



# **Local Mitigation Strategy**

**2025**

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**SUMMARY OF CHANGES**

The Summary of Changes will list the routine updates that will be made to the LMS Plan once it has been accepted. Changes made to the 2025 plan will be archived by Emergency Management. This plan is a living document and can be changed at any time by the LMS Planning Committee/Work Group. Continual citizen participation and input by all interest parties is encouraged.

| <b>Change</b> | <b>Comments/Purpose</b>                   | <b>Date</b> | <b>Pages</b> |
|---------------|-------------------------------------------|-------------|--------------|
| Plan Update   | Plan was updated and revised in entirety. | 2025        | All          |
|               |                                           |             |              |
|               |                                           |             |              |

## EXECUTIVE SUMMARY

According to Title 44 CFR §201.1, the purpose of mitigation planning is for State, local, and Indian tribal governments to identify the natural hazards that impact them, to identify actions and activities to reduce any losses from those hazards, and to establish a coordinated process to implement the plan, taking advantage of a wide range of resources.

Hazard mitigation is defined as any sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards, Title 44 CFR §201.2. Mitigation initiatives or activities may be implemented prior to, during, or after an event. It has been noted that hazard mitigation is most effective when based on an inclusive, comprehensive, long-term plan that is developed before a disaster occurs.

The Columbia County Local Mitigation Strategy (LMS) details the continual work of the Columbia County LMS Working Group (WG) to develop the comprehensive planning process and an analysis for Lake City, Fort White, and unincorporated Columbia County on the risks posed by natural, human-caused, and technological disasters and their vulnerability, extent, and impact to those risks. After reviewing risks and vulnerabilities, the stakeholders have identified strategic mitigation goals, objectives and measures intended to reduce or eliminate future losses due to these risks.

This local mitigation strategy seeks to accomplish the following:

- Identify and describe hazards to which Columbia County is vulnerable;
- Identify and assess populations, facilities, structures and other assets within Columbia County that are most vulnerable to particular hazards;
- Set goals and objectives as a strategy to mitigate property against future losses;
- Based upon these goals and objectives, identify and prioritize mitigation projects that will take advantage of available funding and reduce future losses;
- Identify potential funding sources; and
- Promote hazard risk awareness and mitigation education.

The WG has worked to identify proposed mitigation projects or initiatives that will reduce or eliminate vulnerabilities to make the communities of Columbia County much more resilient to future impacts of hazards. The proposed projects have been identified and developed and will continue to be evaluated by the Working Group for implementation whenever the financial resources become available and based on cost/benefit analysis.

The mitigation project list is considered a “living document”. The project list will and should evolve as projects are undertaken and completed, as future disasters affect the county and new needs are identified, and as local priorities change. As the mitigation projects identified in this plan are implemented, step-by-step, Columbia County will become a more “disaster resistant” community.

The Federal Emergency Management Agency (FEMA) and the Florida Division of Emergency Management (FDEM) require that this document be adopted by the following governing bodies: City of Lake City, the Town of Fort White, and Columbia County Board of County Commissioners (BOCC). Adoption of the Columbia County LMS by the City and County Commissions will not have any legal effect on the Comprehensive Plan or any other legally binding documents. However, adoption of the

LMS will give the County and its jurisdictions priority with respect to funding for disaster recovery and hazard mitigation from state and federal sources.

Through publication of this LMS plan, the Working Group continues to solicit the involvement of the whole community to make the people, neighborhoods, businesses, and institutions of Columbia County safer from the impacts of disaster events.

## **I. INTRODUCTION**

Every community is exposed to some level of hazard risk and must determine what hazards will affect the jurisdictional communities, including their likelihood to occur, severity, and vulnerability. Once this is determined, mitigation actions can occur to increase community resiliency. Mitigation is defined as any action taken to permanently reduce or eliminate the risk to people and their property from the effects of hazards. The nation saves \$4 for every \$1 spent on mitigation programs. And, \$6 for every \$1 spent through mitigation grants funded.

The Columbia County Local Mitigation Strategy attempts to reduce the risks associated with hazards by implementing mitigation goals, objectives, and projects within Columbia County and its municipalities. The LMS process is intended to be a framework for documenting the activities of the LMS Working Group and establishing future mitigation activities within the County. This plan includes updated bylaws of the LMS Working Group; and the overall planning process is intended to make the LMS Working Group more active in the coming years as well as find ways to further promote public participation.

### **A. Purpose**

The purpose of the LMS is to provide an on-going process that will encourage hazard mitigation efforts as part of the ongoing planning efforts of Columbia County. The LMS encourages evaluation of all hazards to evaluate vulnerabilities and develop goals, objectives, plans, programs, and projects to lessen the effects of those hazards and prioritize implementation of projects to further these goals.

### **B. Planning Process:**

The LMS WG utilizes structured planning concepts in a methodical process to identify vulnerabilities to future disasters and to propose the mitigation projects necessary to avoid or minimize exposure. Each step in the planning process builds upon the previous process so that there is a higher level of assurance that the mitigation projects proposed by the participants have a valid basis for both their justification and priority for implementation. It is then an important element for the LMS plan is to document that process and to present its results to the community.

The LMS Working Group is made up of representatives from Columbia County governmental agencies, incorporated municipalities, organizations and associations representing key business industry, community interest groups, other governmental entities, and non-profit or faith-based groups. Interested citizens are always welcome and encouraged to become involved in the process. The Columbia County LMS Working Group by-laws are located in Appendix A of this document and were updated in this planning process.

The LMS Working Group encourages involvement in the mitigation planning process by each jurisdiction in Columbia County. Jurisdictions are encouraged to identify others that should be participating in the LMS Working Group. In the past, annual meetings were held in December of each year for the purpose of preparing the annual update to be submitted. In January of 2020, the Committee voted to move to a quarterly meeting schedule. The 5-year planning update kick-off meeting was held on November 7, 2024 with the LMS Working Group to discuss the process and project expectations. During the update, several other meetings were held to address the hazard and vulnerability analysis as well as other draft modifications. Prior to each meeting the



LMS Working Group was noticed via email distribution by the LMS Coordinator and the public was noticed via the local newspaper publication. Additional efforts by the Chair and Vice-Chair to encourage participation and attention at meetings continued in preparation for submission to the Florida Division of Emergency Management.

a) Review of Community Capabilities and Incorporation of Existing Plans

The LMS is intended to provide the local communities with an opportunity to implement mitigation efforts across all planning documentation. In an attempt to integrate mitigation efforts across both the public and private domain, the LMS Working Group works to incorporate existing planning mechanisms into the LMS. Columbia County and its jurisdictions currently have several existing programs and plans related to hazard mitigation and post-disaster redevelopment as listed in Appendix E of this Plan which includes but is not limited to:

- Columbia County Comprehensive Emergency Management Plan (CEMP) - The CEMP was used to help identify the pertinent hazards for the LMS risk assessment.
- Columbia County Comprehensive Plan and City of Lake City's Comprehensive Plan(s) – The Comprehensive Plan(s) were used to determine the direction of future growth, goals, and objectives of the County and each jurisdiction.
- City of Lake City's Land Development Regulations and Town of Ft. White Land Development Code - Addresses natural hazards in their comprehensive plan and land use regulations through building codes and specifically through their flood plain management and flood prevention damage articles and regulations.
- Suwanee River Water Management District (SWRMD) Strategic Plan
- Jurisdictional Master Plans – Helped identify future growth opportunities and plans, identified environmental impacts, and mitigation opportunities.
- Columbia County Community Wildfire Protection Plan (CWPP) – Identified wildfire vulnerabilities within the County.

**C. Participating Organizations:**

Columbia County encourages participation from its jurisdictions and enables any entity within the jurisdictions or unincorporated county to be involved in the planning effort. The County has involved the City of Lake City and the Town of Ft. White in the planning process.

This is the inclusive list of all jurisdictions that must approve the LMS as a multi-jurisdictional plan. Each jurisdiction is responsible for actual implementation of the plan within their boundaries and ensuring that their projects meet the needs of the communities. Participation will be identified by attendance at meetings, both in person and virtual, and active involvement in the process.

Participation in the planning process included the following entities:

*American Red Cross*

*Advanced Planning Consultants, LLC*

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|                                             |                                                  |
|---------------------------------------------|--------------------------------------------------|
| <i>Alachua County Emergency Management</i>  | <i>Excelcior Ambulance Service</i>               |
| <i>Baker County Emergency Management</i>    | <i>Florida Department of Agriculture</i>         |
| <i>Columbia EMS</i>                         | <i>Florida Department of Health</i>              |
| <i>Columbia County 911 Addressing</i>       | <i>Florida Department of Transportation</i>      |
| <i>Columbia County BCC</i>                  | <i>Florida Division of Emergency Management</i>  |
| <i>Columbia County Building and Zoning</i>  | <i>Florida Fish and Wildlife Commission</i>      |
| <i>Columbia County Emergency Management</i> | <i>Florida Forest Service</i>                    |
| <i>Columbia County Engineer</i>             | <i>Florida Gateway College</i>                   |
| <i>Columbia County Fire Rescue</i>          | <i>Gilchrist County Emergency Management</i>     |
| <i>Columbia County Property Appraiser</i>   | <i>Lake City Police Department</i>               |
| <i>Columbia County Public Works</i>         | <i>Ovid Solutions (Contractor Clay Electric)</i> |
| <i>Columbia County School District</i>      | <i>Suwannee County Emergency Management</i>      |
| <i>Columbia County Safety</i>               | <i>Suwannee River Water Management District</i>  |
| <i>Columbia County Sheriff's Office</i>     | <i>Town of Ft. White</i>                         |
| <i>City of Lake City</i>                    | <i>Union County Emergency Management</i>         |
| <i>Clay Electric CO-OP</i>                  | <i>VA Hospital</i>                               |
| <i>Daniel Crapps Agency</i>                 |                                                  |

The LMS Working Group has had participation from all remaining jurisdictions due to contact with each entity by members of the Office of Emergency Management to obtain updated information for the LMS Update. Email meeting notices are sent to any and all interested parties both within and outside of Columbia County to encourage participation.

#### **D. Public Participation:**

The Working Group continuously seeks new opportunities and ideas to provide information and education to the public regarding ways to be more protected from the impacts of future disasters. The County has been active in communicating with the public and engaging interested members of the community in the planning process. This document, and the analyses contained herein, is the principal information resource for this activity. The Columbia County Department of Emergency Management has an active Facebook page to connect with the community residents: <https://www.facebook.com/ColumbiaCountyEOC/>

The LMS Committee has benefited from the assistance and support of its many members and support staff and intends to continue its efforts to engage more members of the community in the planning process, including more representatives of the private sector. The public has additional opportunities to provide input on the updated LMS Plan, such as through the Columbia County website and municipal meetings where the plan will be formally adopted by resolution within each Columbia County and its participating jurisdictions. A copy of the Local Mitigation Strategy for Columbia County is available on the county website at: <https://em.columbiacountyfla.com/>

This webpage also provides other mitigation information to the public along with a contact link back to the Columbia County Office of Emergency Management.

The LMS Strategy Committee welcomes public input and encourages participation through legal notices of upcoming public meetings. Future meetings are generally hybrid, which utilizes web conferencing and in person attendance at the Emergency Operations Center for interested parties to attend, listen, and participate in the planning process. Public input during meetings is captured within the meeting minutes (Appendix G). Comments are addressed by the Committee for incorporation into the document. Public input options are also available via the County website; however, no comments were received for the 2025 submission. After the updated plan is posted on the website, the opportunity for public comment and input will be available prior to adoption.

Once the plan is adopted, it will remain on the website, available for public comment and input in an ongoing process. In addition to this planning process, many of the jurisdictions maintain their own efforts to inform the public about potential hazards, hazard mitigation, and this planning process. Columbia County and the LMS Strategy Committee will continue efforts to develop a more robust planning process and encourage more participation and involvement from the jurisdictions, interested parties, and the public.

a) Continued Public Involvement

- Educating the County citizens on mitigation and public safety is an important issue for Columbia County with these continued and ongoing projects.
- Columbia County Building & Zoning Department does an excellent job in communication with the County residents especially related to flooding from FIRM's, permitting, to FEMA and Flood Publications<sup>1</sup>. There is a dedicated page to Flood Information from warning to safety measures, flood insurance to property protection measures and a lot more.
- Emergency Management conducts disaster safety presentations at local organizations, small associations and groups, churches, and local schools.
- Emergency Management's Facebook page is popular with the County citizens. The page informs residents with the latest on weather, safety and detailed information on the hazards that affect the County, and significantly more.
- Every year the Lake City Reporter, the local newspaper, produces a free natural hazards guide for the County citizens on preparedness, planning, emergency shelters, ways to stay informed, emergency contact information and additional specifics.
- Annually, the storm spotters program, instruct a class for the County Citizens on improving warning services for hailstorms, wind damage, lightning, flash flooding, heavy rain, and tornado events.
- Florida Forest Service, Fire Prevention Program – Smokey Bear remains an active part of our overall prevention message, but our work goes beyond Smokey. Smokey Bear actively visits the schools in Columbia County to promote wildfire safety and the benefits of fire prevention.

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<sup>1</sup> <https://www.columbiacountyfla.com/FloodInformation.asp>

- The Firewise Communities Program educates homeowners and community professionals about creating defensible space around their homes, helping to protect them from the dangers of wildfire.
- Columbia County Fire Rescue expanded a fire prevention program to spread the news on fire safety to children and adults.

**E. Update Process:**

During the 2025 Columbia County LMS Update, the LMS Strategy Committee took the following actions:

- In 2021, 2022, 2023, 2024 and 2025 quarterly meetings of the LMS Strategy Committees were noticed to the public and held with attendance and meeting minutes provided to document the process.
- In 2024, Columbia County hired a consultant to assist in the 5-year update process.
- The plan was reviewed and rewritten to be compliant with the most current Florida Local Mitigation Strategy Crosswalk.
- The Introduction includes the purpose and planning process and was revised to reflect the current approach.
- The Hazard Identification and Vulnerability Assessment was reviewed for applicable hazards as well as consistency with the Columbia County Comprehensive Emergency Management Plan (CEMP) and also includes human-caused and technological hazards.
- Mitigation Goals Section includes the goals, projects list, National Flood Insurance (NFIP) and Community Rating System (CRS) and was updated to reflect the current list, current NFIP and CRS information.
- The Plan Maintenance Section include monitoring and evaluation; the update process; and process for project implementation and was updated to reflect the current approach.
- LMS Working Group By-Laws Appendices contains the policies of the LMS Working Group and was updated to include the current practices.

Drafts and a final plan were provided to the LMS Strategy Committee for their review, comment, and approval. A series of meetings were also held to review and approve all changes. The LMS Working Group will continue to solicit input from anyone who may have an interest in the process and include any additional parties needed as required by Florida Administrative Code 27P-22.

As with the 2020 LMS update, the 2025 LMS goals, objectives, and priorities remain unchanged and continue to guide this document as is consistent with the County goals and priorities.

## **II. HAZARD IDENTIFICATION AND VULNERABILITY ASSESSMENT**

### **A. Introduction:**

The purpose of the hazard identification and vulnerability assessment is to use best available information and technology to identify and evaluate potential hazard risks facing Columbia County, as well as provide the factual basis for mitigation activities proposed in Columbia County's LMS that aim to reduce those risks. The vulnerability assessment provides for the identification and analysis of known hazards that may threaten life and property across the entire planning area. It also includes the results of a multi-jurisdictional vulnerability assessment conducted for each of Columbia County's municipal jurisdictions to determine where locally specific risks vary from those facing the rest of the county.

Columbia County is vulnerable to a wide range of hazards that threaten life and property. FEMA's current regulations and guidance under the Disaster Mitigation Act of 2000 (DMA 2000) require, at a minimum, an evaluation of a full range of natural hazards. The Hazards within the Columbia County LMS are broken up into three main hazard types:

- Natural Hazards - Are threats of a naturally occurring event will have a negative effect on life, property and the environment.
- Human-Caused Hazards - These hazards result from deliberate or accidental human actions
- Technological Hazards - Include those that are caused by man-made technological advancements, although some can be a result of natural hazards in specific circumstances.

### **B. Initial Hazard Identification**

The potential hazards that may affect the residents and visitors to Columbia County are reviewed on a regular basis. Each jurisdiction will be addressed individually however we begin with a general overview at the county level of each of the hazards. This plan is in line with FEMA's guidance by focusing on hazards that directly affect Columbia County.

Each of the initially identified hazards were studied for their potential impact on Columbia County as well as in terms of the availability of hazard mitigation strategies to reduce that impact. Best available data on historical occurrences, the geographic location, and extent, as well as the probability of future occurrences, were collected and reviewed as part of the hazard identification process in the following sections.

The table below lists the range of hazards identified in this risk assessment:

| Type                 | Hazard                                   | Hazard-Specific Effects                                                      |
|----------------------|------------------------------------------|------------------------------------------------------------------------------|
| Natural              | Hurricane/Tropical Storm                 | High Winds; Flood;<br>Tornadoes                                              |
| Natural              | Thunderstorms/Wind/Lightning             | High Winds; Flooding<br>Wildfire; Structural Fire                            |
| Natural              | Brush Fires, Wildfires, and Forest Fires | Structural Fire                                                              |
| Natural              | Tornadoes and Waterspouts                | High Winds                                                                   |
| Natural              | Hail                                     | Potential injury; potential<br>property damage                               |
| Natural              | Flooding                                 |                                                                              |
| Natural              | Drought                                  | Extreme Temperatures                                                         |
| Natural              | Extreme Heat                             | Drought                                                                      |
| Natural              | Winter Storm/Freeze                      |                                                                              |
| Natural              | Sinkholes/Subsidence                     |                                                                              |
| Natural/Human-Caused | Epidemic/Pandemic                        | Mass Casualty/Fatality                                                       |
| Technological        | Hazardous Materials                      | Fixed Facilities;<br>Transportation;<br>Radiological Release;<br>Biological; |
| Human-Caused         | Civil Disorder/Disturbance               |                                                                              |
| Human-Caused         | Cyberterrorism                           | Critical Infrastructure<br>Disruption                                        |
| Human-Caused         | Terrorism                                | Mass Casualty/Fatality                                                       |
| Technological        | Prolonged Utility/Communications Failure | Critical Infrastructure<br>Disruption                                        |
| All                  | Mass Casualty                            |                                                                              |

**Table 1: Hazard Identification by Type**

Some hazards are not listed due to the geographic location and characteristics of the planning area and are not relevant to Columbia County and the participating jurisdictions, i.e. dam/levee failure, erosion, landslides, earthquakes, tsunamis, coastal spills, and volcanoes. Additionally, past impacts and potential future impacts due to those listed are considered negligible or nonexistent and, therefore, not included in this plan.

**C. Hazard and Vulnerability Assessment Methodology:**

For 2025 the Planning Committee proposed to update the Hazard and Vulnerability Assessment based off a model called Kaiser Permanente. This assessment systematically addresses hazards and prioritizes planning, mitigation, response, and recovery activities. Several components were modulated to account for differing needs and focuses. The following factors were used to determine the overall risk of each hazard: the probability of future instances; the severity of the hazard, including the magnitude felt by the human impacts, property impacts, spatial impacts, and economic impacts; Based on these inputs, the overall vulnerability generated a score which represents the relative risk for the hazards.

Using the formula “Risk = Probability \* Severity,” each potential hazard described in this section is ranked by level of relative risk, probability, and severity. These scales are defined below:

**a) Probability Scale**

This scale takes into effect the likelihood that Columbia County will be impacted by the hazard within a given period of time or the return rate of a hazard and is based on the historical data, estimated return periods, recurrence, or chance of occurrence.

- 0 = None – Although the hazard is noted, no previous occurrence has been recorded; or less than a 0.1% chance of occurrence; or a 1,000-year event or greater.
- 1 = Low – The hazard has occurred 10 years or more ago; or greater than 0.1% to 1.0% chance of occurrence; or a 100-year event.
- 2 = Moderate – The hazard has occurred in the past 6 to 10 years; or greater than 1.0% to 2.0% chance of occurrence; or a 50-year event.
- 3 = High – The hazard to occurred in the past 1-5 years; or greater than 2.0% chance of occurrence; or less than a 50-year event.

**b) Severity Scale**

Based on the magnitude of the hazard and the on-going mitigation measures in place to counteract those hazards. The severity describes how intense a hazard may be felt and comprised of its impacts, as well as any mitigation actions to offset the impacts.

**1) Human Impacts – Possibility of death or injury to the population**

- 0 = None – No possibility of death or injury
- 1 = Low – Less than 2 deaths or 10 injuries reported or expected
- 2 = Moderate – Between 2 – 5 deaths or 10 – 25 injuries reported or expected
- 3 = High – More than 5 deaths or 25 injuries reported or expected

2) Property Impacts – Physical losses and damages to property, buildings, or other critical infrastructure

- 0 = None – No possibility of physical loss and/or damage
- 1 = Low – Physical losses and/or damages are reported or expected to be less than \$10,000
- 2 = Moderate – Physical losses and/or damages are reported or expected to be between \$10,000 and \$1,000,000
- 3 = High – Physical losses and/or damages are reported or expected to be greater than \$1,000,000

3) Environmental Impacts – Amount of geographic area affected

- 0 = None – No geographic area affected
- 1 = Low – Up to 25% of total area or jurisdiction affected
- 2 = Moderate – 26%-50% of total area or jurisdiction affected
- 3 = High – 50% or more of total area or jurisdiction affected

4) Programmatic Impacts (Interruption of businesses, infrastructure, or government services)

- 0 = None – No interruption of services or no more than 12 hours
- 1 = Low – Interruption of services between 1 – 3 days
- 2 = Moderate – Interruption of services between 3 – 7 days
- 3 = High – Interruption of services greater than 7 days

c) Risk

Risk is the culmination of all of these factors to determine the overall exposure of the county and its municipalities to danger, harm, or losses. The risk scoring is based on a 0% to 100% scale and is calculated using the following formula: **Risk = Probability \* Severity**

- **Low** – Risk scoring is less than 30%
- **Medium** – Risk scoring is between 31% to 60%
- **High** – Risk scoring is 61% or greater



Table 2: Columbia County LMS Hazard and Vulnerability Assessment

| COLUMBIA COUNTY LMS<br>HAZARD AND VULNERABILITY ASSESSMENT TOOL |                                                               |                                                              |                                                              |                                                                                 |                                                              |          |
|-----------------------------------------------------------------|---------------------------------------------------------------|--------------------------------------------------------------|--------------------------------------------------------------|---------------------------------------------------------------------------------|--------------------------------------------------------------|----------|
| HAZARD                                                          | PROBABILITY                                                   | SEVERITY                                                     |                                                              |                                                                                 |                                                              | RISK     |
|                                                                 | <i>Likelihood this will occur</i>                             | <i>HUMAN IMPACT</i><br><i>Possibility of death or injury</i> | <i>PROPERTY IMPACT</i><br><i>Physical losses and damages</i> | <i>ENVIRONMENTAL</i><br><i>Amount of Environment Affected (Spatial Impacts)</i> | <i>PROGRAM OPERATIONS</i><br><i>Interruption of services</i> |          |
| SCORE                                                           | 0 = No threat<br>1 = 10+ years<br>2 = 6-10 yrs<br>3 = 1-5 yrs | 0 = None<br>1 = Low<br>2 = Moderate<br>3 = High              | 0 = None<br>1 = Low<br>2 = Moderate<br>3 = High              | 0 = None<br>1 = Up to 25%<br>2 = 26-50%<br>3 = 51% or more                      | 0 = None<br>1 = Low<br>2 = Moderate<br>3 = High              | 0 - 100% |
| Hurricane/ Tropical Storm                                       | 3                                                             | 2                                                            | 3                                                            | 3                                                                               | 2                                                            | 83%      |
| Thunderstorm/Wind/<br>Lightning                                 | 3                                                             | 1                                                            | 2                                                            | 1                                                                               | 1                                                            | 42%      |
| Brush Fire, Wildfire,s and<br>Forest Fires                      | 2                                                             | 1                                                            | 2                                                            | 2                                                                               | 1                                                            | 33%      |
| Tornadoes and Water<br>Spouts                                   | 3                                                             | 1                                                            | 2                                                            | 2                                                                               | 1                                                            | 50%      |
| Hail                                                            | 3                                                             | 0                                                            | 1                                                            | 0                                                                               | 0                                                            | 8%       |
| Flooding                                                        | 2                                                             | 1                                                            | 3                                                            | 1                                                                               | 1                                                            | 33%      |
| Drought                                                         | 3                                                             | 0                                                            | 1                                                            | 3                                                                               | 1                                                            | 42%      |
| Extreme Heat                                                    | 3                                                             | 2                                                            | 1                                                            | 1                                                                               | 0                                                            | 33%      |
| Winter Storm/Freeze                                             | 3                                                             | 1                                                            | 1                                                            | 2                                                                               | 2                                                            | 50%      |
| Sinkholes/ Subsidence                                           | 3                                                             | 0                                                            | 2                                                            | 2                                                                               | 1                                                            | 42%      |
| Epidemic/Pandemic                                               | 2                                                             | 3                                                            | 0                                                            | 0                                                                               | 3                                                            | 33%      |
| Hazardous Materials                                             | 3                                                             | 1                                                            | 1                                                            | 1                                                                               | 1                                                            | 33%      |
| Civil Disturbance                                               | 1                                                             | 2                                                            | 2                                                            | 0                                                                               | 2                                                            | 17%      |
| Cyberattack/<br>Cyberterrorism                                  | 3                                                             | 1                                                            | 1                                                            | 1                                                                               | 3                                                            | 50%      |
| Terrorism                                                       | 1                                                             | 2                                                            | 2                                                            | 0                                                                               | 3                                                            | 19%      |
| Prolonged Utility/<br>Communications Failure                    | 2                                                             | 1                                                            | 2                                                            | 0                                                                               | 3                                                            | 33%      |
| Mass Casualty                                                   | 3                                                             | 3                                                            | 1                                                            | 0                                                                               | 1                                                            | 42%      |
| <i>*Threat increases with percentage.</i>                       |                                                               |                                                              |                                                              |                                                                                 |                                                              |          |
| LOW                                                             | 0%-30%                                                        | MEDIUM                                                       | 31%-60%                                                      | HIGH                                                                            | 61% +                                                        |          |

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**D. Additional Vulnerability Considerations**

When assessing vulnerabilities to natural, human-caused, and technological hazards, it's important to look at a community's exposure, sensitivity, and ability to respond. One of the first factors to consider is the population — including where people live, population density, and demographics such as age, disability, income, and language barriers. Special populations, like those in nursing homes, schools, or correctional facilities, may require additional support and are often more vulnerable during disasters.

The built environment is another key area of focus. This includes the condition, location, and design of homes, businesses, critical facilities, and infrastructure like roads, bridges, and utilities. Structures located in floodplains, wildfire-prone areas, or near industrial hazards are at higher risk. Development trends and land use patterns also play a role as communities may be expanding into hazard-prone areas or lacking strong zoning regulations may face greater losses over time.

Economic vulnerability is also crucial to evaluate. The local economy's resilience, the role of key industries, and the presence of small businesses all affect how quickly a community can recover from a disaster. This ties directly into the strength of lifeline systems such as power, water, and communications, if these systems are outdated or lack redundancy, a single event can lead to cascading failures.

Lastly, a community's regulatory and emergency response capacity is vital. This includes the strength of local building codes, mitigation policies, public warning systems, evacuation routes, and the ability of emergency services to respond effectively. Environmental factors, such as coastal erosion, deforestation, or the loss of wetlands, can amplify risks, especially as climate change increases the frequency and severity of natural hazards.

**a) Repetitive Loss Properties**

Repetitive loss properties are among the most vulnerable structures in Columbia County due to their repeated exposure to flooding. These properties have a history of sustained damage, often resulting in significant financial losses and disruption to residents. Under the National Flood Insurance Program (NFIP), a property may be classified as repetitive loss if it has experienced multiple flood insurance claims—such as two or more losses where repairs equaled or exceeded 25% of the structure's market value, or four or more claims totaling over \$20,000.

The Flood Mitigation Assistance (FMA) Grant Program, administered by FEMA in coordination with the Florida Division of Emergency Management (FDEM), is specifically designed to address this vulnerability by providing funding for mitigation efforts such as elevation, acquisition, or relocation. The Columbia County Department of Public Works continues to work directly with affected property owners to identify and implement long-term flood mitigation solutions. As of the 2025 LMS update, Columbia County has identified 27 repetitive loss properties, with no documented locations within the participating municipalities. Of the 27 repetitive loss properties, 4 of the properties have been identified as severe repetitive loss properties.

**Table 3: Repetitive Loss Property Data**

|                                                                           | <b>COLUMBIA<br/>COUNTY</b> | <b>CITY OF<br/>LAKE CITY</b> | <b>TOWN OF<br/>FT. WHITE</b> |
|---------------------------------------------------------------------------|----------------------------|------------------------------|------------------------------|
| <b># OF PROPERTIES BY TYPE:</b>                                           |                            |                              |                              |
| <i>RESIDENTIAL</i>                                                        | 27                         | 0                            | 0                            |
| <i>COMMERCIAL</i>                                                         | 0                          | 0                            | 0                            |
| <i>INSTITUTIONAL</i>                                                      | 0                          | 0                            | 0                            |
| <b>TOTAL # OF REPETITIVE LOSS<br/>PROPERTIES</b>                          | 27                         | 0                            | 0                            |
| <b># OF REPETITIVE LOSS PROPERTIES<br/>IN A SPECIAL FLOOD HAZARD AREA</b> | 26                         | 0                            | 0                            |
| <b># OF REPETITIVE LOSS PROPERTIES,<br/>REPORTED AS MITIGATED BY FEMA</b> | 0                          | 0                            | 0                            |

b) Land Use Trends and Potential Loss

Land use, especially within hazard-prone areas, has an impact on vulnerability as some uses may be more prone to disaster related damages than others. Residential and industrial development are examples of this. Individual jurisdictions have the most significant and legal authority over land use policy and can make an analysis of potential land use projects to determine if a mitigation strategy is necessary. Local current land uses and potential for new development reports along with future land use and general development trends are indicative of how future development will impact the LMS for Columbia County. Careful consideration of potential risk from various hazards can help guide thoughtful land use to minimize vulnerabilities in the future. When necessary to further local effort, modifications to plans, ordinances, codes and similar policies can be proposed as initiatives for consideration into the LMS.

The Columbia County Comprehensive Plan<sup>2</sup> guides future development through policies and procedures consistent with the County's growth objectives. This plan identifies current and future development trends.

Columbia County has experienced steady population growth and ongoing development over the past two decades. As of 2023, the population reached 73,063 residents—a 1.66% increase from the previous year—with projections estimating 75,489 residents by 2025, reflecting a consistent 1.7% annual growth rate. Since 2000, the county's population has grown by approximately 29%, averaging 1.26% annual growth. To accommodate this increase, the county has seen a rise in housing activity, with numerous single-family and multi-family developments underway. Amendments to land development regulations, including rezonings from residential to commercial intensive uses, indicate a shift toward more diversified and economically driven land use. The Columbia County Economic Development Department has also pursued initiatives to attract private investment and job creation. In response to these changes, the county has adopted comprehensive planning strategies that

<sup>2</sup> [https://library.municode.com/fl/columbia\\_county/codes/land\\_development\\_regulations](https://library.municode.com/fl/columbia_county/codes/land_development_regulations)

include the promotion of mixed-use development and the implementation of infrastructure improvement projects designed to support long-term, sustainable growth.

c) Critical Facilities and Structures

Columbia County maintains an inventory of critical facilities, infrastructure, and structures that are located within hazard areas. This list includes but is not limited to emergency services facilities, medical facilities, government facilities, schools, emergency/evacuation shelters, fire and police stations, emergency operation center, facilities used by special needs populations, and any other facilities identified by Emergency Management. This list is updated annually.

The LMS Working Group has identified goals and objectives to guide the development of this plan. These goals and objectives provide focus for the activities of the LMS Working Group toward mitigation efforts that will meet the needs of the jurisdictions.

The goals selected by the LMS Working Group are related to the broad mitigation needs and capabilities of the communities involved, rather than addressing a specific hazard type or category. Therefore, these mitigation goals and objectives are multi-hazard and are the mitigation related capabilities that are important to Columbia County. These will be present in each participating jurisdiction in the future as the goals are achieved.

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**E. Hazard Profiles:****a) Hurricane/Tropical Storm (Tropical Cyclone Events)****1) *Description***

A hurricane is a tropical cyclone, which is a rapidly rotating storm system characterized by a low-pressure center, a closed low-level atmospheric circulation, strong winds, and a spiral arrangement of thunderstorms that produce heavy rain or squalls.

Tropical cyclones are classified as follows:

- Tropical Depression - An organized system of clouds and thunderstorms with a defined surface circulation and maximum sustained winds of 38 mph or less
- Tropical Storm - An organized system of strong thunderstorms with a defined surface circulation and maximum sustained winds of 39-73 mph
- Hurricane - An intense tropical weather system of strong thunderstorms with a well-defined surface circulation and maximum sustained winds of 74 mph or higher

Hurricanes, tropical depressions, and tropical storms have long affected Florida because of its location. As a narrow peninsula between two warm bodies of water, Florida is regularly affected by hurricanes. The greatest threats to Columbia County posed by a hurricane are wind damage and inland flooding. Wind damage from the storm itself is related to wind speed and the accompanying "pressure" that is exerted on structures. When the wind speed doubles, four times more force is exerted on structures. Wind damage can also be caused by hurricane-spawned tornadoes, which can be more destructive than the hurricane itself. Damage can also be caused by wind-borne debris and flood conditions.

**2) *Location and Extent***

Despite being an inland county, Columbia County is susceptible to impacts from hurricanes. Columbia County is located approximately 70 miles West of the Atlantic Ocean and approximately 50 miles Northeast of Gulf of Mexico

The intensity of hurricanes is measured by the Saffir-Simpson scale, with sustained wind speeds (measured in miles per hour) to measure the extent of a tropical storm or depression. Once a tropical storm reaches wind speeds of 74 miles per hour or greater, it is then classified as a Category 1 hurricane. It is important to note that in 2010, the National Weather Service and National Hurricane Center have changed its criteria by no longer correlating wind speed with storm surge height. No two storms are the same and less intense storms could in fact create storm surge that is comparable to stronger storms.

Typical damage by hurricane category can be seen in the following table.

**Table 4: Saffir-Simpson Scale and Typical Damage<sup>3</sup>**

| Scale      | Wind Speed  | Typical Damage                                                                                                                                                                                                                                                                                                                                                  |
|------------|-------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Category 1 | 74-95 mph   | Well-constructed frame homes could have damage to roof, shingles, vinyl siding, and gutters. Large branches of trees will snap and shallowly rooted trees may be toppled. Extensive damage to power lines and poles likely will result in power outages that could last a few to several days.                                                                  |
| Category 2 | 96-110 mph  | Well-constructed frame homes could sustain major roof and siding damage. Many shallowly rooted trees will be snapped or uprooted and block numerous roads. Near-total power loss is expected with outages that could last from several days to weeks.                                                                                                           |
| Category 3 | 111-129 mph | Well-built framed homes may incur major damage or removal of roof decking and gable ends. Many trees will be snapped or uprooted, blocking numerous roads. Electricity and water will be unavailable for several days to weeks after the storm passes.                                                                                                          |
| Category 4 | 130-156 mph | Well-built framed homes can sustain severe damage with loss of most of the roof structure and/or some exterior walls. Most trees will be snapped or uprooted and power poles downed. Fallen trees and power poles will isolate residential areas. Power outages will last weeks to possibly months. Most of the area will be uninhabitable for weeks or months. |
| Category 5 | ≥157 mph    | A high percentage of framed homes will be destroyed, with total roof failure and wall collapse. Fallen trees and power poles will isolate residential areas. Power outages will last for weeks to possibly months. Most of the area will be uninhabitable for weeks or months.                                                                                  |

### 3) Previous Occurrences

Between 1851 and 2024, Columbia County has been struck directly by 19 storms, including two Category 1 hurricanes and a major Category 3 hurricane (Figure 1).

Between 1851 and 2018, in Florida, 117 hurricanes have directly impacted the state of Florida. The total number of major hurricanes, Category 3 or above, between 1851 and 2024, reached 57, resulting in incalculable damages and loss of life. The following storms are a few of the more notable events that have impacted Columbia County, based on available information:

- Hurricane Hermine, September 2016 – Tropical storm winds from Hurricane Hermine caused several minor incidents, including a tree was blown down onto a car at Hwy 47 S of Lake City. Minor injuries were reported. At 2:15 am on 9/2/16, a wind gust of 43 mph was measured at the Lake City Gateway Airport. Storm total rainfall amounts of 5.77 inches were measured at O' Leno State Park. Two-mile ENE of the city of Columbia, 3.64 inches were measured.

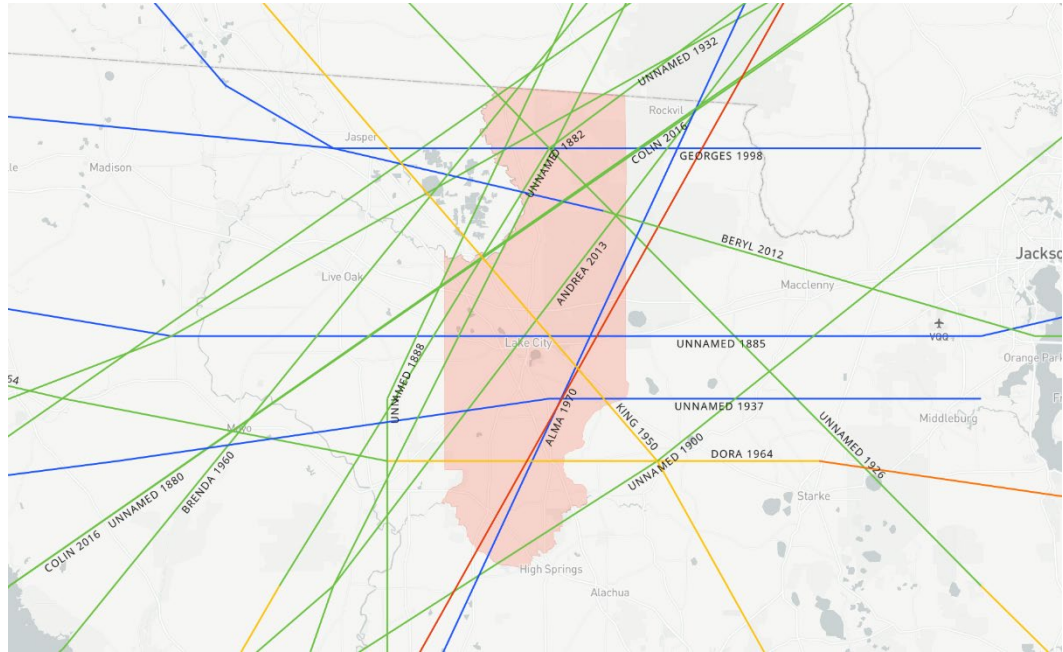
<sup>3</sup> <https://www.nhc.noaa.gov/aboutsshws.php>

- Hurricane Mathew, October 2016 – The peak sustained wind measure at the Lake City Airport was 28 mph on 10/7/16 at 6:15 pm. The peak gust at this location was 41 mph on 10/7/16 at 4:35 pm. At 3:30 pm on 10/7/16 a tree destroyed an occupied mobile home on SE Baya Drive in Lake City. No injuries were reported.
- Hurricane Irma, September 2017 – The Ichetucknee River below Ichetucknee Springs State Park crested at 24.54 feet on 9/16/17 at 1900 EDT. Major flooding occurred at this level. The Santa Fe River at O' Leno State Park set a record flood stage at 57.07 feet on 9/14/17 at 0715 EDT. Major flooding occurred at this level. The Suwannee River near Benton crested at 94.47 feet on 9/21/17. Minor flooding occurred at this level. The Santa Fe River at Three Rivers Estates crested at 24.55 feet on 9/16/17 at 2000 EDT. Major flooding occurred at this level. The Suwannee River at White Springs crested at 76.49 feet on 9/13/17 at 0045 EDT. Minor flooding occurred at this level. Storm total rainfall included 8.44 inches about 8 miles SSW of Lake City.
- Tropical Storm Elsa, July 2021 – Tropical Storm Elsa tracked NNE across the western tier of the local forecast area through the day on Wed, July 7th. The storm made landfall along the FL Big Bend coast. The main impacts from TS Elsa for the local area included 3 confirmed tornadoes, downed trees due to gusty winds, and heavy rainfall which caused flooding in low lying areas. There was one loss of life due to a tree falling onto a car. Peak rainfall was near 7.2 inches in Alachua county and the peak recorded wind gust in a squall was 58 mph in Jekyll Island GA. At 735 am EDT, A tree was blown down over the road on I-10 westbound at mile marker 309. Additional tropical storm damage occurred at 670 SW Tamarac Lane which included trees blown down onto a mobile home which caused damage. The peak wind gust measured during TS Elsa in Columbia County was by the Lake City AWOS was 36 mph at 115 pm EDT.
- Hurricane Ian, September 2022 – Tropical storm winds from Hurricane Ian caused minor damage including a tree which fell onto a home. There were no fatalities or injuries reported.
- Hurricane Nicole, November 2022 – Nicole struck Florida's east coast as a Category 1 hurricane. Columbia County experienced tropical storm conditions, including heavy rains and strong winds, which resulted in minor flooding and temporary power disruptions.
- Hurricane Idalia, August 2023 – Idalia made landfall in Florida's Big Bend region as a Category 4 hurricane. Columbia County was among the areas eligible for federal disaster assistance due to the storm's impact, which included significant rainfall, flooding, and wind damage.
- Hurricane Debby, August 2024 – Debby, a Category 1 hurricane, made landfall near Steinhatchee, Florida. Columbia County experienced heavy rainfall and localized flooding as the storm moved through the region.
- Hurricane Helene, September 26, 2024 – Helene a Category 4 storm, made landfall in Florida's Big Bend region bringing significant impacts to Columbia

County. The county experienced widespread damage, including downed power lines and trees, leading to extensive power outages. Wind gusts reached up to 112 mph the County, causing substantial structural damage leading to the largest debris pickup ever for the County.

- Hurricane Milton, October 2024 – Milton impacted a large portion of Florida, leading to emergency declarations in multiple counties. Columbia County faced adverse effects, including heavy rains and strong winds, contributing to flooding and infrastructure challenges.



**Figure 1: Hurricane Paths in Columbia County and northern Florida, (1851 – 2024)<sup>4</sup>**

#### 4) *Probability of Future Events*

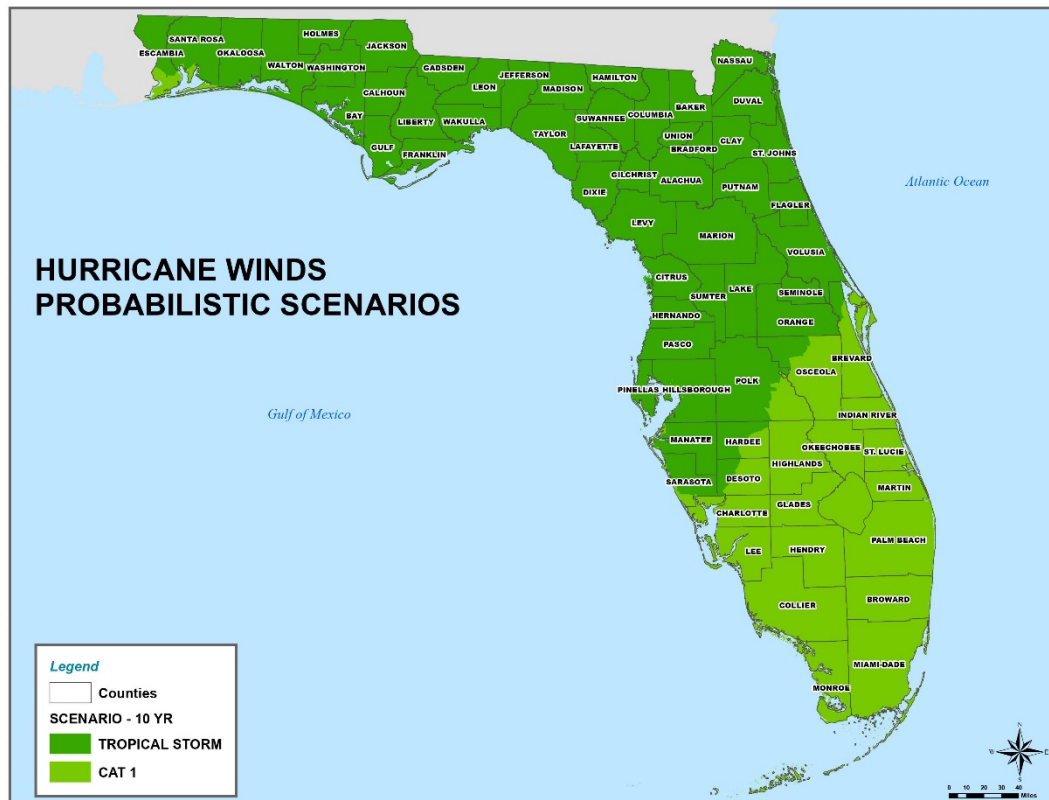
Hurricanes are a seasonal occurrence, with the Atlantic Coast/Gulf of Mexico hurricane season ranging from June 1 to November 30. Although it is rare, tropical storm and hurricane systems may develop outside of the hurricane season. Hurricanes pose a significant threat to Florida, particularly those residents living along the coast.

The probability of a hurricane directly hitting Columbia County is relatively low, given its inland location. Historical data suggests a direct hit from a hurricane is rare, occurring approximately once every 20-30 years on average. While direct landfalls are infrequent, the county often experiences the effects of hurricanes making landfall on Florida's coast. The probability of experiencing tropical storm or hurricane conditions (strong winds, heavy rain, and potential flooding) has increased over the past decade and is likely to happen more frequently. The likelihood of a Category 3 or higher hurricane bringing significant impacts (strong winds and major flooding) to Columbia County is lower.

<sup>4</sup> [NOAA Coastal Services Center](#)

Utilizing HAZUS, FDEM established the following Figure to show the probability that areas in Florida will receive hurricane and/or tropical storm force winds within specified return periods. When looking at the 10-year return period scenario, the map shows that Columbia County will receive tropical storm winds at least once within 10 years.

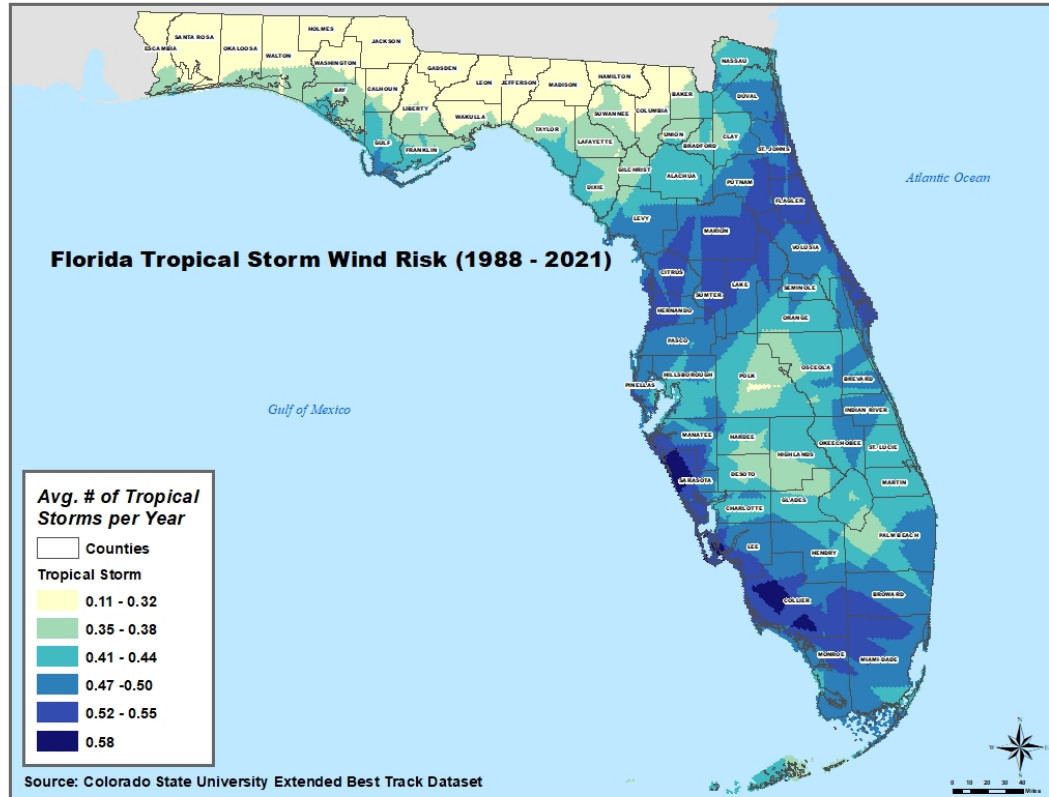
**Figure 2: Florida Tropical Storm Wind Risk<sup>5</sup>**



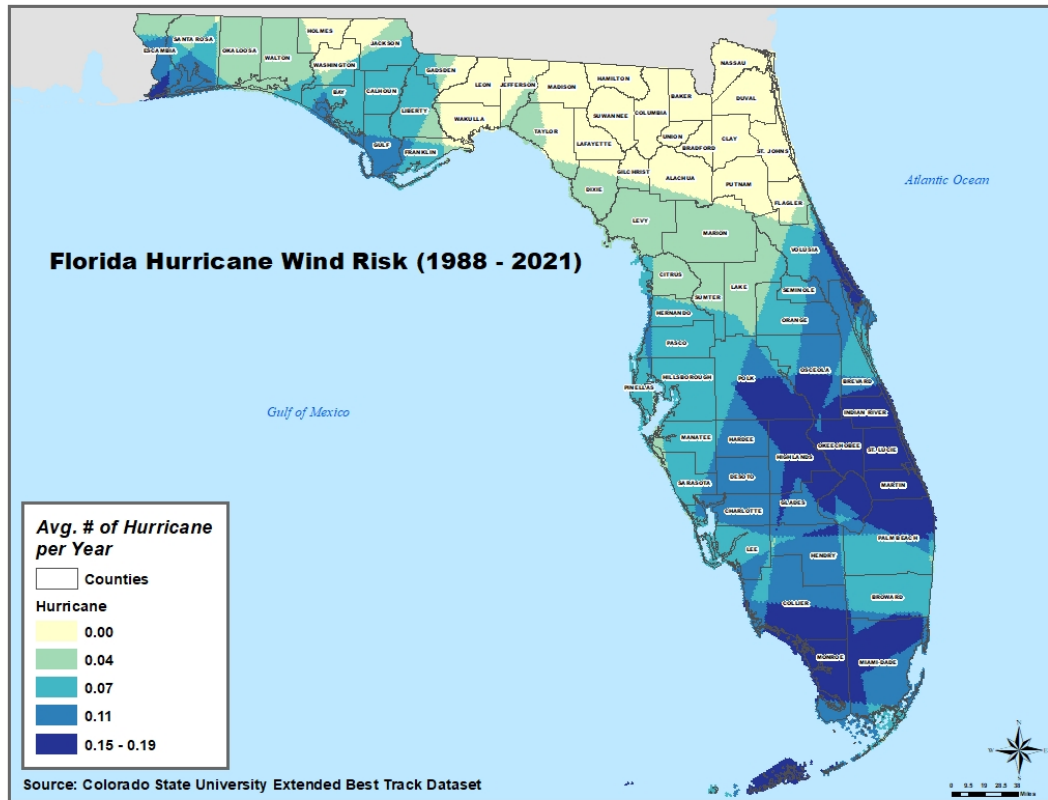
<sup>5</sup> <https://flshmp-floridadisaster.hub.arcgis.com/pages/tropical-cyclone>

The FDEM Risk Assessment also established that the average number of tropical storms per year range between 0.11 and 0.58, and the average number of hurricanes per year range between 0 and 0.19. The Figures below show the Tropical Storm and Hurricane wind risk. The areas in the darkest blue will have the highest annual risk, but that is still less than one event per year. The LMS committee reviewed this information and as of recent years deemed the likelihood to occur as high (impacts to occur every 1-5 years).

**Figure 3: Florida Tropical Storm Wind Risk<sup>6</sup>**



<sup>6</sup> <https://flshmp-floridadisaster.hub.arcgis.com/pages/tropical-cyclone>

**Figure 4: Florida Hurricane Wind Risk<sup>7</sup>**

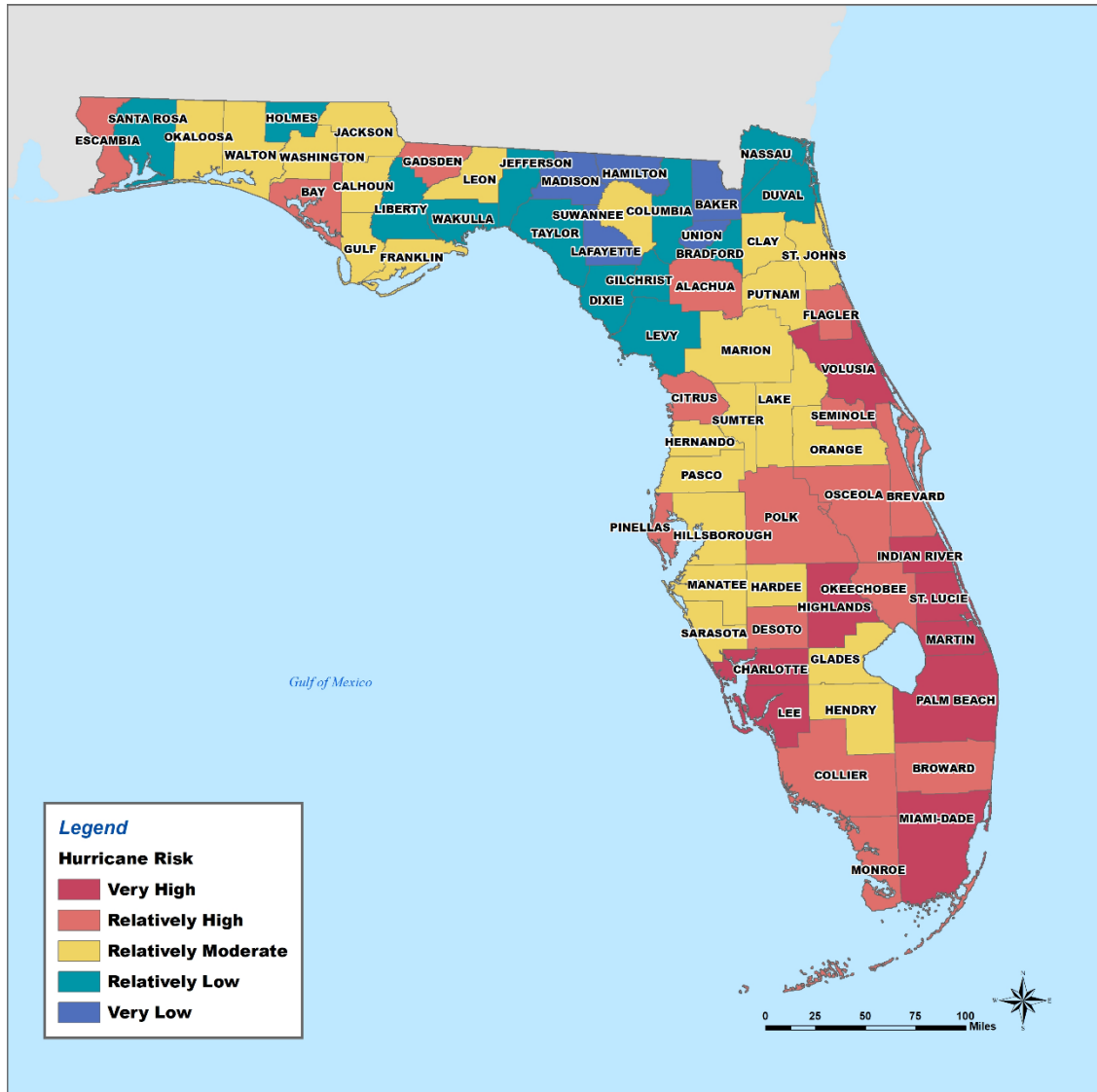
### 5) Vulnerability and Risk Assessment

The worse-case scenario for Columbia County would be a Category 5 hurricane with winds of over 157 mph or higher, a large percentage of framed homes would be destroyed, fallen trees and power poles would isolate residential areas, and power outages would last for weeks to possibly months. Most of the County would be uninhabitable for weeks or months.

However, the strongest recorded storm to impact Columbia County was a Category 3 unnamed hurricane in 1896. Specifics regarding any injuries or property damage were not available.

The following figure from FEMA gathers the data for the National Risk Index (NRI) map using datasets from various stakeholders and partners including academia, local and state officials, federal agencies, and the private sector. The FEMA NRI Map shows each county's overall risk to natural hazards using data about expected annual losses from natural hazards, social vulnerability, and community resilience. Based on this map Columbia County has a relatively moderate risk to hurricanes.

<sup>7</sup> <https://flshmp-floridadisaster.hub.arcgis.com/pages/tropical-cyclone>

Figure 5: Hurricane FEMA NRI Map<sup>8</sup>

The Columbia County community, the residents, structures, and critical facilities, can suffer from hurricane and/or tropical storm events. The impacts associated with hurricanes or tropical storms especially the destructive winds and water, which can be very destructive or catastrophic on the county residential, commercial, and public buildings, as well as the critical infrastructure such as transportation, water, energy, and communication systems. The committee determined that the county and its jurisdictions have a moderate to high impact severity.

