquatic invasive species. There is great concern in California regarding the Zebra, Quagga and recently found Golden Mussels in the California Delta. If invasive species were to take residence in Lake Amador it could cause devastating impacts to the operation of valving, piping, and other water transportation mechanisms within the water distribution system. Additionally, other invasive aquatic species may include plants and algae.

Project Description: JVID currently has a visual pre-boat launch inspection program and an in-reservoir monitoring station to monitor invasive mussels in partnership with California Fish and Wildlife that is checked routinely. This project would continue the monitoring effort but additionally create a pre and post mitigation plan specific to Lake Amador for preventing and eliminating the species if found. Also, the purchase of a decontamination station for cleaning and disinfecting boats before launching in the reservoir.

Other Alternatives: No Action

Existing Planning Mechanism(s) through which Action Will Be Implemented: California Fish and Wildlife – Mussel prevention and mitigation plan

Responsible Office/Partners: JVID GM and Board, California Fish and Wildlife, Lake Amador Resort

Benefits (Losses Avoided): $100s thousands – Millions depending on the damage incurred.

Potential Funding (Local Budgets, Grant Funds, etc.): JVID Reserves, California Fish and Wildlife Mussel Grants.

Timeline: 1-5 years; As soon as funding becomes available and into foreseeable future

Project Priority (High, Medium, Low): High

Action 2. Long Term Water Solutions Analysis Due to Climate Change

Hazards Addressed: Climate Change, Agricultural Hazards

Goals Addressed: 1, 2, 4, 5, 6

Issue/Background (Problem Statement): The changing environment could cause negative impacts such as availability for consistent water reliability from the small JVID watershed. Hotter or colder weather cycles could force farmers to change crop types and or fallow fields.

Project Description: Work with a climate change consultant and/or engineer to come up with a long-term plan and analysis of the potential impacts that could be expected to impact JVID specific to address climate change.

Other Alternatives: No Action

Existing Planning Mechanism(s) through which Action Will Be Implemented: None identified

Responsible Office/Partners: JVID GM and Board, California EPA, USDA

Benefits (Losses Avoided): $1 to Millions depending on severity of impacts caused by Climate Change

Potential Funding (Local Budgets, Grant Funds, etc.): JVID Reserves, FEMA HMA Grants

Timeline: 2030

Project Priority (High, Medium, Low): Low

Action 3. Jackson Creek Dam Spillway Apron Extension Project

Hazards Addressed: Dam Failure

Goals Addressed: 1, 2, 4, 6

Issue/Background (Problem Statement): In 2019 JVID completed a FEMA funded project to protect 3 large erosion areas just downstream from the concrete sill of the spillway. In 2023 additional damage occurred due to the large storm events in January. This project did not include protecting the area between these erosion areas and concrete sill which varies from 20-50 feet in distance. This area just downstream the sill could be another area of concern during heavy spillway flows.

Project Description: Extend a 10-50 foot wide by 4-6"-inch-thick apron the length of the 400' sill and connect with concrete the sill and erosion areas. Protecting the spillway sill and preventing future erosion problems from large spill events and potential operation failure of the spillway.

Other Alternatives: No Action

Existing Planning Mechanism(s) through which Action Will Be Implemented: None Identified

Responsible Office/Partners: JVID GM and Board, California Division Safety of Dams (DSOD), Federal Energy Regulatory Commission (FERC)

Benefits (Losses Avoided): Millions if the spillway was to fail and could cause damage to downstream properties and public safety.

Potential Funding (Local Budgets, Grant Funds, etc.): JVID Reserves, FEMA HMA Grants

Timeline: As soon as funding is available. Within 5 years if possible.

Project Priority (High, Medium, Low): High

Action 4. Lake Amador Spillway Rubber Dam Project

Hazards Addressed: Drought & Water Storage, Agricultural Hazards, Wildfire

Goals Addressed: 1, 2, 4, 6

Issue/Background (Problem Statement): When Lake Amador was constructed in 1965 due to the geology and construction constraints at the spillway site the final lake elevation the dam was left with 13 feet of additional freeboard on the dam when the reservoir is at full capacity. This additional freeboard could account for an additional 2,000 to 4,000-acre feet of storage to the reservoir if a temporary dam is installed at the spillway.

Project Description: Install a temporary rubber inflatable dam up to 5-feet-tall along the 400' long spillway sill. In the late spring, inflate a temporary dam with air to use the additional reservoir freeboard to create additional water storage. This additional water could be used for irrigation and help mitigate future drought and water shortage concerns. It could also be used to fight wildfires.

Other Alternatives: No Action

Existing Planning Mechanism(s) through which Action Will Be Implemented: None identified

Responsible Office/Partners: JVID GM and Board, California Division Safety of Dams (DSOD), Federal Energy Regulatory Commission (FERC)

Benefits (Losses Avoided): Additional Storage and Water Supply to mitigate water shortage and drought concerns

Potential Funding (Local Budgets, Grant Funds, etc.): JVID Reserves, FEMA HMA Grants, Loans

Timeline: 2050

Project Priority (High, Medium, Low): Medium

Action 5. JVID Water Procurement and Additional Water Storage Study

Hazards Addressed: Drought & Water Shortage, Earthquake, Extreme Cold

Goals Addressed: 1, 2, 4, 6

Issue/Background (Problem Statement): Water availability and drought have always been one of the biggest concerns for JVID. This could also be an issue if an earthquake caused damage to the dam holding back Lake Amador, or if a freeze caused pipe damages. Procuring additional water from other nearby watersheds and or agencies would help protect our existing operation and help mitigate future droughts. Additionally, looking for nearby areas to store additional water has also been a priority for JVID.

Project Description: Hire a consultant to help JVID to identify potential projects to store water outside the Lake Amador Reservoir and identify water that could be purchased from other water right holders within our region to supplement Lake Amador storage during times of drought.

Other Alternatives: No Action

Existing Planning Mechanism(s) through which Action Will Be Implemented: None Identified

Responsible Office/Partners: JVID GM and Board, Amador Water Agency, PG&E

Benefits (Losses Avoided): Additional Water would help mitigate future droughts and loss of existing operations and customers.

Potential Funding (Local Budgets, Grant Funds, etc.): JVID Reserves

Timeline: As soon as funding is available and into the foreseeable future; 1-5 years; This action is ongoing and annual.

Project Priority (High, Medium, Low): High

Action 6. Jackson Creek Streambank and Levee Maintenance Project

Hazards Addressed: Levee Failure, Flood: 1%/0.2% Annual Chance

Goals Addressed: 1, 2, 4, 6

Issue/Background (Problem Statement): The Jackson Creek has several miles of levees that farmers have built and used for years to contain the creek flows. During heavy flooding conditions of more than 3,000 cfs historically there has been heavy damage to these levees and stream banks. These stretches of levees have not been maintained from burrowing animals, trees, brush, erosion, etc. for many years.

Project Description: Create a stream bank / levee maintenance plan to clear trees and brush from the levees. Assess the levees condition, harden areas of the banks with rip-rip if necessary to prevent future damage caused by erosion.

Other Alternatives: No Action

Existing Planning Mechanism(s) through which Action Will Be Implemented: None Identified

Responsible Office/Partners: JVID GM and Board

Benefits (Losses Avoided): Protecting life and property while also protecting wildlife habitat by containing the creek flows to the historical channel and preventing further erosion from flood waters.

Potential Funding (Local Budgets, Grant Funds, etc.): JVID Reserves, FEMA HMA Grants

Timeline: 2050

Project Priority (High, Medium, Low): Medium

Action 7. Lake Amador Drive Box Culvert Expansion Project

Hazards Addressed: Flood 1%/0.2% annual chance

Goals Addressed: 1, 2, 4, 6

Issue/Background (Problem Statement): Accessing Lake Amador Recreation Area on Lake Amador Drive the road crosses over the Jackson Creek Dam spillway discharge area. In severe storms or large floods there is a 1,000 feet section of road that can be submerged by flood waters making the drive impassable. Currently there is a two 8'x8'box culverts that create a bridge that have a minimal capacity of about 3,000 cfs of flows from spillway discharge. Any flows larger than 3,000 cfs inundates the road and causes safety concerns for the traveling public.

Project Description: Install additional box culverts and raise the roadway above the historical flood stage. A 1% annual chance flood could be as much as 10,000 cfs of spillway discharge. Install enough drains / culverts to handle a greater than 10,000 cfs flow.

Other Alternatives: No Action

Existing Planning Mechanism(s) through which Action Will Be Implemented: None Identified

Responsible Office/Partners: JVID GM and Board

Benefits (Losses Avoided): Protecting the public from flood waters. Potential loss of life.

Potential Funding (Local Budgets, Grant Funds, etc.): JVID Reserves, FEMA HMA Grants, Loans

Timeline: 2050

Project Priority (High, Medium, Low): Medium

Appendix A Planning Process

A.1 Lists of HMPC Invites/Stakeholders

A.1.1. LHMP Invite List

Organization	Name	Email Address
Amador County Invitees		
Amador County Sheriff	Sheriff Gary Redman	gredman@amadorgov.org
Amador County Sheriff	Lt Jeff Bellotti	jbellotti@amadorgov.org
Amador County Sheriff	Sgt Matt Girton - OES Coordinator	mgirton@amadorgov.org
Amador County Sheriff	OES Program Manager - Diana Evensen	devensen@amadorgov.org
Amador County Sheriff	Sheriff's Office Program Manager - Holly Sandman	Hsandman@amadorgov.org
Amador County Board of Supervisors	Supervisor Jeff Brown	jeffbrown@amadorgov.org
Amador County Board of Supervisors	Supervisor Patrick Crew	pcrew@amadorgov.org
Amador County Board of Supervisors	Supervisor Frank Axe	faxe@amadorgov.org
Amador County Board of Supervisors	Supervisor Richard Forster	rforster@amadorgov.org
Amador County Board of Supervisors	Supervisor Logan Carnell	lcarnell@amadorgov.org
Amador County Board of Supervisors	Supervisor Dan Epperson	depperson@amadorgov.org
Amador County Board of Supervisors	Supervisor Brian Oneto	boneto@amadorgov.org
Amador County C.O.A.	Chuck Iley	ciley@amadorgov.org
Amador County Auditor	Tacy Oneto Rouen	trouen@amadorgov.org
Amador County Assessor	Jim Rooney	jrooney@amadorgov.org
Amador County Health Officer	Dr. Rita Kerr	hofficer@amadorgov.org
Amador County Social Services	Director - Anne Watts	awatts@amadorgov.org
Amador County Behavioral Health	Director - Melissa Cranfill	mcranfill@amadorgov.org
Amador County Public Health	Director - Joanne Hasson	jhasson@amadorgov.org
Amador County Public Health	Diana Haley	dhaley@amadorgov.org
Amador County Public Health	Tracy Dehn	tdehn@amadorgov.org
Amador County Public Works	Director - Rich Vela	rvela@amadorgov.org
Amador County Public Works	Jack O'Brien	jobrien@amadorgov.org
Amador County Public Works	Darek Selman	dselman@amadorgov.org
Amador County Public Works	Valerie Villa	vvilla@amadorgov.org
Amador County Probation	Chief - Mark Bonini	mbonini@amadorgov.org
Amador County Probation	Debbie Segale	dsegale@amadorgov.org

Organization	Name	Email Address
Amdor County I.T. Department	Director - Jeff White	jwhite@amadorgov.org
Amador County Waste Management	Jeff Gardner	Jgardner@amadorgov.org
Amador County Air District	Hermina Perry	hperry@amadorgov.org
Amador County Environmental Health	Scott Meyer	smeyer@amadorgov.org
Amador County Risk Management	Sarah Duarte	sduarte@amadorgov.org
Amador County Animal Control	Director - Evan Jacobs	ejacobs@amadorgov.org
Amador County Ag Dept	Director - Eric Mayberry	emayberry@amadorgov.org
Amador County Ag Dept	Barry Clark	bclark@amadorgov.org
Amador County Planning	Chuck Beatty	Cbeatty@amadorgov.org
Amador County GSA	Director - Glenn Spitzer	gspitzer@amadorgov.org
Amador County Environmental Health	Scott Meyer	smeyer@amadorgov.org
Amador County Recreation Agency	General Manager - Michael Rock	mrock@amadorgov.org
Amador County Recreation Agency	Administrative Assistant - Margaret Friedman	mfriedman@amadorgov.org
Amador County Veterans Services	Angela Sheble	asheble@amadorgov.org
Amador County Building Department	Todd Barr	tbarr@amadorgov.org
City's Invitees		
City of Jackson	City Manager – Carl Simpson	csimpson@ci.jackson.ca.us
City of Jackson	Public Works Superintendent – Bree Wilder	bwilder@ci.jackson.ca.us
City of Jackson	Planning Department	planning@ci.jackson.ca.us
City of Jackson	Building Department	building@ci.jackson.ca.us
City of Jackson	Mayor – Steve McLean	smclean@ci.jackson.ca.us
City of Jackson	Vice Mayor – Chad Simmons	csimmons@ci.jackson.ca.us
City of Jackson	Council Member – Connie Gonsalves	cgonsalves@ci.jackson.ca.us
City of Jackson	Council Member – Max Godde	mgodde@ci.jackson.ca.us
City of Jackson	Council Member – Bob Stimpson	bstimpson@ci.jackson.ca.us
City of Ione	City Manager – George Lee	glee@ione-ca.com
City of Ione	Mayor – Alison LaFayne	alafayne@ione-ca.com
City of Ione	Council Member – Jack Mitchell	jmitchell@ione-ca.com
City of Ione	Council Member – Stacy Rhoades	srhoades@ione-ca.com
City of Ione	Council Member – Dominic Atlan	Datlan@ione-ca.com
City of Sutter Creek	City Manager – Tom Dubois	tdubois@cityofsuttercreek.org
City of Sutter Creek	Public Works Director – Dan Lafontaine	dlafontaine@cityofsuttercreek.org
City of Sutter Creek	Mayor – Claire Gunselman	cgunselman@cityofsuttercreek.org
City of Sutter Creek	Vice Mayor – Julia Sierk	jsierk@cityofsuttercreek.org

Organization	Name	Email Address
City of Sutter Creek	Council Member – Susan Feist	Sfeist@cityofsuttercreek.org
City of Sutter Creek	Council Member – Dan Riordan	Driordan@cityofsuttercreek.org
City of Sutter Creek	Council Member – Jim Swift	jswift@cityofsuttercreek.org
City of Sutter Creek	Steve Christensen	christensen668@sbcglobal.net
City of Amador City	City Manager – Dave Groth	A-3mado.groth@amador-city.com
City of Amador City	Mayor – Sandra Staples	sandy.staples@amador-city.com
City of Amador City	Vice Mayor – Susan Bragstad	amadorolive@twinwolf.net
City of Amador City	City Clerk – Joyce Davidson	city.clerk@amador-city.com
City of Plymouth	City Manager – Margaret Roberts	mroberts@cityofplymouth.org
City of Plymouth	City Manager – Cameron Begbie	
City of Plymouth	Public Works Director – Cathleen Johnson	cjohnson@cityofplymouth.org
City of Plymouth	Public Works	PublicWorks@cityofplymouth.org
City of Plymouth	Mayor – Marianne Akerland	makerland@cityofplymouth.org
City of Plymouth	Vice Mayor – Michael McLaughlin	mmclaughlin@cityofplymouth.org
City of Plymouth	Council Member – Peter Amoruso	pamoruso@cityofplymouth.org
City of Plymouth	Council Member – Doug Sim	dsim@cityofplymouth.org
City of Plymouth	Council Member – Keith White	fiddletown@comcast.net
Law Invitees		
CHP - Amador	Commander Todd Thibodeau	
Jackson Police Department	Chief - Chris Mynderup	cmynderup@ci.jackson.ca.us
Jackson Police Department	Captain - Jose Arevalos	jarevalos@ci.jackson.ca.us
Ione Police Department	Chief - Jon Alfred	jalfred@ione-ca.com
Ione Police Department	Sergeant - Carlo Sgroi	csgroi@ione-ca.com
Sutter Creek Police Department	Chief - Jim O'Connell	joconnell@cityofsuttercreek.org
Sutter Creek Police Department	Sergeant - Matt Brewer	mbrewer@cityofsuttercreek.org
Fire Invitees		
Cal-Fire	Jed Gaines	Jed.Gaines@fire.ca.gov
Cal-Fire	Jon Reis	Jon.Reis@fire.ca.gov
Cal-Fire	Public Information Officer - Wendy Oaks	Wendy.Oaks@fire.ca.gov
U.S. Forest Service	James Thornock	James.thornock@usda.gov
Amador Fire Protection District	Chief - Rob Withrow	rwithrow@amadorgov.org
Amador Fire Protection District	Battalion Chief - Rob Ebling	Rebling@amadorgov.org
Amador Fire Protection District	Battalion Chief - Justin Yelinek	jyelinek@amadorgov.org
Amador Fire Protection District	Battalion Chief - Aaron Watkins	awatkins@amadorgov.org
Amador Fire Protection District	Ashley Anaya	aanaya@amadorgov.org

Organization	Name	Email Address
Amador Fire Protection District	Public Information Officer - Kayla Dale	kdale@amadorgov.org
Jackson Fire Department	Chief - Ryan Pidgeon	Rpidgeon@ci.jackson.ca.us
Ione Fire Department	Chief - Ken Mackey	kmackey@ione-ca.com
Sutter Creek Fire Department	Chief - Dominic Moreno	suttercreekfire@sbcglobal.net
Jackson Valley Fire District	Chief - Randy Makemson	Chief6100@live.com
Medical & Health Invitees		
Amador County Public Health	Director - Joanne Hasson	jhasson@amadorgov.org
Amador County Public Health	Diana Haley	dhaley@amadorgov.org
Amador County Public Health	Tracy Dehn	tdehn@amadorgov.org
Sutter Amador Hospital	CEO - Michael Cureton	Michael.Cureton@sutterhealth.org
Sutter Amador Hospital	Emergency Planner - Rachael Dimmer	Rachael.Dimmer@sutterhealth.org
American Legion Ambulance	President - Alan McNany	amcnany@alpost108.org
American Legion Ambulance	Vice President - Michelle Tyer	mtyer@alpost108.org
Mountain County EMSA	Disaster Preparedness Coordinator - Marc Stevensen	mstevenson@mvemsa.com
MACT Health Board	Director - Sara Ray	Sara.Ray@macthealth.org
MACT Health Care Board	Laura Ellison	Laura.Ellison@macthealth.org
Water Districts Invitees		
Amador Water Agency	Rick Ferriera	rferriera@amadorwater.org
Amador Water Agency	Lucas Carthew	lcarthew@amadorwater.org
Amador Water Agency	Brandt Cook	bcook@amadorwater.org
Amador Water Agency	Antero Acierto	aacierto@amadorwater.org
EBMUD	Tim Cox	Timothy.Cox@ebmud.com
Jackson Valley Irrigation District	General Manager - Steve Fredricks	steve@jvid.org
River Pines Public Utility District	Amy Gedney	agedney@riverpinespud.org
River Pines Public Utility District	General Manager - Candi Bingham	rppud@riverpinespud.org
El Dorado Irrigation District	Chief Dam Safety Engineer - John Kessler	jkessler@eid.org
Kirkwood Meadows Public Utility District	General Manager - Erik Christeson	echristeson@kmpud.com
Kirkwood Meadows Public Utility District	Asst General Manager - Rick Ansel	ransel@kmpud.com
CA Department of Water Resources	Senior Engineer - Justin Siu	Justin.siu@water.ca.gov
CA Department of Water Resources	Flood Center	flood_center@water.ca.gov
Other Utilities & Transportation Invitees		
PG&E	James Croshurst	Jhcg@pge.com

Organization	Name	Email Address
PG&E	Kim Johansen	Kro7@pge.com
PG&E	Samantha Hill	samantha.hill@pge.com
PG&E	Andrew Murray	ABMA@pge.com
PG&E	Kevin Quakenbush	KLQI@pge.com
PG&E	Public Safety Specialist Supervisor - Pam Perdue	PSP6@pge.com
PG&E	Public Safety Specialist for Amador County - Todd Crawford	T6CX@pge.com
PG&E	Corporate Security Dept - Randy Malashus	C0M8@pge.com
PG&E	Mother Lode Hydro Manager - Clint Harris	cwhf@pge.com
Volcano Communications	General Manager - Frank Leschinsky	frankl@volcanotel.com
Cal-Trans	Wes Bingham	wes.bingham@dot.ca.gov
Cal-Trans	Nick Uselton	nicholas.uselton@dot.ca.gov
Amador Transit	Maggie Amarant	maggie@amadortransit.com
Amador Transit	April Miller	april@amadortransit.com
Misc Invitees		
Foster Morrison	Jeanine Foster	jeanine.foster@fostermorrison.com
Amador County Unified School District	Interim Superintendent - Jared Critchfield	Jcritchfield@acusd.org
Red Cross	Regional Director - Rebecca Mich	beatriz.mich@redcross.org
Red Cross	Lisa Baker	lisa.baker2@redcross.org
Jackson Rancheria	CEO Crystal Jack	cjack@jacksoncasino.com
Harrahs	CEO - Jeff Cutri	Jcurti@harrahs.com
Harrahs - Tribe Rep.	Chief of Staff for Tribe - Wayne Smith	wayne@buenavistatribe.com
Ione Band of Miwok Indians	President - Sara Dutschke	Sara@Ionemiwok.net
Ione Band of Miwok Indians	Administrative Assistant - Kirsten Charnoski	Kirsten.c@ionemiwok.net
Cal-OES	Emergency Services Coordinator - John Casillas	John.Casillas@caloes.ca.gov
Cal-OES	Emergnecy Services Coordinator - John Anger,	john.anger@caloes.ca.gov
Cal-OES	Planning Division - Victoria LaMarr-Haas	victoria.lamar-haas@caloes.ca.gov
ARC Amador	Executive Director - Karyn Gregorius	kgregorius@arcofamador.org
ARC Amador	Lurali Moore	lmoore@arcofamador.org
Pine Grove Community Services	General Manager - Lori Arnberg	pgcomser@volcano.net
LAFCO	Local Agency Formation Commision	LAFCO@amadorgov.org

Organization	Name	Email Address
Evacuation Teams of Amador	Bobbi Laughton	jlaughton@att.net
ACART	Kelly Reason	kellyreason2024@gmail.com
Amador Chamber of Commerce	Executive Director - Brad Barnard	brad.amadorchamber@gmail.com
Amador Chamber of Commerce	President - Matt Toma	matt@tomasurvey.com
Amador Chamber of Commerce	Vice President - Kevin Barnett	kevin@themountainmerchant.com
Amador Chamber of Commerce	Secretary/Treasurer - Sharon Lundgren	sharonl@volcano.net
Amador Chamber of Commerce	Rich Hoffman	Hoffmangallery007@gmail.com
Amador Chamber of Commerce	Paul Molinelli, Jr	pauljr@aceswaste.com
Amador Chamber of Commerce	Katie Dunne	
Amador Chamber of Commerce	Susan Manning	feedbarn@volcano.net
Amador Chamber of Commerce	Beth Barnard	bbarnard@ledger.news
Amador Chamber of Commerce	Erika Simmons	esimmons@trcac.org
Amador Chamber of Commerce	Laura Ray	lray@jacksoncasino.com
Amador Chamber of Commerce	John Williamson	jwilliamson@acfgives.org
Amador Chamber of Commerce	Jim Guidi	jim@kvgcradio.com
Amador Chamber of Commerce	Director - Ashley Carnicello	Ashley@operationcare.org
El Dorado County OES	Director - Troy Morton	mortont@edso.org
Calaveras County OES	Director - Eric Holt	eholt@calaverascounty.gov
Alpine County OES	Undersheriff - Chris Harootunian	charootunian@alpineso.com
Victory Village	President - Jason Mulford	Jason@vvvets.org
Victory Village	Secretary - Cameron Begbie	
Victory Village	Vice President & Treasurer - Leland Meyer	Leland@vvvets.org
Victory Village	Director - Nichole Mulford	DirectorNichole@vvvets.org
Homeless Task Force	Steve Christensen	Christensen668@sbcglobal.net
Amador Resource Conservation District	Executive Director - Amanda Watson	Amanda@amadorrcd.org
Amador Fire Safe Council	Administrative Assistant - Dana Simpson	dana@amadorrcd.org
Amador Fire Safe Council	Public Outreach Coordinator - Megan Watts	megan@amadorfiresafe.org
Amador Fire Safe Council	Todd Bertwell, RCD/FSC	Todd@amadorrcd.org
Area 12 Agency on Aging	Executive Director - Kristin Millhoff	kristin@area12.org
Area 12 Agency on Aging	Assistant Director - Tracey Sawyer	tsawyer@area12.org
Jackson Senior Center	Executive Director - Chris Kalton	Chris@amadorseniorcenter.org
Fiddletown Community Center	Deirdre Mueller	info@fiddletowncc.org
Ione Citizen	Larry Rhoades	larryrhoades@yahoo.com
Ione Citizen	Bette Rhoades	betterhoades@yahoo.com

Organization	Name	Email Address
ACART	Kitten Chapman	myponynme@yahoo.com

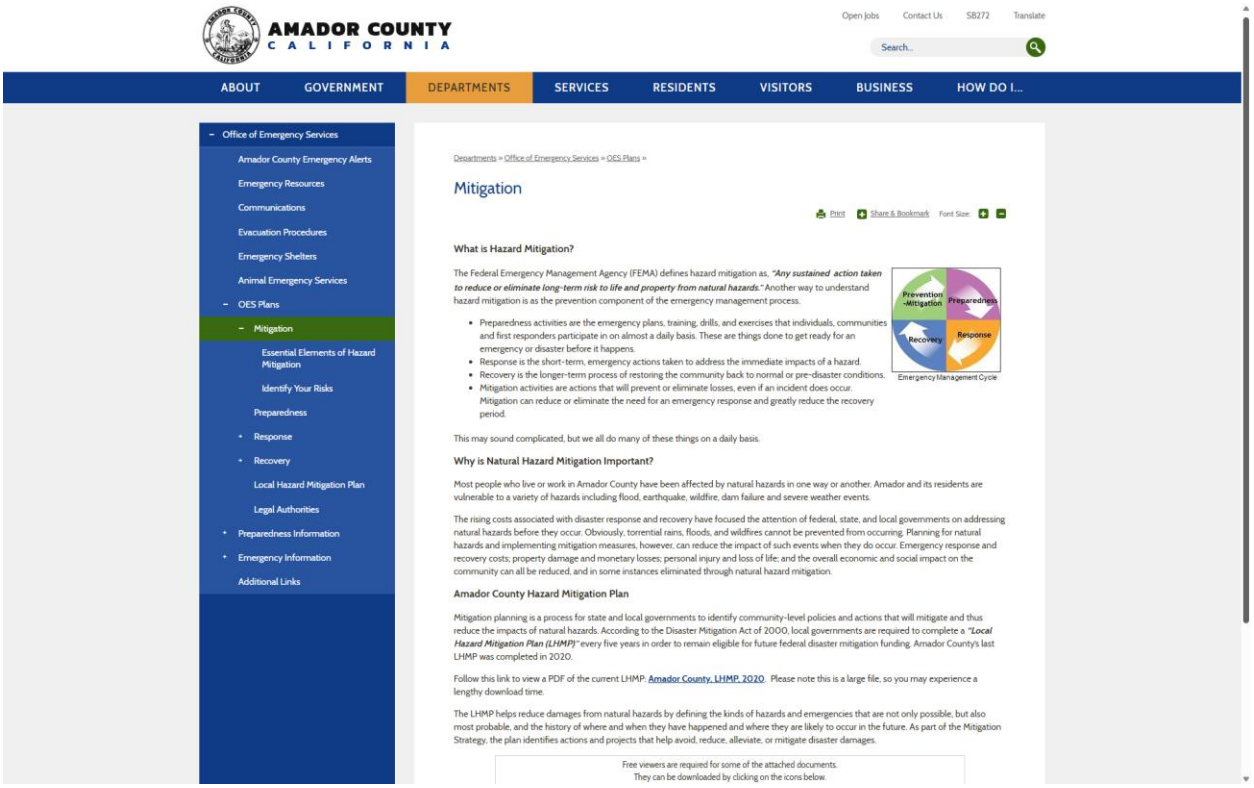
A.1.2. HMPC Participant List

Organization	Name	Email Address
Amador County Participants		
Amador County Sheriff	Sheriff Gary Redman	gredman@amadorgov.org
Amador County Sheriff	Lt Jeff Bellotti	jbellotti@amadorgov.org
Amador County Sheriff	Sgt Matt Girton - OES Coordinator	mgirton@amadorgov.org
Amador County Board of Supervisors	Supervisor Jeff Brown	jeffbrown@amadorgov.org
Amador County Board of Supervisors	Supervisor Patrick Crew	pcrew@amadorgov.org
Amador County Board of Supervisors	Supervisor Logan Carnell	lcarnell@amadorgov.org
Amador County Board of Supervisors	Supervisor Dan Epperson	depperson@amadorgov.org
Amador County Board of Supervisors	Supervisor Brian Oneto	boneto@amadorgov.org
Amador County C.O.A.	Chuck Iley	ciley@amadorgov.org
Amador County Health Officer	Dr. Rita Kerr	hofficer@amadorgov.org
Amador County Social Services	Director - Anne Watts	awatts@amadorgov.org
Amador County Behavioral Health	Director - Melissa Cranfill	mcranfill@amadorgov.org
Amador County Public Health	Director - Joanne Hasson	jhasson@amadorgov.org
Amador County Public Health	Diana Haley	dhaley@amadorgov.org
Amador County Public Health	Tracy Dehn	tdehn@amadorgov.org
Amador County Public Works	Director - Rich Vela	rvela@amadorgov.org
Amador County Public Works	Jack O'Brien	jobrien@amadorgov.org
Amador County Waste Management	Jeff Gardner	Jgardner@amadorgov.org
Amador County Air District	Hermina Perry	hperry@amadorgov.org
Amador County Environmental Health	Scott Meyer	smeyer@amadorgov.org
Amador County Animal Control	Director - Evan Jacobs	ejacobs@amadorgov.org
Amador County Ag Dept	Director - Eric Mayberry	emayberry@amadorgov.org
Amador County Ag Dept	Barry Clark	bclark@amadorgov.org
Amador County Planning	Chuck Beatty	Cbeatty@amadorgov.org
Amador County GSA	Director - Glenn Spitzer	gspitzer@amadorgov.org
Amador County Environmental Health	Scott Meyer	smeyer@amadorgov.org
Amador County Building Department	Todd Barr	tbarr@amadorgov.org
City's Participants		
City of Jackson	City Manager – Carl Simpson	csimpson@ci.jackson.ca.us

Organization	Name	Email Address
City of Ione	Council Member – Stacy Rhoades	srhoades@ione-ca.com
City of Sutter Creek	City Manager – Tom Dubois	tdubois@cityofsuttercreek.org
City of Sutter Creek	Public Works Director – Dan Lafontaine	dlafontaine@cityofsuttercreek.org
City of Sutter Creek	Vice Mayor – Julia Sierk	jsierk@cityofsuttercreek.org
City of Sutter Creek	Steve Christensen	christensen668@sbcglobal.net
City of Amador City	City Manager – Dave Groth	A-8mado.groth@amador-city.com
City of Amador City	Mayor – Sandra Staples	sandy.staples@amador-city.com
City of Plymouth	City Manager – Margaret Roberts	mroberts@cityofplymouth.org
City of Plymouth	City Manager – Cameron Begbie	
City of Plymouth	Public Works Director – Cathleen Johnson	cjohnson@cityofplymouth.org
Law Participants		
Jackson Police Department	Captain - Jose Arevalos	jarevalos@ci.jackson.ca.us
Fire Participants		
U.S. Forest Service	James Thornock	James.thornock@usda.gov
Amador Fire Protection District	Chief - Rob Withrow	rwithrow@amadorgov.org
Amador Fire Protection District	Battalion Chief - Justin Yelinek	jyelinek@amadorgov.org
Amador Fire Protection District	Ashley Anaya	aanaya@amadorgov.org
Amador Fire Protection District	Public Information Officer - Kayla Dale	kdale@amadorgov.org
Jackson Fire Department	Chief - Ryan Pidgeon	Rpidgeon@ci.jackson.ca.us
Ione Fire Department	Chief - Ken Mackey	kmackey@ione-ca.com
Sutter Creek Fire Department	Chief - Dominic Moreno	suttercreekfire@sbcglobal.net
Jackson Valley Fire District	Chief - Randy Makemson	Chief6100@live.com
Medical & Health Participants		
Amador County Public Health	Director - Joanne Hasson	jhasson@amadorgov.org
Amador County Public Health	Diana Haley	dhaley@amadorgov.org
Amador County Public Health	Tracy Dehn	tdehn@amadorgov.org
Sutter Amador Hospital	Emergency Planner - Rachael Dimmer	Rachael.Dimmer@sutterhealth.org
American Legion Ambulance	President - Alan McNany	amcnany@alpost108.org
American Legion Ambulance	Vice President - Michelle Tyer	mtyer@alpost108.org
MACT Health Care Board	Laura Ellison	Laura.Ellison@macthealth.org
Water Districts Participants		
Amador Water Agency	Rick Ferriera	rferriera@amadorwater.org
Amador Water Agency	Lucas Carthew	lcarthew@amadorwater.org
Amador Water Agency	Brandt Cook	bcook@amadorwater.org

Organization	Name	Email Address
Amador Water Agency	Antero Acierto	aacierto@amadorwater.org
Jackson Valley Irrigation District	General Manager - Steve Fredricks	steve@jvid.org
River Pines Public Utility District	Amy Gedney	agedney@riverpinespud.org
Other Utilities & Transportation Participants		
PG&E	James Croshurst	Jhcg@pge.com
PG&E	Kim Johansen	Kro7@pge.com
PG&E	Samantha Hill	samantha.hill@pge.com
PG&E	Andrew Murray	ABMA@pge.com
PG&E	Kevin Quakenbush	KLQI@pge.com
PG&E	Mother Lode Hydro Manager - Clint Harris	cwhf@pge.com
Volcano Communications	General Manager - Frank Leschinsky	frankl@volcanotel.com
Cal-Trans	Wes Bingham	wes.bingham@dot.ca.gov
Cal-Trans	Nick Uselton	nicholas.uselton@dot.ca.gov
Misc Participants		
Foster Morrison	Jeanine Foster	jeanine.foster@fostermorrison.com
Red Cross	Regional Director - Rebecca Mich	beatriz.mich@redcross.org
Red Cross	Lisa Baker	lisa.baker2@redcross.org
Cal-OES	Emergency Services Coordinator - John Anger	john.anger@caloes.ca.gov
ARC Amador	Executive Director - Karyn Gregorius	kgregorius@arcofamador.org
ARC Amador	Lurali Moore	lmoore@arcofamador.org
Amador Chamber of Commerce	President - Matt Toma	matt@tomasurvey.com
Amador Chamber of Commerce	Jim Guidi	jim@kvgcradio.com
Amador Chamber of Commerce	Director - Ashley Carnicello	Ashley@operationcare.org
Amador Resource Conservation District	Executive Director - Amanda Watson	Amanda@amadorrcd.org
Amador Fire Safe Council	Todd Bertwell, RCD/FSC	Todd@amadorrcd.org
Ione Citizen	Larry Rhoades	larryrhoades@yahoo.com
Ione Citizen	Bette Rhoades	betterhoades@yahoo.com
ACART	Kitten Chapman	myponynme@yahoo.com

A.2 Website for Hazard Mitigation Plan: Project Website



A.3 HMPC Meeting #1: Kickoff Meeting

A.3.1. Kickoff Meeting Invite to HMPC and Stakeholders

From: Matthew Girton <mgirton@amadorgov.org>
Sent: Tuesday, November 12, 2024 9:26 AM
To: Matthew Girton; cameron@vvvets.org; michael.cureton@sutterhealth.org; Debbie Segale; Angela M. Sheble; bstimpson@ci.jackson.ca.us; smclean@ci.jackson.ca.us; leland@vvvets.org; wayne@buenavistatribe.com; jcritchfield@acusd.org; Robert Withrow; dwratten@ione-ca.com; katie_dunne@hotmail.com; Jim Rooney; pamoruso@cityofplymouth.org; kmackey@ione-ca.com; james.thornock@usda.gov; steve@jvid.org; LAFCO Agency; jed.gaines@fire.ca.gov; Herminia Perry; csimmons@ci.jackson.ca.us; beatriz.mich@redcross.org; jalfred@ione-ca.com; joconnell@cityofsuttercreek.org; wes.bingham@dot.ca.gov; april@amadortransit.com; bbarnard@ledger.news; Michael Rock; directornichole@vvvets.org; jessica@amadortransit.com; Diana Evensen; laura.ellison@macthealth.org; dlafontaine@cityofsuttercreek.org; cwhf@pge.com; mgodde@ci.jackson.ca.us; kevin@themountainmerchant.com; Health Officer; Richard Vela; jlaughton@att.net; Jeanine Foster; jon.reis@fire.ca.gov; Frank Axe; publicworks@cityofplymouth.org; justin.siu@water.ca.gov; chris@amadorseniorcenter.org; rachael.dimmer@sutterhealth.org; Tracy Dehn; mstevenson@mvemsa.com; Anne Watts; makerland@cityofplymouth.org; Pat Crew; Tacy Rouen; feedbarn@volcano.net; dsim@cityofplymouth.org; amadorolive@twinwolf.net; jason@vvvets.org; Jack O'Brien; tthibodeau@chp.ca.gov; pauljr@aceswaste.com; Robert Ebling; Chuck Iley; Kayla Dale; alafayne@ione-ca.com; cjohnson@cityofplymouth.org; Valerie Villa; rppud@riverpinespud.org; Melissa Cranfill; jsierk@cityofsuttercreek.org; mmclaughlin@cityofplymouth.org; glee@ione-ca.com; kgregorius@arcofamador.org; mbrewer@cityofsuttercreek.org; cjack@jacksoncasino.com; cgonsalves@ci.jackson.ca.us; Mark Bonini; Jeff Brown; t6cx@pge.com; bwilder@ci.jackson.ca.us; Jeffry Gardner; mtyer@alpost108.org; csimpson@ci.jackson.ca.us; mroberts@cityofplymouth.org; jim@kvgcradio.com; tdubois@cityofsuttercreek.org; kristin@area12.org; Chuck Beatty; Brian Oneto; cgunselman@cityofsuttercreek.org; david.groth@amador-city.com; Justin Yelinek; Darek Selman; chief6100@live.com; dana@amadorrcd.org; john.casillas@caloes.ca.gov; Richard Forster; city.clerk@amador-city.com; Gary Redman; esimmons@trcac.org; amcnany@alpost108.org; eholt@calaverascounty.gov; Jeff White; lance.ablang@water.ca.gov; jwilliamson@acfgives.org; hoffmangallery007@gmail.com; Jeffrey Bellotti; Glenn Spitzer; planning@ci.jackson.ca.us; Scott Meyer; joey@kvgcradio.com; victoria.lamar-haas@caloes.ca.gov; sfeist@cityofsuttercreek.org; srhoades@ione-ca.com; wendy.oaks@fire.ca.gov; suttercreekfire@sbcglobal.net; Holly Sandman; amanda@amadorrcd.org; datlan@ione-ca.com; megan@amadorfiresafe.org; csgroi@ione-ca.com; timothy.cox@ebmud.com; sara@ionemiwok.net; jarevalos@ci.jackson.ca.us; lray@jacksoncasino.com; charootunian@alpineso.com; rpidgeon@ci.jackson.ca.us; fiddletown@comcast.net; mortont@edso.org; jcurti@harrahs.com; kellyreason2024@gmail.com; Evan Jacobs; building@ci.jackson.ca.us; rferriera@amadorwater.org; frankl@volcanotel.com; Diana Haley; Joanne Hasson; cmynderup@ci.jackson.ca.us; brad.amadorchamber@gmail.com; sharonl@volcano.net; ashley@operationcare.org; sandy.staples@amador-city.com; psp6@pge.com; maggie@amadortransit.com; Aaron Watkins; Sarah Duarte; Barry Clark; pgcomser@volcano.net; tsawyer@area12.org; sara.ray@macthealth.org; ransel@kmpud.com; jmitchell@ione-ca.com; echristeson@kmpud.com; matt@tomasurvey.com; driordan@cityofsuttercreek.org; kirsten.c@ionemiwok.net; jtirapelli@ione-ca.com; jswift@cityofsuttercreek.org; jkessler@eid.org; Eric Mayberry; Margaret Friedman; Todd Barr; christensen668@sbcglobal.net
Subject: Hazard Mitigation Planning Committee Meeting
When: Wednesday, December 4, 2024 1:00 PM-4:00 PM America/Los_Angeles.
Where: 810 Court Street, Jackson, CA, 95642

Good morning, Amador County and Neighbors!

The Amador County Sheriff's Office of Emergency Services has partnered with Foster Morrison Consulting, to update our 2021 Local Hazard Mitigation Plan. The purpose of this update is to assess risk to natural hazards, implement actions to reduce future losses and maintain eligibility for federal mitigation grant funding in accordance with the Disaster Mitigation Act of 2000.

If you have received this email, you have been identified as a community stakeholder, and your input would be greatly appreciated. With that said, if there is someone else in your organization you'd like to send to this meeting, please forward this invitation to them - All are invited.

Our first stakeholder meeting is scheduled for December 4th, from 1:00 p.m. to 4:00 p.m., inside the Board of Supervisors Chambers located at 810 Court Street, Jackson, Ca. We hope to see you there! Please see the attached documents for further information, and feel free to contact me if you have any questions.

Thank you.

When

Wednesday Dec 4, 2024 · 1pm – 4pm (Pacific Time - Los Angeles)

Location

810 Court Street, Jackson, CA, 95642
View map

Guests

Attachments

Amador County LHMP Pre...

Amador County Public O...

A.3.2. HMPC #1: Kickoff Meeting Agenda

AGENDA

AMADOR COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN (LHMP) UPDATE

Hazard Mitigation Planning Committee (HMPC)
Kickoff Meeting #1

Wednesday December 4, 2024
1:00 - 4:00 pm
Board of Supervisors Chambers
810 Court Street
Jackson, CA 95642

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1. Introductions
2. Hazard Mitigation & the Disaster Mitigation Act Planning Requirements
3. The Role of the Hazard Mitigation Planning Committee (HMPC): Participating Jurisdictions and Stakeholders
4. Planning for Public Input
5. Coordinating with Other Agencies and Stakeholders
6. LHMP Update Schedule
7. Hazard Identification
8. Data Needs
9. Questions?

A.3.3. HMPC #1: Kickoff Meeting Sign-in Sheet

SIGN-IN SHEET
AMADOR COUNTY LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Meeting #1: Project Kickoff
December 4, 2024 (1:00-4:00 pm)
Board of Supervisors Chambers | Jackson, California

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Jeff Brown	jeffbrown@amadorgov.org		Amador County
Kayla Dale	Kdale@amadorgov.org		AFPD
Rob Withrow	Rwithrow@amadorgov.ca		AFPD
Jack Obrien	Tobrien@Amador.gov.org		P.W.
Karyn Gregorius	Kgregorius@arcofamador.org		The Arc of Amador & Calaveras
Brandt Cook	bcook@amadorwater.org		AWA
Rita Kerr	hotflicer@amadorcounty.gov	209-223-6907	ACBH
LUCAS CARTHEW	LCARTHEW@AMADORWATER.ORG		AWA
LAURA ELLISON	laura.ellison@mactherlta.org		MACT
SCOTT MEYER	SMeyer@amadorgov.org		ENVIRONMENTAL HEALTH
Steve Christensen	christensen668@sbcglobal.net		Sutter Creek

SIGN-IN SHEET
AMADOR COUNTY LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Meeting #1: Project Kickoff
December 4, 2024 (1:00-4:00 pm)
Board of Supervisors Chambers | Jackson, California

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Wes Bingham	Wes.Bingham@DOT.CA.GOV	209-483-3091	Caltrans
James Thornock	James.Thornock@usda.gov	209-419-0682	USFS
Cathleen Johnson	cjohnson@cityofplymouth.org	209-257-9414	City of Plymouth
Dan Lefontaine	dlafontaine@cityofsuttercreek.org	530 219 6327	City of Sutt. Creek
Herminia Perry	hperry@amadorgov.org	209-257-0112	Amador Air
Rachael Dimmer	Rachael.Dimmer@sutterhealth.	916-778-6640	Sutter Amador Hospitals
Joanne Hasson	jhasson@amadorcounty.gov	209-223-6407	ACRA
Diana Haley	dhaley@amadorcounty.gov	209-223-6407	ACPH
ANDREW MURRAY	ABMA@PGE.com	408 693 1264	PGE
Kevin Quackenbush	KLQ1@PGE.COM	209 479 3367	PGE Coordinator

SIGN-IN SHEET
AMADOR COUNTY LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Meeting #1: Project Kickoff
December 4, 2024 (1:00-4:00 pm)
Board of Supervisors Chambers | Jackson, California

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Steven Fredrick / GM	steve@jvid.org	209-274-2037	Jackson Valley Irrigation
Barry Clark / Ag	bclark@amadorgov.org	209-223-6487	Co. Ag Dept.
Jeff Bellotti	jbellotti@amadorgov.org	209-223-6672	Sheriff
Ryan Pidgeon, Fire Chief	rpidgeon@ci.jackson.ca.us	209-273-7333	Jackson Fire
Richard Vela, PW Dir.	rvela@amadorgov.org	209.223.6457	Amador Co. PW
Matt Toms	matt@tomssurvey.com	209-969-0203	Plasses / Commander / ITS
Joey Guidi	joey@kvgcradio.com	(209) 223-1340	KVGC
JOSÉ ARÉVALOS	Jarevalos@ci.jackson.ca.us	209-223-1771	Jackson PD
Todd Bertuell AFSC	todd@amadorrcd.org	209-217-1147	ARCD / AFSC
Lurali Moore	lmoore@arcofamador.org	209-267-5978	The Arc of Amador/Calaveras

SIGN-IN SHEET
AMADOR COUNTY LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Meeting #1: Project Kickoff
December 4, 2024 (1:00-4:00 pm)
Board of Supervisors Chambers | Jackson, California

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Lisa Baker Red cross	lisa.baker2@redcross.org	510-917-3938	Red Cross
Rebecca Mich	beatriz.mich@redcross.org	209.503.3110	Red Cross
Melissa Cranfill	mcranfill@amadorgov.org	223-6335	Behavioral Health
LARRY RHOADES	LARRYRhoades@Yahoo.com	209-418-5689	CITIZEN ZONE
Sandy Staples	sandy.staples@amador-city.com	209.431.1513	Amador city
Bethe Rhoades	betherhoades@yahoo	209 607 4465	citizen of Zone
Frank Leschinsky Public Sector	frankl@volcanotel.com	209 296-1427	Volcano Telephone
Samantha Hill SVPM	samantha.hill@pge.com	209-213-9096	PG & E
Kim Johansen	KRO7@pge.com	530-760-7741	PG & E
James Crowhurst	JHCq@PGE.com	209 974 2394	PG+E
CLINT HARRIS	CWHF@PGE.COM	530 986 0439	PG & E
Stacy Rhoades / Zone City	StacyRhoades@USminecorp.com	209-304-4217	City of Zone

A.4 HMPC #2: Risk Assessment Meeting

A.4.1. Emailed Invite to Risk Assessment Meeting

From: Matthew Girton <mgirton@amadorgov.org>
Sent: Monday, March 10, 2025 10:18 AM
To: Gary Redman <gredman@amadorgov.org>; Jeremy Martin <jmartin@amadorgov.org>; Diana Evensen <devensen@amadorgov.org>; Jeff Brown <jeffbrown@amadorgov.org>; Logan Carnell <lcarnell@amadorgov.org>; Brian Oneto <boneto@amadorgov.org>; Chuck Iley <ciley@amadorgov.org>; Tacy Rouen <trouen@amadorgov.org>; Jim Rooney <jrooney@amadorgov.org>; Health Officer <hofficer@amadorgov.org>; Diana Haley <dhaley@amadorgov.org>; Joanne Hasson <jhasson@amadorgov.org>; Melissa Cranfill <mcranfill@amadorgov.org>; Anne Watts <awatts@amadorgov.org>; Scott Meyer <smeyer@amadorgov.org>; Jeffry Gardner <jgardner@amadorgov.org>; Debbie Segale <dsegale@amadorgov.org>; Valerie Villa <vvilla@amadorgov.org>; Darek Selman <dselman@amadorgov.org>; Glenn Spitzer <gspitzer@amadorgov.org>; Barry Clark <bclark@amadorgov.org>; Sarah Duarte <sduarte@amadorgov.org>; Jack O'Brien <jobrien@amadorgov.org>; Herminia Perry <hperry@amadorgov.org>; Margaret Friedman <mfriedman@amadorgov.org>; Richard Vela <rvela@amadorgov.org>; Chuck Beatty <cbeatty@amadorgov.org>; Frank Axe <faxe@amadorgov.org>; Jeff White <jwhite@amadorgov.org>; Todd Barr <tbarr@amadorgov.org>; Jeffrey Bellotti <jbellotti@amadorgov.org>; Angela M. Sheble <asheble@amadorgov.org>; Holly Sandman <hsandman@amadorgov.org>; Pat Crew <pcrew@amadorgov.org>; Eric Mayberry <emayberry@amadorgov.org>; Evan Jacobs <ejacobs@amadorgov.org>; Michael Rock <mrock@amadorgov.org>; Tracy Dehn <tdehn@amadorgov.org>; Mark Bonini <mbonini@amadorgov.org>; Carl Simpson <csimpson@ci.jackson.ca.us>; bwilder@ci.jackson.ca.us; planning@ci.jackson.ca.us; building@ci.jackson.ca.us; smclean@ci.jackson.ca.us; csimmons@ci.jackson.ca.us; cgonsalves@ci.jackson.ca.us; mgodde@ci.jackson.ca.us; bstimpson@ci.jackson.ca.us; George Lee <glee@ione-ca.com>; alafayne@ione-ca.com; jmitchell@ione-ca.com; srhoades@ione-ca.com; Datlan@ione-ca.com; Tom DuBois <tdubois@cityofsuttercreek.org>; Dan Lafontaine <dlafontaine@cityofsuttercreek.org>; cgunselman@cityofsuttercreek.org; jsierk@cityofsuttercreek.org; Sfeist@cityofsuttercreek.org; Driordan@cityofsuttercreek.org; jswift@cityofsuttercreek.org; Dave Groth <david.groth@amador-city.com>; sandy.staples@amador-city.com; amadorolive@twinwolf.net; City Clerk <city.clerk@amador-city.com>; Margaret Roberts <mroberts@cityofplymouth.org>; cjohnson@cityofplymouth.org; PublicWorks@cityofplymouth.org; makerland@cityofplymouth.org; Michael McLaughlin <mmclaughlin@cityofplymouth.org>; pamoruso@cityofplymouth.org; dsim@cityofplymouth.org; fiddletown@comcast.net; Chris Mynderup <cmynderup@ci.jackson.ca.us>; Jose Arevalos <jarevalos@ci.jackson.ca.us>; Jon Alfred <jalfred@ione-ca.com>; Carlo Sgroi <csgroi@ione-ca.com>; Jim O'Connell <joconnell@cityofsuttercreek.org>; Matt Brewer <mbrewer@cityofsuttercreek.org>; mmassod@chp.ca.gov; Gaines, Jed@CALFIRE <Jed.Gaines@fire.ca.gov>; Reis, Jon@CALFIRE <Jon.Reis@fire.ca.gov>; Oaks, Wendy@CALFIRE <Wendy.Oaks@fire.ca.gov>; James.thornock@usda.gov; Robert Withrow <rwithrow@amadorgov.org>; Robert Ebling <Rebling@amadorgov.org>; Justin Yelinek <jyelinek@amadorgov.org>; Aaron Watkins <awatkins@amadorgov.org>; Kayla Dale <kdale@amadorgov.org>; Ryan Pidgeon <Rpidgeon@ci.jackson.ca.us>; Ken Mackey <kmackey@ione-ca.com>; Dominic Moreno <suttercreekfire@sbcglobal.net>; Chief Randy Makemson <Chief6100@live.com>; Michael.Cureton@sutterhealth.org; Dimmer, Rachael <Rachael.Dimmer@sutterhealth.org>; Alan McNany <amcnany@alpost108.org>; Michelle Tyer <mtyer@alpost108.org>; Ray, Sara (MACT) <Sara.Ray@macthealth.org>; Ellison, Laura (MACT) <Laura.Ellison@macthealth.org>; dutyofficer@mvemsa.com; Rick Ferriera <rferriera@amadorwater.org>; Cox, Timothy <Timothy.Cox@ebmud.com>; Steven Fredrick - JVID <steve@jvid.org>; rppud@riverpinespud.org; Kessler, John <jkessler@eid.org>; echristeson@kmpud.com; Rick Ansel <ransel@kmpud.com>; Perdue,

Perdue, Pamela <PSP6@pge.com>; Crawford, Todd <T6CX@pge.com>; Malashus, Randy <C0M8@pge.com>; Harris, Clint <cwhf@pge.com>; Frank Leschinsky <frankl@volcanotel.com>; Bingham, Wes W@DOT <wes.bingham@dot.ca.gov>; Maggie <maggie@amadortransit.com>; April <april@amadortransit.com>; Jeanine Foster <jeanine.foster@fostermorrison.com>; Jared Critchfield <Jcritchfield@acusd.org>; Mich, Beatriz <beatriz.mich@redcross.org>; Crystal Jack <cjack@jacksoncasino.com>; Jcurti@harrahs.com; Wayne Smith <wayne@buenavistatribe.com>; Sara@ionemiwok.net; Kirsten.c@ionemiwok.net; Casillas, John@CalOES <John.Casillas@caloes.ca.gov>; LaMar-Haas, Victoria@CalOES <victoria.lamar-haas@caloes.ca.gov>; kgregorius@arcofamador.org; pgcomser@volcano.net; LAFCO Agency <LAFCO@amadorgov.org>; jlaughton@att.net; Kitten Chapman <k.chapman.acart@gmail.com>; brad.amadorchamber@gmail.com; Matthew Toma <matt@tomasurvey.com>; Kevin Barnett <kevin@themountainmerchant.com>; sharonl@volcano.net; joey@kvgcradio.com; Hoffmangallery007@gmail.com; Paul Molinelli Jr. <pauljr@aceswaste.com>; feedbarn@volcano.net; Beth Barnard <bbarnard@ledger.news>; Erika Simmons <esimmons@trcac.org>; lray@jacksoncasino.com; jwilliamson@acfgives.org; jim@kvgcradio.com; Ashley Carnicello <Ashley@operationcare.org>; Amanda Watson <Amanda@amadorrcd.org>; dana@amadorrcd.org; Megan Watts <megan@amadorfiresafe.org>; kristin@area12.org; tsawyer@area12.org; Chris Kalton <Chris@amadorseniorcenter.org>; info@fiddletowncc.org; Brandt Cook <bcook@amadorwater.org>; Lucas Carthew <lcarthew@amadorwater.org>; ABMA@pge.com; Todd Bertwell <todd@amadorrcd.org>; lmoore@arcofamador.org; Baker, Lisa <lisa.baker2@redcross.org>; Samantha.Hill@pge.com; KR07@pge.com; Crowhurst, Shug <JHCg@pge.com>
Subject: Amador County Local Hazard Mitigation Plan (LHMP) Update

All:

Last December, we kicked off the **Amador County Local Hazard Mitigation Plan (LHMP) Update project**. That kickoff meeting provided an overview of the project and resulted in an updated list of natural hazards (e.g., wildfire, flood, earthquake, severe weather, etc.) to be included in the 2025 LHMP. Since then, Foster Morrison Consulting has been collecting data and preparing a risk assessment – which will consist of a written profile and analysis of each identified natural hazard, supported by technical, historical, and local data. The risk assessment will become a part of the updated LHMP.

****SAVE THE DATE** Please join us for our second Hazard Mitigation Planning Committee (HMPC) Meeting on the Risk Assessment.** The purpose of this meeting is to share draft risk assessment materials – including mapping, data, and other information – and invite your feedback. See attached agenda.

When: April 9, 2025 (Wednesday), 1:00 - 4:00 pm

Where: Board of Supervisors Chambers, 810 Court Street, Jackson, CA 95642

A Google invite for the meeting will follow this email.

Questions? Please feel free to reach out to myself or Jeanine Foster, Foster Morrison Consulting, at 303-717-7171 or jeanine.foster@fostermorrison.com. For more information about the project, visit: https://www.amadorgov.org/departments/office-of-emergency-services/local-hazard-mitigation-plan

Hope to see you there.

Thank you,

--
Matt Girton, Sergeant
Office of Emergency Services - Coordinator
Amador County Sheriff's Office
700 Court Street, Jackson, CA 95642
Phone: (209) 223-6384
Fax: (209) 223-1609

A.4.2. HMPC #2: Risk Assessment Meeting Reminder Email

Note: This email was sent to the same list of individuals as the previous email. That list is not included here to save space.

All,

****Meeting Reminder**** Please join us for the second meeting of the Hazard Mitigation Planning Committee (HMPC) in support of the Amador County Local Hazard Mitigation Plan (LHMP) Update Project:

Wednesday, April 9, 2025 (1:00 - 4:00 pm)
Board of Supervisors Chambers
810 Court Street
Jackson, CA 95642

We need your support! The purpose of this meeting is to share natural hazard risk assessment materials developed to date – including mapping, data, other information, and data gaps. We invite your feedback and continued input. See attached agenda.

Questions? Please feel free to reach out to myself or Jeanine Foster, Foster Morrison Consulting, at 303 717-7171 or jeanine.foster@fostermorrison.com

Thank you,

--
Matt Girton, Sergeant
Office of Emergency Services - Coordinator
Amador County Sheriff's Office
700 Court Street, Jackson, CA 95642
Phone: (209) 223-6384
Fax: (209) 223-1609

A.4.3. HMPC #2: Risk Assessment Meeting Agenda

AGENDA

AMADOR COUNTY MULTI-JURISDICTIONAL
LOCAL HAZARD MITIGATION PLAN (LHMP) UPDATE
Hazard Mitigation Planning Committee (HMPC)
Meeting #2 – Risk Assessment

April 9, 2025
1:00 - 4:00 pm
Board of Supervisors Chambers
810 Court Street
Jackson, CA 95642

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1. Introductions
2. Status of the DMA Planning Process
3. Review of Risk Assessment (PowerPoint)
4. Open Discussion and Input on the Risk Assessment (Handout)
5. Review of Data Needs
6. Next Steps
7. Questions?

A.4.4. HMPC #2: Risk Assessment Meeting Sign in Sheet

SIGN-IN SHEET
AMADOR COUNTY LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Meeting #2: Risk Assessment Meeting
April 9, 2025 (1:00-4:00 pm)
Board of Supervisors Chambers | Jackson, California

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Dave Groth	david.groth@amadorcity.com	435-671-5754	Amador City
Richard Vela	rvela@amadorgov.org	209.223.6457	Amador Co. PW
Tom DuBois	tdubois@cityofsuttercreek.org	415-377 8455	Sutter Creek
Brandt Cook	bcook@amadorwater.org	2092575206	AWA
Rachael Dimmer	Rachael.dimmer@sutterhealth.org	916-778-6690	SIAH
Melissa Cranfill	mcranfill@amadorgov.org	209-223-6335	ACBH
Rita Kerr Health Officer	hofficer@amadorcounty.gov	209-223-6407	ACPH
JACK O'Brien	JOBrien@Amador.org	209-223-6517	AC. PW.

SIGN-IN SHEET
AMADOR COUNTY LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Meeting #2: Risk Assessment Meeting
April 9, 2025 (1:00-4:00 pm)
Board of Supervisors Chambers | Jackson, California

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Matt Girton	mgirton@amadorgov.org	209 223.6384	Amador County OES
Stacy Rhoades	S.Rhoades@IONE-CA.com	209 304-4217	City of Ione
Kitten Chapman	myponyname@yahoo.com	209 662-2308	ACART
Nick Uselton	nicholas.uselton@Dot.ca.gov	(209) 483-3092	Caltrans
Justin Yelinek	jyelinek@amadorgov.org	209-304-[illegible]981	APIO
Sandy Stapler	sandy.stapler@amadorcity.com	209 491.1563	Amador City
Todd Bertwell	todd@amadorrcd.org	209-217-1147	AFSC
JOSE AREVALOS	jarevalos@ci.jackson.ca.us	209-223-9646	JPD
Lisa Baker	lisa.Baker2@redcross.org	510917-3938	ARC
Beatriz Mich	beatriz.mich@redcross.org	209-503-3110	ARC
[illegible]	[illegible]	[illegible]	[illegible]
Barry Clark	bclark@amadorcountygov	209-223-6457	Ag

SIGN-IN SHEET
AMADOR COUNTY LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Meeting #2: Risk Assessment Meeting
April 9, 2025 (1:00-4:00 pm)
Board of Supervisors Chambers | Jackson, California

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Julia Sierk Sutter Creek Council	juliesierke@comcast.net	209-304-7874	City of Sutter Creek
Dan Lafontaine Sutter Creek Pw director	dlafontaine@cityofsuttercreek.org	530 219 6327	" "
Lurali Moore The Arc	lmoore@arcofamador.org	209-267-5798	
John Anger, ESC	John.Anger@caloes.ca.gov	9169261371	Cal OES
Kayla Dale, AFPD PIO	Kdale@amadergov.org	209-223-6391	

A.5 HMPC #3 & #4: Mitigation Strategy Meetings

A.5.1. Email Invites to Mitigation Strategy Meetings

From: Matthew Girton <mgirton@amadorgov.org>
Sent: Wednesday, May 7, 2025 9:59 AM
To: SO-Administration <so-administration@amadorgov.org>; Jim Rooney <jrooney@amadorgov.org>; Tacy Rouen <trouen@amadorgov.org>; Chuck Iley <ciley@amadorgov.org>; BOS-Board of Supervisors <boardofsupervisors@amadorgov.org>; Diana Evensen <devensen@amadorgov.org>; Melissa Cranfill <mcranfill@amadorgov.org>; Anne Watts <awatts@amadorgov.org>; Rita H. Kerr <hofficer@amadorcounty.gov>; Holly Sandman <hsandman@amadorgov.org>; Joanne Hasson <jhasson@amadorcounty.gov>; Diana Haley <dhaley@amadorcounty.gov>; Tracy Dehn <tdehn@amadorcounty.gov>; Richard Vela <rvela@amadorgov.org>; Jack O'Brien <jobrien@amadorgov.org>; Darek Selman <dselman@amadorgov.org>; Valerie Villa <vvilla@amadorgov.org>; Jeff White <JWhite@amadorcounty.gov>; Jeffry Gardner <jgardner@amadorgov.org>; Herminia Perry <hperry@amadorgov.org>; Scott Meyer <smeyer@amadorgov.org>; Sarah Duarte <sduarte@amadorgov.org>; Evan M. Jacobs <ejacobs@amadorcounty.gov>; Eric Mayberry <emayberry@amadorgov.org>; Barry Clark <BClark@amadorcounty.gov>; Chuck Beatty <CBeatty@amadorgov.org>; Glenn Spitzer <gspitzer@amadorgov.org>; Michael Rock <mrock@amadorgov.org>; Margaret Friedman <mfriedman@amadorgov.org>; Angela M. Sheble <asheble@amadorcounty.gov>; Todd Barr <tbarr@amadorgov.org>; Carl Simpson <csimpson@ci.jackson.ca.us>; bwilder@ci.jackson.ca.us; smclean@ci.jackson.ca.us; cgonsalves@ci.jackson.ca.us; mgodde@ci.jackson.ca.us; csimmons@ci.jackson.ca.us; bstimpson@ci.jackson.ca.us; George Lee <glee@ione-ca.com>; alafayne@ione-ca.com; jmitchell@ione-ca.com; srhoades@ione-ca.com; Datlan@ione-ca.com; Tom DuBois <tdubois@cityofsuttercreek.org>; Dan Lafontaine <dlafontaine@cityofsuttercreek.org>; cgunselman@cityofsuttercreek.org; jsierk@cityofsuttercreek.org; Sfeist@cityofsuttercreek.org; Driordan@cityofsuttercreek.org; jswift@cityofsuttercreek.org; Dave Groth <david.groth@amador-city.com>; sandy.staples@amador-city.com; amadorolive@twinwolf.net; City Clerk <city.clerk@amador-city.com>; Margaret Roberts <mroberts@cityofplymouth.org>; cjohnson@cityofplymouth.org; makerland@cityofplymouth.org; Michael McLaughlin <MMcLaughlin@cityofplymouth.org>; pamoruso@cityofplymouth.org; dsim@cityofplymouth.org; fiddletown@comcast.net; Chris Mynderup <cmynderup@ci.jackson.ca.us>; Jose Arevalos <jarevalos@ci.jackson.ca.us>; Jon Alfred <jalfred@ione-ca.com>; Carlo Sgroi <csgroi@ione-ca.com>; Jim O'Connell <joconnell@cityofsuttercreek.org>; Matt Brewer <mbrewer@cityofsuttercreek.org>; Gaines, Jed@CALFIRE <jed.gaines@fire.ca.gov>; Reis, Jon@CALFIRE <Jon.Reis@fire.ca.gov>; James.thornock@usda.gov; Robert Withrow <rwithrow@amadorgov.org>; Robert Ebling <rebling@amadorgov.org>; Justin Yelinek <jyelinek@amadorgov.org>; Aaron Watkins <AWatkins@amadorgov.org>; Kayla Dale <kdale@amadorgov.org>; Ryan Pidgeon <Rpidgeon@ci.jackson.ca.us>; Ken Mackey <Kmackey@ione-ca.com>;

Dominic Moreno <suttercreekfire@sbcglobal.net>; Chief Randy Makemson <Chief6100@live.com>; Michael.Cureton@sutterhealth.org; Dimmer, Rachael <Rachael.Dimmer@sutterhealth.org>; Alan McNany <amcnany@alpost108.org>; Michelle Tyer <mtyer@alpost108.org>; Ray, Sara (MACT) <Sara.Ray@macthealth.org>; Ellison, Laura (MACT) <laura.ellison@macthealth.org>; Rick Ferriera <RFerriera@amadorwater.org>; Cox, Timothy <timothy.cox@ebmud.com>; Steven Fredrick - JVID <steve@jvid.org>; River Pines PUD <rppud@riverpinespud.org>; Kessler, John <jkessler@eid.org>; Erik Christeson <echristeson@kmpud.com>; Rick Ansel <ransel@kmpud.com>; Crawford, Todd <T6CX@pge.com>; Frank Leschinsky <frankl@volcanotel.com>; Bingham, Wes W@DOT <wes.bingham@dot.ca.gov>; Uselton, Nicholas@DOT <nicholas.uselton@dot.ca.gov>; Maggie <maggie@amadortransit.com>; April <april@amadortransit.com>; Jeanine Foster <jeanine.foster@fostermorrison.com>; Jared Critchfield <jcritchfield@acusd.org>; Mich, Beatriz <beatriz.mich@redcross.org>; Casillas, John@CalOES <John.Casillas@caloes.ca.gov>; Brandt Cook <bcook@amadorwater.org>; Kitten Chapman <myponynme@yahoo.com>; Todd Bertwell <todd@amadorrcd.org>; Baker, Lisa <lisa.baker2@redcross.org>; lmoore@arcofamador.org; Lucas Carthew <lcarthew@amadorwater.org>
Subject: LHMP: Mitigation Strategy Meetings

...
Jun 11, 2025, 1:00pm – Jun 11, 2025, 4:00pm
(GMT-07:00) Pacific Time - Los Angeles
810 Court St

...
Jun 12, 2025, 9:00am – Jun 12, 2025, 12:00pm
(GMT-07:00) Pacific Time - Los Angeles
810 Court St

All,

Thanks again to everyone that attended our April Risk Assessment meeting!

You are invited to the **Amador County 2025 Local Hazard Mitigation Plan Update Mitigation Strategy meetings of the Hazard Mitigation Planning Committee (HMPC).**

In preparation for the upcoming meetings, please see below:

1. **Identify and bring your mitigation project ideas to the meetings!**

These are the <u>two most important meetings</u> for this LHMP Update project:

- **Wednesday, June 11 (1:00 - 4:00 pm)** - we will <u>briefly</u> revisit the risk assessment data developed to date and will be establishing updated LHMP goals and objectives.
- **Thursday, June 12 (9:00 am – 12:00 pm)** - we will be working to identify and discuss potential mitigation actions and projects for reducing Amador's risk and vulnerability to identified hazards and disasters.

<u>Please make sure everyone attends who has mitigation actions and projects to include in the LHMP Update for all identified priority hazards.</u>

<u>Meeting Locations for Both Meetings:</u>

Board of Supervisors Chambers

810 Court Street

Jackson, CA 95642

As always, Hazard Mitigation Planning Committee Meetings are open to the public.

2. **Attached is an Agenda for the two meetings**.

3. **Also attached is a FEMA publication – Mitigation Ideas**

   Take a look – it is easy to skim through and will give you mitigation ideas, by hazard. What fits your Jurisdiction?

County, City, District, and stakeholder participation and coordination is a requirement of an approved LHMP, as is the inclusion of any hazard data, information, and mitigation projects you may want to see included in the Plan. Your continued participation and input is critical to the success of this project!

Please reach out to me or Jeanine Foster at Jeanine.foster@fostermorrison.com if you have questions.

Look forward to seeing everyone.

--
Matt Girton, Sergeant
Office of Emergency Services - Coordinator
Amador County Sheriff's Office
700 Court Street, Jackson, CA 95642
Phone: (209) 223-6384
Fax: (209) 223-1609

A.5.2. HMPC #3 & #4: Email Invite (Reminder) to Mitigation Strategy Meetings

From: Matthew Girton <mgirton@amadorgov.org>
Sent: Monday, June 2, 2025 1:36 PM
To: SO-Administration <so-administration@amadorgov.org>; Jim Rooney <jrooney@amadorgov.org>; Tacy Rouen <trouen@amadorgov.org>; Chuck Iley <ciley@amadorgov.org>; BOS-Board of Supervisors <boardofsupervisors@amadorgov.org>; Diana Evensen <devensen@amadorgov.org>; Melissa Cranfill <mcranfill@amadorgov.org>; Anne Watts <awatts@amadorgov.org>; Rita H. Kerr <hofficer@amadorcounty.gov>; Holly Sandman <hsandman@amadorgov.org>; Joanne Hasson <jhasson@amadorcounty.gov>; Diana Haley <dhaley@amadorcounty.gov>; Tracy Dehn <tdehn@amadorcounty.gov>; Richard Vela <rvela@amadorgov.org>; Jack O'Brien <jobrien@amadorgov.org>; Darek Selman <dselman@amadorgov.org>; Valerie Villa <vvilla@amadorgov.org>; Jeff White <JWhite@amadorcounty.gov>; Jeffry Gardner <jgardner@amadorgov.org>; Herminia Perry <hperry@amadorgov.org>; Scott Meyer <smeyer@amadorgov.org>; Sarah Duarte <sduarte@amadorgov.org>; Evan M. Jacobs <ejacobs@amadorcounty.gov>; Eric Mayberry <emayberry@amadorgov.org>; Barry Clark <BClark@amadorcounty.gov>; Chuck Beatty <CBeatty@amadorgov.org>; Glenn Spitzer <gspitzer@amadorgov.org>; Michael Rock <mrock@amadorgov.org>; Margaret Friedman <mfriedman@amadorgov.org>; Angela M. Sheble <asheble@amadorcounty.gov>; Todd Barr <tbarr@amadorgov.org>; Carl Simpson <csimpson@ci.jackson.ca.us>; bwilder@ci.jackson.ca.us; smclean@ci.jackson.ca.us; cgonsalves@ci.jackson.ca.us; mgodde@ci.jackson.ca.us; csimmons@ci.jackson.ca.us; bstimpson@ci.jackson.ca.us; George Lee <glee@ione-ca.com>; alafayne@ione-ca.com; jmitchell@ione-ca.com; srhoades@ione-ca.com; Datlan@ione-ca.com; Tom DuBois <tdubois@cityofsuttercreek.org>; Dan Lafontaine <dlafontaine@cityofsuttercreek.org>; cgunselman@cityofsuttercreek.org; jsierk@cityofsuttercreek.org; Sfeist@cityofsuttercreek.org; Driordan@cityofsuttercreek.org; jswift@cityofsuttercreek.org; Dave Groth <david.groth@amador-city.com>; sandy.staples@amador-city.com; amadorolive@twinwolf.net; City Clerk <city.clerk@amador-city.com>; Margaret Roberts <mroberts@cityofplymouth.org>; cjohnson@cityofplymouth.org; makerland@cityofplymouth.org; Michael McLaughlin <MMcLaughlin@cityofplymouth.org>; pamoruso@cityofplymouth.org; dsim@cityofplymouth.org; fiddletown@comcast.net; Chris Mynderup <cmynderup@ci.jackson.ca.us>; Jose Arevalos <jarevalos@ci.jackson.ca.us>; Jon Alfred <jalfred@ione-ca.com>; Carlo Sgroi <csgroi@ione-ca.com>; Jim O'Connell <joconnell@cityofsuttercreek.org>; Matt Brewer <mbrewer@cityofsuttercreek.org>; Jed@CALFIRE <jed.gaines@fire.ca.gov>; Jon@CALFIRE <Jon.Reis@fire.ca.gov>; James.thornock@usda.gov; Robert Withrow <rwithrow@amadorgov.org>; Robert Ebling <rebling@amadorgov.org>; Justin Yelinek <jyelinek@amadorgov.org>; Aaron Watkins <AWatkins@amadorgov.org>; Kayla Dale <kdale@amadorgov.org>; Ryan Pidgeon <Rpidgeon@ci.jackson.ca.us>; Ken Mackey <Kmackey@ione-ca.com>; Dominic Moreno <suttercreekfire@sbcglobal.net>; Chief Randy Makemson <Chief6100@live.com>; Michael.Cureton@sutterhealth.org; Rachael <Rachael.Dimmer@sutterhealth.org>; Michelle Tyer <mtyer@alpost108.org>; Ray, Sara (MACT) <Sara.Ray@macthealth.org>; Ellison, Laura (MACT) <laura.ellison@macthealth.org>; Rick Ferriera <RFerriera@amadorwater.org>; Timothy <timothy.cox@ebmud.com>; Steven Fredrick - JVID <steve@jvid.org>; River Pines PUD <rppud@riverpinespud.org>; John <jkessler@eid.org>; Erik Christeson <echristeson@kmpud.com>; Rick Ansel <ransel@kmpud.com>; Todd <T6CX@pge.com>; Frank Leschinsky <frankl@volcanotel.com>; Wes W@DOT <wes.bingham@dot.ca.gov>; Nicholas@DOT <nicholas.uselton@dot.ca.gov>; Maggie <maggie@amadortransit.com>; April <april@amadortransit.com>; Jeanine Foster <jeanine.foster@fostermorrison.com>; Jared Critchfield <jcritchfield@acusd.org>; Beatriz <beatriz.mich@redcross.org>; John@CalOES <John.Casillas@caloes.ca.gov>; Brandt Cook <bcook@amadorwater.org>; Kitten Chapman <myponynme@yahoo.com>; Todd Bertwell <todd@amadorrcd.org>; Lisa <lisa.baker2@redcross.org>; lmoore@arcofamador.org; Lucas Carthew

Lucas Carthew <lcarthew@amadorwater.org>
Subject: LHMP: Mitigation Strategy Meetings: Reminder

All,

This is a reminder of the upcoming meetings for the 2025 Amador County LHMP Update Project.

Meeting Location (For both June 11th and 12th meetings):
Board of Supervisors Chambers
810 Court Street
Jackson, CA 95642

June 11th - 1:00 pm to 4:00 pm
June 12th - 9:00 am to 12:00 pm

***These are the two most important meetings for this LHMP Update project*!**

Please make sure that everyone who attends has mitigation actions and projects to include in the LHMP Update for your jurisdiction's priority hazards.

See attachments:

1. **Attached is the Mitigation Action Status summary from the 2020 LHMP**. Each participating jurisdiction to the 2020 LHMP should review their previous mitigation actions and complete the table to provide a status update of previous actions/projects and to determine which 2020 actions you may want to include in this LHMP Update. ***Bring your completed status summary to the meetings.*** Note, we will also need you to email us a copy of your 2020 mitigation status summary for inclusion in the updated plan.

2. **Also attached is a FEMA publication – Mitigation Ideas**

   Take a look – it is easy to skim through and will give you mitigation ideas, by hazard. What fits for Amador County? Your Jurisdiction?

Please reach out to myself or Jeanine Foster at Jeanine.foster@fostermorrison.com if you have questions.

Look forward to seeing everyone.

Thanks,

--
Matt Girton, Sergeant
Office of Emergency Services - Coordinator
Amador County Sheriff's Office
700 Court Street, Jackson, CA 95642
Phone: (209) 223-6384
Fax: (209) 223-1609

A.5.3. HMPC #3 & #4: Mitigation Strategy Meeting Agenda

AGENDA

AMADOR COUNTY
LOCAL HAZARD MITIGATION PLAN (LHMP) UPDATE
Hazard Mitigation Planning Committee (HMPC)
Meetings #3 & 4 – Mitigation Strategy

Wednesday June 11, 2025 (1:00 - 4:00 pm)
Thursday June 12, 2025 (9:00 am - 12:00 pm)

Board of Supervisors Chambers
810 Court Street
Jackson, CA 95642

HMPC Meeting #3:

1. Introductions
2. LHMP Project Status and Next Steps/Timeline
3. Risk Assessment Status
4. Priority Hazards Review
5. Develop Plan Goals and Objectives
6. Introduction to HMPC Meeting #4: Mitigation Alternatives/Actions/Projects

HMPC Meeting #4:

1. Introductions
2. Review Mitigation Categories and Selection Criteria
3. Brainstorming of Mitigation Alternatives/Actions/Projects by Hazard
4. Prioritization of Mitigation Actions/Projects
5. Next Steps

A.5.4. HMPC #3 & #4: Mitigation Strategy Meeting Sign in Sheets

June 11 Meeting

SIGN-IN SHEET
AMADOR COUNTY LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Meeting #3: Mitigation Strategy Meeting
June 11, 2025 (1:00-4:00 pm)
Board of Supervisors Chambers | Jackson, California

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Frank Leschinsky Public Sector Manager	frankl@volcano1.com	209-296-1477	VolcanoTel.com
SGT MATT GIRTON	mgirton@AMADORGOV.ORG	209.223.6354	AMADOR OES
Beatriz Mills Red Cross	beatriz.mills@redcross.org	209.503.3110	Red Cross
ANTERO ALCIERTO MAPPING GIS TECHNICIAN	AACIERTO@AMADORWATER.ORG	(209) 304-8760	AMADOR WATER AGENCY
Amy GEDNEY	agedney@riverpinespud.org		RPPUD
Ryan Pidgeon, Fire Chief	rpidgeon@ci.Jackson.ca.us	209-223-7333	City of Jackson FD
Barry Clark, Deputy Ag Com	bclark@amadoracounty.gov	209.223.6487	Ag
Nick Uselton/CMAS	nicholas.uselton@dot.ca.gov	(209) 483-3092	Caltrans
Todd Bartwell	todd@amadorrcd.org	209-217-1147	AFSC
John Anger	john.anger@calOES.ca.gov	916 926 1371	ALERT
Karyn Gregorius	kgregorius@arcofamador.org	209-267-5978	The Arc of Amador and Calaveras
Ashley Amaya - Fire Prevention Officer	aamaya@amadorcounty.gov	209-223-6224	AFPD

SIGN-IN SHEET
AMADOR COUNTY LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Meeting #3: Mitigation Strategy Meeting
June 11, 2025 (1:00-4:00 pm)
Board of Supervisors Chambers | Jackson, California

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Dan Epperson, Supervisor	depperson@AmadorCounty.gov	209-361-9864	Supervision Dist 2
Richard Vela Amador Co. PW Dir.	rvela@amadorcounty.gov	209.223.6457	Amador County Public Works
Dan Lafontaine/ COSC PW Dir.	dlafontaine@cityofsuttercreek.org	530 279 6322	City of Sutter Creek
Lisa Baker	lisa.baker2@redcross.org		

SIGN-IN SHEET
AMADOR COUNTY LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Meeting #3: Mitigation Strategy Meeting
June 11, 2025 (1:00-4:00 pm)
Board of Supervisors Chambers | Jackson, California

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Josie O'Brien	JObrien@amadorcounty.gov	223-6517	A.C.
Tracy Dehn Assistant Clerk	tdehn@amadorcounty.gov	223-6639	ACPH

June 12 Meeting

SIGN-IN SHEET
AMADOR COUNTY LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Meeting #4: Mitigation Strategy Meeting
June 12, 2025 (9:00-12:00 pm)
Board of Supervisors Chambers | Jackson, California

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Lurali Moore	lmoore@arcofamador.org	209-267-5978	The Arc of Amador & Calaveras
John Anger	John.Anger@CalOES.ca.gov	9169261371	AREP
Todd Bertuell	~~todd.bert~~ todd@amadorrcd.org	209-217-1147	AFSC
Richard Vela	rvela@amadorcounty.gov	209-223-6427	Amador Co. PW
Nick Uselton	nicholas.Uselton@dot.ca.gov	209-485-3092	Caltrans
Barry Clark	bclark@amadorcounty.gov	209-223-6487	Ag
Becky Mich	beatriz.mich@redcross.org	209.593.3110	Red Cross
Ryan Pidgeon	RPidgeon@ci.Jackson.ca.us	209-273-7323	City of Jackson
Kayla Dale	Kdale@amadorcounty.gov	209-223-6391	AFPD
Luke Carlton	LCARLTON@AMADORWATER.ORG	209-257-5207	AWA
Tracy Dehn	tdehn@amadorcounty.gov	209 223-6407	ACPH

SIGN-IN SHEET
AMADOR COUNTY LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Meeting #4: Mitigation Strategy Meeting
June 12, 2025 (9:00-12:00 pm)
Board of Supervisors Chambers | Jackson, California

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Lisa Baker	lisa.baker@redcross.org	510-917-3938	Red Cross
Jake Oberiel	JOberiel@AmadorCounty.org	223-6517	P.W.
ANTERO ACIERTO	AACIERTO@AMADORWATER.ORG	(209) 304-8760	AMADOR WATER AGENCY
Dan Lafontaine	dlafontaine@cityofsuttercreek.org	(530) 2M 6327	City of Sutter Creek

A.6 HMPC #5: Final HMPC Meeting

A.6.1. Final HMPC Meeting Invite

Note: This email was sent out to the entire HMPC list in Section A.1.2.

From: Matthew Girton MGirton@amadorcounty.gov
Sent: Wednesday, September 15, 2025 12:21 PM
To: Jeanine Foster jeanine.foster@fostermorrison.com
Subject: Fw: LHMP: Next Meetings

All,

Please see below information on the final steps for the Amador County 2025 Local Hazard Mitigation Plan (LHMP) Update project:

LHMP Public Review Draft and Public Meeting. The LHMP Public Review Draft is up on the Amador County website for public review and comment at: https://www.amadorgov.org/departments/office-of-emergency-services/local-hazard-mitigation-plan. A printed copy of the LHMP is available at the Amador County Sheriff's Office located at 700 Court Street, Jackson, CA 95642.

A public meeting on the Draft LHMP will be held Wednesday, October 8, 2025 from 5:30 -7:00 pm at the Amador County Board of Supervisors Chambers, 700 Court St. Jackson, CA 95642.
A press release and other outreach is being issued by the County. **Please help get the word out to the public.**

Final HMPC Meeting. Our final planning committee meeting is scheduled for Thursday October 9, 2025 from 9:00 am -12:00 pm, also at the Amador County Board of Supervisors Chambers. This meeting will address public comments received and finalize all input to the LHMP. We will also be evaluating any changes in hazard vulnerabilities and mitigation priorities to the Amador County Planning Area over the last five years for inclusion in the final LHMP document.

Final LHMP Input. All final planning committee (and jurisdictional, public and stakeholder) input on the Draft LHMP needs to be provided no later than October 17, 2025. Please take time to download and review the Plan from the County website.

There are several options for providing comments on the LHMP Public Review Draft:

1. Email comments to jeanine.foster@fostermorrison.com or mgirton@amadorgov.org
2. Drop off written comments or send by mail to: Amador County Sheriff's Office, Office of Emergency Services, Attn. Sergeant Girton, 700 Court Street, Jackson, CA 95642
3. Bring comments to the final public or HMPC meeting

If you have any questions, please contact Jeanine Foster at jeanine.foster@fostermorrison.com or Sergeant Matt Girton at mgirton@amadorgov.org.

Thank you for your continued engagement in the process.

Matt Girton, Sergeant
Office of Emergency Services - Coordinator
Amador County Sheriff's Office
700 Court Street, Jackson, CA 95642
Phone: (209) 223-6384
Fax: (209) 223-1609
Please note my new email address

A.6.2. Final HMPC Meeting Invite Reminder

From: Matthew Girton <MGirton@amadorcounty.gov>
Sent: Monday, September 29, 2025 3:14 PM
To: BOS-Board of Supervisors <boardofsupervisors@amadorcounty.gov>; Chuck Iley <CIley@amadorcounty.gov>; Glenn Spitzer <gspitzer@amadorcounty.gov>; Chuck Beatty <CBeatty@amadorcounty.gov>; Richard Vela <rvela@amadorcounty.gov>; Jack O'Brien <jobrien@amadorcounty.gov>; Anne Watts <awatts@amadorcounty.gov>; Melissa Cranfill <MCranfill@amadorcounty.gov>; Joanne Hasson <jhasson@amadorcounty.gov>; Tracy Dehn <tdehn@amadorcounty.gov>; Diana Haley <dhaley@amadorcounty.gov>; Jeffry Gardner <jgardner@amadorcounty.gov>; Herminia Perry <hperry@amadorcounty.gov>; Evan M. Jacobs <ejacobs@amadorcounty.gov>; Eric Mayberry <emayberry@amadorcounty.gov>; Barry Clark <BClark@amadorcounty.gov>; Robert Withrow <rwithrow@amadorcounty.gov>; Kayla Dale <kdale@amadorcounty.gov>; Robert Ebling <rebling@amadorcounty.gov>; Justin Yelinek <JYelinek@amadorcounty.gov>; Aaron Watkins <AWatkins@amadorcounty.gov>; Ken Mackey <kmackey@ione-ca.com>; rpidgeon <rpidgeon@ci.jackson.ca.us>; suttercreekfire@sbcglobal.net; Chief Randy Makemson <chief6100@live.com>; Chris Mynderup <cmynderup@ci.jackson.ca.us>; Jose Arevalos <jarevalos@ci.jackson.ca.us>; Jim O'Connell <joconnell@cityofsuttercreek.org>; Jon Alfred <jalfred@ione-ca.com>; Bingham, Wes W@DOT <wes.bingham@dot.ca.gov>; Dan Lafontaine <dlafontaine@cityofsuttercreek.org>; stacy.rhoades@usminecorp.com; sandy.staples@amador-city.com; steve@jvid.org; Todd Bertwell <todd@amadorrcd.org>; Frank Leschinsky <frankl@volcanotel.com>; aacierto@amadorwater.org; Mich, Beatriz <beatriz.mich@redcross.org>; agedney@riverpinespud.org; Uselton, Nicholas@DOT <nicholas.uselton@dot.ca.gov>; Cameron Begbie <cbegbie@lavadog.net>; srhoades@ione-ca.com; George Lee <glee@ione-ca.com>; Carl Simpson <csimpson@ci.jackson.ca.us>; Tom DuBois <tdubois@cityofsuttercreek.org>; kgregorius@arcofamador.org; lisa.baker2@redcross.org; lmoore@arcofamador.org; Lucas Carthew <lcarthew@amadorwater.org>; Dimmer, Rachael <rachael.dimmer@sutterhealth.org>; Rita H. Kerr <HOfficer@amadorcounty.gov>; Michelle Tyer <mtyer@alpost108.org>; samantha.hill@pge.com; Harris, Clint <cwhf@pge.com>; james.thornock@usda.gov; cjohnson@cityofplymouth.org; Scott Meyer <SMeyer@amadorcounty.gov>; cquinn@cityofplymouth.org
Cc: SO-Administration <so-administration@amadorcounty.gov>; John.Anger@CalOES.ca.gov; Jeanine Foster <jeanine.foster@fostermorrison.com>; Chris Morrison <chris.morrison@fostermorrison.com>
Subject: LHMP: Next Meeting

Good afternoon,

This is just a friendly reminder that the final public and planning committee meetings are being held to review and provide comments on the Public Review Draft LHMP. If you haven't already received a copy of that Draft, it can be found on the Amador County website, here. I won't ask that any of you attend the Public Meeting, but I would be very appreciative if you could please attend the final planning committee meeting on **Thursday, October 9th at 9:00 am, in the Board of Supervisors Chambers.** Jeanine has one final, FEMA required, exercise to run through, and your participation and input is needed.

Thank you, and I hope to see you there!

Matt Girton, Sergeant
Office of Emergency Services - Coordinator
Amador County Sheriff's Office

A.6.3. HMPC #5: Final HMPC Meeting Agenda

AGENDA

AMADOR COUNTY MULTI-JURISDICTIONAL
LOCAL HAZARD MITIGATION PLAN (LHMP) UPDATE
Hazard Mitigation Planning Committee (HMPC)
Final Meeting #5

Thursday, October 9, 2025
9:00 - 12:00 pm
Board of Supervisors Chambers
810 Court Street
Jackson, CA 95642

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1. Introductions
2. Status of the LHMP Planning Process
3. Addressing Public Comments
4. Final Planning Committee Input/Outstanding Items
5. Summary of Changes in Amador Planning Area Hazard Vulnerabilities/ Mitigation Priorities
6. Final Steps
7. Questions?