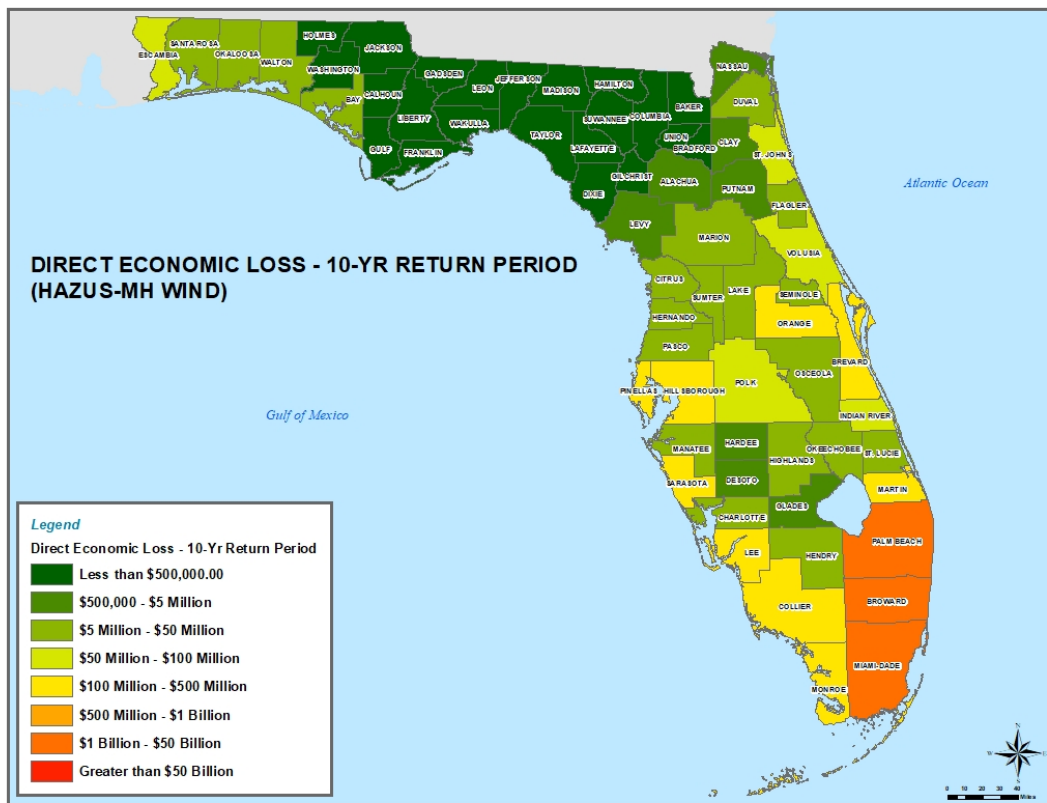
The entire county is very vulnerable to heavy winds, rains, and flooding as well as the potential for tornadoes which can come from hurricanes and tropical storm events. Columbia County's public and private buildings, infrastructure, critical facilities, and some

<sup>8</sup> <https://flshmp-floridadisaster.hub.arcgis.com/pages/tropical-cyclone>

framed homes depending on zone location, and especially the mobile homes in the county. These mobile homes located throughout the county are particularly vulnerable to wind damage. Significant impact on agriculture could also occur with the County's farms and market value of the important crops harvested and livestock.

The economic effect or financial impact could be devastating from a large-scale hurricane event not only during the crisis phase, which immediately follows the event, through the recovery and rebuilding stages. FDEM modeling from HAZUS-MH Wind was completed for a return period of 10-years. The following figure reflects the count of structures and value of structures damaged within the return period scenarios, showing areas most vulnerable to winds. Thus, in a 10-year period, Columbia County can expect a direct economic loss of less than \$500,000.

**Figure 6: Direct Economic Loss – 10 Year Return Period (Hazus-MH Wind)<sup>9</sup>**



<sup>9</sup> <https://flshmp-floridadisaster.hub.arcgis.com/pages/tropical-cyclone>

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**b) Thunderstorms/Wind/Lightning****1) *Description***

Thunderstorms consist of rain-bearing clouds that also produces lightning. Any person who has been a resident of Florida during the summer is well aware of the typical weather patterns during this season. Warm mornings give way to afternoon thunderstorms that are typically localized and can be very intense. Compared to many other places in the nation, Florida receives an exorbitant amount of lightning strikes that are responsible for numerous deaths and property damage every year. Northwest Florida averages between 70 and 80 thunderstorms each year.

**2) *Location and Extent***

All areas of Columbia County are susceptible to the effects of thunderstorms. These events are common throughout Florida, occur throughout the year and typically are widespread events. Although thunderstorms generally affect a small area, they are very dangerous given their ability to produce accompanying hazards including high winds, hail, and lightning which all may cause serious injury or death, in addition to property damage. They are most common in Florida because atmospheric conditions are favorable for generating powerful storms.

All areas of Columbia County are susceptible to the effects of high winds related to a thunderstorm. A severe thunderstorm includes damaging winds greater than 58 mph (50 knots) or greater and hail 1 inch or larger in diameter. High winds have been further broken down into three categories by the NWS Storm Events database:

- High Wind: Sustained non-convective winds of 35 knots (40 mph) or greater lasting for 1 hour or longer or winds (sustained or gusts) of 50 knots (58 mph) for any duration (or otherwise locally/regionally defined), on a widespread or localized basis. In some mountainous areas, the above numerical values are 43 knots (50 mph) and 65 knots (75 mph), respectively.
- Strong Wind: Non-convective winds gusting less than 50 knots (58 mph), or sustained winds less than 35 knots (40 mph) resulting in a fatality, injury, or damage.
- Thunderstorm Wind: Winds, arising from convection (occurring within 30 minutes of lightning being observed or detected), with speeds of at least 50 knots (58 mph), or winds of any speed (non-severe thunderstorm winds below 50 knots) producing a fatality, injury, or damage. Events with maximum sustained winds or wind gusts less than 50 knots (58 mph) should be entered as a Storm Data event only if they result in fatalities, injuries, or serious property damage.

All areas of Columbia County are susceptible to lightning strikes and their potential effects. Any lightning bolt can kill. Lightning plays a crucial role in the fire-based ecologies of the forests; unfortunately, it also plays a role in fires that might threaten human life and property. Many of the fires in 1998<sup>10</sup> that impacted the State of Florida were ignited by lightning strikes. Damage to buildings can also be prevented by lightning rod systems and

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<sup>10</sup> U.S. Fire Administration, 2004



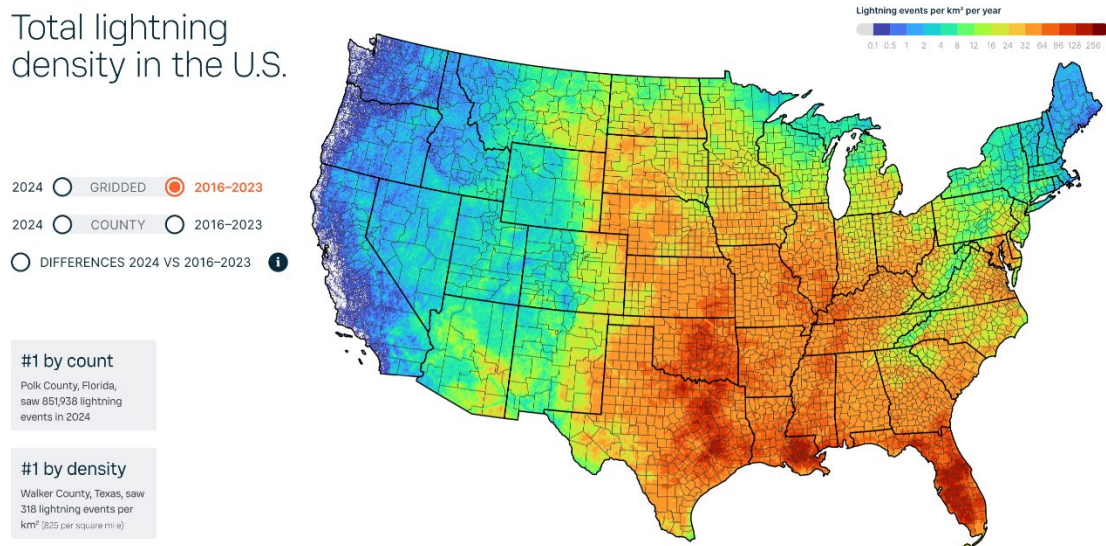
surge protectors to reduce the risk of fires. With regard to a scale for lightning, there is no scale for strength (such as weak vs. strong).

### 3) Previous Occurrences

Within Columbia County, lightning accounted for 2 deaths and 6 injuries between 1950 through 2024. Since 2010, sixty-six<sup>11</sup> (66) people have died in Florida from lightning strikes, an average of 4+ people per year, while some 25+ people are injured on average in the United States. Columbia County could expect 4-12 cloud-to-ground lightning flashes per square kilometer per year.

The Figure below indicates lightning density from 2016 through 2023.

**Figure 7: Vaisala National Lightning Detection Network (2016 - 2023)<sup>12</sup>**



Since 2010, there have been 73 thunderstorm/wind events in the county, 25 of which caused damage in Columbia County. Details of these impacts, including the magnitude and amount of property damage cost can be found at [www.ncdc.noaa.gov/stormevents](http://www.ncdc.noaa.gov/stormevents).

**Table 5: Summary of Thunderstorm/Wind Events in Columbia County (January 2010 – December 2024)<sup>13</sup>**

|                                                |    |
|------------------------------------------------|----|
| Number of County/Zone areas affected:          | 1  |
| Number of Days with Event:                     | 73 |
| Number of Days with Event and Death:           | 1  |
| Number of Days with Event and Death or Injury: | 4  |
| Number of Days with Event and Property Damage: | 25 |
| Number of Days with Event and Crop Damage:     | 0  |
| Number of Event Types reported:                | 2  |

<sup>11</sup> <https://www.noaa.gov/jetstream/lightning/lightning-safety>

<sup>12</sup> Lightning data from Vaisala.com provided in the 2023 Annual Lightning Report

<sup>13</sup> <http://ncdc.noaa.gov/stormevents>



Additionally, from 1/1/23 to 1/1/2024, lightning contributed to 4 fires burning approximately 1.65 acres in the County.

#### *4) Probability of Future Events*

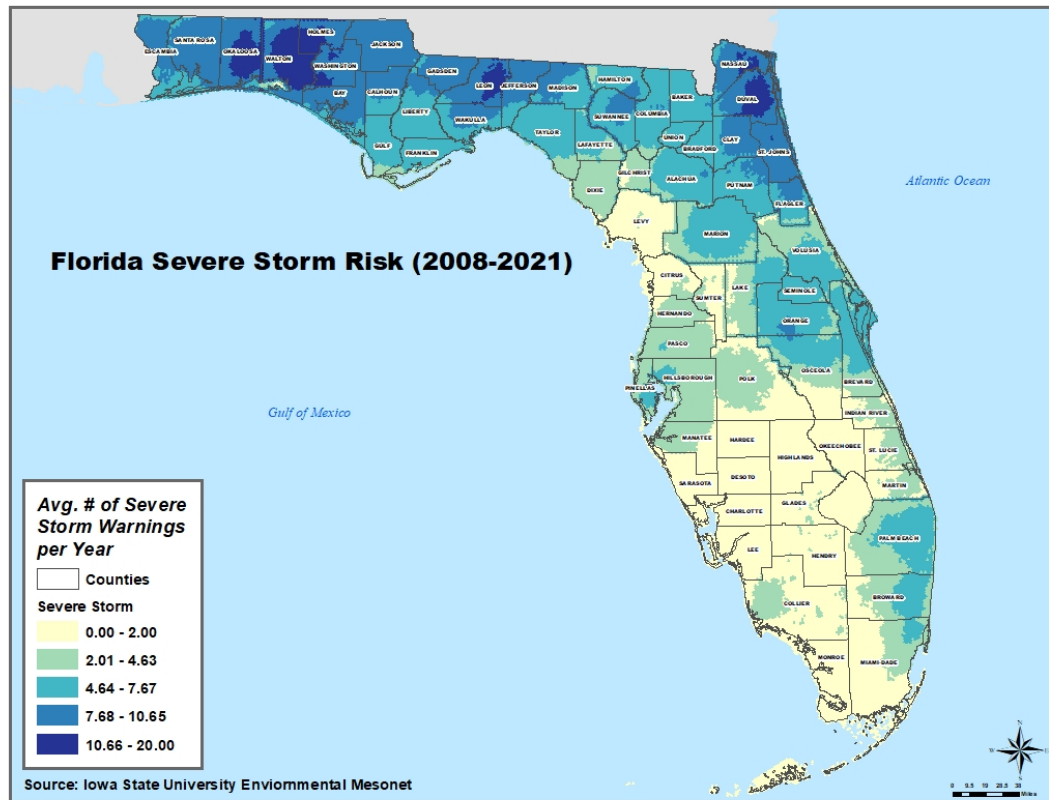
The probability of future occurrences of thunderstorms/winds/lightning within Columbia County is high as these events occur frequently especially during summer months. Generally speaking, all of Columbia County and its jurisdictions are subject to the effects of Thunderstorms, Wind, or Lightning. It is anticipated since Columbia County has experienced lightning storms before, it will likely occur again. Wind events in recent history have averaged from 40 to 70 knots and it is likely that those will occur again as well. The county has certainly experienced high winds and gusts that have impacted the residents and businesses of Columbia County.

#### *5) Vulnerability and Risk Assessment*

Columbia County is very susceptible to thunderstorms, high winds, and lightning. With the population of Columbia County continuing to grow, the effects of thunderstorms and wind events will be felt even more than in the past and substantial damage can be experienced by residents. With severe thunderstorms and lightning, segments of the population could be negatively affected. Agriculture concerns could suffer damage and economic losses. Individuals in open areas such as golf courses and parks are at risk, as well as those that may be participating in boating or other water activities on the numerous lakes and streams in Columbia County. Vulnerable populations, such as the elderly, socioeconomically disadvantaged, and unhoused individuals, typically have an increased risk to these hazards. Critical facilities and infrastructure would be possibly impacted in a severe storm. While historically thunderstorms haven't typically caused significant damage to structures, in Columbia County, the threat continues to remain based on each storm's potential. The committee determined that the county and its jurisdictions have a low to moderate impact severity.

The Figure below indicates the Florida severe storm risk from 2008 – 2021. Columbia County can anticipate 4.64 – 7.67 severe storm warnings on a yearly basis.

**Figure 8: Florida Severe Storm Risk (2008-2021) – Avg. # of severe storm warnings per year<sup>14</sup>**



<sup>14</sup> <https://flshmp-floridadisaster.hub.arcgis.com/pages/severe-thunderstorm>

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c) Brush fires, Wildfires and Forest Fires

1) *Description*

According to the Federal Emergency Management Agency (FEMA), a wildland fire or wildfire is an unplanned, unwanted fire burning in a natural area, such as a forest, grassland, or prairie. As building development expands into these areas, homes and business may be situated in or near areas susceptible to wildfires. This is called the wildland urban interface. Wildfires can damage natural resources, destroy homes, and threaten the safety of the public and the firefighters who protect forests and communities.

With the exception of fires triggered by lightning strikes, which can be mitigated in their impact by the precipitation of an accompanying thunderstorm, wildfires tend to be the culmination of hot, dry weather patterns that merely create the conditions for their occurrence. Once those conditions along with the buildup of dry fuel to feed a fire are in place, the occurrence of a brushfire depends simply on the right spark in the right place.

The three factors contributing directly to the behavior of wildfires are topography, fuel, and weather. Wildfires spread quickly igniting brush, trees, and homes. Every year, thousands of acres of wildland and many homes are destroyed by fires that can erupt at any time of the year from a variety of causes including arson, lightning, and debris burning. Like other natural processes, such as flooding, fire serves a purpose in the ecosystem regardless of its inconvenience for humans. In the wildland, fires have always served to clear underbrush from the forest and allow the regeneration of certain species at the expense of others. With or without human presence, fire is a part of nature.

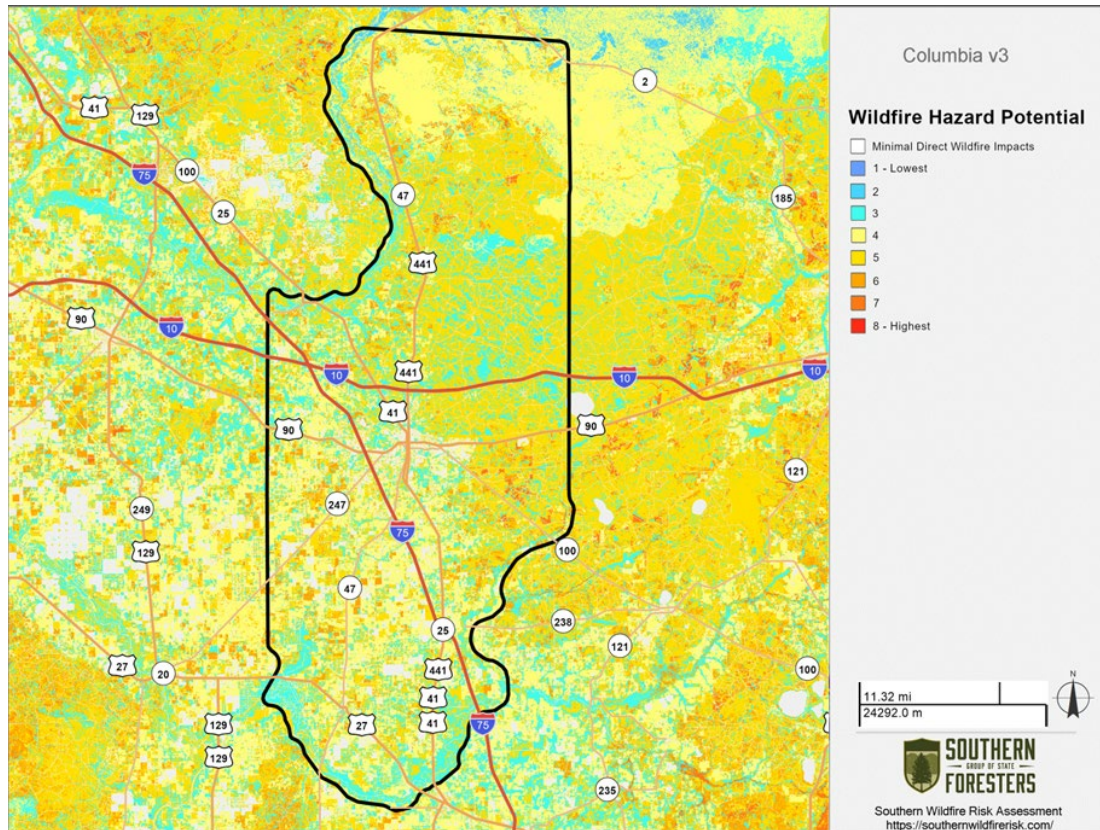
Efforts to eliminate wildfires from the natural environment, rather than helping matters, have served to make such fires more severe when they occur. Vegetative fuels accumulate in the forest understory, and when fires occur, they are more severe and disastrous than might otherwise have been the case. It is important to integrate the role of wildfires in understanding wildland ecosystems, and to incorporate these findings in planning for development that occurs at the interface between growing urban areas and this wildland.

A Community Wildfire Protection Plan becomes the focus of hazard identification efforts as part of the process of planning for mitigation and post-disaster recovery and reconstruction. Adding to the fire hazard is the growing number of people living in new communities built in areas that were once wildland.

## 2) Location and Extent

Columbia County and its jurisdictions are similar in the areas that have the most potential impacts from wildfire. A view of the Southern Wildfire Risk Assessment Portal (SouthWRAP) burn probability model is identified in the figure below. For a more detailed report of the potential impacts to the County and its jurisdictions, see the Southern Wildfire Risk Assessment report in Appendix J.

**Figure 9: Columbia County Wildfire Hazard Potential<sup>15</sup>**



Wildfire Hazard Potential is mapped with eight classes, ranging from low (blue) to high (red) hazard levels. The highest classes indicate areas with fuels more prone to experiencing extreme fire behavior during severe fire-weather conditions. Although Wildfire Hazard Potential is useful for long-term planning purposes, it does not incorporate current or forecasted weather conditions and should not be relied upon as a seasonal outlook.

Wildland fires can adversely impact homes, businesses, and vegetation, specifically those that are in higher risk areas. And, wildland fires affect visibility as well as air quality, which, can severely affect populations with compromised respiratory systems (such as the elderly). Impacts of wildfires are measured by acres burned each year.

<sup>15</sup> Source: <https://www.southernwildfirerisk.com/> (Accessed: February 2025)

### 3) Previous Occurrences

All of Columbia County and its jurisdictions may be directly or indirectly impacted by wildfires especially during months with minimal rainfall. Carelessness can lead to wildfires during dry or windy conditions and when burning restrictions are not followed. Even with prescribed burns, Columbia County remains at risk for brush fires in unincorporated areas and at the wildland/urban interface areas. From 2023 through 2024, the County experienced over 54 wildfire incidents burning close to 200 acres as detailed in the following table.

**Table 6: Fire by Cause**  
**Columbia County, FL (1/1/2023 – 1/1/2024)<sup>16</sup>**

| <b>Cause</b>                                                                                     | <b>Number of Fires</b> | <b>Percent (Fires)</b> | <b>Acres</b> | <b>Percent (Acres)</b> |
|--------------------------------------------------------------------------------------------------|------------------------|------------------------|--------------|------------------------|
| <i>No Cause Assigned - No Cause Assigned</i>                                                     | 1                      | 1.85%                  | 15           | 7.52%                  |
| <i>Debris and open burning - No Cause Assigned</i>                                               | 4                      | 7.41%                  | 7.4          | 3.71%                  |
| <i>Fireworks - No Cause Assigned</i>                                                             | 1                      | 1.85%                  | 0.1          | 0.05%                  |
| <i>Other causes - No Cause Assigned</i>                                                          | 1                      | 1.85%                  | 0.1          | 0.05%                  |
| <i>Smoking - Cigar/cigarette/pipe</i>                                                            | 1                      | 1.85%                  | 0.1          | 0.05%                  |
| <i>Equipment/vehicle use - Comm. transport vehicle</i>                                           | 1                      | 1.85%                  | 0.25         | 0.13%                  |
| <i>Equip/ vehicle use - Electric motor/power tools/battery</i>                                   | 1                      | 1.85%                  | 2            | 1.00%                  |
| <i>Power generation/transmission/distribution - Electrical transmission/distribution systems</i> | 1                      | 1.85%                  | 0.5          | 0.25%                  |
| <i>Recreation and ceremony - Gas cooking/warming/lighting device</i>                             | 1                      | 1.85%                  | 1.5          | 0.75%                  |
| <i>Debris and open burning - Machine pile/slash</i>                                              | 1                      | 1.85%                  | 0.05         | 0.03%                  |
| <i>Debris and open burning - Open trash burning</i>                                              | 2                      | 3.70%                  | 6.05         | 3.03%                  |
| <i>Debris and open burning - Other (remarks required)</i>                                        | 2                      | 3.70%                  | 0.75         | 0.38%                  |
| <i>Debris and open burning - Other land clearing</i>                                             | 3                      | 5.56%                  | 1.8          | 0.90%                  |
| <i>Equipment and vehicle use - Passenger vehicle/motorized RV</i>                                | 1                      | 1.85%                  | 0.1          | 0.05%                  |
| <i>Equip/vehicle use - Tractors/mowers/brush hogs</i>                                            | 2                      | 3.70%                  | 3.01         | 1.51%                  |
| <i>Undetermined (remarks req.) - Under investigation</i>                                         | 1                      | 1.85%                  | 0.5          | 0.25%                  |
| <i>Arson - Unknown (remarks required)</i>                                                        | 1                      | 1.85%                  | 6            | 3.01%                  |
| <i>Equipment and vehicle use - Unknown</i>                                                       | 1                      | 1.85%                  | 0.1          | 0.05%                  |
| <i>Other causes - Unknown (remarks required)</i>                                                 | 1                      | 1.85%                  | 7.7          | 3.86%                  |
| <i>Debris and open burning - Yard debris</i>                                                     | 16                     | 29.63%                 | 18.86        | 9.46%                  |
| <i>Natural - Lightning</i>                                                                       | 4                      | 7.41%                  | 1.65         | 0.83%                  |
| <i>Natural - Other (remarks required)</i>                                                        | 1                      | 1.85%                  | 1            | 0.50%                  |
| <i>Undetermined (remarks required) - No Cause</i>                                                | 3                      | 5.56%                  | 0.7          | 0.35%                  |
| <i>Undetermined - Origin and/or cause not identified</i>                                         | 3                      | 5.56%                  | 124.25       | 62.29%                 |

<sup>16</sup> Source: Source Florida Forest Service

| <b>Cause</b> | <b>Number of Fires</b> | <b>Percent (Fires)</b> | <b>Acres</b> | <b>Percent (Acres)</b> |
|--------------|------------------------|------------------------|--------------|------------------------|
| <i>Total</i> | 54                     |                        | 199.47       |                        |

Historically, there have only been 13 recorded wildfire occurrences in the County since 1950.<sup>17</sup>

**Table 7: Columbia County Wildfires (1/1/1950 –12/31/2024)**

| <b>Location or County</b> | <b>Date</b> | <b>Death</b> | <b>Injuries</b> | <b>Property Damage</b> | <b>Crop Damage</b> |
|---------------------------|-------------|--------------|-----------------|------------------------|--------------------|
| Lake City                 | 7/10/1998   | 0            | 4               | 0.00K                  | 0.00K              |
| Countywide                | 4/14/1999   | 0            | 0               | 0.00K                  | 0.00K              |
| Countywide                | 4/25/1999   | 0            | 0               | 0.00K                  | 0.00K              |
| Countywide                | 5/3/1999    | 0            | 1               | 0.00K                  | 0.00K              |
| Countywide                | 5/4/1999    | 0            | 0               | 0.00K                  | 0.00K              |
| Countywide                | 5/12/1999   | 0            | 0               | 0.00K                  | 0.00K              |
| Countywide                | 5/18/1999   | 0            | 0               | 0.00K                  | 0.00K              |
| Columbia (Zone)           | 5/8/2007    | 0            | 0               | 10.600 M               | 0.00K              |
| Columbia (Zone)           | 6/1/2011    | 0            | 0               | 0.00K                  | 0.00K              |
| Columbia (Zone)           | 7/1/2011    | 0            | 0               | 0.00K                  | 0.00K              |
| Columbia (Zone)           | 5/6/2012    | 0            | 0               | 0.00K                  | 0.00K              |
| Columbia (Zone)           | 3/28/2017   | 0            | 0               | 0.00K                  | 0.00K              |
| Southern Columbia (Zone)  | 1/19/2013   | 0            | 0               | 0.00K                  | 0.00K              |
| <b>000Total</b>           |             |              |                 | <b>\$10,600,000;</b>   | <b>5 Injured</b>   |

The most notable occurrences include:

- May 2007 – Lightning strikes on May 5 which ignited two 11-acre and 21-acre fires on Bugaboo Island in the southern Okefenokee National Wildlife Refuge (southwest of Stephen Foster State Park). On the 8th through the 10th high winds around large coastal low pressure system quickly resulted in extreme fire spread in southern Ware and Clinch counties in Southeast Georgia (the Georgia Bugaboo Scrub Fire).

The fires combined and raced southward toward Baker and Columbia counties in north Florida becoming the Florida Bugaboo Scrub Fire. Due to close proximity to large populated areas, most significantly Lake City, Florida the fire generated large media attention and became the dominant fire between Bugaboo Scrub complexes. In the evening on the 8th, Georgia St. Rd 94 and Florida St. Rd 2 (one road with two designations) were closed from Moniac, to Fargo, Georgia due to the threat of the Bugaboo Scrub fire crossing and St. Rd 2 poor visibility because of smoke in the area. By 4:00 pm, 500 people were evacuated from the vicinity of Taylor, Florida in northern Baker County and others were evacuated near Moniac, Georgia.

<sup>17</sup> [Storm Events Database](#)

The focus the fire-fighting efforts from May 8 – May 10 was on structure protection in the Taylor and Baxter, Florida area. Fire crews, along with private timber companies, were working along the flanks of the fire where conditions allowed, as well as, working to protect structures. Fire crews and forest industry personnel were also strengthening lines on the SW edge of the Georgia Bugaboo Scrub near Fargo. The Southern Area Blue Team assumed responsibility of the Florida Bugaboo Scrub Fire, South of St. Rd 2 on May 10 at 10:00 am. At this point the fire had burned nearly 26,746 acres.

From May 10 to May 13, the fire burned SW toward Deep Creek and Lake City in Columbia County causing evacuations in those areas and sporadic closings of I-10 and I-75 in the area. By May 13, the Florida Bugaboo Scrub Fire had burned 102,000 acres and Georgia Bugaboo had burned 131,718 acres, the totals for both were 233,718 acres and 570 persons were forced from their homes. Smoke from these large fires produced hazy conditions as far south as Miami over the weekend. On May 14, around 4:00 pm, the fire jumped containment line in the Fairview Road area east of US 441, about five miles north of the Deep Creek community but was contained overnight. At this time the fire was considered to be 50% contained. On May 15, a critical day for firefighters as wind gusted to 18 mph, with low humidity and higher temperatures making containment the fire more difficult.

The fire was located about 8 miles north of I-10 and 1.5 miles east of US Hwy 441. While no homes were damaged or destroyed, the fire burned to within a mile of the closest homes, which were located on Omar Terrace, about a mile E of US 441 and the Deep Creek community. At this point, there are some 300 homes were evacuated affecting approximately 1,000 people, with 48 structural fire units were situated around 350 homes in the immediate area of the fire to prevent loss. By Tuesday evening, the Florida portion of the Bugaboo Fire had increased to 119,501 acres and was 50% contained. After this point, the fire remained within containment with burnout operations continuing around the perimeter through the remainder of the month. Rains from Tropical Storm Barry (June 1 – June 2) aided with fire control efforts.

- July 1998 – Florida's wildfires began on May 25, 1998 and burnt parts of Northeast Florida. A large area of high pressure settled over Florida in the late Spring, keeping the traditional thunderstorms from forming. Lightning sparked most of the brush fires in hard to reach dry woods. Total cost across Northeast Florida will exceed \$200 million. Four individuals were injured in the County however, specifics were not available as to the injuries.

#### 4) *Probability of Future Events*

The predominance of forested acreage, current patterns of development and historical weather conditions indicate the probability of occurrence is high. The threat of fires cannot be eliminated, but public education and the use of prescribed burns can be used to better manage this hazard. Based on recent history, the probability exists for small wildland fires



but it has been 6 years since a significantly large fire, thus the likelihood to occur is moderate (every 6-10 years). An estimated acreage cannot be determined as the amount of acres burned can vary wildly from year to year. The State of Florida has a 12-month wildfire season that typically peaks between late April through mid-June.

#### 5) *Vulnerability and Risk Assessment*

The major causes of brush and forest fires are due to lightning, human negligence, or cases of criminal mischief, and occurs during the months with higher thunderstorm activities. Late winter and spring also are prime periods for wildfires, fueled by strong winds and a lack of rainfall during that same time frame. Columbia County has a considerable amount of undeveloped area with prime fuel source for fires and experienced major fire events in the past.

As more development occurs adjacent to these areas, the County becomes susceptible to wildfire damages in the Wildland Urban Interface areas. The level of vulnerability is high throughout the County because of the patterns and location of new development, probability of occurrence based on fuel types, and costs associated with these events. Florida Forest Service reported 1,369 wildfires in Columbia County from 2000 through 2020 involving over 51,000 acres.

The Florida Wild Land Fire Risk Assessment System (FRAS)<sup>18</sup> and the Southern Wildfire Risk Assessment Portal (SouthWRAP)<sup>19</sup> are tools available that will depict wildfire risk to the community.

The Wildland Urban Interface is the largest issue facing wildland firefighters in Columbia County. This creates unique challenges because interface residents frequently expect local government to provide the same level of service they received when they lived in the city (law enforcement, ambulance, fire protection, etc.). In addition, land managers find it increasingly difficult to manage forests for timber, wildlife and watershed when these areas are interspersed with subdivisions and individual homes.

Interface homes are frequently vulnerable to wildland fires because fire departments are no longer just minutes away, and are, for the most part, unable to protect homes in outlying areas from wildland fire disasters.

The Florida Forest Service Wildland Urban Interface (WUI) Risk Index (Figure below) identifies areas where the potential impact of wildfire on people and their homes and assess a risk based on housing density and fire intensity (Flame Length) to determine areas that may be majorly impacted by a wildfire incident. The susceptibility map designating those higher risk areas in the County can be found in the Columbia County Wildfire Protection Plan<sup>20</sup> containing the report titled "Southern Wildfire Risk Assessment Summary Report."

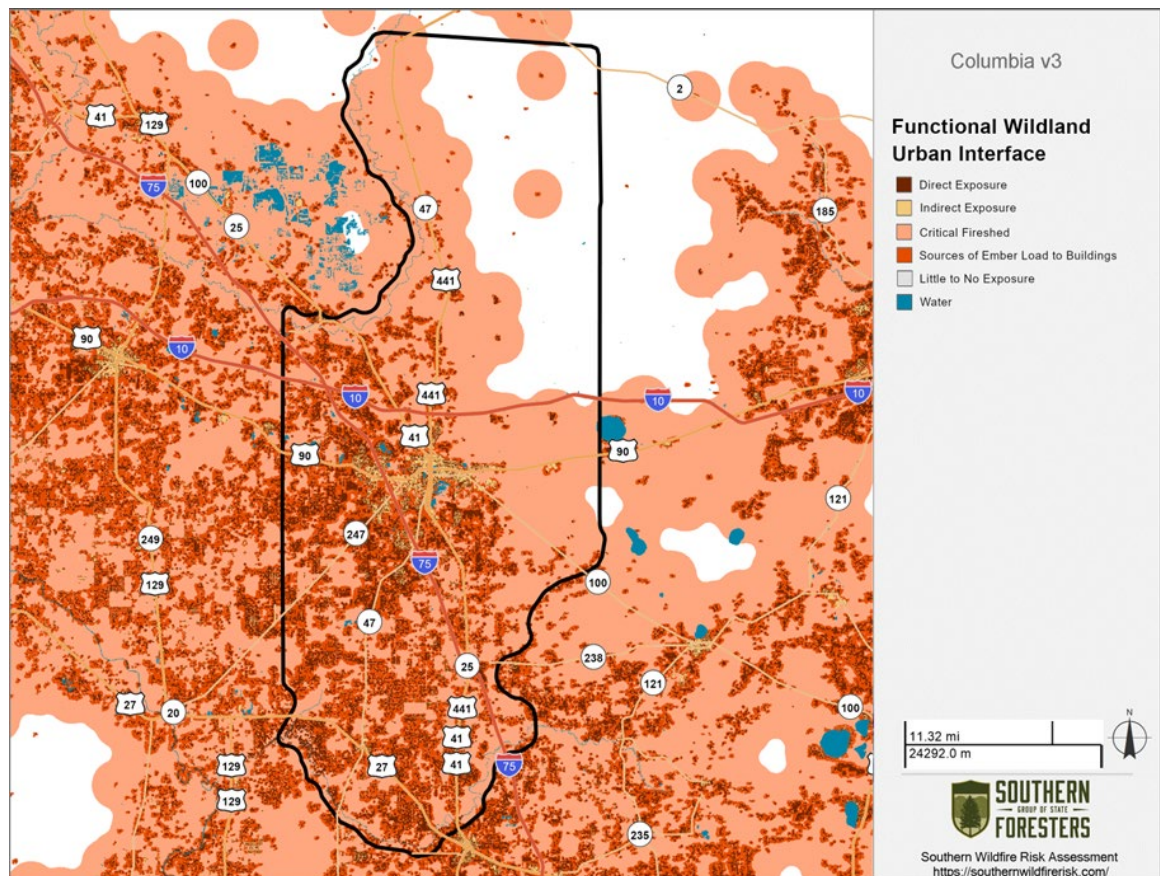
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<sup>18</sup> <https://www.fdacs.gov/Divisions-Offices/Florida-Forest-Service/Wildland-Fire/Resources>

<sup>19</sup> <https://www.southernwildfirerisk.com/>

<sup>20</sup> Columbia County Wildfire Protection Plan



**Figure 10: Wildland Urban Interface (WUI) Risk Index<sup>21</sup>**

Wildfires in Columbia County primarily affect wooded areas with low population density and do not typically pose a danger to highly populated areas. However, wildfires can still impact all jurisdictions in Columbia County. Structures, critical facilities, infrastructure, and housing for vulnerable populations have some exposure to impact by wildfires. An exact dollar loss cannot be determined due to the fact impact is undefined. There have been no significant wildfires other than those reflected in this section. The committee determined that the county and its jurisdictions have a low to moderate impact severity.

Other impacts resulting from wildfires include:

- **Smoke** - To mitigate the amount of smoke resulting from prescribed burning, Florida Forest Service officials ensure strict adherence to prescribed burn standards. This is imperative for many reasons, including but not limited to the region's military flight operations, which are some of the busiest in the world. Smoke resulting from wildfire can not only hinder such operations but also pose significant danger when impacting local roadways.
- **Continued Growth** - Compounding the wildfire problem in Florida has been the growing number of people relocating to the state. Estimates are that more than

<sup>21</sup> <https://www.southernwildfirerisk.com/>

900 people move to Florida each day and many of them decide to build their homes in areas called the wild land/urban interface – areas where natural vegetation meets homes and communities. As development expands to accommodate this continued growth, more wild land/urban interface problems will arise. Also, residents new to the interface areas are not aware that wildland fires usually pose more danger than fires in other places because they are fast moving fires which often require the interaction of many pieces of fire-fighting equipment, and such operations utilize more resources and time. Also, the cost of these operations grows proportionally with their complexity.

To further mitigate the potential wildfire threat, established in June 2015, and updated in 2019 the County maintains a Community Wildfire Protection Plan (CWPP); the plan was reviewed and updated in 2023. Located in Appendix C, the plan provides the planning process, vulnerability assessment, the current wildfire protection activities, the CWPP goals and objectives, the action plan, and the implementation and maintenance for the plan.

The CWPP can consolidate knowledge and serve as a single resource for wildland fire risk and hazard mitigation information. Included are an assessment of Columbia County's wildfire vulnerability, local organizations and resources available to assist with wildfire mitigation and response, and a pre-fire action plan for reducing wildfire vulnerability throughout the county. The plan also addresses the challenges of fire protection in the Wildland Urban Interface (WUI) through locally supported proactive solutions and activities, which facilitate the creation of Fire Adapted Communities (FAC).

As populations' increase and development continues to push into the rural wildland areas, it will be necessary to take active steps to reduce the wildfire risk to Columbia County residents. Through the approved CWPP, development regulations, vegetative fuel reduction, and on-going public education programs in high-risk areas, the potential for loss of human life and property from wildfire can be greatly reduced.

d) Tornadoes and Waterspouts

1) *Description*

A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud extending to the ground. Tornadoes are most often generated by thunderstorm activity (but sometimes result from hurricanes and other tropical storms) when cool, dry air intersects and overrides a layer of warm, moist air forcing the warm air to rise rapidly. Tornado speeds can reach in excess of 300 miles per hour. Damage paths can vary as wide as one mile and as long as 50 miles.

Some tornadoes are clearly visible, while rain or nearby low-hanging clouds may obscure others. Occasionally, tornadoes develop so rapidly that little, if any, advance warning is possible. Before a tornado hits, the wind may die down and the air may become very still. A cloud of debris can mark the location of a tornado even if a funnel cloud is not visible. Tornadoes generally occur near the trailing edge of a thunderstorm.

Waterspouts fall into two categories: fair weather waterspouts and tornadic waterspouts.

Tornadic waterspouts are tornadoes that form over water or move from land to water. These have the same characteristics as a land tornado and are associated with severe thunderstorms. Tornadic waterspouts are often accompanied by high winds and seas, large hail, and frequent, dangerous lightning.

Fair weather waterspouts usually form along the dark flat base of a line of developing cumulus clouds. This type of waterspout is generally not associated with thunderstorms. While tornadic waterspouts develop downward in a thunderstorm, a fair-weather waterspout develops on the surface of the water and works its way upward. By the time the funnel is visible, a fair-weather waterspout is near maturity. Fair weather waterspouts form in light wind conditions, so they normally move very little.

## 2) *Location and Extent*

Similar to hurricane data, there has been only reliable recorded data for tornadoes since 1950. Although the Midwest has the reputation for the worst tornadoes, Florida experiences the greatest number of tornadoes per square mile of all the states. Florida has averaged 52 tornadoes reported per year since 1961, with an average of two fatalities per year. Florida's tornadoes are generally of shorter duration (3 miles) and have narrower paths (125 yards wide). All areas of Columbia County are susceptible to tornadoes and their potential effects.

The Fujita Scale (now the Enhanced Fujita Scale) is used to determine the intensity of tornadoes. Most of the tornadoes that have hit Columbia County have been on the lower spectrum, in the F0 or F1 range. On February 1, 2007, the National Weather Service switched from the Fujita Scale to the Enhanced Fujita Scale to better reflect examinations of tornado damage surveys, aligning wind speeds more closely with associated storm damage. The Enhanced Fujita Scale levels are listed in the table below.

**Table 8: Measuring the Intensity of Tornadoes (Extent)<sup>22</sup>**

| Scale | Wind Speed (mph) |
|-------|------------------|
| EF0   | 65-85            |
| EF1   | 86-110           |
| EF2   | 111-135          |
| EF3   | 136-165          |
| EF4   | 166-200          |
| EF5   | >200             |

Because of the unpredictable patterns of tornadoes, and because the entire state of Florida has a relatively high risk, the entire County is vulnerable to tornado-induced damage. The damage potential for a tornado increases as a function of population density. As the number of structures and people increases, the potential damage/injury rate increases. Mobile homes, poorly constructed and/or substandard housing, apartment

<sup>22</sup> <http://www.srh.noaa.gov/oun/?n=efscale>

The EF scale still is a set of wind estimates (not measurements) based on damage.

complexes and low-rent housing projects are especially susceptible because of their lack of resistance to high winds, and apartment complexes and low-rent projects because of their size and densities.

### 3) *Previous Occurrences*

There have been 24 recorded tornadoes in Columbia County since 1950 that have caused nearly \$7,400,000 in total damage. These same tornadoes have also been responsible for 12 injuries and 1 death.

The following highlights the more significant events in Columbia County in the last twenty years.

- March 2008: National Weather Service storm survey of the tornado track indicated most damage was EF1 scale with a small area of EF2 damage near NE Denver Street opposite a large field. Numerous trees and power lines were snapped or blown over by the storm. Truck and trailers were also blown over in an industrial park. 19 homes were destroyed, 21 suffered major damage, and 20 had minor damage. Two businesses were destroyed with six suffering major damage. One female fatality occurred when a tree went through her mobile home. A male indirect fatality occurred when trying to connect a power generator. The mesocyclone, which spanned this tornado was tracked across Taylor, Lafayette, and Suwannee counties prior to this touchdown and it later spanned tornadoes in Baker, Charlton and Nassau counties. Five individuals were injured however, further details were not available.
- A pre-frontal squall in and mesolow tracked across southeast Georgia and northeast Florida in several waters of convection through the day. High instability was present, with upper level forcing in place ahead of a long wave trough. The tornado was associated with the core of a mesolow that tracked ENE inland from the Gulf Coast and over Columbia county and NE over Charlton County. Very heavy rainfall of 4-6 inches occurred over 24 hours with hourly rainfall rates of 2-3 inches in some locations.

An EF1 tornado with maximum winds of 95 mph caused significant tree damage to properties at the intersection of Pinemount Road and Nugget Road. Many large oak trees were twisted and snapped with large limbs 8-12 inches torn off. Large pine trees were twisted at the bases and toppled. An outbuilding had significant damage. Sheets of metal were strewn across the property. Pieces of lumber were impaled into the pastureland 1 to 2 feet. Large pilings in the ground 1-1.5 ft were lifted out of the ground and dispersed across the property. The cost of damage is unknown.

The table below lists the incidences of tornadoes in Columbia County since 2000.

**Figure 11: Tornado/Funnel Cloud Events in Columbia County (2000 – 2024)<sup>23</sup>**

| Location | Date       | Magnitude | Deaths | Injuries | Property Damage |
|----------|------------|-----------|--------|----------|-----------------|
| Lulu     | 12/25/2006 | F2        | 0      | 1        | -0-             |

<sup>23</sup> <http://ncdc.noaa.gov/stormevents>

|                        |           |     |          |          |             |
|------------------------|-----------|-----|----------|----------|-------------|
| <i>Lake City</i>       | 3/07/2008 | EF2 | 1        | 5        | \$4M        |
| <i>Bass</i>            | 5/15/2014 | EF1 | 0        | 0        | -0-         |
| <i>Bass</i>            | 6/07/2020 | EF0 | 0        | 0        | -0-         |
| <i>Winfield</i>        | 2/15/2021 | EF0 | 0        | 0        | -0-         |
| <i>Columbia County</i> | 7/07/2021 | EF0 | 0        | 0        | -0-         |
| <i>Mason</i>           | 8/04/2024 | EF0 | 0        | 0        | -0-         |
| <b>Total</b>           |           |     | <b>1</b> | <b>6</b> | <b>\$4M</b> |

An up-to-date list of reported tornado and waterspout events for the County can be found at <https://www.ncdc.noaa.gov/stormevents/>.

#### 4) *Probability of Future Events*

Based on recent history and the increased occurrence of tornadoes, there is a high probability to occur every 1-5 years. While the majority of these events are small in terms of size, intensity and duration, a greater number of stronger storms (i.e., F2 and F3 tornadoes) have been reported in the past. Further, even a minor tornado can cause substantial damage. According to the National Oceanic and Atmospheric Association, as of 2004, Florida was ranked number one in the number of tornados per square mile, most of which are weak, and referred to as spawn tornados. While tornados can occur at any time during the day or night, they tend to form during the late afternoon and into the evening.

Based on historical trend, from 1950 through 2020, there have been twenty-four (24) reported tornados throughout the County, four occurring since 2020. The expected tornado size would be approximately 20-yards wide, with a 175-yard path. Most tornados are expected to touchdown for relatively short periods of time in a bounce type pattern. The occurrence of a tornado touchdown on an annual basis is considered high. Severe storms occur regularly throughout the year, but do not always cause damage.

#### 5) *Vulnerability and Risk Assessment*

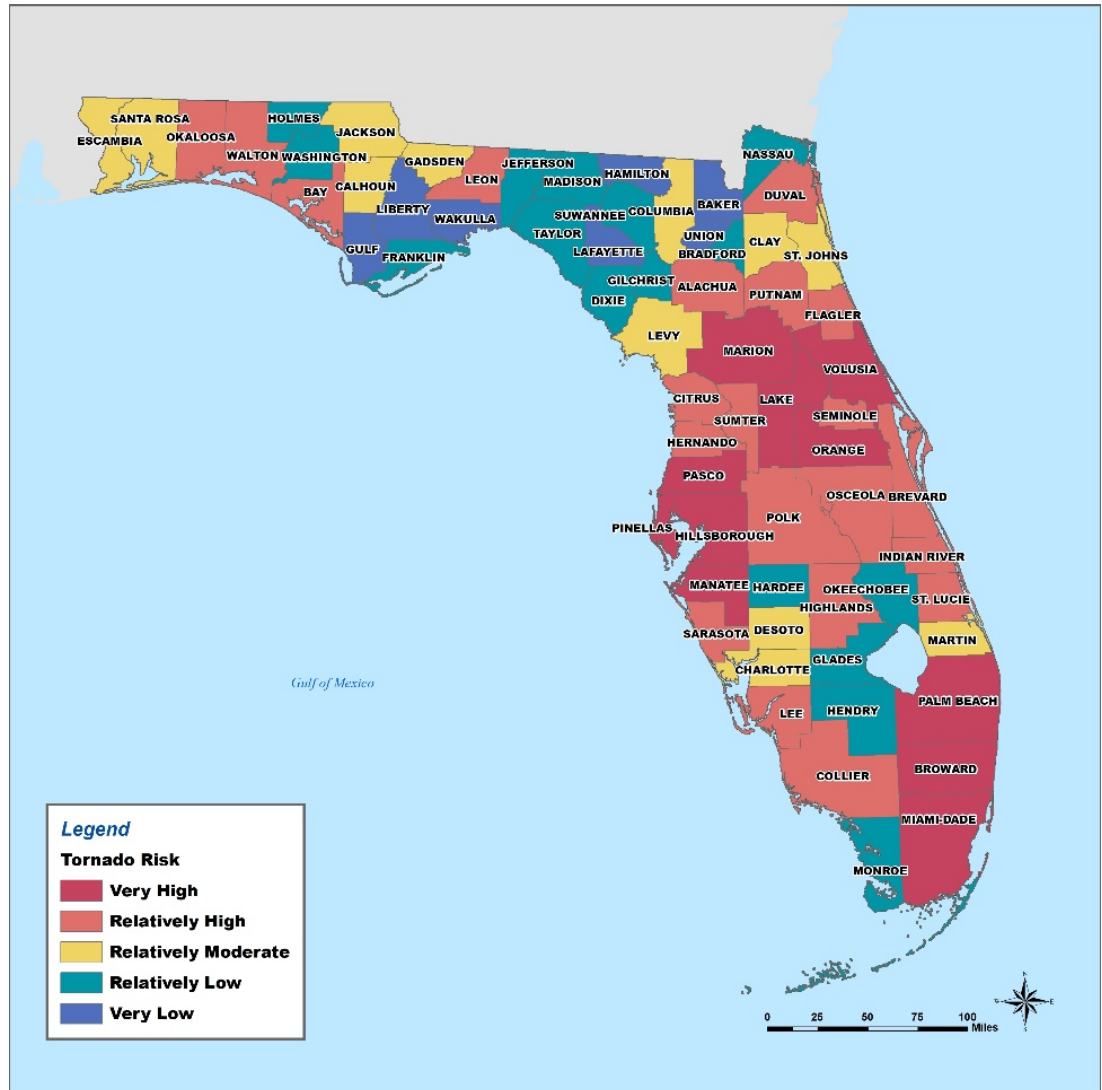
Due to the unpredictable nature of tornadoes, all of Columbia County and its jurisdictions are vulnerable to their impacts. High wind speeds can cause damage to structures with the most significant threat to mobile homes and other older substandard or unreinforced properties. The total mobile home population in Columbia County is estimated at 10,067<sup>24</sup> accounting for nearly 33% of the total housing stock. Tornadoes have caused significant damage to the City of Lake City and Columbia County with over \$7,400,000 over the last 45 years. The damage is primarily caused by wind damage to roofs and tree debris impacting transportation and power services. Tornado warnings are issued several times a year and are evenly distributed throughout the County.

<sup>24</sup> [data.census.gov](https://data.census.gov/); 2022 ACS 1-Year Estimates: Total Pop. in Occupied Housing by Tenure by Units in Structure



The FEMA NRI Map shows each county's overall risk to Tornadoes. Columbia County has a relatively moderate risk to tornadoes.

**Figure 12: Tornado Risk<sup>25</sup>**



<sup>25</sup> <https://flshmp-floridadisaster.hub.arcgis.com/pages/severe-thunderstorm>

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e) Hail

1) *Description*

Hail is frozen precipitation that can occur during a thunderstorm. Hail forms when raindrops freeze into balls of ice. Up until January 2010, severe hail in Columbia County was defined as three-fourths of an inch (penny size) or larger. However, in January 2010, the National Weather Service raised the hail size criteria for Severe Thunderstorm Warnings from 0.75-inch (penny size) to 1.00 inch (quarter size).

According to the National Weather Service, within Florida, many storms which have the potential for 0.75-inch hail also have the potential to produce 50-knot + (58 mph +) winds. Many storms capable of producing 0.75-inch to just below 1-inch size hail will still require Severe Thunderstorm Warnings for 50-knot + (58 mph +) damaging winds. Special Weather Statements will continue to be issued for "strong storms", generally those with 45-57 mph winds and small hail, below 1.00-inch.

2) *Location and Extent*

Severe thunderstorms can happen anytime of the year in the State of Florida and produce hail at any time. Although, hailstorm events occur most often during the late winter and early spring severe weather season and as previously mentioned, often accompany thunderstorms or tornadoes. A hail event has no geographic limitations to the area it affects. All of Columbia County and its jurisdictions are at risk of a hail event.

On average, Columbia County has seen hail from .75 to 2.00 inches in diameter. Columbia County would expect to receive the same size diameter hail and possibly even greater sizes, which may occur from extremely high cloud tops that develop.

Damage from hail increases with the size of the hail and can cause damage to vehicles, aircraft, and homes, and can be fatal to people and livestock. However, Florida thunderstorms do not often include hail because the hailstones usually melt before they reach the ground because of the generally warm temperatures in Columbia County.

3) *Previous Occurrences*

From 1950 to 2024 there have been 55 severe hailstorms that have struck Columbia County. Approximately 40% of the hailstorms produced hail over 1-inch in diameter. More recent occurrences that produced substantial damage include:

- Spring Storm in 2003: A storm that hit Columbia County produced 2-inch hail the size of golf balls in and around the City of Lake City. There was no significant property damage reported.
- February 2021: More recently, a wave of strong storms resulted in golf ball sized hail as large as 1.75 inches falling in Lake City. There was no significant property damage reported.

Since 2010 there have been 13 documented hailstorm events in Columbia County (Table 8) with hail ranging in size from 0.75 to 1.75 inches in diameter. None of these hailstorms resulted in property damage or crop damage or any significance. Locations and dates of hailstorms are listed in the table that follows. Should hail occur, it could cause damage to

car dealerships and the agricultural enterprises which include greenhouses, horticulture, foliage, and citrus crops. This could result in an economic effect to the County. Critical facilities and infrastructure would likely not be impacted. Other than injuries to individuals that may get caught out in the hailstorm, populations would be unlikely to be affected.

**Table 9: Hailstorm Damage in Columbia County Florida (2010 – Present)<sup>26</sup>**

| Location        | Date      | Size     | Damages |
|-----------------|-----------|----------|---------|
| Ft. White       | 4/30/2010 | 1.00 in. | -0-     |
| Suwannee Valley | 5/22/2010 | 1.00 in. | -0-     |
| Suwannee Valley | 5/29/2010 | 0.75 in. | -0-     |
| Benton          | 5/14/2011 | 1.00 in. | -0-     |
| Bass            | 6/6/2011  | 0.75 in. | -0-     |
| Ft. White       | 6/6/2011  | 1.00 in. | -0-     |
| Lake City       | 3/23/2013 | 1.75 in. | -0-     |
| Bass            | 5/25/2014 | 0.75 in. | -0-     |
| Bass            | 3/26/2015 | 1.00 in. | -0-     |
| Five Points     | 3/26/2015 | 0.88 in. | -0-     |
| Lake City       | 6/8/2018  | 0.88 in. | -0-     |
| Lake City       | 2/15/2021 | 1.75 in. | -0-     |
| Watertown       | 5/11/2023 | 1.00 in. | -0-     |

#### 4) *Probability of Future Events*

Based on the frequency of hail events in the past, the probability of future hail occurrences in Columbia County is moderate to high. Over the past 10 years, Columbia County has been impacted by one or more hail events per year. It can be expected that future hail events will continue to cause minor to severe damage to property and to agriculture throughout Columbia County.

#### 5) *Vulnerability and Risk Assessment*

As it cannot be predicted where hail may fall, all existing and future buildings, facilities, and populations in Columbia County and its jurisdictions are considered to be equally exposed to this hazard and could potentially be impacted. Hail can become as big as baseballs or golf balls; however, Florida typically experiences hail the size of pennies (0.75-inches) or quarters (1.00-inches). An average hailstorm can last for a few minutes to hours. While all of Columbia County's assets are equally exposed to hail, anticipated future damages or losses are expected to be minimal. The committee determined that the county and its jurisdictions have a low impact severity.

<sup>26</sup> <http://www.ncdc.noaa.gov/stormevents>



f) Flooding1) *Description*

Flooding is a general and temporary condition of partial or complete inundation of normally dry land areas from:

- The overflow of inland or tidal waters;
- The unusual and rapid accumulation or runoff of surface waters from any source

Floods can be slow or fast rising but generally develop over a period of days. Floods are one of the most commonly occurring hazards in the United States<sup>27</sup>. Localized, riverine, and closed basin inland flooding are the three types of flood hazards that are a threat and can have significant impacts in the County.

Riverine flooding and inland flooding risks are identified by the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps (FIRMs), which identify the risk of flooding on these maps and for those areas within the county and its jurisdictions.

2) *Location and Extent*

Flood zones are delineated on the FIRM and indicate the severity or type of flooding expected. The adopted baseline flood probability, or base flood, for the zones is a flood having a one-percent chance of being equaled or exceeded in any given year. This base flood is commonly referred to as the “100-year flood” or the “one-percent annual chance flood.” The base flood elevation (relative to actual ground elevation) published in the Flood Insurance Study establishes the base floodplain and sets limits for regulatory purposes.

The extent of flooding depicted on the FIRM is based on the 1% and 0.2% annual chance to be inundated with flood waters. Each jurisdiction has flood zones as identified on the FEMA FIRMs, but the unincorporated areas of the County have the larger areas and the larger potential threat and impact potential.<sup>28</sup>

The various flood zones from the FIRMs are listed in the following table along with the associated flood risks. Just because a property is not in an identified flood zone on the FIRM does not mean the property escapes flood risk. The risk is merely lower than those identified and describe on the FIRM.

Due to its inland location, Columbia County is not subject to coastal flooding but is prone to riverine flooding. There is also a significant number of low-lying areas in the center of the County that would be subject to isolated lowland flooding.

<sup>27</sup> [www.ready.gov/floods](http://www.ready.gov/floods)

<sup>28</sup> Appendix I-F – 100 Year Floodplain Map

**Table 10: FEMA Flood Zone Definitions<sup>29</sup>**

| <b>Zone</b>           | <b>Description</b>                                                                                                                                                                                                                           |
|-----------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>A</b>              | Areas subject to inundation by the 1-percent-annual-chance flood event. Because detailed hydraulic analyses have not been performed, no Base Flood Elevations (BFEs) or flood depths are shown.                                              |
| <b>AE,<br/>A1-A30</b> | Areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods. BFEs are shown within these zones. (Zone AE is used on new and revised maps in place of Zones A1–A30.)                                |
| <b>AH</b>             | Areas subject to inundation by 1-percent-annual-chance shallow flooding (usually areas of ponding) where average depths are 1–3 feet. BFEs derived from detailed hydraulic analyses are shown in this zone.                                  |
| <b>AO</b>             | Areas subject to inundation by 1-percent-annual-chance shallow flooding (usually sheet flow on sloping terrain) where average depths are 1–3 feet. Average flood depths derived from detailed hydraulic analyses are shown within this zone. |
| <b>AR</b>             | Areas that result from the decertification of a previously accredited flood protection system that is determined to be in the process of being restored to provide base flood protection.                                                    |
| <b>A99</b>            | Areas subject to inundation by the 1-percent-annual-chance flood event, but which will ultimately be protected upon completion of an under-construction                                                                                      |

Flood maps that identify the flood zones in all of the county jurisdictions are maintained by the County's Geographic Information Systems (GIS) department and can also be found at the following websites:

- [www.fema.gov](http://www.fema.gov)
- [Columbia County GIS Department](#)

### 3) *Previous Occurrences*

There have been several significant flooding events in Columbia County over the years, including:

- In March of 1998 - Several counties in Florida (St. Johns, Baker, Nassau, Union Suwannee, Alachua, Marion, Hamilton, Gilchrist, Flagler, Duval, Clay, Bradford and Putnam) are included in this total property damage figure of \$2.35 million. The total flooding data related to El Nino observed more than 2,800 homes and more than 175 businesses were destroyed.
- On June 25, 2012 - Tropical Storm Debby moved across the area from the northeast Gulf of Mexico. Deep tropical moisture combined with a stalled frontal boundary across north Florida over a period of several days caused extensive,

<sup>29</sup> <https://www.fema.gov/flood-zones>

flooding rainfall, as well as historic river flooding on the St. Mary's River. A few severe storms developed each day, but the main impact was flooding from rainfall and extensive river flooding which flooded homes in Baker, Charlton, Camden and Nassau counties. The cost of damage was underestimated.