A.6.4. HMPC #5: Final Meeting Sign In Sheets

SIGN-IN SHEET
AMADOR COUNTY LOCAL HAZARD MITIGATION PLANNING PROJECT
HMPC Meeting #5: Draft LHMP
October 9, 2025 (9:00-12:00 pm)
Board of Supervisors Chambers | Jackson, California

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Jeff Bellotte	jbellotte@amadorcounty.gov	209.223.6672	ACSO
Becky Mich	beatriz.mich@redcross.org	209.503.3110	Red Cross
John Anger	John.Anger@CalOES.CA.gov	9169261374	Cal OES
Bette Rhoades	betteRhoades@yahoo.com		Citizen Ione
Lanay Rhoades	LanayRhoades@yahoo.com		" "
Cameron Begbie	cbegbie@cityofplymouth.org	209-293-9444	Plymouth
Dan Lafontaine	dlafontaine@cityofsuttercreek.org	209 2154855	City of Sutter Creek
Lisa Baker	lisa.baker2@redcross.org	510-917-3934	Red cross
Lurali Moore	lmoore@arcofamador.org	209 267 5978	The Arc

A.7 Public Involvement

A.7.1. Public Meeting Outreach Flyers: Project Announcement and Kickoff Meetings

Help Reduce Disaster Losses in Your Community by Participating in the Amador County 2025 Local Hazard Mitigation Plan Update

Amador County is developing a Local Hazard Mitigation Plan (LHMP) Update to their 2021 plan. The purpose of the 2025 LHMP Update is to assess risk to natural hazards, implement actions to reduce future losses, and maintain eligibility for federal mitigation grant funding in accordance with the Disaster Mitigation Act of 2000. Partners in this planning effort include the incorporated communities of Amador City, Ione, Jackson, Plymouth, and Sutter Creek, and several special districts located throughout the County.

What is Hazard Mitigation?

Hazard mitigation means any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards.

Why is Hazard Mitigation Important?

Most people who live or work in Amador County have been affected by natural hazards in one way or another. Amador County and its residents are vulnerable to a variety of hazards including floods, dam failure, drought, wildfire, and other severe weather events.

Rising costs associated with disaster response and recovery have focused the attention of federal, state, and local government officials on addressing natural hazards before they occur. For example, torrential rains and floods cannot always be prevented from occurring. Planning for natural hazards and implementing hazard mitigation and risk reduction measures, however, can reduce the impact of such events when they do occur. Emergency response and recovery costs; property damage; personal injury and loss of life; and the overall economic and social impact on the community can all be reduced, and in some instances eliminated through natural hazard mitigation.

2025 Local Hazard Mitigation Plan and Plan Update Process

Amador County is leading the effort, along with Amador City, Ione, Jackson, Plymouth, and Sutter Creek, and several special districts, to develop an update to their 2021 LHMP. The 2025 LHMP Update is being developed by a Hazard Mitigation Planning Committee (HMPC) comprised of representatives from various County and City departments; Districts; neighboring jurisdictions; key federal, state, and local agency stakeholders; and the public.

The plan will be developed to meet new FEMA LHMP guidance (effective April 2023) and will address an updated list of hazards and assess the likely risk and vulnerability of these hazards to the people and assets of the Amador County planning area. This will involve establishing an updated mitigation strategy designed to reduce the impacts of future disasters on people and property, critical facilities and infrastructure, and the environment as well as to the local economy.

Opportunities for Input

Members of the community have a very important role in this process. Several planning committee and public meetings will be held over the next year. A draft of the 2025 Amador County LHMP Update will be available late summer 2025 for review and comment by the public and all interested stakeholders on the County LHMP website at: https://www.amadorgov.org/departments/office-of-emergency-services/local-hazard-mitigation-plan and in hard copy form in select public locations to be announced. A public meeting on the Draft Plan and a final planning committee meeting will also occur in fall 2025. All interested stakeholders and members of the public are encouraged to attend the planning committee and public meetings.

For more information on this project contact the following individuals:

Matt Girton	**Jeanine Foster**
Amador County Sheriff's Office of Emergency Services	Foster Morrison Consulting Ltd.
Phone: (209) 223-6384	Phone: (303) 717-7171
mgirton@amadorgov.org	jeanine.foster@fostermorrison.com

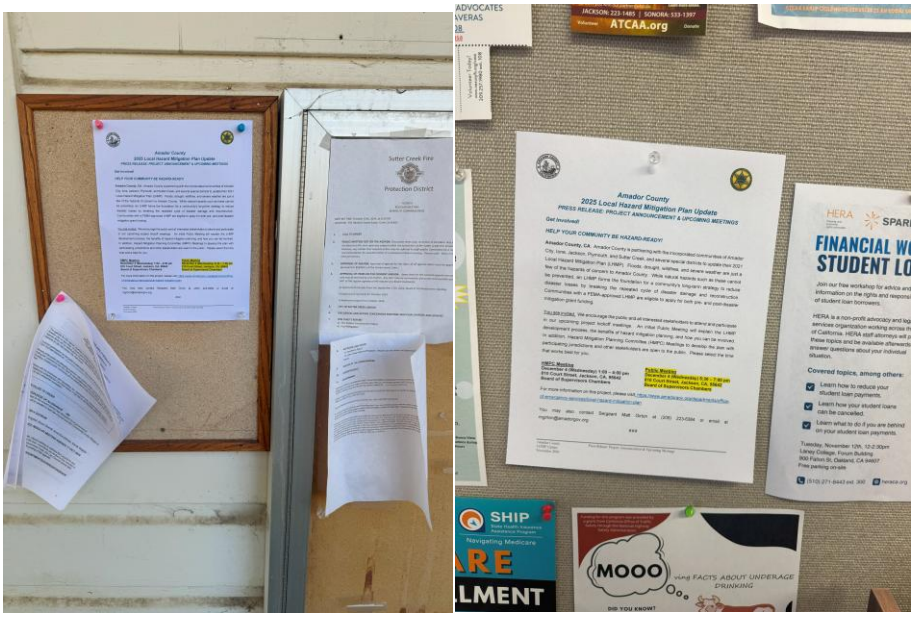
A.7.2. Posting Locations of Outreach Flyers

Below is a list of all the places the Outreach Flyer was posted:

- Amador City - City Hall - 14531 East School Street, Amador City, CA, 95601
- Amador County Administration Building - 810 Court Street, Jackson, CA, 95642
- Amador County Health & Human Services Building - 10877 Conductor Blvd, Sutter Creek, CA, 95685
- Amador County Transportation Commission Office - 117 Valley View Way, Sutter Creek, CA, 95685
- Buckhorn/Pioneer - IGA Payless Grocery Store (aka Young's Payless Market IGA) - 26560 Highway 88, Pioneer, CA, 95666
- Buckhorn/Pioneer - Pioneer Branch Library - 25070 Buckhorn Ridge Road, Pioneer, CA, 95666
- Camanche - Camanche Blues General Store - 4232 Camanche Parkway North, Ione, CA, 95640
- Fiddletown - Fiddletown Community Center - 14445 Fiddletown Road, Fiddletown, CA, 95629
- Ione City Hall - 1 East Main Street, Ione, CA, 95640
- Jackson City Hall - 33 Broadway #D, Jackson, CA, 95642
- Jackson Fire Department - 175 Main Street, Jackson, CA, 95642
- Jackson Library - 530 Sutter Street, Jackson, CA, 95642
- Pine Grove Market - 19394 Highway 88, Pine Grove, CA, 95665
- Pine Grove Town Hall & Library - 19889 Highway 88, Pine Grove, CA, 95665
- Pioneer Veteran's Hall - 25100 Buckhorn Ridge Road, Pioneer, CA, 95666
- Plymouth City Hall - 9426 Main Street, Plymouth, CA, 95669
- River Pines Town Hall - 22900 Canyon Avenue, River Pines, CA, 95675
- Sutter Creek City Hall - 18 Main Street, Sutter Creek, CA, 95685
- Volcano Post Office - 16120 Main Street, Volcano, CA, 95689
- Volcano - Sizemore County Store - 16146 Main Street, Volcano, CA, 95689

These are shown below:

Amador City Hall/Amador County Administration Building Flyer Postings

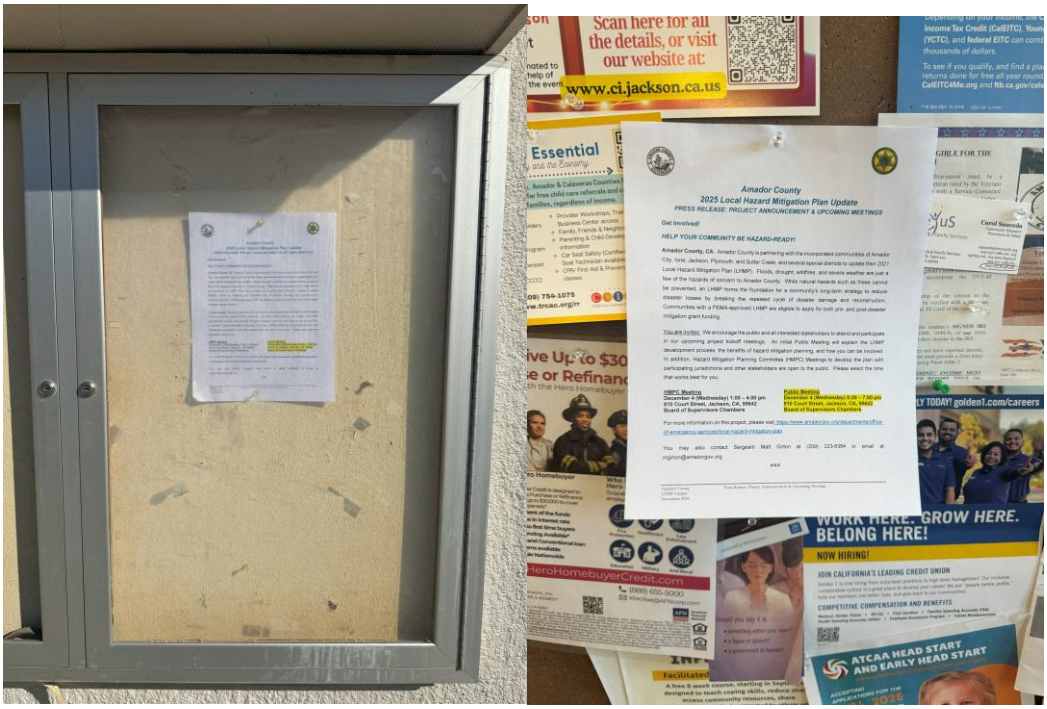


Amador County Health & Human Services/Amador County Transportation Commission Office Flyer Postings

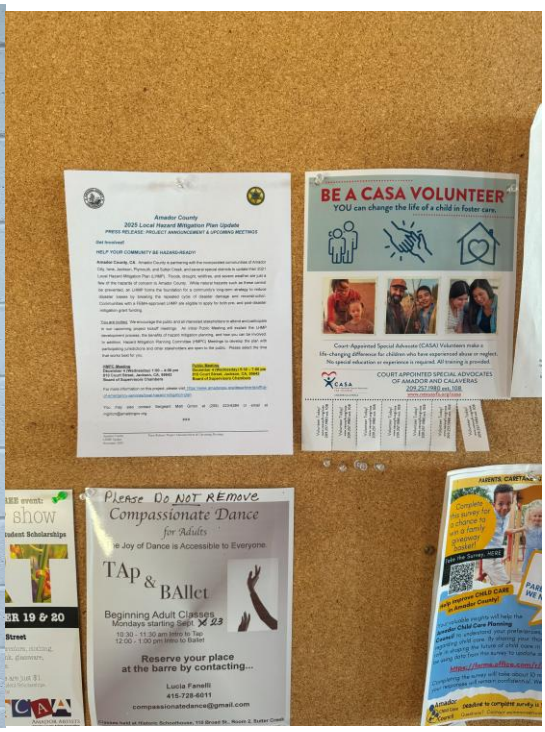
Young's Payless Market/Pioneer Branch Library Flyer Postings

Camanche Blue's General Store/Fiddletown Community Center Flyer Postings

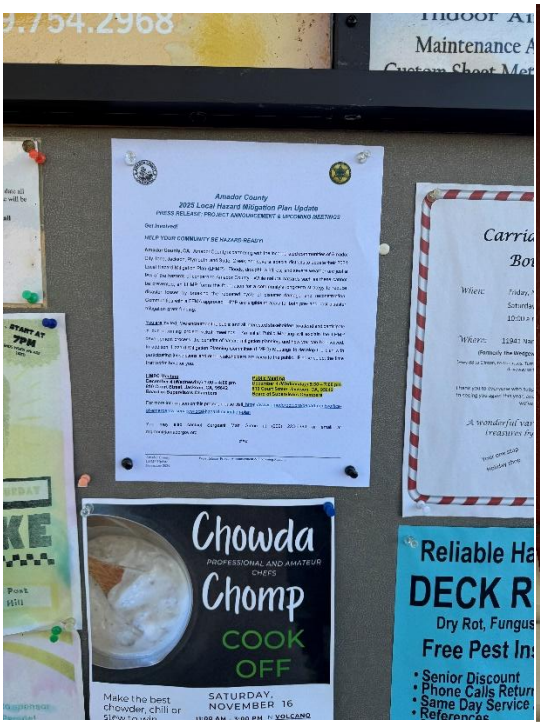
Ione City Hall/Jackson City Hall Flyer Postings

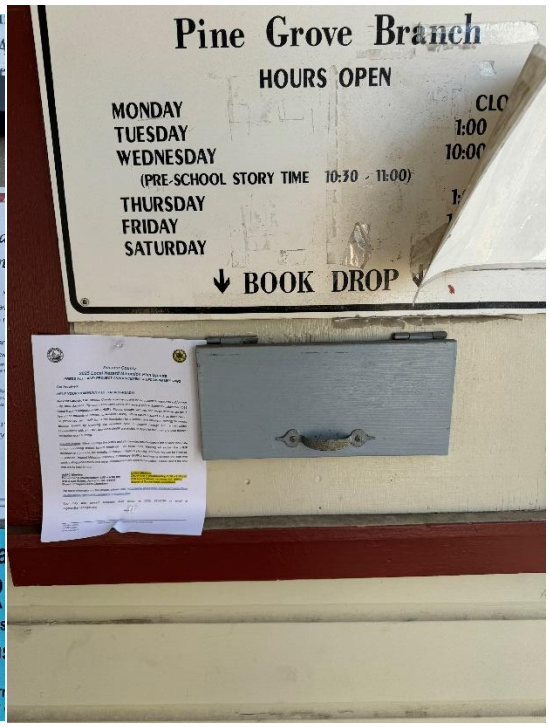


Jackson Fire Department/Jackson Library Flyer Postings



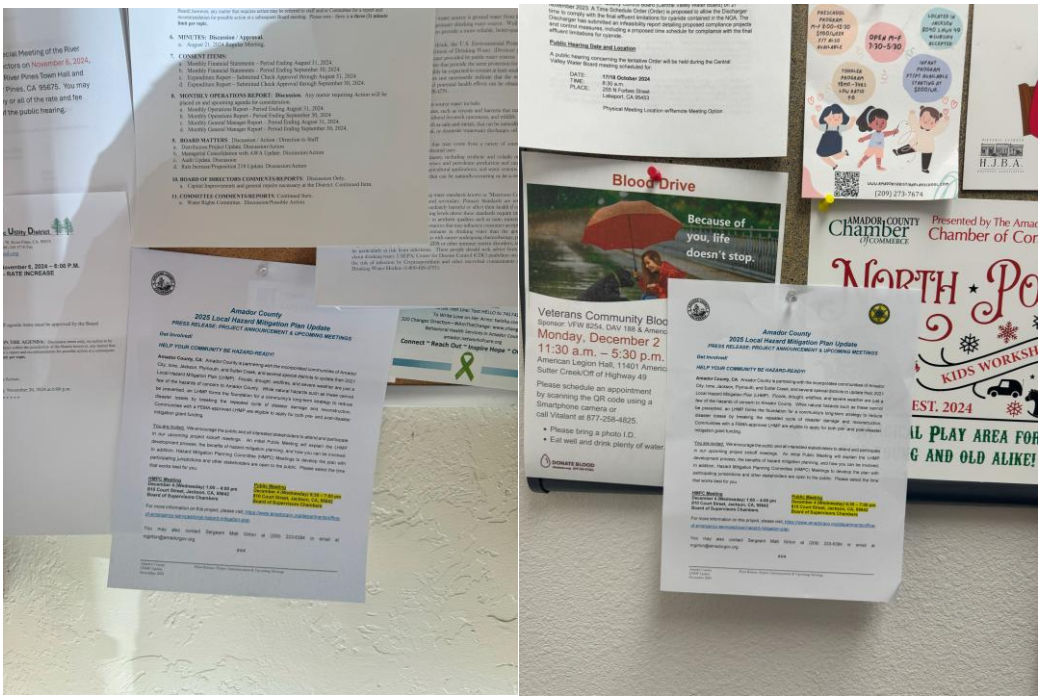
Pine Grove Market/Pine Grove Town Hall & Library Flyer Postings





Pioneer Veteran's Hall/Plymouth City Hall Flyer Postings

River Pines Town Hall/ Sutter Creek City Hall Flyer Postings



Volcano Post Office/Sizemore County Store Flyer Postings

A.7.3. Project Announcement/Public Meeting #1 in The Fiddler

Amador County Local Hazard Mitigation Plan (LHMP)
Update Project

The LHMP provides the County with a plan to respond to natural hazards (e.g., wildfire, flood, earthquake, severe weather, etc.). Foster Morrison Consulting has been collecting data and preparing a risk assessment for the updated LHMP. For more information, see LHMP Project.

Please join us for our second Hazard Mitigation Planning Committee (HMPC) Meeting to view a draft risk assessment materials and provide your feedback.

When: April 9, 2025 (Wednesday), 1:00 - 4:00 pm
Where: Board of Supervisors Chambers, 810 Court Street, Jackson, CA 95642

Questions? Please contact me at (209) 223-6384 or Jeanine Foster, Foster Morrison Consulting, at 303-717-7171 or jeanine.foster@fostermorrison.com.

Thank you,
Matt Girton, Sergeant
Office of Emergency Services - Coordinator, Amador County Sheriff's Office

A.7.4. Project Announcement/Public Meeting #1 Press Release in Ledger Dispatch on November 8, 2024

of time until someone says Beetlejuice's name three times and the mischievous demon returns to unleash his very own brand of mayhem.

HERE
PG-13 | 104 MIN
From the reunited director, writer, and stars of Forrest Gump, Here is an original film about multiple families

After Santa Claus – Code Name: RED ONE – is kidnapped, the North Pole's Head of Security (Dwayne Johnson) must team up with the world's most infamous bounty hunter (Chris Evans) in a globe-trotting, action-packed mission to save Christmas.

THE BEST CHRISTMAS PAGEANT EVER
PG | 100 MIN
Based on the beloved book, THE BEST CHRISTMAS PAGEANT EVER centers on the Herdmans – absolutely the worst kids in the history of the world. But this Christmas, they're taking over their local church Pageant – and they just might unwittingly teach a shocked community the true

WE LIVE IN TIME
R | 108 MIN
Almut (Florence Pugh) and Tobias (Andrew Garfield) are brought together in a surprise encounter that changes their lives. Through snapshots of their life together – falling for each other, building a home, becoming a family – a difficult truth is revealed that rocks its foundation. As they embark on a path challenged by the limits of time, they learn to cherish each moment of the unconventional route their love story has taken, in filmmaker John Crowley's decade-spanning, deeply moving romance.

HONORING OUR VETERANS
$15 FREE SLOT PLAY FOR ALL VETERANS
MONDAY, NOVEMBER 11
10 A.M. TO 10 P.M.
$100,000 VETERAN'S DAY CASH HOT SEATS
$10,000 CASH WINNER EVERY HOUR
MONDAY, NOVEMBER 11
10 A.M. TO 8 P.M.
JACKSON RANCHERIA CASINO RESORT
800-822-WINN • JACKSONCASINO.COM
12222 NEW YORK RANCH ROAD • JACKSON, CA 95642
Best of Amador 2024
ALL RIGHTS RESERVED. Problem Gambling? 800-GAMBLER

Amador County
2025 Local Hazard Mitigation Plan Update
PRESS RELEASE: PROJECT ANNOUNCEMENT & UPCOMING MEETINGS

Get Involved!

HELP YOUR COMMUNITY BE HAZARD-READY!

Amador County, CA: Amador County is partnering with the incorporated communities of Amador City, Ione, Jackson, Plymouth, and Sutter Creek, and several special districts to update their 2021 Local Hazard Mitigation Plan (LHMP). Floods, drought, wildfires, and severe weather are just a few of the hazards of concern to Amador County. While natural hazards such as these cannot be prevented, an LHMP forms the foundation for a community's long-term strategy to reduce disaster losses by breaking the repeated cycle of disaster damage and reconstruction. Communities with a FEMA-approved LHMP are eligible to apply for both pre- and post-disaster mitigation grant funding.

You are invited. We encourage the public and all interested stakeholders to attend and participate in our upcoming project kickoff meetings. An initial Public Meeting will explain the LHMP development process, the benefits of hazard mitigation planning, and how you can be involved. In addition, Hazard Mitigation Planning Committee (HMPC) Meetings to develop the plan with participating jurisdictions and other stakeholders are open to the public. Please select the time that works best for you.

HMPC Meeting
December 4 (Wednesday) 1:00 – 4:00 pm
810 Court Street, Jackson, CA, 95642
Board of Supervisors Chambers

Public Meeting
December 4 (Wednesday) 5:30 – 7:00 pm
810 Court Street, Jackson, CA, 95642
Board of Supervisors Chambers

For more information on this project, please visit https://www.amadorgov.org/departments/office-of-emergency-services/local-hazard-mitigation-plan

You may also contact Sergeant Matt Girton at (209) 223-6384 or email at mgirton@amadorgov.org

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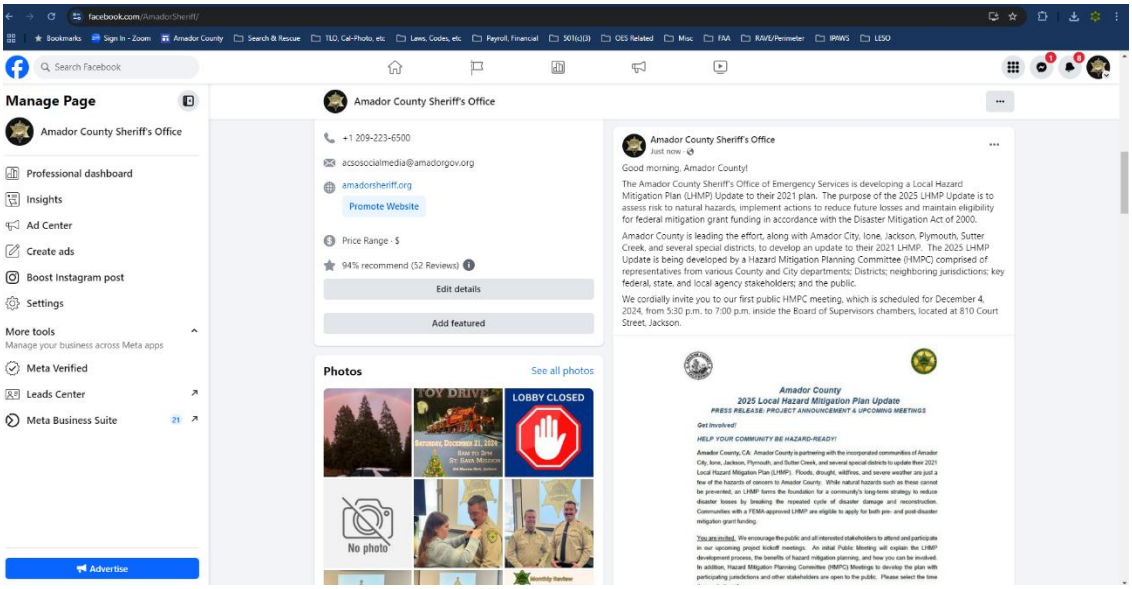
Amador County
LHMP Update
November 2024

Press Release: Project Announcement & Upcoming Meetings

A.7.5. Public Meeting #1 Announcement on Amador County Sheriff's Office Facebook Page



A.7.6. Public Meeting #1: Public Agenda

AGENDA

AMADOR COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN (LHMP) UPDATE
Public Kickoff Meeting #1

Wednesday December 4, 2024
5:30 - 7:00 pm
Board of Supervisors Chambers
810 Court Street
Jackson, CA 95642

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1. Introductions
2. Hazard Mitigation & the Disaster Mitigation Act Planning Requirements
3. LHMP Update Schedule
4. Hazard Identification
5. Questions?

A.7.7. Public Meeting #1: Public Sign in Sheet

SIGN-IN SHEET
AMADOR COUNTY LOCAL HAZARD MITIGATION PLANNING PROJECT
Public Meeting #1: Project Kickoff
December 4, 2024 (5:30-7:00 pm)
Board of Supervisors Chambers | Jackson, California

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
JEFF BELLOTTI	jbellotti@amadorgov.org	209-223-6170	SHERIFF

A.7.8. Public Meeting #2: Outreach Flyers

Help Reduce Disaster Losses in Your Community by Participating in the Amador County 2025 Local Hazard Mitigation Plan Update

Amador County is developing a Local Hazard Mitigation Plan (LHMP) Update to their 2021 plan. The purpose of the 2025 LHMP Update is to assess risk to natural hazards, implement actions to reduce future losses, and maintain eligibility for federal mitigation grant funding in accordance with the Disaster Mitigation Act of 2000. Partners in this planning effort include the incorporated communities of Amador City, Ione, Jackson, Plymouth, and Sutter Creek; the Amador County Water Agency; and the Jackson Valley Irrigation District.

What is Hazard Mitigation?

Hazard mitigation means any action taken to reduce or eliminate the long-term risk to human life and property from natural hazards.

Why is Hazard Mitigation Important?

Most people who live or work in Amador County have been affected by natural hazards in one way or another. Amador County and its residents are vulnerable to a variety of hazards including floods, dam failure, drought, wildfire, and other severe weather events.

Rising costs associated with disaster response and recovery have focused the attention of federal, state, and local government officials on addressing natural hazards before they occur. For example, torrential rains and floods cannot always be prevented from occurring. Planning for natural hazards and implementing hazard mitigation and risk reduction measures, however, can reduce the impact of such events when they do occur. Emergency response and recovery costs; property damage; personal injury and loss of life; and the overall economic and social impact on the community can all be reduced, and in some instances eliminated through natural hazard mitigation.

2025 Local Hazard Mitigation Plan and Plan Update Process

The 2025 LHMP development process began in November 2024. A Hazard Mitigation Planning Committee (HMPC) comprised of representatives from various County and City departments; Districts; neighboring jurisdictions; key federal, state, and local agency stakeholders; and the public is guiding development of the Plan. The LHMP Update addresses an updated list of hazards and assesses the likely impacts those hazards pose to people and assets of the Amador County planning area. Additionally, the Plan contains an updated mitigation strategy, including updated goals and mitigation actions and projects, designed to reduce natural hazard risk and future disaster losses.

Opportunities for Input

Members of the community have a very important role in this process. A draft of the 2025 Amador County LHMP Update is available for review and comment by the public and all interested stakeholders on the Amador County LHMP webpage at: https://www.amadorgov.org/departments/office-of-emergency-services/local-hazard-mitigation-plan and in printed copy in the Amador County Sheriff's Office at: 700 Court Street, Jackson, CA 95642.

Comments on the Public Review Draft (Final comments due by October 17, 2025)

There are several options for providing comments on the LHMP Public Review Draft:

- Email comments to jeanine.foster@fostermorrison.com or mgirton@amadorgov.org
- Drop off written comments or send by mail to: Amador County Sheriff's Office, Office of Emergency Services, Attn. Sergeant Girton, 700 Court Street, Jackson, CA 95642
- Bring comments to the final Public or HMPC meetings

Final Public and HMPC Meetings on the Public Review Draft LHMP

All interested stakeholders and members of the public are encouraged to attend either of these meetings.

Public Meeting	**HMPC Meeting**
October 8 (Wednesday) 5:30-7:00 pm	October 9 (Thursday) 9:00 am – 12:00 pm
Amador County Board of Supervisors Chambers 810 Court Street Jackson, CA 95642	Amador County Board of Supervisors Chambers 810 Court Street Jackson, CA 95642

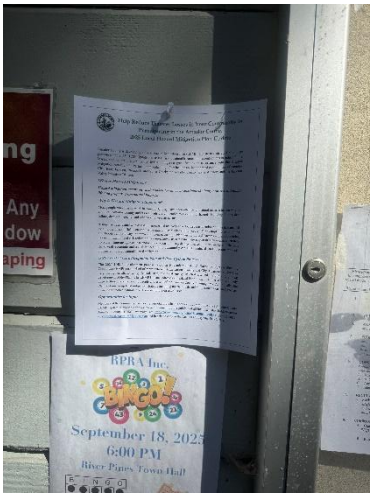
For more information on this project visit: https://www.amadorgov.org/departments/office-of-emergency-services/local-hazard-mitigation-plan or contact the following individuals:

Matt Girton	**Jeanine Foster**
Amador County Sheriff's Office of Emergency Services	Foster Morrison Consulting Ltd.
Phone: (209) 223-6384	Phone: (303) 717-7171
mgirton@amadorgov.org	jeanine.foster@fostermorrison.com

A.7.9. Public Meeting #2: Outreach Flyer Public Postings

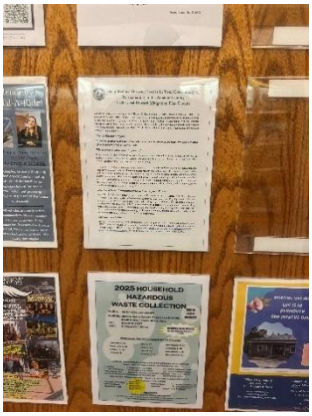
Amador City Public Bulletin Board near the Amador City Post Office - 10781 Water Street, Amador City, CA, 95601

River Pines Town Hall – 22900 Canyon Avenue, River Pines, CA, 95675



Fiddletown Community Center – 14445 Fiddletown Road, Fiddletown, CA, 95629

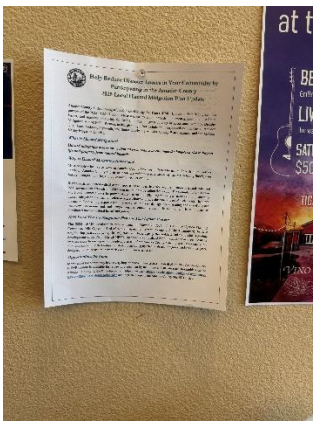
Plymouth City Hall – 9426 Main Street, Plymouth, CA, 95669



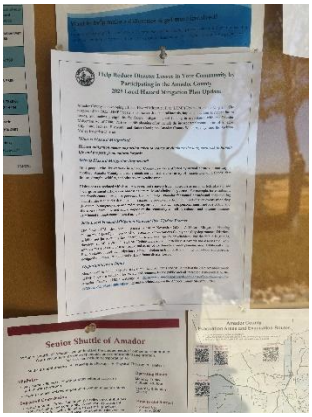
Ione City Hall – 1 East Main Street, Ione, CA, 95640

Camanche Blue's General Store – 4232 Camanche Parkway North, Ione, CA, 95640

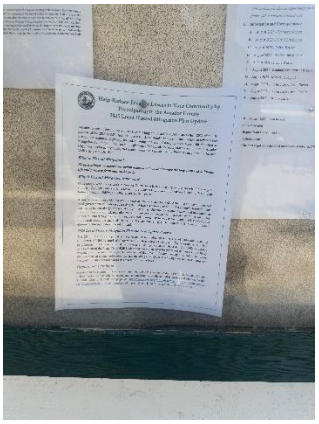
Amador County Health & Human Services – 10877 Conductor Blvd, Sutter Creek, CA, 95685



Amador County Transportation Commission Office – 117 Valley View Way, Sutter Creek, CA, 95685

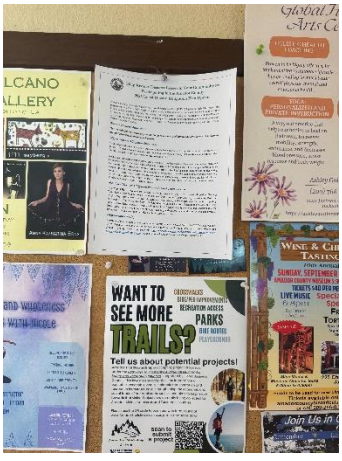


Sutter Creek City Hall – 18 Main Street, Sutter Creek, CA, 95685

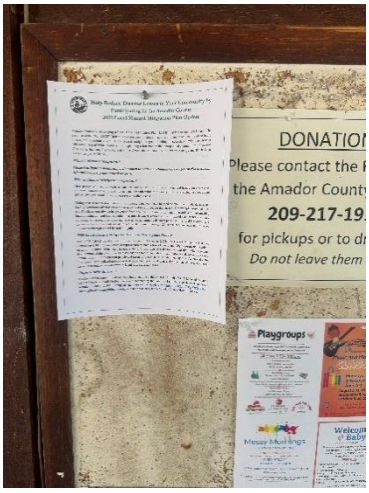


Sizemore County Store - 16146 Main Street, Volcano, CA, 95689

Volcano Post Office – 16120 Main Street, Volcano, CA, 95689

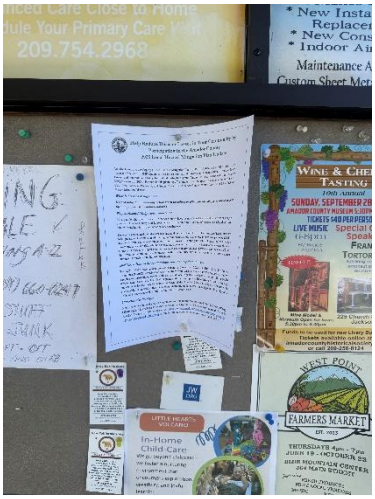


Pioneer Branch Library – 25070 Buckhorn Ridge Road, Pioneer, CA, 95666

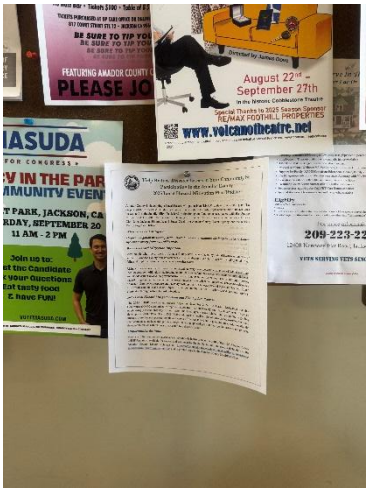


Young's Payless Market – 26560 Highway 88, Pioneer, CA, 95666

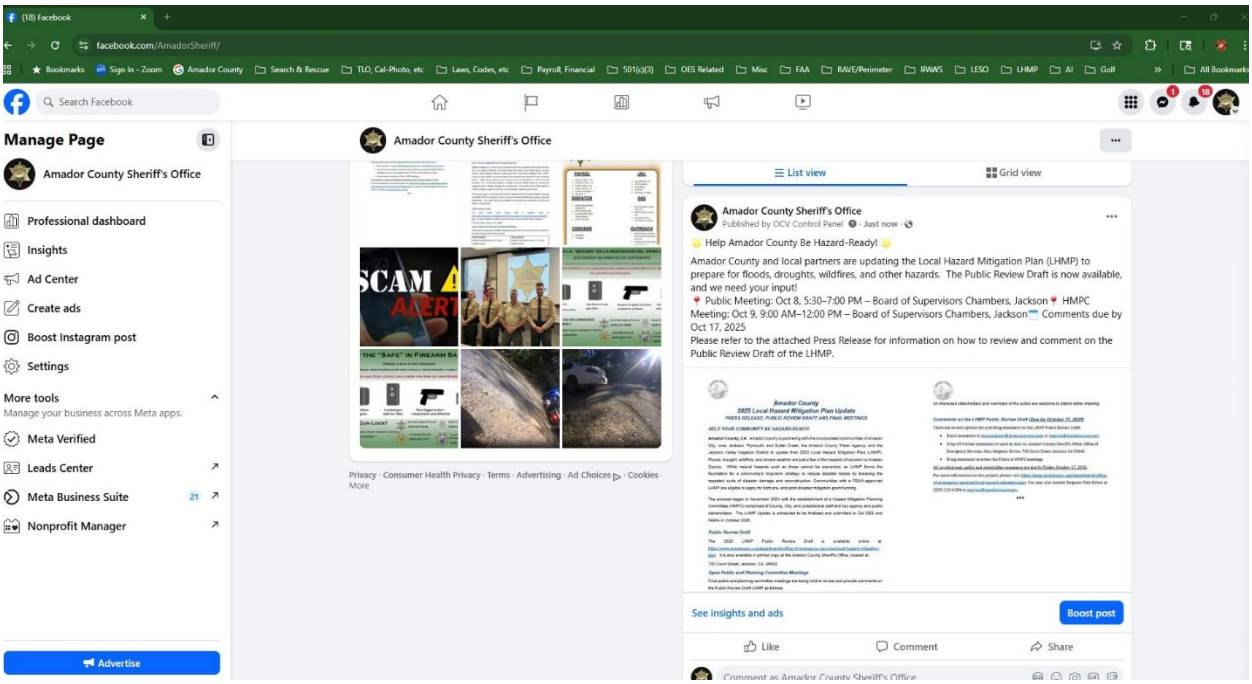
Pine Grove Market – 19394 Highway 88, Pine Grove, CA, 95665



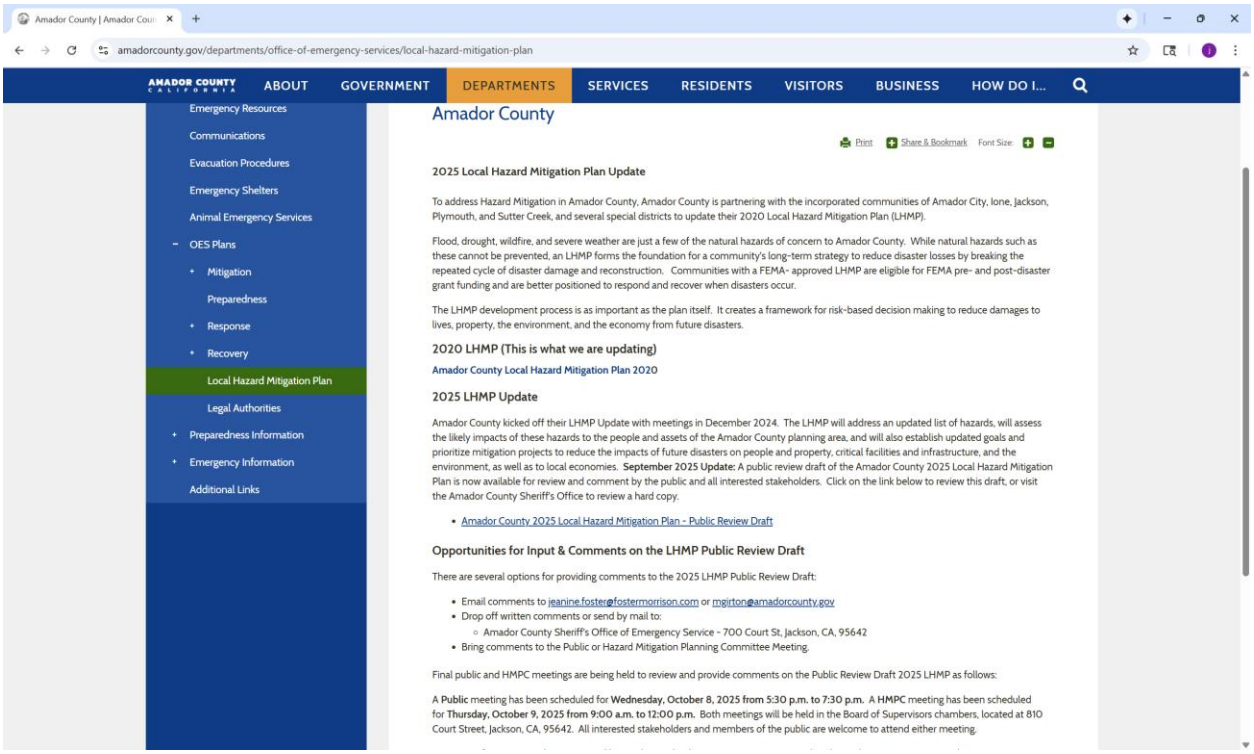
Amador County Administration Building – 810 Court Street, Jackson, CA, 95642



A.7.10. Public Meeting #2 - Amador County Sheriff's Office Facebook Page – September 15, 2025



A.7.11. Public Meeting #2 – Website Invite for Public Comment and Public Meeting



A.7.12. Public Meeting #2: Newspaper Article inviting Public Input

AD ID #: Y514 - LHMP

PROOF OF PUBLICATION
(2015-5 C.C.P.)

STATE OF CALIFORNIA
COUNTY OF AMADOR

I am a citizen of the United States and a resident of the said County. I am over the age of eighteen years; and not a party to or interested in the above matter. I am the principal Clerk of the Printer and Publisher of the Amador Ledger Dispatch. A newspaper of general circulation, published once a week in the City of Jackson, California, County of Amador, and which newspaper has been adjudicated a newspaper of general circulation by the Superior Court, of the County of Amador, State of California dated June 19, 1953, Court decree numbers; 5575/5551; that the notice of which the annexed is a printed copy (set in type not smaller than nonpereil) has been published in each regular and entire issue of said newspaper and not in any supplement thereof on the following dates; to wit:

September 19, 26

all in the year: 2025

I certify (or declare) under Penalty of perjury that the foregoing is true and correct.

Date at Jackson, California this

26 of September 2025

Paula Mitchell
SIGNATURE

Amador Ledger Dispatch
P.O. Box 1240
106 Water Street
Jackson, CA 95642
(209) 223-8761

PUBLIC NOTICE

Amador County
2025 Local Hazard Mitigation Plan Update
Press Release: Public Review Draft and Final Meetings

HELP YOUR COMMUNITY BE HAZARD-READY!

Amador County, CA: Amador County is partnering with the incorporated communities of Amador City, Ione, Jackson, Plymouth, and Sutter Creek; the Amador County Water Agency; and the Jackson Valley Irrigation District to update their 2020 Local Hazard Mitigation Plan (LHMP). Floods, drought, wildfires, and severe weather are just a few of the hazards of concern to Amador County. While natural hazards such as these cannot be prevented, an LHMP forms the foundation for a community's long-term strategy to reduce disaster losses by breaking the repeated cycle of disaster damage and reconstruction. Communities with a FEMA-approved LHMP are eligible to apply for both pre- and post-disaster mitigation grant funding.

The process began in November 2024 with the establishment of a Hazard Mitigation Planning Committee (HMPC) comprised of County, City, and jurisdictional staff and key agency and public stakeholders. The LHMP Update is scheduled to be finalized and submitted to Cal OES and FEMA in October 2025.

Public Review Draft

The 2025 LHMP Public Review Draft is available online at: https://www.amadorgov.org/departments/office-of-emergency-services/local-hazard-mitigation-plan. It is also available in printed copy at the Amador County Sheriff's Office, located at:
700 Court Street, Jackson, CA, 95642

Open Public and Planning Committee Meetings

Final public and planning committee meetings are being held to review and provide comments on the Public Review Draft LHMP as follows:

Public Meeting	HMPC Meeting
October 8 (Wednesday) 5:30-7:00 pm	**October 9 (Thursday) 9:00 am – 12:00 pm**
Amador County **Board of Supervisors Chambers** **810 Court Street** **Jackson, CA 95642**	**Amador County** **Board of Supervisors Chambers** **810 Court Street** **Jackson, CA 95642**

All interested stakeholders and members of the public are welcome to attend either meeting.

Comments on the LHMP Public Review Draft (Due by October 17, 2025)

There are several options for providing comments on the LHMP Public Review Draft:

- Email comments to jeanine.foster@fostermorrison.com or mgirton@amadorcounty.gov
- Drop off written comments or send by mail to: Amador County Sheriff's Office, Office of Emergency Services, Attn. Sergeant Girton, 700 Court Street, Jackson, CA 95642
- Bring comments to either the Public or HMPC meetings

All jurisdictional, public and stakeholder comments are due by Friday, October 17, 2025.

For more information on this project, please visit: https://www.amadorgov.org/departments/office-of-emergency-services/local-hazard-mitigation-plan. You may also contact Sergeant Matt Girton at (209) 223-6384 or mgirton@amadorcounty.gov.

PUBLISHED: AMADOR, LEDGER DISPATCH, SEPTEMBER 19, 26, 2025-Y514

A.7.13. Public Meeting #2: Agenda

AGENDA

AMADOR COUNTY MULTI-JURISDICTIONAL LOCAL HAZARD MITIGATION PLAN (LHMP) UPDATE

Public Meeting #2

Wednesday October 8, 2025
5:30 - 7:00 pm
Board of Supervisors Chambers
810 Court Street
Jackson, CA 95642

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1. Introductions
2. Overview of the LHMP Development Process
3. Overview of the Amador County LHMP
4. Public Comments and Input
5. Next Steps
6. Questions

A.7.14. Public Meeting #2: Sign in Sheets

SIGN-IN SHEET
AMADOR COUNTY LOCAL HAZARD MITIGATION PLANNING PROJECT
Public Meeting #2: Draft LHMP
October 8, 2025 (5:30-7:00 pm)
Board of Supervisors Chambers | Jackson, California

Name/Title	Email Address	Phone	Department/Organization/ Affiliation
Jeff Bellotti / Lt. ACSO	jbellotti@amadorcounty.gov	209-223-6672	ACSO

A.7.15. Public Comments

No public or other stakeholder comments were received during the 2025 LHMP Update development process.

A.8 Meeting Handouts

Below are the handouts for each meeting. Handouts specific to the Mitigation Strategy Meetings can be found in Appendix C.

A.8.1. HMPC Meeting #1: Kickoff Meeting Handouts

Amador County LHMP Update: Hazard Identification and Profiles – 2024

Disaster Declarations and National Weather Service Research

Amador County Disaster History

Amador County – Disaster Declarations 1950-2024

Year	Disaster Name	Disaster Type	Disaster Cause	State Declaration # and Date	Federal Declaration # and Date
2023	California Severe Winter Storms, Straight-line Winds, Flooding, Landslides, and Mudslides	Storm	Storm	–	DR-4699 4/3/2023
2023	California Severe Winter Storms, Flooding, Landslides, and Mudslides	Flood	Severe winter storms	3/01/2023	EM-3592 3/10/2023
2023	California Severe Winter Storms, Flooding, Landslides, and Mudslides	Flood	Severe winter storms	2023-01 1/4/2023	DR-4683 1/14/2023
2021	December 2021 Storms	Storm	Storm	2022-03 12/30/2021	–
2021	California Caldor Fire	Fire	Fire	2021-06 8/17/2021 9/1/2021	EM-3571 9/1/2021
2020	California Covid-19 Pandemic	Biological	Biological	3/22/2020	DR-4482 3/22/2020
2020	California Covid-19 Pandemic	Biological	Biological	3/13/2020	EM-3428 3/13/2020

Year	Disaster Name	Disaster Type	Disaster Cause	State Declaration # and Date	Federal Declaration # and Date
2019	California Severe Winter Storms, Flooding, Landslides, And Mudslides	Storms	Storms	2019-03 5/18/2019	DR-4434 5/18/2019
2017	Severe Winter Storms, Flooding, Mudslides in California	Flood	Storms	2017-03 3/7/2017	DR-4308 4/1/2017
2017	Severe Winter Storms, Flooding, and Mudslides in California	Storm	Storm	2017-01 1/23/2017	DR-4301 2/14/2017
2015	California Butte Fire	Fire	Fire	–	FM-5111 8/16/2016
2015	California Drought/Tree Mortality	Drought	Drought	2015-05 10/10/2015	–
2015	Summer 2015 Wildfires	Fire	Fire	2015-03 8/27/2015	DR-4240 9/22/2015
2007	2007 Severe Freeze	Freeze	Freeze	2007-02 01/12/07, 01/16/07, 01/19/07, 01/20/07, 01/26/07	DR-1689 3/13/2007
2006	California Severe Storms, Flooding, Landslides, and Mudslides	Flood	Storms	2006-03 4/10/2006	DR-1646 6/5/2006
2005/2006	Severe Storms, Flooding, Mudslides, and Landslides in California	Flood	Storms	2006-01 1/12/2006	DR-1628 2/3/2006
2005	Hurricane Katrina Evacuations	Economic	Hurricane	–	EM-3248 2/3/2006
2001	Energy Emergency	Economic	Greed	1/1/2001	–
1998	California Severe Winter Storms and Flooding	Flood	Storms	–	DR-1203 2/9/1998
1997	California Severe Storms/flooding	Flood	Storms	97-01 1/2/1997-1/31/1997	DR-1155 1/4/1997

Year	Disaster Name	Disaster Type	Disaster Cause	State Declaration # and Date	Federal Declaration # and Date
1995	California Severe Winter Storms, Flooding, Landslides, Mud Flows	Flood	Storms	95-03-N 95-04-S 3/12/1995-3/24/1995	DR-1046 3/12/1995
1995	California Severe Winter Storms, Flooding, Landslides, Mud Flows	Flood	Storms	95-01 1/09/1995-2/17/1995	DR-1044 1/10/1995
1986	California Severe Storms, Flooding	Flood	Storms	86-01 2/18/1986-3/12/1986	DR-758 2/21/1986
1982	Heavy Rain and Flooding	Flood	Storms	82-03 4/1/1982	–
1980	April Storms	Flood	Storms	80-01 4/1/1980	–
1977	California Drought	Drought	Drought	–	EM-3023 1/20/1977
1976	1976 Drought	Drought	Drought	2/9/76, 2/13/76, 2/24/76, 3/26/76, 7/6/76	–
1969	California Severe Storms, Flooding	Flood	Storms	1/23/69, 1/25,69, 1/28/69, 1/29/69, 2/8/69, 2/10/69, 2/16/69, 3/12/69	DR-253 1/26/1969
1964	California Heavy Rains & Flooding	Flood	Storms	12/22/64, 12/23/64, 12/28/64, 1/5/65, 1/14/65	DR-183 12/24/1964
1964	Seismic Sea Wave	Other	Other	–	DR-169 4/1/1964
1963	Severe Storms, Heavy Rains and Flooding	Flood	Storms	2/7/63, 2/26/63, 2/29/63, 4/22/63	DR-145 2/25/1963
1962	Severe Storms and Flooding	Flood	Storms	–	DR-138 10/24/1962
1961	1961 Widespread Fires	Fire	Fire	9/8/1961	–

Year	Disaster Name	Disaster Type	Disaster Cause	State Declaration # and Date	Federal Declaration # and Date
1959	1959 Heavy Rains	Flood	Storms	9/17/1959	–
1958	1958 April Storms and Floods	Flood	Storms	4/2/1958	DR-82 4/4/1958
1958	1958 February Storms and Floods	Flood	Storms	2/26/1958	–
1955	1955 Floods	Flood	Flood	12/22/1955	12/23/1955
1950	1950 Floods	Flood	Flood	50-01 11/21/1950	DR-15 2/15/1954

Amador County State and Federal Disasters Disaster Declaration Summary by Hazard Type 1950-2024

Disaster Type	State Declarations		Federal Declarations	
	Count	Years	Count	Years
Drought	2	1976, 2015	1	1977
Economic	1	2001	0	–
Fire	2	1961, 2021	3	2015, 2016, 2021
Flood	23	1950, 1955, 1958 (twice), 1959, 1963, 1964, 1965, 1969, 1980, 1982, 1986, 1995 (twice*), 1997, 2006 (twice*), 2017 (twice*), 2019*, 2021, 2023 (twice*)	20	1950, 1955, 1958, 1962, 1963, 1964, 1969, 1986, 1995 (twice*), 1997, 1998, 2006 (twice*), 2017 (twice*), 2019*, 2023 (three*)
Freeze	1	2007	1	2007
Hurricane	0	–	1	2005
Pandemic	2	2020 (twice)	2	2020 (twice)
Seismic Sea Wave (Tsunami)	0	–	1	1964
Totals	**31**	–	**29**	**–**

Source: Cal OES/ FEMA

* Landslides were also included in these flood disaster declarations.

Amador County Disasters since 2020 LHMP

- 2020 California Covid-19 Pandemic (2 state and 2 federal declarations)
- 2021 California Caldor Fire (state and federal declaration)
- 2021 December 2021 Storms (state declaration)
- 2023 California Severe Winter Storms, Flooding, Landslides, and Mudslides (2 state and 3 federal declarations)

Severe Weather Events

NCDC Storm Events 1950 to 7/31/2024

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Cold/Wind Chill	3	0	0	0	0	$0	$0
Debris Flows	20	0	0	0	0	$26,000	$0
Dense Fog	373	0	13	53	59	$5,073,000	$0
Drought	249	0	0	0	0	$0	$0
Dust Devil	1	0	0	0	0	$500	$0
Dust Storm	5	0	0	0	0	$100,000	$0
Excessive Heat	22	0	0	0	0	$0	$0
Extreme Cold/Wind Chill	4	0	0	0	0	$0	$0
Flash Flood	5	0	0	0	0	$25,000	$0
Flood	69	0	0	0	0	$6,118,000	$5,800,000
Frost/Freeze	190	0	0	0	0	$100,000	$402,955,000
Funnel Cloud	21	0	0	0	0	$0	$0
Hail	22	0	0	0	4	$110,000	$3,656,000
Heat	100	32	0	10	0	$170,000	$224,801,000
Heavy Rain	38	0	0	0	0	$201,000	$49,060,000
Heavy Snow	328	0	0	0	0	$0	$0
Heavy Wind	2	0	0	0	0	$0	$0
High Wind	91	0	0	0	4	$211,817,000	$150,000
Landslide	2	0	0	0	0	$28,000	$0
Lightning	7	0	0	0	0	$32,500	$0
Strong Wind	141	1	0	0	0	$2,174,900	$57,000
Thunderstorm Winds	16	0	0	0	0	$181,000	$7,800,000
Tornado	10	0	0	0	0	$147,750	$30,000
Wildfire	118	4	1	97	7	$47,328,000	$0
Winter Storm	183	2	1	0	0	$8,405,000	$0
Winter Weather	79	0	1	0	0	$282,000	$0
Total	**2099**	**39**	**16**	**160**	**74**	**$282,319,650**	**$694,309,000**

Source: NCDC

*Note: Losses reflect totals for all impacted areas, some of which fell outside of Amador County

FEMA's National Risk Index, 2024: List of 18 Hazards

FEMA's National Risk Index is a dataset and online tool that can be used to help communities better understand the natural hazard risk to their communities. FEMA requires LHMPs to utilize the 18 identified hazards as a starting point for determining hazards of concern in their Hazard Mitigation Planning Process.

- Avalanche
- Coastal Flooding
- Cold Wave
- Drought
- Earthquake
- Hail
- Heat Wave
- Hurricane
- Ice Storm
- Landslide
- Lightning
- Riverine Flooding
- Strong Wind
- Tornado
- Tsunami
- Volcanic Activity
- Wildfire
- Winter Weather

Hazards Comparison List

2019 County LHMP Hazards	Amador County General Plan Safety Element (2016)	2023 State of California Plan Applicable Hazards	Proposed 2025 Hazards
Agricultural Hazards: Severe Weather/Insect/Pests	–	Invasive and Nuisance Species	Agricultural Hazards: Severe Weather/Pests/Invasive Species
Aquatic Invasive Species	–	Invasive and Nuisance Species	–
Avalanche	Avalanche	Snow Avalanche	Avalanche
Climate Change	–	Climate Change & Related Hazards	Climate Change
Dam Failure	As part of Seismic Hazards	Dam Failure	Dam Failure
Drought & Water shortage	–	Droughts and Water Shortage	Drought & Water shortage
Earthquake (large damaging/small)	As part of Seismic Hazards	Earthquake	Earthquake (w/subhazards)
Floods: 1%/0.2% annual chance	Flood Hazards	Riverine, Stream, and Alluvial Flood	Floods: 1%/0.2% annual chance (w/levee failure)
Floods: Localized Stormwater	Flood Hazards	–	Floods: Localized Stormwater
Landslide, Mudslide, Debris Flow	As part of Seismic Hazards	Landslide, Debris Flow, and Other Earth Movements	Landslide, Mudslide, Debris Flow
Levee Failure	–	Levee Failure	*(Include in Flood 1%/0.2%)*
Pandemic	–	Epidemic, Pandemic, and Vector Borne Disease	--
			Severe Weather: Extreme Cold, Freeze, and Snow
Severe Weather: Extreme Heat	–	Extreme Heat/Freeze	Severe Weather: Extreme Heat
Severe Weather: Heavy Rains and Storms (Hail, Lightning)	–	Severe Wind, Weather, and Storms	Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)
Severe Weather: High Winds and Tornadoes	–	Part of Severe Wind, Weather, and Storms listed above	Severe Weather: High Winds and Tornadoes
Severe Weather: Winter Storms and Freeze	–	Part of Severe Wind, Weather, and Storms listed above	*(include in above Severe Weather: Extreme Cold, Freeze, and Snow)*
Wildfire	Fire Hazards	Wildfire	Wildfire

* Power Outages/PSPS will be discussed as a Common Vulnerability/Impact of all hazards

Amador County Hazard Identification Assessment

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Agricultural Hazards (severe weather/pests/invasive species)					
Avalanche					
Climate Change					
Dam Failure					
Drought & Water shortage					
Earthquake (w/subhazards)					
Floods: 1%/0.2% annual chance (w/ levee failure)					
Floods: Localized Stormwater					
Landslide, Mudslide, Debris Flow					
Severe Weather: Extreme Cold, Freeze, and Snow					
Severe Weather: Extreme Heat					
Severe Weather: Heavy Rains and Storms (Hail, Lightning)					
Severe Weather: High Winds and Tornadoes					
Wildfire (w/smoke and air quality)					

Geographic Extent
Limited: Less than 10% of planning area
Significant: 10-50% of planning area
Extensive: 50-100% of planning area

Likelihood of Future Occurrences
Highly Likely: Near 100% chance of occurrence in next year, or happens every year.
Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.
Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.
Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Magnitude/Severity
Catastrophic: More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths
Critical: 25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability
Limited: 10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability
Negligible: Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance
Low: Minimal potential impact
Medium: Moderate potential impact
High: Widespread potential impact

Climate Change Influence
Low: Minimal potential impact
Medium: Moderate potential impact
High: Widespread potential impact

*Amador County LHMP Update: 2025 Hazards**

- Agricultural Hazards (severe weather/pests/invasive species)
- Avalanche
- Climate Change
- Dam Failure
- Drought & Water Shortage
- Earthquake (w/ subhazards)
- Flood: 1%/0.2% annual chance (w/ levee failure)
- Flood: Localized Stormwater
- Landslide, Mudslide, and Debris Flow
- Severe Weather: Extreme Cold, Freeze, and Snow
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)
- Severe Weather: High Winds and Tornadoes
- Wildfire (w/ smoke and air quality)

* Power Outages/PSPS will be treated as a common vulnerability/impact of above hazards

Amador County LHMP Update: Historic Hazard Worksheet (Past Occurrences)

Please fill out one sheet for each significant hazard event with as much detail as possible. Attach supporting documentation, photocopies of newspaper articles, links, or other original sources.

Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Crop damage	
Infrastructure damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Opinion on likelihood of occurring again	
Source of information	
Comments	

	Please return worksheets by mail, email, or fax to: Jeanine Foster, Foster Morrison 6095 Zang Way Arvada, CO 80004 fax: (720) 893-0863 email: jeanine.foster@fostermorrison.com
Prepared by:	
Phone:	
Email:	
Date:	

A.8.2. HMPC Meeting #2: Risk Assessment Meeting Handouts

AGENDA

AMADOR COUNTY MULTI-JURISDICTIONAL
LOCAL HAZARD MITIGATION PLAN (LHMP) UPDATE
Hazard Mitigation Planning Committee (HMPC)
Meeting #2 – Risk Assessment

April 9, 2025
1:00 - 4:00 pm
Board of Supervisors Chambers
810 Court Street
Jackson, CA 95642

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1. Introductions
2. Status of the DMA Planning Process
3. Review of Risk Assessment (PowerPoint)
4. Open Discussion and Input on the Risk Assessment (Handout)
5. Review of Data Needs
6. Next Steps
7. Questions?

Contact Info:

Jeanine Foster (jeanine.foster@fostermorrison.com) (303.717.7171)

FOSTER MORRISON CONSULTING

Foster Morrison Consulting, Ltd.

Status of the 2025 Amador County LHMP Update Project/Next Steps

FEMA's 4-Phase-10 Step DMA/CRS Planning Process

Phase I: Organize Resources

1) Get organized

2) Plan for public involvement

3) Coordinate with other departments and agencies

Phase II: Risk Assessment

4) Identify the hazard(s)

5) Assess the risks

Capability Assessment

Phase III: Mitigation Strategy

6) Set planning goals

7) Review mitigation alternatives

8) Draft an action plan

Phase IV: Adoption and Implementation

9) Adopt the plan

10) Implement the plan, evaluate its worth, and revise as needed

LHMP Update Project Schedule/Key Dates

2025 LHMP Update Meetings

- **April 9** (Wednesday) HMPC Meeting #2 (Risk Assessment) (1:00-4:00 pm)
- **June 11** (Wednesday) HMPC Meeting #3 (Mitigation Strategy: Goals Development) (1:00-4:00 pm)
- **June 12** (Thursday) HMPC Meeting #4 (Mitigation Strategy: Actions/Projects) (9:00 am -12:00 pm)
- **October 8** (Wednesday) Final Public Meeting #2 (Draft Plan) (5:30-7:00 pm)
- **October 9** (Thursday) HMPC Meeting #5 (9:00 am -12:00 pm)

LHMP Document Drafts

- **August 1** (Friday): HMPC (First) Draft LHMP to Amador/HMPC
- **August 29** (Friday): Amador/HMPC comments due on Draft Plan
- **September 12** (Friday): Comments incorporated into Public Review (Second) Draft to Amador/HMPC
- **September 17** (Tuesday): Public Review Draft on Amador website
- **October 17** (Friday)**:** all final Amador, HMPC and Public input to Foster Morrison

- **October 31** (Friday): All final comments incorporated and LHMP submittal to Cal OES – October 2025

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Agricultural Hazards: Severe Weather/Invasive Species (pests/weeds)	Extensive	Highly Likely	Limited	Medium	Medium
Avalanche	Limited	Likely	Critical	Medium	Medium
Climate Change	Extensive	Likely	Limited	Medium	--
Dam Failure	Limited	Unlikely	Critical	Medium	Medium
Drought & Water Shortage	Extensive	Likely	Critical	Medium	High
Earthquake (w/subhazards)	Extensive	Unlikely	Catastrophic	Medium	Low
Floods: 1%/0.2% Annual Chance (w/ levee failure)	Significant	Occasional/Unlikely	Critical	Medium	Medium
Floods: Localized Stormwater	Extensive	Highly Likely	Limited	Medium	Medium
Landslide, Mudslide, Debris Flow	Limited	Likely	Critical	Medium	Medium
Severe Weather: Extreme Cold, Freeze, and Snow	Extensive	Highly Likely	Limited	Medium	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Limited	Medium	High
Severe Weather: Heavy Rains and Storms (Hail, Lightning)	Extensive	Highly Likely	Limited	Medium	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Highly Likely	Limited	Medium	Medium
Wildfire (w/smoke and air quality)	Extensive	Highly Likely	Catastrophic	High	Medium

Geographic Extent

Limited: Less than 10% of planning area

Significant: 10-50% of planning area

Extensive: 50-100% of planning area

Likelihood of Future Occurrences

Highly Likely: Near 100% chance of occurrence in next year, or happens every year.

Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.

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Magnitude/Severity

Catastrophic: More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths

Critical: 25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability

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Negligible: Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance

Low: Minimal potential impact

Medium: Moderate potential impact

High: Widespread potential impact

Climate Change Influence

Low: Minimal potential impact

Medium: Moderate potential impact

High: Widespread potential impact

Risk Assessment Methodology

Calculating Likelihood of Future Occurrence

The frequency of past events is used in this section to gauge the likelihood of future occurrences. Based on historical data, the likelihood of future occurrence is categorized into one of the following classifications:

- **Highly Likely**: Near 100% chance of occurrence in next year, or happens every year.
- **Likely**: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.
- **Occasional**: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.
- **Unlikely**: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Calculating Vulnerability

Vulnerability is measured in general, qualitative terms, and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential:

- **Extremely Low**: The occurrence and potential cost of damage to life and property is very minimal to non-existent.
- **Low**: Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**: Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**: Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have already occurred in the past.
- **Extremely High**: Very widespread and catastrophic impact.

Defining Significance (Priority) of a Hazard

Defining the significance or priority of a hazard to a community is based on a subjective analysis of several factors. This analysis is used to focus and prioritize hazards and associated mitigation measures for the plan. These factors include the following:

- **Past Occurrences**: Frequency, extent, and magnitude of historic hazard events.
- **Likelihood of Future Occurrences**: Based on past hazard events.
- **Ability to Reduce Losses through Implementation of Mitigation Measures**: This looks at both the ability to mitigate the risk of future occurrences as well as the ability to mitigate the vulnerability of a community to a given hazard event.

Risk Assessment Summary: Amador County Planning Area

Agricultural Hazards: Severe Weather/Invasive Species (Pests and Weeds)

- Agricultural losses occur on an annual basis and are usually associated with severe weather events, including heavy rains, floods, freeze, heat, and drought. Other agricultural hazards include fires, crop and livestock disease, insects, and noxious weeds.
- According to the California Invasive Plant Council, **insects of concern to plants and crops include**: Glassy-winged sharp shooter, Gypsy moth, Japanese beetle, Mediterranean fruit fly, Melon fruit fly, Oriental fruit fly, and Bark beetle. **Invasive weeds include**: Rush Skeletonweed, Giant Reed, Oblong Spurge, Tamarisk, Yellow Starthistle, Scotch Broom, Perrenial Pepperweed, Scotch Thistle, Spanish Broom, Barb Goatgrass, French Bloom, Medusahead, Diffuse Knapweed, Spotted Knapweed. **Aquatic Invasive Species include**: Zebra and Quagga Mussels, invasive fish species, and aquatic weeds such as hydrilla, water hyacinth, Arundo, Loosestrife, Sesbania, and the South American Spongeplant.
- The Amador County Agricultural Commissioner noted that the County is most concerned with drought, freeze, and insect infestations and issues and their impacts on the agricultural industry.
- There have been no FEMA or state disaster declarations associated specifically with the Agricultural industry. The NCDC contains no records of Ag incidents in the County. The USDA has issued numerous Ag declarations related to severe weather events over the past 50 years and from 2012 – 2024 include: 16 Drought; 1 Excessive Rain, High Winds, Cold Temperatures, Hail; 1 Excessive Rain; and 2 Freeze.
- CAN COUNTY AG CONFIRM THE SPECIFIC PESTS/WEEDS OF CONCERN TO THE COUNTY? CAN THE COUNTY PROVIDE DAMAGE INFORMATION ON PAST OCCURRENCES OR SPECIFIC CONCERNS/ISSUES? TO DROUGHT, FREEZE, INSECTS?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium / High?
- Priority Hazard

Avalanche

- The vast majority of avalanches occur during and shortly after storms. This hazard generally affects a small number of people, such as snowboarders, skiers, and hikers who venture into backcountry areas during or after winter storms. Road and highway closures, damaged structures, and destruction of forests are also a direct result of avalanches. The combination of steep slopes, abundant snow, weather, snowpack, and an impetus to cause movement, can lead to an avalanche event.
- Avalanche-prone areas are found upcountry in eastern Amador, primarily along SR 88 in the Devil's Gate and Kirkwood areas, where these conditions readily occur.
- No federal or state disaster declarations. The NCDC database shows 5 avalanche events in Amador County since 1993. While past occurrences show annual incidents of avalanches, the only avalanche related deaths in Amador occurred at the Kirkwood area in 2018 when a mother and her son died skiing back to their cabin in Kirkwood. Since the 2020 LHMP, in March 2024, an avalanche closed Highway 88 for a 3.5 mile stretch in Amador County.
- CAN THE COUNTY PROVIDE ADDITIONAL INFORMATION ON PAST OCCURRENCES CAUSING DAMAGES OR SPECIFIC CONCERNS/ISSUES?
- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium

- Non-Priority Hazard?

Climate Change

- The 2023 State of California Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and both snowmelt and rainwater running off sooner in the year. Climate Change has the potential to alter the nature and frequency of most hazards.
- Snow levels seem to be higher (or larger) each year, and the recent atmospheric river winter rains are more intense. In addition, the Amador County Air Quality District noted that within the last five years, Amador County has experienced extreme droughts that have affected the health of the forest. The lack of rain contributed to the Bark Beetle infestation, causing thousands of trees to die. This has led to large areas of Amador County being at higher risk of wildfire. The combined effects of the drought, decline in the health of the forest, temperature changes, and wildfires in and around neighboring counties, much contributed to climate change, have also led to poor air quality.
- DO ANY JURISDICTIONS HAVE ADDITIONAL INFORMATION ON CLIMATE CHANGE IMPACTS OR SPECIFIC CONCERNS/ISSUES?
- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium
- Priority Hazard

Dam failure

- According to data provided by Cal DWR, DSOD data, there are 20 dams in Amador County constructed for flood control, storage, electrical generation, and recreational purposes. Of these, 4 are rated as extremely high, 9 rated as High Hazard, 1 as Significant Hazard, and 6 as Low Hazard.
- In addition to these dams located within Amador County, there are 16 other dams (2 Extremely High, 8 High Hazard, 4 Significant Hazard, and 2 Low Hazard) outside the County (located in San Joaquin, El Dorado, Calaveras, Alpine Counties) with the potential to affect people and property in Amador County.
- All 6 Extremely High and 16 of the 17 High Hazard dams (all but Patterson in El Dorado County) have inundations in Amador County. There is no inundation data available for any of the Significant or Low Hazard dams.
- The most significant dams of concern include the Extremely High and High Hazard dams where loss of life is possible. The failure of a dam may affect the dam site and downstream areas.
- Unincorporated County is the only jurisdiction with dam inundation areas from Extremely High Hazard dams. Unincorporated County and the Cities of Ione and Jackson are the only 3 jurisdictions with dam inundation areas from High Hazard dams intersecting their jurisdictions.
- WHAT DAMS ARE OF GREATEST CONCERN TO THE AMADOR COUNTY PLANNING AREA AND PARTICIPATING JURISDICTIONS?
- According to multiple sources, there have been no past dam failure events affecting Amador County.
- Likelihood of Future Occurrence: Unlikely
- Vulnerability: High or Extremely High
- Priority Hazard

Drought and Water Shortage

- Amador County has been in and out of drought since 2014. Historical drought data for the Amador County Planning Area and region indicate there have been 5 significant droughts in the last 87 years.
- 2 state (1976, 2014) disaster declarations and 1 federal declaration (1977) for Amador County since 1950. There have been 158 NCDC drought events in Amador County, all related to events in the 2014 to 2023 drought. Since 2020, drought has led to an increase in tree mortality resulting in 40 local emergency proclamations for tree mortality.
- According to the Amador Water Agency (AWA) 2024-2025 Annual Water Supply & Demand Assessment Shortage Report, the Agency has a significant surplus of water supply above current and projected demands. The Amador Water System (AWS) water supply is a pre-1914 water right that has never been curtailed in the most severe single-year or a multiple-year drought. In addition, while the water supply associated with the Central Amador Water Project (CAWP) was temporarily curtailed during recent drought years, the significant storage volume in the Lower Bear Reservoir has allowed previous water supply demands to be met, and are expected to be met in the future, even in dry years. The total well capacity for the portion of both systems reliant on groundwater are larger than current and projected demands. (All TRUE?)
- Key concerns related to drought and water shortage, include an increase in tree mortality and wildfire conditions leading to an increase in risk of more catastrophic wildfires, availability of water for fire fighting, and an increase in conservation measures and restrictions. (OTHERS?)
- CAN JURISDICTIONS PROVIDE DAMAGES OR RESTRICTIONS THAT HAVE OCCURRED DUE TO THE MOST RECENT DROUGHT. WAS WATER SUPPLY AFFECTED IN THE COUNTY, EVEN IN THE SHORT TERM?
- Likelihood of Future Occurrence: Drought - Likely/Water supply - Occasional
- Vulnerability: Medium
- Priority Hazard

Earthquake

- According to the 2016 Amador County Safety Element, the County is located in a relatively aseismic area with respect to other more seismically active areas in California. No Alquist-Priolo earthquake fault zones are located in the County, and areas subject to liquefaction, ground failure, or surface rupture are not identified on State hazard Maps. However, ground shaking may be experienced in western Amador from distant earthquakes occurring to the west and the east. To the west these include, the San Andreas fault and the somewhat closer Hayward fault.
- Other potential sources for earthquakes in Amador County are the faults associated with the western edge of the Central Valley, recently defined as the Coast Range Central Valley (CRCV) boundary thrust fault system. Various documents define portions of this little known system as the Midland Fault Zone or the Dunnigan Hills fault where the 1892 Vacaville-Winters earthquake occurred. The eastern portion of the County is at greatest risk to earthquakes on faults located on both sides of the California-Nevada border. Structural damage from past earthquakes has not historically been reported in Amador County.
- The Uniform Building Code (UBC) identifies four seismic zones in the United States. The zones are numbered one through four, with Zone 4 representing the highest level of seismic hazard. The UBC establishes more stringent construction standards for areas within Zones 3 and 4. All of California lies within either Zone 3 or Zone 4. Amador County is within the less hazardous Zone 3.
- The USGS National Seismic Hazard Maps provides acceleration and probabilities for various time periods. This data indicates that the expected severity of earthquakes in the region is mostly low.

- USGS identified 65, 5.0 or greater earthquakes have occurred within 90 miles of City of Jackson in Amador.
- Hazus runs were conducted for the following: A Carson Range Fault 7.2 earthquake event; Great Valley (Dunnigan Hills) Fault 6.53 earthquake event; and a Hayward + Rogers Creek 7.58 earthquake event.
- WERE THERE ISSUES IN THE COUNTY FROM HISTORICAL EARTHQUAKES? GROUND SHAKING? HAVE ANY STUDIES BEEN DONE ON EARTHQUAKE AND SECONDARY IMPACTS SUCH AS TO DAMS AND LEVEES?
- THE COUNTY NOTED THAT THERE ARE NO URM OR SOFT STORY BUILDINGS IN UNINCORPORATED COUNTY. OTHER JURISDICTIONS?
- Likelihood of Future Occurrence: Unlikely – large, damaging earthquake; Occasional – minor earthquake
- Vulnerability: Extremely High
- Priority Hazard

Flood Hazards

1%/0.2% Annual Chance

- Historically, portions of Amador County have always been at risk to flooding because of its annual percentage of rainfall in the winter and the number of watercourses that traverse the County. Flooding in Amador County results from prolonged heavy rainfall (sometimes combined with snowmelt) over tributary areas primarily during the period from November through March.
- Amador County has mapped DFIRM floodplains which detail the risk of 1% and 0.2% annual chance flooding in the County.
- The 2016 Amador County Flood Insurance Study, FEMA determined that there are no certified levees (i.e., levees providing 1% annual chance level of protection) that exist within Amador County. There is an uncertified levee located along Sutter Creek within the City of Ione.
- 22 state and 20 federal declarations from 1950-present were for heavy rains and flooding. Flooding is an ongoing issue for the planning area. Since 2020, this includes one state (2021) and three state and federal (2023) disaster declarations. The NCDC lists 43 flood events since 1993.
- HMPC - REVIEW RISK ASSESSMENT AND ADD INFORMATION ON MAJOR FLOOD EVENTS. NEED SUMMARY OF IMPACTS FROM THE (1) 2021 AND (3) 2023 FLOOD EVENTS (THAT RESULTED IN DISASTER DECLRATIONS) FOR ALL JURISDICTIONS.
- Likelihood of Future Occurrence: 100-Occasional; 200 – Unlikely; 500-Unlikely
- Vulnerability: High
- Priority Hazard

Localized/Stormwater flooding

- Significant localized flood history in the County – occurs annually
- Recent atmospheric river events occurring in 2021, 2022, and 2023 have led to more significant flooding throughout the County.
- CAN EACH JURISDICTION PROVIDE DETAILS ON LOCALIZED FLOODING PROBLEM AREAS AND SPECIFIC CONCERNS? PICTURES/DESCRIPTIONS ON FLOOD EVENTS SINCE 2020?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium

- Priority Hazard

Landslides, Mudslides, and Debris Flows

- There have been no direct disaster declarations associated with landslides in Amador County. However, there have been 9 state and 10 federal disaster declarations related to flood that documented landslide issues. The NCDC contains no records of landslides in the County, but had one recorded debris flow event.
- CGS mapping indicates that the eastern portion of the County Planning Area has areas of high to very high susceptibility for landslides. The western portion of the County, while much more limited, also includes some areas at high to very high landslide susceptibility.
- WHAT SPECIFIC AREAS ARE AT RISK TO LANDSLIDES? ANY ACTIVE LANDSLIDES TO BE MITIGATED?
- CAN JURISDICTIONS PROVIDE INFORMATION ON PAST LANDSLIDE EVENTS AND PROBLEM AREAS? PHOTOS?
- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium
- Priority Hazard

Severe weather

Severe Cold, Freeze, and Snow

- Annual occurrences of cold temperatures and snow.
- In western Amador County monthly average minimum temperatures from November through April range from the upper-30s to mid-50s. The lowest recorded daily extreme was 20°F on December 20, 1998. In a typical year, minimum temperatures fall below 32°F on 5.2 days with no days falling below 0°F.
- In eastern Amador County monthly average minimum temperatures from November through April range from the mid-10s to mid-20s. The lowest recorded daily extreme was -26°F on January 19, 1937. In a typical year, minimum temperatures fall below 32°F on 231.4 days with 8.5 days falling below 0°F.
- Average snowfall in western Amador is 1.42 inches with record snowfall in 1967 of 9 inches.
- Average snowfall in eastern Amador is 380.2 inches with record snowfall in 1967 of 693.4 inches. Historical data of the highest daily snowfall on January 26, 1957, when 65.0 inches fell. The maximum snow depth was on March 24, 1983, with a depth of 199.0 inches.
- The County has had 1 past state disaster declaration for freeze (2007). NCDC identified 61 extreme cold or freeze events as well as 514 winter weather and storms.
- Amador County Public Works noted no other incidents since 2020 where damages, injuries, or deaths occurred. Large winter weather events occurred in late February to early March 2024, but the County had prepared well for the incidents.
- PLEASE PROVIDE DETAILS ON EXTREME COLD, FREEZE, AND SNOW EVENTS AND HOW YOUR JURISDICTION WAS AFFECTED.
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Extreme Heat

- Annual occurrences of hot temperatures.
- In western Amador County, monthly average maximum temperatures in the warmest months (May through October) range from the mid-70s to the low 90s. The highest recorded daily extreme was 110°F on July 14, 2006. In a typical year, maximum temperatures exceed 90°F on 69.3 days.
- In eastern Amador County, monthly average maximum temperatures in the warmest months (May through October) range from the mid-50s to the low 70s. The highest recorded daily extreme was 95°F on July 7,1998. In a typical year, maximum temperatures exceed 90°F on 0.3 days.
- There have been no FEMA or Cal OES disasters related to extreme heat and no USDA disaster declarations for extreme heat. The NCDC recorded 124 extreme heat events since 1993.
- PLEASE PROVIDE DETAILS ON EXTREME HEAT EVENTS AND HOW YOUR JURISDICTION WAS AFFECTED. DOES THE AIR QUALITY DISTRICT MAINTAIN AIR QUALITY DATA FOR EXTREME HEAT DAYS?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Heavy rains and storms (Hail, Lightning)

- Significant County history: annual occurrences.
- According to the WRCC, average annual precipitation in western Amador County is 26.55 inches per year. The highest recorded annual precipitation is 46.19 inches in 1950; the highest recorded precipitation for a 24-hour period is 5.62 inches on March 18, 2012. The lowest recorded annual precipitation was 10.17 inches in 1976.
- Average annual precipitation in eastern Amador County is 47.05 inches per year. The highest recorded annual precipitation is 85.21 inches in 1983; the highest recorded precipitation for a 24-hour period is 9.35 inches on December 13, 1919. The lowest recorded annual precipitation was 10.17 inches in 1976.
- There have been 22 state and 20 federal declarations since 1950 for flooding, including heavy rains and storms. This includes 1 state (2021) and 3 state and federal (2023) events since 2020.
- The NCDC data recorded 2 hail, 6 heavy rain, 106 winter weather, and 0 lightning events for Amador County since 1950.
- PLEASE PROVIDE DETAILS ON HEAVY RAIN AND STORM EVENTS AND HOW YOUR JURISDICTION WAS AFFECTED.
- Severe storms/heavy rains are the primary cause of most major flooding
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

High Winds and Tornadoes

- Significant County history: annual occurrences of high winds; tornadoes are more rare.
- Portions of the County are located in a special wind hazard region, referred to as foehn winds. A foehn wind is a type of dry down-slope wind that occurs in the lee (downwind side) of a mountain range. These can contribute to wildfire weather and increase the potential for wildfire spread.

- No state for federal disaster declarations for high winds or tornadoes. In 2016, there was a USDA declaration associated with high winds. The NCDC data recorded 160 high wind and 3 funnel clouds for Amador County since 1950.
- Significant concerns are associated with high winds fueling fires and triggering PSPS events.
- CAN THE HMPC PROVIDE INFORMATION ON PAST HIGH WINDS AND TORNADO EVENTS AND DAMAGES? WHAT ARE THE PRIMARY CONCERNS TO THE EACH JURISDICTION?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Wildfire

- Wildfires occur on an annual basis in the Amador County Planning Area.
- Any ignition has the potential to become an out of control wildfire. Wildfire is the most significant hazard the County faces.
- 3 state (1961 Rancheria Creek Fire, 2016 Butte Fire, 2021 Caldor Fire) and 2 federal (Butte and Caldor Fire) disaster declarations for Wildfire since 1950; 48 NCDC wildfire and 2 smoke events since 1993.
- CAN EACH PARTICIPATING JURISDICTION PROVIDE US IMPACTS/DAMAGES TO THEIR JURISDICTION FROM THE 2021 CALDOR FIRE? WHAT ABOUT SMOKE AND AIR QUALITY IMPACTS? DOES THE AIR QUALITY DISTRICT TRACK THIS INFORMATION BY CAUSE?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Extremely High
- Priority Hazard

A.8.3. HMPC #3 & #4: Mitigation Strategy Meeting Handouts

These can be found in Appendix C of this Plan.

A.8.4. HMPC #5: Final Meeting Handouts for HMPC

The handout used for the HMPC is in Section 2.2 of the Base Plan.

A.8.5. Public Meeting #1: Kickoff Meeting Handouts

*Amador County LHMP Update: 2025 Hazards**

- Agricultural Hazards (severe weather/pests/invasive species)
- Avalanche
- Climate Change
- Dam Failure
- Drought & Water Shortage
- Earthquake (w/ subhazards)
- Flood: 1%/0.2% annual chance (w/ levee failure)
- Flood: Localized Stormwater
- Landslide, Mudslide, and Debris Flow
- Severe Weather: Extreme Cold, Freeze, and Snow
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms (Hail, Lightning, Wind)
- Severe Weather: High Winds and Tornadoes
- Wildfire (w/ smoke and air quality)

* Power Outages/PSPS will be treated as a common vulnerability/impact of above hazards

Amador County LHMP Update: Historic Hazard Worksheet (Past Occurrences)

Please fill out one sheet for each significant hazard event with as much detail as possible. Attach supporting documentation, photocopies of newspaper articles, links, or other original sources.

Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Crop damage	
Infrastructure damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Opinion on likelihood of occurring again	
Source of information	
Comments	

	Please return worksheets by mail, email, or fax to: Jeanine Foster, Foster Morrison 6095 Zang Way Arvada, CO 80004 fax: (720) 893-0863 email: jeanine.foster@fostermorrison.com
Prepared by:	
Phone:	
Email:	
Date:	

A.8.6. Public Meeting #2 Handouts for Public

AMADOR COUNTY
2025 LOCAL HAZARD MITIGATION PLAN (LHMP)
FINAL PUBLIC MEETING
OCTOBER 8, 2025

*Participating Jurisdictions**

- Amador County
- City of Amador City
- City of Ione
- City of Jackson
- City of Plymouth
- City of Sutter Creek
- Amador Water District
- Jackson Valley Irrigation District

* All participated in 2020 Amador County LHMP

*Hazards List**

- Ag Hazards: Severe Weather/Pests/Invasive Species
- Avalanche
- Climate Change
- Dam Failure
- Drought & Water Shortage (with tree mortality)
- Earthquake (w/ subhazards)
- Flood: 1%/0.2% (w/ levee failure)
- Flood: Localized Stormwater Flooding
- Landslide, Mudslide, and Debris Flow
- Severe Weather: Extreme Cold, Freeze, and Snow
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms (Hail, Lightning)
- Severe Weather: High Winds and Tornadoes
- Wildfire (with smoke/air quality)

*Power Outages/PSPS is treated as a common vulnerability/impact of above hazards

Mitigation Strategy: Amador County Planning Area Goals

Goal #1: Provide protection for people's lives, property, public health, and the environment and reduce risk and losses from natural hazards

- Minimize impact to existing development
- Minimize impact to future development
- Minimize economic and resource impact
- Promote resiliency strategies

- Consider and prioritize the use of prevention measures such as land use controls and code enhancements

Goal #2: Provide protection for critical facilities, infrastructure, utilities and services from hazard impacts

- Protect and improve resiliency of critical facilities, services, and community lifelines from hazard impacts to protect life and reduce loss of property
- Implement critical facility upgrades, retrofits, and mitigation measures to ensure reliability of services
- Update and maintain GIS list of critical facilities: Essential Services, At-Risk Populations, Hazardous Materials Facilities

Goal #3: Improve community (public and stakeholder) awareness, education, and preparedness to natural hazard events

- Enhance public/stakeholder outreach, education and preparedness planning for all hazards of concern and for all populations, including underserved and vulnerable populations
- Reinforce emergency response systems
- Foster household preparedness and self-responsibility for hazard mitigation
- Increase public and stakeholder knowledge and awareness about the risk and vulnerability to identified hazards and how to take responsibility for and mitigate these risks with a focus on high priority hazards such as wildfire and flood
- Leverage existing public outreach and education mechanisms such as community coalitions and other existing forums; expand social media presence and local community boards
- Increase use of technology to communicate hazard information (e.g., GIS)
- Provide education and outreach on evacuation routes, signage, roles and responsibilities, as well as on various emergency communication modes

Goal #4: Build community resilience and increase communities' ability to be prepared for, respond to, and recover from a disaster event

- Improve community capabilities to mitigate hazards, reduce losses, and to better recover from disasters
- Integrate mitigation into planning and decision making by embedding mitigation strategies into everyday county policies, capital projects, and other similar mechanisms
- Improve interagency (local, state, federal) emergency coordination, communication, and operational capacity to ensure effective community preparedness, response and recovery
- Maintain current service levels and continue internal and operational training
- Enhance alert and warning systems and ensure effective system redundancies
- Improve emergency communication systems with reliable backup (e.g., cell phones, radios, sirens, reverse 911, multi-media, etc.)
- Improve identification, education, and emergency notifications of vulnerable and underserved populations
- Enhance the use of shared resources/Develop a strong mutual aid support system
- Improve and make better use of technology (e.g., GIS)
- Establish and expand GIS technologies to map hazards and community assets for mitigation planning and to support hazard response and community recovery
- Maintain coordination of disaster plans, data, and information with changing DHS/FEMA and State requirements
- Support and build upon evacuation planning and sheltering efforts in the County
- Mitigate future hazard losses through adequate land use/facilities planning

Goal #5: Reduce fire severity and intensity in Amador County and surrounding lands

- Reduce life safety issues, property loss, natural resource impacts, and damages associated with wildfires
- Prevent and reduce wildfire ignitions
- Increase agency and jurisdictional coordination to reduce wildfire risk, severity and intensity
- Increase vegetation management countywide to reduce wildfire losses
- Be proactive in identifying and prioritizing mitigation funding to minimize risk and vulnerability to wildfire
- Prioritize wildfire mitigation around critical facilities and infrastructure
- Support efforts to gain access to affordable insurance for all communities including underserved and vulnerable populations

Goal #6: Maintain FEMA Eligibility/Position the communities for Grant funding

- Improve community ability to be competitive/successful with grant funding opportunities from application development to project delivery
- Establish and share best practices among agencies for development of grant applications, project permits, etc.

Educate (and advocate) local officials to support local access to funding.