- On September 6, 2014 - A weak low-level trough extended across the Okefenokee Swamp southward across the Suwanee River Valley, which triggered early morning slow moving showers and thunderstorms across Columbia county. A moisture feed off of the Gulf of Mexico due to low level SSW winds and spokes of energy rotating around a low center meandering over the local area fueled slow moving convection, which caused flash flooding over Columbia County generally between the cities of Columbia and Lake City. Daily storm total amounts ranged from 7 to almost 10.5 inches. Several inches of floodwater covered roadways throughout Columbia County.

The table below lists the incidences of floods in Columbia County since 2000.

**Table 11: Flood Damage in Columbia County Florida (2000 – Present)<sup>30</sup>**

| <i>Location</i>     | <i>Date</i> | <i>Deaths</i> | <i>Injuries</i> | <i>Property Damage</i> | <i>Crop Damage</i> |
|---------------------|-------------|---------------|-----------------|------------------------|--------------------|
| <i>Columbia Co.</i> | 9/8/2004    | 0             | 0               | 0                      | 0                  |
| <i>Columbia Co.</i> | 9/9/2004    | 0             | 0               | 0                      | 0                  |
| <i>Columbia Co.</i> | 9/28/2004   | 0             | 0               | 0                      | 0                  |
| <i>Ft. White</i>    | 1/21/2010   | 0             | 0               | 0                      | 0                  |
| <i>Ft. White</i>    | 1/21/2010   | 0             | 0               | 0                      | 0                  |
| <i>Winfield</i>     | 6/25/2012   | 0             | 0               | 100000                 | 0                  |
| <i>Lake City</i>    | 8/4/2015    | 0             | 0               | 0                      | 0                  |
| <i>Lake City</i>    | 12/14/2018  | 0             | 0               | 0                      | 0                  |
| <i>Ellisville</i>   | 6/25/2021   | 0             | 0               | 0                      | 0                  |
| <i>Ellisville</i>   | 8/5/2021    | 0             | 0               | 0                      | 0                  |
| <i>Ellisville</i>   | 8/5/2021    | 0             | 0               | 0                      | 0                  |
| <i>Columbia</i>     | 8/5/2021    | 0             | 0               | 0                      | 0                  |
| <i>Wilburn</i>      | 8/5/2021    | 0             | 0               | 0                      | 0                  |
| <i>Lake City</i>    | 8/19/2021   | 0             | 0               | 0                      | 0                  |
| <i>Lake City</i>    | 8/19/2021   | 0             | 0               | 0                      | 0                  |
| <i>Lake City</i>    | 8/26/2022   | 0             | 0               | 0                      | 0                  |

Since 2015, there have been additional minor flooding events that have impacted roads throughout the County, however, none have been reported to have caused any significant property damage.

#### 4) *Probability of Future Events*

The probability of future occurrence is moderate to high as heavy rains associated with low lying areas, poor drainage areas and riverine overflow can result in flooding. Intense

<sup>30</sup> <http://www.ncdc.noaa.gov/stormevents>

rainfall in a short period of time can cause flash flooding. The location and distribution of the rainfall, the land use and topography, vegetation types and growth/density, soil type, and soil water-content are all contributing factors. In recent years, Increased hurricane activity has led to more frequent flooding.

#### 5) *Vulnerability and Risk Assessment*

Flooding events, either from a tropical storm, a hurricane, or simply a heavy summer rain, pose a major hazard throughout the County and it is not necessary for development to be in the 100-year floodplain to be at risk.

Based on quantitative measurement and referencing the flood depth for this hazard,<sup>31</sup> the worse-case scenario would be another severe and long duration thunderstorm, hurricane or tropical storm event accompanied with heavy rain which could cause flooding for several days, weeks to a month or longer surpassing the April 1973 flood event.<sup>32</sup>

The April 1973 flood was the largest flood at the Town of White Springs since 1862 and exceeded the 1948 flood by 3 feet at the White Springs gage. (The Town of White Spring is located approximately 12.8 miles northwest of Lake City). Floodwaters remained over the lowland for 30 days, and for a time several major highways (Interstate 75, US Route 41, and US Route 129) were closed. Many people were forced to evacuate their homes, and Columbia County was included in the “major disaster area” declared by the President.

With development along the Suwannee and Santa Fe Rivers and their floodplains, numerous structures and roads are at risk from more frequent flood events.

A century ago, Lake City residents traveled by boat along a route now known as State Road 47, following the old Ichetucknee River. Although the river now flows underground through limestone channels, it can still flood during heavy rain, causing the old riverbed and its tributaries now marked as County Roads 240, 242, and 341 to overflow. These low-lying areas, once lakes, can quickly flood again. The Ichetucknee Trace remains visible on topographic maps, appearing like a river due to its consistently low elevation.

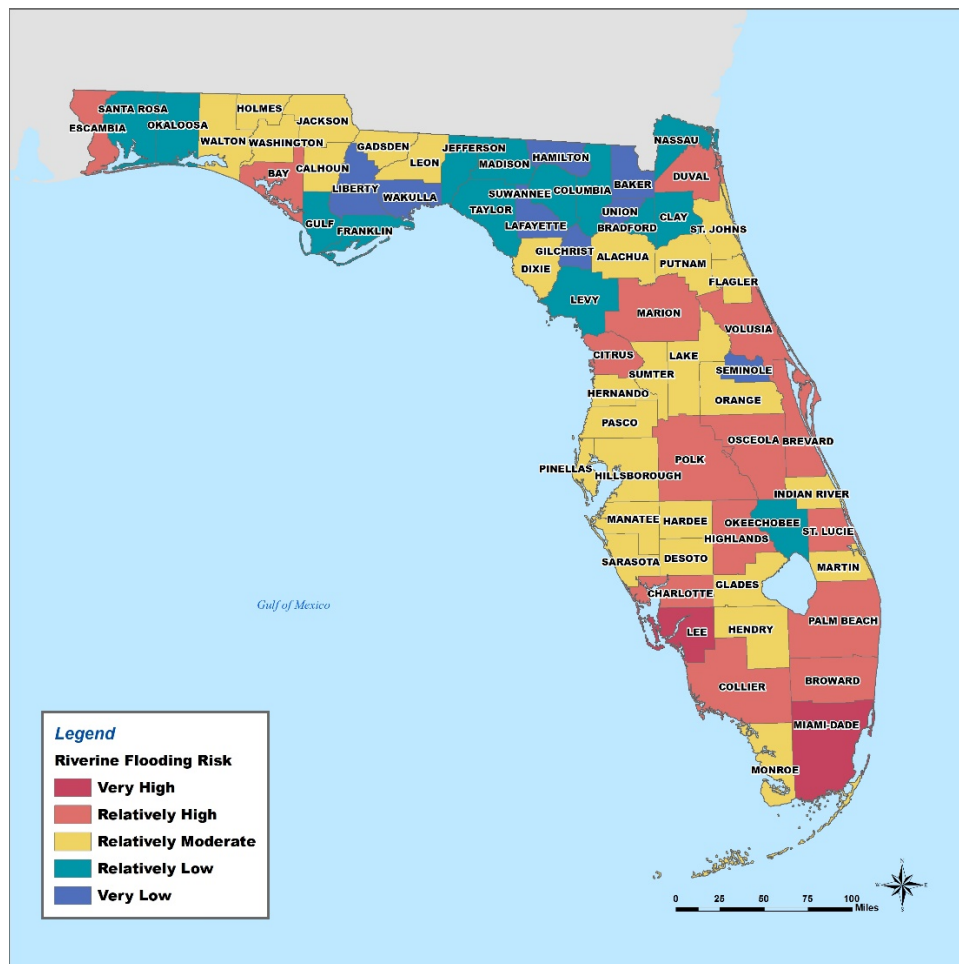
Depending on crest levels of the rivers, significant structural and infrastructure damage is likely to occur. Columbia County’s buildings, infrastructure, and critical facilities are considered vulnerable to damage caused by flooding events. The most vulnerable populated area in the county are the citizens who are within close proximity to the Suwannee and Santa Fe Rivers. In addition to those that live within the 100-year floodplain areas in Lake City and the unincorporated area of the County.

The Figure below identifies riverine flooding risk and Columbia County is considered to have relatively low risk. The committee determined that the county and its jurisdictions have a low to moderate impact severity.

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<sup>31</sup> [Santa Fe River at Three Rivers Estates \(in NAVD88\) | Suwannee River at White Springs \(in NAVD88\)](#)

<sup>32</sup> [FEMA Flood Insurance Study for Columbia County, Principal Flood Problems](#)

Figure 13: Riverine Flooding Risk<sup>33</sup>

To help mitigate some of those vulnerabilities, Columbia County does an excellent job informing the residents on floods from mapping to safety measures to specifics on what to do after a flood event.<sup>34</sup> The county has also instituted a home buyout program to purchase properties that frequently flood.

<sup>33</sup> <https://flshmp-floridadisaster.hub.arcgis.com/pages/flooding>

<sup>34</sup> <https://www.columbiacountyfla.com/FloodInformation.asp>

g) Drought1) *Description*

A drought is a period of time when an area or region experiences below-normal precipitation. The lack of adequate precipitation can cause reduced soil moisture or groundwater, diminished stream flow, crop damage, and a general water shortage.

2) *Location and Extent*

All areas of Columbia County are subject to the effects of drought conditions. Columbia County has a significant amount of acreage designated for conservation, public, and agricultural land uses. Resident populations may be affected due to water supply system strain and/or failure. Agricultural concerns such as horticulture, animal services, citrus, and vegetable crops may be affected by long and short-term drought conditions which could have a negative economic effect.

Additionally, each jurisdiction within the county has the potential to feel the impacts of drought, though with different consequences since the community is diverse with population and development centers in the southern portions of the county, and agriculture and farming industries found in the central and northern parts of the county.

The extent of drought in Florida is generally measured through one of two indices, the Keetch-Byram Drought Index (KBDI) or the U.S. Drought Monitor Index. While Columbia County historically has not been immune to regional or statewide droughts, recent population growth has accelerated the depletion of water supplies. The KBDI has a range from 0 for no drought to 800 being the most severe drought.

**Figure 14: KBDI Scale<sup>35</sup>**

| KBDI Scale     | Expected Conditions and Wildfire Threat                                                                                                                                                                                         |
|----------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>0-200</b>   | Soil moisture is high. Typical of spring dormant season following winter precipitation.                                                                                                                                         |
| <b>200-300</b> | Typical of late spring, early growing season. Lower litter and duff layers are drying and beginning to contribute to fire intensity.                                                                                            |
| <b>300-400</b> |                                                                                                                                                                                                                                 |
| <b>400-500</b> | Typical of late summer, early fall. Lower litter and duff layers actively contribute to fire intensity and will burn actively.                                                                                                  |
| <b>500-600</b> |                                                                                                                                                                                                                                 |
| <b>600-700</b> | Often associated with more severe drought with increased wildfire occurrence. Intense, deep burning fires with significant downwind spotting can be expected. Live fuels can also be expected to burn actively at these levels. |
| <b>700-800</b> |                                                                                                                                                                                                                                 |

<sup>35</sup> <https://flshmp-floridadisaster.hub.arcgis.com/pages/drought>

The table below summarizes the mean KBDI for Columbia County since January 1, 2022.

**Table 12: Keetch-Byram Drought Index (KBDI) for Columbia County, Florida (2022 – 2025)<sup>36</sup>**

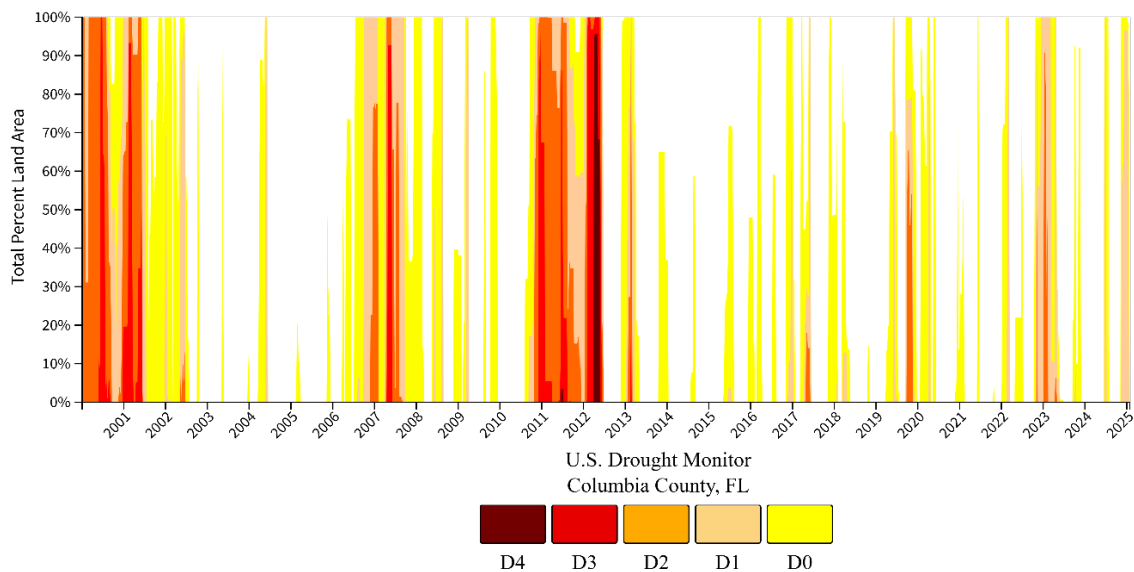
| Date            | KBDI       |
|-----------------|------------|
| January 1, 2022 | <b>102</b> |
| July 1, 2022    | <b>268</b> |
| January 1, 2023 | <b>329</b> |
| July 1, 2023    | <b>150</b> |
| January 1, 2024 | <b>26</b>  |
| July 1, 2024    | <b>588</b> |
| January 1, 2025 | <b>380</b> |

### 3) Previous Occurrences

During 1977, a two-month dry emergency caused an estimated \$30,000,000 in damages to the State of Florida, and the Governor declared a three-month drought during 1979, the worst since 1971.

Since 2000, the longest duration of drought (D1-D4) in Florida lasted 124 weeks beginning on April 11, 2006 and ending on August 19, 2008. The most intense period of drought occurred the week of February 27, 2001 where D4 (Exceptional Drought) affected 39.08% of Florida land.<sup>37</sup> The figure below shows a 25-year comparison of drought by condition for Columbia County. D4 drought conditions are defined as conditions where exceptional and widespread crop/pasture losses occur as well as shortages of water which create water emergencies.

**Figure 15: 25-Year Drought Comparison for Columbia County, FL (2000 – 2025)**



<sup>36</sup> [Florida Forest Service Weather - Observed Dispersion Index](#)

<sup>37</sup> <https://www.drought.gov/drought/states/florida>

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#### *4) Probability of Future Events*

From January 2020 through January 2025, the Palmer Drought Severity Index (PDSI) categorized the region between a no drought condition and a “D2 severe drought” condition. Using historical records, it can be estimated that Columbia County will experience at least one drought every 4 years, giving it a high likelihood to occur.

There is no way to predict when a drought will occur or how long it may last. Drought conditions existed in Florida from 1965 through 1982, from 1997 to 2002, 2006 to present with some relief the rainy months in 2013 and 2014. The conditions of various areas of the state have been affected to different degrees. The probability of a drought remains high for the County.

#### *5) Vulnerability and Risk Assessment*

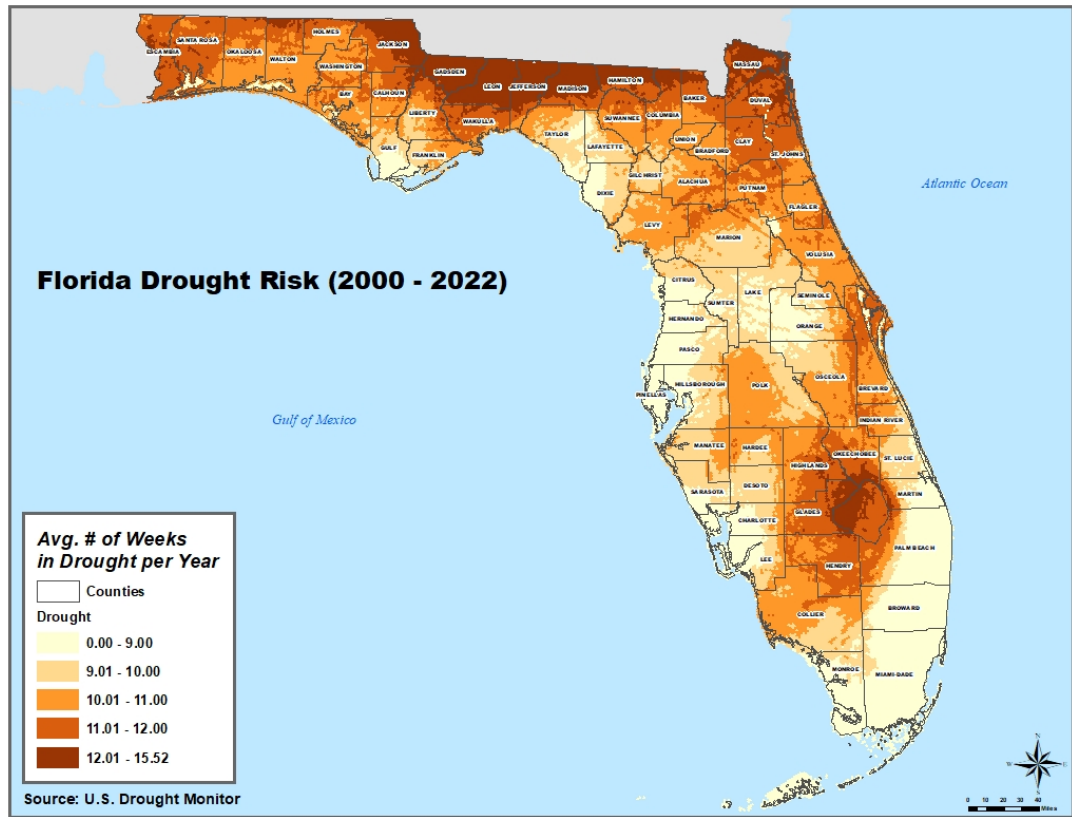
It is increasingly likely that Columbia County could have another drought or extreme heat event. Extreme heat events can occur simultaneously with drought but can occur without the other. While extreme heat events can cause death to any person of any age, the elderly, very young, and mobility restricted are considered the most at risk.

Based on the figure below it is expected that the county could see an average of up to 20 weeks or more of drought each year according to the data acquired from U.S. Drought Monitor.<sup>38</sup>

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<sup>38</sup> <https://droughtmonitor.unl.edu/>

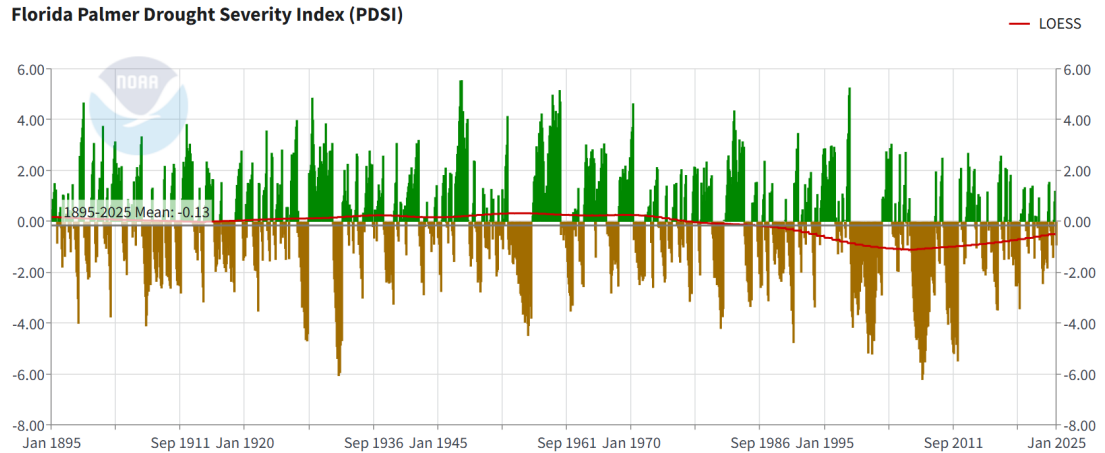


**Figure 16: Florida Drought Risk (2000 - 2022)**<sup>39</sup>

All of Columbia County and its jurisdictions are vulnerable to drought. Drought is typically associated with crop damage, and not necessarily the built environment (i.e., improved property). In a worst-case scenario, drought within Columbia County could reach moderate to severe levels (400 to 800) out of a potential score of 800 on the KBDI Index.

The Palmer Drought Severity Index data for the State of Florida from 1895 to 2025 has shown a trend of more frequent severe drought conditions as seen in the following figure.

<sup>39</sup> <https://flshmp-floridadisaster.hub.arcgis.com/pages/drought>

**Figure 17: Florida PDSI Trend (1895 - 2025)**

Columbia County has experienced moderate to severe drought conditions over the last five years. Heavy rains during the rainy season can reduce the drought index substantially, however dry spells can increase the number in a relatively short period. It is important to note that during prolonged cold spells when conditions are often windy, it will make conditions dry very quickly. Fires can be triggered from careless activities during extremely dry periods and water consumption may have to be curtailed if consumption exceeds rainfall and replenishment of the water table. The committee determined that the county and its jurisdictions have a low to high (environmental) impact severity.

During a drought water levels in rivers, swamps, and lakes would become lower, as would the water table. Local governments and water management districts within the County would find it necessary to impose water usage restrictions. The agricultural community and the residents would be impacted by a lengthy and damaging drought event. With over 979 farms, the effect could be considerable loss in revenue for the County. Farmers would be particularly affected by the drought conditions, as the water table fell, and deeper wells had to be drilled for irrigation purposes.

h) Extreme Heat1) *Description*

Extreme heat is defined as extended period where the temperature and relative humidity combine for a dangerous heat index. During the summer months heat can be very dangerous, as it can induce hyperthermia (heat stroke), heat exhaustion, or dehydration.

2) *Location and Extent*

All of Columbia County and its jurisdictions are equally at-risk from extreme heat. It is also especially hazardous to certain segments of the population such as the elderly and young children. Additionally, heat increases the demand for electricity to operate air conditioners, increasing the likelihood of brownouts and blackouts within the electrical grid.

While there are various definitions for extreme heat (or heat waves), the National Weather Service issues a heat advisory when the daytime temperatures will exceed a certain temperature depending on the time of the year. It is during these times that those vulnerable populations will be especially prone to extreme heat-related illnesses and conditions. Florida is quite accustomed to daytime temperatures in the 90's in the summertime. Also, with Florida being a peninsula, the breezes from both coastlines assists in keeping the temperatures generally below 100° F. The table below shows the heat threat levels from the National Weather Service.

**Table 13: Excessive Heat Threat Chart<sup>40</sup>**

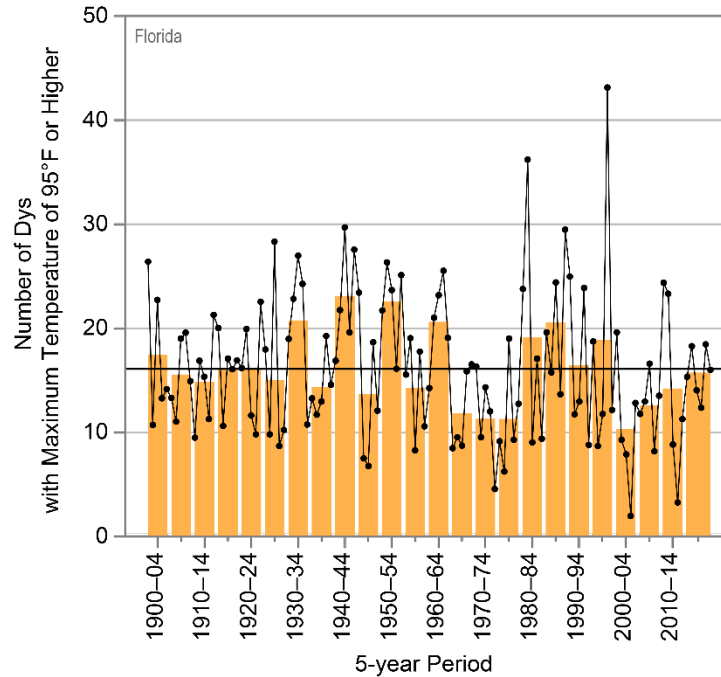
| <b>Excessive Heat Threat Level</b> | <b>Threat Level Descriptions</b>                                                                                                                                                                                                                               |
|------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Extreme                            | <i>"An Extreme Threat to Life and Property from Excessive Heat"</i><br>Highest heat index 118 degrees (F) or greater                                                                                                                                           |
| High                               | <i>"A High Threat to Life and Property from Excessive Heat"</i><br>Highest heat index 113-117 degrees (F) or greater                                                                                                                                           |
| Moderate                           | <i>"A Moderate Threat to Life and Property from Excessive Heat"</i><br>Highest heat index 108-112 degrees (F) or greater                                                                                                                                       |
| Low                                | <i>"A Low Threat to Life and Property from Excessive Heat"</i><br>Highest heat index 105-107 degrees (F) or greater.                                                                                                                                           |
| Very Low                           | <i>"A Very Low Threat to Life and Property from Excessive Heat"</i><br>Highest heat index around 105 degrees (F) for July and August<br>or...between 102-104 degrees (F) for June through September<br>or...between 99-103 degrees (F) for May through October |
| Non-Threatening                    | <i>"No Discernable Threat to Life and Property from Excessive Heat"</i><br>Warm season weather conditions are non-threatening                                                                                                                                  |

Florida typically experiences far fewer days with temperatures exceeding 100°F than most other southern states, it is the most humid state in the nation leading to uncomfortable

<sup>40</sup> [https://www.weather.gov/mlb/heat\\_threat](https://www.weather.gov/mlb/heat_threat)

summers for visitors and local residents. As mentioned, extended periods of extreme heat, especially when combined with high humidity, can result in heat-related illness among vulnerable populations, as well as place excess stress on agricultural production, water supplies, and energy generation.<sup>41</sup>

**Figure 18: Observed Number with Maximum Temperature Above 95 Degrees, State of Florida**



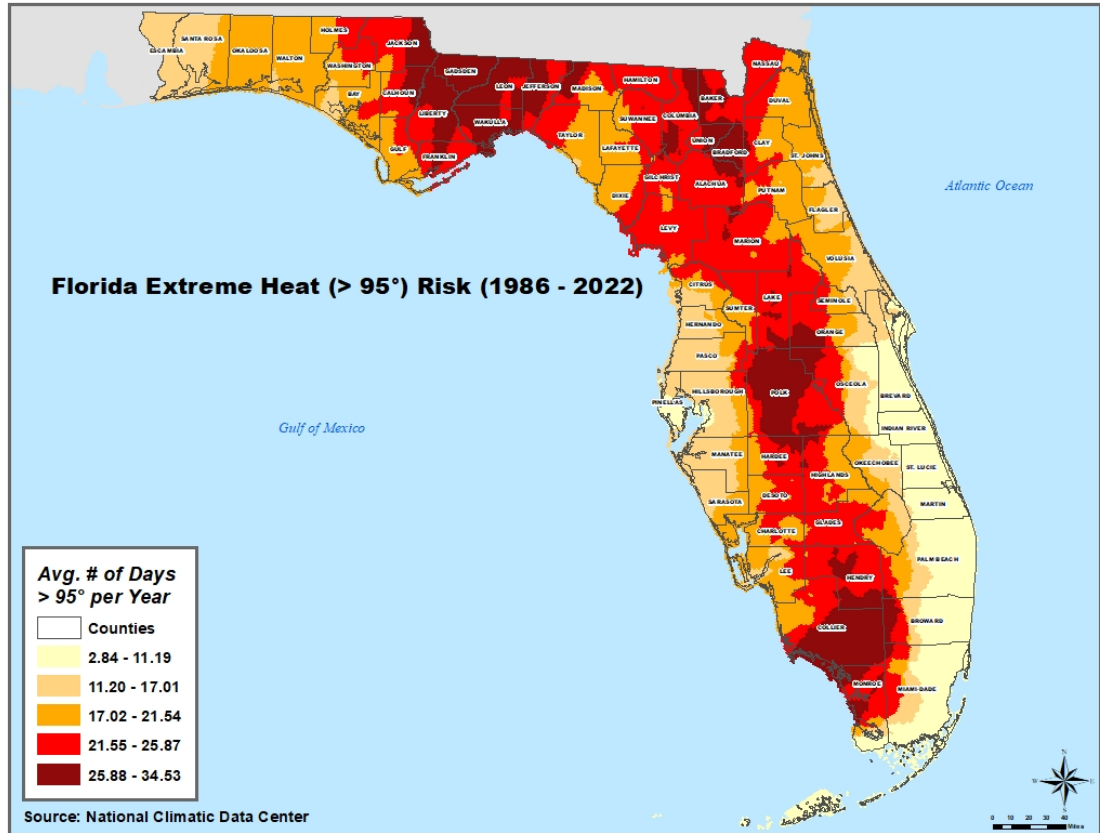
### 3) Previous Occurrences

Research from past years did not produce data that revealed extraordinary hot spells within Florida. However, a noteworthy period in the State of Florida, including all of Columbia County, was the heat wave of June – July 1998, when coastal breezes were impeded – allowing temperatures across the State to range between the upper 90's and 101 degrees. Wildfires became extreme in certain parts of the State (National Weather Service, Melbourne). This time was known as the '98 Florida Firestorm. There have been no recorded extreme heat incidents since the last LMS update.

### 4) Probability of Future Events

As noted in the table below and based on the previous occurrences, each year Florida typically has 21-34 days over 95 degrees, thus indicating a high probability to occur.

<sup>41</sup> <https://statesummaries.ncics.org/chapter/fl/>

**Figure 19: Avg. # of Days > 95 degrees per year<sup>42</sup>**

### 5) Vulnerability and Risk Assessment

All areas of Columbia County are susceptible to extreme heat. A significant heat wave coinciding with a drought could damage crops creating an economic effect. Additionally, a heat wave event presents a safety threat for the County's population, especially the vulnerable population, elderly persons, small children, population with chronic illnesses, and individuals on certain medications or drugs, are particularly susceptible to heat reactions.

The vulnerability to heat depends on climatic factors such as the frequency of heat waves and on individual risk factors, which could include; medical, age, gender, pre-existing disease, use of certain medications, level of hydration, living alone, housing condition, the presence and use of air-conditioning in the home or residential institution. It also can be said that the vulnerability to heat wave could result as a function of sensitivity to exposure, the characteristics of the population, the exposure to heat wave duration and, the measures and actions in place to reduce the loss of life.

According to the U.S. Census Bureau, in 2023 it was estimated that the median age in Columbia County was 43.2 years of age. Additionally, as of 2023, 20.7% of the population

<sup>42</sup> <https://fishmp-floridadisaster.hub.arcgis.com/pages/extreme-heat>

in Columbia County was aged 65 years or older, representing a rather sizable portion of the county that is more vulnerable to extended periods of extreme heat (or heat waves). The County, much like the rest of the State, continues to be a destination for retirees and has seen, and will continue to see, its elderly population increase. Additionally, urbanization will lead to an increase in the “heat island” effect from an increase in impervious surfaces, which only exacerbates extreme heat as a hazard in the future. The committee determined that the county and its jurisdictions have a low to moderate impact severity.

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i) Winter Storm/Freeze

1) *Description*

The National Weather Service (NWS) defines a Winter Storm as a weather event with accumulating frozen precipitation such as snow, sleet, and/or freezing rain. This event affects every state in the continental United States, although such weather is typically uncommon in Florida, especially southern parts.

During the winter, the North Florida region is occasionally invaded by massive cold fronts that originate far to the north and the results are carried to the Southern states. Although the temperature within these air masses rises significantly during their passage to Florida, they are capable of bringing intense cold to the State.

Florida has experienced occasional cold fronts that can bring high winds and relatively cooler temperatures for the entire state, with high temperatures that could remain into the 40s and 50s (4 to 15 °C) and lows of 20s and 30s (-7 to 4 °C) for few days in the northern and central parts of Florida, although below-freezing temperatures are very rare in the southern part of the state.

2) *Location and Extent*

For Columbia County, episodes of extreme freezing temperatures would be widespread to all locations and not just specific locales. Columbia County typically has severe freezing temperatures in short duration every year with long term hard freezing weather occurring every few years. As a result of freezing temperatures, Columbia County can expect to experience crop damage, icing on roadways, ruptured pipes, as well as the increased threat to the lives of the homeless and elderly. The threat and risk from freezing temperatures increases the further north you travel in the County and the further you move from the coastal areas.

3) *Previous Occurrences*

Several significant winter storm events have taken place recently.

- December 2010 – Low level moisture and strong cold air advection on the west side of a 1000 mb surface low offshore of the Georgia Atlantic Coast brought a wintry mix of snow flurries and sleet during the mid-morning hours to parts of Northeast Florida.
- January 2016 – Snow flurries were observed across much of northeast Florida as a surface low deepened offshore of the mid-Atlantic coast with a cold northerly flow and wrap-around low-level moisture in place over the local area.
- January 2018 – Freezing rain started to accumulate on vegetation and vehicles in Lake City. Additionally, a freeze event caused power outages due to downed power lines and tree limbs in Lake City, as well as south of town.
- December 2022 – An arctic blast caused hard freeze watches, and warnings were issued to the Panhandle and Big Bend. Freeze watches were issued into central Florida. Impacts were felt all over the U.S. Frost and ice accumulation, along with hard freeze conditions, were experienced in northern Florida.

- January 2025 - Columbia County, Florida, experienced a rare and impactful winter storm that brought unprecedented snowfall and freezing temperatures to the region. The winter storm was part of the 2025 Gulf Coast blizzard, brought significant snowfall to areas unaccustomed to such conditions. Parts of Florida recorded snowfall amounts that broke previous state records, with some areas experiencing up to 8 inches of snow. This storm led to hazardous conditions across the county, including icy roads and power outages. County officials urged residents to stay off the roads due to the risk of ice, particularly on bridges and overpasses. All Columbia County schools and offices closed by 4:30 PM on Tuesday, January 21, and remained closed on Wednesday, January 22, to ensure the safety of students and staff.

According to NOAA, since 2010, four events have occurred in Columbia County. These are outlined in the table below.

**Table 14: Freeze and Wind Chill Events Columbia County (2010 – 2025)<sup>43</sup>**

| Location | Date       | Type           | Damage |
|----------|------------|----------------|--------|
| Columbia | 12/26/2010 | Winter Weather | -0-    |
| Columbia | 01/23/2016 | Winter Weather | -0-    |
| Columbia | 01/03/2018 | Winter Storm   | -0-    |

#### 4) Probability of Future Events

Given historical patterns, the probability of the occurrence of a freeze (below 36 degrees Fahrenheit) is at least one day per year. Columbia County has experienced multiple freeze events since 2010, indicating that hard freezes (temperatures at or below 28°F) are possible, though not frequent.

Snow and wintry precipitation (sleet/freezing rain) are rare but have occurred in extreme weather patterns. The annual probability of a freeze (less than or equal to 32°F) is considered high. The annual probability of a hard freeze (less than or equal to 28°F) is moderate. The annual probability of a winter storm (snow/sleet/freezing rain) is considered low.<sup>44</sup>

While freezes are a near certainty each winter, significant winter storms remain rare but possible, particularly during strong cold air outbreaks.

All portions of Columbia County have been impacted by episodes of winter storms/freezing temperatures in the past, therefore confirming that the entire county is susceptible and according to previous occurrences the future probability is high (1-5 years).

According to the National Climactic Data Center, it is expected that portions of the County could see an average of 20 to 37 extreme cold (<32 degrees) days each year (see figure

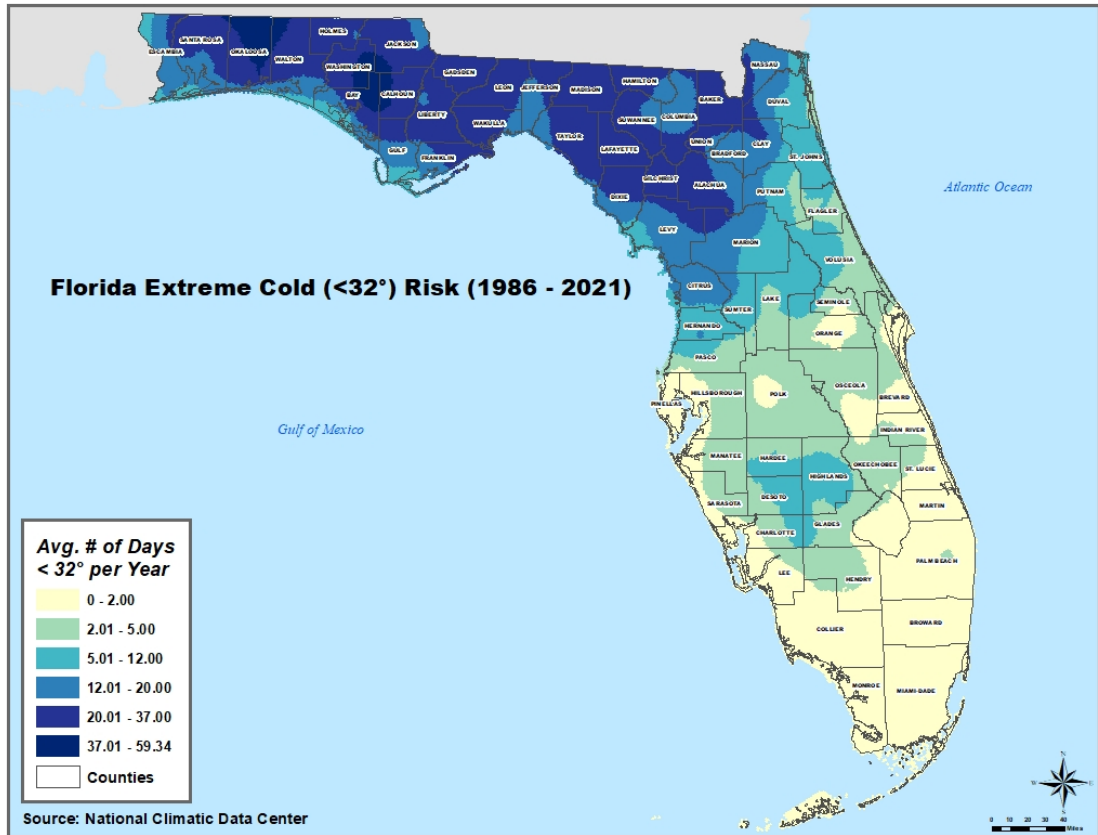
<sup>43</sup> [Storm Events Database](#)

<sup>44</sup> National Weather Service (NWS) & NOAA Climate Data



below) based on the average number of extreme cold days that occurred from the year 1986 through 2021.

**Figure 20: Florida Extreme Cold Risk (1986 – 2021)<sup>45</sup>**



### 5) Vulnerability and Risk Assessment

The number of people impacted by a freeze is not overly significant and, compared to other events, the economic costs are considered low. Columbia County's agricultural areas to the north of Interstate 10 are most vulnerable to winter storms and freezes as a result of the associated economic impact. However, a winter storm could cause major economic impact to the whole County, the County does not have support infrastructure required for a sustained period of time.

Temperatures in Columbia County can be as low as single digits, but rarely below zero. Additionally, light, freezing rain has been reported on occasion. Frozen precipitation in small amounts, although not commonplace, is possible within Columbia County. The probability of another significant freeze event continues to be moderate.

With regard to a scale to measure the magnitude or severity, the National Weather Service issues a threat awareness chart regarding one's vulnerability to the hazard of excessive

<sup>45</sup> [Winter Weather | FL SHMP](#)

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cold temperatures, especially wind chill. Columbia County may occasionally be subject to the types of winter storms that can include snow precipitation and accumulation. The committee determined that the county and its jurisdictions have a low to moderate impact severity.

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j) Sinkholes/Subsidence

1) *Description*

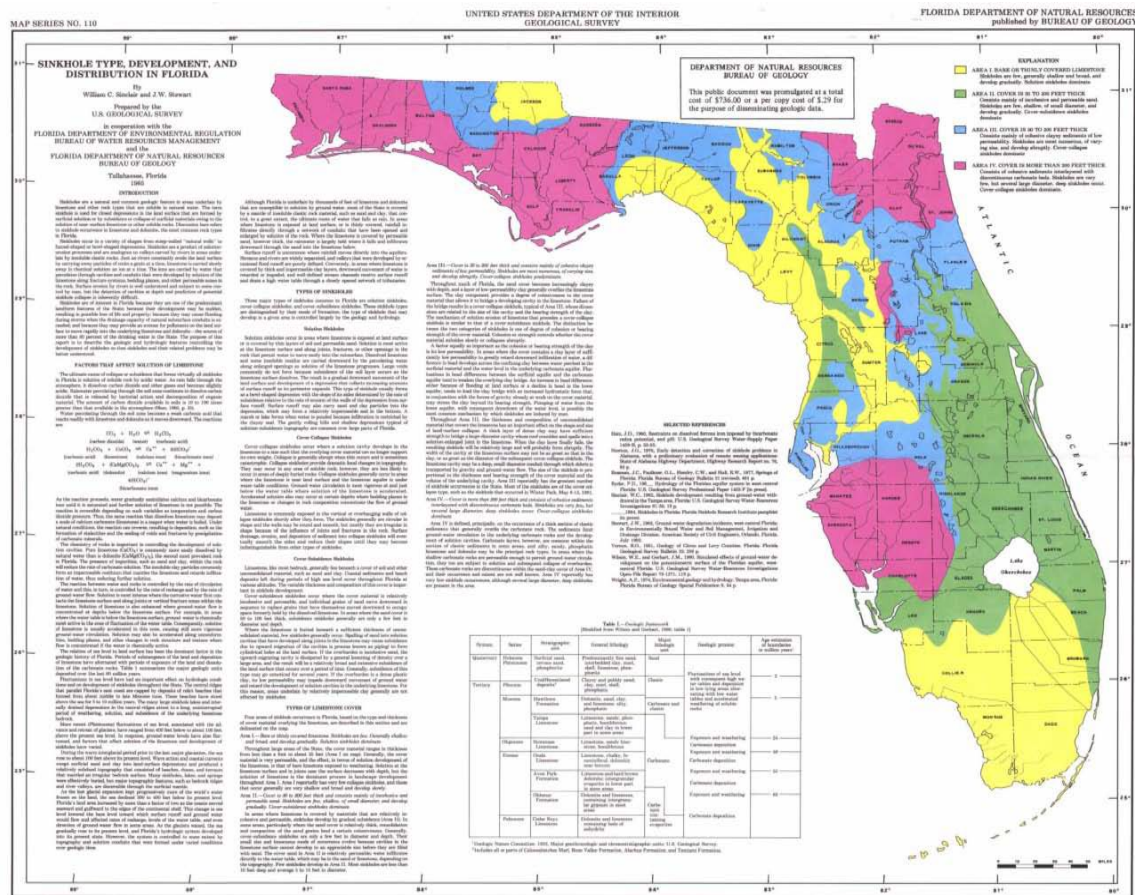
According to United States Geological Survey (USGS), a sinkhole is a depression in the ground that has no natural external surface drainage. Basically, this means that when it rains, all of the water stays inside the sinkhole and typically drains into the subsurface. Sinkholes are dramatic because the land usually stays intact for a period of time until the underground spaces just get too big. If there is not enough support for the land above the spaces, then a sudden collapse of the land surface can occur.

Topographically, Florida is part of a large Karst formation that comprises a section of the southeastern portion of the United States. Karst refers to the rock “foundation” that is slowly eaten through by chemical weathering eventually leading to subsidence or sinkholes. In Florida, the rock is generally limestone or gypsum, but it can be other types as well. The Karst terrain is also marked by the numerous caves and underground drainages.

2) *Location and Extent*

The Figure below shows the potential for sinkholes in the State of Florida. Columbia County has parts of Area I, Area III, and Area IV. Area I is considered bare or thinly covered limestone where sinkholes are few, generally shallow and broad, and develop gradually. Area III illustrates where cover is between 30 and 200 feet thick and consists mainly of cohesive clayey sediments of low permeability where sinkholes are most numerous and vary in size and develop abruptly. Area IV illustrates where cover is more than 200 feet thick and consists of cohesive sediments interlaid with discontinuous carbonate beds.

Sinkhole events in these areas are very few in occurrence, however, several large in diameter, deep sinkholes can occur.

Figure 21: Sinkhole Type, Development, and Distribution in Florida<sup>46</sup>

### 3) Previous Occurrences

Sinkhole occurrence locations have been documented on public and private properties in Columbia County. Due to the inability to access private property, it is likely that possible sinkhole occurrences have not been recorded and are not mapped by the County. From 1970 through 2024, there have been approximately 55 sinkholes reported in Columbia County<sup>47</sup>.

The most notable sinkhole occurrence that occurred in the County was in March of 2005. As reported by the Geological Society of America, the largest sinkhole in Columbia County, referred to as "Mimi's sink", was in March 2005. Details reveal that during the first days in March, the largest of the sinkholes was 80 m deep or 262.467 feet deep and the location was 30.17 and -82.71, approximately 16 miles south of the White Springs phosphate mine's southern boundary. Subsequently, new sinkholes appeared at three locations southeast of the Lake City sinkholes. The first was on March 29, 2005 was a large subsidence collapse located in the southbound lane of I-75, approximately 25 miles

<sup>46</sup> Source: U.S. Department of the Interior, Geologic Survey. <https://floridadep.gov/fgs>

<sup>47</sup> Source: FDEP. <https://floridadep.gov/fgs/sinkholes/content/sinkhole-faq>

southeast of Lake City and around 2 miles north of Alachua exit was another sinkhole 121 meters or approximately 397 feet deep in Alachua County.

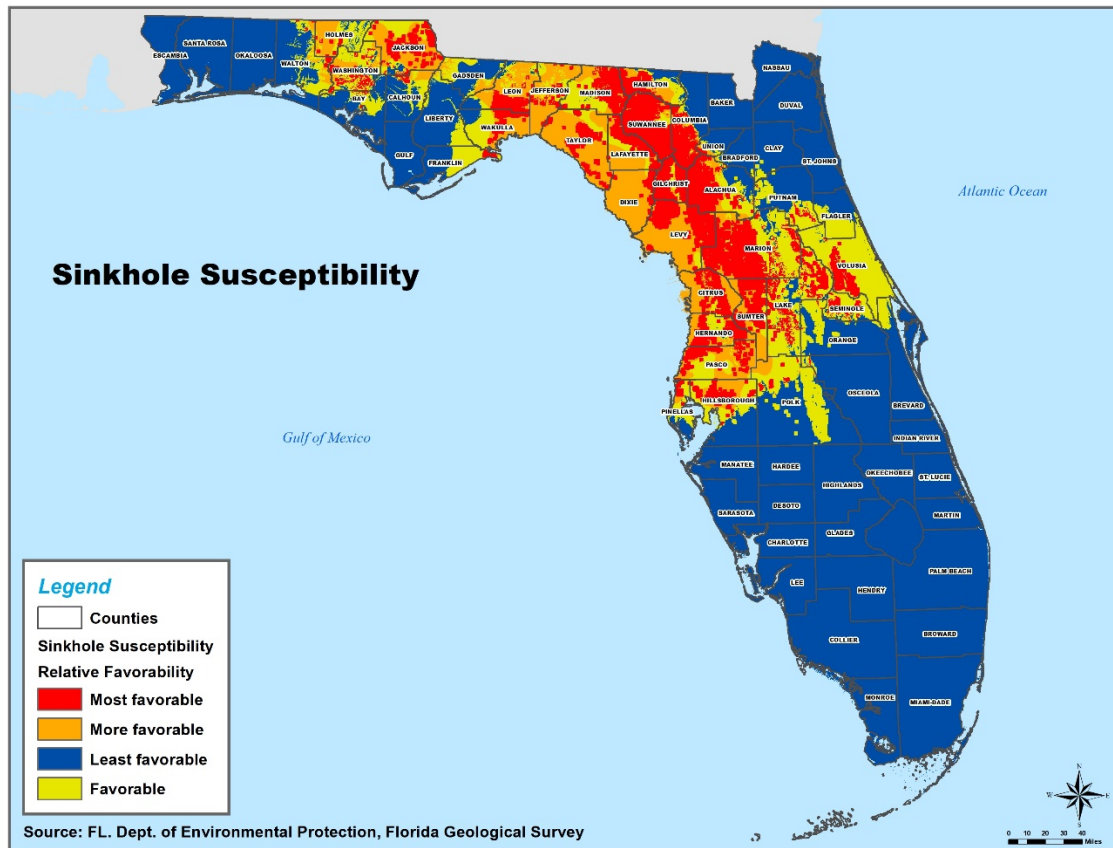
#### *4) Probability of Future Events*

There is a high probability of future sinkhole occurrences in Columbia County, according to historic data as sinkhole events occur every few years.

Activities that increase the risk of sinkholes include groundwater pumping, construction and development practices, and breakages in water lines, though they can also occur due to natural or geological factors. Additionally, while population increases don't directly cause more sinkholes, the supporting development and water use that comes with it may increase sinkhole risk and impact by destabilizing the soil.

#### *5) Vulnerability and Risk Assessment*

From 2010 to 2024, Columbia County has had a reported 5 sink holes of various sizes, ranging from under 3 feet wide to over 20 feet wide. While most of the sinkholes are relatively minor and pose little threat, there is always the possibility of a much larger sinkhole causing significant damage within the County. A majority of the county is listed as an area that is favorable to sinkhole formation, however, the population of residents that live in the Lake City and Southern area of the County are at greatest risk. The committee determined that the county and its jurisdictions have a low to moderate impact severity. The Figure below shows Florida's sinkhole susceptibility, with Columbia County being favorable to most favorable.

**Figure 22: Florida Sinkhole Susceptibility<sup>48</sup>**

<sup>48</sup> <https://flshmp-floridadisaster.hub.arcgis.com/pages/sinkhole>

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k) Epidemic/Pandemic

1) *Description*

An epidemic is a disease that affects a greater number of people than is usual within a region. A pandemic is the same as an epidemic except it has spread to more than one region of the world. Infectious diseases are caused by pathogenic microorganisms, such as bacteria, viruses, parasites or fungi; the diseases can be spread, directly or indirectly, from one person to another. Zoonotic diseases are infectious diseases of animals that can cause disease when transmitted to humans.

For the purpose of this Plan, infectious disease has been categorized as (1) pandemic and (2) localized infectious disease outbreaks.

A pandemic is an epidemic that occurs over a wide geographic area, often global. Pandemics results when a microorganism (or disease condition) emerges that is pathogenic for humans but to which humans have no immunity or prior protection. Thus, an epidemic occurs and the number of cases substantially exceeds the number of expected cases over a given period of time. Pandemics generally refer to infectious diseases that spread efficiently from person to person across the globe, although the term may be used to describe medical conditions with other risk factors, such as chronic illnesses like cardiovascular diseases.

2) *Location and Extent*

Populated areas throughout Columbia County its jurisdictions are the most at risk from human disease. Disease is not a risk, in itself, to the physical or operational integrity of any type of structure. However, high absenteeism could threaten the operating capabilities of businesses, industries, institutions and government agencies.

In 2020, Columbia County planned the implementation of a comprehensive Pandemic Plan in order to facilitate the continuity of governmental operations so as to provide necessary services to the citizens of the County in the event that a pandemic strikes the Gulf Coast of Florida.<sup>49</sup>

In the event of a pandemic, medical and health care facilities may be overwhelmed, with local care not readily accessible to those in need. Fatalities would significantly increase. Public safety would be compromised due to illness among public safety and security agencies. Quarantine and isolation techniques would be imposed, requiring a significant enforcement challenge. Temporary health care facilities and field hospitals would have to be activated and staffed by professionals from outside the county.

Overall, the human and economic consequences of the event would be very substantial.

3) *Previous Occurrences*

Below are the epidemics/pandemics that may have had notable impacts:

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<sup>49</sup> Columbia County Pandemic Plan 2020

- The “Spanish Flu,” 1918/1919: The Spanish Flu began in August 1918, in three disparate locations: Brest, Boston and Freetown. An unusually severe and deadly strain of influenza spread worldwide. The disease spread across the world, killing 25 million in the course of six months; some estimates put the total of those killed worldwide at well over twice that number. An estimated 17 million died in India, 500,000 in the USA and 200,000 in the UK. It vanished within 18 months and the actual strain was never determined, though some recent attempts at reconstructing genes from the virus have been successful.
- H5N1 “Bird Flu,” 1997/2003: Asian highly pathogenic avian influenza (HPAI) A(H5N1) virus occurs mainly in birds and is highly contagious among them. HPAI Asian H5N1 is especially deadly for poultry. The virus was first detected in 1996 in geese in China. Asian H5N1 was first detected in humans in 1997 during a poultry outbreak in Hong Kong and has since been detected in poultry and wild birds in more than 50 countries in Africa, Asia, Europe, and the Middle East. Six countries are considered to be endemic for Asian HPAI H5N1 virus in poultry (Bangladesh, China, Egypt, India, Indonesia, and Vietnam).  
Since its widespread re-emergence in 2003, rare, sporadic human infections with this virus have been reported in Asia, and later in Africa, Europe, and the Middle East. Human infections with Asian H5N1 viruses have been associated with severe disease and death. Most human infections with avian influenza viruses, including HPAI Asian H5N1 viruses, have occurred after prolonged and close contact with infected birds. Rare human-to-human spread with this virus has occurred, but it has not been sustained and no community spread of this virus has ever been identified.<sup>50</sup>
- SARS, 2002/2003: Severe acute respiratory syndrome (SARS) is a viral respiratory illness caused by a coronavirus called SARS-associated coronavirus (SARS-CoV). SARS was first reported in Asia in February 2003. The illness spread to more than two dozen countries in North America, South America, Europe, and Asia before the SARS global outbreak of 2003 was contained.  
Since 2004, there have not been any known cases of SARS reported anywhere in the world. The content in this website was developed for the 2003 SARS epidemic. But some guidelines are still being used.<sup>51</sup>
- H1N1, 2009: In the spring of 2009, a novel influenza A (H1N1) virus emerged. It was detected first in the United States and spread quickly across the United States and the world. This new H1N1 virus contained a unique combination of influenza genes not previously identified in animals or people. This virus was designated as influenza A (H1N1)pdm09 virus. From April 12, 2009 to April 10, 2010, CDC estimated there were 60.8 million cases (range: 43.3-89.3 million), 274,304 hospitalizations (range: 195,086-402,719), and 12,469 deaths (range: 8868-18,306) in the United States due to the (H1N1)pdm09 virus.<sup>52</sup>

<sup>50</sup> <https://www.cdc.gov/flu/avianflu/h5n1-virus.htm>

<sup>51</sup> <https://www.cdc.gov/sars/index.html>

<sup>52</sup> <https://www.cdc.gov/flu/pandemic-resources/2009-h1n1-pandemic.html>



- Ebola, 2014-2016: On March 23, 2014, the World Health Organization (WHO) reported cases of Ebola Virus Disease (EVD) in the forested rural region of southeastern Guinea. The identification of these early cases marked the beginning of the West Africa Ebola epidemic, the largest in history. On March 23, 2014, with 49 confirmed cases and 29 deaths, the WHO officially declared an outbreak of EVD.

Overall, eleven people were treated for Ebola in the United States during the 2014-2016 epidemic. On September 30, 2014, CDC confirmed the first travel-associated case of EVD diagnosed in the United States in a man who traveled from West Africa to Dallas, Texas. The patient (the index case) died on October 8, 2014. Two healthcare workers who cared for him in Dallas tested positive for EVD. Both recovered.

On October 23, 2014, a medical aid worker who had volunteered in Guinea was hospitalized in New York City with suspected EVD. The diagnosis was confirmed by the CDC the next day. The patient recovered. Seven other people were cared for in the United States after they were exposed to the virus and became ill while in West Africa, the majority of whom were medical workers. They were transported by chartered aircraft from West Africa to hospitals in the United States. Six of these patients recovered, one died.

- MERS, 2014: In May 2014, CDC confirmed two unlinked imported cases of MERS in the United States—one to Indiana, the other to Florida. Both cases were among healthcare providers who lived and worked in Saudi Arabia. Both traveled to the U.S. from Saudi Arabia, where scientists believe they were infected. Both were hospitalized in the U.S. and later discharged after fully recovering.<sup>53</sup>
- Zika Virus, 2015 and 2016: In early 2015, a widespread epidemic of Zika fever, caused by the Zika virus in Brazil, spread to other parts of South and North America. It also affected several islands in the Pacific, and Southeast Asia. In 2016, a reported 5,168 cases of Zika virus were reported in the U.S. In the State of Florida, this included 1,107 cases of the virus.<sup>54</sup>
- COVID-19, 2020: On January 11, 2020, Chinese health authorities preliminarily identified more than 40 human infections with novel coronavirus in an outbreak of pneumonia under investigation in Wuhan City, Hubei Province, China. Chinese health authorities subsequently posted the full genome of the so-called “novel coronavirus 2019”, or “2019-nCoV”, in GenBank®, the National Institutes of Health genetic sequence database.

On February 11, 2020 the World Health Organization announced an official name for the disease that is causing the 2019 novel coronavirus outbreak, COVID-19 and declared it a pandemic outbreak on March 11, 2020.<sup>55</sup>

<sup>53</sup> <https://www.cdc.gov/coronavirus/mers/us.html>

<sup>54</sup> <https://www.cdc.gov/zika/index.html>

<sup>55</sup> Florida Department of Health – [Novel Coronavirus \(2019nCoV\)](#)

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#### 4) *Probability of Future Events*

According to previous history and the CDC, pandemic type events rarely happen (4 times in the 20<sup>th</sup> century), therefore indicating a low/moderate probability. But after COVID-19 there is evidence of more frequent occurrences of epidemic and pandemic type events.

Based on the occurrences and future probability, the County has made some assumptions about how to plan for a pandemic/epidemic which is outlined below.

- Susceptibility to the pandemic influenza virus will be universal.
- Efficient and sustained person-to-person transmission signals an imminent pandemic.
- The clinical disease attack rate will likely be 30% or higher in the overall population during the pandemic. Illness rates will be highest among school-aged children (about 40%) and decline with age. Among working adults, an average of 20% will become ill during a community outbreak.
- Some people will become infected but not develop clinically significant symptoms. Asymptomatic or minimally symptomatic individuals can transmit infection and develop immunity to subsequent infection.
- Of those who become ill with influenza, 50% will seek outpatient medical care.
- With the availability of effective antiviral drugs for treatment, this proportion may be higher in the next pandemic.
- The number of hospitalizations and deaths will depend on the virulence of the pandemic virus. Estimates differ about 10-fold between more and less severe scenarios. Two scenarios are presented based on extrapolation of past pandemic experience. Planning should include the more severe scenario.
- Risk groups for severe and fatal infection cannot be predicted with certainty but are likely to include infants, the elderly, pregnant women, and persons with chronic medical conditions.
- Rates of absenteeism will depend on the severity of the pandemic.
- In a severe pandemic, absenteeism attributable to illness, the need to care for ill family members and fear of infection may reach 40% during the peak weeks of a community outbreak, with lower rates of absenteeism during the weeks before and after the peak.
- Certain public health measures (closing schools, quarantining household contacts of infected individuals, “snow days”) are likely to increase rates of absenteeism.
- The typical incubation period (interval between infection and onset of symptoms) for influenza is approximately 2 days.
- Persons who become ill may shed virus and can transmit infection for up to one day before the onset of illness. Viral shedding and the risk of transmission will be greatest during the first 2 days of illness. Children usually shed the greatest amount of virus and, therefore, are likely to post the greatest risk for transmission.

- On average, infected persons will transmit infection to approximately two other people.
- An affected community, a pandemic outbreak will last about 6 to 8 weeks.
- Multiple waves (periods during which community outbreaks occur across the country) of illness could occur with each wave lasting 2 to 3 months. Historically, the largest waves have occurred in the fall and winter, however, the seasonality of a pandemic cannot be predicted with certainty.

#### 5) *Vulnerability and Risk Assessment*

Certain people are at high-risk for serious complications (infants, elderly, pregnant women, extreme obesity and persons with certain chronic medical conditions). Further impacting risk, most people have little or no immunity because they have no previous exposure to the virus or similar viruses.

Seasonal flu rates of medical visits, complications, hospitalizations and death can vary from low to high. The CDC estimates that flu-related hospitalizations since 2010 ranged from 140,000 to 710,000, while flu-related deaths are estimated to have ranged from 12,000 to 56,000. Now in comparison, pandemic flu rates of medical visits, complications, hospitalizations and death can range from moderate to high. The number of deaths could be much higher than the seasonal flu (e.g. The estimated U.S. death toll during the 1918 pandemic was approximately 675,000). With the recent impacts of COVID19, additional pandemic numbers will continually change.

Considering the spread and infection rate, a pandemic event may cause major impacts on the general public, such as travel restrictions and school or business closings. Additionally, there is the potential for severe impact on domestic and world economies.<sup>56</sup>

Most efforts in analyzing the impacts and effects of disease and pandemic have been done at the national level. Because of the dynamics involved with the spread of disease and pandemic, a local level assessment has not been conducted specifically, but the local understanding that if a pandemic does impact our community, it will quickly overwhelm our local healthcare system. The committee determined that the county and its jurisdictions have a low to high (human and program operations) impact severity.

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<sup>56</sup> <https://www.cdc.gov/flu/pandemic-resources/basics/about.html>

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## I) Hazardous Materials

### 1) *Description*

A hazardous material is any item or agent which has the potential to cause harm to humans, animals, or the environment, either by itself or through interaction with other factors. Emergencies can happen during production, storage, transportation, use or disposal. populations are at risk when chemicals are used unsafely or released in harmful amounts where you live, work or play.

Hazardous materials include:

- Explosives;
- Flammable, non-flammable, and poison gas;
- Flammable liquids;
- Flammable, spontaneously combustible, and dangerous when wet solids;
- Oxidizers and organic peroxides;
- Poisons and infectious substances;
- Radioactive materials; and
- Corrosive materials.<sup>57</sup>

The Code of Federal Regulations (CFR), 40 CFR 302, establishes the list of extremely hazardous substances, threshold planning quantities, and facility notification responsibilities necessary for the development and implementation of State and local emergency response plans.

Facilities storing, using, or transporting hazardous materials with certain characteristics, and specific quantities as listed in 40 CFR 302, that may be of critical risk to safety, health and life of a community must report that information to the local, state, and Federal government to assist in identifying those materials and where they are located, so the risk can be assessed and planned for by the community.

### 2) *Location and Extent*

The release of hazardous materials to the environment could cause a multitude of problems. Although these incidents can happen almost anywhere, certain areas of the County are at higher risk, such as near roadways that are frequently used for transporting hazardous materials and locations with industrial facilities that use, store, or dispose of such materials. Areas crossed by railways, waterways, airways, and pipelines also have increased potential for mishaps. Incidences can occur during production, storage, transportation, use, or disposal of hazardous materials. Communities can be at risk if a chemical is used unsafely or released in harmful amounts into the environment. Hazardous materials can cause death, serious injury, long-lasting health effects, and damage to buildings, the environment, homes, and other property.

The term “release” includes spilling, leaking, pumping, pouring, emitting, emptying, discharging, escaping, leaching, dumping, or disposing into the environment of any

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<sup>57</sup> National Archives and Records Administration, “[Code of Federal Regulations Title 49: Transportation](#)”

hazardous material. Hazardous materials releases (HMRs) may be intentional or accidental and may occur at fixed facilities or on vehicles.

HMRs are harmful in three ways:

- 1) Life safety concerns. Chemical, biological, and radiological agents can cause significant health risks to those exposed to them; biological agents can be additionally dangerous if they are infectious. Flammable and explosive materials also present life safety concerns if they are exposed to heat.
- 2) Costly and delicate nature of cleanup. Any release of a hazardous material requires a thorough and careful clean-up of the site and decontamination of those exposed.
- 3) Operational delays. Delays caused by any HMR and the ensuing evacuation and cleanup processes could lead to significant economic losses due to traffic delays (mobile releases) or operational shut-down (fixed facilities).

Most incidents occur with little or no warning and can be difficult to detect until symptoms present themselves in those affected. Although major chemical incidents seem most threatening, it is the smaller, more routine accidents and spills that have a greater impact on humans, wildlife, economy, and environment. Some of the most common spills involve tanker trucks and railroad tankers containing gasoline, chlorine, or other industrial chemicals.

Accidental hazardous waste/materials spills can be reported immediately following the spill, thus reducing the amount of time the spill is left uncontained. Most hazardous waste/materials spills occur with little or no warning, and can be difficult, if not impossible, to detect until symptoms present themselves to those affected. External releases may create airborne plumes of chemical, biological, or radiological elements that can affect a wide area and last for hours or days. Internal releases would most likely require evacuation of a facility for hours to days. Both external and internal releases would require extensive clean-up efforts, which could last days to months depending on the type and magnitude of the spill.

### 3) *Previous Occurrences*

There have been no notable facility hazardous materials release incidents in Columbia County. However, with major corridors that transverse the county, there are periodic transportation accidents with vehicles carrying hazardous materials that cause HazMat related incidents.

### 4) *Probability of Future Events*

The threat of future incidents involving hazardous materials is ever increasing, not only from Columbia County's growth and increasing demand for hazardous products, but also from homeland security threats. The County also is a major transportation route whereby hazardous materials are constantly traveling through the community in the immediate proximity of citizens, homes, and local businesses. Transportation of hazardous materials via highways, airports, railways, waterways, or pipelines requires citizens to live within vulnerable areas of hazardous materials. Another transportation hazard involves lithium

car batteries that pose fire and explosion hazards due to the risk of thermal runaway, which can produce intense, hard-to-extinguish fires and toxic gas emissions. They also carry risks of electric shock and environmental contamination from damaged cells. Even after a crash or fire is controlled, batteries may reignite hours or days later, requiring special handling and monitoring. The probability and risk of a small hazardous material event is highly likely, especially related to transportation as these occur on a regular basis. The risk of a significant hazardous materials incident remains low due to stringent industry regulation and scrutiny of such facilities and transport.

#### *5) Vulnerability and Risk Assessment*

Columbia County is at risk from a variety of hazardous materials incidents. These incidents can occur at either fixed facilities in the County or from the transportation of hazardous material through the County. As a result of the risk of moving hazardous materials, there are more transportation accidents involving hazardous materials in Columbia County than those that occur at fixed facilities. These transportation accidents can occur on roadways, railways, waterways, air and pipelines.

Areas with multiple chemical facilities experience a greater risk of a chemical incident than other locations. Propane installations are located across the state and their presence increases the risk of an incident. Hazardous material shipments move through the county annually; these shipments can occur at any time, day or night, and by means of road, rail, air and water, and often through areas with urbanized, high traffic volume routes. Hazardous waste/materials spills may be accidental or intentional and may occur at fixed facilities or during transportation. Hazardous materials are widely used in public and private facilities and farms. Numerous facilities in Columbia County store, use, dispose, or have the capacity and infrastructure to handle hazardous materials on a regular basis; under Title III of the Emergency Planning and Community Right to Know Act, facilities that meet certain requirements must report to federal, state, and local authorities. These facilities are commonly referred to as “Tier I” or “Tier II” facilities. The North Central Florida LEPC handles Tier Two reporting and conducts Site visits for the county.

To assist in planning for potential hazardous materials incidents, the County works with the North Central Florida LEPC in utilizing CAMEO FM, a system of software applications used widely to plan for and respond to chemical emergencies. The CAMEO program identifies each facility and creates a worst-case scenario vulnerable zone (VZ) around that facility to help in the planning process to understand all the areas that could potentially be impacted by a chemical release or accident. In an effort to define the hazard areas for our extremely hazardous materials (classified as “302” hazards), it uses the output of “worst-case scenarios” from the CAMEO FM Program. When identifying the worst-case vulnerability zones for all the “302” facilities in the County, all of the heavily populated areas are at risk from at least one of the “302” facilities.

There are approximately 53 Tier II facilities located in Columbia County, 9 of which are Extremely Hazardous Substance facilities. Transportation risks associated with hazardous materials will be discussed individually below:

### Roadways

Interstate 75 is one of the country's most significant interstate corridors connecting businesses in Columbia County to markets along the Gulf Coast and as far north as Canada. Interstate 10, which extends coast to coast, intersects with I-75 and runs through the middle of the county. Federal highways U.S. 41, 47, 90 and 441 extend out in all directions from Lake City and connect with I-75 and I-10 in several places.

### Railways

Florida Gulf & Atlantic Railroad, which is owned by Pinsky Railroad Company operates the rail line along U.S. Highway 90 through Columbia County. This line provides a direct connection to JAXPORT, the deep water port in Jacksonville, Florida.

### Pipelines

Columbia County contains 3 high-pressure natural gas distribution lines<sup>58</sup>. One pipeline runs across north-central Columbia County, extending from the eastern county border to the western county border. Another pipeline runs south from Lake City, then extends east to west across southern Columbia County. Substantial fire and explosions could occur due to accidental damage to lines by unauthorized excavation.

Though accidents can and do happen, most of the pipelines are underground and away from potential environmental and human impacts. The risk of such accidents remains relatively low for all of our jurisdictions.

### Airports/Aircraft

Lake City Gateway Airport (LCQ) is located within the County. It has two asphalt paved runways: 10/28 is 8,003 by 150 feet (2,439 x 46 m) and 5/23 is 4,000 by 75 feet (1,219 x 23 m). The airport supports MRO facilities, such as the Aero Corporation starting in 1961, which was acquired by TIMCO Aviation Services in late 1990s and was acquired in February 2014 by HAECO. HAECO modifies and repairs large aircraft, such as commercial Boeing 727, Boeing 737 and various Airbus airliners, as well as military C-130 Hercules and P-3 Orion aircraft for US military and US civilian operators, as well as overseas military and civilian customers. The United States Department of Agriculture operates an Air Tanker Base at LCQ that supports the suppression of wildfires in the southeast regions of the United States. Additionally, Med Trans is based at LCQ and operates a helicopter air ambulance service for the North Central Florida area.

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<sup>58</sup> <https://pvnpm.phmsa.dot.gov/PublicViewer/>

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m) Civil Disorder/Disturbance

1) *Description*

Civil disorder is typically the result of groups or individuals within the population feeling, rightly or wrongly, that their needs or rights are not being met, either by society at large, a segment thereof, or the current overriding political system. When this results in community disruption where intervention is required to maintain public safety it becomes a civil disturbance. Civil disturbances can also occur in reaction to political movements or special events that attract large crowds, or as a result of an unemployment or economic crisis. When groups or individuals disrupt the community to the point where intervention is required to maintain public safety, the event has become a civil disturbance.

2) *Location and Extent*

Civil disturbance can occur anywhere but tend to occur most often in urban areas and spans a wide variety of actions which include, but is not limited to labor unrest, strikes, civil disobedience, demonstrations, riots, prison riots, or rebellion leading to revolution. Triggers could include racial tension, religious conflict, unemployment, a decrease in normally accepted services or goods, such as extreme water, food, gasoline rationing, or unpopular political actions. The most common type of civil disturbance is riots. Riots can cause extensive social disruption, loss of jobs, death, and property damage. The loss and damages may result from those involved in the action or initiated by authorities in response to the perception of a potential threat.

3) *Previous Occurrences*

Historically, Columbia and its jurisdictions have been fortunate not to have experienced any notable civil disturbances in the past.

4) *Probability of Future Events*

The probability of civil disturbances occurring in Columbia County is considered low.

5) *Vulnerability and Risk Assessment*

It is impossible to conduct a vulnerability analysis and loss estimation by jurisdiction for Civil Disturbances. While peaceful protests or demonstrations occur frequently, it is difficult to determine when a protest will become a civil disturbance or riot, by disrupting daily operations or by becoming violent. Based on the historical occurrences, the large, urban areas of the state are more likely to be affected by Civil Disturbances than the small rural areas. The committee determined that the county and its jurisdictions have a low to moderate impact severity.



n) Cyberattack/Cyberterrorism1) *Description*

For the purposes of this document, a cyberattack is defined as a malicious computer-to-computer attack through cyberspace that undermines the confidentiality, integrity, or availability of a computer (or network), data on that computer, or processes and systems controlled by that computer. National Security Presidential Directive 54/Homeland Security Presidential Directive 23 (NSPD-54/HSPD-23) defines cyberspace as the interdependent network of information technology infrastructures, and includes the Internet, telecommunications networks, computer systems, and embedded processors and controllers in critical industries.

Threats to cyber space are regarded as one of the most serious economic and national security challenges in this day in age for the United States. As the Director of National Intelligence (DNI) recently testified before Congress, “the growing connectivity between information systems, the Internet, and other infrastructures creates opportunities for attackers to disrupt telecommunications, electrical power, energy pipelines, refineries, financial networks, and other critical infrastructures.”<sup>59</sup>

The duration of a cyberattack is dependent on the complexity of the attack, how widespread it is, how quickly the attack is detected, and the resources available to aid in restoring the system. One of the difficulties of malicious cyber activity is that it could come from virtually anyone, virtually anywhere. The following tables summarize the common types and sources of cyberthreats.<sup>60</sup>

**Table 15: Common Types of Cyber Attacks**

| Type of Attack                       | Description                                                                                                                                                                                                                                                               |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Botnet</i>                        | A collection of compromised machines (bots) under (unified) control of an attacker (botmaster).                                                                                                                                                                           |
| <i>Denial of service</i>             | A method of attack from a single source that denies system access to legitimate users by overwhelming the target computer with messages and blocking legitimate traffic. It can prevent a system from being able to exchange data with other systems or use the Internet. |
| <i>Distributed denial of service</i> | A variant of the denial of service attack that uses a coordinated attack from a distributed system of computers rather than from a single source. It often makes use of worms to spread to multiple computers that can then attack the target.                            |
| <i>Exploit tools</i>                 | Publicly available and sophisticated tools that intruders of various skill levels can use to determine vulnerabilities and gain entry into targeted systems.                                                                                                              |
| <i>Logic bombs</i>                   | A form of sabotage in which a programmer inserts code that causes the program to perform a destructive action when some triggering event occurs, such as terminating the programmer's employment.                                                                         |

<sup>59</sup> Director of National Intelligence, Annual Threat Assessment of the Intelligence Community for the Senate Armed Services Committee, Statement for the Record, March 10, 2009, at 39.

<sup>60</sup> United States Government Accountability Office, “Critical Infrastructure Protection: Department of Homeland Security Faces Challenges in Fulfilling Cybersecurity Responsibilities”, Report #GAO-05-434 (May 2005), [www.gao.gov/new.items/d05434.pdf](http://www.gao.gov/new.items/d05434.pdf)

| Type of Attack      | Description                                                                                                                                                                                                                                                                                                                                                                                       |
|---------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Phishing</i>     | The creation and use of emails and websites designed to look like those of well-known legitimate businesses, financial institutions, and government agencies in order to deceive Internet users into disclosing their personal data, such as bank and financial account information and passwords. Phishers use or sell this information for criminal purposes, such as identity theft and fraud. |
| <i>Sniffer</i>      | Also known as packet sniffer. A program that intercepts routed data and examines each packet in search of specified information, such as passwords transmitted in clear text.                                                                                                                                                                                                                     |
| <i>Trojan horse</i> | A computer program that conceals harmful code. A Trojan horse usually masquerades as a useful program that a user would wish to execute.                                                                                                                                                                                                                                                          |
| <i>Virus</i>        | A program that infects computer files, usually executable programs, by inserting a copy of itself into the file. These copies are usually executed when the infected file is loaded into memory, allowing the virus to infect other files. Unlike the computer worm, a virus requires human involvement (usually unwitting) to propagate.                                                         |
| <i>War dialing</i>  | Simple programs that dial consecutive telephone numbers looking for modems.                                                                                                                                                                                                                                                                                                                       |
| <i>War driving</i>  | A method of gaining entry into wireless computer networks using a laptop, antennas, and a wireless network adaptor that involves patrolling locations to gain unauthorized access.                                                                                                                                                                                                                |
| <i>Worm</i>         | An independent computer program that reproduces by copying itself from one system to another across a network. Unlike computer viruses, worms do not require human involvement to propagate.                                                                                                                                                                                                      |

**Table 16: Common Sources of Cybersecurity Threats**

| <b>Threat</b>                        | <b>Description</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
|--------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <i>Bot-network operators</i>         | Bot-network operators are hackers; however, instead of breaking into systems for the challenge or bragging rights, they take over multiple systems in order to coordinate attacks and to distribute phishing schemes, spam, and malware attacks. The services of these networks are sometimes made available on underground markets (e.g., purchasing a denial-of-service attack, servers to relay spam or phishing attacks, etc.).                                                                                                                                                                                                                                                                                                |
| <i>Criminal groups</i>               | Criminal groups seek to attack systems for monetary gain; specifically, organized crime groups use spam, phishing, and spyware/malware to commit identity theft and online fraud. International corporate spies and organized crime organizations also pose a threat to the United States through their ability to conduct industrial espionage and large-scale monetary theft, and to hire or develop hacker talent.                                                                                                                                                                                                                                                                                                              |
| <i>Foreign intelligence services</i> | Foreign intelligence services use cyber tools as part of their information-gathering and espionage activities; in addition, several nations are aggressively working to develop information warfare doctrine, programs, and capabilities. Such capabilities enable a single entity to have a significant and serious impact by disrupting the supply, communications, and economic infrastructures that support military power—impacts that could affect the daily lives of U.S. citizens across the country.                                                                                                                                                                                                                      |
| <i>Hackers</i>                       | Hackers break into networks for the thrill of the challenge or for bragging rights in the hacker community. While remote hacking once required a fair amount of skill or computer knowledge, hackers can now download attack scripts and protocols from the Internet and launch them against victim sites. Thus, while attack tools have become more sophisticated, they have also become easier to use. According to the Central Intelligence Agency, the large majority of hackers do not have the requisite expertise to threaten difficult targets such as critical U.S. networks; nevertheless, the worldwide population of hackers poses a relatively high threat of an isolated or brief disruption causing serious damage. |
| <i>Insiders</i>                      | The disgruntled organization insider is a principal source of computer crime. Insiders may not need a great deal of knowledge about computer intrusions because their knowledge of a target system often allows them to gain unrestricted access to cause damage to the system or to steal system data. The insider threat also includes outsourcing vendors as well as employees who accidentally introduce malware into systems.                                                                                                                                                                                                                                                                                                 |
| <i>Phishers</i>                      | Individuals or small groups that execute phishing schemes in an attempt to steal identities or information for monetary gain. Phishers may also use spam and spyware/malware to accomplish their objectives.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
| <i>Spammers</i>                      | Individuals or organizations that distribute unsolicited email with hidden or false information in order to sell products, conduct phishing schemes, distribute spyware/malware, or attack organizations (e.g., denial of service).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |
| <i>Spyware/Malware authors</i>       | Individuals or organizations with malicious intent carry out attacks against users by producing and distributing spyware and malware. Several destructive computer viruses and worms have harmed files and hard drives, including the Melissa Macro Virus, the Explore.Zip worm, the CIH (Chernobyl) Virus, Nimda, Code Red, Slammer, and Blaster.                                                                                                                                                                                                                                                                                                                                                                                 |
| <i>Cyberterrorists</i>               | Cyberterrorists seek to destroy, incapacitate, or exploit critical infrastructures in order to threaten national security; cause mass casualties, weaken economies, or target businesses; and/or damage public morale and confidence. Cyberterrorists may use phishing schemes or spyware/malware in order to generate funds or gather sensitive information.                                                                                                                                                                                                                                                                                                                                                                      |

## 2) *Location and Extent*

As most day-to-day activities rely on the Internet in one aspect or another, any person or infrastructure is susceptible to cybersecurity threats. Energy pipelines, specifically U.S. natural gas pipelines, have been cited by DHS as targets of cyberattack. While information on these attacks is not publicly available knowledge, cyber security officials warn that, with sufficient access, a hacker could “manipulate pressure and other control system settings, potentially reaping explosions and other dangerous conditions.”<sup>61</sup> While cyber risks and threats are mainly thought of as not having specific locations, there are physical sites that would be impacted. Locations at risk could include government agencies, institutions of higher education, medical facilities, and various private sector entities.

## 3) *Previous Occurrences*

Low-level cyber-attacks occur daily and sometimes hourly on governmental systems. Most of these attacks do not breach the County systems, however, there have been cases of minor breaches.

The most notable cyber-attacks include:

- **Lake City Ransomware Attack (2019):** In June 2019, Lake City, a municipality within Columbia County, suffered a significant ransomware attack. The incident began on June 10 when the city's computer systems were infected with malware known as "Triple Threat," which combines multiple methods to infiltrate and encrypt data. As a result, numerous city services were disrupted, including email and online payment systems. After deliberation, the city authorized a payment of 42 bitcoins (approximately \$460,000 at the time) to the attackers to regain access to their data. Subsequently, the city's IT director was dismissed from his position.<sup>62</sup>
- **Columbia County School District Hack (2023):** In late 2023, the Columbia County School District experienced a cyber-attack that disrupted its internet services. The breach occurred over a weekend, leaving the district without internet access until the issue was resolved around midnight on the following Monday. Details regarding the nature of the attack and the extent of the impact were not fully disclosed.<sup>63</sup>

## 4) *Probability of Future Events*

Based on the growing sophistication and political climate, there is a high probability of future cyberattack events to occur within Columbia County.

## 5) *Vulnerability and Risk Assessment*

The public is heavily reliant on technology for daily life, including cell phones, handheld devices such as tablets, and computers. Any disruption to this technology caused by a cyberattack would impair the ability for the public to conduct basic activities, such as

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<sup>61</sup> Florida State Hazard Mitigation Plan, 2013

<sup>62</sup> [Lake City, Fla., Authorizes Nearly \\$500K Ransomware Payment](#)

<sup>63</sup> [School district system hacked | Lake City Reporter](#)

communications, mobile banking, and work. Property and facilities may become either uninhabitable or unusable as a result of a cyberattack, particularly if their infrastructure is reliant on technology for sustainability.

A significant majority of critical infrastructure systems are in some way tied to technology, oftentimes through virtual operations and supervisory control and data acquisition (SCADA) systems. Therefore, a cyberattack could disable the vast majority of systems which control these pieces of critical infrastructure, as well as traffic control, dispatch, utility, and response systems. Targeted cyberattacks can impact water or wastewater treatment facilities. The disruption of the virtual systems tied to this infrastructure could cause water pollution or contamination and subsequent environmental issues.

Cyberattacks can interfere with emergency response communication and activities. Given that many first responders rely on technology both at operations center and in the field, a cyberattack could impair the ability to communicate. For example, many agencies rely on technology to notify and route responders to the scene of the emergency. More specifically, 911 dispatch centers rely on technology which makes them vulnerable to cyber exploits. The committee determined that the county and its jurisdictions have a low to high (program operations) impact severity.

In response to such threats, Columbia County's insurance carrier recommended in early 2024 that the county engage Arctic Wolf, a cybersecurity firm, to monitor network activities and help prevent future attacks.

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o) Terrorism

1) *Description*

A terrorist incident could involve a wide variety of materials or actions, or combinations of materials and actions. These could range from uncomplicated incidents impacting relatively small areas, to highly complex incidents with very widespread physical or economic consequence. The response to such an incident would require specialized personnel and resources beyond the capabilities of Columbia County and its municipalities, and would require assistance from mutual aid organizations, adjacent counties, the State of Florida, and the Federal government.

2) *Location and Extent*

Columbia County has many facilities and systems that are considered to be critical infrastructure; whose continued and uninterrupted operation is necessary for the health, safety and well-being of the community. These facilities could be considered potential targets for a terrorist attack which could have potentially widespread consequences for adjacent neighborhoods or the community as a whole. With a military naval air station located in Columbia County, the County and its residents could be considered a potential target for acts of terrorism as has happened recently.

3) *Previous Occurrences*

Columbia County has experienced several incidents involving threats to schools, primarily in the form of social media posts and bomb threats. While these events have caused concern, they have not resulted in actual acts of terrorism.

- On April 18, 2022, Columbia High School received a bomb threat around 10:30 a.m. The Columbia County Sheriff's Office promptly evacuated students and staff, conducted a thorough search, and found no suspicious devices. The school was deemed safe, and normal operations resumed.
- In February 2025, a 16-year-old from Fort White was arrested for calling the Columbia County Sheriff's Office and threatening a school shooting in 2024. The individual faces at least 48 criminal charges related to using a communication device to make threats and is being referred to adult court.

4) *Probability of Future Events*

Historically, there have been few acts of terrorism committed in the State. However, with the heightened level of national terrorism events, and because of the number of facilities within the State associated with tourism, the military, government, cultural, academic, and transportation, the potential is considered to be high nationwide.

Based on previous occurrences the probability of a terrorist act to occur within Columbia County is considered low.

#### *5) Vulnerability and Risk Assessment*

The potential for terrorism exists within the US; however, the risk of international or homegrown violent extremists acting specifically within Columbia County is relatively low. This is due in part to its citizens the community's attributes, as well as, to the pro-activity of law enforcement and the response community, and the interagency cooperation and communication present within the county.

However, low risk does not translate into zero risk. Columbia County is comprised of the typical community and governmental infrastructure, facilities, military facilities, and special events venues that one may find in any established, medium-sized community around the country. And when you combine that with an attractive climate and beautiful beaches that draw large numbers of tourists and visitors to the community, there are those types of individuals whose discontent with government, or other views, if taken to the extreme, may take advantage of those community attributes for potential nefarious activities.

Even with some of the groups residing in our County, the risk for domestic violence and security issues remains low. The committee determined that the county and its jurisdictions have a moderate to high impact severity.

p) Prolonged Utility/Communications Failure

1) *Description*

A utility failure can result from a variety of related causes, including sagging lines due to hot weather, flashovers from transmission lines to nearby trees and incorrect relay settings. According to the electric utility industry's trade association, the potential for such disturbances is expected to increase with the profound changes now sweeping the electric utility industry.

A communication failure is defined as the severe interruption or loss of private and or public communications systems, including but not limited to transmission lines, broadcast, relay, switching and repeater stations as well as communications satellites, electrical generation capabilities, and associated hardware and software applications necessary to operate communications equipment. These disruptions may result from equipment failure, human acts (deliberate or accidental), or the results of natural or human made disasters.

2) *Location and Extent*

A prolonged utility failure can have the following potential impacts on Columbia County: electrical power outage, surface and air transportation disruption, potable water system loss of disruption, sewer system outage, telecommunication system outage, human and health safety, psychological hardship, economic disruption, and disruption of community services. All municipalities are at equal risk for prolonged power outages; however, some communities may be restored more quickly than others depending on other high priority locations with which they share a grid.

A prolonged communications failure would affect essential facilities and the day to day operations of local government as well as the business community. Sites of concern would range from dispatch agencies, satellite uplink and downlink sites, internet service provider sites, and the telecommunication industry switching sites. Interruptions in day to day communications would create problems for businesses, public agencies, citizens and emergency services.

3) *Previous Occurrences*

Utility failure/disruption occurs on a daily basis and is typically minor and services are restored quickly. Most of the prolonged utility failure/disruption is directly associated with other contributing hazards such as hurricanes, tornadoes, floods, technological failures etc.

4) *Probability of Future Events*

While the probability of future utility and communications failure incidents in the County is difficult to predict, the historic record indicates that significant disruptions or failures have occurred. Data is not readily available on the frequency of smaller outages across the county; however, it is reasonable to assume that utility and communications failure events of shorter duration will continue to occur in the future. The potential for another major utility or communications failure that disrupts services for Columbia County residents is always possible, yet are expected to occur less frequently than smaller incidents. In addition,



future changes in climate may also impact the frequency and probability of future utility or communication failure occurrences. Probability of severe prolonged utility and communications failure is considered moderate.

*5) Vulnerability and Risk Assessment*

Loss of electricity can lead to the inability to use electric-powered equipment, such as: lighting; heating, ventilation, and air conditioning (HVAC) and necessary equipment; communication equipment (telephones, computers, etc.); small appliances such as refrigerators and medical equipment. This all can lead to food/medical supply spoilage, loss of heating and cooling. Utility failure can also pose a threat to the general population of Columbia County regarding the loss of communications, gas, and water supply that are critical to ensure the health, safety, and general welfare of the population. The special needs population can be especially vulnerable to loss of heat or air conditioning during extreme weather conditions.

Considering all of these factors related to a prolonged utility failure/disruption the committee determined that the county and its jurisdictions have a low to high (program operations) impact severity.

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q) Mass Casualty

1) *Description*

A mass casualty incident (MCI) is any incident in which emergency medical services resources, such as personnel and equipment, are overwhelmed by the number and severity of casualties.

2) *Location and Extent*

A mass casualty incident can be caused by various incidents/factors. Largely these are associated with the following examples: terrorism; large gatherings/special events; biological; and transportation.

Any location in Columbia County is at risk of experiencing a mass casualty event. Areas or events that are densely populated within County that could potentially be more likely targets for a mass casualty event, especially one caused by terrorism.

3) *Previous Occurrences*

Historically, Columbia and its jurisdictions have been fortunate not to have experienced any notable mass casualty incidents in the past.

4) *Probability of Future Events*

Based on the proximity to major transportation routes, the committee determined the probability of occurrence to be high within Columbia County.

5) *Vulnerability and Risk Assessment*

As previously mentioned, any location in Columbia County is at risk of experiencing a mass casualty event, especially those that are more densely populated. Additionally, any areas surrounding a mass casualty event will be in danger of additional injuries and fatalities depending on the type of incident. A mass casualty event can be particularly chaotic for first responders who can become quickly overwhelmed by responding simultaneously to the crisis and consequences of an attack. In the event of a terrorist attack, response could become inhibited due to debris on the road, traffic, or airborne disease/chemicals. Access must be coordinated in order to perform effective rescue efforts. First responders may also be targeted in the event of secondary attacks. The committee determined that the county and its jurisdictions have a low to high (human) impact severity.

**F. Changes in Risk and Vulnerability**

Over the past 5 to 10 years, Columbia County has experienced a measurable increase in the probability, vulnerability, and overall risk associated with natural hazards. The frequency and severity of hurricanes, tropical storms, and severe weather events have intensified, with multiple significant impacts occurring between 2022 and 2024. At the same time, continued population growth and development, especially into hazard-prone areas such as floodplains and the wildland-urban interface have increased exposure to flooding, wildfire, and wind damage. The newly adopted Hazard and Vulnerability Assessment (HVA) scale, implemented in this LMS update, provides a more systematic and data-driven approach to evaluating these risks, helping

to identify emerging trends and shifts in community vulnerability over time. In addition to natural threats, the County also faces growing risk from human-caused and technological hazards. The probability and severity of cyberattacks, utility disruptions, and critical infrastructure failures have increased in recent years, as reliance on digital systems, SCADA networks, and interdependent infrastructure grows. These threats present cascading impacts that can disrupt essential services and public safety operations. As a result, the county's cumulative risk profile continues to escalate, highlighting the need for proactive, multi-hazard mitigation strategies and improved resilience planning across all sectors.

### III. MITIGATION GOALS AND OBJECTIVES:

The Columbia County Local Mitigation Strategy outlines the goals and objectives that will lead mitigation efforts in each participating jurisdiction over the next 5 years. The implementation plan to accomplish these initiatives is offered below.

The following procedures in updating the Columbia County Mitigation Strategy include:

- Re-evaluate and approve mitigation goals and objectives
- Review and examine the existing mitigation projects/initiatives and/or action items
- Identify new mitigation projects/initiatives and/or action items
- Prioritize all mitigation projects/initiatives and/or action items
- Determine all appropriate funding sources

Each of these components ensures that the County has an established mitigation strategy that helps reduce its vulnerability.

#### A. Goals and Objectives

Columbia County's LMS Mitigation Goals and Objectives are intended to reduce or avoid the long-term vulnerability to the effects of the profiled hazards addressed in the risk assessment section.

The mitigation goals are comprehensive long-term policy and vision statements that explain what is to be achieved during implementation of the mitigation strategy.

In the planning process the Working Group establishes goals for the entire planning area and all of the participating jurisdictions. The current goals and objectives were reviewed and carefully evaluated and it was determined that they needed revisions and updates based on the following criteria:

- They reflect the updated risk assessment.
- They were analyzed and re-evaluated which lead to the current mitigation projects that will reduce the vulnerability for each jurisdiction.
- They support the changes made in the mitigation priority list.
- They provided the direction needed to reflect the current State of Florida goals for mitigating hazards within the counties.

The mitigation goals for 2025 address the vulnerability of Columbia County's citizens, critical facilities, buildings, and infrastructure. Improving public awareness of hazard risk and mitigation and ensuring that the entire community has the knowledge on how to prepare for, and respond to, all hazard events is essential to building a more resilient and informed population. These efforts help reduce loss of life and property, enhance community readiness, and empower individuals to take proactive steps before, during, and after disasters.

**Table 17: Mitigation Goals and Objectives**

| <b>GOAL</b> | <b>OBJECTIVE</b> | <b>DESCRIPTION</b>                                                                                                                                                                               |
|-------------|------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>1.</b>   |                  | <b>Protect human health, safety, and welfare against all hazards</b>                                                                                                                             |
|             | <i>a.</i>        | <i>Protect all vulnerable populations.</i>                                                                                                                                                       |
|             | <i>b.</i>        | <i>Ensure the protection of critical facilities.</i>                                                                                                                                             |
|             | <i>c.</i>        | <i>Maintain a sufficient number of emergency shelters.</i>                                                                                                                                       |
|             | <i>d.</i>        | <i>Continue on-going education and outreach programs for the County citizens on all natural hazard events to include: safety, prevention, preparedness, mitigation, recovery, and insurance.</i> |
|             | <i>e.</i>        | <i>Promote early warning systems to promote the safety of citizens through communication regarding all hazard events.</i>                                                                        |
|             | <i>f.</i>        | <i>Work to provide continued training for government officials (through FEMA, ASFPM, etc.).</i>                                                                                                  |
| <b>2.</b>   |                  | <b>Protect public and private property</b>                                                                                                                                                       |
|             | <i>a.</i>        | <i>Utilize every opportunity to mitigate vulnerable structures.</i>                                                                                                                              |
|             | <i>b.</i>        | <i>Ensure public facilities and buildings are hardened to withstand all hazards.</i>                                                                                                             |
|             | <i>c.</i>        | <i>Evaluate current conditions of public building and facilities to withstand all hazards.</i>                                                                                                   |
|             | <i>d.</i>        | <i>Continue to enforce current building codes.</i>                                                                                                                                               |
|             | <i>e.</i>        | <i>Maintain infrastructure at the City Municipal Airport.</i>                                                                                                                                    |
|             | <i>f.</i>        | <i>Promote post-disaster mitigation as part of the recovery process.</i>                                                                                                                         |
| <b>3.</b>   |                  | <b>Minimize loss of public utilities</b>                                                                                                                                                         |
|             | <i>a.</i>        | <i>Update and maintain current zoning regulations to minimize damage and utility service disruption.</i>                                                                                         |
|             | <i>b.</i>        | <i>Continually work with utility companies to maintain utility services while minimizing down time.</i>                                                                                          |
|             | <i>c.</i>        | <i>Maintain the level of utility service to the public in incorporated and unincorporated areas.</i>                                                                                             |

| GOAL      | OBJECTIVE                                                   | DESCRIPTION                                                                                                                                                                      |
|-----------|-------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>4.</b> | <b>Minimize the effects of flooding in Columbia County</b>  |                                                                                                                                                                                  |
|           | <i>a.</i>                                                   | <i>Promote better floodplain management and risk awareness of flooding events.</i>                                                                                               |
|           | <i>b.</i>                                                   | <i>Continue to evaluate and identify all flood areas throughout incorporated and unincorporated areas.</i>                                                                       |
|           | <i>c.</i>                                                   | <i>Maintain and update flood data and Flood Insurance Rate Maps (FIRM).</i>                                                                                                      |
|           | <i>d.</i>                                                   | <i>Ensure infrastructure can withstand and function effectively during flooding events.</i>                                                                                      |
|           | <i>e.</i>                                                   | <i>Continue to enforce zoning regulations and flood ordinances with annual reviews and updates, if necessary.</i>                                                                |
|           | <i>f.</i>                                                   | <i>Continue on-going education programs for the County citizens on flooding events.</i>                                                                                          |
|           | <i>g.</i>                                                   | <i>Acquisition and/or retrofit repetitive loss (RL) properties.</i>                                                                                                              |
|           | <i>h.</i>                                                   | <i>Perform additional flood studies in Zone A and AE areas to establish Base Flood Elevations (BFE).</i>                                                                         |
|           | <i>i.</i>                                                   | <i>Work to increase inspection of existing properties in AE flood zones for compliance with flood ordinance.</i>                                                                 |
| <b>5.</b> | <b>Minimize the effects of wildfires in Columbia County</b> |                                                                                                                                                                                  |
|           | <i>a.</i>                                                   | <i>Support the Florida Forest Service with fuel reduction activities in the Wildland-Urban Interface.</i>                                                                        |
|           | <i>b.</i>                                                   | <i>Continue support on the Florida Forest Service programs in educating homeowners about wildfires and the need for vegetation management programs, such as prescribed fire.</i> |
|           | <i>c.</i>                                                   | <i>Coordinate with the Florida Forest Service to develop and retrofit strategies incorporating Firewise construction and landscaping techniques.</i>                             |

The LMS Board will be responsible for the implementation of all identified tasks and the annual update of the goals, objectives, and tasks through the LMS. Each year, the LMS will review the current goals and objectives and update them with new or modified goals and objectives including the identification of specific tasks with timelines for completion.

#### IV. MITIGATION PROGRAMS

The County and all of its municipalities participate in several mitigation programs and utilize mitigation grant programs in an effort to minimize the impacts to our community from natural disasters. The County participates in the following mitigation programs:

##### **A. National Florida Insurance Program (NFIP) and Community Rating System (CRS)**

Flood insurance is designed to provide an alternative to disaster assistance to reduce the escalating costs of repairing damage to buildings and their contents caused by floods. In addition to providing flood insurance and reducing flood damages through floodplain management regulations, the NFIP identifies and maps the Nation's floodplains. Mapping flood hazards creates broad-based awareness of the flood hazards and provides the data needed for floodplain management programs and to actuarially rate new construction for flood insurance. Flood insurance policy information is listed on the next page.

The Columbia County Office of Emergency Management Department and the LMS Strategy Committee will continue to promote and educate the community about the benefits of this program and its implications on reducing flood hazards throughout the community. Jurisdictions within Columbia County are continuing to conduct a variety of activities associated with the NFIP. Activities include, but are not limited to:

- Collecting flood elevation certificates
- Eliminating repetitive flood loss properties
- Informing residents of map changes
- Adopting new maps

As the jurisdictions of Columbia County adopt the Local Mitigation Strategy, the list of actions related to the NFIP within individual jurisdictions will continue to be refined and updated to reflect the most comprehensive list of possible activities within the LMS relating to the NFIP and CRS.

The Community Rating System (CRS) is a voluntary program for NFIP-participating. The goals of the CRS are to reduce flood losses, facilitate accurate insurance rating, and to promote the awareness of flood insurance. The CRS has been developed to provide incentives in the way of premium discounts for communities to go beyond the minimum floodplain management requirements to develop extra measures to provide protection from flooding. At this update, Columbia County (Class 8) is participating in the CRS as of October 1, 2024. The City of Lake City and the Town of Ft. White are not currently participating in the program.

The County is continuously working toward improving its CRS ranking. More detailed information about the CRS program can be found at <https://www.fema.gov/national-flood-insurance-program-community-rating-system>.

The following table illustrates the number of NFIP policies “in force” for the County and its jurisdictions as of February 28, 2025<sup>64</sup>.

<sup>64</sup> | [Flood Insurance Data and Analytics](#)

**Table 18: NFIP Claim Information for Columbia County (2/28/2025)<sup>65</sup>**

| COMMUNITY                                 | NFIP<br>COMMUNITY # | POLICIES<br>"IN FORCE" | INSURANCE<br>"IN FORCE" (\$) | WRITTEN PREMIUMS<br>"IN FORCE" (\$) |
|-------------------------------------------|---------------------|------------------------|------------------------------|-------------------------------------|
| <b>UNINCORPORATED<br/>COLUMBIA COUNTY</b> | 120070              | 647                    | \$152,194,000                | \$499,411                           |
| CITY OF LAKE CITY                         | 120406              | 57                     | \$20,737,000                 | \$47,307                            |
| TOWN OF FT. WHITE                         | 120349              | 1                      | \$350,000                    | \$857                               |

**B. Compliance with NFIP**

All jurisdictions within the County participate with NFIP.

**Table 19: Columbia County Participation in the NFIP**

| CID #          | COMMUNITY<br>NAME    | COUNTY             | INIT FHBM<br>IDENTIFIED | INIT FIRM<br>IDENTIFIED | CURR EFF<br>MAP<br>DATE | REG<br>EMER<br>DATE | TRIBAL |
|----------------|----------------------|--------------------|-------------------------|-------------------------|-------------------------|---------------------|--------|
| <b>120070B</b> | Columbia<br>County   | Columbia<br>County | 1/20/78                 | 1/6/88                  | 11/2/18                 | 1/6/88              | NO     |
| <b>120406B</b> | City of Lake<br>City | Columbia<br>County | 10/29/76                | 1/6/88                  | 11/2/18                 | 1/6/88              | NO     |
| <b>120349#</b> | TOWN OF<br>FT. WHITE | COLUMBIA<br>COUNTY |                         | 2/4/09                  | (NSFHA)<br>*            | 9/30/13             | NO     |

**a) Columbia County NFIP Overview**

As of 2/28/2025, see table 18 there are currently 705 flood insurance policies in force. Current flood maps were updated and adopted February 4, 2009 and selected areas were revised with an effective date on November 2, 2018. The detailed floodplain studies were performed in the Flood Insurance Study (FIS) by FEMA and SRWMD on Rose Creek, Cannon Creek, and Montgomery Outlet Stream, Santa Fe River and the Suwannee River to create profiles prior to our last map revision. These profiles can be found in FIS #12023CV000B dated November 2, 2018. Prior to that date Columbia County was using flood maps from February 4, 2009.

Columbia County's current floodplain ordinance was adopted on December 30, 2008 and can be found in Article 8, Floodplain Management of the Land Development Regulations. The ordinance was adopted to meet 44 Code of Federal Regulations Section 60.3(b) of the NFIP. The Columbia County Planner serves as the designated Floodplain Administrator (Article 8, Section 8.3.3) and is also currently the CRS Coordinator.

Continued adherence to requirements set forth in Article 8 of Columbia County Land Development Regulations, Flood Prevention Damage Regulations. The Conservation Element of Columbia County Comprehensive Plan contains many objectives and policies that

<sup>65</sup> <https://nfipservices.floodsmart.gov/reports-flood-insurance-data>



support floodplain management provisions. Policy V.2.3 requires the county to identify and purchase environmentally sensitive lands. Policy V.2.4 establishes the 35 ft. buffer around all wetlands. Policy V.2.6 requires the County's land development regulations to require all new development to maintain the natural functions of environmentally sensitive areas. Policy V.2.7 requires the county to provide for the regulation of development within 100-yr. floodplains, regulating freeboard requirements and density. Policy V.2.14 and V.2.15 establish 50 or 75 feet buffers from rivers, streams, creeks, etc. Policy V.3.2 requires all proposed subdivision plats be submitted to the SRWMD for review and comment.

The Columbia County Building Department currently requires all permit applications to be reviewed by the building official to ensure compliance with the Florida Building Code and to be reviewed by the zoning department to determine zoning and flood zone determinations. Both departments must approve all permit applications submitted before a permit can be issued. Any information dealing with flood zone Base Flood Elevation (BFE), Flood Insurance Rate Map (FIRM) panel # and date are shown on the permit as well as any other requirements such as finished floor elevation certificate.

Columbia County Emergency Management works closely with the Building and Zoning Department to map areas that are prone to frequent floods and track repetitive loss properties. After a disaster all damaged structures are inspected and the damage documented, repetitive loss properties are purchased utilizing grant money when funds are available.

The county library maintains a wealth of information for public access on education regarding flood issues to include retrofitting, safety, insurance, maps, historical data, and many other sources of information.

Columbia County Emergency Management monitors maps that are prone to frequent floods and track all repetitive loss properties. The County will continue to participate in the NFIP and follow actions that have been identified, analyzed, and prioritized as necessary steps to remain in compliance with the program. The County will continue to:

- Enforce the most current Florida Building Code, Land Development Regulations, Comprehensive Plan and all Codes of Ordinances;
- Provide outreach efforts to the public with extra emphasis to those properties lying in the repetitive flood areas;
- Furnish up-to-date FIRM information to all that seek information;
- Update the county website with information that will benefit the public and educate the builders, surveyors, and engineers that we work with;
- Monitor all elevation certificates and maintain records and copies for anyone to review;
- Assist local insurance agents with obtaining correct FIRM's and flood insurance rates;
- Participate in all hazard mitigation efforts to include working with Columbia County Emergency Management to maintain and monitor hazard data for future planning;
- Obtain grants to purchase repetitive loss properties;

- Submit all information to FEMA necessary to keep current FIRM's as accurate as possible;
- Participate whenever possible in any future flood studies; and
- Keep all necessary staff trained.

The Building and Zoning Department has reviewed the FEMA 85, Protecting Manufactured Homes from Floods and Other Hazards: The Building and Zoning Department will continue to evaluate if flood policies need to be updated to comply with the publication. If changes are made, the department will then begin the process of educating the local mobile home installers. The department has also reviewed 24 CFR Part 3286 Manufactured Home Installation Program that was published June 20, 2008. This publication from HUD sets prerequisites for installation licenses. We will coordinate this effort with the State of Florida Department of Business and Professional Regulation to determine what changes will be required.

To improve our level of participation, possible changes for the future may include expanding the Environmentally Sensitive Areas (ESA) zoning and land use classification to include properties that are in all A zones. Increase the freeboard requirement for development in Special Flood Hazard Area (SFHA)'s, prohibit development in any floodways, increase inspection efforts for non-compliance of existing properties in AE floodway areas, participate in new flood studies as funds permit, and obtain additional funding to acquire more repetitive loss properties. Columbia County will examine all CRS activities every 5 years during our CRS visit to determine if it is feasible to augment an existing activity or add additional activities.

b) City of Lake City NFIP

As noted in Table 19, the City of Lake City has been participating in the NFIP since January 6, 1988 with Community Identification Number: 120406B. As of 2/28/2025, the City has issued 57 flood insurance policies with repetitive loss properties located within the Lake City area.

The flood maps adopted on February 4, 2009 are reflected in City Ordinance #2009-1175. The Ordinance makes findings to reflect current State and Federal requirements specifically those promulgated in part 44, CFR. In addition, there are program administrative components found in Subdivision Regulations Article 5 and Planned Residential Developments (PRD) section.

The City of Lake City, Florida adopted and maintains a Comprehensive Plan which establishes Goals, Objectives, and Policies which establishes needs of the City to:

- Enhance quality of life by directing development to areas, which have levels of service to accommodate growth in environmentally acceptable standards;
- Provide for traffic circulation; and
- Supports safe, decent, and sanitary housing in suitable environments.

The City integrates flood plain management into the Comprehensive Plan throughout the following sections:

- Future Land Use (Policy I.4.1; Policy I.6.4; Objective I.10)
- Conservation Element (V.2.6; V.2.7; V.2.8; V.4.5)

- Capital Improvements Element (VIII.4.7)

Although the City does not participate in the CRS, they have adopted and implemented standards above and beyond the NFIP standards in an effort to further reduce or eliminate damage from flooding. Ord. 2009-1175, Sec. 50-67 requires 2' to bottom of floor joist where elevations for —All zones are not specified. Section 50-67 (4) (a) requires mobile homes outside of mobile home parks be elevated no lower than 2' above base flood elevation.

The City is ensuring the provisions of public drainage facilities for Future Developments by:

- Standards to ensure post run-off rates do not exceed re-development rates;
- Provide guidance to developers of storm design requirements;
- Maintain standards as adopted by Florida Department of Environmental Protection and Rules of the SRWMD;
- Ensure provisions for safe and reliable potable water system and Fire Hazard reduction capabilities;
- Provide for conservation element that establishes policies, which conserve wetlands by use of alternative clustering development and the setting of density performance standards;
- Requiring the City to participate in the NFIP;
- Establish 35' buffers around wetlands;
- Where appropriate, City shall purchase environmentally sensitive lands (Policy V.2.3); and
- Establishes an Intergovernmental Coordination Element.

The City's Land Development Administrator is designated as the Floodplain Administrator. In addition to information available within the public library the City's Growth Management Department maintains information and guides to development in SFHA's.

The City of Lake City will continue to participate in the NFIP. The following actions have been identified, analyzed, and prioritized as necessary steps to remain in compliance with the program. The City will continue to:

- Emphasize the establishment of on-going drainage maintenance programs to support timely maintenance and repairs of ditches and culverts to minimize effects of flood events;
- Maintain and promote training for Planners/Plan Reviewers for certification as Floodplain Managers;
- Prioritize overlay maps of SFHA's to identify additional flood prone areas not identified on adopted FIRM's;
- Identify flood prone areas not on FIRM's and apply for assistance grants to include areas on maps (located in the northeast section of city);
- Provide information to assist homeowner and developer guidance and measures to reduce damage related to the hazards identified in the LMS; and
- Apply through grant process measures to improve or construct shelters in the event of future hazards.

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c) Town of Ft. White

As stated in Table 5.2, the Town of Ft. White has been participating in the NFIP since February 4, 2009 with Community Identification Number: 120349#. As of September 30, 2018, the Town has issued 3 flood insurance policies.

The Town does not have a designated Floodplain Administrator, thus Columbia County performs the Floodplain Administrator (FPA) duties.

The town integrates flood plain management into the Land Development Code throughout the following sections:

- Floodplain Management – Sections 5.05; 5.05.02 and 5.05.03

Although the Town of Ft. White does have a Land Development Code and addresses Floodplain Management, the Town doesn't have any government services. The Town will continue to comply with the NFIP requirements under the County's NFIP compliance with the following actions that have been identified, analyzed, and prioritized as necessary steps to remain in compliance with the program. The County will continue to:

- Enforce the most current Florida Building Code, Land Development Regulations, Comprehensive Plan and all Codes of Ordinances;
- Provide outreach efforts to the public with extra emphasis to those properties lying in the repetitive flood areas;
- Furnish up-to-date FIRM information to all that seek information;
- Update the county website with information that will benefit the public and educate the builders, surveyors, and engineers that we work with;
- Monitor all elevation certificates and maintain records and copies for anyone to review;
- Assist local insurance agents with obtaining correct FIRM's and flood insurance rates;
- Participate in all hazard mitigation efforts to include working with Columbia County Emergency Management to maintain and monitor hazard data for future planning;
- Obtain grants to purchase repetitive loss properties;
- Submit all information to FEMA necessary to keep current FIRM's as accurate as possible;
- Participate whenever possible in any future flood studies; and
- Keep all necessary staff trained.

d) Substantial Improvement/Substantial Damage:

- Post-Disaster Inspections & Damage Documentation:
  - After a disaster, Columbia County Emergency Management works with the damage assessment team, the Property Appraiser's Office and Building and Zoning Department, to inspect damaged structures and document the extent of damages, including repetitive loss properties.

- These inspections determine whether damage meets or exceeds the 50% threshold of market value, which would classify the structure as substantially damaged under NFIP rules.
- Floodplain Administrator Review and Permitting:
  - The Floodplain Administrator designated official in each jurisdiction is responsible for enforcing LDRs.
  - Any property undergoing substantial improvement or found to be substantially damaged must comply with elevation and construction standards in Special Flood Hazard Areas (SFHAs).
  - This includes requiring:
    - Elevation Certificates
    - Finished floor elevation compliance
    - Compliance with freeboard requirements
    - Ensuring adherence to Flood Insurance Rate Map (FIRM) and Base Flood Elevation (BFE) data
- Permitting Review and Approval:
  - Both the Building Official and Zoning Department must approve permits before construction or repair begins.
  - If improvements or repairs qualify as “substantial,” the structures must be brought into full compliance with current floodplain management regulations (e.g., elevating the structure above BFE, floodproofing, etc.).
- Enforcement and Compliance:
  - Non-compliant structures may face additional inspection or enforcement actions.
  - The County continues efforts to monitor non-compliance, especially within AE floodway areas, and may increase inspection efforts as part of its CRS improvement plan.

### **C. The Flood Mitigation Grant Program (FMA)**

The Flood Mitigation Assistance (FMA) Grant Program was created as part of the National Flood Insurance Reform Act (NFIRA) of 1994 to reduce or eliminate claims under the National Flood Insurance Program (NFIP). The FMA Grant program was updated in FY 2013 by the Flood Insurance Reform Act of 2012 (Public Law 112-114).

Under the FMA program, FEMA provides assistance to states and communities for activities that will reduce the risk of flood damage to structures insurable under the National Flood Insurance Program (NFIP). FMA is a state-administered, cost-share program through which states and communities can receive grants for flood mitigation planning, technical assistance, and mitigation projects. FMA project and planning target allocation is based on the national percentage of NFIP policies present within the jurisdiction. An applicant may apply for funding up to or exceeding its target allocation. Historically, there is typically about \$2 million that becomes available for the State of Florida to distribute to cost effective projects that elevate, flood proof, or even acquire residential or commercial properties that meet the minimum Federal criteria.

The following entities are eligible to apply for FMA funding assistance: state-level agencies including state institutions (e.g. state hospital or university); federally-recognized Indian tribal governments; local governments, including state-recognized Indian tribes, authorized Indian tribal organizations; public colleges and universities; and Indian tribal colleges and universities. Private Non-Profit (PNP) organizations and private colleges and universities are not eligible to apply for an FMA grant. However, an eligible, relevant state agency or local government may apply on behalf of the private entity.

Columbia County has mitigated several properties throughout the county and continues to solicit more opportunities in the program. More specific information about eligibility and the program specifics can be found at <https://www.fema.gov/flood-mitigation-assistance-grant-program>.

a) Repetitive Loss Properties

Each CRS community typically receives a copy of the repetitive loss property list in September of each year. Upon receipt the community begins reviewing the list to determine:

- 1) Is the property located in the community, and,
- 2) Has the property been mitigated. The community, as needed, provides correction and updates.

The actual database of repetitive loss properties will not be provided in this LMS plan because of the specific address and personal information that is associated with the information. However, specific requests for information may be requested from any of the appropriate jurisdictions directly, or through the NFIP at FEMA. As of the 2025 LMS update, Columbia County has identified 27 repetitive loss properties, with no documented locations within the participating municipalities

Each jurisdiction in Columbia County is making a variety of efforts in relieving the burden of the repetitive loss properties from the NFIP. The effort being made not only satisfies the CRS and its activities but also allows the jurisdictions to reduce or eliminate high-risk property from the flood zone, potentially eliminating the need to respond to those properties with emergency vehicle and public works response when they begin to flood.

Through various outreach methods in each jurisdiction that has repetitive loss properties, an effort is being made to eliminate or reduce the risks of future flooding to those properties through various mitigation techniques. Each jurisdiction sends a notice to each owner of a repetitive loss property, soliciting interest and participation in various potential grant programs, in an attempt to mitigate their property from future flood losses. Each interested property owner that responds to the solicitation will be prioritized utilizing the prioritization guidelines, produced by the program in which they apply.