Mitigation Strategy: Amador County Planning Area Mitigation Actions

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Amador County					
Multi-Hazard Actions					
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Previous Action	X	X		Prevention
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	Previous Action	X	X		Prevention Public Education
Action 3. Backup Power Projects for Critical Facilities & Infrastructure	Previous Action	X	X		Prevention Property Protection Natural Resource Protection
Action 4. Establish and Fund a Full-Time Geographic Information Systems (GIS) position for Hazard Mitigation and Emergency Planning	Previous Action	X	X		Prevention Emergency Services
Action 5. Enhance and Harden Cellular and Repeater Communications Infrastructure Countywide	Previous Action	X	X		Property Protection Structural
Action 6. Upgrade and Replace Countywide Emergency Radio Communications Infrastructure	Previous Action	X	X		Prevention Emergency Services

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 7. Emergency Water Storage & Hauling Infrastructure Project	Previous Action	X	X		Prevention Emergency Services
Action 8. Launch of PHapp Mobile Preparedness Public Health Application	New Action	X	X		Prevention Property Protection Natural Resource Protection
Agricultural Hazard Actions					
Action 9. Invasive Pests (Insect)	Previous Action	X	X		Property Protection Natural Resource Protection
Action 10. Invasive Pests (Weeds)	Previous Action	X	X		Property Protection Natural Resource Protection
Climate Change Actions					
Action 11. Climate Resilience through Multi-Hazard Mitigation	New Action	X	X		Prevention Property Protection Natural Resource Protection
Dam Failure, Flood, Localized Flood, and Heavy Rains and Storm Actions					
Action 12. Flood & Dam Failure Resilience Plan	New Action	X	X	X	Prevention Property Protection Natural Resource Protection
Earthquake Actions					
Action 13. Amador County Earthquake Preparedness & Seismic Resilience Plan	New Action	X	X		Prevention Property Protection Natural Resource Protection
Landslide Actions					
Action 14. Landslide Hazard Mitigation & Slope Stability Plan	New Action	X	X		Prevention Property Protection Natural Resource Protection
Severe Weather: Extreme Cold, Freeze, and Snow Actions					
Action 15. Severe Winter Weather Resilience Plan	New Action	X	X		Prevention Property Protection Natural Resource Protection
Severe Weather: Extreme Heat Actions					
Action 16. Extreme Heat Resilience Plan	New Action	X	X		Prevention Property Protection Natural Resource Protection
Wildfire, Drought, and Extreme Heat Actions					

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 17. Tree Mortality Program Coordinator	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 18. Countywide wildfire resiliency coordination GIS mapping project to support fuels reduction efforts	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 19. Forest Health Projects	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 20. Ingress/Egress Phases I and II: Public Education and Fuels Reduction	Previous Action	X	X		Prevention Property Protection Natural Resource Protection
Action 21. Community Fuel Break Network	Previous Action	X	X		Prevention Property Protection Natural Resource Protection
Action 22. Defensible Space Assistance	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 23. Defensible Space Public Education	New Action	X	X		Public Education
Action 24. Develop Amador County CWPP and Implementation of Identified Projects	Previous Action	X	X		Prevention Property Protection Public Education Natural Resource Protection
Action 25. Vegetation Management projects – Monitoring and Maintenance	Previous Action	X	X		Property Protection Natural Resource Protection
City of Amador City					
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Previous Action	X	X		Prevention
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	Previous Action	X	X		Prevention Public Education
Action 3. NEED MORE ACTIONS					

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
City of Ione					
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Previous Action	X	X		Prevention
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	Previous Action	X	X		Prevention Public Education
Action 3. Develop a Climate Adaptation Plan	New Action	X	X		Prevention Public Education
Action 4. Implement Water Conservation and Drought Preparedness Program	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 5. Update Floodplain Ordinance and Join Community Rating System (CRS)	Previous Action	X	X	X	Prevention Property Protection Natural Resource Protection
Action 6. Develop a Storm Water Master Plan	Previous Action	X	X	X	Prevention Public Education
Action 7. Establish a Cooling Center Network and Shelter Upgrades	Previous Action	X	X		Emergency Services Prevention Property Protection Natural Resource Protection
Action 8. Implement Urban Forestry and Debris Management Program	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 9. Enhance Wildfire Preparedness and Defensible Space	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 10. Develop a Sustainable Sutter Creek Maintenance Program	New Action	X	X		Prevention Property Protection Natural Resource Protection
City of Jackson					
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Previous Action	X	X		Prevention
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	Previous Action	X	X		Prevention Public Education

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 3. Creation of Drone Program	New Action	X	X		Property Protection Natural Resource Protection
Action 4. Backup Power Projects for Critical Facilities and Infrastructure (e.g. Generators, Batteries, Solar, Etc.)	New Action	X	X		Property Protection Structural
Action 5. Creek Excavation and Annual Clearing Projects	Previous Action	X	X	X	Property Protection Natural Resource Protection
Action 6. Pitt Street Bridge Replacement	New Action	X	X	X	Structural
Action 7. Mattley Street Erosion Project	New Action	X	X	X	Prevention Property Protection Natural Resource Protection
Action 8. Home Hardening Education Program/Go Bags, ARC	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 9. Defensible Space Public Education	Previous Action	X	X		Public Education
Action 10. Fuel Break Projects	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 11. Jackson Fire Station 131 Replacement Project	New Action	X	X		Structural
City of Plymouth					
Action 12. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Previous Action	X	X		Prevention
Action 13. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	Previous Action	X	X		Prevention Public Education
Action 14. Develop a Community Wildfire Prevention Plan	New Action	X	X		Prevention Public Education
Action 15. Repairs of Old Sacramento Road to Reduce Flooding and Road Blockage	New Action	X	X	X	Prevention Property Protection Natural Resource Protection
Action 16. Additional Water Tank Storage	Previous Action	X	X		Structural

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
City of Sutter Creek					
Action 17. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan	Previous Action	X	X		Prevention
Action 18. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness	Previous Action	X	X		Prevention Public Education
Action 19. Auditorium, Community Center, and WWTP Backup Power Generators	New Action	X	X		Structural
Action 20. Development of Walking Paths, Native Tree Protection, and Native Tree Species Planting	Previous Action	X	X		Prevention Property Protection Natural Resource Protection
Action 21. Henderson Underdrain	New Action	X	X		Structural
Action 22. Recycled Water System for New Development	New Action	X	X		Structural
Action 23. Early EQ Warning Program	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 24. Sutter Creek Excavation/Annual Cleaning Projects	Previous Action	X	X	X	Prevention Property Protection Natural Resource Protection
Action 25. Stormwater Masterplan Development and Implementation	Previous Action	X	X	X	Prevention Property Protection Natural Resource Protection
Action 26. Culvert Cleaning Projects	Previous Action	X	X	X	Prevention Property Protection Natural Resource Protection
Action 27. Karsan Drive Tributary Slope and Road Stabilization	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 28. Cooling Center/Severe Weather Center	New Action	X	X		Prevention Property Protection Natural Resource Protection
Action 29. Vegetation Management Enforcement and Perimeter Wildfire Protection Fuel break	Previous Action	X	X		Prevention Property Protection Natural Resource Protection

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Amador Water Agency					
Action 30. AWA Tank Flexibility Connectors	New Action	X	X		Structural
Action 31. Camanche WWTP Treatment, Disposal, and Effluent Storage Upgrades	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 32. CAWP Transmission Main Improvements and Tank D Replacement	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 33. CAWP Tiger Creek Afterbay Alternate Supply	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 34. Ione WTP Backwash Handling Improvements	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 35. Tanner Clearwell Replacement	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 36. Tanner WTP Backwash Drying Beds	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 37. Tank Replacement/ Tank Repair	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 38. Amador and Ione Water Systems Taste and Odor Mitigation	Previous Action	X	X		Structural Property Protection Natural Resource Protection
Action 39. Replacement of Two Hypalon Lined and Covered Tanks with New Tanks	Previous Action	X	X		Structural Property Protection Natural Resource Protection
Action 40. Mt. Crossman Main Area Tank for Upper CAWP System	Previous Action	X	X		Structural Property Protection Natural Resource Protection
Action 41. Martell Regional Lift Station and Collection System Improvements	New Action	X	X		Structural Property Protection Natural Resource Protection

Action Title	New Action/ Previous Action	Address Current Development	Address Future Development	Continued NFIP Compliance	Mitigation Type
Action 42. Mace Meadows Pump Station Flooding	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 43. Water Treatment Plant Raw Water Bypasses	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 44. Upgrade Fire Pumps	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 45. Tanner WTP Flow Control and Reliability Improvements	New Action	X	X		Structural Property Protection Natural Resource Protection
Action 46. Ione Reliability Capacity Expansion and Site Security	New Action	X	X		Structural Property Protection Natural Resource Protection
Jackson Valley Irrigation District					
Action 47. Aquatic Invasive Species Monitoring Plan and Decontamination Station	Previous Action	X	X		Natural Resource Protection
Action 48. Long Term Water Solutions Analysis Due to Climate Change	Previous Action	X	X		Property Protection Natural Resource Protection
Action 49. Jackson Creek Dam Spillway Apron Extension Project	Previous Action	X	X		Structural Property Protection Natural Resource Protection
Action 50. Lake Amador Spillway Rubber Dam Project	Previous Action	X	X		Structural Property Protection Natural Resource Protection
Action 51. JVID Water Procurement and Additional Water Storage Study	Previous Action	X	X		Property Protection Natural Resource Protection
Action 52. Jackson Creek Streambank and Levee Maintenance Project	Previous Action	X	X		Structural Property Protection Natural Resource Protection
Action 53. Lake Amador Drive Box Culvert Expansion Project	Previous Action	X	X		Structural Property Protection Natural Resource Protection

Appendix B References

1983 Amador City General Plan Open Space Element

2008 Amador City General Plan Land Use Element

2008 Amador City General Plan Safety Element

2009 City of Plymouth General Plan Land Use Element

2009 City of Plymouth General Plan Safety Element

2009 Ione General Plan Environmental Impact Report

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2009 Ione General Plan Open Space Element

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2014 California Natural Resources Report

2016 Amador County General Plan

2016 Amador County General Plan Conservation Element

2016 Amador County General Plan Land Use Element

2016 Amador County General Plan Safety Element

2017 California Adaptation Planning Guide

2020 Amador County Hazard Mitigation Plan

2020 Amador County LHMP Update

2020 US Census Bureau Average Household Size

2021 Amador Water Agency Water Master Plan Study

2021 California Climate Adaptation Study

2021-2029 Amador County Housing Element

2022 Amador Water Agency Wastewater Master Plan Study

2023 Amador County Crop Report

2023 City of Jackson General Plan Land Use Element

2023 State of California Hazard Mitigation Plan

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2024 Amador County Parcel/Assessor Data

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Cal Adapt – Extended Drought Scenarios

CAL FIRE

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CAL FIRE (LRA 2025)

Cal-Adapt

Cal-Adapt – Number of Extreme Heat Days by Year

Cal-Adapt – Precipitation: Decadal Averages Map

Cal-Adapt – Temperature: Decadal Averages Map

Cal-Adapt Climate Projections

CalAtlas

California Climate Adaptation Strategy

California Department of Conservation

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California Division of Mines and Geology

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City of Amador City GIS

City of Amador City Planning Department

City of Amador City Planning Team Input

City of Ione GIS

City of Ione Planning Department

City of Ione Planning Team Input

City of Jackson General Plan Safety Element

City of Jackson Municipal Code

City of Jackson Planning Department

City of Jackson Planning Team Input

City of Plymouth Municipal Code

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Climate Change and Health Profile Report – Amador County

Design-Magnitude Avalanche Mapping and Mitigation Analyses

Federal Emergency Management Agency – DFIRM 1/20/2016

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Federal Emergency Management Agency – National Flood Hazard Layer

Federal Emergency Management Agency – Wind Zones in the United States

Federal Emergency Management Agency: Building Performance Assessment: Oklahoma and Kansas Tornadoes

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FEMA National Risk Index

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Foxweather.com

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Multi-Hazard Identification and Risk Assessment, FEMA 1997

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National Drought Mitigation Center

National Earthquake Information Center

National Environmental Policy Act (NEPA)

National Flood Insurance Program

National Integrated Drought Information System

National Inventory of Dams

National Oceanic and Atmospheric Administration

National Oceanic and Atmospheric Administration Storm Prediction Center

National Oceanic and Atmospheric Administration's National Climatic Data Center

National Park Service

National Performance of Dams Program

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US Drought Monitor

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US Fish and Wildlife Service

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US Geological Survey Earthquake Intensity Zonation and Quaternary Deposits, Miscellaneous Field Studies Map 9093, 1977

US Geological Survey Emergency Assessment of Post-Fire Debris Flow Hazards

US Geological Survey National Earthquake Information Center

US Geological Survey Open File Report 2015-3009

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Western Regional Climate Center

Appendix C Mitigation Strategy

Amador County
2025 Local Hazard Mitigation Plan (LHMP) Update
HMPC Meetings #3 & #4 - Mitigation Strategy
June 11 & 12, 2025

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AGENDA

AMADOR COUNTY
LOCAL HAZARD MITIGATION PLAN (LHMP) UPDATE
Hazard Mitigation Planning Committee (HMPC)
Meetings #3 & #4 – Mitigation Strategy Meetings

Wednesday June 11, 2025 (1:00 - 4:00 pm)
Thursday June 12, 2025 (9:00 am - 12:00 pm)

HMPC Meeting #3:

1. Introductions
2. LHMP Project Status and Next Steps/Timeline
3. Risk Assessment Status
4. Priority Hazards Review
5. Develop Plan Goals and Objectives
6. Introduction to HMPC Meeting #4: Mitigation Alternatives/Actions/Projects

HMPC Meeting #4:

1. Introductions
2. Review Mitigation Categories and Selection Criteria
3. Brainstorming of Mitigation Alternatives/Actions/Projects by Hazard
4. Prioritization of Mitigation Actions/Projects
5. Next Steps

Mitigation Strategy Meetings
June 11 & 12, 2025
Day 1

Status of the 2025 Amador County LHMP Update Project/Next Steps

FEMA's 4-Phase-10 Step DMA/CRS Planning Process

Phase I: Organize Resources

1) Get organized

2) Plan for public involvement

3) Coordinate with other departments and agencies

Phase II: Risk Assessment

4) Identify the hazard(s)

5) Assess the risks

Capability Assessment

Phase III: Mitigation Strategy

6) Set planning goals

7) Review mitigation alternatives

8) Draft an action plan

Phase IV: Adoption and Implementation

9) Adopt the plan

10) Implement the plan, evaluate its worth, and revise as needed

LHMP Project Schedule/Key Dates

2025 LHMP Update Meetings

- **June 11 (Wednesday):** HMPC Meetings #3 (Mitigation Strategy: Goals Development) (1:00 – 4:00 pm)
- **June 12 (Thursday):** HMPC Meetings #4 (Mitigation Strategy: Actions and Projects) (9:00 am – 12:00 pm)
- **October 8 (Wednesday):** Final Public Meeting #3 (5:30 – 7:00 pm)
- **October 9 (Thursday):** Final HMPC Meeting #5 (9:00 am – 12:00 pm)

Mitigation Strategy Meetings - Follow up

- **June 20 (Friday):** Mitigation Strategy (goals/actions) follow up processed and sent to Amador/HMPC
- **July 18 (Friday):** Mitigation Action (Project) Worksheets due to Foster Morrison

LHMP Document Drafts

- **August 1 (Friday):** HMPC (First) Draft LHMP to Amador /HMPC
- **August 29 (Friday):** Amador/HMPC comments due on Draft Plan
- **September 12 (Friday):** Comments incorporated into Public Review (Second) Draft to Amador
- **September 17 (Wednesday):** Public Review Draft on Amador website
- **October 17 (Friday):** all Amador, HMPC, and Public input to Foster Morrison
- **October 31 (Friday):** Public and final comments incorporated and LHMP ready for submittal to Cal OES – **October 2025**

Amador Hazard Identification & Profiles

Hazard	Geographic Extent	Likelihood of Future Occurrences	Magnitude/ Severity	Significance	Climate Change Influence
Agricultural Hazards (severe weather/pests/invasive species)	Extensive	Highly Likely	Limited	Medium	Medium
Avalanche	Limited	Likely	Critical	Medium	Medium
Climate Change	Extensive	Likely	Limited	Medium	--
Dam Failure	Limited	Unlikely	Critical	Medium	Medium
Drought & Water shortage (w/ tree mortality)	Extensive	Likely	Critical	Medium	High
Earthquake (w/subhazards)	Extensive	Unlikely	Catastrophic	Medium	Low
Floods: 1%/0.2% annual chance (w/ levee failure)	Significant	Occasional/Unlikely	Critical	Medium	Medium
Floods: Localized Stormwater	Extensive	Highly Likely	Limited	Medium	Medium
Landslide, Mudslide, Debris Flow	Limited	Likely	Critical	Medium	Medium
Severe Weather: Extreme Cold, Freeze, and Snow	Extensive	Highly Likely	Limited	Medium	Medium
Severe Weather: Extreme Heat	Extensive	Highly Likely	Limited	Medium	High
Severe Weather: Heavy Rains and Storms (Hail, Lightning)	Extensive	Highly Likely	Limited	Medium	Medium
Severe Weather: High Winds and Tornadoes	Extensive	Highly Likely	Limited	Medium	Medium
Wildfire (w/smoke and air quality)	Extensive	Highly Likely	Catastrophic	High	Medium

Geographic Extent

Limited: Less than 10% of planning area

Significant: 10-50% of planning area

Extensive: 50-100% of planning area

Likelihood of Future Occurrences

Highly Likely: Near 100% chance of occurrence in next year, or happens every year.

Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less.

Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.

Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Magnitude/Severity

Catastrophic: More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths

Critical: 25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability

Limited: 10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability

Negligible: Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid

Significance

Low: Minimal potential impact

Medium: Moderate potential impact

High: Widespread potential impact

Climate Change Influence

Low: Minimal potential impact

Medium: Moderate potential impact

High: Widespread potential impact

Risk Assessment Methodology

Calculating Likelihood of Future Occurrence

The frequency of past events is used in this section to gauge the likelihood of future occurrences. Based on historical data, the likelihood of future occurrence is categorized into one of the following classifications:

- **Highly Likely**: Near 100% chance of occurrence in next year, or happens every year.
- **Likely**: Between 10 and 90% chance of occurrence in next year, or has a recurrence interval of 10 years or less.
- **Occasional**: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years.
- **Unlikely**: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.

Calculating Vulnerability

Vulnerability is measured in general, qualitative terms, and is a summary of the potential impact based on past occurrences, spatial extent, and damage and casualty potential:

- **Extremely Low**: The occurrence and potential cost of damage to life and property is very minimal to non-existent.
- **Low**: Minimal potential impact. The occurrence and potential cost of damage to life and property is minimal.
- **Medium**: Moderate potential impact. This ranking carries a moderate threat level to the general population and/or built environment. Here the potential damage is more isolated and less costly than a more widespread disaster.
- **High**: Widespread potential impact. This ranking carries a high threat to the general population and/or built environment. The potential for damage is widespread. Hazards in this category may have already occurred in the past.
- **Extremely High**: Very widespread and catastrophic impact.

Defining Significance (Priority) of a Hazard

Defining the significance or priority of a hazard to a community is based on a subjective analysis of several factors. This analysis is used to focus and prioritize hazards and associated mitigation measures for the plan. These factors include the following:

- **Past Occurrences**: Frequency, extent, and magnitude of historic hazard events.
- **Likelihood of Future Occurrences**: Based on past hazard events.
- **Ability to Reduce Losses through Implementation of Mitigation Measures**: This considers both the ability to mitigate the risk of future occurrences as well as the ability to mitigate the vulnerability of a community to a given hazard event.

Risk Assessment Summary: Amador 2025 LHMP

Amador County Disasters since 2020 LHMP

- 2020 California Covid-19 Pandemic (2 state and 2 federal declarations)
- 2021 California Caldor Fire (state and federal declaration)
- 2021 December 2021 Storms (state declaration)
- 2023 California Severe Winter Storms, Flooding, Landslides, and Mudslides (2 state and 3 federal declarations)

Agricultural Hazards: Severe Weather/Invasive Species/Pests/Weeds

- Agricultural losses occur on an annual basis and are usually associated with severe weather events, including heavy rains, floods, freeze, heat, and drought. Other agricultural hazards include fires, crop and livestock disease, insects, and noxious weeds.
- According to the California Invasive Plant Council, **insects of concern to plants and crops include**: Glassy-winged sharp shooter, Gypsy moth, Japanese beetle, Mediterranean fruit fly, Melon fruit fly, Oriental fruit fly, and Bark beetle. **Invasive weeds include**: Rush Skeletonweed, Giant Reed, Oblong Spurge, Tamarisk, Yellow Starthistle, Scotch Broom, Perrenial Pepperweed, Scotch Thistle, Spanish Broom, Barb Goatgrass, French Bloom, Medusahead, Diffuse Knapweed, Spotted Knapweed. **Aquatic Invasive Species include**: Zebra and Quagga Mussels, invasive fish species, and aquatic weeds such as hydrilla, water hyacinth, Arundo, Loosestrife, Sesbania, and the South American Spongeplant.
- The Amador County Agricultural Commissioner noted that the County is most concerned with drought, freeze, and insect infestations and issues, and their impacts on the agricultural industry.
- There have been no FEMA or state disaster declarations associated specifically with the Agricultural industry. The NCDC contains no records of Ag incidents in the County. The USDA has issued numerous Ag declarations related to severe weather events over the past 50 years and from 2012 – 2024 include: 16 Drought; 1 Excessive Rain, High Winds, Cold Temperatures, Hail; 1 Excessive Rain; and 2 Freeze.
- CAN COUNTY AG CONFIRM THE SPECIFIC PESTS/WEEDS OF CONCERN TO THE COUNTY? CAN THE COUNTY PROVIDE DAMAGE INFORMATION ON PAST OCCURRENCES OR SPECIFIC CONCERNS/ISSUES? TO DROUGHT, FREEZE, INSECTS?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium/High
- Priority Hazard

Avalanche

- The vast majority of avalanches occur during and shortly after storms. This hazard generally affects a small number of people, such as snowboarders, skiers, and hikers who venture into backcountry areas during or after winter storms. Road and highway closures, damaged structures, and destruction of forests are also a direct result of avalanches. The combination of steep slopes, abundant snow, weather, snowpack, and an impetus to cause movement, can lead to an avalanche event.
- Avalanche-prone areas are found upcountry in eastern Amador, primarily along SR 88 in the Devil's Gate and Kirkwood areas, where these conditions readily occur.
- No federal or state disaster declarations. The NCDC database shows 5 avalanche events in Amador County since 1993. While past occurrences show annual incidents of avalanches, the only avalanche

related deaths in Amador occurred at the Kirkwood area in 2018 when a mother and her son died skiing back to their cabin in Kirkwood. Since the 2020 LHMP, in March 2024, an avalanche closed Highway 88 for a 3.5 mile stretch in Amador County.

- CAN THE COUNTY PROVIDE ADDITIONAL INFORMATION ON PAST OCCURRENCES CAUSING DAMAGES OR SPECIFIC CONCERNS/ISSUES?
- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium
- Priority Hazard?

Climate Change

- The 2023 State of California Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and both snowmelt and rainwater running off sooner in the year. Climate Change has the potential to alter the nature and frequency of most hazards.
- Snow levels seem to be higher (or larger) each year, and the recent atmospheric river winter rains are more intense. In addition, the Amador County Air Quality District noted that within the last five years, Amador County has experienced extreme droughts that have affected the health of the forest. The lack of rain contributed to the Bark Beetle infestation, causing thousands of trees to die. This has led to large areas of Amador County being at higher risk of wildfire. The combined effects of the drought, decline in the health of the forest, temperature changes, and wildfires in and around neighboring counties, much contributed to climate change, have also led to poor air quality.
- DO ANY JURISDICTIONS HAVE ADDITIONAL INFORMATION ON CLIMATE CHANGE IMPACTS OR SPECIFIC CONCERNS/ISSUES?
- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium
- Priority Hazard

Dam failure

- According to data provided by Cal DWR, DSOD data, there are 20 dams in Amador County constructed for flood control, storage, electrical generation, and recreational purposes. Of these, 4 are rated as extremely high, 9 rated as High Hazard, 1 as Significant Hazard, and 6 as Low Hazard.
- In addition to these dams located within Amador County, there are 16 other dams (2 Extremely High, 8 High Hazard, 4 Significant Hazard, and 2 Low Hazard) outside the County (located in San Joaquin, El Dorado, Calaveras, Alpine Counties) with the potential to affect people and property in Amador County.
- All 6 Extremely High and 16 of the 17 High Hazard dams (all but Patterson in El Dorado County) have inundations in Amador County. There is no inundation data available for any of the Significant or Low Hazard dams.
- The most significant dams of concern include the Extremely High and High Hazard dams where loss of life is possible. The failure of a dam may affect the dam site and downstream areas.

- Unincorporated County is the only jurisdiction with dam inundation areas from Extremely High Hazard dams. Unincorporated County and the Cities of Ione and Jackson are the only 3 jurisdictions with dam inundation areas from High Hazard dams intersecting their jurisdictions.
- WHAT DAMS ARE OF GREATEST CONCERN TO THE AMADOR COUNTY PLANNING AREA AND PARTICIPATING JURISDICTIONS?
- According to multiple sources, there have been no past dam failure events affecting Amador County.
- Likelihood of Future Occurrence: Unlikely
- Vulnerability: High
- Priority Hazard

Drought and Water Shortage

- Amador County has been in and out of drought since 2014. Historical drought data for the Amador County Planning Area and region indicate there have been 5 significant droughts in the last 87 years.
- 2 state (1976, 2014) disaster declarations and 1 federal declaration (1977) for Amador County since 1950. There have been 158 NCDC drought events in Amador County, all related to events in the 2014 to 2023 drought. Since 2020, drought has led to an increase in tree mortality resulting in 40 local emergency proclamations for tree mortality.
- According to the Amador Water Agency (AWA) 2024-2025 Annual Water Supply & Demand Assessment Shortage Report, the Agency has a significant surplus of water supply above current and projected demands. The Amador Water System (AWS) water supply is a pre-1914 water right that has never been curtailed in the most severe single-year or a multiple-year drought. In addition, while the water supply associated with the Central Amador Water Project (CAWP) was temporarily curtailed during recent drought years, the significant storage volume in the Lower Bear Reservoir has allowed previous water supply demands to be met, and are expected to be met in the future, even in dry years. The total well capacity for the portion of both systems reliant on groundwater are larger than current and projected demands.
- Key concerns related to drought and water shortage, include an increase in tree mortality and wildfire conditions leading to an increase in risk of more catastrophic wildfires, availability of water for fire fighting, and an increase in conservation measures and restrictions. (OTHERS?)
- CAN JURISDICTIONS PROVIDE DAMAGES OR RESTRICTIONS THAT HAVE OCCURRED DUE TO THE MOST RECENT DROUGHT. WAS WATER SUPPLY AFFECTED IN THE COUNTY, EVEN IN THE SHORT TERM?
- Likelihood of Future Occurrence: Drought - Likely/Water supply - Occasional
- Vulnerability: Medium
- Priority Hazard

Earthquake

- According to the 2016 Amador County Safety Element, the County is located in a relatively aseismic area with respect to other more seismically active areas in California. No Alquist-Priolo earthquake fault zones are located in the County, and areas subject to liquefaction, ground failure, or surface rupture are not identified on State hazard Maps. However, ground shaking may be experienced in western Amador from distant earthquakes occurring to the west and the east. To the west these include the San Andreas fault and the somewhat closer Hayward fault.
- Other potential sources for earthquakes in Amador County are the faults associated with the western edge of the Central Valley, recently defined as the Coast Range Central Valley (CRCV) boundary thrust

fault system. Various documents define portions of this little known system as the Midland Fault Zone or the Dunnigan Hills fault where the 1892 Vacaville-Winters earthquake occurred. The eastern portion of the County is at greatest risk to earthquakes on faults located on both sides of the California-Nevada border. Structural damage from past earthquakes has not historically been reported in Amador County.

- The Uniform Building Code (UBC) identifies four seismic zones in the United States. The zones are numbered one through four, with Zone 4 representing the highest level of seismic hazard. The UBC establishes more stringent construction standards for areas within Zones 3 and 4. All of California lies within either Zone 3 or Zone 4. Amador County is within the less hazardous Zone 3.
- The USGS National Seismic Hazard Maps provides acceleration and probabilities for various time periods. This data indicates that the expected severity of earthquakes in the region is mostly low.
- USGS identified 65, 5.0 or greater earthquakes have occurred within 90 miles of City of Jackson in Amador.
- Hazus runs were conducted for the following: A Carson Range Fault 7.2 earthquake event; Great Valley (Dunnigan Hills) Fault 6.53 earthquake event; and a Hayward + Rogers Creek 7.58 earthquake event.
- WERE THERE ISSUES IN THE COUNTY FROM HISTORICAL EARTHQUAKES? GROUND SHAKING? HAVE ANY STUDIES BEEN DONE ON EARTHQUAKE AND SECONDARY IMPACTS SUCH AS TO DAMS AND LEVEES?
- THE COUNTY NOTED THAT THERE ARE NO URM OR SOFT STORY BUILDINGS IN UNINCORPORATED COUNTY. OTHER JURISDICTIONS?
- Likelihood of Future Occurrence: Unlikely – large, damaging earthquake; Occasional – minor earthquake
- Vulnerability: Extremely High
- Priority Hazard

Flood Hazards

1%/0.2% Annual Chance

- Historically, portions of Amador County have always been at risk to flooding because of its annual percentage of rainfall in the winter and the number of watercourses that traverse the County. Flooding in Amador County results from prolonged heavy rainfall (sometimes combined with snowmelt) over tributary areas primarily during the period from November through March.
- Amador County has mapped DFIRM floodplains which detail the risk of 1% and 0.2% annual chance flooding in the County.
- The 2016 Amador County Flood Insurance Study, FEMA determined that there are no certified levees (i.e., levees providing 1% annual chance level of protection) that exist within Amador County. There is an uncertified levee located along Sutter Creek within the City of Ione.
- 22 state and 20 federal declarations from 1950-present were for heavy rains and flooding. Flooding is an ongoing issue for the planning area. Since 2020, this includes one state (2021) and three state and federal (2023) disaster declarations. The NCDC lists 43 flood events since 1993.
- HMPC - REVIEW RISK ASSESSMENT AND ADD INFORMATION ON MAJOR FLOOD EVENTS. NEED SUMMARY OF IMPACTS FROM THE (1) 2021 AND (3) 2023 FLOOD EVENTS (THAT RESULTED IN DISASTER DECLRATIONS) FOR ALL JURISDICTIONS.
- Likelihood of Future Occurrence: 100-Occasional; 200 – Unlikely; 500-Unlikely
- Vulnerability: High
- Priority Hazard

Localized/Stormwater flooding

- Significant localized flood history in the County – occurs annually
- Recent atmospheric river events occurring in 2021, 2022, and 2023 have led to more significant flooding throughout the County.
- CAN EACH JURISDICTION PROVIDE DETAILS ON LOCALIZED FLOODING PROBLEM AREAS AND SPECIFIC CONCERNS? PICTURES/DESCRIPTIONS ON FLOOD EVENTS SINCE 2020?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Landslides, Mudslides, and Debris Flows

- There have been no direct disaster declarations associated with landslides in Amador County. However, there have been 9 state and 10 federal disaster declarations related to flood that documented landslide issues. The NCDC contains no records of landslides in the County, but had one recorded debris flow event.
- CGS mapping indicates that the eastern portion of the County Planning Area has areas of high to very high susceptibility for landslides. The western portion of the County, while much more limited, also includes some areas at high to very high landslide susceptibility.
- WHAT SPECIFIC AREAS ARE AT RISK TO LANDSLIDES? ANY ACTIVE LANDSLIDES TO BE MITIGATED?
- CAN JURISDICTIONS PROVIDE INFORMATION ON PAST LANDSLIDE EVENTS AND PROBLEM AREAS? PHOTOS?
- Likelihood of Future Occurrence: Likely
- Vulnerability: Medium
- Priority Hazard

Severe weather

Severe Cold, Freeze, and Snow

- Annual occurrences of cold temperatures and snow.
- In western Amador County monthly average minimum temperatures from November through April range from the upper-30s to mid-50s. The lowest recorded daily extreme was 20°F on December 20, 1998. In a typical year, minimum temperatures fall below 32°F on 5.2 days with no days falling below 0°F.
- In eastern Amador County monthly average minimum temperatures from November through April range from the mid-10s to mid-20s. The lowest recorded daily extreme was -26°F on January 19, 1937. In a typical year, minimum temperatures fall below 32°F on 231.4 days with 8.5 days falling below 0°F.
- Average snowfall in western Amador is 1.42 inches with record snowfall in 1967 of 9 inches.
- Average snowfall in eastern Amador is 380.2 inches with record snowfall in 1967 of 693.4 inches. Historical data of the highest daily snowfall on January 26, 1957, when 65.0 inches fell. The maximum snow depth was on March 24, 1983, with a depth of 199.0 inches.

- The County has had 1 past state disaster declaration for freeze (2007). NCDC identified 61 extreme cold or freeze events as well as 514 winter weather and storms.
- Amador County Public Works noted no other incidents since 2020 where damages, injuries, or deaths occurred. Large winter weather events occurred in late February to early March 2024, but the County had prepared well for the incidents.
- PLEASE PROVIDE DETAILS ON EXTREME COLD, FREEZE, AND SNOW EVENTS AND HOW YOUR JURISDICTION WAS AFFECTED.
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Extreme Heat

- Annual occurrences of hot temperatures.
- In western Amador County, monthly average maximum temperatures in the warmest months (May through October) range from the mid-70s to the low 90s. The highest recorded daily extreme was 110°F on July 14, 2006. In a typical year, maximum temperatures exceed 90°F on 69.3 days.
- In eastern Amador County, monthly average maximum temperatures in the warmest months (May through October) range from the mid-50s to the low 70s. The highest recorded daily extreme was 95°F on July 7,1998. In a typical year, maximum temperatures exceed 90°F on 0.3 days.
- There have been no FEMA or Cal OES disasters related to extreme heat and no USDA disaster declarations for extreme heat. The NCDC recorded 124 extreme heat events since 1993.
- PLEASE PROVIDE DETAILS ON EXTREME HEAT EVENTS AND HOW YOUR JURISDICTION WAS AFFECTED. DOES THE AIR QUALITY DISTRICT MAINTAIN AIR QUALITY DATA FOR EXTREME HEAT DAYS?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Heavy rains and storms (Hail, Lightning)

- Significant County history: annual occurrences.
- According to the WRCC, average annual precipitation in western Amador County is 26.55 inches per year. The highest recorded annual precipitation is 46.19 inches in 1950; the highest recorded precipitation for a 24-hour period is 5.62 inches on March 18, 2012. The lowest recorded annual precipitation was 10.17 inches in 1976.
- Average annual precipitation in eastern Amador County is 47.05 inches per year. The highest recorded annual precipitation is 85.21 inches in 1983; the highest recorded precipitation for a 24-hour period is 9.35 inches on December 13, 1919. The lowest recorded annual precipitation was 10.17 inches in 1976.
- There have been 22 state and 20 federal declarations since 1950 for flooding, including heavy rains and storms. This includes 1 state (2021) and 3 state and federal (2023) events since 2020.
- The NCDC data recorded 2 hail, 6 heavy rain, 106 winter weather, and 0 lightning events for Amador County since 1950.
- PLEASE PROVIDE DETAILS ON HEAVY RAIN AND STORM EVENTS AND HOW YOUR JURISDICTION WAS AFFECTED.
- Severe storms/heavy rains are the primary cause of most major flooding
- Likelihood of Future Occurrence: Highly Likely

- Vulnerability: Medium
- Priority Hazard

High Winds and Tornadoes

- Significant County history: annual occurrences of high winds; tornadoes are more rare.
- Portions of the County are located in a special wind hazard region, referred to as foehn winds. A foehn wind is a type of dry down-slope wind that occurs in the lee (downwind side) of a mountain range. These can contribute to wildfire weather and increase the potential for wildfire spread.
- No state for federal disaster declarations for high winds or tornadoes. In 2016, there was a USDA declaration associated with high winds. The NCDC data recorded 160 high wind and 3 funnel clouds for Amador County since 1950.
- Significant concerns are associated with high winds fueling fires and triggering PSPS events.
- CAN THE HMPC PROVIDE INFORMATION ON PAST HIGH WINDS AND TORNADO EVENTS AND DAMAGES? WHAT ARE THE PRIMARY CONCERNS TO THE EACH JURISDICTION?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Medium
- Priority Hazard

Wildfire

- Wildfires occur on an annual basis in the Amador County Planning Area.
- Any ignition has the potential to become an out of control wildfire. Wildfire is the most significant hazard the County faces.
- 3 state (1961 Rancheria Creek Fire, 2016 Butte Fire, 2021 Caldor Fire) and 2 federal (Butte and Caldor Fire) disaster declarations for Wildfire since 1950; 48 NCDC wildfire and 2 smoke events since 1993.
- CAN EACH PARTICIPATING JURISDICTION PROVIDE US IMPACTS/DAMAGES TO THEIR JURISDICTION FROM THE 2021 CALDOR FIRE? WHAT ABOUT SMOKE AND AIR QUALITY IMPACTS? DOES THE AIR QUALITY DISTRICT TRACK THIS INFORMATION BY CAUSE?
- Likelihood of Future Occurrence: Highly Likely
- Vulnerability: Extremely High
- Priority Hazard

Amador County 2025 LHMP Update Priority Hazards

SHOULD ANY HAZARDS BE MOVED TO LOW PRIORITY – ARE THERE MITIGATION ACTIONS FOR EACH OF THESE HAZARDS?

Amador County

Priority Hazards:

- Ag Hazards (Severe Weather/ Pests/ Invasive Species
- Avalanche
- Climate Change
- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Earthquake (w/subhazards)
- Flood: 1%/0.2% Annual Chance Flood (w/ levee failure)
- Flood: Localized Stormwater
- Landslide, Mudslide, and Debris Flow
- Severe Weather: Extreme Cold, Freeze, and Snow
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms (wind, hail, lightning)
- Severe Weather: High Winds and Tornado
- Wildfire (w/smoke and air quality)

Non-Priority Hazards:

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-
-

City of Amador City

Priority Hazards:

- Ag Hazards (Severe Weather/ Pests/ Invasive Species
- Climate Change
- Drought & Water Shortage (w/tree mortality)
- Flood: Localized/Stormwater
- Landslide, Mudslide, Debris Flow
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms (wind, hail, lightning)
- Severe Weather: High Winds and Tornadoes
- Wildfire (w/smoke and air quality)

Non-Priority Hazards:

- Avalanche
- Dam Failure
- Earthquake (w/subhazards)
- Flood: 1%/0.2% annual chance (w/levee failure)
- Severe Weather: Extreme Cold, Freeze, and Snow

City of Ione

Priority Hazards:

- Climate Change
- Drought & Water Shortage (w/tree mortality)
- Flood: 1%/0.2% annual chance (w/levee failure)
- Flood: Localized/Stormwater
- Severe Weather: Extreme Heat
- Severe Weather: High Winds and Tornadoes
- Wildfire (w/smoke and air quality)
-

Non-Priority Hazards:

- Ag Hazards (Severe Weather/ Pests/ Invasive Species
- Avalanche
- Dam Failure
- Earthquake (w/subhazards)
- Landslide, Mudslide, Debris Flow
- Severe Weather: Extreme Cold, Freeze, and Snow
- Severe Weather: Heavy Rains and Storms (wind, hail, lightning)

City of Jackson

Priority Hazards:

- Climate Change
- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Earthquake (w/subhazards)
- Flood: 1%/0.2% annual chance (w/levee failure)
- Flood: Localized/Stormwater
- Landslide, Mudslide, Debris Flow
- Severe Weather: Extreme Cold, Freeze, and Snow
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms (wind, hail, lightning)
- Severe Weather: High Winds and Tornadoes
- Wildfire (w/smoke and air quality)

Non-Priority Hazards:

- Ag Hazards (Severe Weather/ Pests/ Invasive Species
- Avalanche

City of Plymouth

Priority Hazards:

- Climate Change
- Drought & Water Shortage (w/tree mortality)
- Flood: 1%/0.2% annual chance (w/levee failure)
- Flood: Localized/Stormwater
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms (wind, hail, lightning)
- Wildfire (w/smoke and air quality)

Non-Priority Hazards:

- Ag Hazards (Severe Weather/ Pests/Invasive Species
- Avalanche
- Dam Failure
- Earthquake (w/subhazards)
- Landslide, Mudslide, Debris Flow
- Severe Weather: Extreme Cold, Freeze, and Snow

- Severe Weather: High Winds and Tornadoes

City of Sutter Creek

Priority Hazards:

- Climate Change
- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Earthquake (w/subhazards)
- Flood: 1%/0.2% annual chance (w/levee failure)
- Flood: Localized/Stormwater
- Landslide, Mudslide, Debris Flow
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms (wind, hail, lightning)
- Wildfire (w/smoke and air quality)

Non-Priority Hazards:

- Ag Hazards (Severe Weather/ Pests/Invasive Species
- Avalanche
- Severe Weather: Extreme Cold, Freeze, and Snow
- Severe Weather: High Winds and Tornadoes

Amador Water Agency

Priority Hazards:

- Ag Hazards (Severe Weather/ Pests/ Invasive Species
- Climate Change
- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Earthquake (w/subhazards)
- Flood: 1%/0.2% annual chance (w/levee failure)
- Flood: Localized/Stormwater
- Landslide, Mudslide, Debris Flow
- Severe Weather: Extreme Cold, Freeze, and Snow
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms (wind, hail, lightning)
- Severe Weather: High Winds and Tornadoes
- Wildfire (w/smoke and air quality)

Non-Priority Hazards:

- Avalanche

Jackson Valley Irrigation District

Priority Hazards:

- Ag Hazards (Severe Weather/ Pests/ Invasive Species
- Climate Change
- Dam Failure
- Drought & Water Shortage (w/tree mortality)
- Earthquake (w/subhazards)
- Flood: 1%/0.2% annual chance (w/levee failure)
- Severe Weather: Extreme Cold, Freeze, and Snow
- Wildfire (w/smoke and air quality)

Non-Priority Hazards:

- Avalanche
- Flood: Localized/Stormwater

- Landslide, Mudslide, Debris Flow
- Severe Weather: Extreme Heat
- Severe Weather: Heavy Rains and Storms (wind, hail, lightning)
- Severe Weather: High Winds and Tornadoes

Mitigation Strategy: Goals

The most important element of the LHMP is the resulting mitigation strategy which serves as the long-term blueprint for reducing the potential losses identified in the risk assessment. The mitigation strategy is comprised of three components:

1. Mitigation Goals
2. Mitigation Actions
3. Mitigation Action (Implementation) Plan

Mitigation Goals

Up to now, the Hazard Mitigation Planning Committee (HMPC) has been involved in collecting and providing data for the 2025 Amador County Local Hazard Mitigation Plan Update. From this information, a Risk Assessment has been developed that describes the risk and vulnerability of Amador to identified hazards and includes an assessment of the County's current capabilities for countering these threats through existing policies, programs, and projects.

This analysis identifies areas where improvements could or should be made. Formulating Goals should lead to incorporating these improvements into the Mitigation Strategy portion of the LHMP. Our planning goals should provide direction for what risk reduction activities can be undertaken to make the Amador County Planning Area more disaster resilient.

Mitigation Goals are general guidelines that represent the County's vision for reducing or avoiding losses from identified hazards. Goals are stated without regard for achievement, that is, implementation, cost, schedule, and means are not considered.

Goals are public policy statements that:

- **Represent basic desires of the jurisdiction;**
- **Encompass all aspects of planning area, public and private;**
- **Are nonspecific, in that they refer to the quality (not the quantity) of the outcome;**
- **Are future-oriented, in that they are achievable in the future; and**
- **Are time-independent, in that they are not scheduled events.**

  - ✓ While goals are not specific (quantitative), they should not be so general as to be meaningless or unachievable.
  - ✓ Goal statements may form the basis for objectives. They should be stated in such a way as to develop one or more objectives related to each goal.
  - ✓ The key point in writing goals is to remember that they must deal with results, not the activities that produce those results.
  - ✓ Consider other planning area goals from other regional/county/city programs, plans and priorities.

Types/Sources of other area mitigation plans/ programs include:

- General Plans

- Master and Strategic Plans
- Stormwater Program and Plans
- Flood/Levee/Stormwater Management Plans and Studies
- Drought Plans, Urban/Integrated Regional Water Management Plans
- Earthquake Studies and Plans
- Community Wildfire Protection Plans
- Strategic Fire Plans
- Dam Emergency Action Plans
- Emergency Operations Plans
- Climate Plans
- Others?

2018 California State Hazard Mitigation Plan Goals

1. Significantly reduce life loss and injuries.

2. Minimize damage to structures and property, as well as minimizing interruption of essential services and activities.

3. Protect the environment.

4. Promote community resilience through integration of hazard mitigation with public policy and standard business practices.

2023 State Hazard Mitigation Plan Goals

GOAL 1—Significantly reduce risk to life, community lifelines, the environment, property, and infrastructure by planning and implementing whole-community risk reduction and resilience strategies.

GOAL 2—Build capacity and capabilities to increase disaster resilience among historically underserved populations, individuals with access and functional needs, and communities disproportionately impacted by disasters and climate change.

GOAL 3—Incorporate equity metrics, tools, and strategies into all mitigation planning, policy, funding, outreach, and implementation efforts.

GOAL 4—Apply the best available science and authoritative data to design, implement, and prioritize projects that enhance resilience to natural hazards and climate change impacts.

GOAL 5—Integrate mitigation principles into laws, regulations, policies, and guidance to support equitable outcomes to benefit the whole community.

GOAL 6— Significantly reduce barriers to timely, efficient, and effective hazard mitigation planning and action.

2016 Amador Fire Safe Council, High Country Community Wildfire Protection Plan (CWPP)

Purpose:

- To reduce wildfire risk to communities, municipal water supplies, and other at-risk Federal land through a collaborative process of planning, prioritizing, and implementing hazardous fuel reduction projects;
- To enhance efforts to protect watersheds and address threats to forest and rangeland health, including catastrophic wildfire, across the landscape.

Objectives:

- Protect human life
- Protect property from wildfires
- Minimize ignitions
- Decrease wildfire intensity and damage
- Protect important public and private infrastructure

2024 Amador County Strategic Fire Plan, Amador-El Dorado Unit

The goal of the Amador – El Dorado Unit (AEU) of CAL FIRE is to reduce the loss of life, property, watershed values, and other assets at risk from wildfire through a focused pre-fire management program and increased initial attack success.

The above statement is clear; however, the roadmap to accomplish this involves collaboration between stakeholders and communities each of which present different complexities related to project implementation and priorities regarding the threat of a wildland fire. The purpose of this Strategic Fire Plan is to provide effective direction to departmental staff and communities within the Administrative Unit to direct resources and personnel commitments towards the implementation of this Strategic Fire Plan.

The Amador - El Dorado Unit Strategic Fire Plan has been prepared with **the following objectives in priority order.**

- Support project work (fuels reduction) and planning efforts that encourage the development of safe ingress and egress routes for emergency incidents.
- Continue to provide operational training that will support safe and successful suppression operations.
- Utilize CAL FIRE and community resources to mitigate large and damaging wildfires with defensible fuel zone/fuels reduction (prescribed fire) projects at critical operational locations.
- Continue to support the implementation of fire safe clearance standards around structures.
- Support Implementation of the 2008 Wildland-Urban Interface (WUI) Building Standards by collaborating with local government planning departments and ensuring compliance with the state's minimum wildfire protection regulations for building, construction, and development in State Responsibility Areas (SRA) under California's Minimum Fire Safe Standards.
- Conduct incident analysis to evaluate Unit success in achieving the 95% threshold of keeping fires less than 10 acres in size.
- Continually educate the community on their role in the wildlands and support Resource Conservation Districts and Fire Safe Council activities.
- Utilize Fire Prevention operations to reduce ignitions within the Unit.
- Foster and build relationships with local public and private industries to develop cooperative project plans.
- Continually reassess local mitigation projects and update this Fire Plan annually.

Amador County 2016 General Plan: Hazard Related Goals

Land Use Element

Goal LU-3	Ensure the provision of effective law enforcement, fire, emergency medical services, and animal control throughout the county.
Policy LU-3.2	Coordinate with fire districts to maintain and improve fire service levels in the county.
Policy LU-3.3	Increase community awareness regarding public safety, fire, and emergency response issues.

Goal LU-4	Ensure adequate wastewater treatment, storage, and disposal capacity exists to serve the county's current and future demand.
Policy LU-4.2:	Consider infrastructure availability and expansion in the evaluation of individual projects.
Policy LU-4.3	Support efforts by water purveyors to educate the public on how to reduce water use, and utilize reclaimed water.
Policy LU-4.4	Encourage countywide regional coordination and organizational structures to fully implement maximum recycled water reuse opportunities throughout the county
Policy LU-4.5:	Encourage and promote water conservation and reuse to reduce new effluent disposal needs.

Goal LU-6	Ensure that adequate water supply, wastewater disposal, and public services are available prior to development.
Policy LU-6.1	Ensure that new development is able to meet water supply, wastewater disposal, and public service standards.

Goal LU-12	Reduce fire risks to existing and future structures.
Policy LU-12.1	Ensure that appropriate levels of emergency services, including fire protection, can be demonstrated for new development.
Policy LU-12.2	Ensure that new roadways meet County standards for firefighting access. These standards include minimum width, surface, grade, radius, turnaround, turnout, and bridge standards, as well as limitations on one-way roads, dead-end roads, driveways, and gate entrances.
Policy LU-12.3	Continue to ensure that the County's development code addresses evacuation and emergency vehicle access, water supplies and fire flow, fuel modification for defensible space, and home addressing and signing.
Policy LU-12.4	Ensure that new development or redevelopment in the Wildland-Urban Interface meets building and development standards to ensure adequate defensible space.

Conservation Element

Goal C-1	Ensure that all future development permitted in the county can be provided adequate amounts of water.
Policy C-1.1	Coordinate with the county's water suppliers to ensure that water is available to serve both current and planned future residential, commercial, industrial, and agricultural needs. Include upland areas in future water management plans.

Goal C-1	Ensure that all future development permitted in the county can be provided adequate amounts of water.
Policy C-1.2	Guide future development to areas of the county where adequate water supplies can be ensured.
Policy C-1.3	Limit reliance on groundwater wells as sources for community water systems. Where possible, encourage connection of developments to existing water supply systems.
Policy C-1.4	Encourage new development, renovation, landscape, and agricultural projects to include water conservation measures, including use of graywater, reclaimed, or recycled water for irrigation, water-

Goal C-2	Maintain and improve water supply planning and infrastructure.
Policy C-2.1:	Encourage integrated management of surface water and groundwater resources, wastewater, stormwater treatment and use, and the development of reclaimed water.
Policy C-2.2:	Encourage conjunctive use of groundwater and surface water by water agencies to improve water supply reliability.
Policy C-2.3	Support the county's water suppliers, including public agencies and private entities within Amador County, in their efforts to protect water rights and water supply contracts.
Policy C-2.4	Pursue management strategies that develop upstream/ downstream interregional conjunctive use/water transfer programs to meet future water needs in Amador County.
Policy C-2.5	Support efforts by water and wastewater agencies to respond to state mandates addressing the future challenges posed by climate change.
Policy C-2.6	Reduce erosion and sediment loads which might limit the lifespan of existing water storage facilities.
Policy C-2.7	Promote development patterns and practices which permit the continued use and future development of water storage and power generation facilities on the county's streams and rivers.
Policy C-2.8	Federal, state, and/or local designations of surface waters in or adjacent to the County (e.g., Federal Wild and Scenic River, National Recreation Area) are considered incompatible with the long-term water needs of Amador County.

Goal C-10	Reduce GHG emissions associated with automobile travel, electrical power generation and energy use.
Policy C-10.1	Evaluate the potential effects of climate change on the county's human and natural systems and prepare strategies that allow the County to appropriately respond and adapt.
Policy C-10.2	Develop and adopt a comprehensive strategy to reduce GHGs within Amador County by at least 15 percent from current levels by 2020.
Policy C-10.3	Guide new development to areas where pedestrian and bicycle/NEV access to existing activity centers is possible, in order to reduce the need for automobile travel and VMT.
Policy C-10.4	Work with service providers to ensure that transit offerings in the county are stable or expanding, and that transit is tailored to meet residents' needs.
Policy C-10.5	Require new development projects to incorporate building placement and design features to increase energy efficiency in new structures.
Policy C-10.6	Support green building through incentives for Leadership in Energy and Environmental Design (LEED) certification of new commercial, industrial, public, and multi-family residential buildings. Promote incentives for compliance with this standard as a way to increase the energy efficiency of new structures. Promote increased energy efficiency and green building practices through the County's use of these practices.
Policy C-10.7	Support parcel-scale energy generation, including addition of solar panels for residential structures and cogeneration for larger commercial or industrial uses.

Goal C-10	Reduce GHG emissions associated with automobile travel, electrical power generation and energy use.
Policy C-10.8	Expand recycling and waste minimization efforts, including recycling of construction and demolition materials.

Safety Element

Goal S-1	Prevent loss of life or property from flooding.
Policy S-1.1	Direct future development (as defined in "Floodplain Management Regulations" set forth in the Amador County Code) to areas outside the floodway portion of the 100-year floodplain.
Policy S-1.2	Limit development in other areas prone to flooding, including the floodway fringe, other portions of floodplains and inundation areas. Require structures in these areas to incorporate floodproofing measures, including elevation above the 100-year floodplain profile.
Policy S-1.3	Reduce urban runoff and maintain the carrying capacity of floodplains or flood channels. Require provision of on-site retention and detention basins in new development applications as needed to reduce downstream flooding hazards.
Policy S-1.4	Designate agriculture, passive parks, open space, and other low intensity uses within floodplain areas.
Policy S-1.5	Provide for construction of dams and water retention facilities on agricultural lands to support agricultural land uses, consistent with state and federal law.

Goal S-2	Reduce fire risks to current and future structures.
Policy S-2.1	Consistent with state regulations and local code requirements, require new buildings to be constructed to provide fire-defensible spaces, separated from property lines and other buildings on the same or adjacent properties by adequate building setbacks clear of brush and fuel. Require new buildings in areas of moderate to high fire risk to be constructed using building materials and designs that increase fire resistance.
Policy S-2.2	Guide new development to areas where adequate fire protection, roads, and water service are available to support fire response.
Policy S-2.3	Incorporate fire safety site planning techniques within new development applications in high- or very-high fire risk areas. Encourage building envelope or cluster development techniques to increase defensible areas.
Policy S-2.4	Work with fire districts or other agencies and property owners to coordinate efforts to prevent wildfires and grassfires including consolidation of fuel buildup abatement efforts, firefighting equipment access, and water service provision.
Policy S-2.5	Work with fire districts and other agencies to educate the public regarding fire risks and periods of elevated or extreme risk due to drought or other factors.

Goal S-3	Maintain or improve fire response times.
Policy S-3.1	Support efforts by fire districts to obtain adequate funding to provide fire protection at desired levels. Implement impact fees if needed to provide adequate fire service.
Policy S-3.2	Encourage cooperation and regional agreements among fire districts and state and federal fire agencies

Goal S-4	Protect people and property from seismic hazards.
Policy S-4.1	Enforce site-specific seismic design category requirements per the California Building Code (CBC) to minimize earthquake damage.
Policy S-4.2	Require minimum setbacks for habitable construction along streams between the stream bank and structure, based upon the susceptibility of the bank to seismic shaking-induced lurching.
Policy S-4.3	Discourage new construction of structures or improvements in or near a seismic risk area or geologic hazard area unless these projects meet design standards to minimize or eliminate seismic risk.

Goal S-5	Protect people and property from landslides, mudslides, and avalanches.
Policy S-5.1	Use the development review process to lessen the potential for erosion and landslides. Restrict site grading which steepens unstable slopes.
Policy S-5.2	Limit development in areas with high landslide, mudslide, or avalanche susceptibility.

Goal S-7	Respond appropriately and efficiently to natural or human-caused emergencies.
Policy S-7.1	Maintain a disaster response plan to coordinate response actions.
Policy S-7.2	Continue to coordinate with other local public safety and law enforcement agencies to ensure effective emergency response.
Policy S-7.3	Work with other agencies to designate evacuation routes for various natural or human-caused emergencies.
Policy S-7.4	Maintain the operational integrity of essential public

Amador County Goals from Previous 2020 LHMP (This is what we are updating)

Goal #1: Provide protection for people's lives, property, public health, and the environment and reduce losses from natural hazards.

- Minimize impact to existing development
- Minimize impact to future development
- Minimize risk and vulnerability to wildfire
- Minimize risk and vulnerability to flood
- Minimize economic and resource impact
- Promote resiliency strategies

Goal #2: Provide protection for critical facilities, infrastructure, utilities and services from hazard impacts

- Implement critical facility upgrades and mitigation measures to ensure reliability of services
- Update and maintain GIS list of critical facilities: Essential Services, At-Risk Populations, Hazardous Materials Facilities

Goal #3: Improve community (public and stakeholder) awareness, education, and preparedness to natural hazard events

- Enhance public and stakeholder outreach, education and preparedness program to include all hazards of concern
- Increase public and stakeholder knowledge about the risk and vulnerability to identified hazards and how to take responsibility for and mitigate these risks with a focus on high priority hazards such as wildfire and flood
- Leverage existing public outreach and education mechanisms such as community coalitions and other existing forums; expand social media presence and local community boards
- Increase use of technology to communicate hazard information (e.g., GIS)
- Provide education and outreach on evacuation routes, roles and responsibilities, as well as on various emergency communication modes

Goal #4: Increase communities' ability to be prepared for, respond to, and recover from a disaster event

- Improve community capabilities to mitigate hazards and reduce losses
- Improve interagency (local, state, federal) emergency coordination, communication, and operational capacity to ensure effective community preparedness, response and recovery
- Increase the capacity to respond and recover, countywide
- Improve emergency communication systems (cell phones, radios, sirens, reverse 911, multi-media, etc.)
- Increase first responder preparedness and education to hazards of concern
- Improve identification, education, and emergency notifications of vulnerable citizens
- Enhance the use of shared resources/Develop a strong mutual aid support system
- Make better use of technology (e.g., GIS)
- Establish and expand GIS technologies to map hazards and develop models of mitigation planning and to support hazard response and community recovery
- Maintain coordination of disaster plans, data, and related needs
- Mitigate future hazard losses through adequate land use/facilities planning

Goal #5: Maintain FEMA Eligibility/Position the communities for Grant funding

- Improve community ability to be competitive/successful with grant funding opportunities from application development to project delivery
- Establish and share best practices among agencies for development of grant applications, project permits, etc.
- Educate (and advocate) local officials to support local access to funding.

Other Example Goal Statements

- Minimize risk and vulnerability from natural hazards
- Increase communities' awareness of vulnerability to hazards
- Increase the use of shared resources
- Improve communities' capabilities to mitigate losses
- Maintain coordination of disaster plans with changing DHS/FEMA needs
- Maintain FEMA eligibility/position jurisdictions for grant funding
- Maintain/enhance the flood mitigation program to provide 200/500-year flood protection
- Maintain current service levels
- Provide protection for existing buildings from hazards
- Provide protection for future development from hazards
- Provide protection for natural and cultural resources from hazard impacts
- Provide protection for people's lives from hazards
- Provide protection for public health
- Provide protection for critical services (fire, police, etc.) from hazard impacts
- Provide protection for critical lifeline utilities from hazard impacts
- Reduce exposure to hazard related losses
- Reduce the number of emergency incidents
- Make better use of technology

General Recommendation for Categories of Goals

- Reduce Losses/Protection of Life, Property, Public Health, and the Environment from all Hazards
- Reduce Losses/Protection of Critical Facilities and Infrastructure from all Hazards
- Public Education
- Increase City Capabilities to all Hazards
- Any Hazard-specific goals
- Integrate strategies for the protection of underserved and vulnerable populations

Goals Development

The purpose of goal's development is to reach a consensus on goals for the Amador County 2025 LHMP Update. Provided above are numerous example goals for this LHMP. ***You may reword those above or develop your own goals.*** These goal statements should serve as examples. It is vital that our HMPC establish its own goals for this update.

You will each be given 3 sticky notes. On each note you will write what you think the goals for this LHMP Update should be. Use one sticky note for each goal.

When done, we will:

- Pin/tape them to the wall/easel-chart and arrange them by category
- Combine and reword them into 3-5 goals for the plan and send them out to the HMPC for further review and refinement

Mitigation Strategy Meetings
June 11 & 12, 2025
Day 2

Mitigation Strategy Action Development: Ground Rules

Rule 1: All participating jurisdictions MUST have a Mitigation Action/Project to address each of their Priority Hazards (those rated as a high or medium significance in their Hazard Identification table).

Rule 2: Every Mitigation Action/Project MUST be supported by Risk Assessment Data contained within Chap 4 of the Base Plan. Note: this might necessitate backfilling the hazard risk assessment data.

Rule 3: The Mitigation Actions/Projects for this 2025 LHMP should reflect each jurisdiction's WISH LIST for mitigation, regardless of funding source.

Rule 4: Any Mitigation Action/Project that might be considered for FEMA mitigation grant funding over the next 5-years covered by this LHMP MUST be included in this 2025 LHMP.

Rule 5: While the updated Mitigation Strategy should include all potential Mitigation Actions/Projects for the participating jurisdictions (regardless of funding source), keep in mind that the jurisdictions are NOT obligated to implement ANY of the identified Mitigation Actions/Projects – all are always subject to funding and changing priorities.

Rule 6: Each Mitigation Action/Project to be included in this LHMP MUST have a Mitigation Action Worksheet completed by the owning jurisdiction, department or agency. This applies to Mitigation Actions/Projects being carried forward from the County's previous LHMP.

REMEMBER: Having a FEMA approved LHMP for Amador County and participating jurisdictions is a prerequisite for being eligible to apply for FEMA pre and post disaster mitigation funding.

Mitigation Strategy: Actions

Mitigation Actions are specific projects and activities that help achieve the LHMP goals and accomplish risk reduction in the community.

Categories of Mitigation Actions

PREVENTION: Preventive measures are designed to keep the problem from occurring or getting worse. Their objective is to ensure that future development is not exposed to damage and does not increase damage to other properties.

- Planning
- Zoning
- Open Space Preservation
- Land Development Regulations
  - ✓ Subdivision regulations
  - ✓ Building Codes
    - Fire-Wise Construction
  - ✓ Floodplain development regulations
  - ✓ Geologic Hazard Areas development regulations (for roads too!)
- Storm Water Management
- Fuels Management, Fire-Breaks

EMERGENCY SERVICES: protect people during and after a disaster. A good emergency services program addresses all hazards. Measures include:

- Warning (flooding, tornadoes, winter storms, geologic hazards, fire)
  - ✓ NOAA Weather Radio
  - ✓ Sirens
  - ✓ "Reverse 911" (Emergency Notification System)
- Emergency Response
  - ✓ Evacuation & Sheltering
  - ✓ Communications
  - ✓ Backup power supply/generators
  - ✓ Emergency Planning
    - Activating the EOC (emergency management)
    - Closing streets or bridges (police or public works)
    - Shutting off power to threatened areas (utility company)
    - Holding/releasing children at school (school district)
    - Ordering an evacuation (mayor)
    - Opening emergency shelters (Red Cross)
    - Monitoring water levels (engineering)
    - Security and other protection measures (police)
- Critical Facilities Protection (Buildings or locations vital to the response and recovery effort, such as police/fire stations, hospitals, sewage treatment plants/lift stations, power substations)

- ✓ Buildings or locations that, if damaged, would create secondary disasters, such as hazardous materials facilities and nursing homes
- ✓ Lifeline Utilities Protection

➢ Post-Disaster Mitigation

➢ Building Inspections

- ✓ ID mitigation opportunities & funding before reconstruction

PROPERTY PROTECTION: Property protection measures are used to modify buildings subject to damage rather than to keep the hazard away. A community may find these to be inexpensive measures because often they are implemented by or cost-shared with property owners. Many of the measures do not affect the appearance or use of a building, which makes them particularly appropriate for historical sites and landmarks.

➢ Retrofitting/disaster proofing

- ✓ Floods
  - Wet/Dry floodproofing (barriers, shields, backflow valves)
  - Relocation/Elevation
  - Acquisition
  - Retrofitting
- ✓ High Winds/Tornadoes
  - Safe Rooms
  - Securing roofs and foundations with fasteners and tie-downs
  - Strengthening garage doors and other large openings
- ✓ Winter Storms
  - Immediate snow/ice removal from roofs, tree limbs
  - "Living" snow fences
- ✓ Geologic Hazards (Landslides, earthquakes, sinkholes)
  - Anchoring, bracing, shear walls
  - Dewatering sites, agricultural practices
  - Catch basins
- ✓ Drought
  - Improve water supply (transport/storage/conservation)
  - Remove moisture competitive plants (Tamarisk/Salt Cedar)
  - Water Restrictions/Water Saver Sprinklers/Appliances
  - Grazing on CRP lands (no overgrazing-see Noxious Weeds)
  - Create incentives to consolidate/connect water services
  - Recycled wastewater on golf courses
- ✓ Wildfire, Grassfires
  - Replacing building components with fireproof materials
  - Roofing, screening
  - Create "Defensible Space"
  - Installing spark arrestors
  - Fuels Modification
- ✓ Noxious Weeds/Insects

- Mowing
- Spraying
- Replacement planting
- Stop overgrazing
- Introduce natural predators

- Insurance

NATURAL RESOURCE PROTECTION: Natural resource protection activities are generally aimed at preserving (or in some cases restoring) natural areas. In so doing, these activities enable the natural beneficial functions of floodplains and watersheds to be better realized. These natural and beneficial floodplain functions include the following:

- storage of floodwaters
- absorption of flood energy
- reduction in flood scour
- infiltration that absorbs overland flood flow
- groundwater recharge
- removal/filtering of excess nutrients, pollutants, and sediments from floodwaters
- habitat for flora and fauna
- recreational and aesthetic opportunities

Methods of protecting natural resources include:

- Wetlands Protection
- Riparian Area/Habitat Protection/Threatened-Endangered Species
- Erosion & Sediment Control
- Best Management Practices

Best management practices ("BMPs") are measures that reduce nonpoint source pollutants that enter the waterways. Nonpoint source pollutants come from non-specific locations. Examples of nonpoint source pollutants are lawn fertilizers, pesticides, and other farm chemicals, animal wastes, oils from street surfaces and industrial areas and sediment from agriculture, construction, mining and forestry. These pollutants are washed off the ground's surface by stormwater and flushed into receiving storm sewers, ditches and streams. BMPs can be implemented during construction and as part of a project's design to permanently address nonpoint source pollutants. There are three general categories of BMPs:

1. Avoidance: setting construction projects back from the stream.
2. Reduction: Preventing runoff that conveys sediment and other water-borne pollutants, such as planting proper vegetation and conservation tillage.
3. Cleanse: Stopping pollutants after they are en route to a stream, such as using grass drainageways that filter the water and retention and detention basins that let pollutants settle to the bottom before they are drained:

- Dumping Regulations
- Set-back regulations/buffers
- Fuels Management
- Water Use Restrictions

- Landscape Management
- Weather Modification

STRUCTURAL: Projects that have traditionally been used by communities to control flows and water surface elevations. Structural projects keep flood waters away from an area. They are usually designed by engineers and managed or maintained by public works staff. These measures are popular with many because they "stop" flooding problems. However, structural projects have several important shortcomings that need to be kept in mind when considering them for flood hazard mitigation:

- They are expensive, sometimes requiring capital bond issues and/or cost sharing with Federal agencies, such as the U.S. Army Corps of Engineers or the Natural Resources Conservation Service.
- They disturb the land and disrupt natural water flows, often destroying habitats or requiring Environmental Assessments.
- They are built to a certain flood protection level that can be exceeded by a larger flood, causing extensive damage.
- They can create a false sense of security when people protected by a structure believe that no flood can ever reach them.
- They require regular maintenance to ensure that they continue to provide their design protection level.

Structural measures include:

- Detention/Retention structures
- Erosion and Sediment Control
- Basins/Low-head Weirs
- Channel Modifications
- Culvert resizing/replacement/Maintenance
- Levees and Floodwalls
- Anchoring, grading, debris basins (for landslides)
- Fencing (for snow, sand, wind)
- Drainage System Maintenance
- Reservoirs (for flood control, water storage, recreation, agriculture)
- Diversions
- Storm Sewers

PUBLIC INFORMATION: A successful hazard mitigation program involves both the public and private sectors. Public information activities advise property owners, renters, businesses, and local officials about hazards and ways to protect people and property from these hazards. These activities can motivate people to take protection:

- Hazard Maps and Data
- Outreach Projects (mailings, media, web, speakers, displays)
- Library Resources
- Real Estate Disclosure
- Environmental Education

Mitigation Actions/Projects from 2020 Amador County LHMP (This is what we are updating)

Action Title	Complete	Ongoing	Not Yet Started	In 2025 Update*
Amador County				
All Hazard Actions				
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan				
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness				
Action 3. Evaluate All Major and Minor Structures Along Evacuation Routes within Amador County Right of Way				
Action 4. Evaluate All Roadways Used as Evacuation Routes within Amador County Right of Way				
Action 5. Harden and Enhance Cell service: Additional Cell/Repeater Towers/Mobile Repeaters, Generator Backup, Etc.				
Action 6. Amador County Evacuation planning for all Hazards; Include Establishment of Sheltering in Place and Refuge areas.				
Action 7. Reverse 911 Enhancements				
Action 8. Enhance Agency Communications				
Action 9. PRC 4290 Compliant Street and Address Signage for Rural Areas				
Action 10. Fixed Generators to Essential County Facilities				
Action 11. Implement modern GIS capabilities in Amador County				
Avalanche Actions				
Action 12. Annual Review of Kirkwood Ski Area Avalanche Mitigation Program				
Agricultural Hazards Actions				
Action 13. Invasive Insect Pests				
Action 14. Invasive Weed Pests				
Climate Change Actions				
Action 15. Energy Action Plan				
Dam Failure, Flood, Localized Flood, Landslide, and Levee Failure Actions				
Action 16. Improve Storm Water Management Along Road Segments Exhibiting Repetitive Losses From Localized Flooding and Landslides				
Action 17. Review and Amend Flood Ordinance as Appropriate				
Action 18. Evaluate All Areas With Localized Flooding Along Amador County Maintained Roadways				
Action 19. Monitor Shakeridge Road (upcountry) for Landslide or Road Movement				
Action 20. Evaluate Each Roadways That is Subject to Local Land Movement and Minimize Debris Removal within Amador County Right of Way				
Earthquake Actions				

Action Title	Complete	Ongoing	Not Yet Started	In 2025 Update*
Action 21. Identify Un-Reinforced Masonry (URM) and other seismically vulnerable buildings in the County				
Wildfire and Drought and Water Shortage Actions				
Action 22. Evaluate Evacuation Routes for Wildfire That Serve Critical Infrastructure				
Action 23. Community Ingress/Egress – Phase I: Fire Safe Programs and Public Education Activities*				
Action 24. Community Ingress/Egress – Phase II: Brush Clearing and Fuels Reduction*				
Action 25. Construction of Mitchell Mine Fuelbreak*				
Action 26. Outreach and Public Information Immobile Citizen Evacuation*				
Action 27. Development of Firewise Communities in Amador County*				
Action 28. Pine Acres Vegetation Management Program (2526 Acres)				
Action 29. Shake Fiddletown Vegetation Management Program (2526 Acres)				
City of Amador City Actions				
Localized Flood Actions				
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan				
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness				
Action 3. Wastewater Plant Emergency Power				
Action 4. Midtown Sewer Crossing				
Action 5. Vegetation Management				
Action 6. Landslide and Slope Failure Mitigation				
City of Ione Actions				
Multi-Hazard Actions				
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan				
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness				
Action 3. Harden and Enhance Cell Service: Additional Call/repeater towers/mobile repeaters generator back up				
Action 4. Shelter Upgrades to Evalyn Bishop Hall (E.B. Hall)				
Action 5. Backup generators				
Flood, Localized Flood, and Levee Failure Actions				
Action 6. Flood Ordinance Review and Update				
Action 7. Develop and Implement Storm Water Master Plan				
Action 8. Develop Watershed Based Flood Reduction Programs				
Action 9. Stream Maintenance and Debris/Sediment Removal				
Action 10. Replace Five Mile Bridge				

Action Title	Complete	Ongoing	Not Yet Started	In 2025 Update*
Action 11. Pursue certification of the Levee along Sutter Creek				
Wildfire Actions				
Action 12. Ordinance Review – Wildland Urban				
City of Jackson Actions				
Multi-Hazard Actions				
Action 1.Integrate Local Hazard Mitigation Plan into Safety Element of General Plan				
Action 2.Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness				
Action 3.Station 131 generator				
Dam Failure, Flood, Localized Flood Actions				
Action 4.Buena Vista Flood Mitigation Project				
Action 5.Busi Parking Lot Slope Drainage				
Action 6.Annual Creek Cleaning				
Wildfire Actions				
Action 7.Starks Lane Bridge				
Action 8.Defensible Space				
Action 9.Picardo Bridge				
City of Plymouth Actions				
Multi-Hazard Actions				
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan				
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness				
Action 3. Secure City Hall as Critical Infrastructure with Commercial Generator				
Action 4. Indian Creek Stream Restoration & Culvert Improvement in Flood Hazard Zone				
Action 5. Maintain and Enhance Water Canal by Converting Earthen Arroyo Ditch to Fixed Pipeline or Gunite Lined Canal				
Action 6. Develop a Community Wildfire Prevention Plan				
City of Sutter Creek Actions				
Multi-Hazard Actions				
Action 1. Integrate Local Hazard Mitigation Plan into Safety Element of General Plan				
Action 2. Enhance Public Education and Awareness of Natural Hazards and Public Understanding of Disaster Preparedness				
Action 3. Development of Walking Paths, Native Tree Protection & Native Tree Species Planting				
Action 4. Installation of Generator at City Hall and Community Center				
Action 5. Upgrade Ditches and Culverts				

Action Title	Complete	Ongoing	Not Yet Started	In 2025 Update*
Action 6. Develop a Stormwater Management Plan				
Floods and Localized Flood Actions				
Action 7. Sutter Creek City Hall Flooding				
Action 8. Sutter Creek Bank Stabilization				
Wildfire Actions				
Action 9. Perimeter Wildfire Protection Fuel Break				
Amador Water Agency Actions				
Multi-Hazard Actions				
Action 1. AWP Standby Generators				
Ag Hazards and Aquatic Invasive Species Actions				
Action 2. Amador and Ione Water Systems Taste and Odor Mitigation				
Climate Change Actions				
Action 3. Lower Bear Reservoir Expansion Study				
Drought and Water Shortage and Wildfire Actions				
Action 4. Replacement of Two Hypalon Lined and Covered Tanks with New Tanks				
Action 5. Mt. Crossman Main Area Tank for Upper CAWP System				
Action 6. Upgrade Fire Pumps				
Flood and Localized Flood Actions				
Action 7.Mace Meadows Pump Station Flooding				
Action 8.Eggiman Lane Flooding				
Jackson Valley Irrigation District Actions				
Ag Hazards Actions				
Action 1. Outreach to Farmers regarding Agricultural Hazards in the Area				
Aquatic Invasive Species Actions				
Action 2. Lake Amador Aquatic Invasive Species Monitoring				
Climate Change Actions				
Action 3. Long Term Water Solutions Analysis Due to Climate Change				
Dam Failure Actions				
Action 4. Jackson Creek Dam Immediate Inundation Area Public Outreach – Dam Failure				
Action 5. Jackson Creek Dam Spillway Apron Extension Project				
Drought and Water Shortage and Wildfire Actions				
Action 6. JVID Water Meter Maintenance Program				
Action 7. JVID Water Procurement and Additional Water Storage Study				
Action 8. Lake Amador Spillway Rubber Dam Project				
Earthquake Actions				
Action 9. Jackson Creek Dam Seismic Evaluation and Liquefaction Study				
Flood Actions				

Action Title	Complete	Ongoing	Not Yet Started	In 2025 Update*
Action 10. Lake Amador Drive Box Culvert Expansion Project				
Levee Failure Actions				
Action 11. Jackson Creek Levee Maintenance Project				
Severe Weather Actions				
Action 12. JVID Office Backup Generator				
Action 13. JVID Freeze Protection Project				
Wildfire Actions				
Action 14. JVID Fire Hydrant Expansion Project				

* Actions not carried forward were determined by the jurisdictions to be no longer feasible, relevant, lacked funding and local resources to implement, and/or no longer considered a priority

Mitigation Strategy: Action (Implementation) Plan

The mitigation action plan describes how the mitigation actions will be implemented, including how those actions will be prioritized, administered, and incorporated into the community's existing planning mechanism. Each participating jurisdiction must have a mitigation action(s) and an action plan specific to that jurisdiction and its priority hazards and vulnerabilities.

Mitigation Criteria

For use in selecting and prioritizing Proposed Mitigation Measures

1. STAPLEE

Social: Does the measure treat people fairly? (different groups, different generations)

- Community Acceptance
- Effect on Segment of Population
- Social Benefits

Technical: Will it work? (Does it solve the problem? Is it feasible?)

- Technical Feasibility
- Reduce Community Risk
- Long Term Solution/Sustainable
- Secondary Impacts

Administrative: Do you have the capacity to implement & manage project?

- Staffing
- Funding Allocated
- Maintenance/Operations

Political: Who are the stakeholders? Did they get to participate? Is there public support? Is political leadership willing to support?

- Political Support
- Local Champion
- Public Support
- Achieves Multiple Objectives
- Supported by a broad array of Stakeholders

Legal: Does your organization have the authority to implement? Is it legal? Are there liability implications?

- Existing Local Authority
- State Authority
- Potential Legal Challenges

Economic: Is it cost-beneficial? Is there funding? Does it contribute to the local economy or economic development?

- Benefit of Action
- Cost of Action
- Cost Effective/Economic Benefits
- Economically Viable
- Outside Funding Required

Environmental: Does it comply with Environmental regulations?

- Effect on Land/Water
- Effect on Endangered Species
- Effect on Cultural Resources
- Effect on Hazmat sites
- Consistent with Community Environmental Goals
- Consistent with Environmental Laws
- Environmental Benefits

2. SUSTAINABLE DISASTER RECOVERY

- Quality of Life
- Social Equity
- Hazard Mitigation
- Economic Development
- Environmental Protection/Enhancement
- Community Participation

3. SMART GROWTH PRINCIPLES

- Infill versus Sprawl
- Efficient Use of Land Resources
- Full Use of Urban Resources
- Mixed Uses of Land
- Transportation Options
- Detailed, Human-Scale Design

4. OTHER

- Does measure address area with highest risk?
- Does measure protect …
  - ✓ The largest # of people exposed to risk?
  - ✓ The largest # of buildings?
  - ✓ The largest # of jobs?
  - ✓ The largest tax income?
  - ✓ The largest average annual loss potential?
  - ✓ The area impacted most frequently?
  - ✓ Critical Infrastructure (access, power, water, gas, telecommunications)
- Timing of Available funding
- Visibility of Project
- Community Credibility

Mitigation Action Prioritization Instructions

The HMPC's brainstormed list of mitigation actions and projects are organized by hazard and posted on flip-chart paper around the room.

You each have 3 sets of colored dots:

- 3 red dots
- 3 blue dots
- 3 green dots

The red dots are for high priority (5 points each)

The blue dots are for medium priority (3 points each)

The green dots are for low priority (1 point each)

Place your dots on any mitigation action/project, using the different colors to indicate your priority. You may use as many of your dots, of any color, on any mitigation action/project --- or you may spread them out using as few of your dots as you wish. The scored dots will indicate the consensus of the HMPC.

Use the list of mitigation selection criteria (above) to help you make your determinations.

Your votes will indicate the consensus of the team.

After the totals are counted, we will discuss them further to confirm or modify any of the results as necessary to best meet the goals of this LHMP Update.

Amador County
Mitigation Action Worksheet

Mitigation Action/Project Title:	
Hazards Addressed:	
Issue/Background (Problem Statement):	
Project Description:	
Other Alternatives:	
Existing Planning Mechanism(s) through which Action Will Be Implemented:	
Responsible Office/Partners:	
Benefits (Losses Avoided):	
Potential Funding (Local Budgets, Grant Funds, etc.):	
Timeline:	
Project Priority (High, Medium, Low):	

Worksheet completed by:	
Name and Title:	
Phone:	

Mitigation Strategy Meetings – Action Prioritization

Actions Sorted by Hazards

Agency/ Department	Mitigation Action Title	Hazards Addressed	Votes (Points)
All	1. Enhance Public Education and Outreach program for all hazards (priority and non-priority); e.g., Go Bags, ARC support, social media, etc.	Multi-Hazard	12
All	2. Backup power projects for critical facilities and infrastructure (e.g.., generators, batteries, solar, etc.)	Multi-Hazard	11
County	3. Fund GIS position in county – Full Time	Multi-Hazard	57
	4. Perimeter Evacuation Map Program Updates. Coordination and collaboration with County partners	Multi-Hazard	0
	5. Ongoing evacuation planning, education, training, and exercises -establish SOPs -increase community education and awareness including routes and signage	Multi-Hazard	3
	6. Improve transportation infrastructure to ensure roads are open and readily passable for evacuation and emergency response needs	Multi-Hazard	N/A
	7. Shelter planning to establish accessible shelters in key County locations, with signage and public education	Multi-Hazard	N/A
	8. Drone Program	Multi-Hazard	0
	9. Harden and enhance cell service: Additional Cell/Repeater towers/Mobile Repeaters, Generator Backup, etc. (2020 #5)	Multi-Hazard	0
	10. Expand fuel storage for treatment plants in the event of evacuation	Multi-Hazard	N/A
AWA	11. Ione Reservoir site treatment	Multi-Hazard	N/A
AWA	12. Comanche WWTP treatment, disposal, and effluent storage upgrades	Multi-Hazard/ Flood	2
AWA	13. AWA standby generators	Multi-Hazard	N/A
County	14. Replace and update radio infrastructure	Multi-Hazard	0
	15. Develop plan for redundant fiber optic to ensure reliability of state and inter-state voice and data	Multi-Hazard	N/A
	16. Develop plan for redundant, backup power sources for homes/businesses to ensure voice/data functionality during power outages	Multi-Hazard	N/A
	17. Develop plan to extend high speed voice and data services to emergency control camps	Multi-Hazard	N/A

Agency/ Department	Mitigation Action Title	Hazards Addressed	Votes (Points)
County	18. MOU development w/ facilities and partners for sheltering/cooling and warming centers	Multi-hazard/ Severe Weather	0
County	19. Undergrounding utilities	Multi-hazard/ Severe Weather/ Wildfire	32
	20. Alert and Warning project, w/technology enhancements	Multi-Hazard	N/A
	21. Technology enhancements to support hazard mitigation planning and project implementation and for use in disaster preparedness, response, and recovery efforts (e.g., GIS application enhancements)	Multi-Hazard	N/A
County Ag	22. Invasive Species Removal	Agricultural Hazards	5
County Ag	23. Fire prevention measures to reduce impacts to wine production and other crops	Agricultural Hazards	5
County Ag	24. Golden and quagga mussel monitoring and surveillance	Agricultural Hazards	3
AWA	25. Cyanobacteria monitoring and prevention	Agricultural Hazards	0
AWA	26. Amador and Ione Water Systems taste and odor mitigation	Agricultural Hazards	N/A
County	27. Continued Coordination, Dam EAP review, planning and exercises w/ Dam owners	Dam Failure	0
County	28. Inundation map coordination with alert and warning system enhancements	Dam Failure	0
Sutter Creek	29. Henderson Dam underdrain project	Dam Failure	5
County	30. Drought Contingency Plan	Drought & Water Shortage	1
County	31. DWR grant program for SB 522 Drought Task Force and resiliency planning	Drought & Water Shortage	0
Sutter Creek/ Others?	32. Recycled water projects	Drought & Water Shortage	0
County/ All	33. Tree Mortality monitoring, removal, and mitigation projects	Drought & Water Shortage	0
	34. CAWP Tiger Creek Afterbay Alternate Supply in the event of loss of Flume owned by PG&E	Drought & Water Shortage	N/A
AWA	35. Tanner Clearwell replacement	Drought & Water Shortage	30
AWA	36. Tanner WTP flow control and reliability improvements	Drought & Water Shortage	0

Agency/ Department	Mitigation Action Title	Hazards Addressed	Votes (Points)
AWA	37. Tanner backwash drying beds	Drought & Water Shortage	0
AWA	38. Ione backwash handling improvements	Drought & Water Shortage	0
AWA	39. Ione reliability capacity expansion and site security	Drought & Water Shortage	10
AWA	40. CAWP Transmission Main improvements and Tank D replacement	Drought & Water Shortage	0
AWA/ Others	41. Well projects Comanche	Drought & Water Shortage	0
County	42. Emergency water storage and hauling project (State Program)	Drought & Water Shortage	1
All	43. Evaluate private well viability project	Drought & Water Shortage	0
All	44. Assessment and hardening/seismic retrofits of critical facilities and infrastructure to EQ	Earthquake	11
AWA	45. AWA tank flexibility connectors	Earthquake	5
All	46. Identify Un-Reinforced Masonry (URM) and other seismically vulnerable buildings (2020#21)	Earthquake	3
	47. Earthquake sheltering/housing plan for those populations fleeing major earthquakes from other areas	Earthquake	0
	48. Early EQ Warning Program (Cal OES)	Earthquake	0
County	49. Latrobe Road at Old Sacramento improvements	Flood: All	7
Jackson/ Sutter Creek/ Others	50. Creek excavation and annual clearing projects	Flood: All	0
County/ Cities	51. Culvert clearing projects	Flood: All	2
County/ Cities	52. Stormwater master plan development and implementation	Flood: All	3
Jackson	53. Jackson Pitt Street Bridge replacement project	Flood: All	6
Jackson	54. Jackson Fire Station #131 replacement project	Multi hazard/ Flood/ Earthquake	13
Jackson	55. Mattley Street erosion project	Flood	3
AWA	56. Martell regional lift station and collection system improvements	Flood	0
	57. Road drainage projects	Flood	0

Agency/ Department	Mitigation Action Title	Hazards Addressed	Votes (Points)
	58. Flood protection projects for debris flows, bridge scour, etc.	Flood: All	N/A
Sutter Creek	59. Landslide mitigation project – Karsan Road	Landslide, Mudslide, Debris Flow	5
	60. Landslide drainage/ diversion projects	Landslide, Mudslide, Debris Flow	0
County	61. Shakeridge Road monitoring (upcountry) for landslide and road movement (2020 #19)	Landslide, Mudslide, Debris Flow	3
Cal Trans	62. Continue Cal Trans slope inspections of landslide vulnerable areas	Landslide, Mudslide, Debris Flow	0
County	63. Post Fire Debris Flow awareness/ surveillance	Landslide, Mudslide, Debris Flow	0
County	64. Electra Road post Ffre debris flow monitoring	Landslide, Mudslide, Debris Flow	11
AWA	65. Buckhorn water supply project	Landslide, Mudslide, Debris Flow	0
	66. Cooling/warming center/transportation contingency planning	Severe Weather	2
	67. Hazardous tree removal	Drought/ Severe Weather/ Wildfire	29
AWA	68. Tank replacement/ Tank repair/ Tree Removal	Drought/ Wildfire	0
AWA	69. Replacement of two Hypalon lined and covered tanks with new tanks	Drought/ Wildfire	7
AWA	70. Mt. Crossman main area tank for upper CAWP system	Drought/ Wildfire	N/A
	71. Snow Removal planning/ primary and access roads	Severe Weather	4
Ag	72. Mitigation/management of crop damage	Severe Weather	N/A
AWA	73. CAWP Tiger Creek Afterbay Alternate Supply	Multi Hazard/ Wildfire	11
AWA	74. Upgrade fire pumps	Wildfire	N/A
AWA	75. Raw water bypass for firefighting purposes	Wildfire	5
AWA	76. Hardening of critical infrastructure	Wildfire	4
County/ FSC	77. Countywide wildfire resiliency coordination GIS mapping project to support fuels reduction efforts	Wildfire	15

Agency/ Department	Mitigation Action Title	Hazards Addressed	Votes (Points)
County/ FSC/ All	78. Vegetation Management projects – initial treatment efforts	Wildfire	8
County/ FSC/ All	79. Vegetation Management projects – monitoring and maintenance efforts	Wildfire	14
County/ FSC	80. Forest Health projects	Wildfire	6
County/ FSC/ All	81. Ingress/egress fuels management projects/including 200 ft phase II work	Wildfire	8
County/ FSC/ All	82. Fuel break projects	Wildfire	0
County/ FSC/ All	83. Defensible space projects/ property vegetation management	Wildfire	5
County/ FSC/ All	84. Defensible space public education	Wildfire	13
County/ FSC	85. Develop Amador County CWPP and implementation of identified projects	Wildfire	16
County/ FSC/ All	86. Firewise Program promotion and public education	Wildfire	7
County/ FSC/ All	87. Home hardening education program/ Go bags, ARC	Wildfire	0
County/ FSC/ All	88. Identify vulnerable communities and residents open to home hardening and d-space projects	Wildfire	N/A

*Actions identified after action prioritization process

Actions Sorted by Prioritization (Voting) Results

Agency/ Department	Mitigation Action Title	Hazards Addressed	Votes (Points)
County	1. Fund GIS position in county – Full Time	Multi-Hazard	57
County	2. Undergrounding utilities	Multi-hazard/ Severe Weather/ Wildfire	32
AWA	3. Tanner Clearwell replacement	Drought & Water Shortage	30
	4. Hazardous tree removal	Drought/ Severe Weather/ Wildfire	29
County/ FSC	5. Develop Amador County CWPP and implementation of identified projects	Wildfire	16
County/ FSC	6. Countywide wildfire resiliency coordination GIS mapping project to support fuels reduction efforts	Wildfire	15
County/ FSC/ All	7. Vegetation Management projects – monitoring and maintenance efforts	Wildfire	14
County/ FSC/ All	8. Defensible space public education	Wildfire	13
Jackson	9. Jackson Fire Station #131 replacement project	Multi hazard/ Flood/ Earthquake	13
All	10. Enhance Public Education and Outreach program for all hazards (priority and non-priority); e.g., Go Bags, ARC support, social media, etc.	Multi-Hazard	12
All	11. Backup power projects for critical facilities and infrastructure (e.g.., generators, batteries, solar, etc.)	Multi-Hazard	11
AWA	12. CAWP Tiger Creek Afterbay Alternate Supply	Multi Hazard/ Wildfire	11
County	13. Electra Road post Ffre debris flow monitoring	Landslide, Mudslide, Debris Flow	11
All	14. Assessment and hardening/seismic retrofits of critical facilities and infrastructure to EQ	Earthquake	11
AWA	15. Ione reliability capacity expansion and site security	Drought & Water Shortage	10
County/ FSC/ All	16. Vegetation Management projects – initial treatment efforts	Wildfire	8
County/ FSC/ All	17. Ingress/egress fuels management projects/including 200 ft phase II work	Wildfire	8