Currently, each jurisdiction maintains the above information. When projects come to the LMS for funding support, all projects submitted for alternative funding opportunities are supported by the LMS regardless of the jurisdiction and priority as they are individually scored utilizing the LMS project scoring criteria. Depending upon the grant program or alternative funding source, those sources or grant programs may have their own prioritization process, which

may compliment or negate the local prioritization. A list of interested people can be found in each of the jurisdiction's repetitive loss property coordinator offices.

b) Severe Repetitive Loss

The Severe Repetitive Loss (SRL) grant program was authorized by the Bunning-Bereuter-Blumenauer Flood Insurance Reform Act of 2004, which amended the National Flood Insurance Act of 1968 to provide funding to reduce or eliminate the long-term risk of flood damage to severe repetitive loss (SRL) structures insured under the National Flood Insurance Program (NFIP).

The primary objective of the Repetitive Loss Properties Strategy is to eliminate or reduce the damage to property and the disruption of life caused by repeated flooding of the same properties. A specific target group of repetitive loss properties is identified and serviced separately from other NFIP policies by the Special Direct Facility (SDF). The target group included every NFIP-insurance policy that since 1978 and regardless of an ownership change during that period has experienced:

- Insurance property with 2 flood claims where the repairs equaled or exceeded 25% of the market value of the structure at the time of the flood event.
- Insured property with flood history of 4 or more separate claims of \$5,000 each with cumulative total exceeding \$20,000 or at least 2 claim payments where the cumulative amount of 2 claims exceeds the market value of the structure.

Although the FMA Grant Program is federally funded and administered through a partnership with the Florida Division of Emergency Management (FDEM), local and Native American Tribal governments, and the Federal Emergency Management Agency. Authority and responsibility for developing and maintaining a State Mitigation Plan, assisting local and Native American Tribal governments in developing and maintaining Flood Mitigation Plans, reviewing FMA Grant sub-applications, recommending cost effective sub-applications to FEMA and providing pass-through grant funds to awarded FMA Grant projects from eligible sub-applicants resides with FDEM. They also are responsible for ensuring the projects funded are completed and all reporting requirements are met.

The SRL program is different from the other mitigation grant programs because property owners who decline offers of mitigation assistance may experience an increase in their flood insurance premium to more closely reflect the flood risk to the structure. Columbia County will continue to assess the SRL list, to encourage and promote the property owners to mitigate their properties.

**D. Local Match Requirement/Potential Funding Sources**

A very important component of the application for the mitigation process is the identification of funding source(s) to meet the local match requirements for respective projects. While cash match provided by the applicant is an option, the identification of outside funding sources is often sought to create less financial hardship for the applicant. There are a variety of other programs that could potentially be viable sources for mitigation projects. While they all have their own programmatic rules and requirements, there is often the ability to use these programs as tools and resources to assist in the completion of mitigation projects.

The first source of funding may come from the various programs sponsored by the Florida Division of Emergency Management (FDEM). Various Federal programs under the direction of the FDEM Mitigation Unit are a potential resource as well, such as the National Flood Insurance Program, the Flood Mitigation Assistance Program, and the Pre-Disaster Mitigation Program. There is also the Residential Construction Mitigation Program (RCMP), which provides technical and financial resources to homeowners for hurricane retrofitting. If homeowners are recommended for the program, they are eligible for a forgivable loan to complete the retrofitting recommendations. Since 2010, the Repetitive Flood Claims Program and the Severe Repetitive Loss Program were eliminated.

There are also other programs offered, such as the Community Development Block Grant (CDBG) Program and Florida Communities Trust; the Florida Department of Environmental Protection's Florida Coastal Management Program, and various programs under the US Army Corps of Engineers; US Department of Agriculture; US Department of Commerce; US Department of Homeland Security; and the US Department of Housing and Urban Development. This list is not exhaustive, as there are also various other agencies and organizations that provide funding opportunities. This list will continue to be improved upon and shared with mitigation partners to assist them in their planning and funding efforts.

## **V. MITIGATION PROJECT PRIORITY LIST:**

Each goal is followed by several objectives that provide more specific steps to be taken by the LMS Working Group and the jurisdictions to achieve the broad-based, long-range direction for planning. Objectives define the steps that are actionable for implementation by the LMS Working Group and associated community partners.

The objectives are intended to guide selection and implementation of mitigation projects that are included in the project list. The closer the goals and objectives are to reaching a more resilient, disaster community, completion of those projects will further improve the community and achieve the goals of the mitigation planning process.

Since the 2020 plan, Columbia County has completed a number of projects. This list is included in Appendix D. Projects that remain open are generally open due to the fact that match funding is even more difficult to find within local government budgets and mitigation initiatives and generally do not take precedence over providing the basic services that are expected to be provided by local governments to citizens. Also, it is important to note that although a project may be listed as completed, that does not mean it was necessarily funded by FEMA. The initiative may have been completed by the local government on its own or was funded by alternative funding sources. This document is meant to be a planning tool that is not completely reliant on FEMA assistance to add, fund, or complete projects identified within the plan.

It is anticipated that the list of completed projects will grow as there is one mitigation project currently underway as of the plan update that is not yet completed. The intent is to identify a comprehensive range of hazards with involvement by all jurisdictions within Columbia County. Every jurisdiction has an identifiable project/action item within the LMS project listing. Appendix D identifies all of the projects, listed by priority score.



**A. Implementation****a) Prioritization of Projects**

In preparation for the 2025 update, it was decided to use a different method to rank future projects and the LMS Working Group agreed that it would be acceptable to use the STAPLEE method to prioritize the mitigation projects. The STAPLEE model is still the accepted method for rating projects on the project list.

The STAPLEE acronym stands for Social, Technical, Administrative, Political, Legal, Economic, and Environmental factors and the dimensions along which each project is measured. The STAPLEE system assesses each project using a scale that allows for a raw score to be derived. There were 7 different dimensions that were further divided into 22 smaller criteria considerations. The projects were rated using a scale of 1 to 5 for each smaller unit with a 1 being very unfavorable and a 5 being very favorable. A 3 would be considered neither favorable nor unfavorable. The higher a project scored the higher it would be placed on the priority list since this meant it received more “favorable” scores on the criteria consideration.

All projects up until the 2025 plan update have used the old rating criteria. All new projects submitted for consideration to the LMS Working Group since the 2025 update were scored using the STAPLEE criteria. The project listing, as shown within Appendix D, shows the projects ranked using both the old and new criteria. The LMS Working Group wants to ensure that not only is the most user-friendly scoring used for this process, but that all municipalities feel the rating criteria results in their projects being fairly ranked for funding consideration. The LMS Working Group will continue to refine the scoring process as needed.

A table outlining the STAPLEE method is on the next page.

**Table 20: Using the STAPLEE Method to Prioritize Projects**

| <b>Dimension</b>             | <b>Criteria</b>                 | <b>Description</b>                                                                                                                                                                                                                                                                                                                                                               |
|------------------------------|---------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <u><i>Social</i></u>         | Community Acceptance            | Will this project not be objectionable to a large majority of the population being impacted by the hazard?                                                                                                                                                                                                                                                                       |
| <i>Social</i>                | Effect on Segment of Population | Thinking of all immediate, direct, and indirect side effects of the implementation of this project, what will the effect be on the segment of the population (things to consider: property access, construction noise, inconvenience of actions)?                                                                                                                                |
| <u><i>Technical</i></u>      | Technically Feasible            | Most of the projects are at such a scale that they need to be technically feasible at the time they are submitted to the list.                                                                                                                                                                                                                                                   |
| <i>Technical</i>             | Long-Term Solution              | Does the project in, and of, itself or as a part of a large comprehensive program represent a long-term solution to the problem at hand?                                                                                                                                                                                                                                         |
| <i>Technical</i>             | Secondary Impacts               | Secondary impacts include things like scalability of solutions and potential re-use of technologies used in the project.                                                                                                                                                                                                                                                         |
| <u><i>Administrative</i></u> | Staffing                        | Do you have enough staff to administer and manage the project?                                                                                                                                                                                                                                                                                                                   |
| <i>Administrative</i>        | Funding Allocation              | Are there funds currently budgeted for the project?                                                                                                                                                                                                                                                                                                                              |
| <i>Administrative</i>        | Maintenance/Operations          | Will you have enough personnel to maintain and operate the project, if applicable?                                                                                                                                                                                                                                                                                               |
| <u><i>Political</i></u>      | Political Support               | What do the elected officials think of the project? Are they aware of it? What might they think of it?<br><br>The existence of a single person or group of persons that is very vocal in their support for a project might make it easier to realize the mitigation action.<br><br>What does the community think about the project? Do they think it is a fair use of resources? |
| <i>Political</i>             | Local Champion                  | The existence of a single person or group of persons that is very vocal in their support for a project might make it easier to realize the mitigation action.                                                                                                                                                                                                                    |
| <i>Political</i>             | Public Support                  | What does the community think about the project? Do they think it is a fair use of resources?                                                                                                                                                                                                                                                                                    |
| <u><i>Legal</i></u>          | State Authority                 | Does the state have jurisdiction with this kind of project?                                                                                                                                                                                                                                                                                                                      |

| Dimension                   | Criteria                                      | Description                                                                       |
|-----------------------------|-----------------------------------------------|-----------------------------------------------------------------------------------|
| <i>Legal</i>                | Existing Local Authority                      | Does the municipality have the legal authority to undertake the project?          |
| <i>Legal</i>                | Potential Legal Action                        | Will the project potentially cause legal action?                                  |
| <u><i>Economic</i></u>      | Cost of Action                                | How expensive is the project?                                                     |
| <i>Economic</i>             | Benefit of Action                             | How many and how great are the benefits to the project?                           |
| <i>Economic</i>             | Contributes to Economic Goals                 | Does the project align with your community's economic goals?                      |
| <i>Economic</i>             | Outside Funding Required                      | Will you need outside funding to finance your share of the cost?                  |
| <u><i>Environmental</i></u> | Effect on Land and Water                      | What are the long-term effects on the land and water on and adjacent to the site? |
| <i>Environmental</i>        | Effect on Endangered Species                  | Will any endangered species be impacted by the project?                           |
| <i>Environmental</i>        | Consistent with Community Environmental Goals | Will the project be consistent with the community's environmental goals?          |
| <i>Environmental</i>        | Consistent with Federal Laws                  | Will the project be in any danger of breaking any federal rules or regulations?   |

Projects will be submitted to the LMS Working Group for consideration and must include a cost-benefit analysis and a scoring form. Projects can be submitted to the group at any time and action will be taken at the next LMS Working Group meeting. At any time, the LMS Working Group may choose to review the project list and update the prioritization ranking. Environmental factors may dictate that some projects need to be considered due to current conditions that require a project to be moved up on the list for available funding. Other factors may lead to this review include declared disasters, funding availability, new or revised policy development, plan revision cycles, legal or fiscal restraints, and life safety priorities.

b) Tie Breaker

In the event that mitigation projects receive identical scores under the STAPLEE method, Columbia County utilizes a tie-breaker scoring system to further prioritize project selection. This secondary evaluation includes a set of six criteria designed to differentiate projects based on their broader community impact and alignment with strategic goals. These criteria are: (1) how well the project addresses mitigation goals such as minimizing loss of life, property damage, and repetitive loss; (2) the number and severity of hazards it addresses; (3) consistency with existing plans and priorities; (4) the geographic scope of benefits across municipalities and unincorporated areas; (5) the potential to save lives; and (6) the importance

and number of people benefiting from the project. Each criterion is scored on a scale of 1 (low) to 5 (high), providing a transparent and structured mechanism to break ties and ensure that projects offering the greatest overall benefit and alignment with community needs are prioritized for implementation.

**B. Responsible for Mitigation Actions**

The implementation and completion of approved mitigation projects will be administered by the jurisdiction, agency, or organization that proposed the project. On an annual basis, the Columbia County Office of Emergency Management, in coordination with the LMS Working Group, will check the status of the mitigation initiatives to ensure that efforts have been made to complete any projects on the LMS project list. This approach is utilized as only the jurisdiction, agency, or organization that proposed the project has the authority or responsibility for implementation. During the plan implementation process, the LMS Working Group monitors the status of projects, assigns priorities, and will take other action for support and coordination.

**C. Cost-Benefit Analysis**

When a project is submitted to the LMS Working Group, it must be accompanied by a cost-benefit analysis (CBA) for consideration. Projects not including a CBA will be returned to the proposer for completion of the appropriate information prior to resubmission. A copy of a form that has been accepted for documenting the CBA has been included in the appendix to this plan behind the project lists. This form can be utilized by the proposer to document what the costs are associated with a proposed project and estimate the value that will be received as a benefit resulting from completion of the project. The cost benefit analysis results will be factored into the prioritization process to determine the project ranking.

**D. Actions Completed**

Any project that has been funded and completed will be added to the Completed Project List regardless of the source of funding. Columbia County Emergency Management maintains all project lists for Columbia County. The project list can change as funding, requirements, etc. change and/or are updated. For deleted projects, an explanation is included to document the action. The LMS committee periodically reviews the project lists to determine ongoing eligibility and feasibility. Projects may be closed or withdrawn at the discretion of the committee.

**VI. PLAN MAINTENANCE:**

The LMS Strategy Committee will submit the LMS planning document(s) for re-certification and re-adoption to the various governing boards of all jurisdictions represented in the LMS document after each FEMA review and conditional approval every five years. As long as the basic philosophies of the LMS remain unchanged, any information, priorities, processes, procedures, data or other plan information that is added to update the LMS plan between the FEMA five-year review cycle, will automatically become part of the original or most recent jurisdictionally approved LMS plan for each adopting jurisdiction.

Columbia County is committed to involving the public directly in updating and maintaining the Multi-Hazard Mitigation Plan. The Emergency Management Director of Columbia County will oversee monitoring, evaluation, and updating of the plan.

**A. LMS Monitoring and Evaluation:**

Columbia County continues to maintain the Local Mitigation Strategy as a mechanism to guide mitigation actions that are being pursued in both the incorporated and unincorporated areas. The LMS Plan is housed in the Columbia County Office of Emergency Management Department. One of the primary methods by which to maintain the plan is to track the status of the mitigation initiatives. The County has devised a database management system that tracks the projects as they are completed in the county to monitor progress. The Columbia County LMS Strategy Committee will make attempts to complete projects within five years (before the next plan update) as funding becomes available.

The LMS Strategy Committee will meet at least annually to discuss any projects or changes that might have occurred that would be addressed by the update. Meetings can and will be scheduled following after times of natural disaster events and other times as deemed appropriate by the LMS Strategy Committee Chair. Criteria used to evaluate the LMS Document and activities should include and are not limited the following situations:

- Change in requirements at any governmental level
- Changes in development trends and land use
- Completion of existing mitigation projects and introduction of new goals
- Changes in policy, procedure, or code
- Changes in building codes and practices
- Review of legislative actions that could affect funding of mitigation efforts
- Changes in Flood Insurance Rate Maps, National Flood Insurance Program, etc.

These meetings will be organized by the Columbia County Office of Emergency Management. This meeting will result in the preparation of the Annual LMS Progress Report that will be submitted to the state and satisfy the annual CRS program requirement as well. Columbia County Office of Emergency will maintain an up-to-date list of all active Strategy Committee members will be utilized as a distribution list for notification.

While Columbia County has not undergone large-scale development changes since the last LMS revision, incremental population growth and dispersed development—particularly into hazard-prone areas—have nonetheless contributed to a measurable increase in overall risk and

exposure. As of this writing, there are no anticipated development changes or trends that would impact these hazards in the future. This of course is subject to change in the future and will be a topic to be considered at future LMS meetings.

At each LMS meeting, representatives will report on the current status of projects, and if a project's scope or details have changed. It may also be reported that the project has been cancelled all together, in which case the project will be removed from the mitigation initiative prioritization list with an explanation. All changes and activities as a result of the LMS meeting will be considered part of the overall evaluation process, which will be administered and documented by the Columbia County Office of Emergency Management Department and become an official component of the LMS.

The LMS Strategy Committee will use the following criteria, among others, as a starting point for monitoring the overall LMS process:

- Goals and objectives address current and expected conditions
- The nature, magnitude and/or type of risks have changed
- The current resources are appropriate for implementing the plan
- There are implementation problems, such as technical, political or coordination issues with other agencies
- The outcomes have occurred as expected (demonstrating progress)
- The agencies and other partners participated as originally proposed

#### **B. LMS Updates:**

An important key of the planning process is to begin thinking about the steps to update the plan prior to the next review date, which is in 2030. Revisions to the plan should be well underway in 2029, with the Planning Committee providing drafts to state staff for preliminary comments ahead of time. This will ensure that the plan remains in active status and does not lapse for any period of time between plan review periods. Based on experience, it is easy to underestimate the time that it takes to complete the plan update.

In addition to the ongoing maintenance of the plan and LMS activities, the staff assigned to handle mitigation activities will be responsible for the Five-Year Update. The expectation is that continual review and refinements of the LMS Plan between plan updates will allow future updates to go smoothly. The update of the plan will take place by reading the document, identifying items to be fixed and utilizing a computer to make edits to the LMS document. This will occur as changes need to be made, instead of doing all of the changes at once for the five-year update. The Columbia County Office of Emergency Management will continue to update the plan and be the responsible organization for this activity. This will be accomplished through continual review of the plan by LMS Strategy Committee and support staff, as well as input from the general public.

Notice of upcoming meetings will be posted for at least ten days prior to the date of the meeting and available by the following means:

- Columbia County LMS Website notice
- Email distribution list maintained by the Columbia County Office of Emergency Management Department or Office of Emergency Management

- Notice published in local newspapers

Updates will be identified through the input of anyone with sound ideas to improve the plan from Columbia County staff, LMS Strategy Committee members and from the general public. Staff from the Office of Emergency Management. Columbia County Office of Emergency Management assigned LMS responsibilities will update the electronic version of LMS document. The LMS Strategy Committee will review the plan proposed to be submitted for the next update, guide changes as necessary and have final approval of the updated plan to be forwarded to state and federal counterparts for review and ultimate approval.

### **C. Implementation through Existing Plans, Policies, Programs, and Resources:**

While some jurisdictions have taken steps towards integrating mitigation actions into their plans, some have not explicitly addressed these matters within their documents. It is important that some or all of the goals and actions of this local mitigation strategy be incorporated into other plans so that they will have a greater chance of being accomplished. Integrating plans is accomplished by having groups invite each other to each other's meetings. Information sharing can ensure that the common elements are understood and documented within the various plans within Columbia County. Through upcoming meetings that will be taking place with jurisdictions to adopt the Columbia County LMS, integrating the LMS with their respective planning mechanisms will be discussed and encouraged to promote further continuity.

The municipalities utilize the approved LMS in connection with their own plans and procedures to further mitigation efforts working closely with the county to continue making all of Columbia County and its jurisdictions resilient to the hazards identified.

While the majority of the planning efforts are aimed at flooding mitigation it is recognized that all hazards should be considered when revising plans and policies especially concerning land use, floodplain management, stormwater, development, etc. The LMS is adopted by all municipalities in Columbia County and individual municipal and county-wide plans take mitigation efforts into consideration when making revisions.

Through upcoming meetings that will be taking place with jurisdictions to adopt the Columbia County LMS, further integration of the LMS with their respective planning mechanisms will be discussed and encouraged to promote further continuity. Staff from the various organizations responsible for these individual plans will continue communicating with each other to further the process of better integrating these plans and improving overall dialogue about mitigation.

#### **a) Current Capability to Implement Hazard Mitigation**

Columbia County, Lake City, and Ft. White all demonstrate moderate to strong capabilities to implement hazard mitigation through:

- Comprehensive Plan Integration: Mitigation principles are embedded in land use planning, environmental protection, floodplain regulations, subdivision control, and emergency management coordination.
- Land Development Regulations (LDRs): Specific zoning, subdivision, and floodplain management codes help prevent development in high-risk areas (e.g., 100-year floodplains, wetlands).

- Participation in NFIP: All jurisdictions participate in the National Flood Insurance Program and have integrated flood-resistant construction requirements.
- Floodplain Management Ordinances: Each jurisdiction has ordinances in place that regulate development in flood-prone areas and enforce elevation and floodproofing requirements.
- Coordination with Suwannee River Water Management District (SRWMD): The County benefits from SRWMD's floodplain data, permitting oversight, and project funding support.
- Coordination with the Florida Forest Service: The County works with the Florida Forest Service (under the Florida Department of Agriculture and Consumer Services) to support wildfire mitigation and land management practices, particularly in environmentally sensitive areas and wildland-urban interface zones.
- Interjurisdictional Coordination: Columbia County and its municipalities coordinate with other local jurisdictions through the LMS Working Group, enabling integration of mitigation goals across jurisdictional boundaries and planning processes.

b) Gaps and Limitations

Despite the integration of hazard mitigation across plans and codes, the following gaps and limitations are present:

- Limited Local Capacity in Smaller Jurisdictions
  - Ft. White lacks independent authority to amend or expand planning tools; it relies on County LDRs and Comprehensive Plan provisions.
  - Staffing and technical capacity (e.g., no standalone floodplain manager or mitigation planner) may limit timely enforcement or plan updates.
- Limited Funding for Property Acquisition
  - Limited funding for items such as buyouts, acquisitions, or conservation easements for properties repeatedly affected by flooding.
- Development Pressure vs. Risk Avoidance
  - Despite policies discouraging development in high-risk areas, exceptions and variances (e.g., for industrial use or subdivision) are still possible, creating potential long-term risk exposure.

c) Recommendations to Improve Capability

- Enhance Local Capacity & Staffing:
  - Provide training and funding to establish or strengthen mitigation and local floodplain management staff
  - Consider shared services or regional planners to assist smaller jurisdictions.
- Formalize Plan Integration Processes:
  - Conduct annual joint reviews across planning, emergency management, and utilities.
- Strengthen Non-Structural Mitigation:



- Create a property buyout or elevation program for repetitively flooded structures.
  - Use SRWMD strategies to pursue land conservation in high-risk areas.
- Strengthen Public Awareness and Outreach:
  - Increase countywide flood awareness campaign tied to NFIP and CRS goals.
  - Promote mitigation grant education workshops for homeowners and businesses.

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**VII. AUTHORITIES AND REFERENCES:**

Code of Federal Regulations Title 44 201.6. *Local Mitigation Plans*. <http://www.ecfr.gov/cgi-bin/text-idx?rgn=div5&node=44:1.0.1.4.53>

FEMA (2011, Oct 1). *Local Mitigation Plan Review Guidance*, [www.fema.gov:7498/plan\\_review\\_guide\\_final\\_9\\_30\\_11.pdf](http://www.fema.gov:7498/plan_review_guide_final_9_30_11.pdf)

Florida Administrative Code 27P-22. *Hazard Mitigation Grant Program*, <https://www.flrules.org/gateway/ChapterHome.asp?Chapter=27P-22>

Florida Statutes. *Chapter 252 Emergency Management*. [http://www.leg.state.fl.us/STATUTES/index.cfm?App\\_mode=Display\\_Index&Title\\_Request=XVII#TitleXVII](http://www.leg.state.fl.us/STATUTES/index.cfm?App_mode=Display_Index&Title_Request=XVII#TitleXVII)

FEMA. *The Stafford Act*. [http://www.fema.gov/media-library-data/1383153669955-21f970b19e8eaa67087b7da9f4af706e/stafford\\_act\\_booklet\\_042213\\_508e.pdf](http://www.fema.gov/media-library-data/1383153669955-21f970b19e8eaa67087b7da9f4af706e/stafford_act_booklet_042213_508e.pdf)

**APPENDIX: ATTACHED SUBAPPENDICES**

Maps, graphs, charts, tables, diagrams, and other additional data that provide support for the information presented in the LMS Plan are located in attachment Appendices A through H. The appendices are available for review by the public and maintained by the Office of Emergency Management.

**Table 21: List of Appendices**

| <b>SUBAPPENDIX</b> | <b>CONTENT</b>                              |
|--------------------|---------------------------------------------|
| <b>A</b>           | <b>LMS COMMITTEE BY-LAWS AND MEMBERSHIP</b> |
| <b>B</b>           | <b>LMS MEMBERSHIP LIST</b>                  |
| <b>C</b>           | <b>LMS JURISDICTION ADOPTIONS</b>           |
| <b>D</b>           | <b>PROJECT LISTS</b>                        |
| <b>E</b>           | <b>PLAN INTEGRATION</b>                     |
| <b>F</b>           | <b>FLOOD MITIGATION OUTREACH</b>            |
| <b>G</b>           | <b>MEETING DOCUMENTATION</b>                |
| <b>H</b>           | <b>FEMA CROSSWALK</b>                       |
| <b>I</b>           | <b>FLOOD MAPS</b>                           |
| <b>J</b>           | <b>WILDFIRE</b>                             |

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**APPENDIX A: LMS COMMITTEE BY-LAWS****A. ARTICLE I. PURPOSES OF THE STRATEGY COMMITTEE**

The existence of the LMS is voluntarily required for our community under 44 CFR 201 & 206, and 44 CFR 78 to remain eligible to apply for the Hazard Mitigation Grant Program (HMGP), the Pre-Disaster Mitigation (PDM) Grant Program, the Flood Mitigation Assistance (FMA) Grant Program, Repetitive Flood Claims (RFC) Grant Program, and the Severe Repetitive Loss (SRL) Grant Program. So, even though communities do not have to develop mitigation plans, Columbia County and its jurisdictions have opted to voluntarily develop a FEMA approved plan.

Based on the Federal requirements for a variety of grant programs, the LMS exists for two reasons:

1. Meet the 44 CFR 201 & 206 requirements so as to remain eligible for mitigation grant funding opportunities, and
2. Promote and strengthen our communities' ability to prepare for and recover from natural and man-made disaster events.

**B. ARTICLE II. MEMBERSHIP****a) Membership in General**

Participation in the Columbia County LMS Strategy Committee is voluntary by all entities. Membership of the Strategy Committee is open to all jurisdictions, departments, organizations and individuals supporting its purposes.

To become a member, a membership form must be completed and returned to the Chair or Vice Chair (or administrative support) of the LMS Board. Once the membership form has been completed and returned, membership will be immediate. Each jurisdiction, departments, or organization shall also appoint an alternate to their primary representative. The alternate shall have full voting rights in the absence of the primary representative.

The LMS Membership List will be maintained by the Chair or Vice Chair (or administrative support) of the LMS Board and will be available for review as needed or requested.

**b) Maintenance of Standing**

To maintain good standing, members of the Columbia County LMS Working Group must not have more than two (2) consecutive absences at scheduled meetings. At this time, their vote will be withheld from the representative until they attend two (2) consecutive meetings. Their voting rights will be reinstated at the third (3) consecutive meeting. Mitigating or extenuating circumstances will be addressed by the Chair or Vice-Chair as appropriate on behalf of the Columbia County LMS Working Group. Two consecutive absences can also occur in failure to vote by electronic (email or web-hosted service) voting procedures that may be utilized from time to time in place of formal meetings.

**c) Benefits of Membership**

Members of the LMS will have the benefit of being able to sponsor an eligible mitigation project for inclusion and ranking in the LMS project list, allowing it to become eligible in

various grant programs requiring LMS support. See the requirements for sponsoring a project in the project eligibility and submission sections of this plan.

d) Recruitment of New Members

The Columbia County LMS plans to continue holding regular meetings and will continue to coordinate and encourage private, public, and non-profit interest and involvement.

**C. ARTICLE III. LMS ORGANIZATION AND STRUCTURE**

The organizational structure of the Columbia County LMS Working Group shall consist of the Working Group and other subcommittees which may from time to time be created as needed by the Working Group. The Working Group shall have a Chair, and a Vice Chair. Any member is eligible for election to one of these positions. The Columbia County Office of Emergency Management will perform administrative functions for the Working Group as required by State of Florida Emergency Management Scope of Work.

a) Columbia County LMS Working Group

The LMS Chair will preside at each meeting of the Working Group, as well as establish temporary subcommittees and assign personnel to them. The Vice-Chair will fulfill the duties and responsibilities of the chair in their absence.

The Columbia County LMS Working Group will consist of designated representatives from the following:

- Representatives from governmental departments of Columbia County and;
- Representatives from governmental departments of each participating incorporated municipality and;
- Representatives from organizations and associations representing key business industry, and community interest groups of Columbia County and;
- Representatives from other governmental entities and;
- Representatives of non-profit organizations and/or faith-based institutions and;
- Representatives from the general public

Members of the Columbia County LMS Working Group will be coordinated by the Chair or Vice-Chair to serve as the official representative and spokesperson for the jurisdiction or organization regarding the activities and decisions of the Columbia County LMS Working Group. Voting rights are extended exclusively to official representatives of jurisdictions, departments, and organizations listed above. Each jurisdiction, department, and organization will hold one vote in taking actions on behalf of their entities as long as they remain a member in good standing. Members of the general public may attend meetings, participate in discussions, and provide input; however, they do not possess voting privileges within the LMS Working Group.

b) Committees

The Columbia County LMS Working Group shall establish subcommittees at any time for any special purposes. Membership of the committees shall be appointed by the Chair or Vice-Chair of the LMS Working Group, who shall also designate the subcommittee Chair.

Membership shall be unlimited and is open to all interested jurisdictions, organizations and individuals.

c) Program Staff

The Columbia County Office of Emergency Management will serve as the program staff for the Columbia County Working Group and assist in the coordination and support of the Columbia County LMS Working Group activities.

**D. ARTICLE IV. LMS GROUP FUNDING/BUDGET**

The LMS is an unfunded group that has no budget and no money to operate. The organization is purely voluntary and any tasks, action items, or efforts that require funding will be paid by donation or in-kind from our members or participants or any grants that may be acquired for such purpose. The projects typically are either funded through the normal general revenue process of the sponsoring agency or supplemental grant program funds, which may be identified and applications submitted for consideration. Specific processes for identifying projects on the project priority list will be described later in this document.

**E. ARTICLE V. LMS OFFICER**

a) OFFICER ELECTIONS

Any jurisdiction, department, or organization member in good standing of the Columbia County LMS Working Group is eligible for election as an officer. The LMS Working Group will have a Chair and Vice-Chair elected by a majority vote of a quorum of the members present. Each shall serve a term of one year and be eligible for re-election for an unlimited number of terms. A quorum shall consist of designated representative or alternate from at least five (5) of the participating jurisdictions/departments/organizations in good standing. LMS Board elections will be held each December.

In the event that an officer resigns, is no longer eligible, or is otherwise unable to fulfill the duties of the position, the Working Group shall hold a special election at the next scheduled meeting to fill the vacancy. The newly elected officer shall serve the remainder of the unexpired term and may be eligible for re-election thereafter.

b) OFFICER MEMBERSHIP

There is no limitation as to which LMS members may hold the elected positions of the LMS Board or committee. Any person interested and willing to participate may hold any one of the positions if nominated and elected by majority vote of the LMS members as appropriate. The requirement of holding an elected position is:

- Be present at each of the LMS group meetings and any respective committee meeting that they may chair,
- Participate in the process of the LMS and committees as appropriate, take responsibility in accomplishing the goals and tasks of the LMS and the tasks assigned to the committee they may be responsible, as appropriate.

**F. ARTICLE VI. RESPONSIBILITIES**

The responsibilities of each Board and committee position are described in the sections that follow:

**a) LMS WORKING GROUP**

All responsibilities of the LMS Working Group shall be specified by Chapter 27P-22.004 and 27P-22.005, Florida Administrative Code (FAC). These rules are authorized under Florida Statute 252. The Columbia County LMS Working Group will be responsible for all actions and decisions made formally in the name of the Columbia County LMS Working Group.

**b) CHAIRPERSON**

The Chair of the Columbia County LMS Working Group will preside at each meeting of the Columbia County Working Group. The Chairperson will facilitate each general LMS meeting and conduct business with the general "Robert's Rules" for meetings. Decisions cannot be made without a quorum, but meetings and discussion can be held without a quorum. The chairperson is responsible for all the activities of the LMS and will be the spokesperson representing the LMS. The Chairperson or designee must sign all communications from the LMS. The chairperson is responsible, with the support of the entire LMS to implement the goals, objectives, and tasks as outlined in this plan.

**c) VICE-CHAIRPERSON**

The Vice-Chairperson will act as the secondary facilitator of the LMS supporting the Chairperson and all the actions of the LMS. The Vice-Chair will fulfill the duties and responsibilities of the Chair in their absence. The Vice-Chairperson is responsible, with the support of the entire LMS to implement the goals, objectives, and tasks as outlined in this plan.

**d) SUBCOMMITTEES**

The responsibilities of subcommittees will be defined at the time they are established by the Chair of the Columbia County LMS Working Group, or the voting members in good standing.

**G. ARTICLE VII. ACTIONS BY THE WORKING GROUP****e) Authority for Actions**

Only the Working Group has the authority to take final actions. Actions by subcommittees or program staff are not considered final until affirmed by action of the Columbia County LMS Working Group.

**a) Meetings, Voting, and Quorum**

Meetings of the Columbia County LMS Working Group and its subcommittees will be conducted in accord with Robert's Rules of Order, when deemed necessary by Chair of the meeting. Regular meetings of the LMS Working Group will be scheduled at least annually with a minimum of 10 working days' notice. Committees will meet as deemed

necessary by the Chair or Vice-Chair. Meetings can be held via a conferencing mechanism provided a means of recording attendance and voting can be done.

All final actions and decisions in the name of the Columbia County LMS Working Group will be by affirmative vote of a quorum of the voting members present. A quorum shall consist of designated representative or alternate from at least five (5) of the participating jurisdictions/departments/organizations. Voting rights are extended exclusively to official representatives of jurisdictions, departments, and organizations listed under Article III. Each jurisdiction, department, and organization will hold one vote in taking actions on behalf of their entities as long as they remain a member in good standing.

b) Public Notice

Every Working Group meeting, at a minimum, will be publicly advertised within the standards of County advertisement for all other County Public Meetings. The LMS Chair or Vice Chair, with administrative support, will be responsible for creating and submitting those public notices. Creating and maintaining attendance records, agendas, and meeting minutes for each meeting will be the responsibility of the LMS Chair or Vice Chair, with administrative support, and will also be responsible for electronically archiving the information which will be maintained by Columbia County Emergency Management.

**H. ARTICLE VIII. ADOPTION OF AND AMENDMENTS TO THE BYLAWS**

The Bylaws of the Columbia County Working Group may be adopted and/or amended by a quorum of a designated representative or alternate from at least five (5) of the participating jurisdictions/departments/organizations. Each member of the Working Group will have one (1) vote. All proposed changes to the bylaws will be provided to each member of the Columbia County LMS Working Group not less than ten (10) working days prior to such a vote.

**I. ARTICLE VIII. DISSOLUTION OF THE WORKING GROUP**

The Columbia County LMS Working Group may be dissolved by affirmative vote of 100% of the attending quorum, by order of a court of competent jurisdiction, and/or by instruction of the Columbia County governing body. At the time of dissolution, all remaining documents, records, equipment, and supplies belonging to the Columbia County LMS Working Group will be transferred to the Columbia County Office of Emergency Management for disposition.



**APPENDIX B: LMS MEMBERSHIP LIST**

## 2025 Columbia County LMS Working Group Members

| AGENCY                                   | REPRESENTATIVE                                             |
|------------------------------------------|------------------------------------------------------------|
| Advanced Planning Consultants            | Tim Kitchen, Partner                                       |
| Advanced Planning Consultants            | Christopher Chagdes, Partner                               |
| Columbia County Emergency Management     | Shayne Morgan, Emergency Management Director               |
| Columbia County Building & Zoning        | Brandon Stubbs, County Planner                             |
| Columbia County Building & Zoning        | Liza Williams, Planning Technician                         |
| Columbia County Sheriff's Office         | Sean Sikes, Sergeant                                       |
| Columbia County Sheriff's Office         | Joe Lucas, Chief Deputy                                    |
| Columbia County School District          | Keith Hatcher, Director of Purchasing & Risk Management    |
| Columbia County School District          | Judy Tatem, Safe School Coordinator                        |
| Columbia County School District          | Brandon Beadles, Coordinator Choice Education              |
| Columbia County Public Works             | Chad Williams, Public Works Director                       |
| Columbia County Fire Rescue              | Jeff Crawford, Fire Chief                                  |
| Columbia County 911 Addressing           | Matt Crews, GIS Coordinator                                |
| Columbia County Safety                   | David Kraus, Assistant County Manager, Administration      |
| City of Lake City                        | Joe Helfenberger, City Manager                             |
| City of Lake City                        | Thomas Henry, Public Works Director                        |
| City of Lake City                        | Paul Dyal, Executive Director Utilities                    |
| Lake City Police Department              | Argatha Gilmore, Chief                                     |
| Lake City Police Department              | Gerald Butler, Assistant Chief of Police                   |
| Lake City Police Department              | Andy Miles, <i>Lieutenant</i> , Operations Division        |
| Town of Ft. White                        | Ronnie Frazier, Mayor                                      |
| Florida Department of Transportation     | Ed Ward, District 2 Emergency Coordination Officer         |
| Florida Forest Service                   | Doc Bloodworth, Wildfire Mitigation Specialist             |
| Florida Gateway College                  | Mike McKee, Executive Director, Media & Public Information |
| Daniel Crapps Agency                     | Laura Nettles, Realtor                                     |
| Suwannee River Water Management District | Abby Johnson, Communications Coordinator                   |
| Columbia County Citizen                  | Gary Hamilton                                              |
| Gilchrist County Emergency Management    | Ralph Smith, Emergency Management Director                 |
| Suwannee County Emergency Management     | Sharon Hingson, Deputy Director                            |
| The Management Experts                   | Traci Buzbee, Owner                                        |
| The Management Experts                   | Gail Leek, Emergency Management Planner                    |

## **APPENDIX C: LMS JURISDICTION ADOPTIONS**

## **APPENDIX D: PROJECT LISTS**

| COLUMBIA COUNTY NEW/ONGOING/DEFERRED LMS PROJECT LIST |                                               |                                                   |                                              |                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                         |                |          |                                                              |        |         |          |                   |                                                                                                                                             |                                 |                                                             |
|-------------------------------------------------------|-----------------------------------------------|---------------------------------------------------|----------------------------------------------|---------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------|----------------|----------|--------------------------------------------------------------|--------|---------|----------|-------------------|---------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------|-------------------------------------------------------------|
| Jurisdiction                                          | General Location                              | Mitigation Project                                | Mitigation Project or Initiative Description | Hazard(s) Mitigated                                     | Scope of Work                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  | Agency Responsible                      | Estimated Cost | Priority | Funding Source                                               | Status |         |          |                   | Notes                                                                                                                                       | Mitigate new or existing? (N/E) | Timeframe for Completion                                    |
|                                                       |                                               |                                                   |                                              |                                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                |                                         |                |          |                                                              | New    | Ongoing | Deferred | If deferred, why? |                                                                                                                                             |                                 |                                                             |
| Columbia County                                       | 263 NW Lake City Avenue                       | New EOC/Dispatch Center                           | Emergency Response Enhancement               | All                                                     | To construct a hurricane rated building with on-site storage, as well as EOC/EM; Central Communications and the County Dispatch Center                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | CCEM                                    | \$14 million   | 2        | HLMP; RFG; Local General Revenue; Legislative Appropriations | X      |         |          |                   |                                                                                                                                             |                                 | 5-7 years                                                   |
| Columbia County                                       | Countywide                                    | Communications Upgrades                           | Emergency Response Enhancement               | All                                                     | New radio repeaters for primary and secondary radio channels, including backup electrical generators.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | BCC                                     | \$10.3 million | 1        | Local General Revenue; HMGP;                                 |        | X       |          |                   |                                                                                                                                             | N/E                             | Within three - five years                                   |
|                                                       | Countywide                                    | Hazard Outreach Campaign                          | Education & Outreach                         | All                                                     | Columbia County Emergency Management office will conduct a series of outreach meetings/workshops intended to educate the general public regarding all the hazards identified in the LMS. Marketing materials will include rack cards, one-page flyers developed through their office, as well as other materials available through organizations such as FLASH. The CCEM office will develop a schedule of dates (approximately 4) and organizations to target. In the past they have reached out to Kiwanis, Seniors United, and a variety of local schools. In addition, an annual all hazards guide is distributed in conjunction with the local newspaper. | CCEM                                    | \$13,000       | 2        | General Revenue; EMPA;                                       |        | x       |          |                   |                                                                                                                                             | N/E                             | Ongoing                                                     |
| Columbia County                                       | Countywide                                    | Repetitive Loss Resident Buyouts                  | Public Acquisition                           | Hurricanes and Tropical Storms, Flooding                | Acquisition and removal of residences subject to repetitive loss damages.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | BCC                                     | \$5,000,000    | 3        | HMGP; BRIC; FMA;                                             |        | X       |          |                   | Portion of this project is complete, and this an on-going process for the repetitive loss properties. Currently have a HMGP grant for this. | E                               | Within a five-year timeframe                                |
| Lake City                                             | NW Section Lake City                          | Gwen Lake Drainage Basin: Shelby Terrace          | Stormwater Management                        | Hurricanes and Tropical Storms, Thunderstorms, Flooding | Lake City Northwest Lake City Area. Gwen Lake Drainage Basin: Shelby Terrace. Replace Gwen Lake dam and adjoining Shelby Drive outflow bridge.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | City of Lake City & County Public Works | \$150,000      | 4        | General Revenue;                                             |        | X       |          |                   |                                                                                                                                             | N/E                             | Within a five-year timeframe                                |
| Columbia County Fort White Lake City                  | Countywide                                    | Comprehensive Plan Evaluation                     | Comprehensive Plan Evaluation                | All                                                     | Evaluate County and municipal local government comprehensive plans for consistency with the Local Mitigation Strategy and amend the local government comprehensive plans to improve long-term mitigation of natural hazards, with a special emphasis on existing and future buildings and infrastructure.                                                                                                                                                                                                                                                                                                                                                      | Building and Zoning County              | \$2,500        | 5        | Local and County matching funds                              |        | X       |          |                   |                                                                                                                                             |                                 | Within a five-year timeframe                                |
| Lake City                                             | SW Section Lake City, Grandview and Troy Road | Quail Ridge Subdivision Area Drainage             | Stormwater Management                        | Hurricanes and Tropical Storms, Thunderstorms, Flooding | Ditch repair, road improvements, stormwater runoff (pending completion of Suwannee River Water Management District Study).                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | City of Lake City Public Works          | \$300,00       | 6        | HMGP; FMA: Watershed Protection & Flood Prevention           |        | X       |          |                   |                                                                                                                                             | N/E                             | Within a five-year timeframe                                |
| Columbia County                                       | SE Lake City                                  | Alligator Lake & Clay Hole Branch Discharge Study | Engineering Study and Drainage Improvements  | Hurricanes and Tropical Storms, Flooding                | Conduct an engineer study and remove silt and debris out of flow run.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | CC Public Works                         | \$3 million    | 7        | HMGP; FMA: Watershed Protection & Flood Prevention           |        | X       |          |                   | This is included in Suwannee River Water Management Project. Study is completed.                                                            | N/E                             | In the design and permitting phase ... estimated 2018 start |
| Columbia County Fort White Lake City                  | Countywide                                    | Community Emergency Response Team Enhancement     | Volunteer Development                        | All                                                     | Continue to develop and expand the Community Emergency Response Teams throughout the County to include each municipality with the County.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Emergency Management                    | \$10,000       | 8        | EMPA, DHS; RFG Planning Grants                               |        | X       |          |                   |                                                                                                                                             | N/E                             | Within a five-year timeframe                                |

| COLUMBIA COUNTY NEW/ONGOING/DEFERRED LMS PROJECT LIST |                                   |                                                   |                                              |                                                                         |                                                                                                                                                                                                                                                                                                                            |                                      |                                              |          |                                                 |        |         |          |                                           |                                                                                  |                                 |                              |
|-------------------------------------------------------|-----------------------------------|---------------------------------------------------|----------------------------------------------|-------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------|----------------------------------------------|----------|-------------------------------------------------|--------|---------|----------|-------------------------------------------|----------------------------------------------------------------------------------|---------------------------------|------------------------------|
| Jurisdiction                                          | General Location                  | Mitigation Project                                | Mitigation Project or Initiative Description | Hazard(s) Mitigated                                                     | Scope of Work                                                                                                                                                                                                                                                                                                              | Agency Responsible                   | Estimated Cost                               | Priority | Funding Source                                  | Status |         |          |                                           | Notes                                                                            | Mitigate new or existing? (N/E) | Timeframe for Completion     |
|                                                       |                                   |                                                   |                                              |                                                                         |                                                                                                                                                                                                                                                                                                                            |                                      |                                              |          |                                                 | New    | Ongoing | Deferred | If deferred, why?                         |                                                                                  |                                 |                              |
| Columbia County<br>Fort White<br>Lake City            | Countywide                        | Comprehensive Plan High Aquifer Recharge          | Comprehensive Plan Evaluation                | Hurricanes and Tropical Storms, Thunderstorms, Flooding                 | Maintain local government comprehensive plan policies which limit to low-density and non-intensive use in high aquifer recharge areas in order to maintain high rates of water recharge.                                                                                                                                   | Zoning                               | \$2,500                                      | 9        | General Revenue; HHPD;HMGP; RFG Planning Grants |        | X       |          |                                           | This will be done on an yearly basis                                             | N/E                             | Within a five-year timeframe |
| Columbia County<br>Fort White<br>Lake City            | Countywide                        | Comprehensive Plan Water Conservation             | Comprehensive Plan Evaluation                | Hurricanes and Tropical Storms, Thunderstorms, Flooding                 | Maintain local government comprehensive plan policies which support compliance with water conservation programs and emergency water conservation efforts established by the Suwanee River Water Management District.                                                                                                       | Zoning                               | \$2,500                                      | 10       | General Revenue; HHPD;HMGP; RFG Planning Grants |        | X       |          |                                           | This will be done on an yearly basis                                             | N/E                             | Within a five-year timeframe |
| Columbia County<br>Fort White<br>Lake City            | Countywide                        | Minimum Housing Codes                             | Enforcement                                  | All                                                                     | Maintain local government minimum housing codes which establish minimum performance standards for dwelling units.                                                                                                                                                                                                          | Code Enforcement & Building & Zoning | \$5,000                                      | 11       | General Revenue; HHPD;HMGP; RFG Planning Grants |        | X       |          |                                           | This will be done on an yearly basis. Just adopted water Conservation Ordinance. | E                               | Within a five-year timeframe |
| Lake City                                             | Florida Gateway Community College | Construct campus stormwater master plan           | Stormwater Management                        | Hurricanes and Tropical Storms, Thunderstorms, Flooding                 | Create a retention pond and stormwater routing system that will mitigate and retain the runoff from the campus for the immediate future                                                                                                                                                                                    | Florida Gateway College Facilities   | \$2,500,000                                  | 12       | Public education capital Outlay fund            | X      |         |          |                                           |                                                                                  | E                               | Within a five-year timeframe |
| Lake City                                             | Florida Gateway Community College | Place primary electrical distribution underground | mitigate storm damage to electrical grid     | Hurricanes and Tropical Storms, Tornadoes and Downbursts                | As funds are available place existing highline distribution system underground, most critical sections first.                                                                                                                                                                                                              | Florida Gateway College Facilities   | Next leg in center of campus est. ~\$350,000 | 13       | Public education capital Outlay fund            | X      |         |          |                                           |                                                                                  | E                               | Within a five-year timeframe |
| Columbia County                                       |                                   | Canon Creek                                       |                                              | All Hazards                                                             | Drainage Basin                                                                                                                                                                                                                                                                                                             | BCC                                  | \$3 million                                  | 14       | Springs Protection Grant                        | X      |         |          |                                           |                                                                                  | N                               | Dec-21                       |
| City Lake City School Board                           |                                   | Richardson Middle School Shelter Retrofitting     | Emergency Shelter Retrofitting               | All                                                                     | Install backup electrical generator and automatic power transfer switch with 200 amp emergency panel for necessary emergency lighting and equipment circuits.<br><br>Replace 724 square feet of existing windows with hurricane windows and shutters.<br><br>Replace three sets of doors on 5,432 square foot dining area. | BCC Maintenance/CCS B Maintenance    | \$134,200                                    | 15       | HMGP, CIE; FMA; BRIC                            |        |         | X        | Did not progress due to a lack of funding |                                                                                  | E                               | Within a five-year timeframe |
| Columbia County                                       | Fort White                        | Backup Generator for Fort White Substation        | Emergency Response Enhancement               | Hurricanes and Tropical Storms, Thunderstorms, Tornadoes and Downbursts | Purchase and Install a backup electric generator for the Fort White Sheriff Office Substation to provide electricity during power outages.                                                                                                                                                                                 | BCC Maintenance                      | \$21,000                                     | 16       | HMGP; General Revenue                           |        |         | X        | Waiting for funding                       |                                                                                  | E                               | Within a five-year timeframe |

| COLUMBIA COUNTY NEW/ONGOING/DEFERRED LMS PROJECT LIST |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                |                                                         |                                                                                                                                                                        |                       |                          |          |                                                                  |        |         |          |                     |       |                                 |                              |
|-------------------------------------------------------|------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|---------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|--------------------------|----------|------------------------------------------------------------------|--------|---------|----------|---------------------|-------|---------------------------------|------------------------------|
| Jurisdiction                                          | General Location | Mitigation Project                                                                                                                                                                                                                                                                                                                                                                                                                                            | Mitigation Project or Initiative Description   | Hazard(s) Mitigated                                     | Scope of Work                                                                                                                                                          | Agency Responsible    | Estimated Cost           | Priority | Funding Source                                                   | Status |         |          |                     | Notes | Mitigate new or existing? (N/E) | Timeframe for Completion     |
|                                                       |                  |                                                                                                                                                                                                                                                                                                                                                                                                                                                               |                                                |                                                         |                                                                                                                                                                        |                       |                          |          |                                                                  | New    | Ongoing | Deferred | If deferred, why?   |       |                                 |                              |
| Columbia County                                       | Countywide       | River Road<br>Booker T. Combs<br>Tiger Drain<br>Nova Road<br>California Road<br>Central Blvd<br>Hartford Road<br>Old Bellamy<br>Hall Road<br>Riverville Road<br>Falkner Road<br>Ponds Hammock<br>Horne Road<br>High Falls Road<br>James Croft<br>Robert Cox<br>Arrowhead Road<br>Tuskeneggee Rd<br>Pinemount Road<br>Double Run<br>Hunt Road<br>Bell Road<br>Blackjack Road<br>Dicks Road<br>Jeffia Allen Road<br>Perry Road<br>Pinemount Road<br>Murray Road | Floodway Study and Floodway Impediment Removal | Hurricanes and Tropical Storms, Flooding                | Engineering study needed to update the Federal Emergency Management Agency, Flood Insurance Rate Map. Establishing Base Flood Elevations that don't already have them. | Zoning & Public Works | Appx. \$30,000 per study | 17       | HMGP; FMA: Watershed Protection & Flood Prevention               |        |         | X        | Waiting for funding |       | N/E                             | Within a five-year timeframe |
| Columbia County                                       | Five Points      | Double Run Road                                                                                                                                                                                                                                                                                                                                                                                                                                               | Road Improvements                              | Hurricanes and Tropical Storms, Thunderstorms, Flooding | Installation of larger culverts and repair existing drainage of roadway.                                                                                               | CC Public Works       | \$55,200                 | 18       | HMGP; SCARP; SCOP;                                               |        |         | X        | Waiting for funding |       | N/E                             | Within a five-year timeframe |
| Columbia County                                       | Countywide       | Retention Ponds Study                                                                                                                                                                                                                                                                                                                                                                                                                                         | Engineering Study and Drainage Improvements    | Hurricanes and Tropical Storms, Thunderstorms, Flooding | Study existing retention ponds to determine if enlargement would reduce flooding of nearby buildings.                                                                  | CC Public Works       | TBD                      | 19       | HMGP; FMA: Watershed Protection & Flood Prevention               |        |         | X        | Waiting for funding |       | N/E                             | Within a five-year timeframe |
| Columbia County                                       | Countywide       | Comprehensive Plan Sinkholes                                                                                                                                                                                                                                                                                                                                                                                                                                  | Comprehensive Plan Evaluation                  | Sinkholes                                               | Consider amendments to local government comprehensive plans to provide a minimum natural vegetated buffer from known sinkholes to prevent damage to future structures. | FDEP project.         | \$5,000                  | 20       | RCMP; Local and County General Revenue; FMA; RFG Planning Grants |        |         | X        | Waiting for funding |       | N                               | Within a five-year timeframe |

## **APPENDIX E: PLAN INTEGRATION**



## Appendix E - Review & Integration with Existing Plans

The LMS is intended to provide the local communities an opportunity to implement mitigation efforts across all planning documentation. In an attempt to integrate mitigation efforts across both the public and private domain, the LMS Working Group works to incorporate existing planning mechanisms into the LMS and to assure that the LMS is integrated into other mechanisms throughout the county. Many of the LMS Working Group members are also involved in the current update of the County's Comprehensive Plan and brings the LMS goals and objectives to the table of those efforts.

The LMS Working Group consulted, reviewed and analyzed the following documents for review and incorporation into the 2020 LMS:

- Columbia County Comprehensive Plan
- Columbia County Land Development Regulations
- City of Lake City's Comprehensive Plan
- City of Lake City's Land Development Regulations
- Town of Ft. White Land Development Code
- Columbia County Emergency Management Plan
- Suwanee River Water Management District (SWRMD) Strategic Plan
- FEMA Flood Insurance Rate Maps (FIRM) and Flood Insurance Study (FIS), effective date: February 4, 2009; revised November 2, 2018

The County currently uses comprehensive and emergency management planning, capital improvement projects, building codes and ordinances to guide and control development throughout the County, and assists the city and town in this respect. The LMS Working Group recognizes the importance of integrating the hazard mitigation strategies identified in the 2020 update into these planning mechanisms.

The County and the City of Lake City address natural hazards in their comprehensive plan and land use regulations through building codes and specifically through their flood plain management and flood prevention damage articles and regulations. Although the Town of Ft. White does have a Land Development Code, the Town of Ft. White is under the County plans (i.e. comprehensive plan and land development regulations) and use the County processes. A summary of mitigation elements in each of the above listed documents is given below; the flood ordinances and FEMA flood maps are briefly discussed below but are presented in more detail in Section 4, flood section of this plan.

The County has incorporated the requirements of the Local Mitigation Strategy into their comprehensive plans and land development regulations. The process for amending local government comprehensive plans is specified by Florida law, Section 163.3 191, Florida Statutes, which requires local governments to prepare Evaluation and Appraisal Reports of their comprehensive plan at least once every seven years. The purpose of the process is to consider changes to comprehensive plans that reflect new information, comprehensive plan successes and failures, changing conditions and trends, as well as changes in state policy on planning and growth management which may have occurred during the prior seven years. The

County considered new information and policy guidance provided in the LMS in their next evaluation and appraisal report for amendments to their comprehensive plans.

## **I. REVIEW AND INTEGRATION WITH EXISTING PLANS**

The LMS Working Group consulted, reviewed and analyzed the following documents for review and incorporation into the 2025 LMS:

### **A. Columbia County Comprehensive Plan, Amended February 15, 2018 by Ordinance No. 17-21**

#### **a) Future Land Use Element**

##### **1) *Policy I.1.6 and Policy 1.2.2***

Lands classified as Environmentally Sensitive Areas are not preservation areas, or conservation areas, but are lands capable of making a significant contribution to the economy of the County. Agriculture and silviculture activities, conducted in accordance with the silviculture policy contained within the Conservation Element of the Comprehensive Plan are uses which contribute significantly to the County economy and shall be permitted. Land uses permitted within lands classified as Environmentally Sensitive Areas may be required to provide mitigating measures to protect the natural functions of these areas; Environmentally Sensitive Areas, which are lands within the AE zones of the 100- year flood, as designated by the Federal Emergency Management Agency, Flood Insurance Rate Map, dated February 4, 2009, and located in the Santa Fe River Corridor, Suwannee River Corridor and Olustee Creek Corridor; as well as the Ichetucknee Trace as defined by the Ichetucknee Trace boundary objective contained in the Future Land Use Element, shall conform to the following density: Environmentally Sensitive Areas less than or equal to 1.0 dwelling unit per 10 acres.

##### **2) *Policy I.3.7***

The County shall participate in the National Flood Insurance Program and regulate development and the installation of utilities in flood hazard areas in conformance with the program's requirements.

##### **3) *Policy I.12.1***

The County's land development regulations shall contain specific and detailed provisions to manage future growth and development to implement the Comprehensive Plan which shall contain at a minimum the following provisions to: 4. Regulate areas subject to seasonal and periodic flooding and provide for drainage and stormwater management.

#### **b) Housing Element**

##### **1) *Policy III.1.2***

The County shall permit the construction of government subsidized housing only within areas which are served by public facilities which meet or exceed the adopted level of service standards established in the other elements of this Comprehensive Plan. In

addition, government subsidized housing shall be prohibited within areas within the 100-year floodplain, as designated by the Federal Emergency Management Agency, Flood Insurance Rate Map.

c) Conservation Element

1) *Policy V.2.6*

The County shall require all new development to maintain the natural functions of environmentally sensitive areas, including but not limited to wetlands and 100-year floodplains so that the long term environmental integrity and economic and recreational value of these areas is maintained.

2) *Policy V.2.7*

The County shall provide for the regulation of development within the AE zones of the 100-year floodplains of the Santa Fe River, Suwannee River and Olustee Creek; as well as the Ichetucknee Trace as defined in Ichetucknee Trace boundary objective of the Future Land Use Element, by establishing these areas as Environmentally Sensitive in accordance with the land use classification policy contained in the Future Land Use Element of this Comprehensive Plan. In addition, the County shall participate in the National Flood Insurance Program and regulate all development and the installation of utilities in the County within flood hazard areas in conformance with the program requirements. Further, the County shall require all structures in the County to be clustered on the non-floodprone portion of a site. Where the entire site is in a floodprone area, or an insufficient buildable area on the non-floodprone portion of a site exists, all structures located in floodplains shall be elevated no lower than 1 foot above base flood elevation. Non-residential structures located in floodplains may be flood proofed in lieu of being elevated provided that all areas of the structure below the required elevation are watertight. In addition, where the entire site is in a floodprone area or an insufficient buildable area on the non-floodprone portion of site exists, all structures located in areas of shallow flooding shall be elevated at least 2 feet above the highest adjacent grade.