Agency/ Department	Mitigation Action Title	Hazards Addressed	Votes (Points)
County/ FSC/ All	18. Firewise Program promotion and public education	Wildfire	7
County	19. Latrobe Road at Old Sacramento improvements	Flood: All	7
AWA	20. Replacement of two Hypalon lined and covered tanks with new tanks	Drought/ Wildfire	7
County/ FSC	21. Forest Health projects	Wildfire	6
Jackson	22. Jackson Pitt Street Bridge replacement project	Flood: All	6
AWA	23. Raw water bypass for firefighting purposes	Wildfire	5
County/ FSC/ All	24. Defensible space projects/ property vegetation management	Wildfire	5
Sutter Creek	25. Landslide mitigation project – Karsan Road	Landslide, Mudslide, Debris Flow	5
AWA	26. AWA tank flexibility connectors	Earthquake	5
Sutter Creek	27. Henderson Dam underdrain project	Dam Failure	5
County Ag	28. Invasive Species Removal	Agricultural Hazards	5
County Ag	29. Fire prevention measures to reduce impacts to wine production and other crops	Agricultural Hazards	5
AWA	30. Hardening of critical infrastructure	Wildfire	4
	31. Snow Removal planning/ primary and access roads	Severe Weather	4
	32. Ongoing evacuation planning, education, training, and exercises -establish SOPs -increase community education and awareness including routes and signage	Multi-Hazard	3
County	33. Shakeridge Road monitoring (upcountry) for landslide and road movement (2020 #19)	Landslide, Mudslide, Debris Flow	3
County/ Cities	34. Stormwater master plan development and implementation	Flood: All	3
Jackson	35. Mattley Street erosion project	Flood	3
All	36. Identify Un-Reinforced Masonry (URM) and other seismically vulnerable buildings (2020#21)	Earthquake	3
County Ag	37. Golden and quagga mussel monitoring and surveillance	Agricultural Hazards	3

Agency/ Department	Mitigation Action Title	Hazards Addressed	Votes (Points)
	38. Cooling/warming center/transportation contingency planning	Severe Weather	2
AWA	39. Comanche WWTP treatment, disposal, and effluent storage upgrades	Multi-Hazard/ Flood	2
County/ Cities	40. Culvert clearing projects	Flood: All	2
County	41. Drought Contingency Plan	Drought & Water Shortage	1
County	42. Emergency water storage and hauling project (State Program)	Drought & Water Shortage	1
County/ FSC/ All	43. Fuel break projects	Wildfire	0
County/ FSC/ All	44. Home hardening education program/ Go bags, ARC	Wildfire	0
County	45. MOU development w/ facilities and partners for sheltering/cooling and warming centers	Multi-hazard/ Severe Weather	0
	46. Perimeter Evacuation Map Program Updates. Coordination and collaboration with County partners	Multi-Hazard	0
	47. Drone Program	Multi-Hazard	0
	48. Harden and enhance cell service: Additional Cell/Repeater towers/Mobile Repeaters, Generator Backup, etc. (2020 #5)	Multi-Hazard	0
County	49. Replace and update radio infrastructure	Multi-Hazard	0
	50. Landslide drainage/ diversion projects	Landslide, Mudslide, Debris Flow	0
Cal Trans	51. Continue Cal Trans slope inspections of landslide vulnerable areas	Landslide, Mudslide, Debris Flow	0
County	52. Post Fire Debris Flow awareness/ surveillance	Landslide, Mudslide, Debris Flow	0
AWA	53. Buckhorn water supply project	Landslide, Mudslide, Debris Flow	0
Jackson/ Sutter Creek/ Others	54. Creek excavation and annual clearing projects	Flood: All	0
AWA	55. Martell regional lift station and collection system improvements	Flood	0

Agency/ Department	Mitigation Action Title	Hazards Addressed	Votes (Points)
	56. Road drainage projects	Flood	0
	57. Earthquake sheltering/housing plan for those populations fleeing major earthquakes from other areas	Earthquake	0
	58. Early EQ Warning Program (Cal OES)	Earthquake	0
AWA	59. Tank replacement/ Tank repair/ Tree Removal	Drought/ Wildfire	0
County	60. DWR grant program for SB 522 Drought Task Force and resiliency planning	Drought & Water Shortage	0
Sutter Creek/ Others?	61. Recycled water projects	Drought & Water Shortage	0
County/ All	62. Tree Mortality monitoring, removal, and mitigation projects	Drought & Water Shortage	0
AWA	63. Tanner WTP flow control and reliability improvements	Drought & Water Shortage	0
AWA	64. Tanner backwash drying beds	Drought & Water Shortage	0
AWA	65. Ione backwash handling improvements	Drought & Water Shortage	0
AWA	66. CAWP Transmission Main improvements and Tank D replacement	Drought & Water Shortage	0
AWA/ Others	67. Well projects Comanche	Drought & Water Shortage	0
All	68. Evaluate private well viability project	Drought & Water Shortage	0
County	69. Continued Coordination, Dam EAP review, planning and exercises w/ Dam owners	Dam Failure	0
County	70. Inundation map coordination with alert and warning system enhancements	Dam Failure	0
AWA	71. Cyanobacteria monitoring and prevention	Agricultural Hazards	0
AWA	72. Upgrade fire pumps	Wildfire	N/A
County/ FSC/ All	73. Identify vulnerable communities and residents open to home hardening and d-space projects	Wildfire	N/A
Ag	74. Mitigation/management of crop damage	Severe Weather	N/A
	75. Improve transportation infrastructure to ensure roads are open and readily passable for evacuation and emergency response needs	Multi-Hazard	N/A
	76. Shelter planning to establish accessible shelters in key County locations, with signage and public education	Multi-Hazard	N/A

Agency/ Department	Mitigation Action Title	Hazards Addressed	Votes (Points)
	77. Expand fuel storage for treatment plants in the event of evacuation	Multi-Hazard	N/A
AWA	78. Ione Reservoir site treatment	Multi-Hazard	N/A
AWA	79. AWA standby generators	Multi-Hazard	N/A
	80. Develop plan for redundant fiber optic to ensure reliability of state and inter-state voice and data	Multi-Hazard	N/A
	81. Develop plan for redundant, backup power sources for homes/businesses to ensure voice/data functionality during power outages	Multi-Hazard	N/A
	82. Develop plan to extend high speed voice and data services to emergency control camps	Multi-Hazard	N/A
	83. Alert and Warning project, w/technology enhancements	Multi-Hazard	N/A
	84. Technology enhancements to support hazard mitigation planning and project implementation and for use in disaster preparedness, response, and recovery efforts (e.g., GIS application enhancements)	Multi-Hazard	N/A
	85. Flood protection projects for debris flows, bridge scour, etc.	Flood: All	N/A
AWA	86. Mt. Crossman main area tank for upper CAWP system	Drought/ Wildfire	N/A
	87. CAWP Tiger Creek Afterbay Alternate Supply in the event of loss of Flume owned by PG&E	Drought & Water Shortage	N/A
AWA	88. Amador and Ione Water Systems taste and odor mitigation	Agricultural Hazards	N/A

Appendix D Adoption Resolution

Note to Reviewers: When this plan has been reviewed and approved pending adoption by FEMA Region IX, the adoption resolutions will be signed by each participating jurisdiction and added to this appendix. Two model resolutions are provided below. For the County and incorporated communities this adoption resolution also includes compliance with AB 2140 requiring adoption by reference or incorporation into the Safety Element of the General Plan.

Two resolutions were created – one for the County and incorporated communities and one for the Special Districts.

Sample Incorporated Community Adoption Resolution

(LOCAL GOVERNMENT: City)

RESOLUTION NO.

A RESOLUTION OF (LOCAL GOVERNMENT) ADOPTING THE (TITLE AND DATE OF MITIGATION PLAN).

WHEREAS the (local governing body) recognizes the threat that natural hazards pose to people and property within (local government); and

WHEREAS the (local government) has prepared a multi-hazard mitigation plan, hereby known as (title and date of mitigation plan) in accordance with federal laws, including the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended; the National Flood Insurance Act of 1968, as amended; and the National Dam Safety Program Act, as amended; and

WHEREAS (title and date of mitigation plan) identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in (local government) from the impacts of future hazards and disasters; and

WHEREAS adoption by the (local governing body) demonstrates its commitment to hazard mitigation and achieving the goals outlined in the (title and date of mitigation plan).

WHEREAS the (local governing body) seeking FEMA approval of hazard mitigation plan desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the (title and date of mitigation plan) by reference into the Safety Element of the General Plan in accordance with the requirements of AB 2140; and

NOW THEREFORE, BE IT RESOLVED BY THE (LOCAL GOVERNMENT), (STATE), THAT:

In accordance with (local rule for adopting resolutions), the (local governing body) adopts the (title and date of mitigation plan). *While content related to (local government) may require revisions to meet the plan approval requirements, changes occurring after adoption will not require (local government) to re-adopt any further iterations of the plan. Subsequent plan updates following the approval period for this plan will require separate adoption resolutions.*

BE IT RESOLVED, that the (Name of Government/District/Organization seeking FEMA approval of hazard mitigation plan) adopts the (title and date of mitigation plan) by reference into the safety element of their general plan in accordance with the requirements of AB 2140; and

BE IT FURTHER RESOLVED, the (local governing body) will submit this adoption resolution to the California Office of Emergency Services and FEMA Region IX officials to enable the plan's final approval in accordance with the requirements of the Disaster Mitigation Act of 2000 and to establish conformance with the requirement of AB 2140.

ADOPTED by a vote of ____ in favor and ____ against, and ____ abstaining, this _____ day of _____, _____.

By: _____ (print name)

ATTEST: By: _____ (print name)

APPROVED AS TO FORM: By: _____ (print name)

Sample Special District Adoption Resolution

(LOCAL GOVERNMENT: Special Districts)

RESOLUTION NO.

A RESOLUTION OF (LOCAL GOVERNMENT) ADOPTING THE (TITLE AND DATE OF MITIGATION PLAN).

WHEREAS the (local governing body) recognizes the threat that natural hazards pose to people and property within (local government); and

WHEREAS the (local government) has prepared a multi-hazard mitigation plan, hereby known as (title and date of mitigation plan) in accordance with federal laws, including the Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended; the National Flood Insurance Act of 1968, as amended; and the National Dam Safety Program Act, as amended; and

WHEREAS (title and date of mitigation plan) identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in (local government) from the impacts of future hazards and disasters; and

WHEREAS adoption by the (local governing body) demonstrates its commitment to hazard mitigation and achieving the goals outlined in the (title and date of mitigation plan).

NOW THEREFORE, BE IT RESOLVED BY THE (LOCAL GOVERNMENT), (STATE), THAT:

In accordance with (local rule for adopting resolutions), the (local governing body) adopts the (title and date of mitigation plan). *While content related to (local government) may require revisions to meet the plan approval requirements, changes occurring after adoption will not require (local government) to re-adopt any further iterations of the plan. Subsequent plan updates following the approval period for this plan will require separate adoption resolutions.*

BE IT FURTHER RESOLVED, the (local governing body) will submit this adoption resolution to the California Office of Emergency Services and FEMA Region IX officials to enable the plan's final approval in accordance with the requirements of the Disaster Mitigation Act of 2000.

ADOPTED by a vote of ____ in favor and ____ against, and ____ abstaining, this _____ day of _____, _____.

By: _____ (print name)

ATTEST: By: _____ (print name)

APPROVED AS TO FORM: By: _____ (print name)

Appendix E Threatened and Endangered Species

Table E-1 Special Status Species in Amador County

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
Animals - Amphibians					
Ambystoma californiense pop. 1	California tiger salamander - central California DPS	Threatened	Threatened	WL	–
Ambystoma californiense pop. 2	California tiger salamander - Santa Barbara County DPS	Endangered	Threatened	WL	–
Batrachoseps diabolicus	Hell Hollow slender salamander	None	None	-	–
Spea hammondii	western spadefoot	Proposed Threatened	None	SSC	–
Ambystoma californiense pop. 1	California tiger salamander - central California DPS	Threatened	Threatened	WL	–
Animals - Birds					
Accipiter cooperii	Coopers hawk	None	None	WL	–
Aquila chrysaetos	golden eagle	None	None	FP | WL	–
Buteo regalis	ferruginous hawk	None	None	WL	–
Buteo swainsoni	Swainsons hawk	None	Threatened	–	–
Circus hudsonius	northern harrier	None	None	SSC	–
Elanus leucurus	white-tailed kite	None	None	FP	–
Haliaeetus leucocephalus	bald eagle	Delisted	Endangered	FP	–
Eremophila alpestris actia	California horned lark	None	None	WL	–
Branta hutchinsii leucopareia	cackling (=Aleutian Canada) goose	Delisted	None	WL	–
Chaetura vauxi	Vauxs swift	None	None	SSC	–
Ardea alba	great egret	None	None	–	–
Ardea herodias	great blue heron	None	None	–	–
Botaurus lentiginosus	American bittern	None	None	–	–
Egretta thula	snowy egret	None	None	–	–
Ixobrychus exilis	least bittern	None	None	SSC	–
Nycticorax nycticorax	black-crowned night heron	None	None	–	–
Charadrius montanus	mountain plover	None	None	SSC	–
Pica nuttalli	yellow-billed magpie	None	None	–	–

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
Coccyzus americanus occidentalis	western yellow-billed cuckoo	Threatened	Endangered	–	–
Falco columbarius	merlin	None	None	WL	–
Falco mexicanus	prairie falcon	None	None	WL	–
Falco peregrinus anatum	American peregrine falcon	Delisted	Delisted	–	–
Spinus lawrencei	Lawrences goldfinch	None	None	–	–
Antigone canadensis canadensis	lesser sandhill crane	None	None	SSC	–
Antigone canadensis tabida	greater sandhill crane	None	Threatened	FP	–
Progne subis	purple martin	None	None	SSC	–
Riparia riparia	bank swallow	None	Threatened	–	–
Agelaius tricolor	tricolored blackbird	None	Threatened	SSC	–
Xanthocephalus xanthocephalus	yellow-headed blackbird	None	None	SSC	–
Icteria virens	yellow-breasted chat	None	None	SSC	–
Lanius ludovicianus	loggerhead shrike	None	None	SSC	–
Chlidonias niger	black tern	None	None	SSC	–
Sternula antillarum browni	California least tern	Endangered	Endangered	FP	–
Pandion haliaetus	osprey	None	None	WL	–
Geothlypis trichas sinuosa	saltmarsh common yellowthroat	None	None	SSC	–
Setophaga petechia	yellow warbler	None	None	SSC	–
Ammodramus savannarum	grasshopper sparrow	None	None	SSC	–
Melospiza melodia maxillaris	Suisun song sparrow	None	None	SSC	–
Melospiza melodia pop. 1	song sparrow (Modesto population)	None	None	SSC	–
Spizella breweri	Brewers sparrow	None	None	–	–
Pelecanus erythrorhynchos	American white pelican	None	None	SSC	–
Nannopterum auritum	double-crested cormorant	None	None	WL	–
Melanerpes lewis	Lewis woodpecker	None	None	–	–
Laterallus jamaicensis coturniculus	California black rail	None	Threatened	FP	–
Numenius americanus	long-billed curlew	None	None	WL	–
Asio flammeus	short-eared owl	None	None	SSC	–
Asio otus	long-eared owl	None	None	SSC	–
Athene cunicularia	burrowing owl	None	Candidate Endangered	SSC	–
Plegadis chihi	white-faced ibis	None	None	WL	–
Selasphorus rufus	rufous hummingbird	None	None	–	–
Empidonax traillii	willow flycatcher	None	Endangered	–	–
Vireo bellii pusillus	least Bells vireo	Endangered	Endangered	–	–

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
Accipiter cooperii	Coopers hawk	None	None	WL	–
Aquila chrysaetos	golden eagle	None	None	FP | WL	–
Buteo regalis	ferruginous hawk	None	None	WL	–
Buteo swainsoni	Swainsons hawk	None	Threatened	–	–
Animals – Crustaceans					
Branchinecta lynchi	vernal pool fairy shrimp	Threatened	None	–	–
Branchinecta mesovallensis	midvalley fairy shrimp	None	None	–	–
Linderiella occidentalis	California linderiella	None	None	–	–
Dumontia oregonensis	hairy water flea	None	None	–	–
Lepidurus packardi	vernal pool tadpole shrimp	Endangered	None	–	–
Animals - Fish					
Acipenser medirostris pop. 1	green sturgeon - southern DPS	Threatened	None	SSC	–
Acipenser transmontanus	white sturgeon	None	Candidate Threatened	SSC	–
Archoplites interruptus	Sacramento perch	None	None	SSC	–
Cottus gulosus	riffle sculpin	None	None	SSC	–
Lavinia exilicauda exilicauda	Sacramento hitch	None	None	SSC	–
Mylopharodon conocephalus	hardhead	None	None	SSC	–
Pogonichthys macrolepidotus	Sacramento splittail	None	None	SSC	–
Hysterocarpus traskii traskii	Sacramento-San Joaquin tule perch	None	None	–	–
Hypomesus transpacificus	Delta smelt	Threatened	Endangered	–	–
Spirinchus thaleichthys	longfin smelt	None	Threatened	–	–
Spirinchus thaleichthys pop. 2	longfin smelt - San Francisco Bay-Delta DPS	Endangered	Threatened	–	–
Entosphenus tridentatus	Pacific lamprey	None	None	SSC	–
Lampetra ayresii	western river lamprey	None	None	SSC	–
Oncorhynchus mykiss irideus pop. 11	steelhead - Central Valley DPS	Threatened	None	SSC	–
Oncorhynchus mykiss irideus pop. 8	steelhead - central California coast DPS	Threatened	None	SSC	–
Oncorhynchus tshawytscha pop. 11	chinook salmon - Central Valley spring-run ESU	Threatened	Threatened	–	–
Oncorhynchus tshawytscha pop. 13	chinook salmon - Central Valley fall / late fall-run ESU	None	None	SSC	–
Oncorhynchus tshawytscha pop. 7	chinook salmon - Sacramento River winter-run ESU	Endangered	Endangered	–	–

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
Animals – Insects					
Andrena blennospermatis	Blennosperma vernal pool andrenid bee	None	None	–	–
Andrena subapasta	An andrenid bee	None	None	–	–
Anthicus sacramento	Sacramento anthicid beetle	None	None	–	–
Bombus crotchii	Crotchs bumble bee	None	Candidate Endangered	–	–
Bombus pensylvanicus	American bumble bee	None	None	–	–
Metapogon hurdi	Hurds metapogon robberfly	None	None	–	–
Cicindela hirticollis abrupta	Sacramento Valley tiger beetle	None	None	–	–
Desmocerus californicus dimorphus	valley elderberry longhorn beetle	Threatened	None	–	–
Hydrochara rickseckeri	Rickseckers water scavenger beetle	None	None	–	–
Danaus plexippus plexippus pop. 1	monarch - California overwintering population	Proposed Threatened	None	–	–
Animals - Mammals					
Vulpes vulpes patwin	Sacramento Valley red fox	None	None	–	–
Reithrodontomys raviventris	salt-marsh harvest mouse	Endangered	Endangered	FP	–
Dipodomys heermanni heermanni	Heermanns kangaroo rat	None	None	–	–
Taxidea taxus	American badger	None	None	SSC	–
Bassariscus astutus raptor	northern California ringtail	None	None	FP	–
Antrozous pallidus	pallid bat	None	None	SSC	–
Lasionycteris noctivagans	silver-haired bat	None	None	–	–
Lasiurus cinereus	hoary bat	None	None	–	–
Lasiurus frantzii	western red bat	None	None	SSC	–
Myotis ciliolabrum	western small-footed myotis	None	None	–	–
Animals - Mollusks					
Margaritifera falcata	western pearlshell	None	None	–	–
Gonidea angulata	western ridged mussel	None	None	–	–
Animals - Reptiles					
Actinemys marmorata	northwestern pond turtle	Proposed Threatened	None	SSC	–
Thamnophis gigas	giant gartersnake	Threatened	Threatened	–	–
Phrynosoma blainvillii	coast horned lizard	None	None	SSC	–
Community - Terrestrial					
–	Coastal and Valley Freshwater Marsh	None	None	–	–

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
–	Coastal Brackish Marsh	None	None	–	–
–	Elderberry Savanna	None	None	–	–
–	Great Valley Mixed Riparian Forest	None	None	–	–
–	Great Valley Valley Oak Riparian Forest	None	None	–	–
–	Northern Claypan Vernal Pool	None	None	–	–
–	Northern Hardpan Vernal Pool	None	None	–	–
–	Valley Needlegrass Grassland	None	None	–	–
–	Valley Oak Woodland	None	None	–	–
Plants – Vascular					
Sagittaria sanfordii	Sanfords arrowhead	None	None	–	1B.2
Cicuta maculata var. bolanderi	Bolanders water-hemlock	None	None	–	2B.1
Eryngium pinnatisectum	Tuolumne button-celery	None	None	–	1B.2
Lilaeopsis masonii	Masons lilaeopsis	None	Rare	–	1B.1
Calycadenia spicata	spicate calycadenia	None	None	–	1B.3
Centromadia parryi ssp. rudis	Parrys rough tarplant	None	None	–	4.2
Hesperevax caulescens	hogwallow starfish	None	None	–	4.2
Lasthenia chrysantha	alkali-sink goldfields	None	None	–	1B.1
Lasthenia ferrisiae	Ferris goldfields	None	None	–	4.2
Senecio hydrophiloides	sweet marsh ragwort	None	None	–	4.2
Symphyotrichum lentum	Suisun Marsh aster	None	None	–	1B.2
Cryptantha hooveri	Hoovers cryptantha	None	None	–	1A
Lepidium latipes var. heckardii	Heckards pepper-grass	None	None	–	1B.2
Brasenia schreberi	watershield	None	None	–	2B.3
Downingia pusilla	dwarf downingia	None	None	–	2B.2
Legenere limosa	legenere	None	None	–	1B.1
Extriplex joaquinana	San Joaquin spearscale	None	None	–	1B.2
Cuscuta obtusiflora var. glandulosa	Peruvian dodder	None	None	–	2B.2
Carex comosa	bristly sedge	None	None	–	2B.1
Lathyrus jepsonii var. jepsonii	Delta tule pea	None	None	–	1B.2
Trifolium hydrophilum	saline clover	None	None	–	1B.2
Juncus leiospermus var. ahartii	Aharts dwarf rush	None	None	–	1B.2
Scutellaria galericulata	marsh skullcap	None	None	–	2B.2
Scutellaria lateriflora	side-flowering skullcap	None	None	–	2B.2
Fritillaria agrestis	stinkbells	None	None	–	4.2

Scientific Name	Common Name	Federal Status	State Status	CDFW Status	CA Rare Plant Rank
Hibiscus lasiocarpos var. occidentalis	woolly rose-mallow	None	None	–	1B.2
Clarkia biloba ssp. brandegeeae	Brandegees clarkia	None	None	–	4.2
Oenothera deltoides ssp. howellii	Antioch Dunes evening-primrose	Endangered	Endangered	–	1B.1
Chloropyron molle ssp. molle	soft salty birds-beak	Endangered	Rare	–	1B.2
Gratiola heterosepala	Boggs Lake hedge-hyssop	None	Endangered	–	1B.2
Orcuttia tenuis	slender Orcutt grass	Threatened	Endangered	–	1B.1
Orcuttia viscida	Sacramento Orcutt grass	Endangered	Endangered	–	1B.1
Navarretia eriocephala	hoary navarretia	None	None	–	4.3
Navarretia myersii ssp. myersii	pincushion navarretia	None	None	–	1B.1
Ranunculus lobbii	Lobbs aquatic buttercup	None	None	–	4.2
Limosella australis	Delta mudwort	None	None	–	2B.1
Brodiaea rosea ssp. vallicola	valley brodiaea	None	None	–	4.2

Sources: California Natural Diversity Database BIOS Viewer Tool

Federal Status

Endangered: The classification provided to an animal or plant in danger of extinction within the foreseeable future throughout all or a significant portion of its range.

Threatened: The classification provided to an animal or plant which is likely to become an endangered species within the foreseeable future throughout all or a significant portion of its range.

Proposed Endangered: The classification provided to an animal or plant that is proposed for federal listing as Endangered in the Federal Register under Section 4 of the Endangered Species Act.

Proposed Threatened: The classification provided to an animal or plant that is proposed for federal listing as Threatened in the Federal Register under Section 4 of the Endangered Species Act.

Candidate: The classification provided to an animal or plant that has been studied by the United States Fish and Wildlife Service, and the Service has concluded that it should be proposed for addition to the Federal Endangered and Threatened species list.

None: The plant or animal has no federal status.

Delisted: The plant or animal was previously listed as Endangered or Threatened, but is no longer listed on the Federal Endangered and Threatened species list.

CDFW Status

FP: Fully Protected: This classification was the State of California's initial effort to identify and provide additional protection to those animals that were rare or faced possible extinction.

SSC: Species of Special Concern: To this end, the Department has designated certain vertebrate species as "Species of Special Concern" because declining population levels, limited ranges, and/or continuing threats have made them vulnerable to extinction. The goal of designating species as "Species of Special Concern" is to halt or reverse their decline by calling attention to their plight and addressing the issues of concern early enough to secure their long-term viability.

WL: Watch List: Species that were previously designated as "Species of Special Concern" but no longer merit that status, or which do not yet meet SSC criteria, but for which there is concern and a need for additional information to clarify status.

CA Rare Plant Rank

1A: Plants presumed extinct in California and rare/extinct elsewhere

1B.1: Plants rare, threatened, or endangered in California and elsewhere; seriously threatened in California

1B.2: Plants rare, threatened, or endangered in California and elsewhere; fairly threatened in California

1B.3: Plants rare, threatened, or endangered in California and elsewhere; not very threatened in California

2A: Plants presumed extirpated in California, but more common elsewhere

2B.1: Plants rare, threatened, or endangered in California, but more common elsewhere; seriously threatened in California

2B.2: Plants rare, threatened, or endangered in California, but more common elsewhere; fairly threatened in California

2B.3: Plants rare, threatened, or endangered in California, but more common elsewhere; not very threatened in California

3.1: Plants about which we need more information; seriously threatened in California
3.2: Plants about which we need more information; fairly threatened in California
3.3: Plants about which we need more information; not very threatened in California
4.1: Plants of limited distribution; seriously threatened in California
4.2: Plants of limited distribution; fairly threatened in California
4.3: Plants of limited distribution; not very threatened in California

Appendix F Critical Facilities

Critical Facility Name	Critical Facility Type	Critical Facility Category	Jurisdiction	DFIRM Flood Zone	FRA/SRA Fire Hazard Severity Zone	Deep Seated Landslide Class	LRA Fire Hazard Severity Zone	Extremely High Hazard Dam Inundation	High Hazard Dam Inundation
Innovative Renal Care Jackson Dialysis Center	Clinic	At Risk Population	Unincorporated Amador County	Other Areas	Moderate	0	Outside of LRA Responsibility Area	N	N
Community Compass Disability Services & Support	Community Center	At Risk Population	Jackson	Other Areas	Outside of FRA/SRA Area	0	High	N	N
Operation Care	Other	At Risk Population	Jackson	Other Areas	Outside of FRA/SRA Area	0	High	N	N
Kit Carson Convalescent	Residential Care Facility	At Risk Population	Jackson	Other Areas	Outside of FRA/SRA Area	0	High	N	N
Amador Residential Care Facility	Residential Care Facility	At Risk Population	Jackson	Other Areas	Outside of FRA/SRA Area	III	High	N	N
Jackson Hills Assisted Living	Residential Care Facility	At Risk Population	Jackson	Other Areas	Outside of FRA/SRA Area	0	High	N	N
United Home Care	Residential Care Facility	At Risk Population	Jackson	Other Areas	Outside of FRA/SRA Area	0	High	N	N
Gold Quartz Inn Retirement Home	Residential Care Facility	At Risk Population	Sutter Creek	Other Areas	Outside of FRA/SRA Area	0	High	N	N

Critical Facility Name	Critical Facility Type	Critical Facility Category	Jurisdiction	DFIRM Flood Zone	FRA/SRA Fire Hazard Severity Zone	Deep Seated Landslide Class	LRA Fire Hazard Severity Zone	Extremely High Hazard Dam Inundation	High Hazard Dam Inundation
Ione Junior High School (6-8)	School	At Risk Population	Ione	Other Areas	Outside of FRA/SRA Area	0	Moderate	N	N
Ione Elementary School (K-5)	School	At Risk Population	Ione	Other Areas	Outside of FRA/SRA Area	0	High	N	N
Mountain Oaks Charter School ( )	School	At Risk Population	Ione	1% Annual Chance Flood Hazard	Outside of FRA/SRA Area	0	Non-Wildland	N	N
Foothill Indian Ed. Alliance AfterSch (K-6)	School	At Risk Population	Ione	1% Annual Chance Flood Hazard	Outside of FRA/SRA Area	0	Non-Wildland	N	N
Jackson Elementary School (K-5)	School	At Risk Population	Jackson	Other Areas	Outside of FRA/SRA Area	0	Non-Wildland	N	N
Jackson Junior High School (6-8)	School	At Risk Population	Jackson	Other Areas	Outside of FRA/SRA Area	III	Non-Wildland	N	N
Argonaut High School (9-12)	School	At Risk Population	Jackson	Other Areas	Outside of FRA/SRA Area	0	High	N	N
North Star Independent Study (K-12)	School	At Risk Population	Sutter Creek	Other Areas	Outside of FRA/SRA Area	0	High	N	N
Independence Continuation High (9-12)	School	At Risk Population	Sutter Creek	Other Areas	Outside of FRA/SRA Area	0	High	N	N
Sutter Creek Primary School (K-3)	School	At Risk Population	Sutter Creek	Other Areas	Outside of FRA/SRA Area	0	Very High	N	N

Critical Facility Name	Critical Facility Type	Critical Facility Category	Jurisdiction	DFIRM Flood Zone	FRA/SRA Fire Hazard Severity Zone	Deep Seated Landslide Class	LRA Fire Hazard Severity Zone	Extremely High Hazard Dam Inundation	High Hazard Dam Inundation
Amador High School (9-12)	School	At Risk Population	Sutter Creek	Other Areas	Outside of FRA/SRA Area	0	Very High	N	N
Sutter Creek Elementary School (4-6)	School	At Risk Population	Sutter Creek	Other Areas	Outside of FRA/SRA Area	0	Very High	N	N
Community Christian School (P-8)	School	At Risk Population	Unincorporated Amador County	Other Areas	Very High	III	Outside of LRA Responsibility Area	N	N
Pine Grove Elementary School (K-6)	School	At Risk Population	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
Pioneer Montessori Pre-School (P)	School	At Risk Population	Unincorporated Amador County	Other Areas	Very High	V	Outside of LRA Responsibility Area	N	N
Pioneer Elementary School (K-6)	School	At Risk Population	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
Plymouth Elementary School (K-6)	School	At Risk Population	Plymouth	Other Areas	Outside of FRA/SRA Area	0	Moderate	N	N
Amador County Juvenile Hall/Community (K-12)	School	At Risk Population	Unincorporated Amador County	Other Areas	High	0	Outside of LRA Responsibility Area	N	N
ATCAA - Head Start Center	School	At Risk Population	Ione	0.2% Annual Chance Flood Hazard	Outside of FRA/SRA Area	0	Moderate	N	N
ATCAA - Head Start Center	School	At Risk Population	Jackson	Other Areas	Outside of FRA/SRA Area	VII	Moderate	N	N

Critical Facility Name	Critical Facility Type	Critical Facility Category	Jurisdiction	DFIRM Flood Zone	FRA/SRA Fire Hazard Severity Zone	Deep Seated Landslide Class	LRA Fire Hazard Severity Zone	Extremely High Hazard Dam Inundation	High Hazard Dam Inundation
Head Start ECS State Preschool (ATCAA - Head Start Center)	School	At Risk Population	Jackson	Other Areas	Outside of FRA/SRA Area	VI	Moderate	N	N
Victory Village	Veterans Services	At Risk Population	Unincorporated Amador County	Other Areas	High	0	Outside of LRA Responsibility Area	N	N
Victory Village	Veterans Services	At Risk Population	Jackson	Other Areas	Outside of FRA/SRA Area	0	High	N	N
ATCAA - Veteran's Housing Unit	Veterans Services	At Risk Population	Jackson	Other Areas	Outside of FRA/SRA Area	0	Moderate	N	N
Amador County Animal Control	Animal Shelter	Essential Services	Unincorporated Amador County	Other Areas	High	V	Outside of LRA Responsibility Area	N	N
Bridge 26C-0007: BUENA VISTA RD (MOKELUMNE R)	Bridge	Essential Services	Unincorporated Amador County	1% Annual Chance Flood Hazard	Very High	VI	Outside of LRA Responsibility Area	Y	Y
Bridge 26C-0003: BUENA VISTA RD (JACKSON CRK)	Bridge	Essential Services	Unincorporated Amador County	1% Annual Chance Flood Hazard	Very High	0	Outside of LRA Responsibility Area	Y	Y
Bridge 26C-0012: CAMANCHE RD (JACKSON CRK)	Bridge	Essential Services	Unincorporated Amador County	1% Annual Chance Flood Hazard	Moderate	0	Outside of LRA Responsibility Area	Y	Y

Critical Facility Name	Critical Facility Type	Critical Facility Category	Jurisdiction	DFIRM Flood Zone	FRA/SRA Fire Hazard Severity Zone	Deep Seated Landslide Class	LRA Fire Hazard Severity Zone	Extremely High Hazard Dam Inundation	High Hazard Dam Inundation
Bridge 30C-0016: MIDDLE BAR RD (MOKELUMNE R)	Bridge	Essential Services	Unincorporated Amador County	1% Annual Chance Flood Hazard	Very High	0	Outside of LRA Responsibility Area	Y	Y
Bridge 26C-0038: STONY CREEK RD (JACKSON CRK)	Bridge	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	Y
Bridge 26C-0011: COOK RD (DRY CRK)	Bridge	Essential Services	Unincorporated Amador County	1% Annual Chance Flood Hazard	Moderate	0	Outside of LRA Responsibility Area	N	Y
Bridge 26C-0002: FIVE MILE DR (SUTTER CRK)	Bridge	Essential Services	Ione	1% Annual Chance Flood Hazard	Outside of FRA/SRA Area	0	High	N	Y
Bridge 26C-0032: FIVE MILE DR (FIVE MILE CRK)	Bridge	Essential Services	Unincorporated Amador County	1% Annual Chance Flood Hazard	Moderate	VII	Outside of LRA Responsibility Area	N	Y
Bridge 26C-0010: PREVITALI RD (JACKSON CRK)	Bridge	Essential Services	Unincorporated Amador County	1% Annual Chance Flood Hazard	Very High	0	Outside of LRA Responsibility Area	N	N
Bridge 26C-0041: SUTTER CREEK RD (SUTTER CRK)	Bridge	Essential Services	Unincorporated Amador County	1% Annual Chance Flood Hazard	High	III	Outside of LRA Responsibility Area	N	N
Bridge 26C-0017: CARBONDALE RD (WILLOW CRK)	Bridge	Essential Services	Unincorporated Amador County	1% Annual Chance Flood Hazard	High	0	Outside of LRA Responsibility Area	N	N

Critical Facility Name	Critical Facility Type	Critical Facility Category	Jurisdiction	DFIRM Flood Zone	FRA/SRA Fire Hazard Severity Zone	Deep Seated Landslide Class	LRA Fire Hazard Severity Zone	Extremely High Hazard Dam Inundation	High Hazard Dam Inundation
Bridge 26C-0015: WILLOW CREEK RD (WILLOW CRK)	Bridge	Essential Services	Unincorporated Amador County	1% Annual Chance Flood Hazard	Very High	0	Outside of LRA Responsibility Area	N	N
Bridge 26C-0042: OLD AMADOR RD (RANCHERIA CRK)	Bridge	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
Bridge 26C-0043: BUNKER HILL RD (RANCHERIA CRK)	Bridge	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
Bridge 26C-0040: PINE GROVE VOLCANO RD (SUTTER CRK)	Bridge	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
Bridge 26C-0031: CARBONDALE RD (WILLOW CRK)	Bridge	Essential Services	Unincorporated Amador County	1% Annual Chance Flood Hazard	High	0	Outside of LRA Responsibility Area	N	N
Bridge 26C-0030: CARBONDALE RD (WILLOW CRK)	Bridge	Essential Services	Unincorporated Amador County	1% Annual Chance Flood Hazard	High	0	Outside of LRA Responsibility Area	N	N
Bridge 26C-0009: LATROBE RD (LITTLE INDIAN CRK)	Bridge	Essential Services	Unincorporated Amador County	1% Annual Chance Flood Hazard	High	0	Outside of LRA Responsibility Area	N	N

Critical Facility Name	Critical Facility Type	Critical Facility Category	Jurisdiction	DFIRM Flood Zone	FRA/SRA Fire Hazard Severity Zone	Deep Seated Landslide Class	LRA Fire Hazard Severity Zone	Extremely High Hazard Dam Inundation	High Hazard Dam Inundation
Bridge 26C-0018: OLD SACRAMENTO RD (LITTLE INDIAN CRK)	Bridge	Essential Services	Unincorporated Amador County	1% Annual Chance Flood Hazard	High	0	Outside of LRA Responsibility Area	N	N
Bridge 26C-0019: OLD SACRAMENTO RD (LITTLE INDIAN CRK)	Bridge	Essential Services	Plymouth	Other Areas	High	0	High	N	N
Bridge 26C-0033: SPRING VALLEY RD (LITTLE INDIAN CRK)	Bridge	Essential Services	Unincorporated Amador County	Other Areas	High	0	Outside of LRA Responsibility Area	N	N
Bridge 26C-0022: SHENANDOAH RD (BIG INDIAN CRK)	Bridge	Essential Services	Unincorporated Amador County	1% Annual Chance Flood Hazard	High	0	Outside of LRA Responsibility Area	N	N
Bridge 26C-0021: FIDDLETOWN RD (NORTH FORK DRY CRK)	Bridge	Essential Services	Unincorporated Amador County	Other Areas	High	VI	Outside of LRA Responsibility Area	N	N
Bridge 26C-0020: FIDDLETOWN RD (NORTH FORK DRY CRK)	Bridge	Essential Services	Unincorporated Amador County	1% Annual Chance Flood Hazard	High	0	Outside of LRA Responsibility Area	N	N
Bridge 26C-0039: JIBBOOM ST (NORTH FORK DRY CRK)	Bridge	Essential Services	Unincorporated Amador County	1% Annual Chance Flood Hazard	High	0	Outside of LRA Responsibility Area	N	N

Critical Facility Name	Critical Facility Type	Critical Facility Category	Jurisdiction	DFIRM Flood Zone	FRA/SRA Fire Hazard Severity Zone	Deep Seated Landslide Class	LRA Fire Hazard Severity Zone	Extremely High Hazard Dam Inundation	High Hazard Dam Inundation
Bridge 26C-0001: LATROBE RD (CONSUMNES R)	Bridge	Essential Services	Unincorporated Amador County	1% Annual Chance Flood Hazard	Very High	0	Outside of LRA Responsibility Area	Y	N
Bridge 26C-0029: TYLER RD (SOUTH FORK COSUMNES R)	Bridge	Essential Services	Unincorporated Amador County	1% Annual Chance Flood Hazard	High	0	Outside of LRA Responsibility Area	N	N
Bridge 26C-0013: BELL RD (PIGEON CRK)	Bridge	Essential Services	Unincorporated Amador County	1% Annual Chance Flood Hazard	Very High	0	Outside of LRA Responsibility Area	N	N
Bridge 26C-0026: BELL RD (BIG INDIAN CRK)	Bridge	Essential Services	Unincorporated Amador County	1% Annual Chance Flood Hazard	Very High	0	Outside of LRA Responsibility Area	Y	N
Bridge 26C-0027: BELL RD (EAST FORK INDIAN CRK)	Bridge	Essential Services	Unincorporated Amador County	1% Annual Chance Flood Hazard	Very High	0	Outside of LRA Responsibility Area	Y	N
Bridge 26C-0014: SHENANDOAH RD (SOUTH FORK CONSUMNES R)	Bridge	Essential Services	Unincorporated Amador County	1% Annual Chance Flood Hazard	High	0	Outside of LRA Responsibility Area	N	N
Bridge 26C-0028: LAWRENCE RD (SOUTH FORK CONSUMNES R)	Bridge	Essential Services	Unincorporated Amador County	1% Annual Chance Flood Hazard	High	0	Outside of LRA Responsibility Area	N	N
Bridge 26C-0016: UPTON RD (SOUTH FORK CONSUMNES R)	Bridge	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N

Critical Facility Name	Critical Facility Type	Critical Facility Category	Jurisdiction	DFIRM Flood Zone	FRA/SRA Fire Hazard Severity Zone	Deep Seated Landslide Class	LRA Fire Hazard Severity Zone	Extremely High Hazard Dam Inundation	High Hazard Dam Inundation
Jackson Civic Center	Civic Center	Essential Services	Jackson	1% Annual Chance Flood Hazard	Outside of FRA/SRA Area	III	Moderate	N	Y
Sutter Amador Health Pediatric Center	Clinic	Essential Services	Jackson	Other Areas	Outside of FRA/SRA Area	0	High	N	N
Sutter Amador Women's Service	Clinic	Essential Services	Jackson	Other Areas	Outside of FRA/SRA Area	0	High	N	N
MACT Clinic	Clinic	Essential Services	Ione	1% Annual Chance Flood Hazard	Outside of FRA/SRA Area	0	Non-Wildland	N	N
Heritage Medical	Clinic	Essential Services	Jackson	1% Annual Chance Flood Hazard	Outside of FRA/SRA Area	0	High	N	N
Sutter Family Medicine	Clinic	Essential Services	Jackson	Other Areas	Outside of FRA/SRA Area	0	High	N	N
Sutter Family Practice	Clinic	Essential Services	Jackson	Other Areas	Outside of FRA/SRA Area	0	High	N	N
Sierra Wind Wellness and Recovery Center	Clinic	Essential Services	Jackson	Other Areas	Outside of FRA/SRA Area	0	High	N	N
Amador Family Physicians	Clinic	Essential Services	Jackson	0.2% Annual Chance Flood Hazard	Outside of FRA/SRA Area	III	High	N	N
Amador County Behavioral Health	Clinic	Essential Services	Unincorporated Amador County	Other Areas	High	0	Outside of LRA Responsibility Area	N	N

Critical Facility Name	Critical Facility Type	Critical Facility Category	Jurisdiction	DFIRM Flood Zone	FRA/SRA Fire Hazard Severity Zone	Deep Seated Landslide Class	LRA Fire Hazard Severity Zone	Extremely High Hazard Dam Inundation	High Hazard Dam Inundation
WellSpace Health	Clinic	Essential Services	Unincorporated Amador County	Other Areas	Moderate	0	Outside of LRA Responsibility Area	N	N
Jackson Rancheria Health Complex	Clinic	Essential Services	Unincorporated Amador County	Other Areas	Moderate	III	Outside of LRA Responsibility Area	N	N
MACT Health Board	Clinic	Essential Services	Unincorporated Amador County	Other Areas	Moderate	0	Outside of LRA Responsibility Area	N	N
Sutter Amador Health Pioneer	Clinic	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
Sutter Amador Health Plymouth	Clinic	Essential Services	Plymouth	Other Areas	Outside of FRA/SRA Area	0	Non-Wildland	N	N
Sutter Amador Outpatient Services & Imaging	Clinic	Essential Services	Jackson	Other Areas	Outside of FRA/SRA Area	0	High	N	N
Sutter Amador Surgery Center	Clinic	Essential Services	Jackson	Other Areas	Outside of FRA/SRA Area	0	Moderate	N	N
AT&T Infrastructure Building	Communications	Essential Services	Jackson	Other Areas	Outside of FRA/SRA Area	0	Non-Wildland	N	N
The HUB Youth and Community Center	Community Center	Essential Services	Jackson	Other Areas	Outside of FRA/SRA Area	0	Non-Wildland	N	N
Amador Senior Center	Community Center	Essential Services	Jackson	Other Areas	Outside of FRA/SRA Area	0	High	N	N