3) *Policy V.2.8*

Where the alternative of clustering all structures on the non-wetland portion of the site exists, the County shall conserve wetlands as defined in the environmentally sensitive land policy of the Future Land Use Element of this Comprehensive Plan by prohibiting any development which alters the natural function of wetlands and regulating mining operations, as provided for in the mining policy contained within the Future Land Use Element of this Comprehensive Plan, within wetlands. Mitigation efforts shall be required for activities which alter the natural functions of wetlands in accordance with Chapter 40B-400, Florida Administrative Code, in effect upon the adoption of this policy. Such mitigation shall result in no net loss of wetlands and all restored or created wetlands shall be of the same ecological type, nature and function. Where the alternative of clustering all structures on the non-wetland portion of a site does not exist, the County shall allow only minimal residential development activity in those areas defined as wetlands within this Comprehensive Plan and such development

activity shall conform to the density requirement for the land use classification applicable to the location of the wetland. However, in no case shall residential dwelling unit density be greater than 1 dwelling unit per 5 acres. In addition, such development activity shall comply with the following densities and performance standards. 1. Residences and any support buildings shall be elevated no lower than 1 foot above the highest recorded flood level in the wetland. If flooding data is not available, residences and any support buildings shall be built at least 2 feet above the highest seasonal water level.

## **B. Columbia County Land Development Regulations**

### **a) Article 4 – Zoning Regulations**

#### ***1) Section 4.3 Conservation, 4.3.7 and several areas throughout Article 4 reference the details on the minimum feet in the setbacks***

Special provisions. The location of any structure (except permitted docks, walkways, and piers) shall be set back a minimum of 35 feet from wetlands. The location of any structure (except permitted docks, walkways, and piers) shall be set back a minimum of 75 feet from the Suwannee, Santa Fe and Ichetucknee Rivers. The location of any structure (except permitted docks, walkways, and piers) shall be set back a minimum of 35 feet from all other perennial rivers, streams and creeks.

#### ***2) Section 4.4 "ESA" environmentally sensitive areas, 4.4.1***

Districts and intent. The "ESA" environmentally sensitive area category includes three zone districts: ESA-1, 2, 3. Lands in these districts are considered in need of special planning and treatment regarding land development regulation. These are not preservation districts, but land uses permitted within these districts are to provide mitigating measures to protect the natural functions of areas which are limited to the planning and treatment of land development within the 100-year floodplain of the Ichetucknee Springs State Park, O'Leno State Park, Osceola National Forest, Pinhook Swamp, Suwannee River Corridor, Santa Fe River Corridor and Ichetucknee Trace, as designated within the Federal Emergency Management [Agency] flood insurance rate map for the county, as amended. These regulations prohibit intensive residential, intensive recreational and intensive agricultural uses and prohibit industrial and commercial development within the 100-year floodplain of the areas designated as environmentally sensitive areas.

#### ***3) Section 4.17 Industrial, 4.17.5***

Special exceptions 2. Bulk storage yards including bulk storage of flammable liquids, subject to provisions of local and state fire codes.

#### ***4) Section 4.18 "PRD" Planned Residential Development. 4.18.6***

Procedure for approval of a planned residential development. e. A site analysis map at the same scale as the preliminary development plan described below shall be submitted indicating flood prone areas, areas with slopes greater than five percent, areas of soils which are marginally suited for development purposes and tree cover.

b) Article 5 – Subdivision Regulations

1) *Section 5.2 Policy, Section 5.2.2.6*

Land to be subdivided shall prevent periodic and seasonal flooding by providing adequate protective flood control and drainage facilities.

2) *Section 5.5 Character of the Land*

Land which the Board of County Commissioners finds to be unsuitable for subdivision development due to flooding, improper drainage, steep slopes, rock formations, adverse earth formations or topography, utility easements, or other features which will reasonably be harmful to the safety, health, and general welfare of the present or future inhabitants of the subdivision and/or its surrounding areas shall not be subdivided or developed unless adequate methods are formulated by the sub divider and approved by the Board of County Commissioners to solve the problems created by the unsuitable land conditions.

3) *Section 5.33.14*

Required information on preliminary plat Natural features, including lakes, marshes or swamps, water courses, wooded areas, and land subject to the 100-year flood as defined by the Federal Emergency Management Agency official flood maps.

4) *Section 5.36.7*

Location of streams, lakes and swamps, and land subject to the 100-year flood as defined by the Federal Emergency Management Agency. Where no flood elevation is determined the area shall be determined by sub dividers engineer.

c) Article 7 – Stormwater Management Regulations

1) *Section 7.1 – Relationship to other stormwater management requirements.*

2) *Section 7.1.2. General exemptions.*

The following development activities are exempt from these land development regulations, except that steps to control erosion and sedimentation must be taken for all development and any development exempt from chapter 62 or 40B-4 as cited above which is adjacent to or drains into a surface water, canal, or stream, or which empties into a sinkhole, shall first allow the runoff to enter a grassed swale or other conveyance designed to percolate 80 percent of the runoff from a three year, one hour design storm within seventy- two (72) hours after a storm event. 8. Action taken under emergency conditions to prevent imminent harm or danger to persons, or to protect property from imminent fire, violent storms, hurricanes, or other hazards. A report of the emergency action shall be made to the board of county commissioners and water management district as soon as practicable.

d) Article 8 – Floodplain Management

1) *Section 8.1 General, Section 8.1.1*

These regulations shall be known as the Floodplain Management Ordinance of Columbia County, hereinafter referred to as "this ordinance."

2) *Section 8.1.2*

The provisions of this ordinance shall apply to all development that is wholly within or partially within any flood hazard area, including but not limited to the subdivision of land; filling, grading, and other site improvements and utility installations; construction, alteration, remodeling, enlargement, improvement, replacement, repair, relocation or demolition of buildings, structures, and facilities that are exempt from the Florida Building Code; placement, installation, or replacement of manufactured homes and manufactured buildings; installation or replacement of tanks; placement of recreational vehicles; installation of swimming pools; and any other development.

3) *Section 8.1.3*

The purposes of this ordinance and the flood load and flood resistant construction requirements of the Florida Building Code are to establish minimum requirements to safeguard the public health, safety, and general welfare and to minimize public and private losses due to flooding through regulation of development in flood hazard areas to: 1.Minimize unnecessary disruption of commerce, access and public service during times of flooding; 2.Require the use of appropriate construction practices in order to prevent or minimize future flood damage; 3.Manage filling, grading, dredging, mining, paving, excavation, drilling operations, storage of equipment or materials, and other development which may increase flood damage or erosion potential; 4.Manage the alteration of flood hazard areas, watercourses, and shorelines to minimize the impact of development on the natural and beneficial functions of the floodplain; 5.Minimize damage to public and private facilities and utilities; 6.Help maintain a stable tax base by providing for the sound use and development of flood hazard areas; 7. Minimize the need for future expenditure of public funds for flood control projects and response to and recovery from flood events; and 8.meet the requirements of the National Flood Insurance Program for community participation as set forth in Title 44 Code of Federal Regulations, Section 59.22.

e) Article 12 - Appeals, Special Exceptions, Variances and Interpretations

1) *Section 12.3 – Variances, General 12.3.3*

Variances to flood damage prevention regulations. The board of county commissioners may permit modifications in the minimum standards of design under the following conditions: 4. In passing upon such variance applications, the board of county commissioners shall consider all technical evaluations, all relevant factors, all standards specified within article 8 of these land development regulations, and:(a)The danger that materials may be swept onto other land to the injury of others; (b)The danger to life and property due to flooding or erosion damage; (c) The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage

on the individual owner; (d)The importance of the services provided by the proposed facility to the community; (e) The necessity of the facility to a waterfront location, in the case of a functionally dependent facility; (f)The availability of alternative locations, not subject to flooding or erosion damage, for the proposed use; (g)The compatibility of the proposed use with existing and anticipated development, (h) The relationship of the proposed use to the county's comprehensive plan and floodplain management program for the county; (i)The safety of access to the property in times of flood for ordinary and emergency vehicles; (j)The expected heights, velocity, duration, rate of rise and sediment transport of the flood waters and the effects of wave action, if applicable, expected at the site, and; (k) The costs of providing governmental services during and after flood conditions including maintenance and repair of public utilities and facilities such as sewer, gas, electrical, and water systems, and streets and bridges. 6. There is no substantial increase in flood hazard or flood damage potential, if certified by a professional engineer registered in the State of Florida.

### **C. City of Lake City Comprehensive Plan**

#### **a) Goal, Objectives and Policies Goal I**

In recognition of the importance of enhancing the quality of life in the City, direct development to those areas which have in place, or have agreements to provide, service capacity to accommodate growth in an environmentally acceptable manner.

##### *1) Objective I.2*

The City shall adopt performance standards which regulate the location of land development consistent with topography and soil conditions and the availability of facilities and services.

##### *2) Policy I.2.1*

The City shall restrict development within unsuitable areas due to flooding, improper drainage, steep slopes, rock formations and adverse earth formations by the following design standards for arrangement of development.

##### *3) Policy I.4.1*

The City's land development regulations shall continue to contain specific and detailed provisions to manage future growth and development to implement the Comprehensive Plan which shall contain at a minimum the following provisions to 4. Regulate areas subject to seasonal and periodic flooding and provide for drainage and stormwater management.

##### *4) Objective I.6*

The City shall continue to include within the portion regarding the report and recommendation of the Planning and Zoning Board on amendments to such regulations, that such report shall address whether the proposed amendment will be a deterrent to the improvement or development of adjacent land uses and it shall be concluded by the local governing body, based upon such report and prior to approval

of the amendment, that the granting of the amendment will not adversely impact adjacent land uses.

5) *Policy 1.64*

The City shall participate in the National Flood Insurance Program and regulate development and the installation of utilities in flood hazard areas in conformance with the programs requirements.

6) *Goal V*

Conserve through appropriate use and protection the resources of the City to maintain the integrity of natural functions.

7) *Policy V.2.6*

The City shall continue to require all new development to maintain the natural functions of natural flood storage, pollution alternatives, in wetlands and 100- year floodprone areas.

8) *Policy V.2.7*

The City shall participate in the National Flood Insurance Program and regulate development and the installation of utilities in flood hazard areas in conformance with the program requirements. Further, the City shall require all structures to be clustered on the non-floodprone portion of a site. Where the entire site is in a floodprone area, or an insufficient buildable area on the non-flood prone portion of a site exists, all structures, located in flood plains, shall be elevated no lower than 1 foot above base flood elevation. Non-residential structures located in floodplains, may be flood proofed in lieu of being elevated provided that all areas of the structure below the required elevation are watertight. In addition, where the entire site is in a floodprone area or an insufficient buildable area on the non- floodprone portion of site exists, all structures, located in areas of shallow flooding shall be elevated at least two feet above the highest adjacent grade.

9) *Policy V.4.5*

The City shall address, during the development review process, the mitigation of development activities within environmentally sensitive areas, which include but are not limited to those areas identified as environmentally sensitive areas, on the Future Land Use Plan Map of this Comprehensive Plan to ensure that the possible impacts created by the proposed development activity will not significantly alter the natural functions of these significant natural resources. All new development will maintain the natural functions of environmentally sensitive areas, including but not limited to wetlands and 100-year floodplains so that the long term environmental integrity and economic impact and recreation value of these areas is maintained.

10) *Objective VIII. 4*

The City shall maintain an annual capital improvements budgeting process to manage the fiscal resources of the City, so that needed capital improvements, identified within



the Comprehensive Plan, are provided for existing and future development and re-development.

*11) Policy VIII. 4.7*

The City shall replace or renew community facility plants damaged due to storm surge or flood only where such facility can meet minimum requirements for flood proofing.

**D. City of Lake City Land Development Regulations**

a) Article Five. Subdivision Regulations

*1) Section 5.2 Policy 5.2.2*

Land to be subdivided shall 6. Prevent periodic and seasonal flooding by providing adequate protective flood control and drainage facilities.

b) Article Eight. Flood Damage Prevention Regulations

*1) Section 8.1*

Standards for Reducing Flood Hazards in the Area of Special Flood Hazard. The standards in this Article apply to all development within the Areas of Special Flood Hazard as shown on the Federal Emergency Management Agency official flood maps. In all areas of special flood hazard, the following provisions are required 4. New construction and substantial improvements shall be constructed by methods and practices that minimize flood damage.

*2) Section 8.3*

Standards for Nonresidential Construction Structures located in all A-zones may be flood-proofed in lieu of being elevated provided that all areas of the structure below the required elevation are watertight with walls substantially impermeable to the passage of water and use structural components having the capability of resisting hydrostatic and hydrodynamic loads and the effect of buoyancy.

*3) Section 8.7*

Standards for Unnumbered A Zones Located within the A-zone areas of special flood hazard, areas denoted with the letter "A" with no suffix are referred to as "unnumbered A zones". These are areas where special flood hazards exist but where no base flood data has been provided.

*4) Section 8.8*

Standards for Areas of Shallow Flooding The following standards apply to areas of shallow flooding located within the area of special flood hazard. 1. The lowest floor of all new construction of and substantial improvements to residential structures shall be elevated above the highest adjacent grade at least as high as the depth number specified in feet on the Flood Insurance Rate Map (at least two (2) feet if no depth number is specified.)

5) *Section 8.13*

Special Provisions for Subdivisions An applicant requesting the plat approval of a major or minor subdivision shall be informed by the Land Development Regulations Administrator of the use and condition restrictions contained within this Article and Article 5 of these land development regulations. Lands which lie within any "flood hazard area" as shown on the Federal Emergency Management Agency, official flood maps, shall be subdivided and developed only if 1. All such proposals are consistent with the need to minimize flood damage. 8.All agreements for deed, purchase agreements, leases or other contracts for sale or exchange of lots within an area of special flood hazard and all instruments conveying title to lots within an area of special flood hazard prominently publish the following flood hazard warning in the document: FLOOD HAZARD WARNING This property may be subject to flooding. You should contact the City Land Development Regulation Administrator and obtain the latest information about flood elevations and restrictions before making plans for the use of this property.

6) *Section 8.15*

Additional Duties of the Land Development Regulation Administrator related to Flood Insurance and Flood Control. The Land Development Regulation Administrator shall 1. For the purpose of the determination of applicable flood insurance risk premium rates within Zone A on the City's Flood Insurance Rate Map published by the Federal Emergency Management Agency.

7) *Section 11.3 Variances, General Variances to Flood Damage Prevention Regulations 4*

In passing upon such variance applications, the City Council shall consider all technical evaluations, all relevant factors, all standards specified within Article 8 of these land development regulations, and a. The danger that materials may be swept onto other land to the injury of others; b.The danger to life and property due to flooding or erosion damage; c.The susceptibility of the proposed facility and its contents to flood damage and the effect of such damage on the individual owner; h.The relationship of the proposed use to the Comprehensive Plan and floodplain management program for the City; i.The safety of access to the property in times of flood for ordinary and emergency vehicles; and k.The costs of providing governmental services during and after flood conditions including maintenance and repair of public utilities and facilities such as sewer, gas, electrical, and water systems, and streets and bridges.

**E. Town of Ft. White Land Development Code**

a) Section 5.05 Floodplain Management

These regulations and the flood load and flood resistant construction requirements of the Florida Building Code are to establish minimum requirements to safeguard the public health, safety, and general welfare and to minimize public and private losses due to flooding through regulation of development in flood hazard areas to:

- Minimize unnecessary disruption of commerce, access and public service during times of flooding;
- Require the use of appropriate construction practices in order to prevent or minimize future flood damage;
- Manage filling, grading, dredging, mining, paving, excavation, drilling operations, storage of equipment or materials, and other development which may increase flood damage or erosion potential;
- Manage the alteration of flood hazard areas, watercourses, and shorelines to minimize the impact of development on the natural and beneficial functions of the floodplain;
- Minimize damage to public and private facilities and utilities;
- Help maintain a stable tax base by providing for the sound use and development of flood hazard areas;
- Minimize the need for future expenditure of public funds for flood control projects and response to and recovery from flood events; and
- Meet the requirements of the National Flood Insurance Program for community participation as set forth in the Title 44 Code of Federal Regulations, Section 59.22.

1) *5.05.02 Applicability B.*

Areas to which this ordinance applies. This ordinance shall apply to all flood hazard areas within the Town of Fort White, as established in subsection 5.05.02.C of these regulations. C. Basis for establishing flood hazard areas. The Flood Insurance Study for Columbia County, Florida, and incorporated areas dated February 4, 2009, and all subsequent amendments and revisions, and the accompanying Flood Insurance Rate Maps (FIRM), and all subsequent amendments and revisions to such maps, are adopted by reference as a part of this ordinance and shall serve as the minimum basis for establishing flood hazard areas. Studies and maps that establish flood hazard areas are on file at the Town of Fort White, 118 SW Wilson Springs Road, Fort White, Florida.

2) *5.05.03 Duties and Powers of the Floodplain Administrator A. Designation.*

The Town Clerk is designated as the Floodplain Administrator. The Floodplain Administrator may delegate performance of certain duties to other employees.

B. General. The Floodplain Administrator is authorized and directed to administer and enforce the provisions of these regulations. The Floodplain Administrator shall have the authority to render interpretations of these regulations consistent with the intent and purpose of these regulations and may establish policies and procedures in order to clarify the application of its provisions. Such interpretations, policies, and procedures shall not have the effect of waiving requirements specifically provided in this ordinance without the granting of a variance. Applications and permits. The Floodplain Administrator, in coordination with other pertinent offices of the community, shall:

- Review applications and plans to determine whether proposed new development will be located in flood hazard areas;
- Review applications for modification of any existing development in flood hazard areas for compliance with the requirements of these regulations;
- Interpret flood hazard area boundaries where such interpretation is necessary to determine the exact location of boundaries; a person contesting the determination shall have the opportunity to appeal the interpretation;
- Provide available flood elevation and flood hazard information;
- Determine whether additional flood hazard data shall be obtained from other sources or shall be developed by an applicant;
- Review applications to determine whether proposed development will be reasonably safe from flooding;
- Issue floodplain development permits or approvals for development other than buildings and structures that are subject to the Florida Building Code, including buildings, structures and facilities exempt from the Florida Building Code, when compliance with this ordinance is demonstrated, or disapprove the same in the event of noncompliance; and
- Coordinate with and provide comments to the Building Official to assure that applications, plan reviews, and inspections for buildings and structures in flood hazard areas comply with the applicable provisions of these regulations.

**F. Columbia County Emergency Management Plan (CEMP)**

The Columbia County Comprehensive Emergency Management Plan (CEMP), updated in June 2023, was reviewed and referenced in this LMS planning cycle.

**G. Suwannee River Water Management District (SRWMD) Strategic Plan 2020 - 2024**

a) Flood Protection Section

SRWMD works with the FDOT, FDEM, local governments, and landowners to implement regional and local flood protection and flood control projects. Such projects assist local governments to manage, maintain, or expand stormwater infrastructure to better capture runoff, increase stormwater storage, and reduce peak discharge rates.

Also the District provides information to the public to reduce and mitigate flood risks. The District partners with Federal Emergency Management Agency (FEMA) to update floodplain maps to help the public make informed decisions that reduce risk to life and property. Further, SRWMD is the primary source of current flooding information for other agencies and the public, including real-time river levels and rainfall amounts, so that people can make well-informed property at risk.

Through the environmental resource permitting (ERP) Program, the District ensures that development does not result in flooding. Permit reviews are performed to prevent net loss of the 100-year floodplain or increases in flood levels. Permit evaluations also consider specific storm design conditions and potential impacts to upstream and downstream properties. Two Goals are outlined:

1) *Goal One – Reduce and Mitigate Flooding Risks, Strategies include:*

- Promote naturally occurring recharge by increasing water storage through hydrologic restoration
- Identify and study 100-year flood elevations of unstudied parcels/areas which are prone to flooding
- Identify unmet flood protection needs of local governments
- Conduct frequent river inspections for unpermitted activities and structures
- Communicate best available data on flood risk to stakeholders

2) *Goal Two – Encourage Non-Structural Flood Plain Management Approaches, Strategies include:*

- Maximize land acquisition and/or development restrictions of land within 100-year floodplain
- Seek opportunities and evaluate all land purchases for flood protection potential
- Coordinate with appropriate governmental entities on data sharing and consistency for flood forecasts
- Increase public awareness of flood protection tools, permit requirements, and flood risks
- Strategically partner with stakeholders to identify and implement flood projects
- Coordinate with FDEP to develop a consistent message to evaluate flood risk of single-family homes

SRWMD will measure progress towards the completion of individual and programmatic tasks contained within the aforementioned goals and strategies by tracking the completion of the planning, funding, construction, or implementation phases of the tasks and strategies. Achievements will be measured by the percent of acreage of riverine floodplain under protection; whether the District's cost-share programs have funded at least one flood control project each year; funding opportunities identified for the Dixie County surface water management projects; the acres of hydrologic restoration implemented and maintained, as well as the associated recharge benefits; and the number of compliance cases addressed, and trainings provided.

**H. FEMA Flood Insurance Rate Maps (FIRM) and Flood Insurance Study (FIS), effective date: February 4, 2009; revised November 2, 2018**

Revision details on the study:

Initial Countywide FIS Effective Date: February 4, 2009

Revised FIS Effective Date: November 2, 2018 – Add Base Flood Elevations, change zone designations, change Special Flood Hazard Areas, reflect updated topographic

information, update map format, add roads and road names, and to incorporate previously issued Letters of Map Amendment and to update corporate limits.

Physical Map Revision (PMR), Effective November 2, 2018:

For this PMR, updated analyses were included for the flooding sources shown in the following table, "Scope of Revision."

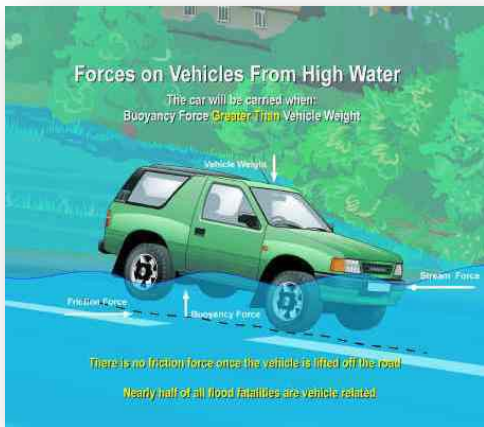
Scope of Revision for the Columbia County FIS

| <b><i>Flooding Source</i></b>             | <b><i>Limits of Revised or New Detailed Study</i></b>                                                       |
|-------------------------------------------|-------------------------------------------------------------------------------------------------------------|
| <i>Clay Hole Creek</i>                    | From approximately 3 miles upstream of Interstate 75 to approximately 2.6 miles downstream of Interstate 75 |
| <i>Deep Creek</i>                         | From approximately 0.84 miles upstream of US Highway 441 to its confluence with Suwannee River              |
| <i>Falling Creek</i>                      | From approximately 0.73 miles upstream of Triple Run Road to its confluence with Suwannee River             |
| <i>Falling Creek Tributary</i>            | From just upstream of Range Road to its confluence with Falling Creek                                       |
| <i>Gwen Lake</i>                          | Drainage area contributing to Gwen Lake                                                                     |
| <i>Lake Desoto</i>                        | Drainage area contributing to Lake Desoto                                                                   |
| <i>Lake Harper</i>                        | Drainage area contributing to Lake Harper                                                                   |
| <i>Lake Jeffery</i>                       | Drainage area contributing to Lake Jeffery                                                                  |
| <i>Robinson Creek</i>                     | From approximately 1.5 miles upstream of US Highway 441 to its confluence with Suwannee River               |
| <i>Unnamed Tributary to Falling Creek</i> | Drainage area contributing to Unnamed Tributary to Falling Creek Tributary                                  |
| <i>Watertown Lake</i>                     | Drainage area contributing to Watertown Lake                                                                |

## **APPENDIX F: FLOOD MITIGATION OUTREACH**

## Appendix F – Flood Mitigation Outreach

### FLOOD SAFETY MEASURES



#### TURN AROUND, DON'T DROWN

You can protect yourself from flood hazards by taking measures to ensure the safety of life and property before, during, and after a flood occurs.

##### Be prepared before a flood

✓ Copy your most important documents and store originals in a safe place outside the home. Take photos with your phone or camera of your most valuable possessions and store the copies with other important documents. Make an itemized list of other possessions. Store receipts for any expensive household items where they will not be destroyed.

##### Have an emergency plan

✓ Provide your insurance agent, employer, and family with emergency contact information. Set aside an emergency kit equipped with a large

flashlight, batteries, charging devices for phones, candles, waterproof matches and a battery operated radio. Make sure your cell phone is charged. Keep a 3-day supply of non-perishable food and water on hand.

##### Stay informed

- ✓ Sign up for your community's warning system. The Emergency Alert System (EAS) and National Oceanic and Atmospheric Administration (NOAA) Weather Radio also provide emergency alerts.
- ✓ Turn on a battery operated radio or television to get the latest emergency information. Continue listening to the radio for news about what to do, where to go, and places to avoid.

##### If evacuation becomes necessary, do so immediately

- ✓ Learn and practice the County's evacuation routes, shelter plans, and flash flood response. Be sure that you turn off all utility services at the main connection.

##### Do not walk or swim through flood waters

- ✓ Drowning is the number one cause of flood deaths, mostly during flash floods. Currents can be deceptive; six inches of moving water can knock you off your feet. If you walk in standing water, see how deep the water is by using a pole or stick.

##### Do not drive through a flooded area

- ✓ More people drown in their cars than anywhere else. Do not drive around road barriers; the road or bridges further down the road may be washed out. Two feet of moving water can sweep your car away.

##### Stay away from power lines and electrical wires

- ✓ The number two flood killer after drowning is electrocution. Electric current can travel through water. Report downed power lines to your Power Company or County Emergency Operations Center at (386) 719-7530.

##### Be alert for gas leaks

- ✓ Do not smoke or burn candles or lanterns. Gas is easily ignited. In a flood, be sure your gas is turned off by the gas company.

##### Don't leave pets behind

- ✓ Contact the Animal Shelter at (386) 752-3191 if you cannot take your pets with you to your next destination. Look out for animals, especially snakes
- ✓ Small animals may seek shelter in your home.

Visit [www.fema.gov](http://www.fema.gov) and [www.ready.gov](http://www.ready.gov) for more information.



## **APPENDIX G: MEETING DOCUMENTATION**

## Shayne Morgan

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**Subject:** Local Mitigation Strategy Meeting  
**Location:** Columbia County EOC, 263 NW Lake City Ave., Lake City, FL 32055

**Start:** Thu 12/8/2022 10:00 AM  
**End:** Thu 12/8/2022 11:30 AM

**Recurrence:** (none)

**Meeting Status:** Meeting organizer

**Organizer:** Shayne Morgan  
**Required Attendees:** Shayne Morgan; 'Andy Miles'; 'Bloodworth, Doc'; 'Bouie, Willie (Willie.Bouie@em.myflorida.com)'; Brandon Stubbs; 'Butler, Lola (Lola.Butler@dot.state.fl.us)'; Chad Williams; 'Clerk Town of Fort White'; Connie Brecheen; David Kraus; 'David Peaton (dpeaton@alachuacounty.us)'; 'Gerald Butler'; Jeff Crawford; Jeff Hampton; 'johnsond@lcfla.com'; 'Josh Wehinger (wehingerj@lcfla.com)'; 'Joyce.Davis@suwanneesherriff.com'; 'JPB@srwmd.org'; 'Judy Tatem (TatemJ@columbiak12.com)'; 'Justin Lazzara (Justin.Lazzara@em.myflorida.com)'; 'Keith O'Steen (osteenk@doacs.state.fl.us)'; Kevin Kirby; 'Land, Henry (Hamilton County EM Director)'; 'Lawrence.Barrett@fgc.edu'; 'Leslie.Ross-Pringle@va.gov'; 'Mark Hunter (mark.hunter@columbiasheriff.org)'; 'Martin Redmond (martin.redmond@myfwc.com)'; 'Mike Burroughs'; 'Pace, Kevin'; 'Pam Allen (pamallen56@hotmail.com)'; 'Paul Dyal'; 'Ralph Smith - Gilchrist County Emergency Management (rsmith@gcfr.org)'; 'Robert Holloway'; Ron Williams; 'Russell. Owens@va.gov (Russell.Owens@va.gov)'; 'Stew Lilker (StewLilker@columbiacountyobserver.com)'; Thomas Brazil; 'Tim Allen (allentc@unionsheriff.us)'; Timothy B. Murphy; 'Todd Widergren (widergren@columbiak12.com)'; 'Todd Wilson'; 'Tony Britt'; Troy Crews

**Optional Attendees:** Butler, Gerald; Smith, Dean

The next meeting of the Columbia County Local Mitigation Strategy Working group will be held on Wednesday, January 12, 2022 at 9:30 am. The public notice for the meeting is below. If you have any questions please do not hesitate to let me know.

---

The Columbia County Local Mitigation Strategy Working Group will meet at 10:00 am on Thursday December 8, 2022. This meeting will be held in the Columbia County Emergency Operations Center, 263 NW Lake City Avenue, Lake City, FL 32055. The County encourages any interested citizens and/or business owners to attend and provide input. The Working Group provides input in the preparation of the project list that is a part of the Columbia County Local Mitigation Strategy. This document serves as a plan to reduce the community's long term risk for protecting people and property from the effects of natural disasters and to build a safer and stronger community. Please contact Columbia County Emergency Management at (386) 758-1383 for more information or you can email me at (386) 758-1383

Sincerely,  
Shayne

**From:** [Shayne Morgan](#)  
**To:** ["Amber Brock \(amber.brock@dot.state.fl.us\)"; "Andy Miles"; "Bloodworth, Doc"; Brandon Stubbs; Chad Williams; "chris.volz@suwanneesherriff.com"; "Clerk Town of Fort White"; "David Kraus \(david\\_kraus@columbiacountyfla.com\)"; "David Peaton \(dpeaton@alachuacounty.us\)"; "Gerald Butler"; Jeff Crawford; "Jeff Hampton \(jeff@ccpafl.com\)"; "Jen Grice"; "Josh Wehinger \(wehingerj@lcfla.com\)"; "Joyce.Davis@suwanneesherriff.com"; "JPB@srwmd.org"; "Judy Tatem \(TatemJ@columbiak12.com\)"; "Keith O'Steen \(osteenk@doacs.state.fl.us\)"; "Kevin Kirby \(kevin\\_kirby@columbiacountyfla.com\)"; "Land, Henry \(Hamilton County EM Director\)"; "Lawrence.Barrett@fgc.edu"; "Mark Hunter \(mark.hunter@columbiasheriff.org\)"; "Martin Redmond \(martin.redmond@myfwc.com\)"; "Mike Burroughs"; "mike.mckee@fgc.edu"; "Pace, Kevin"; "Pam Allen \(pamallen56@hotmail.com\)"; "Paul Dyal"; "Ralph Smith - Gilchrist County Emergency Management \(rsmith@gcfr.org\)"; "Robert Holloway"; Ron Williams; "Stew Lilker \(StewLilker@columbiacountyobserver.com\)"; "Thomas Brazil \(tbrazil@columbiacountyfla.com\)"; "Thomas Henry \(Henryt@lcfla.com\)"; "Tim Allen \(allentc@unionsheriff.us\)"; Timothy B. Murphy; "Todd Widergren \(widergren@columbiak12.com\)"; "Todd Wilson"; "Tony Britt"; Troy Crews](#)  
**Cc:** [Traci Buzbee \(tsbuzbee@hotmail.com\)](#)  
**Subject:** Upcoming Local Mitigation Strategy meeting  
**Date:** Wednesday, December 29, 2021 11:18:00 AM

---

Good morning everyone,

The next meeting of the Columbia County Local Mitigation Strategy Working group will be held on Wednesday, January 12, 2022 at 9:30 am. The public notice for the meeting is below. If you have any questions please do not hesitate to let me know.

The Columbia County Local Mitigation Strategy Working Group will meet at 9:30 am on Wednesday, January 12, 2022. This meeting will be held in the Columbia County Emergency Operations Center, 263 NW Lake City Avenue, Lake City, FL 32055. The County encourages any interested citizens and/or business owners to attend and provide input. The Working Group provides input in the preparation of the project list that is a part of the Columbia County Local Mitigation Strategy. This document serves as a plan to reduce the community's long term risk for protecting people and property from the effects of natural disasters and to build a safer and stronger community. Please contact Columbia County Emergency Management at (386) 758-1383 for more information.

Sincerely,

Shayne Morgan, FPEM, FMI  
Director  
Columbia County Emergency Management  
263 NW Lake City Avenue  
Lake City, FL 32055  
Office Phone: (386) 758-1383  
Work Cell Phone: (386) 623-2248  
E-mail: [Shayne\\_morgan@columbiacountyfla.com](mailto:Shayne_morgan@columbiacountyfla.com)  
Fax: (386) 752-9644



Columbia County Emergency Management Sign-In Sheet

|                                         |  |           |                         |  |
|-----------------------------------------|--|-----------|-------------------------|--|
| Event/Incident/Meeting:                 |  | Date:     | 263 NW Lake City Avenue |  |
| Local Mitigation Strategy Working Group |  | 1-12-2022 | 9:30 am                 |  |



| Name                                                                          | Agency/Organization                | E-Mail Address                             | Phone Number   | INITIALS                                        | INITIALS | INITIALS | INITIALS |
|-------------------------------------------------------------------------------|------------------------------------|--------------------------------------------|----------------|-------------------------------------------------|----------|----------|----------|
| Shayne Morgan                                                                 | Columbia County EM                 | <u>Shayne_morgan@columbiacountyfla.com</u> | (386) 758-1383 | <i>Sm</i>                                       |          |          |          |
| Judy Tatem                                                                    | Columbia County School District    | <u>Tatenj@columbiak12.com</u>              | (386) 755-8192 |                                                 |          |          |          |
| Amber Brock                                                                   | Florida Dept. of Transportation    | <u>Amber.brock@dot.state.fl.us</u>         | 384-9161-7581  | <i>ad</i>                                       |          |          |          |
| Andy Miles                                                                    | <u>Lake City Police Dept.</u>      | <u>milesa@lcfla.com</u>                    |                |                                                 |          |          |          |
| Doc Bloodworth                                                                | Florida Forest Service             | <u>Doc.bloodworth@freshfromflorida.com</u> | 386-243-6228   | <i>DB</i>                                       |          |          |          |
| Brandon Stubbs                                                                | <del>Columbia County Planner</del> | <u>bstubbs@columbiacountyfla.com</u>       | 386-759-1119   | <i>BS</i>                                       |          |          |          |
| <i>Community Development Jennifer Dubose</i><br><i>Coordinator</i> Chris Volz |                                    |                                            |                | <i>Jenifae Dubose @ Columbia County fla.com</i> |          |          |          |
|                                                                               | Suwannee County EM                 | <u>Chris.volz@suwanneesheriff.com</u>      |                |                                                 |          |          |          |
| Town of Fort White                                                            | Town of Fort White                 | <u>Clerk@fortwhitefl.com</u>               |                |                                                 |          |          |          |
| David Peaton                                                                  | Alachua County EM                  | <u>dpeaton@alachuacounty.us</u>            |                |                                                 |          |          |          |
| Gerald Butler                                                                 | Lake City Police Dept.             | <u>ButlerG@lcflapd.com</u>                 |                |                                                 |          |          |          |
| Jeff Crawford                                                                 | Columbia County Fire               | <u>Jeff_crawford@columbiacountyfla.com</u> |                |                                                 |          |          |          |
| Jeff Hampton                                                                  | Columbia County Property Appraiser | <u>jeff@ccpafl.com</u>                     |                |                                                 |          |          |          |
| Jen Grice                                                                     | Alachua County EM                  | <u>jhorner@alachuacounty.us</u>            |                |                                                 |          |          |          |

EOC ACTIVATION: \_\_\_\_\_

CIC ACTIVATION: \_\_\_\_\_

MEETING/TRAINING: *X*



Columbia County Emergency Management Sign-In Sheet

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| Local Mitigation Strategy Working Group |  | 1-12-2022 | 9:30 am                 |



| Name             | Agency/Organization                                 | E-Mail Address                                                                           | Phone Number | INITIALS | INITIALS | INITIALS | INITIALS |
|------------------|-----------------------------------------------------|------------------------------------------------------------------------------------------|--------------|----------|----------|----------|----------|
| Josh Wehinger    | Lake City Fire                                      | <a href="mailto:wehingerj@lcfia.com">wehingerj@lcfia.com</a>                             |              |          |          |          |          |
| Joyce Davis      | Suwannee County EM                                  | <a href="mailto:Joyce.Davis@suwanneesheriff.com">Joyce.Davis@suwanneesheriff.com</a>     |              |          |          |          |          |
| Keith O'Steen    | Florida Dept. Ag<br>Consumer Serv.                  | <a href="mailto:osteenk@doacs.state.fl.us">osteenk@doacs.state.fl.us</a>                 |              |          |          |          |          |
| Kevin Kirby      | Columbia County Board<br>of County<br>Commissioners | <a href="mailto:Kevin_kirby@columbiacountyfla.com">Kevin_kirby@columbiacountyfla.com</a> |              |          |          |          |          |
| Henry Land       | Hamilton County EM                                  | <a href="mailto:hland@hamiltongov.org">hland@hamiltongov.org</a>                         |              |          |          |          |          |
| Lawrence Barrett | Florida Gateway College                             | <a href="mailto:Lawrence.Barrett@fgc.edu">Lawrence.Barrett@fgc.edu</a>                   |              |          |          |          |          |
| Mark Hunter      | Columbia County<br>Sheriff                          | <a href="mailto:Mark.hunter@columbiasheriff.org">Mark.hunter@columbiasheriff.org</a>     |              |          |          |          |          |
| Martin Redmond   | Fish and Wildlife                                   | <a href="mailto:Martin.redmond@myfwc.com">Martin.redmond@myfwc.com</a>                   |              |          |          |          |          |
| Mike Burroughs   | Florida Highway Patrol                              | <a href="mailto:michaelburroughs@flhsmv.gov">michaelburroughs@flhsmv.gov</a>             |              |          |          |          |          |
| Mike McKee       | Florida Gateway College                             | <a href="mailto:Mike.mckee@fgc.edu">Mike.mckee@fgc.edu</a>                               |              |          |          |          |          |
| Kevin Pace       | Florida Highway Patrol                              | <a href="mailto:KevinPace@flhsmv.gov">KevinPace@flhsmv.gov</a>                           |              |          |          |          |          |
| Pam Allen        | Hamilton County EM                                  | <a href="mailto:Pamallen56@hotmail.com">Pamallen56@hotmail.com</a>                       |              |          |          |          |          |
| Paul Dyal        | City of Lake City                                   | <a href="mailto:DyalP@lcfia.com">DyalP@lcfia.com</a>                                     |              |          |          |          |          |

EOC ACTIVATION: \_\_\_\_\_

CIC ACTIVATION: \_\_\_\_\_

MEETING/TRAINING:   X





Columbia County Emergency Management Sign-In Sheet

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| Local Mitigation Strategy Working Group |  | 1-12-2022 | 9:30 am                 |



| Name            | Agency/Organization                           | E-Mail Address                                                                                   | Phone Number | INITIALS | INITIALS | INITIALS | INITIALS |
|-----------------|-----------------------------------------------|--------------------------------------------------------------------------------------------------|--------------|----------|----------|----------|----------|
| Ralph Smith     | Glitchrist County EM                          | <a href="mailto:rsmith@gcfr.org">rsmith@gcfr.org</a>                                             |              |          |          |          |          |
| Robert Holloway | Columbia County Sheriff's Office              | <a href="mailto:Robert.holloway@columbiasheriff.org">Robert.holloway@columbiasheriff.org</a>     |              |          |          |          |          |
| Ron Williams    | Columbia County Board of County Commissioners | <a href="mailto:Ron_williams@columbiacountyfla.com">Ron_williams@columbiacountyfla.com</a>       |              |          |          |          |          |
| Stew Lilker     | Columbia County Observer                      | <a href="mailto:StewLilker@columbiacountyobserver.com">StewLilker@columbiacountyobserver.com</a> |              |          |          |          |          |
| Thomas Brazil   | Columbia County 9-1-1                         | <a href="mailto:tbrazil@columbiacountyfla.com">tbrazil@columbiacountyfla.com</a>                 |              |          |          |          |          |
| Thomas Henry    | City of Lake City                             | <a href="mailto:Henryt@lcfla.com">Henryt@lcfla.com</a>                                           |              |          |          |          |          |
| Todd Widergren  | Columbia County Schools                       | <a href="mailto:widergrent@columbiak12.com">widergrent@columbiak12.com</a>                       |              |          |          |          |          |
| Todd Wilson     | Lake City Reporter                            | <a href="mailto:twilson@lakecityreporter.com">twilson@lakecityreporter.com</a>                   |              |          |          |          |          |
| Tony Britt      | Lake City Reporter                            | <a href="mailto:tbritt@lakecityreporter.com">tbritt@lakecityreporter.com</a>                     |              |          |          |          |          |
| Troy Crews      | Columbia County Building and Zoning           | <a href="mailto:Troy_crews@columbiacountyfla.com">Troy_crews@columbiacountyfla.com</a>           |              |          |          |          |          |
|                 |                                               |                                                                                                  |              |          |          |          |          |
|                 |                                               |                                                                                                  |              |          |          |          |          |
|                 |                                               |                                                                                                  |              |          |          |          |          |

EOC ACTIVATION: \_\_\_\_\_

CIC ACTIVATION: \_\_\_\_\_

MEETING/TRAINING:   X



The Columbia County Local Mitigation Strategy Working Group will hold its next meeting at 9 am on Tuesday, December 12, 2023. The meeting will be held in the Columbia County Emergency Operations Center (EOC), 263 NW Lake City Avenue, Lake City, FL 32055. The County encourages any interested citizen(s) and/or business owners to attend and provide input as a part of this meeting. The Working Group provides input in the preparation of the project list that is part of the Columbia County Local Mitigation Strategy. This Document serves as a plan to reduce the community's long term risk for protecting people and property from the effects of natural disasters and to build a safer and stronger community. Please contact Columbia County Emergency Management (386) 758-1383 or by email at:

[Shayne\\_morgan@columbiacountyfla.com](mailto:Shayne_morgan@columbiacountyfla.com).

## Shayne Morgan

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**Subject:** 2023 Local Mitigation Strategy Meeting  
**Location:** Columbia County EOC, 263 NW Lake City Avenue, Lake City, FL 32055

**Start:** Tue 12/12/2023 9:00 AM  
**End:** Tue 12/12/2023 11:00 AM

**Recurrence:** (none)

**Meeting Status:** Meeting organizer

**Organizer:** Shayne Morgan  
**Required Attendees:** Shayne Morgan; Andy Miles; Bloodworth, Doc; Butler, Lola (Lola.Butler@dot.state.fl.us); Chad Williams; chris.volz@suwanneesherriff.com; Clerk Town of Fort White; David Kraus; David Peaton (dpeaton@alachuacounty.us); donna.burdett@redcross.org; Gary Pelletier; Gerald Butler; Glen Hammers (glen.hammers@em.myflorida.com); Jeff Crawford; Jeff Hampton; johnsond@lcfla.com; Josh Wehinger (wehingerj@lcfla.com); JPB@srwmd.org; Judy Tatem (TatemJ@columbiak12.com); Keith O'Steen (osteenk@doacs.state.fl.us); Kevin Kirby; Land, Henry (Hamilton County EM Director); Lawrence.Barrett@fgc.edu; Leslie.Ross-Pringle@va.gov; Lt. Timothy Kiss (timothy.kiss@myfwc.com); Mark Hunter (mark.hunter@columbiasheriff.org); Martin Redmond (martin.redmond@myfwc.com); Mike Burroughs; Pace, Kevin; Pam Allen (pamallen56@hotmail.com); Patrick James (Patrick.James@em.myflorida.com); Ralph Smith - Gilchrist County Emergency Management (rsmith@gcfr.org); Robert Holloway; Ron Williams; Russell. Owens@va.gov (Russell.Owens@va.gov); Staz Guntek; Stew Lilker (StewLilker@columbiacountyobserver.com); Thomas Brazil; Tim Allen (allentc@unionsheriff.us); Timothy B. Murphy; Todd Widergren (widergren@columbiak12.com); Todd Wilson; Tony Britt; Troy Crews; Kristin Lentz; Shane Overstreet

**Optional Attendees:** Butler, Gerald; Scott, Brian; Brown, Stephen; Brigitte Carrillo

This is our annual meeting of the Columbia County Local Mitigation Strategy Working Group. Attached is our project list, also if there are any projects that we would like to discuss and add, please bring them with you to the meeting.

If you have any questions please feel free to let me know.

Shayne Morgan, (386) 758-1383

**COLUMBIA COUNTY LMS UPDATE Kickoff Meeting Agenda**  
**November 7, 2024 @ 10:00am**  
**Virtual – WebEx**

**I. Welcome and Introductions**

**II. General LMS Committee Business Items**

1. 2025 Election of Officers
2. Other action items

**III. Discuss SOW and Update Process**

3. Review, update, and revise the Columbia County Local Mitigation Strategy (LMS) for compliance with state and federal standards.
  - a. FDEM Compliance Crosswalk Criteria
4. Update LMS Plan
  - a. Document the planning process
  - b. Update the county profile
  - c. Update the Hazard Risk and Vulnerability Assessment
    - i. Natural Hazard Risk and Vulnerability
  - d. Update the Mitigation Strategy
  - e. Update Plan Evaluation and Maintenance
  - f. Update Appendices (as appropriate)
    - i. LMS Project or Initiatives Master List
    - ii. Formalize process for adding projects
5. Update format and functionality
6. Include a completed LMS Crosswalk with notations
7. Provide support during the Local Hazard Mitigation Plan Review and Approval process.

**IV. Project Timeline**

1. 11/7/24: Initial Kick-Off Meeting
2. 11/7/24 – 1/31/25: Update LMS Plan Hazards and Vulnerability Analysis
3. 1/31/25: LMS Plan Hazards and Vulnerability Analysis modifications meeting
4. 2/14/25: Updated LMS Plan Hazards and Vulnerability Analysis
5. Date(s) TBD: LMS Working Group Meeting(s)
6. 3/14/25: Draft LMS Plan
7. 3/14/25: Draft LMS Modifications Meeting

8. 3/28/25: Draft LMS Plan review and comments due
9. 4/11/25: Updated Draft LMS Plan
10. 4/25/25: Formalize process for adding projects/initiatives
11. 5/9/25: Update LMS Project or Initiatives Master List
12. 5/23/25: Final LMS Plan presented
13. 6/15/24: LMS Plan submitted to the Florida Division of Emergency Management
  - a. Monitoring and support

**V. Next Steps/Action Items**

1. Update/Revisions to Hazard Identification and Vulnerability Assessment
  - a. Outreach (as necessary) to stakeholders to gather data/information
2. LMS Workgroup Meetings
3. Scheduling of other project timeline meetings

**COLUMBIA COUNTY LMS UPDATE Kickoff Meeting Minutes**  
**November 7, 2024 @ 10:00am**  
**Virtual – WebEx**

**I. Welcome and Introductions**

1. Attendees were welcomed and introduced themselves for the record

**II. General LMS Committee Business Items**

2. 2025 Election of Officers
  - a. Tim Kitchen made proposition for any interested parties to nominate themselves or be nominated for either the LMS Chair or Vice Chair positions; no nominations were made; Tim then made a motion to accept that Shayne Morgan remain the LMS Chair and Shane Overstreet to remain the Vice Chair; All members indicated approval by signaling aye and there were no objections; The motion was approved, and officers were confirmed for 2025

**III. SOW and LMS Update Process**

1. Tim discussed the review, update, and revision process for the Columbia County Local Mitigation Strategy (LMS) for compliance with state and federal standards.
  - a. Discussions included the completion of the FDEM Compliance Crosswalk Criteria
2. Tim then discussed the LMS Plan Update:
  - a. Document the planning process – It is required at part of the update to document the entire planning process to include plan distribution, modifications/edits, meeting coordination, public involvement, etc.
  - b. Update the county profile – Update the county profile to include updated information such as demographics and other pertinent information that provides the composition of the county
  - c. Update the Hazard Risk and Vulnerability Assessment
    - i. Right now, the LMS is focused on Natural Hazard Risk and Vulnerability; It was discussed if the group would like to see other hazards included such as Technological and/or Human-Caused; The group approved APC to recommend new hazards for incorporation
    - ii. It was discussed if the group would like to see the hazards ranked with numeric values as scored by the committee and it was approved
    - iii. Shane mentioned that the Community Wildfire Protection Plan (CWPP) should be approved and distributed in January
    - iv. The plan can be streamlined by looking at trends over time and eliminated historical data from prior to 2000, thus 2000 – 2025 shall be analyzed more in depth

- d. Update to the Mitigation Strategy (as appropriate)
- e. Update Plan Evaluation and Maintenance (as appropriate)
- f. Update Appendices (as appropriate)
  - i. LMS Project or Initiatives Master List
  - ii. Formalize process for adding projects
- 3. Update format and functionality
  - a. Will look to streamline the plan and make it more user/reader friendly; Will look at removed some items from the word document to be hosted in folders; items will still be compiled into a pdf for submission
- 4. APC will complete the LMS Crosswalk with notations
- 5. APC will provide support during the Local Hazard Mitigation Plan Review and Approval process
- 6. Shayne reminded the cities that upon approval by FDEM, the jurisdictions would need to adopt the plan before final adoption from the county
- 7. Would like to establish a quarterly meeting timeline
- 8. Shayne to provide the Clay Electric letter/project road map

#### **IV. Discussed the Project Timeline**

- 1. 11/7/24: Initial Kick-Off Meeting
- 2. 11/7/24 – 1/31/25: Update LMS Plan Hazards and Vulnerability Analysis
- 3. 1/31/25: LMS Plan Hazards and Vulnerability Analysis modifications meeting
- 4. 2/14/25: Updated LMS Plan Hazards and Vulnerability Analysis
- 5. Date(s) TBD: LMS Working Group Meeting(s)
- 6. 3/14/25: Draft LMS Plan
- 7. 3/14/25: Draft LMS Modifications Meeting
- 8. 3/28/25: Draft LMS Plan review and comments due
- 9. 4/11/25: Updated Draft LMS Plan
- 10. 4/25/25: Formalize process for adding projects/initiatives
- 11. 5/9/25: Update LMS Project or Initiatives Master List
- 12. 5/23/25: Final LMS Plan presented
- 13. 6/15/24: LMS Plan submitted to the Florida Division of Emergency Management
  - a. Monitoring and support

#### **V. Next Steps/Action Items**

- 1. Update/Revisions to Hazard Identification and Vulnerability Assessment
  - a. Outreach (as necessary) to stakeholders to gather data/information

2. LMS Workgroup Meetings (as required)
3. Scheduling of other project timeline meetings

**VI. Adjourn**

1. There being no further business, the meeting was adjourned.

**VII. Attendees**

2. Shayne Morgan – Columbia County EM
3. Garret Register – Lake City Police Department
4. Don Rosenthal – City of Lake City Manager
5. Ret Thompkins – Lake City Fire
6. Patrick James – Florida Division of Emergency Management
7. Bryan Gunter – Clay Electric Company
8. Chris Bryan – Clay Electric Company
9. Christopher Chagdes – APC
10. Heather Henderson – Suwannee County Emergency Management
11. Howard Bulthuis – Columbia County Sheriff's Office
12. Leroy Marshall – Suwannee River Water Management District
13. Tim Kitchen – APC
14. Troy Adams – Clay Electric Company

| Meeting Number | Meeting Start Time  | Meeting End Time    | Display Name                        | First Name | Last Name | Role     | Attendee Email                         | Join Time           | Leave Time          | Attendance | Connection  | Session Name                                                             |
|----------------|---------------------|---------------------|-------------------------------------|------------|-----------|----------|----------------------------------------|---------------------|---------------------|------------|-------------|--------------------------------------------------------------------------|
| Columbia       | 2024-11-07 11:46:10 | 2024-11-07 11:46:10 | 3867581125                          | N/A        | N/A       | attendee |                                        | 2024-11-07 11:46:10 | 2024-11-07 11:46:10 | 49 mins    | Other app   | Columbia County Local Mitigation Strategy (LMS) Update - Kickoff Meeting |
| Columbia       | 2024-11-07 11:46:10 | 2024-11-07 11:46:10 | Bryan Gunter (CEC)                  | N/A        | N/A       | attendee | bgunter@clayelectric.com               | 2024-11-07 11:46:10 | 2024-11-07 11:46:10 | 40 mins    | Desktop app | Columbia County Local Mitigation Strategy (LMS) Update - Kickoff Meeting |
| Columbia       | 2024-11-07 11:46:10 | 2024-11-07 11:46:10 | Call-in User_1                      | N/A        | N/A       | attendee |                                        | 2024-11-07 11:46:10 | 2024-11-07 11:46:10 | 39 mins    | Other app   | Columbia County Local Mitigation Strategy (LMS) Update - Kickoff Meeting |
| Columbia       | 2024-11-07 11:46:10 | 2024-11-07 11:46:10 | Chris Bryan (CEC)                   | N/A        | N/A       | attendee | cbryan@clayelectric.com                | 2024-11-07 11:46:10 | 2024-11-07 11:46:10 | 36 mins    | Desktop app | Columbia County Local Mitigation Strategy (LMS) Update - Kickoff Meeting |
| Columbia       | 2024-11-07 11:46:10 | 2024-11-07 11:46:10 | Christopher Chagdes                 | N/A        | N/A       | attendee | chris@advanced-plan.com                | 2024-11-07 11:46:10 | 2024-11-07 11:46:10 | 14 mins    | Desktop app | Columbia County Local Mitigation Strategy (LMS) Update - Kickoff Meeting |
| Columbia       | 2024-11-07 11:46:10 | 2024-11-07 11:46:10 | Christopher Chagdes                 | N/A        | N/A       | attendee | chris@advanced-plan.com                | 2024-11-07 11:46:10 | 2024-11-07 11:46:10 | 100 mins   | Desktop app | Columbia County Local Mitigation Strategy (LMS) Update - Kickoff Meeting |
| Columbia       | 2024-11-07 11:46:10 | 2024-11-07 11:46:10 | City of Lake City                   | N/A        | N/A       | attendee | johnsond@lcfla.com                     | 2024-11-07 11:46:10 | 2024-11-07 11:46:10 | 47 mins    | Web app     | Columbia County Local Mitigation Strategy (LMS) Update - Kickoff Meeting |
| Columbia       | 2024-11-07 11:46:10 | 2024-11-07 11:46:10 | Heather Henderson (Suw Co EM)       | N/A        | N/A       | attendee | heather.henderson@suwanneesherriff.com | 2024-11-07 11:46:10 | 2024-11-07 11:46:10 | 26 mins    | Desktop app | Columbia County Local Mitigation Strategy (LMS) Update - Kickoff Meeting |
| Columbia       | 2024-11-07 11:46:10 | 2024-11-07 11:46:10 | Howard                              | N/A        | N/A       | attendee | howard.bulthuis@columbiasheriff.org    | 2024-11-07 11:46:10 | 2024-11-07 11:46:10 | 43 mins    | Web app     | Columbia County Local Mitigation Strategy (LMS) Update - Kickoff Meeting |
| Columbia       | 2024-11-07 11:46:10 | 2024-11-07 11:46:10 | Leroy Marshall                      | N/A        | N/A       | attendee | lrm@srwmd.org                          | 2024-11-07 11:46:10 | 2024-11-07 11:46:10 | 11 mins    | Mobile app  | Columbia County Local Mitigation Strategy (LMS) Update - Kickoff Meeting |
| Columbia       | 2024-11-07 11:46:10 | 2024-11-07 11:46:10 | Leroy Marshall                      | N/A        | N/A       | attendee | lrm@srwmd.org                          | 2024-11-07 11:46:10 | 2024-11-07 11:46:10 | 28 mins    | Desktop app | Columbia County Local Mitigation Strategy (LMS) Update - Kickoff Meeting |
| Columbia       | 2024-11-07 11:46:10 | 2024-11-07 11:46:10 | Ret Tompkins                        | N/A        | N/A       | attendee | tompkinsr@lcfla.com                    | 2024-11-07 11:46:10 | 2024-11-07 11:46:10 | 48 mins    | Web app     | Columbia County Local Mitigation Strategy (LMS) Update - Kickoff Meeting |
| Columbia       | 2024-11-07 11:46:10 | 2024-11-07 11:46:10 | Shayne Morgan -- Columbia County EM | N/A        | N/A       | attendee | shayne_morgan@columbiacountyfla.com    | 2024-11-07 11:46:10 | 2024-11-07 11:46:10 | 59 mins    | Web app     | Columbia County Local Mitigation Strategy (LMS) Update - Kickoff Meeting |
| Columbia       | 2024-11-07 11:46:10 | 2024-11-07 11:46:10 | Tim Kitchen                         | Tim        | Kitchen   | host     | tim@advanced-plan.com                  | 2024-11-07 11:46:10 | 2024-11-07 11:46:10 | 114 mins   | Desktop app | Columbia County Local Mitigation Strategy (LMS) Update - Kickoff Meeting |
| Columbia       | 2024-11-07 11:46:10 | 2024-11-07 11:46:10 | Troy Adams                          | N/A        | N/A       | attendee | tadams@clayelectric.com                | 2024-11-07 11:46:10 | 2024-11-07 11:46:10 | 48 mins    | Desktop app | Columbia County Local Mitigation Strategy (LMS) Update - Kickoff Meeting |



**COLUMBIA COUNTY LMS**  
**HAZARD AND VULNERABILITY ASSESSMENT Meeting Agenda**  
**March 13, 2025 @ 1:30pm**  
**Virtual – WebEx**

- I. Welcome and Introductions**
- II. General LMS Committee Business Items**
- III. Hazard and Vulnerability Crosswalk**
- IV. Hazard Identification and Vulnerability Assessment Review**
  - 1. Methodology
  - 2. Hazard Profile Updates
    - a. Description
    - b. Location and Extent
    - c. Previous Occurrences
    - d. Probability of Future Events
    - e. Vulnerability of Future Events
- V. Project Timeline**
  - 1. 3/13/25: LMS Plan Hazards and Vulnerability Analysis modifications meeting
  - 2. 3/27/25: Updated LMS Plan Hazards and Vulnerability Analysis
  - 3. Date(s) TBD: LMS Working Group Meeting(s)
  - 4. 4/11/25: Draft LMS Plan
  - 5. 4/18/25: Draft LMS Modifications Meeting**
  - 6. 5/2/25: Draft LMS Plan review and comments due
  - 7. 5/9/25: Updated Draft LMS Plan
  - 8. 5/16/25: LMS Meeting - Formalize process and update LMS Project or Initiatives Master List**
  - 9. 5/30/25: Final LMS Plan submitted
  - 10. 6/13/24: LMS Plan submitted to the Florida Division of Emergency Management
    - a. Monitoring and support
- VI. Next Steps/Action Items**
  - 1. Update/Revisions to Hazard Identification and Vulnerability Assessment
  - 2. Update/Revisions to other LMS Plan elements
  - 3. LMS Workgroup Meetings
  - 4. Scheduling of other project timeline meetings

**COLUMBIA COUNTY LMS**  
**HAZARD AND VULNERABILITY ASSESSMENT Meeting Agenda**  
**March 13, 2025 @ 1:30pm**  
**Virtual – WebEx**

**I. Welcome and Introductions**

1. The meeting focused on updating the LMS with the latest hazard identification and risk assessments to ensure a more operational and streamlined emergency management plan.
2. Participants (in person and virtual) provided name and agency to awareness

**II. Hazard and Vulnerability Crosswalk**

1. Participants reviewed the created crosswalk to see the recommended hazards in relation to the current CEMP and LMS

**III. Hazard Identification and Vulnerability Assessment Review**

1. Methodology
  - a. APC revised the LMS methodology to better identify jurisdictional risk
    - i. Risk = Probability \* Severity
    - ii. Probability – likelihood to occur
    - iii. Severity – Human Impacts, Property Impacts, Environmental Impacts, Programmatic Impacts
  - b. Participants reviewed each of the Hazard Profiles below and then scored them based on data and subject matter expertise
2. Each Hazard Profile was updated with the following structure
  - a. Description
  - b. Location and Extent
  - c. Previous Occurrences
  - d. Probability of Future Events
  - e. Vulnerability of Future Events
3. A summary of the Hazard Profiles includes:
  - a. Hurricanes & Tropical Storms (Risk – 83%)
    - i. Data from NOAA and Florida Division of Emergency Management (FDEM) was used to assess historical occurrences and trends.
    - ii. Recent storms suggest an increasing frequency, with potential impacts on human safety, infrastructure, and economic stability.
  - b. Thunderstorms, Wind, and Lightning (Risk 42%)

- i. High frequency of thunderstorms with moderate property damage potential.
  - ii. Notable impact on power outages, often lasting from hours to days.
- c. Wildfires (Risk – 33%)
  - i. Historically occurring every 6-10 years, but recent trends indicate increasing frequency (e.g., 2013, 2017, 2023).
  - ii. Risk is highest in wildland-urban interface areas.
- d. Tornadoes (Risk – 50%)
  - i. Occur approximately every 1-5 years, with recent increases in frequency.
  - ii. Vulnerability analysis shows that mobile homes and older structures are at higher risk.
- e. Hail (Risk – 8%)
  - i. Occurs every 1-5 years with minimal injuries reported.
  - ii. Property and crop damage are typically minor.
- f. Flooding (Risk – 33%)
  - i. FEMA flood maps were reviewed to assess flood-prone areas.
  - ii. Increased hurricane activity has led to more frequent flooding.
  - iii. Home buyout programs for frequently flooded properties were discussed.
  - iv. Look at addressing bridges
- g. Drought (Risk – 42%)
  - i. Occurs in cyclical patterns every 4-5 years.
  - ii. Has significant environmental and agricultural impacts, including reduced water flow levels.
- h. Extreme Heat (Risk – 33%)
  - i. Increasing trend of high-temperature days (21-34 days per year over 95°F).
  - ii. Poses risks to vulnerable populations (elderly, children, outdoor workers).
- i. Winter Storms & Freeze Events (Risk – 50%)
  - i. Notable freezes in 2010, 2016, 2018, and 2025.
  - ii. School closures and road safety issues (icy bridges) were discussed.
- j. Sinkholes (Risk – 42%)
  - i. Moderate risk based on geological data.

- ii. Property damage potential is significant, though no major injuries have been reported.
- k. Epidemics & Pandemics (Risk – 33%)
  - i. Discussed historical and recent outbreaks (e.g., COVID-19, flu upticks).
  - ii. Increased monitoring and preparedness measures suggested.
- l. Hazardous Materials Incidents (Risk – 33%)
  - i. 53 Tier 2 facilities in Columbia County with hazardous substances.
  - ii. Transportation and pipeline hazards were noted as key risks.
- m. Cyber Attacks (Risk – 50%)
  - i. Daily cyber threats pose risks to government and business operations.
  - ii. Previous attacks (e.g., city of Lake City paying ransom) highlighted as concerns.
- n. Civil Disturbances (Risk – 17%)
  - i. Low probability but potential for impact on government operations and businesses.
- o. Terrorism (Risk – 19%)
  - i. Assessed as a low-risk but high-impact hazard if it were to occur.
- p. Prolonged Utility Outages (Risk – 33%)
  - i. Includes power grid disruptions from storms, accidents, or cyber-attacks.
  - ii. Increasing frequency due to extreme weather events.
- q. Mass Casualty Events (Risk – 42%)
  - i. Considered as a broad category encompassing transportation accidents, large-scale disasters, or coordinated attacks.

#### IV. Projected Project Timeline

1. Date(s) TBD: LMS Working Group Meeting(s)
2. 4/11/25: Draft LMS Plan
- 3. 4/18/25: Draft LMS Modifications Meeting**
4. 5/2/25: Draft LMS Plan review and comments due
5. 5/9/25: Updated Draft LMS Plan
- 6. 5/16/25: LMS Meeting - Formalize process and update LMS Project or Initiatives Master List**
7. 5/30/25: Final LMS Plan submitted
8. 6/13/24: LMS Plan submitted to the Florida Division of Emergency Management
  - a. Monitoring and support

**V. Next Steps/Action Items**

1. Update/Revisions to Hazard Identification and Vulnerability Assessment
2. Update/Revisions to other LMS Plan elements
3. LMS Workgroup Meetings
4. Scheduling of other project timeline meetings

**VI. Attendees**

1. Shayne Morgan – Columbia County EM
2. David Cross – County Manager
3. Shannon Williams – Consultant/Grant Writer
4. Shannon Colon – Wildfire Mitigation Specialist
5. Chris Chagdes – APC
6. Tim Kitchen – APC
7. Leroy Marshall – Suwannee River Water Management District
8. Troy Adams – Clay Electric
9. Katelyn Barrington – SVEC
10. Stephanie McDonald – FWC
11. George Thomas – Mayor of Ft. White
12. Chad Williams – County Engineer
13. Derick Thomas – Clay Electric
14. Lola Butler – FDOT
15. Cindy Walker
16. Dee Johnson – City of Lake City
17. Jeffery Crawford

| Meeting N: | Meeting St  | Meeting End Time    | Display Name                        | First Name | Last Name | Role     | Attendee Email                      | Join Time  | Leave Time | Attendance | Connection | Session Name                                                     |
|------------|-------------|---------------------|-------------------------------------|------------|-----------|----------|-------------------------------------|------------|------------|------------|------------|------------------------------------------------------------------|
| Columbia   | '2025-03-1' | 2025-03-13 16:00:21 | Chad Williams                       | N/A        | N/A       | attendee | chad_williams@columbiacountyfla.com | 2025-03-1' | 2025-03-1' | 92 mins    | Web app    | Columbia County LMS Update - Hazard and Vulnerability Assessment |
| Columbia   | '2025-03-1' | 2025-03-13 16:00:21 | Christopher Chagdes                 | N/A        | N/A       | attendee | chris@advanced-plan.com             | 2025-03-1' | 2025-03-1' | 156 mins   | Desktop a  | Columbia County LMS Update - Hazard and Vulnerability Assessment |
| Columbia   | '2025-03-1' | 2025-03-13 16:00:21 | Cindy Walker                        | N/A        | N/A       | attendee | cindy@ovidsolutions.net             | 2025-03-1' | 2025-03-1' | 49 mins    | Desktop a  | Columbia County LMS Update - Hazard and Vulnerability Assessment |
| Columbia   | '2025-03-1' | 2025-03-13 16:00:21 | Dee                                 | N/A        | N/A       | attendee | johnsond@lcfla.com                  | 2025-03-1' | 2025-03-1' | 16 mins    | Web app    | Columbia County LMS Update - Hazard and Vulnerability Assessment |
| Columbia   | '2025-03-1' | 2025-03-13 16:00:21 | Derick Thomas-Clay Electric         | N/A        | N/A       | attendee | dthomas@clayelectric.com            | 2025-03-1' | 2025-03-1' | 73 mins    | Desktop a  | Columbia County LMS Update - Hazard and Vulnerability Assessment |
| Columbia   | '2025-03-1' | 2025-03-13 16:00:21 | George Thomas                       | N/A        | N/A       | attendee | mayor@fortwhitefl.com               | 2025-03-1' | 2025-03-1' | 28 mins    | Web app    | Columbia County LMS Update - Hazard and Vulnerability Assessment |
| Columbia   | '2025-03-1' | 2025-03-13 16:00:21 | Jeffery Crawford                    | N/A        | N/A       | attendee | jeff_crawford@columbiacountyfla.com | 2025-03-1' | 2025-03-1' | 14 mins    | Web app    | Columbia County LMS Update - Hazard and Vulnerability Assessment |
| Columbia   | '2025-03-1' | 2025-03-13 16:00:21 | Katelyn Barrington-SVEC             | N/A        | N/A       | attendee | katelynb@svec-coop.com              | 2025-03-1' | 2025-03-1' | 70 mins    | Web app    | Columbia County LMS Update - Hazard and Vulnerability Assessment |
| Columbia   | '2025-03-1' | 2025-03-13 16:00:21 | Leroy Marshall                      | N/A        | N/A       | attendee | lrm@srwmd.org                       | 2025-03-1' | 2025-03-1' | 71 mins    | Desktop a  | Columbia County LMS Update - Hazard and Vulnerability Assessment |
| Columbia   | '2025-03-1' | 2025-03-13 16:00:21 | Lola Butler, FDOT                   | N/A        | N/A       | attendee | lola.butler@dot.state.fl.us         | 2025-03-1' | 2025-03-1' | 63 mins    | Desktop a  | Columbia County LMS Update - Hazard and Vulnerability Assessment |
| Columbia   | '2025-03-1' | 2025-03-13 16:00:21 | Shayne Morgan -- Columbia County EM | N/A        | N/A       | attendee | shayne_morgan@columbiacountyfla.com | 2025-03-1' | 2025-03-1' | 73 mins    | Desktop a  | Columbia County LMS Update - Hazard and Vulnerability Assessment |
| Columbia   | '2025-03-1' | 2025-03-13 16:00:21 | Tim Kitchen                         | Tim        | Kitchen   | host     | tim@advanced-plan.com               | 2025-03-1' | 2025-03-1' | 155 mins   | Desktop a  | Columbia County LMS Update - Hazard and Vulnerability Assessment |
| Columbia   | '2025-03-1' | 2025-03-13 16:00:21 | Troy Adams-Clay Electric            | N/A        | N/A       | attendee | tadams@clayelectric.com             | 2025-03-1' | 2025-03-1' | 74 mins    | Desktop a  | Columbia County LMS Update - Hazard and Vulnerability Assessment |
| Columbia   | '2025-03-1' | 2025-03-13 16:00:21 | stephanie mcdonald                  | N/A        | N/A       | attendee | stephanie.mcdonald@myfwc.com        | 2025-03-1' | 2025-03-1' | 77 mins    | Web app    | Columbia County LMS Update - Hazard and Vulnerability Assessment |

**COLUMBIA COUNTY LMS  
DRAFT PLAN Meeting Agenda  
April 15, 2025 @ 1:30pm  
Virtual – WebEx**

**I. Welcome and Introductions**

**II. General LMS Committee Business Items**

**III. Draft LM Plan**

1. Planning Process
2. Hazard Identification and Vulnerability Assessment
3. Mitigation Goals and Objectives
4. Mitigation Project Priority List
5. Bylaws

**IV. Project Timeline**

1. 3/13/25: LMS Plan Hazards and Vulnerability Analysis modifications meeting
2. 3/27/25: Updated LMS Plan Hazards and Vulnerability Analysis
3. Date(s) TBD: LMS Working Group Meeting(s)
4. 4/11/25: Draft LMS Plan
- 5. 4/15/25: Draft LMS Modifications Meeting**
6. 5/2/25: Draft LMS Plan review and comments due
7. 5/9/25: Updated Draft LMS Plan
- 8. 5/19/25: LMS Meeting - Formalize process and update LMS Project or Initiatives Master List**
9. 5/30/25: Final LMS Plan submitted
10. 6/13/24: LMS Plan submitted to the Florida Division of Emergency Management
  - a. Monitoring and support

**V. Next Steps/Action Items**

1. Update/Revisions to identified LMS Plan elements
  - a. Appendices
  - b. Crosswalk
2. LMS Workgroup Meetings
3. Final Plan and submission

**COLUMBIA COUNTY LMS**  
**DRAFT PLAN Meeting Minutes**  
**April 15, 2025 @ 1:30pm**  
**Virtual – WebEx**

**I. Welcome and Introductions**

1. Participants (in person and virtual) provided name and agency for awareness

**II. Draft LM Plan**

1. Planning Process
  - a. Discussed ongoing stakeholder engagement, public participation, and the planning process for the LMS update.
2. Hazard Identification and Vulnerability Assessment
  - a. Discussed how in the previous meeting the Hazard Identification and Vulnerability Assessment methodology and process was revamped with a new tool.
    - i. Each hazard profile – description, location and extent, previous occurrences, and probability of future events help determine vulnerability and risk
3. Reviewed and Confirmed Mitigation Goals and Objectives
  - a. Goal 1, Objectives a-f – review and approved
  - b. Goal 2, Objectives a-f - review and approved
    - i. Objective b and c revised to say “all hazards” instead of just “natural”
  - c. Goal 3, Objectives a-c - review and approved
    - i. Objective c revised to say “incorporated and unincorporated areas” instead of “city and town limits”
  - d. Goal 4, Objectives a-i - review and approved
    - i. Objective b revised to say “incorporated and unincorporated areas” instead of “county”
  - e. Goal 5, Objectives a-c - review and approved
4. Mitigation Project Priority List
  - a. Discussed two versions of applying for and prioritizing projects
  - b. The group had a consensus on utilizing the STAPLEE method
  - c. May add a few other determining factors such as type of hazard mitigated, # of population benefited, and goal/objectives that it meets



**5. Bylaws**

- a. Discussed the newly established bylaws: Membership, Organization and Structure, Funding/Budget, Officers, Responsibilities, Working Group Actions, Adoption of and Amendments, and Dissolution
- b. Revised to include voting rights of all jurisdictions, departments, and organizations
- c. Quorum constitutes at least five (5) of the participating jurisdictions/ departments/ organizations
- d. Added context regarding: “Members of the general public may attend meetings, participate in discussions, and provide input; however, they do not possess voting privileges within the LMS Working Group”

**III. Remaining Project Timeline**

1. 5/2/25: Draft LMS Plan review and comments due
2. 5/9/25: Updated Draft LMS Plan
- 3. 5/19/25: LMS Meeting - Formalize process and update LMS Project or Initiatives Master List**
4. 5/30/25: Final LMS Plan submitted
5. 6/13/24: LMS Plan submitted to the Florida Division of Emergency Management
  - a. Monitoring and support

**IV. Next Steps/Action Items**

1. Update/Revisions to identified LMS Plan elements
  - a. Appendices
  - b. Crosswalk
2. Plan Revision Meetings
3. Final Plan and submission

**V. Attendees**

1. Amanda M – Excelsior
2. Bryan Gunter – Clay Electric
3. Chris Bryan – Clay Electric
4. Chris Harris – Hamilton County
5. Christopher Chagdes – APC
6. Dee Johnson – City of Lake City
7. Don Meyer – Columbia County Sheriff’s Office
8. Shannon Colon – FFS

9. Glen Hammers – FDEM
10. Jeffery Crawford – Columbia County Fire Rescue
11. Katelyn Barrington – SVEC
12. Kathy Bland – ARC
13. Leroy Marshall – SRWMD
14. Shayne Morgan – Columbia County EM
15. Tim Kitchen – APC
16. Troy Adams – Clay Electric

| Meeting Name                                    | Meeting Start Time  | Meeting End Time    | Display Name                     | First Name | Last Name | Role     | Attendee Email                      | Join Time           | Leave Time          | Attendance | Connection  | Session Name                                    |
|-------------------------------------------------|---------------------|---------------------|----------------------------------|------------|-----------|----------|-------------------------------------|---------------------|---------------------|------------|-------------|-------------------------------------------------|
| Columbia County Draft LMS Modifications Meeting | 2025-04-15 15:53:09 | 2025-04-15 15:53:09 | Amanda M                         | N/A        | N/A       | attendee | lake@excelsioramb.com               | 2025-04-15 15:53:09 | 2025-04-15 15:53:09 | 49 mins    | Web app     | Columbia County Draft LMS Modifications Meeting |
| Columbia County Draft LMS Modifications Meeting | 2025-04-15 15:53:09 | 2025-04-15 15:53:09 | Bryan Gunter (CEC)               | N/A        | N/A       | attendee | bgunter@clayelectric.com            | 2025-04-15 15:53:09 | 2025-04-15 15:53:09 | 50 mins    | Desktop app | Columbia County Draft LMS Modifications Meeting |
| Columbia County Draft LMS Modifications Meeting | 2025-04-15 15:53:09 | 2025-04-15 15:53:09 | Call-in User_1                   | N/A        | N/A       | attendee |                                     | 2025-04-15 15:53:09 | 2025-04-15 15:53:09 | 51 mins    | Other app   | Columbia County Draft LMS Modifications Meeting |
| Columbia County Draft LMS Modifications Meeting | 2025-04-15 15:53:09 | 2025-04-15 15:53:09 | Chris Harris                     | N/A        | N/A       | attendee | hamem.harris@gmail.com              | 2025-04-15 15:53:09 | 2025-04-15 15:53:09 | 53 mins    | Mobile app  | Columbia County Draft LMS Modifications Meeting |
| Columbia County Draft LMS Modifications Meeting | 2025-04-15 15:53:09 | 2025-04-15 15:53:09 | Christopher Chagdes              | N/A        | N/A       | attendee | chris@advanced-plan.com             | 2025-04-15 15:53:09 | 2025-04-15 15:53:09 | 149 mins   | Desktop app | Columbia County Draft LMS Modifications Meeting |
| Columbia County Draft LMS Modifications Meeting | 2025-04-15 15:53:09 | 2025-04-15 15:53:09 | Dee- City of Lake City           | N/A        | N/A       | attendee | johnsond@lcfla.com                  | 2025-04-15 15:53:09 | 2025-04-15 15:53:09 | 60 mins    | Web app     | Columbia County Draft LMS Modifications Meeting |
| Columbia County Draft LMS Modifications Meeting | 2025-04-15 15:53:09 | 2025-04-15 15:53:09 | Don                              | N/A        | N/A       | attendee | meyer.don584@gmail.com              | 2025-04-15 15:53:09 | 2025-04-15 15:53:09 | 50 mins    | Mobile app  | Columbia County Draft LMS Modifications Meeting |
| Columbia County Draft LMS Modifications Meeting | 2025-04-15 15:53:09 | 2025-04-15 15:53:09 | FFS Shannon Colon                | N/A        | N/A       | attendee | shannon.colon@fdacs.gov             | 2025-04-15 15:53:09 | 2025-04-15 15:53:09 | 50 mins    | Web app     | Columbia County Draft LMS Modifications Meeting |
| Columbia County Draft LMS Modifications Meeting | 2025-04-15 15:53:09 | 2025-04-15 15:53:09 | Glen Hammers                     | N/A        | N/A       | attendee | glen.hammers@em.myflorida.com       | 2025-04-15 15:53:09 | 2025-04-15 15:53:09 | 43 mins    | Desktop app | Columbia County Draft LMS Modifications Meeting |
| Columbia County Draft LMS Modifications Meeting | 2025-04-15 15:53:09 | 2025-04-15 15:53:09 | Jeffery Crawford CCFR            | N/A        | N/A       | attendee | jeff_crawford@columbiacountyfla.com | 2025-04-15 15:53:09 | 2025-04-15 15:53:09 | 57 mins    | Desktop app | Columbia County Draft LMS Modifications Meeting |
| Columbia County Draft LMS Modifications Meeting | 2025-04-15 15:53:09 | 2025-04-15 15:53:09 | Katelyn Barrington-SVEC          | N/A        | N/A       | attendee | katelyn@svec-coop.com               | 2025-04-15 15:53:09 | 2025-04-15 15:53:09 | 27 mins    | Web app     | Columbia County Draft LMS Modifications Meeting |
| Columbia County Draft LMS Modifications Meeting | 2025-04-15 15:53:09 | 2025-04-15 15:53:09 | Kathy Bland                      | N/A        | N/A       | attendee | kathy.bland3@redcross.org           | 2025-04-15 15:53:09 | 2025-04-15 15:53:09 | 52 mins    | Mobile app  | Columbia County Draft LMS Modifications Meeting |
| Columbia County Draft LMS Modifications Meeting | 2025-04-15 15:53:09 | 2025-04-15 15:53:09 | Leroy Marshall                   | N/A        | N/A       | attendee | lrm@srwmd.org                       | 2025-04-15 15:53:09 | 2025-04-15 15:53:09 | 38 mins    | Web app     | Columbia County Draft LMS Modifications Meeting |
| Columbia County Draft LMS Modifications Meeting | 2025-04-15 15:53:09 | 2025-04-15 15:53:09 | Shayne Morgan -- Columbia County | N/A        | N/A       | attendee | shayne_morgan@columbiacountyfla.com | 2025-04-15 15:53:09 | 2025-04-15 15:53:09 | 62 mins    | Desktop app | Columbia County Draft LMS Modifications Meeting |
| Columbia County Draft LMS Modifications Meeting | 2025-04-15 15:53:09 | 2025-04-15 15:53:09 | Tim Kitchen                      | Tim        | Kitchen   | host     | tim@advanced-plan.com               | 2025-04-15 15:53:09 | 2025-04-15 15:53:09 | 149 mins   | Desktop app | Columbia County Draft LMS Modifications Meeting |
| Columbia County Draft LMS Modifications Meeting | 2025-04-15 15:53:09 | 2025-04-15 15:53:09 | Troy Adams                       | N/A        | N/A       | attendee | tadams@clayelectric.com             | 2025-04-15 15:53:09 | 2025-04-15 15:53:09 | 57 mins    | Mobile app  | Columbia County Draft LMS Modifications Meeting |

**COLUMBIA COUNTY LMS  
DRAFT PLAN Meeting Agenda  
May 19, 2025 @ 1:30pm  
Virtual – WebEx**

**I. Welcome and Introductions**

**II. General LMS Committee Business Items**

**III. Draft LM Plan**

1. Appendices
2. Membership Application Form
3. Project/Initiative list
  - a. Project Submission Form
  - b. Staplee Instructions/Criteria
  - c. Potential Tie Breaker Criteria

**IV. Remaining Project Timeline**

1. 5/30/25: Final LMS Plan submitted
2. 6/13/24: LMS Plan submitted to the Florida Division of Emergency Management
  - a. Monitoring and support

**V. Next Steps/Action Items**

1. Update/Revisions to identified LMS Plan elements
2. Final Plan and submission

**COLUMBIA COUNTY LMS**  
**DRAFT PLAN Meeting Minutes**  
**May 19, 2025 @ 1:30pm**  
**Virtual – WebEx**

**I. Welcome and Introductions**

1. Participants (in person and virtual) provided name and agency for awareness

**II. Draft LM Plan**

1. Appendices
  - a. Discussed the Appendices outline and included documents
    - i. Highlighted importance of plan integration with comprehensive and zoning plans.
    - ii. Reviewed FEMA crosswalk updates and compliance requirements for the LMS.
2. Membership Application Form
  - a. Introduced membership application formalization for LMS participation
  - b. Add to footer: Please return this form to Shayne Morgan at:  
Shayne\_Morgan@columbiacountyfla.com
3. Project/Initiative list
  - a. Project Submission Form
    - i. This is the form for those that wish to propose new projects
    - ii. Approved; Keep with Excel file
  - b. Staplee Instructions/Criteria
    - i. Basic instruction/explanation of the Staplee criteria
    - ii. Staplee criteria scoring considerations
  - c. Potential Tie Breaker Criteria
    - i. Addressed potential scoring ties in project prioritization, recommending tiebreaker criteria
    - ii. Edit the population criteria to better reflect the population of Columbia County
    - iii. Add explanation to the LMS Base Plan

**III. Remaining Project Timeline**

1. 5/30/25: Final LMS Plan submitted
2. 6/13/25: LMS Plan submitted to the Florida Division of Emergency Management
  - a. Monitoring and support

**IV. Next Steps/Action Items**

1. Update/Revisions to identified LMS Plan elements
2. Final Plan and submission

**V. Attendees**

1. Bryan Gunter - CEC
2. Chad Williams – Columbia County
3. Chris Bryan - CEC
4. Christopher Chagdes - APC
5. David Kraus - Columbia County
6. Dee Johnson - City of Lake City
7. Derick Thomas – Clay Electric
8. Emily Lumpkin – Hamilton County
9. Excelsior Ambulance
10. Glen Hammers - FDEM
11. Jeff Crawford - Columbia County
12. John Blanchard IV - Baker County EM/ Region 4
13. Karen Smoot - Columbia County
14. Katelyn Barrington - SVEC
15. Lola Butler - FDOT
16. Shayne Morgan – Columbia County EM
17. Tim Kitchen - APC
18. Timothy Allen - Union County EM / 911 Director
19. Troy Adams - Clay Electric
20. Dale Williams - North Florida
21. Staz Guntek - Columbia County

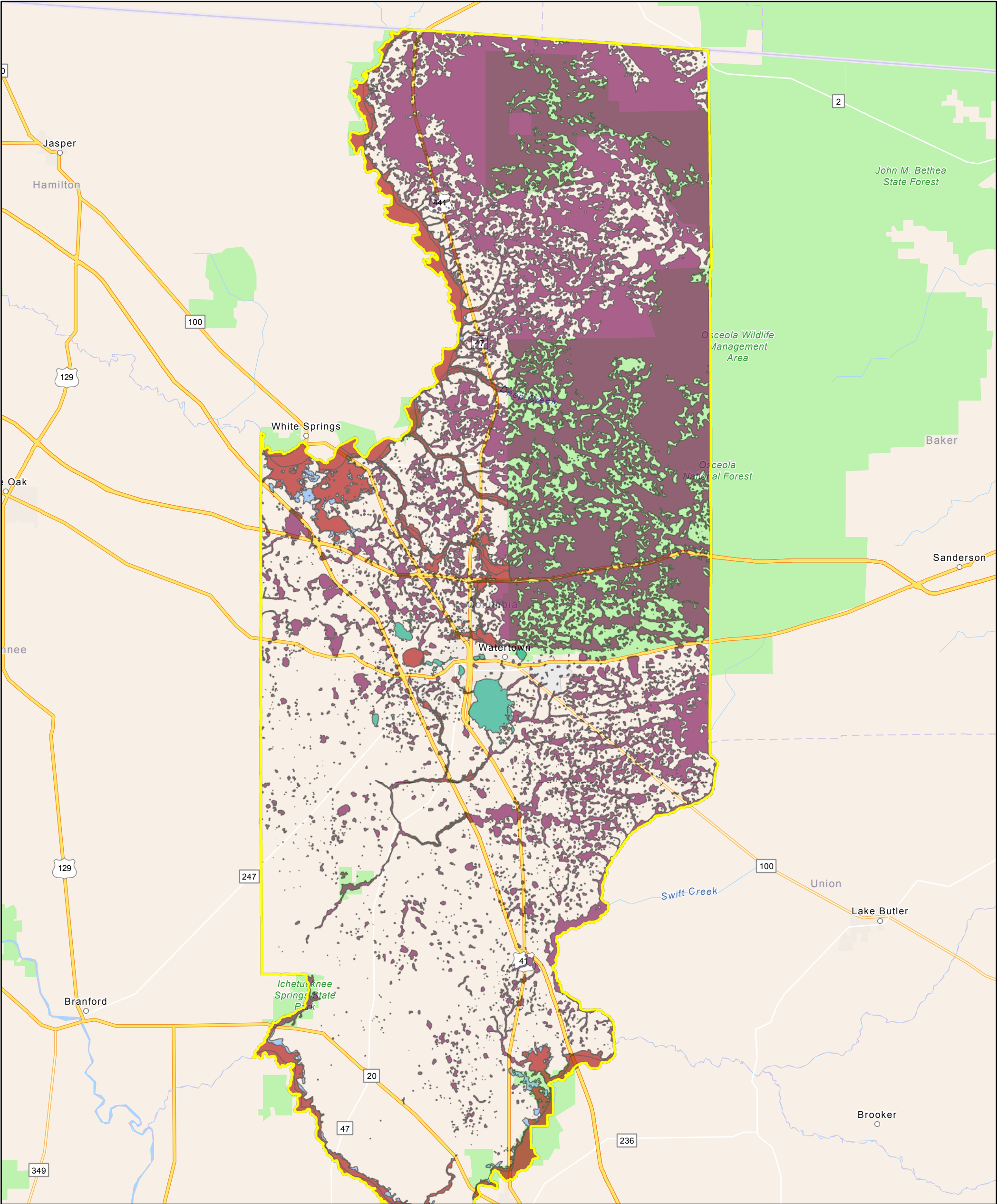
| Meeting N° | Meeting St. | Meeting En  | Display Name                                   | First Name | Last Name | Role     | Attendee Email                  | Join Time  | Leave Time | Attendance | Connectio  | Session Name                                                                 |
|------------|-------------|-------------|------------------------------------------------|------------|-----------|----------|---------------------------------|------------|------------|------------|------------|------------------------------------------------------------------------------|
| Columbia   | '2025-05-1' | '2025-05-1' | Baker County EM/ John Blanchard IV/ Region 4   | N/A        | N/A       | attendee | john.blanchard@bakerso.com      | 2025-05-1' | 2025-05-1' | 29 mins    | Web app    | Columbia County LMS Final Draft Meeting & Project/Initiative List Discussion |
| Columbia   | '2025-05-1' | '2025-05-1' | Bryan Gunter (CEC)                             | N/A        | N/A       | attendee | bgunter@clayelectric.com        | 2025-05-1' | 2025-05-1' | 24 mins    | Desktop a  | Columbia County LMS Final Draft Meeting & Project/Initiative List Discussion |
| Columbia   | '2025-05-1' | '2025-05-1' | Call-in User_1                                 | N/A        | N/A       | attendee |                                 | 2025-05-1' | 2025-05-1' | 28 mins    | Other app  | Columbia County LMS Final Draft Meeting & Project/Initiative List Discussion |
| Columbia   | '2025-05-1' | '2025-05-1' | Chad Williams                                  | N/A        | N/A       | attendee | cwilliams@columbiacountyfla.com | 2025-05-1' | 2025-05-1' | 22 mins    | Web app    | Columbia County LMS Final Draft Meeting & Project/Initiative List Discussion |
| Columbia   | '2025-05-1' | '2025-05-1' | Chris Bryan (CEC)                              | N/A        | N/A       | attendee | cbryan@clayelectric.com         | 2025-05-1' | 2025-05-1' | 26 mins    | Desktop a  | Columbia County LMS Final Draft Meeting & Project/Initiative List Discussion |
| Columbia   | '2025-05-1' | '2025-05-1' | Christopher Chagdes                            | N/A        | N/A       | attendee | chris@advanced-plan.com         | 2025-05-1' | 2025-05-1' | 75 mins    | Desktop a  | Columbia County LMS Final Draft Meeting & Project/Initiative List Discussion |
| Columbia   | '2025-05-1' | '2025-05-1' | David                                          | N/A        | N/A       | attendee | dkraus@columbiacountyfla.com    | 2025-05-1' | 2025-05-1' | 27 mins    | Web app    | Columbia County LMS Final Draft Meeting & Project/Initiative List Discussion |
| Columbia   | '2025-05-1' | '2025-05-1' | Dee- City of Lake City                         | N/A        | N/A       | attendee | johnsond@lcfla.com              | 2025-05-1' | 2025-05-1' | 33 mins    | Web app    | Columbia County LMS Final Draft Meeting & Project/Initiative List Discussion |
| Columbia   | '2025-05-1' | '2025-05-1' | Derick Thomas                                  | N/A        | N/A       | attendee | dthomas@clayelectric.com        | 2025-05-1' | 2025-05-1' | 28 mins    | Web app    | Columbia County LMS Final Draft Meeting & Project/Initiative List Discussion |
| Columbia   | '2025-05-1' | '2025-05-1' | Emily Lumpkin                                  | N/A        | N/A       | attendee | elumpkin@hamiltoneoc.com        | 2025-05-1' | 2025-05-1' | 24 mins    | Web app    | Columbia County LMS Final Draft Meeting & Project/Initiative List Discussion |
| Columbia   | '2025-05-1' | '2025-05-1' | Excelsior Ambulance                            | N/A        | N/A       | attendee | lake@excelsioramb.com           | 2025-05-1' | 2025-05-1' | 23 mins    | Web app    | Columbia County LMS Final Draft Meeting & Project/Initiative List Discussion |
| Columbia   | '2025-05-1' | '2025-05-1' | Glen Hammers                                   | N/A        | N/A       | attendee | glen.hammers@em.myflorida.com   | 2025-05-1' | 2025-05-1' | 30 mins    | Mobile app | Columbia County LMS Final Draft Meeting & Project/Initiative List Discussion |
| Columbia   | '2025-05-1' | '2025-05-1' | Jeff Crawford                                  | N/A        | N/A       | attendee | jcrawford@columbiacountyfla.com | 2025-05-1' | 2025-05-1' | 32 mins    | Web app    | Columbia County LMS Final Draft Meeting & Project/Initiative List Discussion |
| Columbia   | '2025-05-1' | '2025-05-1' | Karen Smoot                                    | N/A        | N/A       | attendee | ksmoot@columbiacountyfla.com    | 2025-05-1' | 2025-05-1' | 27 mins    | Web app    | Columbia County LMS Final Draft Meeting & Project/Initiative List Discussion |
| Columbia   | '2025-05-1' | '2025-05-1' | Katelyn Barrington-SVEC                        | N/A        | N/A       | attendee | katelynb@svec-coop.com          | 2025-05-1' | 2025-05-1' | 28 mins    | Web app    | Columbia County LMS Final Draft Meeting & Project/Initiative List Discussion |
| Columbia   | '2025-05-1' | '2025-05-1' | Lola Butler, FDOT                              | N/A        | N/A       | attendee | lola.butler@dot.state.fl.us     | 2025-05-1' | 2025-05-1' | 36 mins    | Web app    | Columbia County LMS Final Draft Meeting & Project/Initiative List Discussion |
| Columbia   | '2025-05-1' | '2025-05-1' | Shayne Morgan                                  | N/A        | N/A       | attendee | smorgan@columbiacountyfla.com   | 2025-05-1' | 2025-05-1' | 33 mins    | Web app    | Columbia County LMS Final Draft Meeting & Project/Initiative List Discussion |
| Columbia   | '2025-05-1' | '2025-05-1' | Tim Kitchen                                    | Tim        | Kitchen   | host     | tim@advanced-plan.com           | 2025-05-1' | 2025-05-1' | 75 mins    | Desktop a  | Columbia County LMS Final Draft Meeting & Project/Initiative List Discussion |
| Columbia   | '2025-05-1' | '2025-05-1' | Timothy Allen - Union County EM / 911 Director | N/A        | N/A       | attendee | allentc@unionsheriff.us         | 2025-05-1' | 2025-05-1' | 33 mins    | Desktop a  | Columbia County LMS Final Draft Meeting & Project/Initiative List Discussion |
| Columbia   | '2025-05-1' | '2025-05-1' | Troy Adams-Clay Electric                       | N/A        | N/A       | attendee | tadams@clayelectric.com         | 2025-05-1' | 2025-05-1' | 27 mins    | Desktop a  | Columbia County LMS Final Draft Meeting & Project/Initiative List Discussion |
| Columbia   | '2025-05-1' | '2025-05-1' | sguntek                                        | N/A        | N/A       | attendee | sguntek@columbiacountyfla.com   | 2025-05-1' | 2025-05-1' | 25 mins    | Web app    | Columbia County LMS Final Draft Meeting & Project/Initiative List Discussion |

## **APPENDIX H: FEMA CROSSWALK**



**APPENDIX I: FLOOD MAP(S)**

# Columbia County FL. - Flood Zones



5/19/2025, 11:28:34 AM

County Boundary

Flood Zones 2018

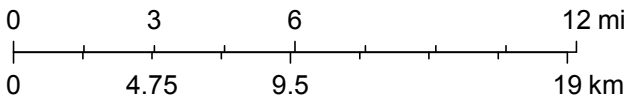
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A

AE

AH

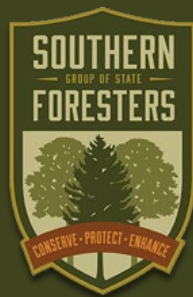
1:300,000



Sources: Esri, TomTom, Garmin, FAO, NOAA, USGS, © OpenStreetMap contributors, and the GIS User Community

## **APPENDIX J: WILDFIRE**

# SOUTHERN WILDFIRE RISK ASSESSMENT SUMMARY REPORT



***Columbia County***



Report was generated using  
[www.southernwildfirerisk.com](http://www.southernwildfirerisk.com)

Report version: 5.0

Report generated: 6/27/2025

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[Damage Potential](#)

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[Housing Unit Density](#)

[Housing Unit Impact](#)

[Housing Unit Risk](#)

[Sources of Ember Load to Buildings](#)

[Functional Wildland Urban Interface \(WUI\)](#)

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# Disclaimer

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The wildfire hazard maps in the Southern Wildfire Risk Assessment Portal include fuel disturbances through 2022. Events after January 2023, such as recent hurricanes and tornadoes, are not reflected in these maps. Users in these areas should prioritize local knowledge of current fuel and hazard conditions.

The wildfire hazard information provided is intended solely for wildfire mitigation and prevention planning, communication, and collaboration purposes. It is not designed or validated for underwriting or insurance-related processes. Insurance entities should use their own methodologies and property-specific assessments to evaluate wildfire susceptibility. The Southern Group of State Foresters and its application providers accept no liability for the use of this data in insurance practices. Property boundaries included in the products are approximate and not intended for legal, engineering, or surveying purposes. They represent relative locations only.

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# Introduction

Welcome to the Southern Wildfire Risk Assessment Summary Report.

This tool allows users of the Professional Viewer application of the Southern Wildfire Risk Assessment (SWRA) web Portal (SouthWRAP) to define a specific project area and summarize wildfire related information for this area. A detailed risk summary report is generated using a set of predefined map products developed by the Southern Wildfire Risk Assessment project which have been summarized explicitly for the user defined project area. The report is generated in MS WORD format.

The report has been designed so that information from the report can easily be copied and pasted into other specific plans, reports, or documents depending on user needs. Examples include, but are not limited to, Community Wildfire Protection Plans, Local Fire Plans, Fuels Mitigation Plans, Hazard Mitigation Plans, Homeowner Association Risk Assessments, and Forest Management or Stewardship Plans. Formats and standards for these types of reports vary from state to state across the South, and accordingly SouthWRAP provides the SWRA information in a generic risk report format to facilitate use in any type of external document. The SouthWRAP Risk Summary Report also stands alone as a viable depiction of current wildfire risk conditions for the user defined project area.

SouthWRAP provides a consistent, comparable set of scientific results to be used as a foundation for wildfire mitigation and prevention planning in the South.

Results of the assessment can be used to help prioritize areas in the state where mitigation treatments, community interaction and education, or tactical analyses might be necessary to reduce risk from wildfires.





The SouthWRAP products included in this report are designed to provide the information needed to support the following key priorities:

- Identify areas that are most prone to wildfire
- Identify areas that may require additional tactical planning, specifically related to mitigation projects and Community Wildfire Protection Planning
- Provide the information necessary to justify resource, budget and funding requests
- Allow agencies to work together to better define priorities and improve emergency response, particularly across jurisdictional boundaries
- Define wildland communities and identify the risk to those communities
- Increase communication and outreach with local residents and the public to create awareness and address community priorities and needs
- Plan for response and suppression resource needs
- Plan and prioritize hazardous fuel treatment programs

To learn more about the SWRA project or to create a custom summary report, go to [www.southernwildfirerisk.com](http://www.southernwildfirerisk.com).

## Map Products and Descriptions

Each map product in this Summary Report is accompanied by a general description, table, chart, or map. Please see the table below for a list of data layers available in the Summary Report.

| Layer                                | Description                                                                                                                                                                                       |
|--------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Burn Probability                     | Burn Probability is the likelihood of wildfire burning a specific location within one calendar year or wildfire season.                                                                           |
| Wildfire Exposure Score              | Wildfire Exposure Score combines wildfire likelihood (Burn Probability) and damage to homes (Damage Potential) for all areas regardless of whether a structure currently exists at that location. |
| Damage Potential                     | Damage Potential represents the possible damage from wildfire to a home or parcel considering both fire intensity and embers from nearby fuel.                                                    |
| Housing Unit Density                 | This layer displays housing unit density measured in housing units per square kilometer.                                                                                                          |
| Housing Unit Impact                  | Housing Unit Impact represents the relative potential impact to housing units if a fire were to occur.                                                                                            |
| Housing Unit Risk                    | Housing Unit Risk represents the relative potential risk to housing units.                                                                                                                        |
| Sources of Ember Load to Buildings   | This layer displays the potential for fuel to be a source of embers to buildings.                                                                                                                 |
| Functional Wildland Urban Interface  | This dataset classifies the land near buildings into wildfire risk mitigation zones.                                                                                                              |
| Characteristic Fire Intensity Scale  | Quantifies the potential fire intensity by orders of magnitude as determined by fuel and a range of possible wind and weather conditions.                                                         |
| 95th Percentile Fire Intensity Scale | 95th Percentile (Average-Worst) Fire Intensity Scale quantifies fire intensity by orders of magnitude as determined by the worst five percent of wind and weather conditions.                     |
| Characteristic Flame Length          | Flame length measures the height of flames as determined by fuel and a range of possible wind and weather conditions.                                                                             |
| 95th Percentile Flame Length         | 95th Percentile (Average-Worst) Flame Length measures the height of flames as determined by the worst five percent of wind and weather conditions.                                                |
| Characteristic Rate of Spread        | This layer represents the rate of spread (ROS) as determined by fuel and weather characteristics across a full range of possible wind and weather conditions.                                     |
| 95th Percentile Rate of Spread       | 95th Percentile (Average-Worst) Rate of Spread measures the rate of spread as determined by the worst five percent of wind and weather conditions.                                                |
| Probability of Crown Fire            | This layer shows the likelihood of experiencing at least mid-grade passive crown fire.                                                                                                            |

| Layer                                       | Description                                                                                                                                                                                      |
|---------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Probability of Exceeding Manual Control     | This layer shows the likelihood that flames at the head of the fire will exceed 4 feet, which is generally considered the limit for manual fire control.                                         |
| Probability of Exceeding Mechanical Control | This layer shows the likelihood that flames at the head of the fire will exceed 8 feet, which is considered the limit for mechanical fire control in fire operations.                            |
| Probability of Extreme Fire Behavior        | This layer shows the likelihood that flames at the head of the fire will exceed 11 feet, which is considered threshold for extreme fire behavior in fire operations.                             |
| Suppression Difficulty Index                | Suppression Difficulty Index provides a rating of relative difficulty in performing wildfire control work considering factors like terrain, access, fuel, and fire behavior.                     |
| Wildfire Hazard Potential                   | Wildfire Hazard Potential maps challenges to wildfire control and includes information such as Burn Probability, small-fire ignition density, fire intensity measures, and fuel/vegetation type. |
| Conditional Ember Production Index          | A relative index of the potential ember production if a fire were to occur.                                                                                                                      |
| Conditional Ember Load Index                | A relative index of the potential for a location to receive embers from surrounding land if a fire were to occur.                                                                                |
| Surface Fuels                               | Contains the parameters needed to compute surface fire behavior characteristics.                                                                                                                 |
| Percent Slope                               | Percent Slope measures the rate of change of elevation over a given horizontal distance, expressed as a percent.                                                                                 |

# Wildfire Hazard

The information in this section of the report describes the annual likelihood of wildfire based on fire modeling, and two integrated hazard layers characterizing wildfire risk to homes, including a measure of ember load from nearby fuel.

Contents:

[Burn Probability](#)

[Wildfire Exposure Score](#)

[Damage Potential](#)

# Burn Probability

Burn probability is the likelihood of wildfire burning a specific location within a set time frame - commonly represented as the chance of burning during one calendar year or wildfire season.

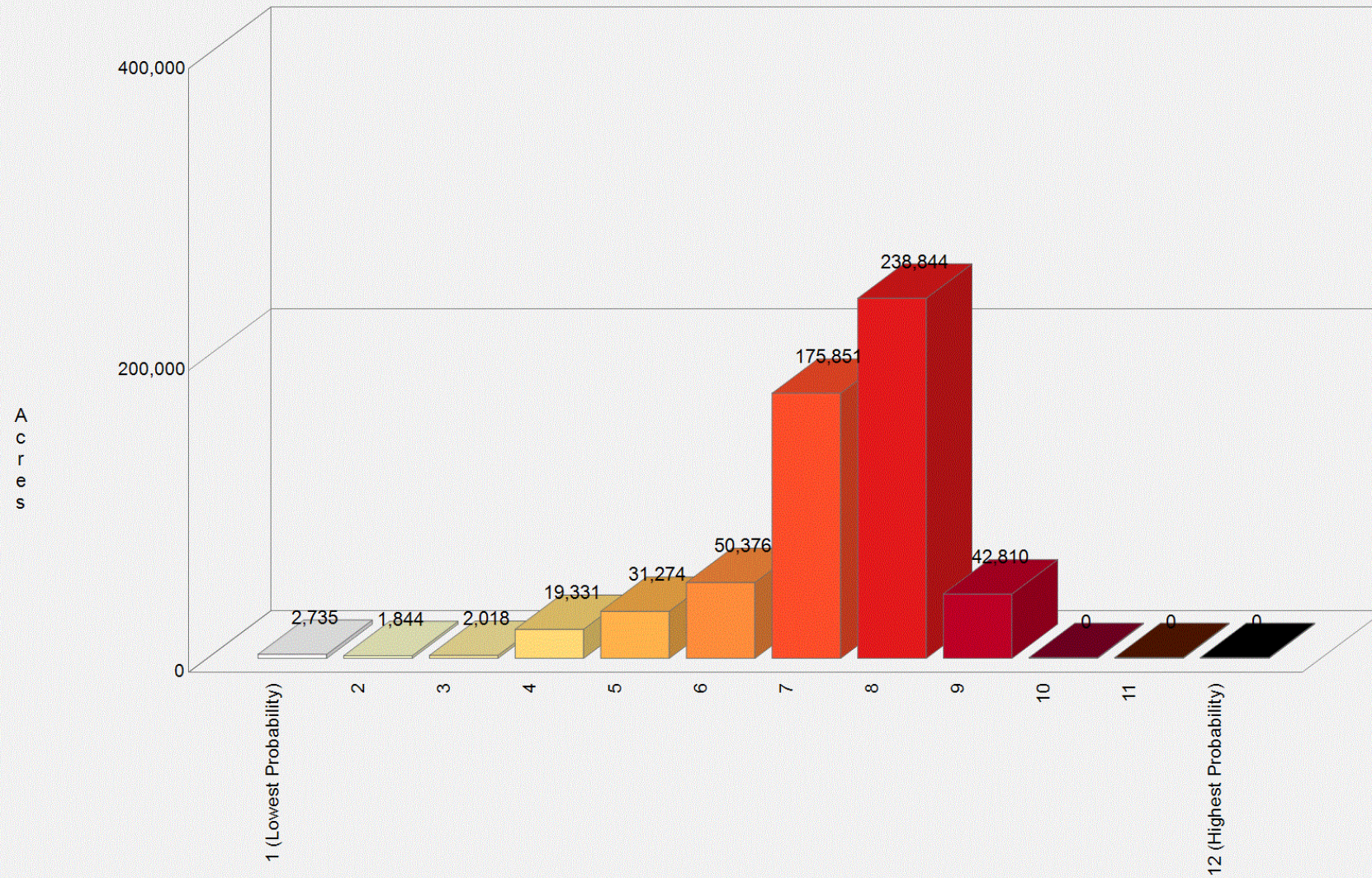
Burn Probability can be expressed as a fraction (ex. 0.005) or odds (1-in-200) and is based on fire behavior modeling across thousands of simulations of possible fire seasons. In each simulation, factors contributing to the probability of a fire occurring, including weather and ignition likelihood are varied based on patterns derived from observations in recent decades. It is not predictive and does not reflect any currently forecasted weather or fire danger conditions. Burn Probability does not say anything about the intensity of fire if it occurs.

Data Source: Southern Wildfire Risk Assessment, Pyrologix 2023 (includes fuel disturbances through 2022)

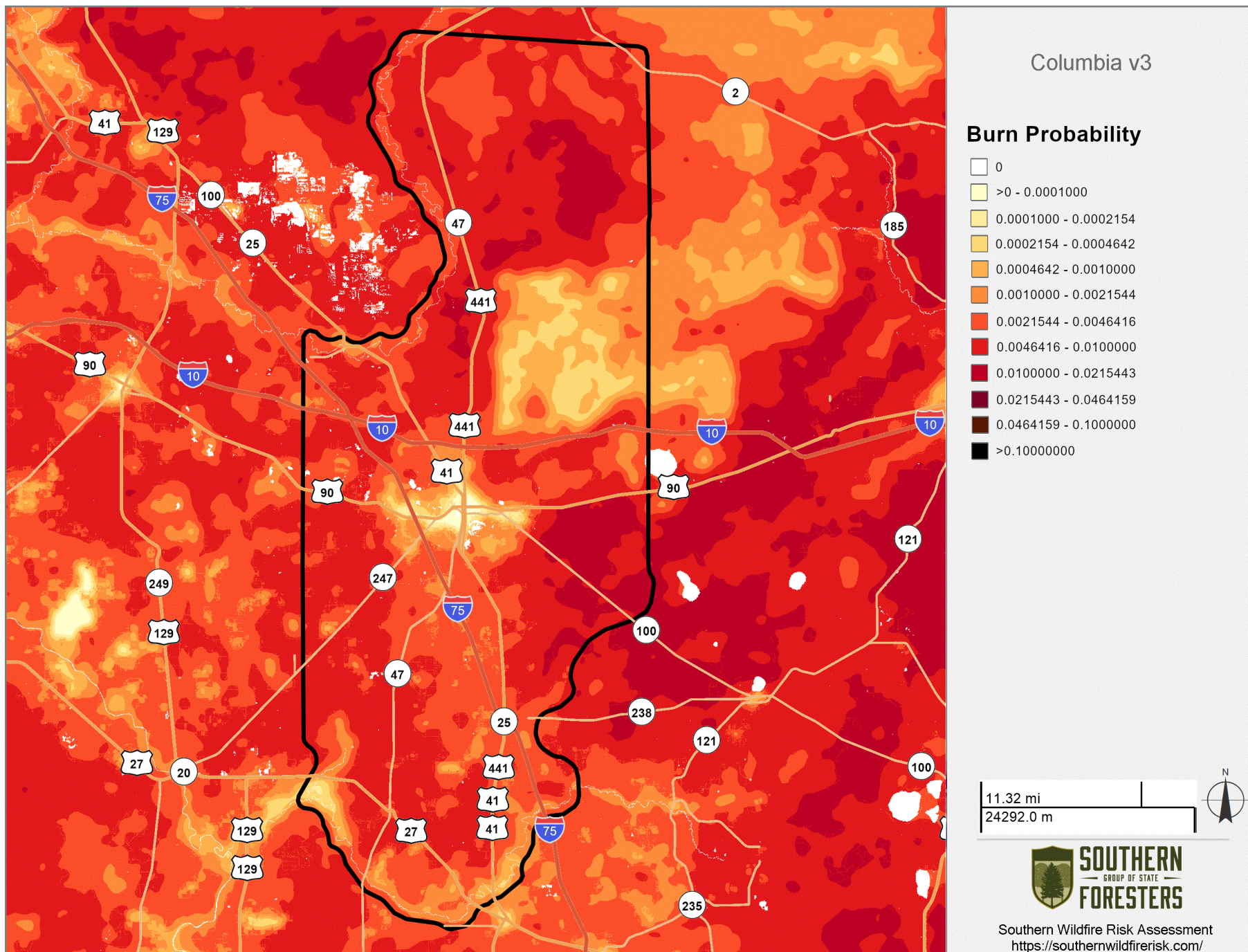
|  | Burn Probability Category | Acres          | Percent      |
|--|---------------------------|----------------|--------------|
|  | 0                         | 2,735          | 0 %          |
|  | >0 - 0.0001000            | 1,844          | 0 %          |
|  | 0.0001000 - 0.0002154     | 2,018          | 0 %          |
|  | 0.0002154 - 0.0004642     | 19,331         | 3 %          |
|  | 0.0004642 - 0.0010000     | 31,274         | 6 %          |
|  | 0.0010000 - 0.0021544     | 50,376         | 9 %          |
|  | 0.0021544 - 0.0046416     | 175,851        | 31 %         |
|  | 0.0046416 - 0.0100000     | 238,844        | 42 %         |
|  | 0.0100000 - 0.0215443     | 42,810         | 8 %          |
|  | 0.0215443 - 0.0464159     | 0              | 0 %          |
|  | 0.0464159 - 0.1000000     | 0              | 0 %          |
|  | >0.10000000               | 0              | 0 %          |
|  | <b>Total</b>              | <b>565,081</b> | <b>100 %</b> |



Columbia v3  
Burn Probability









## Wildfire Exposure Score

Wildfire Exposure Score combines two important wildfire factors related to structure exposure: the chance of wildfire (Burn Probability – defined as the likelihood of wildfire burning a specific location within a calendar year or wildfire season) and the potential damage to homes from wildfire (Damage Potential – defined as an estimate of damage that a wildfire could cause to homes considering both fire intensity and embers from nearby fuel).

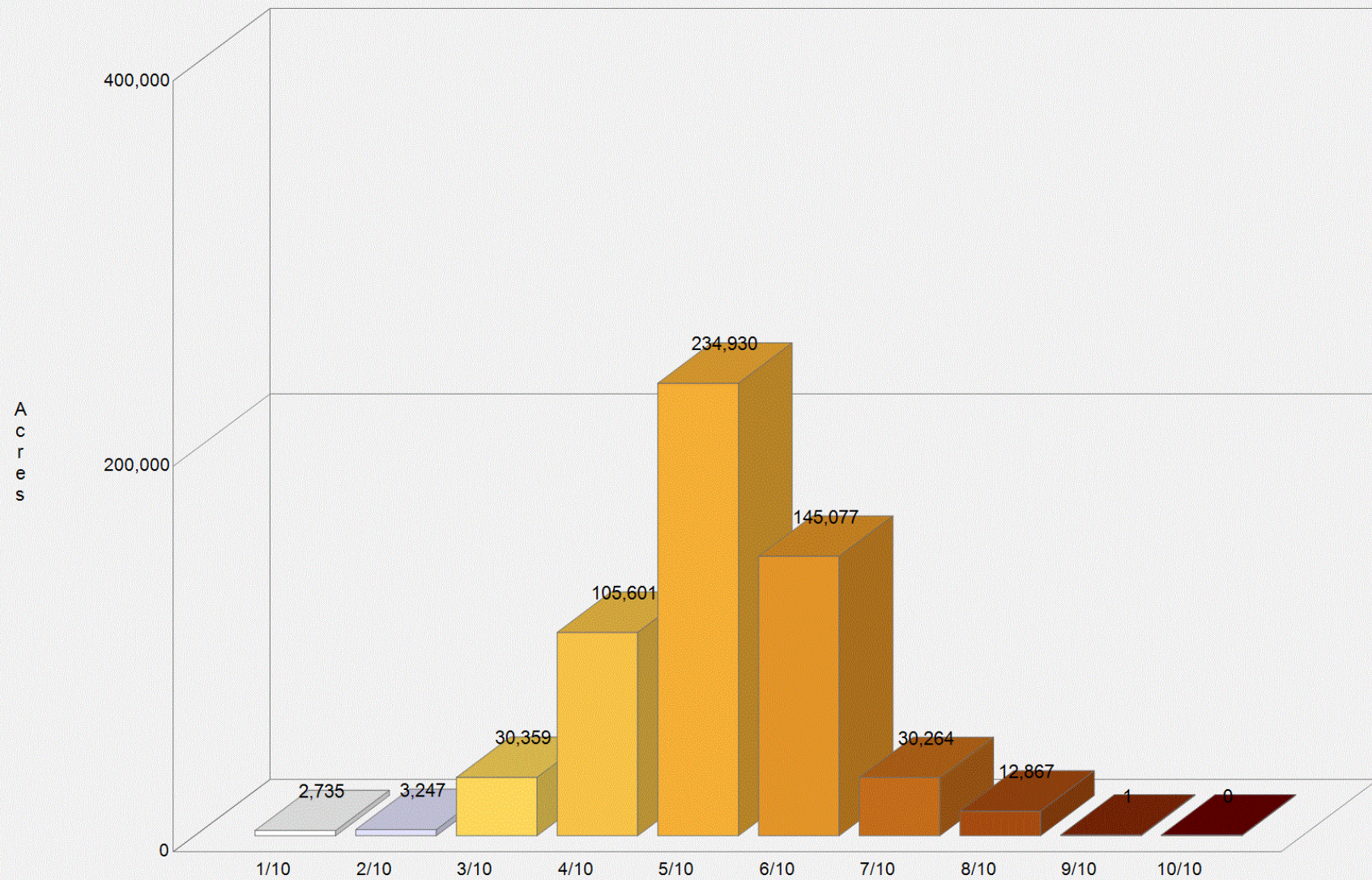
Exposure scores are provided for all areas regardless of whether a structure currently exists at that location.