Critical Facility Name	Critical Facility Type	Critical Facility Category	Jurisdiction	DFIRM Flood Zone	FRA/SRA Fire Hazard Severity Zone	Deep Seated Landslide Class	LRA Fire Hazard Severity Zone	Extremely High Hazard Dam Inundation	High Hazard Dam Inundation
The Arc of Amador and Calaveras	Community Center	Essential Services	Sutter Creek	Other Areas	Outside of FRA/SRA Area	0	High	N	N
Sutter Creek Auditorium	Community Center	Essential Services	Sutter Creek	Other Areas	Outside of FRA/SRA Area	0	High	N	N
Pine Grove Town Hall	Community Center	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
Pioneer Community Veterans Hall	Community Center	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
Armory Hall	Community Center	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
Fiddletown Community Center	Community Center	Essential Services	Unincorporated Amador County	1% Annual Chance Flood Hazard	High	0	Outside of LRA Responsibility Area	N	N
River Pines Town Hall	Community Center	Essential Services	Unincorporated Amador County	Other Areas	High	0	Outside of LRA Responsibility Area	N	N
Amador Superior Court	Court House	Essential Services	Jackson	Other Areas	Outside of FRA/SRA Area	0	High	N	N
California Department of Motor Vehicles	DMV	Essential Services	Jackson	Other Areas	Outside of FRA/SRA Area	0	Non-Wildland	N	N
American Legion Post 108; Station 6	EMS Station	Essential Services	Ione	Other Areas	Outside of FRA/SRA Area	0	Non-Wildland	N	N

Critical Facility Name	Critical Facility Type	Critical Facility Category	Jurisdiction	DFIRM Flood Zone	FRA/SRA Fire Hazard Severity Zone	Deep Seated Landslide Class	LRA Fire Hazard Severity Zone	Extremely High Hazard Dam Inundation	High Hazard Dam Inundation
American Legion Post 108; Station 1	EMS Station	Essential Services	Ione	Other Areas	Outside of FRA/SRA Area	V	Non-Wildland	N	N
American Legion Post 108; Station 2	EMS Station	Essential Services	Unincorporated Amador County	Other Areas	Moderate	0	Outside of LRA Responsibility Area	N	N
American Legion Post 108; Station 3	EMS Station	Essential Services	Unincorporated Amador County	1% Annual Chance Flood Hazard	Very High	0	Outside of LRA Responsibility Area	N	N
American Legion Post 108; Station 5	EMS Station	Essential Services	Plymouth	Other Areas	Outside of FRA/SRA Area	0	Non-Wildland	N	N
Amador County Sheriff's Department	EOC	Essential Services	Jackson	Other Areas	Outside of FRA/SRA Area	0	Non-Wildland	N	N
Howard Park	Evacuation Shelter	Essential Services	Ione	Other Areas	Outside of FRA/SRA Area	0	High	N	N
Amador County Fairgrounds	Evacuation Shelter	Essential Services	Plymouth	Other Areas	Outside of FRA/SRA Area	0	High	N	N
Sierra Baptist Church	Evacuation Shelter	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
Amador Senior Center	Evacuation Shelter	Essential Services	Jackson	Other Areas	Outside of FRA/SRA Area	0	High	N	N
Up Country Pool Center	Evacuation Shelter	Essential Services	Jackson	Other Areas	Outside of FRA/SRA Area	0	Moderate	N	N

Critical Facility Name	Critical Facility Type	Critical Facility Category	Jurisdiction	DFIRM Flood Zone	FRA/SRA Fire Hazard Severity Zone	Deep Seated Landslide Class	LRA Fire Hazard Severity Zone	Extremely High Hazard Dam Inundation	High Hazard Dam Inundation
JVFPD 171 - County	Fire Station	Essential Services	Unincorporated Amador County	Other Areas	High	0	Outside of LRA Responsibility Area	N	N
CDF 181 (Buena Vista) - Calfire	Fire Station	Essential Services	Unincorporated Amador County	Other Areas	Very High	VIII	Outside of LRA Responsibility Area	N	N
JVFPD 172 - County	Fire Station	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	Y
IFD 161 - City	Fire Station	Essential Services	Ione	1% Annual Chance Flood Hazard	Outside of FRA/SRA Area	0	Non-Wildland	N	N
JFD 131 - City	Fire Station	Essential Services	Jackson	Other Areas	Outside of FRA/SRA Area	0	Moderate	N	N
JFD 132 - City	Fire Station	Essential Services	Jackson	Other Areas	Outside of FRA/SRA Area	0	High	N	N
MCSPFD - Calfire	Fire Station	Essential Services	Ione	Other Areas	Outside of FRA/SRA Area	V	Very High	N	N
CDF 60 (Sutter Hill) - Calfire	Fire Station	Essential Services	Unincorporated Amador County	Other Areas	Moderate	0	Outside of LRA Responsibility Area	N	N
SCFPD 142 - City	Fire Station	Essential Services	Sutter Creek	1% Annual Chance Flood Hazard	Outside of FRA/SRA Area	0	High	N	N
SCFPD 141 - City	Fire Station	Essential Services	Sutter Creek	0.2% Annual Chance Flood Hazard	Outside of FRA/SRA Area	0	Very High	N	N

Critical Facility Name	Critical Facility Type	Critical Facility Category	Jurisdiction	DFIRM Flood Zone	FRA/SRA Fire Hazard Severity Zone	Deep Seated Landslide Class	LRA Fire Hazard Severity Zone	Extremely High Hazard Dam Inundation	High Hazard Dam Inundation
AFPD 114 - County	Fire Station	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
CDF 80 (Zion) - Calfire	Fire Station	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
SCFPD 143 - City	Fire Station	Essential Services	Amador City	Other Areas	Outside of FRA/SRA Area	0	Very High	N	N
AFPD 112 - County	Fire Station	Essential Services	Unincorporated Amador County	Other Areas	Very High	V	Outside of LRA Responsibility Area	N	N
AFPD 121 - County	Fire Station	Essential Services	Unincorporated Amador County	Other Areas	High	0	Outside of LRA Responsibility Area	N	N
USFS Amador Ranger - USFS	Fire Station	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
AFPD 111 - County	Fire Station	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
LFPD 152 - County	Fire Station	Essential Services	Unincorporated Amador County	Other Areas	High	V	Outside of LRA Responsibility Area	N	N
AFPD 122 - County	Fire Station	Essential Services	Plymouth	Other Areas	Outside of FRA/SRA Area	0	Non-Wildland	N	N
LFPD 151 - County	Fire Station	Essential Services	Unincorporated Amador County	Other Areas	Very High	V	Outside of LRA Responsibility Area	N	N

Critical Facility Name	Critical Facility Type	Critical Facility Category	Jurisdiction	DFIRM Flood Zone	FRA/SRA Fire Hazard Severity Zone	Deep Seated Landslide Class	LRA Fire Hazard Severity Zone	Extremely High Hazard Dam Inundation	High Hazard Dam Inundation
AFPD 123 - County	Fire Station	Essential Services	Unincorporated Amador County	Other Areas	High	0	Outside of LRA Responsibility Area	N	N
CDF 10 (Dew Drop) - Calfire	Fire Station	Essential Services	Unincorporated Amador County	Other Areas	Very High	V	Outside of LRA Responsibility Area	N	N
CDF 30 (Pine Lodge) - Calfire	Fire Station	Essential Services	Unincorporated Amador County	Other Areas	High	0	Outside of LRA Responsibility Area	N	N
KFD KwdMdws - County	Fire Station	Essential Services	Unincorporated Alpine County	Other Areas	High	VII	Outside of LRA Responsibility Area	N	N
Amador County District Attorney's Office	Government Administration	Essential Services	Jackson	Other Areas	Outside of FRA/SRA Area	0	Non-Wildland	N	N
First 5 Amador	Healthcare/School Services	Essential Services	Jackson	Other Areas	Outside of FRA/SRA Area	0	High	N	Y
Sutter Amador Hospital	Hospital	Essential Services	Jackson	Other Areas	Outside of FRA/SRA Area	0	High	N	N
Amador County Jail	Jail	Essential Services	Jackson	Other Areas	Outside of FRA/SRA Area	0	Non-Wildland	N	N
Ione Library	Library	Essential Services	Ione	1% Annual Chance Flood Hazard	Outside of FRA/SRA Area	0	High	N	N
Jackson Library	Library	Essential Services	Jackson	Other Areas	Outside of FRA/SRA Area	0	High	N	N

Critical Facility Name	Critical Facility Type	Critical Facility Category	Jurisdiction	DFIRM Flood Zone	FRA/SRA Fire Hazard Severity Zone	Deep Seated Landslide Class	LRA Fire Hazard Severity Zone	Extremely High Hazard Dam Inundation	High Hazard Dam Inundation
Pine Grove Library	Library	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
Pioneer Library	Library	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
Plymouth Library	Library	Essential Services	Plymouth	Other Areas	Outside of FRA/SRA Area	0	Non-Wildland	N	N
Kirkwood Meadows PUC - Bulk Propane Storage	Other	Essential Services	Unincorporated Amador County	Other Areas	High	VII	Outside of LRA Responsibility Area	N	N
Amador County Public Works Corporation Yard	Other	Essential Services	Unincorporated Amador County	Other Areas	High	V	Outside of LRA Responsibility Area	N	N
Amador County Airport	Other	Essential Services	Unincorporated Amador County	Other Areas	Moderate	0	Outside of LRA Responsibility Area	N	N
ATCAA - Service Center	Other	Essential Services	Unincorporated Amador County	Other Areas	Very High	V	Outside of LRA Responsibility Area	N	N
Cal-Trans Maintenance Station - Pine Grove	Other	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
Cal-Trans Maintenance Station - Ione	Other	Essential Services	Ione	1% Annual Chance Flood Hazard	Outside of FRA/SRA Area	0	Moderate	N	N

Critical Facility Name	Critical Facility Type	Critical Facility Category	Jurisdiction	DFIRM Flood Zone	FRA/SRA Fire Hazard Severity Zone	Deep Seated Landslide Class	LRA Fire Hazard Severity Zone	Extremely High Hazard Dam Inundation	High Hazard Dam Inundation
California Highway Patrol (State)	Police Station	Essential Services	Jackson	Other Areas	Outside of FRA/SRA Area	0	High	N	N
Jackson Police Department (City)	Police Station	Essential Services	Jackson	1% Annual Chance Flood Hazard	Outside of FRA/SRA Area	III	Moderate	N	Y
Ione Police Department (City)	Police Station	Essential Services	Ione	1% Annual Chance Flood Hazard	Outside of FRA/SRA Area	0	Moderate	N	N
Amador County Sheriff's Department (County)	Police Station	Essential Services	Jackson	Other Areas	Outside of FRA/SRA Area	0	Non-Wildland	N	N
Sutter Creek Police Department (City)	Police Station	Essential Services	Sutter Creek	1% Annual Chance Flood Hazard	Outside of FRA/SRA Area	0	High	N	N
Ione Post Office	Post Office	Essential Services	Ione	1% Annual Chance Flood Hazard	Outside of FRA/SRA Area	0	Non-Wildland	N	N
Jackson Post Office	Post Office	Essential Services	Jackson	Other Areas	Outside of FRA/SRA Area	0	Moderate	N	N
Sutter Creek Post Office	Post Office	Essential Services	Sutter Creek	Other Areas	Outside of FRA/SRA Area	III	Very High	N	N
Pine Grove Post Office	Post Office	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
Amador City Post Office	Post Office	Essential Services	Amador City	Other Areas	Outside of FRA/SRA Area	III	Very High	N	N

Critical Facility Name	Critical Facility Type	Critical Facility Category	Jurisdiction	DFIRM Flood Zone	FRA/SRA Fire Hazard Severity Zone	Deep Seated Landslide Class	LRA Fire Hazard Severity Zone	Extremely High Hazard Dam Inundation	High Hazard Dam Inundation
Pioneer Post Office	Post Office	Essential Services	Unincorporated Amador County	Other Areas	Very High	V	Outside of LRA Responsibility Area	N	N
Volcano Post Office	Post Office	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
Plymouth Post Office	Post Office	Essential Services	Plymouth	Other Areas	Outside of FRA/SRA Area	0	Moderate	N	N
Fiddletown Post Office	Post Office	Essential Services	Unincorporated Amador County	Other Areas	High	0	Outside of LRA Responsibility Area	N	N
Electra Rd Powerhouse	Power Plant	Essential Services	Unincorporated Amador County	Other Areas	Very High	III	Outside of LRA Responsibility Area	Y	Y
Tiger Creek Powerhouse	Power Plant	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	Y	Y
Salt Springs Powerhouse	Power Plant	Essential Services	Unincorporated Amador County	Other Areas	Very High	III	Outside of LRA Responsibility Area	Y	N
Electra Rd Substation	Power Substation	Essential Services	Unincorporated Amador County	Other Areas	Very High	VII	Outside of LRA Responsibility Area	Y	N
Clay Substation	Power Substation	Essential Services	Ione	Other Areas	Outside of FRA/SRA Area	0	High	N	N
Martell Substation	Power Substation	Essential Services	Unincorporated Amador County	Other Areas	Moderate	0	Outside of LRA Responsibility Area	N	N

Critical Facility Name	Critical Facility Type	Critical Facility Category	Jurisdiction	DFIRM Flood Zone	FRA/SRA Fire Hazard Severity Zone	Deep Seated Landslide Class	LRA Fire Hazard Severity Zone	Extremely High Hazard Dam Inundation	High Hazard Dam Inundation
Ione Substation	Power Substation	Essential Services	Ione	Other Areas	Outside of FRA/SRA Area	0	Very High	N	N
Pine Grove Substation	Power Substation	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
Oleta Substation	Power Substation	Essential Services	Plymouth	Other Areas	Outside of FRA/SRA Area	0	High	N	N
Mule Creek State Prison	Prison	Essential Services	Ione	Other Areas	Outside of FRA/SRA Area	0	High	N	N
Jackson City Hall	Public Administration Building	Essential Services	Jackson	1% Annual Chance Flood Hazard	Outside of FRA/SRA Area	VI	Moderate	N	Y
Ione City Hall	Public Administration Building	Essential Services	Ione	1% Annual Chance Flood Hazard	Outside of FRA/SRA Area	0	Moderate	N	N
Amador County Administration Center	Public Administration Building	Essential Services	Jackson	Other Areas	Outside of FRA/SRA Area	0	Moderate	N	N
Amador County General Services Administration	Public Administration Building	Essential Services	Unincorporated Amador County	Other Areas	Moderate	0	Outside of LRA Responsibility Area	N	N
Sutter Creek City Hall	Public Administration Building	Essential Services	Sutter Creek	Other Areas	Outside of FRA/SRA Area	0	High	N	N
Amador City City Hall	Public Administration Building	Essential Services	Amador City	Other Areas	Outside of FRA/SRA Area	0	Very High	N	N

Critical Facility Name	Critical Facility Type	Critical Facility Category	Jurisdiction	DFIRM Flood Zone	FRA/SRA Fire Hazard Severity Zone	Deep Seated Landslide Class	LRA Fire Hazard Severity Zone	Extremely High Hazard Dam Inundation	High Hazard Dam Inundation
Plymouth City Hall	Public Administration Building	Essential Services	Plymouth	Other Areas	Outside of FRA/SRA Area	0	Moderate	N	N
CAMANCHE HILLS HUNT CLUB - WELL 01	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	High	V	Outside of LRA Responsibility Area	Y	N
LAKE AMADOR - TREATED	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	III	Outside of LRA Responsibility Area	N	N
LAKE AMADOR - RAW	Public Water System	Essential Services	Unincorporated Amador County	1% Annual Chance Flood Hazard	Very High	0	Outside of LRA Responsibility Area	Y	Y
MP ASSOCIATES - WELL 01 - TREATED - ARSENIC	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
MP ASSOCIATES - WELL 01	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
SUNSET WEST - WELL 01 - TREATED - IRON	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	VIII	Outside of LRA Responsibility Area	N	N
SUNSET WEST - WELL 01	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	V	Outside of LRA Responsibility Area	N	N
MELODY OAKS - WELL 02 - ABANDONED	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N

Critical Facility Name	Critical Facility Type	Critical Facility Category	Jurisdiction	DFIRM Flood Zone	FRA/SRA Fire Hazard Severity Zone	Deep Seated Landslide Class	LRA Fire Hazard Severity Zone	Extremely High Hazard Dam Inundation	High Hazard Dam Inundation
MELODY OAKS - WELL 01	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
MELODY OAKS - WELL 01 - TREATED	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
TABEAU MHP - WELL 02	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
TABEAU MHP - WELL 01 - DESTROYED	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
MALLO GOLD MINE PLAZA - WELL 02	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
MALLO GOLD MINE PLAZA - WELL 01 - INACTIVE	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
DRYTOWN - AWA PURCHASED SOURCE	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	High	0	Outside of LRA Responsibility Area	N	N
VOLCANO CSD - WELL 01 - STANDBY	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
VOLCANO CSD - CLEVELAND TUNNEL - TREATED	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	VII	Outside of LRA Responsibility Area	N	N

Critical Facility Name	Critical Facility Type	Critical Facility Category	Jurisdiction	DFIRM Flood Zone	FRA/SRA Fire Hazard Severity Zone	Deep Seated Landslide Class	LRA Fire Hazard Severity Zone	Extremely High Hazard Dam Inundation	High Hazard Dam Inundation
VOLCANO CSD - CLEVELAND TUNNEL - RAW	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	IX	Outside of LRA Responsibility Area	N	N
TIGER CREEK POWERHOUSE - TREATED	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	Y	Y
TIGER CREEK POWERHOUSE - AFTEBAY - RAW	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	VIII	Outside of LRA Responsibility Area	Y	Y
AMADOR CHRISTIAN CENTER - WELL 01	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	High	0	Outside of LRA Responsibility Area	N	N
ALLAN ROAD HOA - SPRING 01	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	V	Outside of LRA Responsibility Area	N	N
GOLDEN VALLEY CAMP - WELL 01	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	VI	Outside of LRA Responsibility Area	N	N
GOLDEN VALLEY CAMP - WELL 02	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
HOPE FOUNDATION - WELL 01	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	High	0	Outside of LRA Responsibility Area	N	N
DEER RIDGE INN - WELL #3 - DESTROYED	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
HOPE FOUNDATION - WELL 02	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	V	Outside of LRA Responsibility Area	N	N

Critical Facility Name	Critical Facility Type	Critical Facility Category	Jurisdiction	DFIRM Flood Zone	FRA/SRA Fire Hazard Severity Zone	Deep Seated Landslide Class	LRA Fire Hazard Severity Zone	Extremely High Hazard Dam Inundation	High Hazard Dam Inundation
DEER RIDGE INN - WELL #2	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
DEER RIDGE INN - WELL 01	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
OK CORRAL - WELL 01	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	V	Outside of LRA Responsibility Area	N	N
RANCHO DEL ORO - WELL 01	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	High	0	Outside of LRA Responsibility Area	N	N
WELL 01	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	V	Outside of LRA Responsibility Area	N	N
BLACK S STATION - WELL 01	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
FIDDLETOWN CSD - WELL 02 - TREATED	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	High	III	Outside of LRA Responsibility Area	N	N
FIDDLETOWN - WELL 01 - DESTROYED	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	High	III	Outside of LRA Responsibility Area	N	N
ORO MADRE MOOSE - WELL 01	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	High	0	Outside of LRA Responsibility Area	N	N
COOK S STATION - WELL 01	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N

Critical Facility Name	Critical Facility Type	Critical Facility Category	Jurisdiction	DFIRM Flood Zone	FRA/SRA Fire Hazard Severity Zone	Deep Seated Landslide Class	LRA Fire Hazard Severity Zone	Extremely High Hazard Dam Inundation	High Hazard Dam Inundation
COOK S STATION - WELL 02	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	V	Outside of LRA Responsibility Area	N	N
SPINETTA VINEYARD - WELL 01	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	High	0	Outside of LRA Responsibility Area	N	N
BEAR RIVER SOUTH SHORE - SPRING 01	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	III	Outside of LRA Responsibility Area	N	N
BEAR RIVER GROUP CAMP - WELL 01	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	VIII	Outside of LRA Responsibility Area	N	N
AMADOR HARVEST INN - WELL 01	Public Water System	Essential Services	Unincorporated Amador County	1% Annual Chance Flood Hazard	Moderate	0	Outside of LRA Responsibility Area	N	N
BEAR RIVER SUMMER HOME TRACT - WELL 01	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
CAMP WINTON - SPRING 01 - ABANDONED	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	VI	Outside of LRA Responsibility Area	N	N
CAMP WINTON - SPRING 02 - ABANDONED	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	VI	Outside of LRA Responsibility Area	N	N
CAMP WINTON - SPRING 03 - ABANDONED	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	VI	Outside of LRA Responsibility Area	N	N
CAMP WINTON - SPRING 04 - ABANDONED	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	VI	Outside of LRA Responsibility Area	N	N

Critical Facility Name	Critical Facility Type	Critical Facility Category	Jurisdiction	DFIRM Flood Zone	FRA/SRA Fire Hazard Severity Zone	Deep Seated Landslide Class	LRA Fire Hazard Severity Zone	Extremely High Hazard Dam Inundation	High Hazard Dam Inundation
HAM'S STATION - WELL 01	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	V	Outside of LRA Responsibility Area	N	N
CAMP WINTON - WELL 01	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
RANCHO CICADA - WELL 01	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	III	Outside of LRA Responsibility Area	N	N
BEAR RIVER LAKE RESORT - WELL 01	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
CAMP RITCHIE	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N
STOCKTON MUN FAMILY CAMP - PLASSE'S SPRING 01	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Moderate	VIII	Outside of LRA Responsibility Area	N	N
PLASSES CABIN'S - PLASSE'S SPRING 01	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Moderate	VIII	Outside of LRA Responsibility Area	N	N
S. SILVER LAKE HOA - SPRING 01	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Moderate	III	Outside of LRA Responsibility Area	N	N
E. SILVER LAKE HOA - MEADOW SPRING	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Moderate	V	Outside of LRA Responsibility Area	N	N

Critical Facility Name	Critical Facility Type	Critical Facility Category	Jurisdiction	DFIRM Flood Zone	FRA/SRA Fire Hazard Severity Zone	Deep Seated Landslide Class	LRA Fire Hazard Severity Zone	Extremely High Hazard Dam Inundation	High Hazard Dam Inundation
E. SILVER LAKE HOA - CREEK SPRING	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Moderate	V	Outside of LRA Responsibility Area	N	N
E. SILVER LAKE HOA - MUD SPRING - ABANDONED	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Moderate	VIII	Outside of LRA Responsibility Area	N	N
KAY'S RESORT - WELL 01	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Moderate	0	Outside of LRA Responsibility Area	N	N
E. SILVER LAKE HOA - TIMBERLINE SPRING	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Moderate	IX	Outside of LRA Responsibility Area	N	N
KIT CARSON LODGE - POLAR BEAR WELL	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Moderate	0	Outside of LRA Responsibility Area	N	N
KIT CARSON LODGE - LODGE WELL - STANDBY	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Moderate	0	Outside of LRA Responsibility Area	N	N
SILVER LAKE CAMPGROUND - SPRING 01	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Moderate	IX	Outside of LRA Responsibility Area	N	N
Kirkwood Meadows PUD - Dangburg 250,000 gallon tank	Public Water System	Essential Services	Unincorporated Amador County	Other Areas	Moderate	V	Outside of LRA Responsibility Area	N	N
Amador USFS Ranger Station	Ranger Station	Essential Services	Unincorporated Amador County	Other Areas	Very High	0	Outside of LRA Responsibility Area	N	N

Critical Facility Name	Critical Facility Type	Critical Facility Category	Jurisdiction	DFIRM Flood Zone	FRA/SRA Fire Hazard Severity Zone	Deep Seated Landslide Class	LRA Fire Hazard Severity Zone	Extremely High Hazard Dam Inundation	High Hazard Dam Inundation
Amador County Unified School District Office	School District Office	Essential Services	Jackson	Other Areas	Outside of FRA/SRA Area	0	Non-Wildland	N	N
Amador County Veterans Services	Veterans Services	Essential Services	Unincorporated Amador County	Other Areas	Moderate	0	Outside of LRA Responsibility Area	N	N
Scottsville Sewer Lift Station	Wastewater Facility	Essential Services	Jackson	Other Areas	Outside of FRA/SRA Area	0	Very High	N	N
West View Sewer Lift Station	Wastewater Facility	Essential Services	Jackson	Other Areas	Outside of FRA/SRA Area	0	High	N	N
High School Sewer Lift Station	Wastewater Facility	Essential Services	Unincorporated Amador County	Other Areas	High	0	Outside of LRA Responsibility Area	N	N
Jackson Wastewater Treatment Plant	Wastewater Treatment Plant	Essential Services	Jackson	Other Areas	Outside of FRA/SRA Area	VI	Very High	N	Y

Appendix G FEMA National Risk Index Report

National Risk Index

January 09, 2025

Amador County, California

Summary

Risk Index is **Relatively Low**

Score **77.8**

Expected Annual Loss is **Relatively Low**

Score **78.1**

Social Vulnerability is **Relatively Moderate**

Score **59.4**

Community Resilience is **Relatively Moderate**

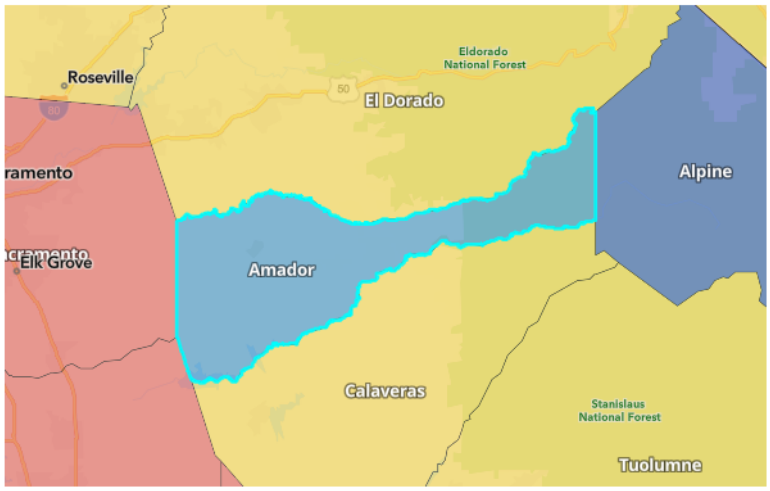
Score **43.2**

While reviewing this report, keep in mind that low risk is driven by lower loss due to natural hazards, lower social vulnerability, and higher community resilience.

For more information about the National Risk Index, its data, and how to interpret the information it provides, please review the **About the National Risk Index** and **How to Take Action** sections at the end of this report. Or, visit the National Risk Index website at hazards.fema.gov/nri/learn-more to access supporting documentation and links.

Risk Index

The Risk Index rating is **Relatively Low** for **Amador County, CA** when compared to the rest of the U.S.



Score **77.79**

National Percentile
77.79

Percentile Within California
12.10

0 100

78% of U.S. counties have a lower Risk Index

12% of counties in California have a lower Risk Index

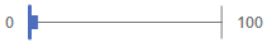
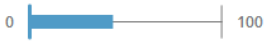
Risk Index Legend

Very High | Relatively High | Relatively Moderate | Relatively Low | Very Low

No Rating | Not Applicable | Insufficient Data

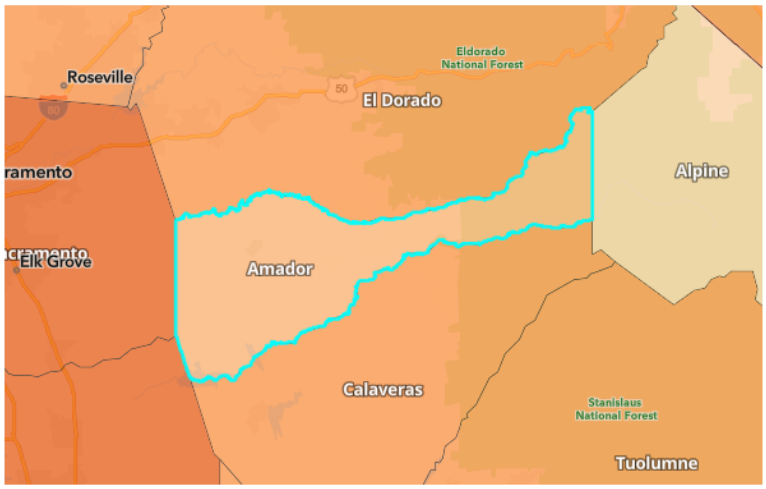
Hazard Type Risk Index

Hazard type Risk Index scores are calculated using data for only a single hazard type, and reflect a community's Expected Annual Loss value, community risk factors, and the adjustment factor used to calculate the risk value.

Hazard Type	Risk Index Rating	Risk Index Score	National Percentile
Avalanche	Very Low	26.4	
Coastal Flooding	Not Applicable	--	
Cold Wave	No Rating	0	
Drought	Relatively High	98.7	
Earthquake	Relatively Low	82.4	
Hail	Very Low	4.4	
Heat Wave	Relatively Moderate	94.3	
Hurricane	Not Applicable	--	
Ice Storm	Not Applicable	--	
Landslide	Relatively Low	44	
Lightning	Very Low	24.6	
Riverine Flooding	Relatively Low	54.1	
Strong Wind	Very Low	2.5	
Tornado	Very Low	6.2	
Tsunami	Not Applicable	--	
Volcanic Activity	Not Applicable	--	

Expected Annual Loss

In **Amador County, CA**, expected loss each year due to natural hazards is **Relatively Low** when compared to the rest of the U.S.



Score	78.06

National Percentile
78.06

Percentile Within California
17.20

0 100

78% of U.S. counties have a lower Expected Annual Loss

17% of counties in California have a lower Expected Annual Loss

Expected Annual Loss Legend

Very High | Relatively High | Relatively Moderate | Relatively Low | Very Low

No Expected Annual Losses | Not Applicable | Insufficient Data

Composite Expected Annual Loss	**$16,309,058.75**
Composite Expected Annual Loss Rate National Percentile	**81**

Building EAL	**$8,622,287.36**	Population EAL	**0.20** fatalities
Building EAL Rate	**$1 per $942.43 of building value**	Population EAL Rate	**1 per 203.42K people**
Agriculture EAL	**$5,381,404.03**	Population Equivalence EAL	**$2,305,367.36**
Agriculture EAL Rate	**$1 per $6.61 of agriculture value**		

Expected Annual Loss for Hazard Types

Expected Annual Loss scores for hazard types are calculated using data for only a single hazard type, and reflect a community's relative expected annual loss for only that hazard type.

13 of 18 hazard types contribute to the expected annual loss for **Amador County, CA**.

Hazard Type	Expected Annual Loss Rating	EAL Value	Score
Wildfire	Relatively High	$7,534,156	97.3
Drought	Relatively High	$5,114,470	98.8
Heat Wave	Relatively Moderate	$1,761,917	94.4
Earthquake	Relatively Low	$1,188,592	80.8
Riverine Flooding	Relatively Low	$535,814	56.3
Avalanche	Very Low	$61,612	39.9
Lightning	Very Low	$40,178	25.9
Tornado	Very Low	$23,039	8.3
Landslide	Relatively Low	$21,900	45.3
Winter Weather	Relatively Low	$18,927	28.9
Strong Wind	Very Low	$5,716	5.1
Hail	Very Low	$2,739	6.8
Cold Wave	No Expected Annual Losses	$0	0.0
Coastal Flooding	Not Applicable	--	--
Hurricane	Not Applicable	--	--
Ice Storm	Not Applicable	--	--
Tsunami	Not Applicable	--	--

Expected Annual Loss Values

Hazard Type	Total	Building Value	Population Equivalence	Population	Agriculture Value
Avalanche	$61,612	$79	$61,533	0.01	n/a
Coastal Flooding	--	--	--	--	--
Cold Wave	$0	$0	$0	0.00	$0
Drought	$5,114,470	n/a	n/a	n/a	$5,114,470
Earthquake	$1,188,592	$1,045,030	$143,562	0.01	n/a
Hail	$2,739	$983	$946	0.00	$811
Heat Wave	$1,761,917	$64	$1,752,784	0.15	$9,069
Hurricane	--	--	--	--	--
Ice Storm	--	--	--	--	--
Landslide	$21,900	$4,500	$17,400	0.00	n/a
Lightning	$40,178	$4,663	$35,515	0.00	n/a
Riverine Flooding	$535,814	$20,513	$258,496	0.02	$256,805
Strong Wind	$5,715	$1,321	$4,390	0.00	$5
Tornado	$23,039	$17,120	$5,673	0.00	$246
Tsunami	--	--	--	--	--
Volcanic Activity	--	--	--	--	--
Wildfire	$7,534,156	$7,527,083	$7,073	0.00	$0
Winter Weather	$18,927	$931	$17,996	0.00	$0

Exposure Values

Hazard Type	Total	Building Value	Population Equivalence	Population	Agriculture Value
Avalanche	$59,000,000	$1,000,000	$58,000,000	5.00	n/a
Coastal Flooding	--	--	--	--	--
Cold Wave	$0	$0	$0	0.00	$0
Drought	$26,500,133	n/a	n/a	n/a	$26,500,133
Earthquake	$477,624,156,000	$8,125,756,000	$469,498,400,000	40,474.00	n/a
Hail	$477,114,656,936	$8,125,867,642	$468,953,200,000	40,427.00	$35,589,294
Heat Wave	$477,114,646,325	$8,125,867,572	$468,953,189,458	40,427.00	$35,589,294
Hurricane	--	--	--	--	--
Ice Storm	--	--	--	--	--
Landslide	$181,116,409,942	$3,325,809,127	$177,790,600,815	15,326.78	n/a
Lightning	$477,079,067,642	$8,125,867,642	$468,953,200,000	40,427.00	n/a
Riverine Flooding	$14,920,746,533	$285,551,878	$14,612,002,878	1,259.66	$23,191,777
Strong Wind	$477,114,656,936	$8,125,867,642	$468,953,200,000	40,427.00	$35,589,294
Tornado	$477,114,656,936	$8,125,867,642	$468,953,200,000	40,427.00	$35,589,294
Tsunami	--	--	--	--	--
Volcanic Activity	--	--	--	--	--
Wildfire	$209,068,882,831	$3,204,088,565	$205,852,480,824	17,745.90	$12,313,443
Winter Weather	$477,114,646,325	$8,125,867,572	$468,953,189,458	40,427.00	$35,589,294

Annualized Frequency Values

Hazard Type	Annualized Frequency	Events on Record	Period of Record
Avalanche	0 events per year	1	1960-2019 (60 years)
Coastal Flooding	--	--	--
Cold Wave	0 events per year	0	2005-2021 (16 years)
Drought	53.4 events per year	1,260	2000-2021 (22 years)
Earthquake	0.318% chance per year	n/a	2021 dataset
Hail	0.1 events per year	5	1986-2021 (34 years)
Heat Wave	1.9 events per year	30	2005-2021 (16 years)
Hurricane	--	--	--
Ice Storm	--	--	--
Landslide	0 events per year	0	2010-2021 (12 years)
Lightning	1.9 events per year	43	1991-2012 (22 years)
Riverine Flooding	0.7 events per year	16	1996-2019 (24 years)
Strong Wind	0 events per year	2	1986-2021 (34 years)
Tornado	0.1 events per year	0	1950-2021 (72 years)
Tsunami	--	--	--
Volcanic Activity	--	--	--
Wildfire	0.592% chance per year	n/a	2021 dataset
Winter Weather	8.1 events per year	132	2005-2021 (16 years)

Historic Loss Ratios

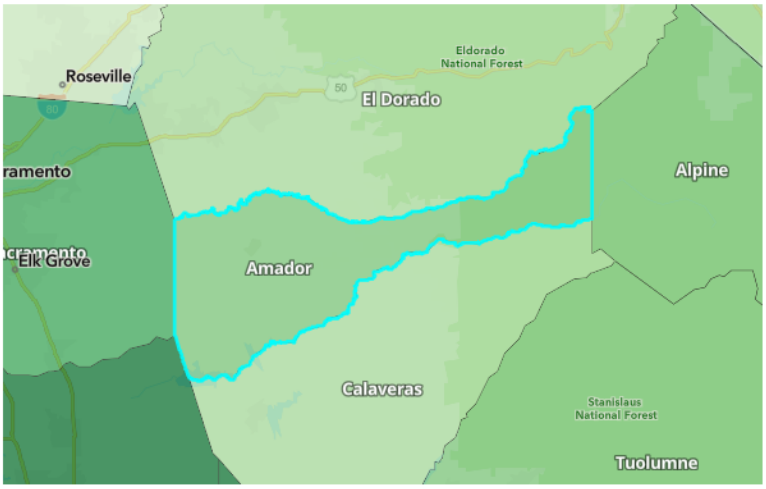
Hazard Type	Overall Rating
Avalanche	Relatively Moderate
Coastal Flooding	--
Cold Wave	No Rating
Drought	Relatively High
Earthquake	Relatively Low
Hail	Very Low
Heat Wave	Relatively Low
Hurricane	--
Ice Storm	--
Landslide	Very Low
Lightning	Very High
Riverine Flooding	Relatively Low
Strong Wind	Relatively Low
Tornado	Very Low
Tsunami	--
Volcanic Activity	--
Wildfire	Relatively Low
Winter Weather	Very Low

Expected Annual Loss Rate

Hazard Type	Building EAL Rate (per building value)	Population EAL Rate (per population)	Agriculture EAL Rate (per agriculture value)
Avalanche	$1 per $102.68M	1 per 7.62M	--
Coastal Flooding	--	--	--
Cold Wave	--	--	--
Drought	--	--	$1 per $6.96
Earthquake	$1 per $7.78K	1 per 3.27M	--
Hail	$1 per $8.27M	1 per 495.67M	$1 per $43.90K
Heat Wave	$1 per $127.16M	1 per 267.55K	$1 per $3.92K
Hurricane	--	--	--
Ice Storm	--	--	--
Landslide	$1 per $1.81M	1 per 26.95M	--
Lightning	$1 per $1.74M	1 per 13.20M	--
Riverine Flooding	$1 per $396.12K	1 per 1.81M	$1 per $138.59
Strong Wind	$1 per $6.15M	1 per 106.83M	$1 per $7.86M
Tornado	$1 per $474.64K	1 per 82.67M	$1 per $144.69K
Tsunami	--	--	--
Volcanic Activity	--	--	--
Wildfire	$1 per $1.08K	1 per 66.30M	$1 per $541.15M
Winter Weather	$1 per $8.73M	1 per 26.06M	$1 per $803.18B

Social Vulnerability

Social groups in **Amador County, CA** have a **Relatively Moderate** susceptibility to the adverse impacts of natural hazards when compared to the rest of the U.S.



Score **59.42**

National Percentile
59.42

Percentile Within California
34.50

0 100

59% of U.S. counties have a lower Social Vulnerability

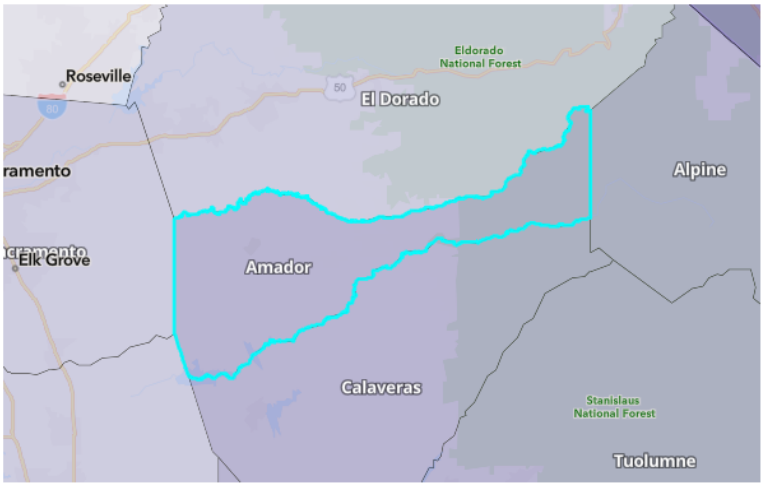
34% of counties in California have a lower Social Vulnerability

Social Vulnerability Legend

Very High | Relatively High | Relatively Moderate | Relatively Low | Very Low | Data Unavailable

Community Resilience

Communities in **Amador County, CA** have a **Relatively Moderate** ability to prepare for anticipated natural hazards, adapt to changing conditions, and withstand and recover rapidly from disruptions when compared to the rest of the U.S.



Score **43.19**

National Percentile
43.19

Percentile Within California
44.80

0 100

57% of U.S. counties have a higher Community Resilience

55% of counties in California have a higher Community Resilience

Community Resilience Legend

Very High | Relatively High | Relatively Moderate | Relatively Low | Very Low | Data Unavailable

About the National Risk Index

The National Risk Index is a dataset and online tool to help illustrate the United States communities most at risk for 18 natural hazards: Avalanche, Coastal Flooding, Cold Wave, Drought, Earthquake, Hail, Heat Wave, Hurricane, Ice Storm, Landslide, Lightning, Riverine Flooding, Strong Wind, Tornado, Tsunami, Volcanic Activity, Wildfire, and Winter Weather.

The National Risk Index leverages available source data for Expected Annual Loss due to these 18 hazard types, Social Vulnerability, and Community Resilience to develop a baseline relative risk measurement for each United States county and Census tract. These measurements are calculated using average past conditions, but they cannot be used to predict future outcomes for a community. The National Risk Index is intended to fill gaps in available data and analyses to better inform federal, state, local, tribal, and territorial decision makers as they develop risk reduction strategies.

Explore the National Risk Index Map at **hazards.fema.gov/nri/map**.

Visit the National Risk Index website at **hazards.fema.gov/nri/learn-more** to access supporting documentation and links.

Calculating the Risk Index

Risk Index scores are calculated using an equation that combines scores for Expected Annual Loss due to natural hazards, Social Vulnerability and Community Resilience:

$$\text{Risk Index} = \text{Expected Annual Loss} \times \text{Social Vulnerability} \div \text{Community Resilience}$$

Risk Index scores are presented as a composite score for all 18 hazard types, as well as individual scores for each hazard type.

For more information, visit hazards.fema.gov/nri/determining-risk.

Calculating Expected Annual Loss

Expected Annual Loss scores are calculated using an equation that combines values for exposure, annualized frequency, and historic loss ratios for 18 hazard types:

> **Expected Annual Loss = Exposure × Annualized Frequency × Historic Loss Ratio**

Expected Annual Loss scores are presented as a composite score for all 18 hazard types, as well as individual scores for each hazard type.

For more information, visit **hazards.fema.gov/nri/expected-annual-loss**.

Calculating Social Vulnerability

Social Vulnerability is measured using the Social Vulnerability Index (SVI) published by the Centers for Disease Control and Prevention (CDC).

For more information, visit **hazards.fema.gov/nri/social-vulnerability**.

Calculating Community Resilience

Community Resilience is measured using the Baseline Resilience Indicators for Communities (HVRI BRIC) published by the University of South Carolina's Hazards and Vulnerability Research Institute (HVRI).

For more information, visit **hazards.fema.gov/nri/community-resilience**.

How to Take Action

There are many ways to reduce natural hazard risk through mitigation. Communities with high National Risk Index scores can take action to reduce risk by decreasing Expected Annual Loss due to natural hazards, decreasing Social Vulnerability, and increasing Community Resilience.

For information about how to take action and reduce your risk, visit **hazards.fema.gov/nri/take-action**.

Disclaimer

The National Risk Index (the Risk Index or the Index) and its associated data are meant for planning purposes only. This tool was created for broad nationwide comparisons and is not a substitute for localized risk assessment analysis. Nationwide datasets used as inputs for the National Risk Index are, in many cases, not as accurate as available local data. Users with access to local data for each National Risk Index risk factor should consider substituting the Risk Index data with local data to recalculate a more accurate risk index. If you decide to download the National Risk Index data and substitute it with local data, you assume responsibility for the accuracy of the data and any resulting data index. Please visit the **Contact Us** page if you would like to discuss this process further.

The methodology used by the National Risk Index has been reviewed by subject matter experts in the fields of natural hazard risk research, risk analysis, mitigation planning, and emergency management. The processing methods used to create the National Risk Index have produced results similar to those from other natural hazard risk analyses conducted on a smaller scale. The breadth and combination of geographic information systems (GIS) and data processing techniques leveraged by the National Risk Index enable it to incorporate multiple hazard types and risk factors, manage its nationwide scope, and capture what might have been missed using other methods.

The National Risk Index does not consider the intricate economic and physical interdependencies that exist across geographic regions. Keep in mind that hazard impacts in surrounding counties or Census tracts can cause indirect losses in your community regardless of your community's risk profile.

Nationwide data available for some risk factors are rudimentary at this time. The National Risk Index will be continuously updated as new data become available and improved methodologies are identified.

The National Risk Index Contact Us page is available at **hazards.fema.gov/nri/contact-us**.

Appendix H Hazus Earthquake Reports

The following pages contain the Hazus earthquake reports from the following three scenarios:

- Carson Range 7.23 Deterministic Scenario
- Great Valley 6.53 Deterministic Scenario
- Hayward + Rogers Creek 7.58 Deterministic Scenario

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