Data Source: Southern Wildfire Risk Assessment, Pyrologix 2023 (includes fuel disturbances through 2022)

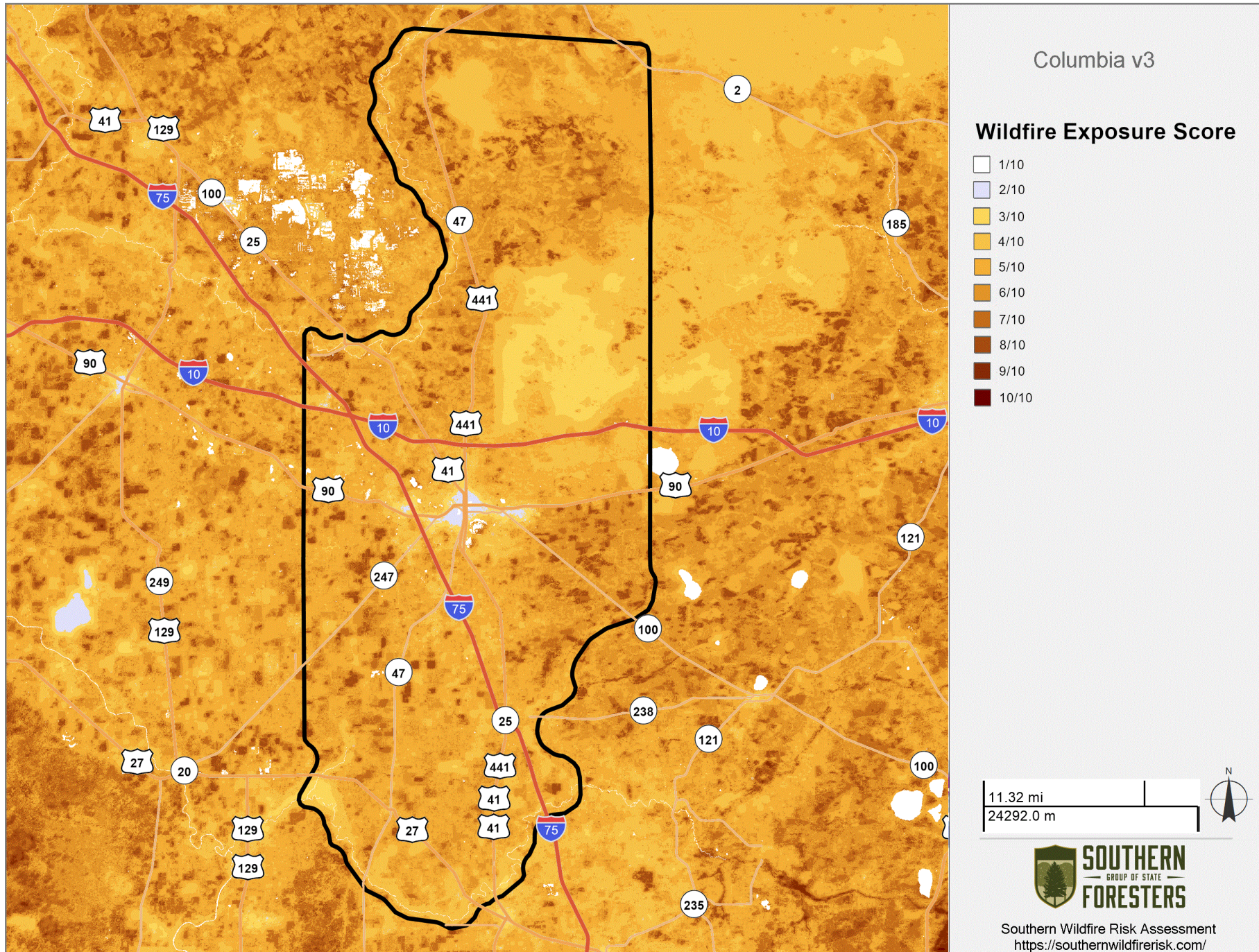
|  | Wildfire Exposure Score Category | Acres          | Percent      |
|--|----------------------------------|----------------|--------------|
|  | 1/10                             | 2,735          | 0 %          |
|  | 2/10                             | 3,247          | 1 %          |
|  | 3/10                             | 30,359         | 5 %          |
|  | 4/10                             | 105,601        | 19 %         |
|  | 5/10                             | 234,930        | 42 %         |
|  | 6/10                             | 145,077        | 26 %         |
|  | 7/10                             | 30,264         | 5 %          |
|  | 8/10                             | 12,867         | 2 %          |
|  | 9/10                             | 1              | 0 %          |
|  | 10/10                            | 0              | 0 %          |
|  | <b>Total</b>                     | <b>565,081</b> | <b>100 %</b> |



Columbia v3  
Wildfire Exposure Score









# Damage Potential

Damage Potential provides an index of potential damage to homes from wildfire. It considers factors like flame length and embers lofted from nearby fuel.

Damage Potential is a relative index (from low to high), that provides a broad measure of the possible damage from wildfire, based generally on the landscape, rather than specific characteristics of a home or parcel. For planning uses and broad applications, the index is calculated for all areas regardless of whether a structure currently exists at that location. This index does not incorporate a measure of wildfire likelihood.

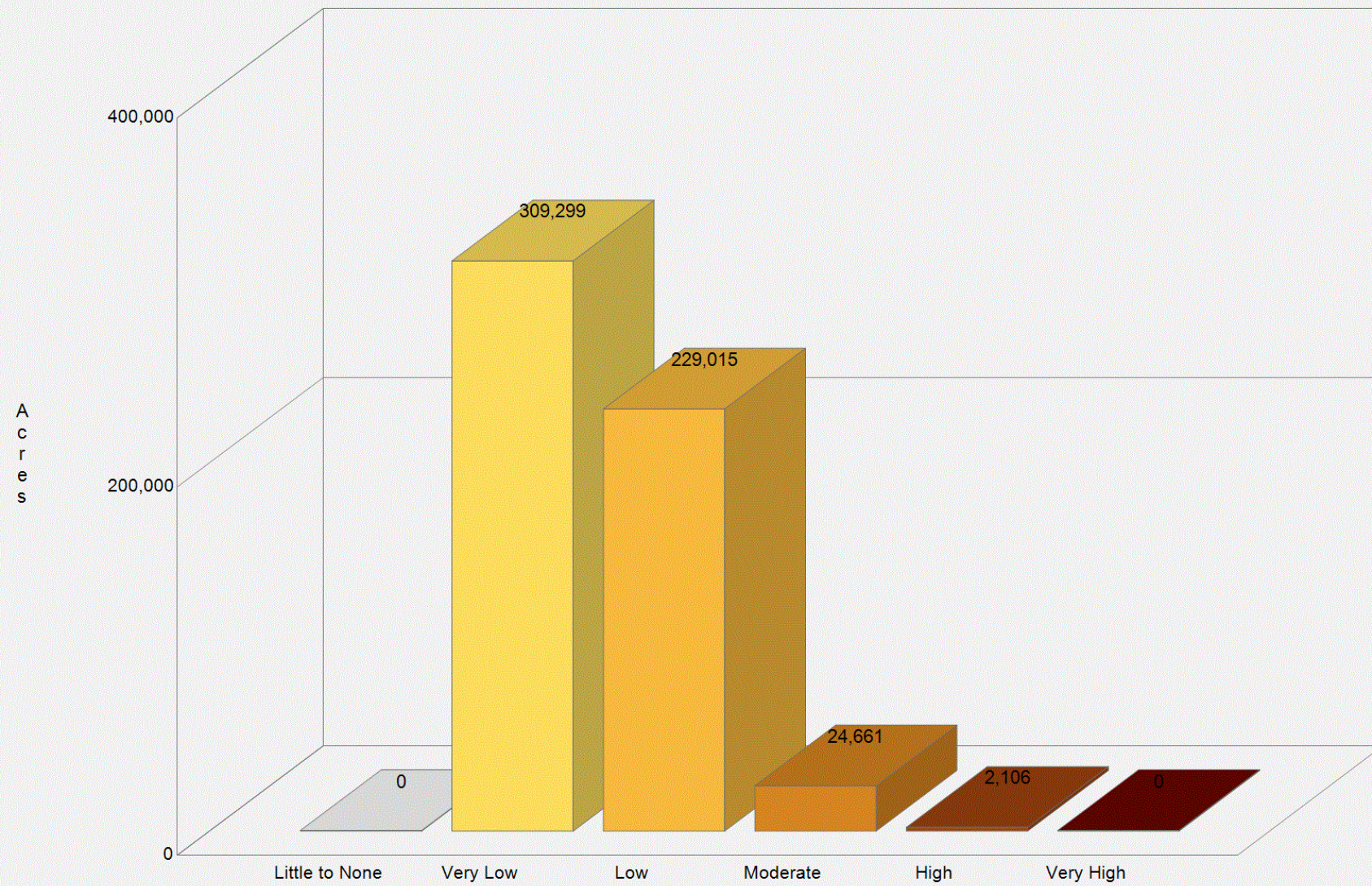
Damage Potential is a fire-effects measure and includes flame-length estimates that reflect all spread directions (heading, backing, and flanking). Intensities from nonheading spread directions are considerably lower than those at the head of the fire.

Data Source: Southern Wildfire Risk Assessment, Pyrologix 2023 (includes fuel disturbances through 2022)

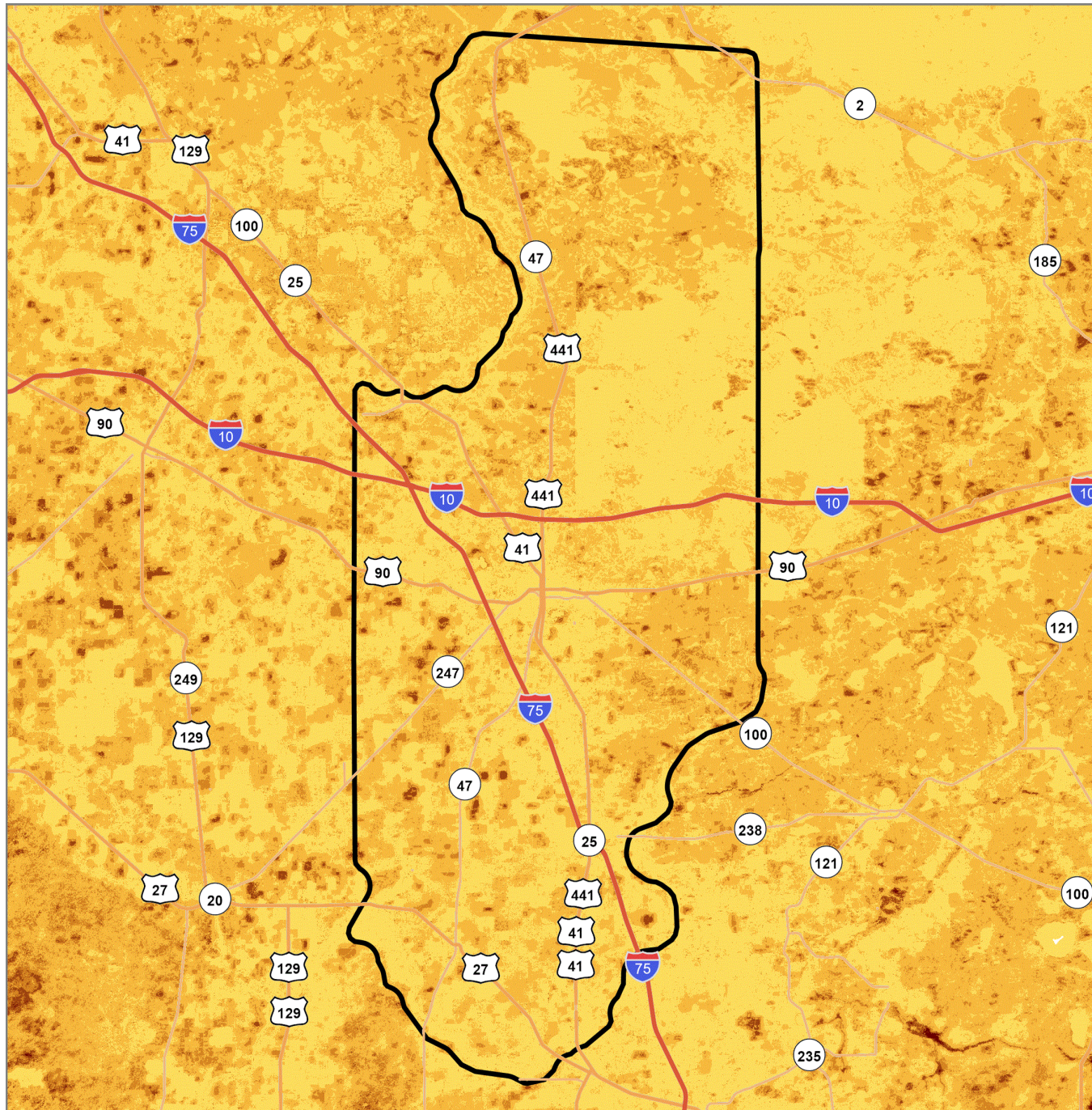
|  | Damage Potential Category | Acres          | Percent      |
|--|---------------------------|----------------|--------------|
|  | Little to None            | 0              | 0 %          |
|  | Very Low                  | 309,299        | 55 %         |
|  | Low                       | 229,015        | 41 %         |
|  | Moderate                  | 24,661         | 4 %          |
|  | High                      | 2,106          | 0 %          |
|  | Very High                 | 0              | 0 %          |
|  | <b>Total</b>              | <b>565,081</b> | <b>100 %</b> |



**Columbia v3**  
**Damage Potential**







Columbia v3

### Damage Potential

- Little to None
- Very Low
- Low
- Moderate
- High
- Very High

11.32 mi  
24292.0 m

**SOUTHERN**  
GROUP OF STATE  
**FORESTERS**

Southern Wildfire Risk Assessment  
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# Risk to Homes and Communities

The information in this section provides useful information for communities to help prepare for and prevent wildfires.

## Contents:

[Housing Unit Density](#)

[Housing Unit Impact](#)

[Housing Unit Risk](#)

[Sources of Ember Load to Buildings](#)

[Functional Wildland Urban Interface \(WUI\)](#)

# Housing Unit Density

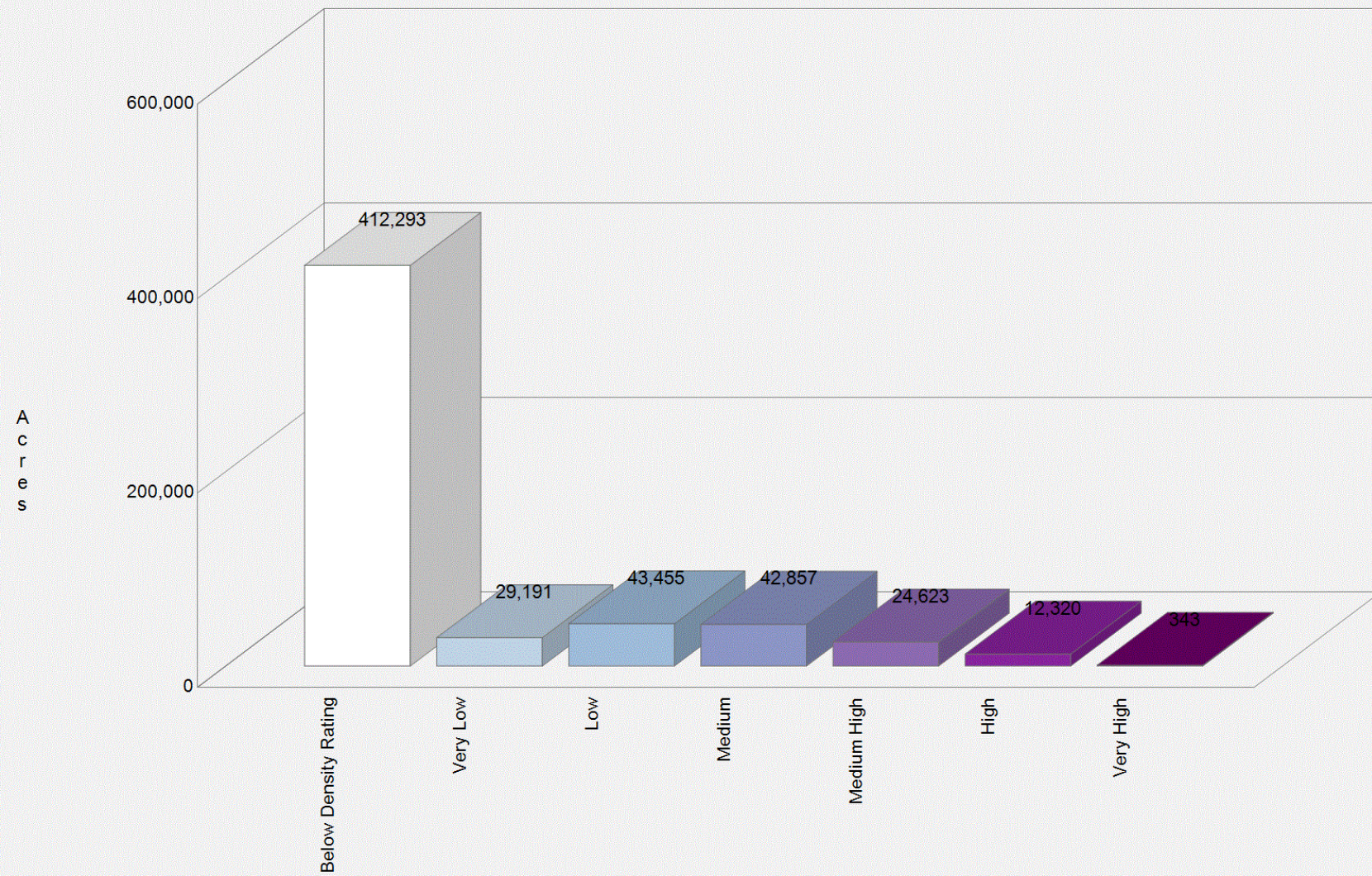
This layer displays housing unit density measured in housing units per square kilometer and reflects 2020 estimates of housing unit counts from the U.S. Census Bureau, combined with building footprint data from Onegeo and USA Structures - both reflecting 2022 conditions.

Data Source: Southern Wildfire Risk Assessment, Pyrologix 2023 (includes fuel disturbances through 2022)

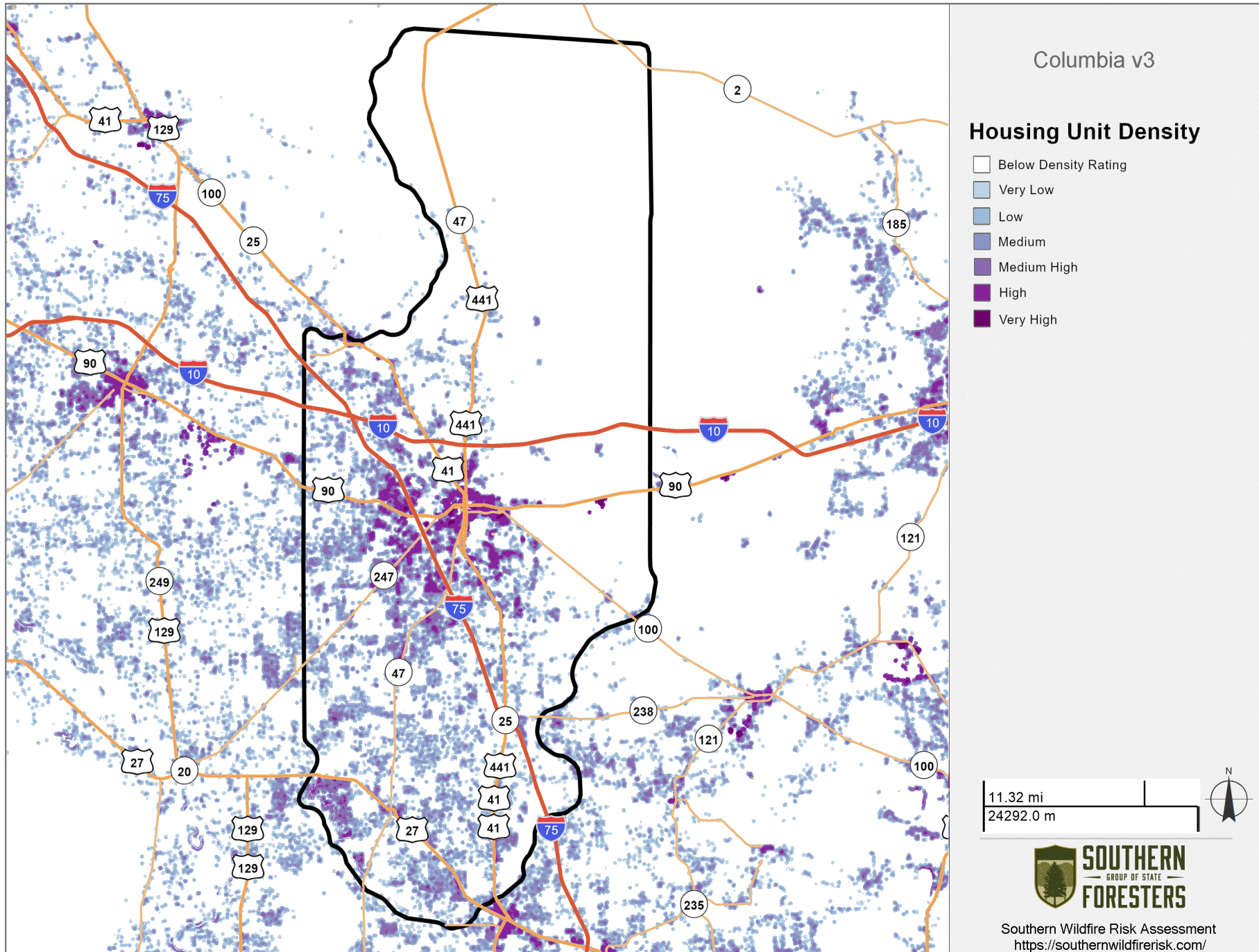
|  | Housing Unit Density Category | Acres   | Percent |
|--|-------------------------------|---------|---------|
|  | Below Density Rating          | 412,293 | 73 %    |
|  | Very Low                      | 29,191  | 5 %     |
|  | Low                           | 43,455  | 8 %     |
|  | Medium                        | 42,857  | 8 %     |
|  | Medium High                   | 24,623  | 4 %     |
|  | High                          | 12,320  | 2 %     |
|  | Very High                     | 343     | 0 %     |
|  | Total                         | 565,081 | 100 %   |



Columbia v3  
Housing Unit Density







# Housing Unit Impact

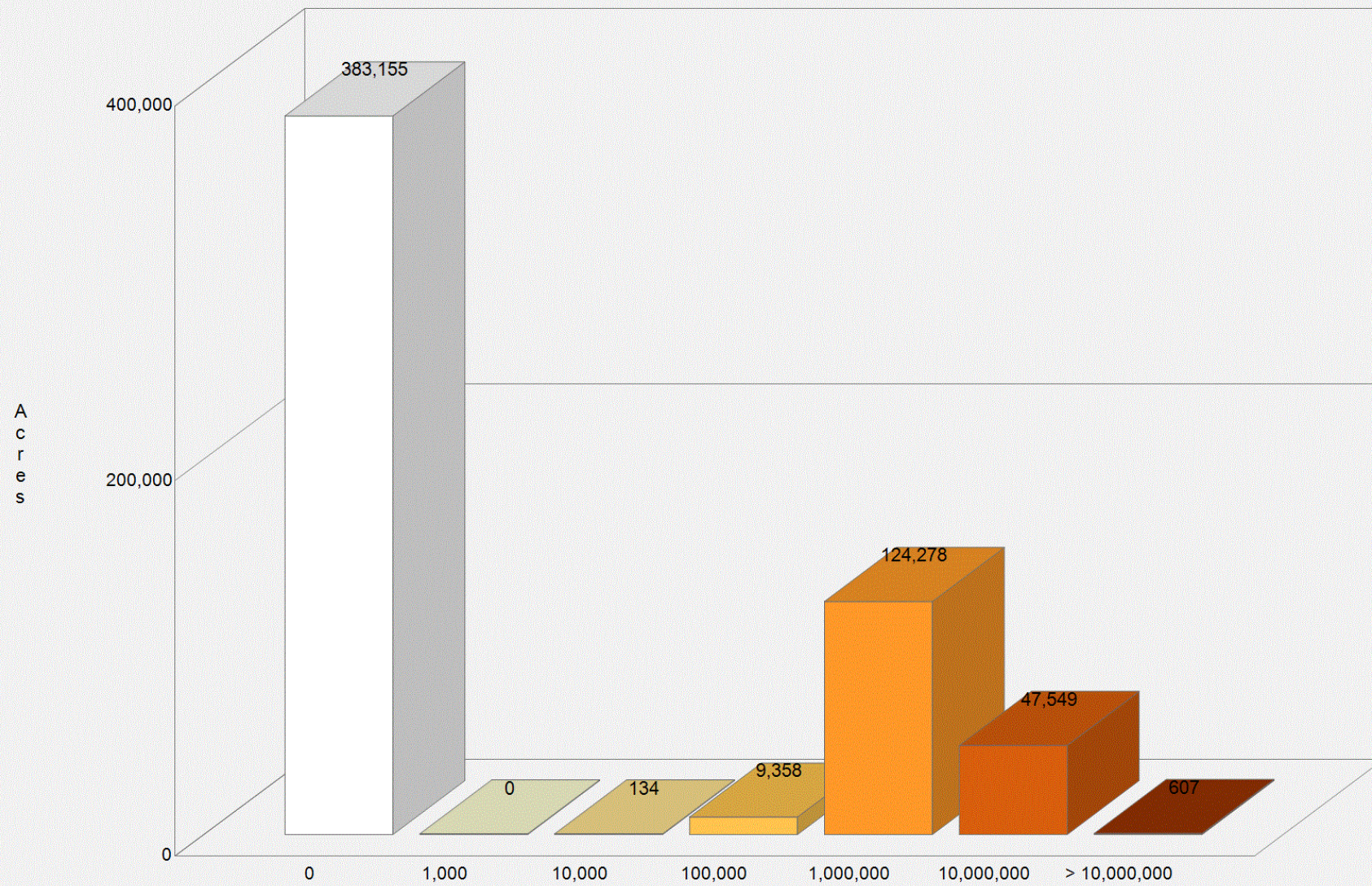
This dataset represents the relative potential impact to housing units if a fire were to occur. Housing Unit Impact (HUImpact) incorporates housing-unit counts with the general consequences of fire on a home as a function of fire intensity. HUImpact does not include fire likelihood and does not reflect individual structure mitigations that would influence susceptibility.

Data Source: Southern Wildfire Risk Assessment, Pyrologix 2023 (includes fuel disturbances through 2022)

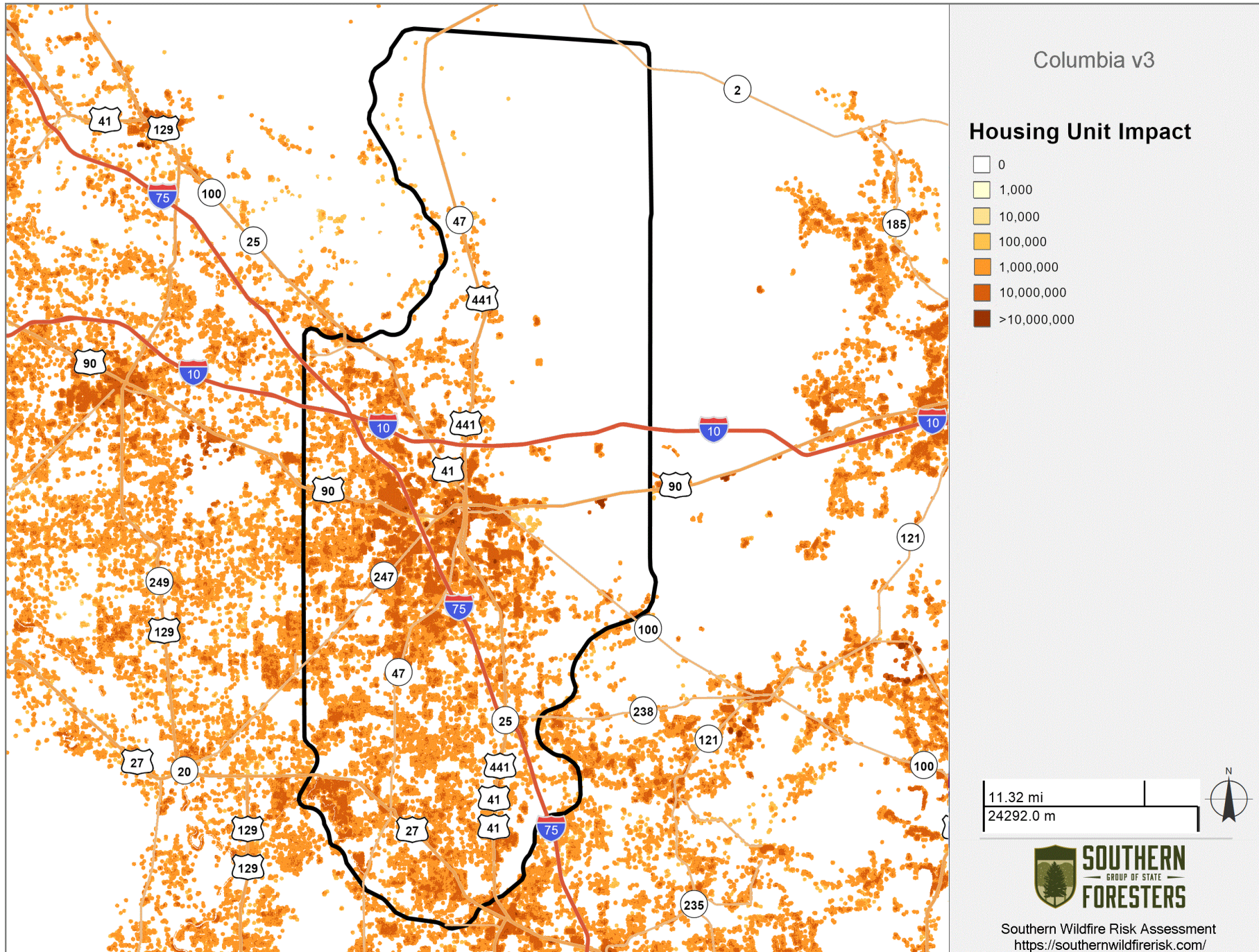
|  | Housing Unit Impact Category | Acres   | Percent |
|--|------------------------------|---------|---------|
|  | 0                            | 383,155 | 68 %    |
|  | 1,000                        | 0       | 0 %     |
|  | 10,000                       | 134     | 0 %     |
|  | 100,000                      | 9,359   | 2 %     |
|  | 1,000,000                    | 124,278 | 22 %    |
|  | 10,000,000                   | 47,549  | 8 %     |
|  | > 10,000,000                 | 607     | 0 %     |
|  | Total                        | 565,081 | 100 %   |



Columbia v3  
Housing Unit Impact







# Housing Unit Risk

Housing Unit Risk (HURisk) represents the potential risk to housing units and incorporates both the general consequences of fire on a home as a function of fire intensity, and Burn Probability as a measure of wildfire likelihood. HURisk does not reflect individual structure mitigations that would influence susceptibility.

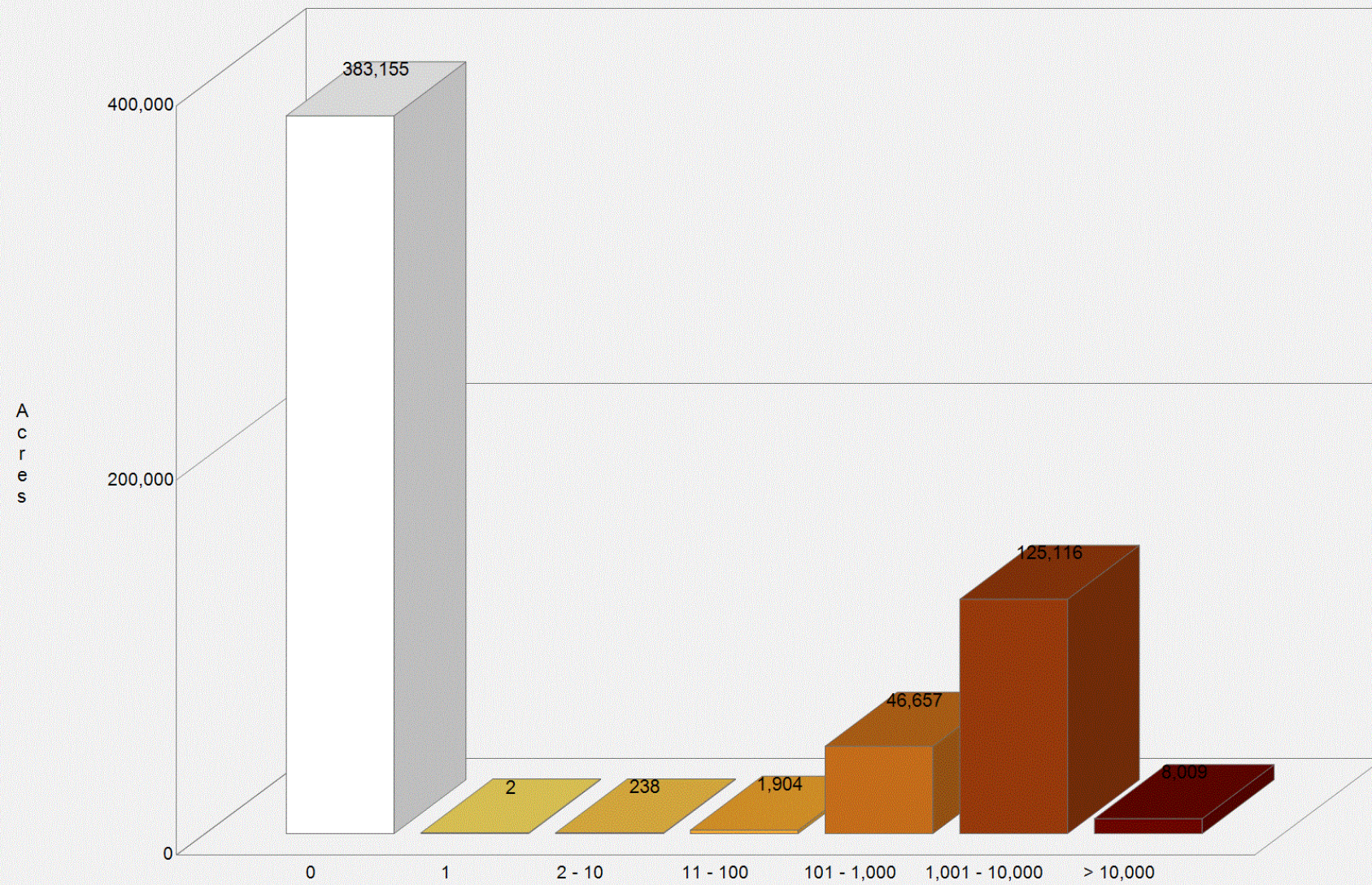
Housing Unit Risk integrates all four primary elements of wildfire risk - likelihood, intensity, susceptibility, and exposure - on pixels where housing unit density is greater than zero.

Data Source: Southern Wildfire Risk Assessment, Pyrologix 2023 (includes fuel disturbances through 2022)

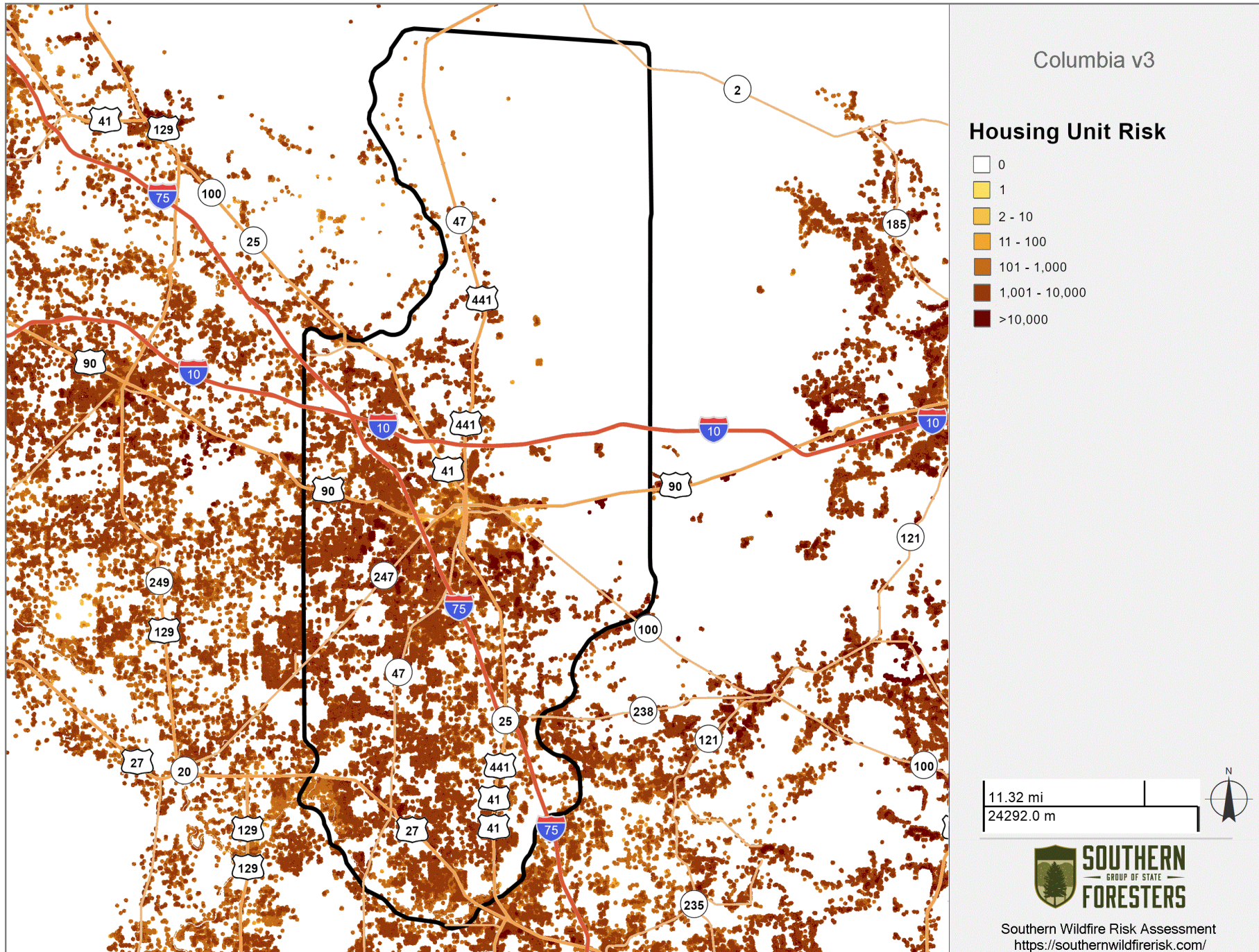
|  | Housing Unit Risk Category | Acres          | Percent      |
|--|----------------------------|----------------|--------------|
|  | 0                          | 383,155        | 68 %         |
|  | 1                          | 2              | 0 %          |
|  | 2 - 10                     | 238            | 0 %          |
|  | 11 - 100                   | 1,904          | 0 %          |
|  | 101 - 1,000                | 46,657         | 8 %          |
|  | 1,001 - 10,000             | 125,116        | 22 %         |
|  | > 10,000                   | 8,009          | 1 %          |
|  | <b>Total</b>               | <b>565,081</b> | <b>100 %</b> |



Columbia v3  
Housing Unit Risk









## Sources of Ember Load to Buildings

Sources of Ember Load to Buildings (SELB) is a relative index of the potential for fuel to produce embers that land where buildings are located, given that a fire occurs.

SELB identifies burnable land cover that produces embers capable of reaching nearby buildings. Units are an index of the relative number of embers rather than a count of embers produced. Ember production is a function of fire type and intensity; ember travel is a function of wind speed and direction. Ember modeling is based on fire modeling from WildEST, a process used to perform and combine multiple fire behavior simulations under a range of weather types (wind speed, wind direction, fuel moisture content). WildEST results reflect how often weather conditions occur and capture the influence of high-spread conditions. SELB is based on heading-only fire behavior and does not include the likelihood of wildfire.

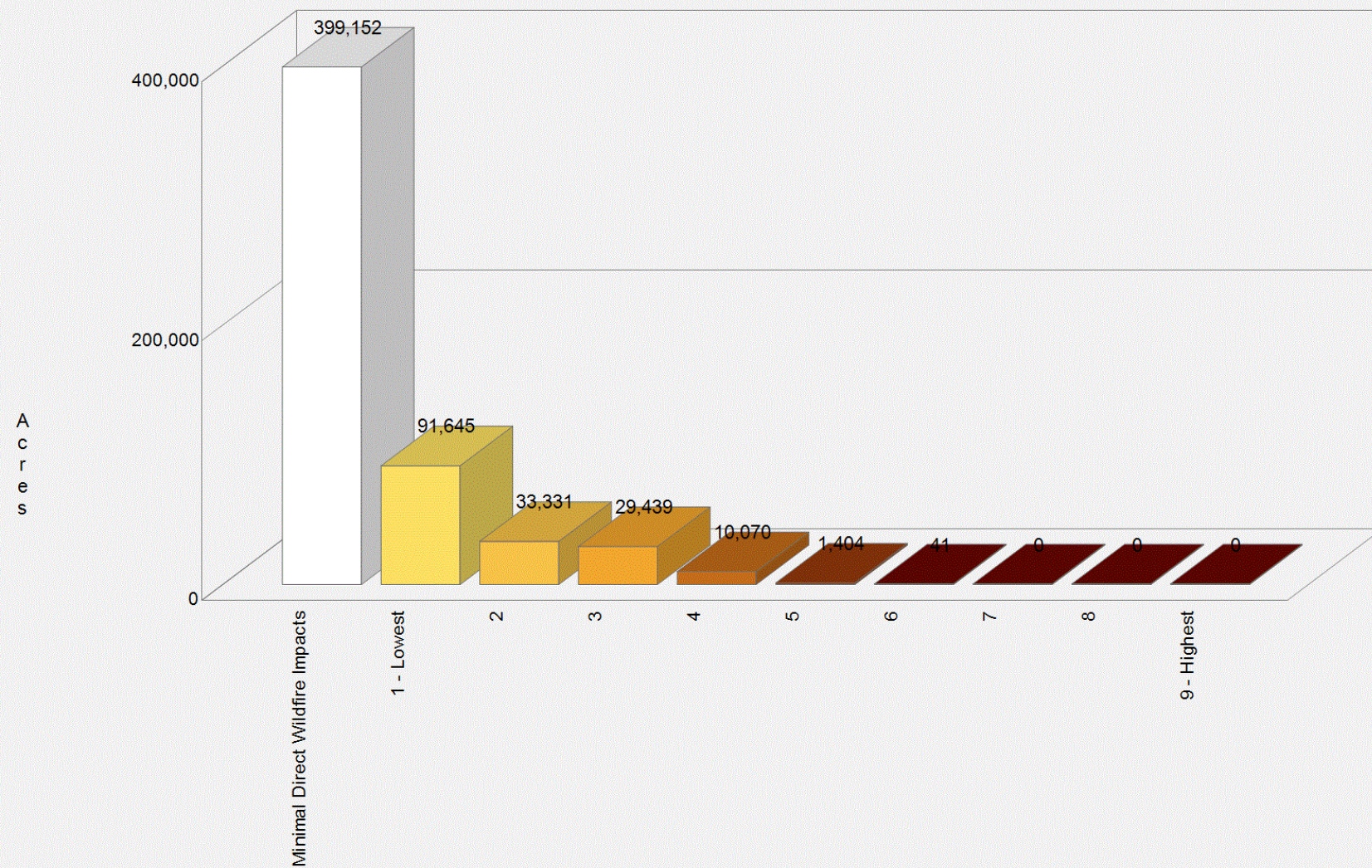
The Sources of Ember Load to Buildings layer is useful for prioritizing mitigation actions to reduce the potential for ember damage to buildings.

Data Source: Southern Wildfire Risk Assessment, Pyrologix 2023 (includes fuel disturbances through 2022)

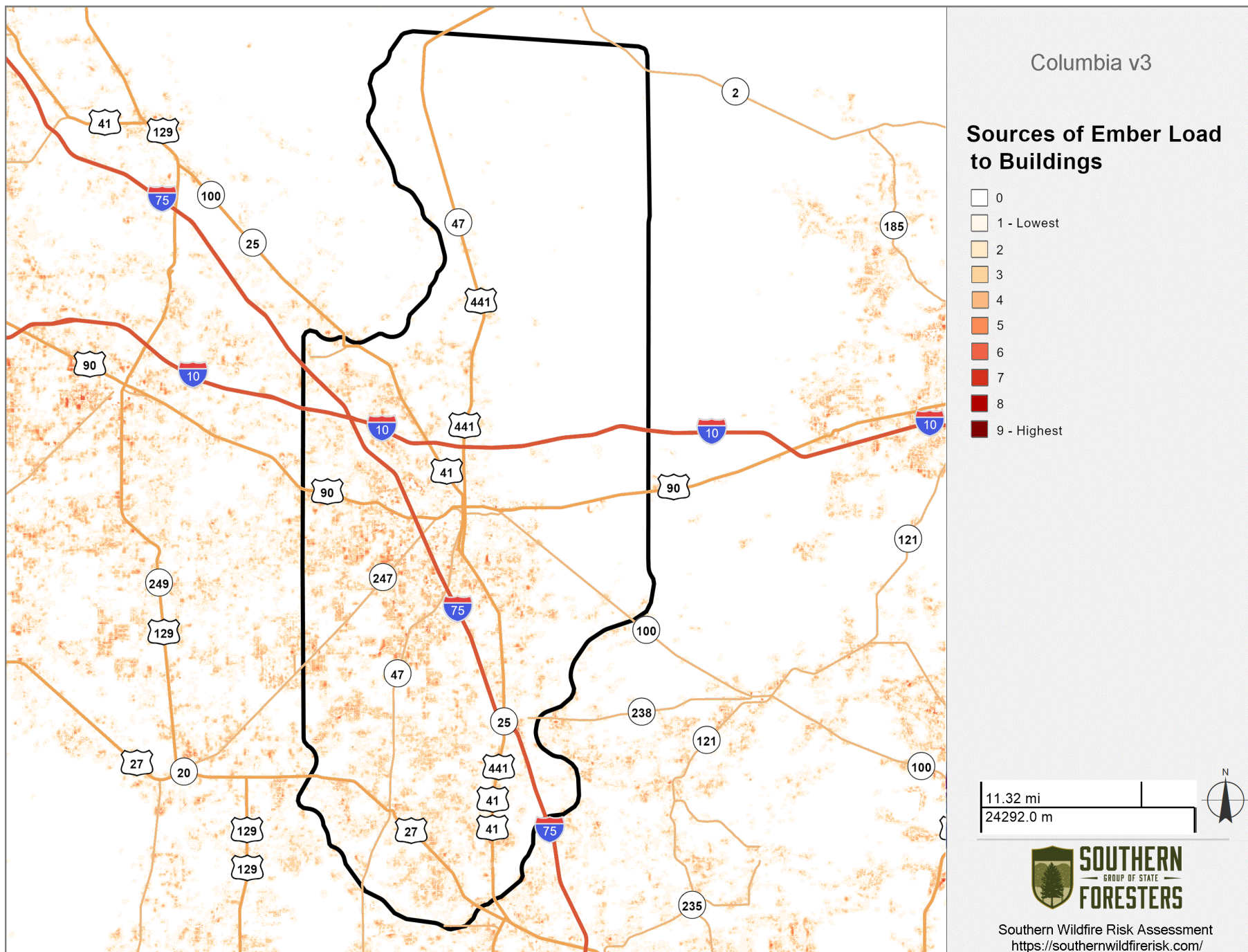
|  | Sources of Ember Load to Buildings Category | Acres          | Percent      |
|--|---------------------------------------------|----------------|--------------|
|  | Minimal Direct Wildfire Impacts             | 399,152        | 71 %         |
|  | 1 - Lowest                                  | 91,645         | 16 %         |
|  | 2                                           | 33,331         | 6 %          |
|  | 3                                           | 29,440         | 5 %          |
|  | 4                                           | 10,070         | 2 %          |
|  | 5                                           | 1,404          | 0 %          |
|  | 6                                           | 41             | 0 %          |
|  | 7                                           | 0              | 0 %          |
|  | 8                                           | 0              | 0 %          |
|  | 9 - Highest                                 | 0              | 0 %          |
|  | <b>Total</b>                                | <b>565,081</b> | <b>100 %</b> |



**Columbia v3**  
**Sources of Ember Load to Buildings**







# Functional Wildland Urban Interface (WUI)

Functional WUI represents a classification of the land near buildings\* into zones that describe the wildfire risk mitigation activities appropriate for each zone.

**Direct Exposure** - The Direct Exposure zone is burnable land cover within 75 m of a structure. Reducing fire intensity and ember production in this zone would reduce the exposure of nearby buildings to heat and embers. Buildings in this zone also require hardening of the structure to resist ignition.

**Indirect Exposure** - The Indirect Exposure zone is nonburnable land cover within 1500 m of burnable land cover that is within 75 m of a structure, meaning that embers and home-to-home spread could reach within this zone. Indirectly exposed structures would benefit from the hardening of the structure to resist ignition from embers and nearby structures, but defensible space is usually not required due to the heavily developed nature of the zone.

**Critical Fireshed** - The Critical Fireshed is the unpopulated land within about 2.4 km of a group of structures. Fires that originate within or spread to the Critical Fireshed have an immediate threat of reaching the nearby structures; fuel treatments that slow fire spread in this zone can reduce risk to these structures.

**Sources of Ember Load to Buildings** - These are areas of burnable land cover that produces embers capable of reaching nearby buildings. Ember production is a function of fire type and intensity, and ember travel is a function of wind speed and direction. Fuel treatment in this zone is a priority for reducing ember load to the nearby buildings.

**Little-to-No Exposure** - The Little-to-No Exposure zone is nonburnable land that is within 75 m of a structure but greater than 1500 m from a large (500 ha) contiguous block of burnable land cover. Flames—even from home-to-home spread—and embers are unlikely to reach the Little-to-No-Exposure zone, but smoke and evacuations could still impact this area.

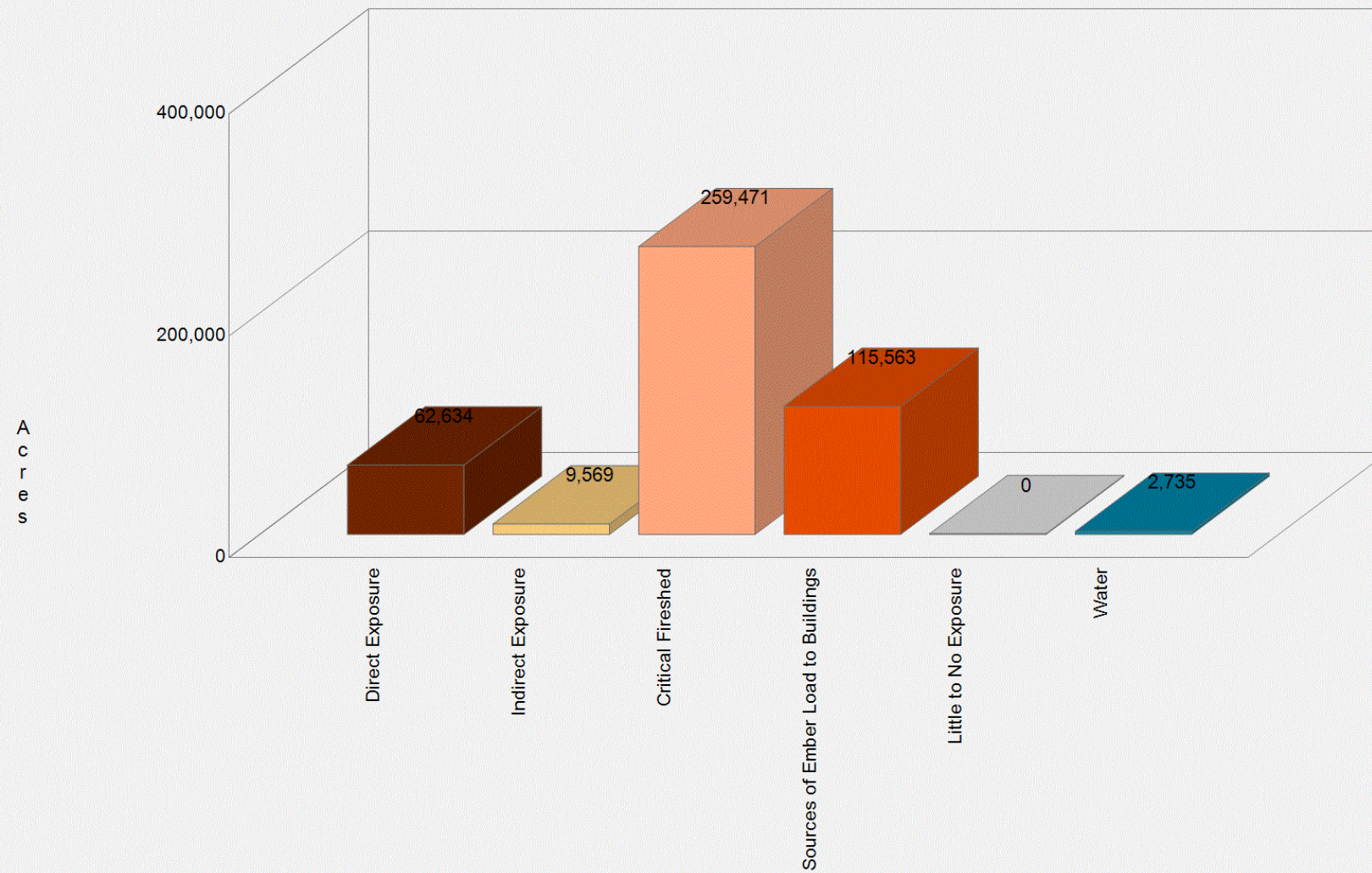
\*Buildings used in producing Functional WUI are defined as greater than 40 sq meters.

Data Source: Southern Wildfire Risk Assessment, Pyrologix 2023 (includes fuel disturbances through 2022)

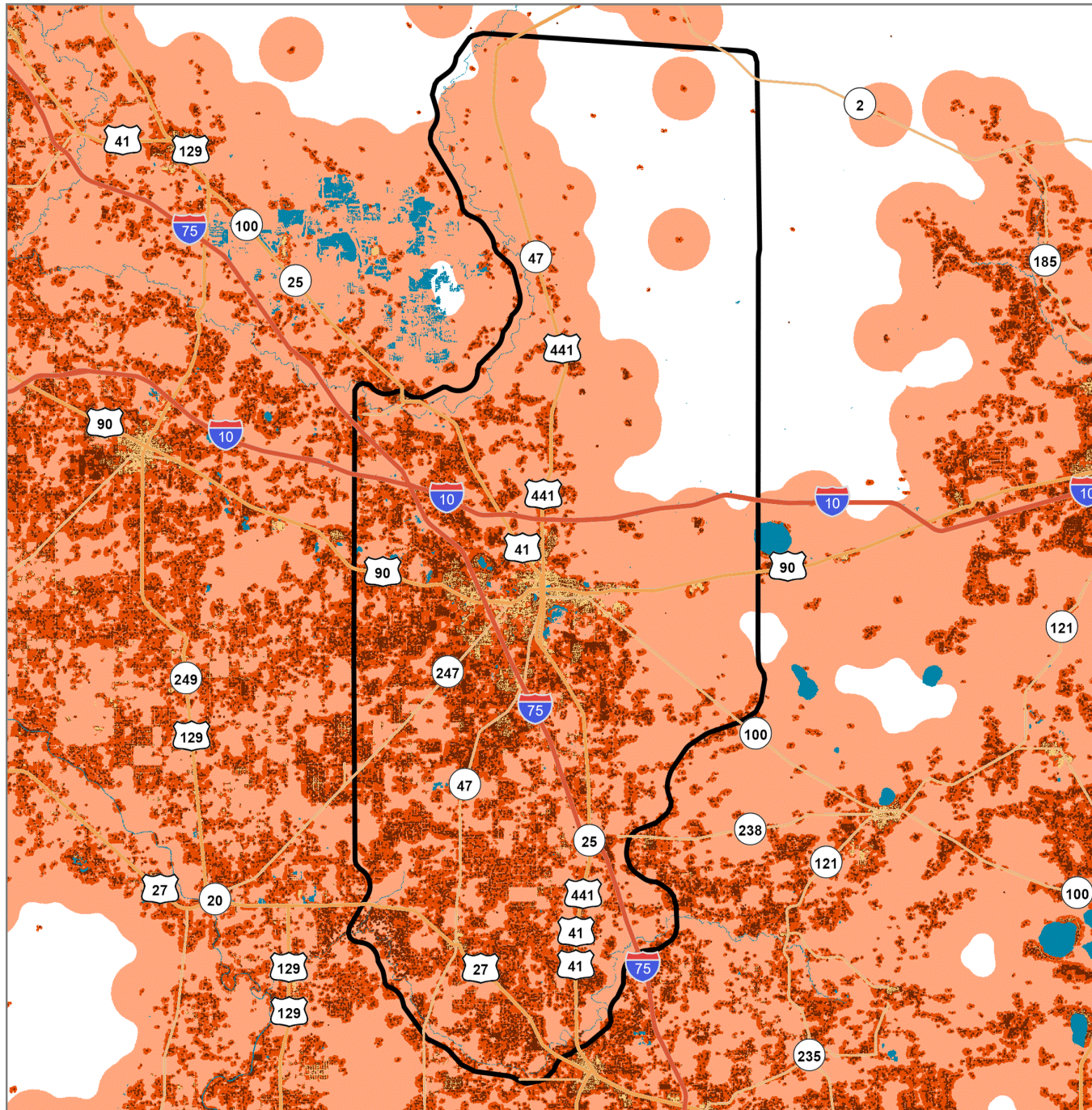
|  | Functional Wildland Urban Interface (WUI) Category | Acres          | Percent      |
|--|----------------------------------------------------|----------------|--------------|
|  | Direct Exposure                                    | 62,634         | 14 %         |
|  | Indirect Exposure                                  | 9,569          | 2 %          |
|  | Critical Fireshed                                  | 259,471        | 58 %         |
|  | Sources of Ember Load to Buildings                 | 115,563        | 26 %         |
|  | Little to No Exposure                              | 0              | 0 %          |
|  | Water                                              | 2,735          | 1 %          |
|  | <b>Total</b>                                       | <b>449,972</b> | <b>100 %</b> |



Columbia v3  
Functional Wildland Urban Interface (WUI)







Columbia v3

## Functional Wildland Urban Interface

- Direct Exposure
- Indirect Exposure
- Critical Fireshed
- Sources of Ember Load to Buildings
- Little to No Exposure
- Water

11.32 mi  
24292.0 m



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# Flame Front Characteristics

The information in this section of the report describes fire behavior characteristics at the flaming front of the fire.

## Contents:

- [Characteristic Fire Intensity Scale](#)
- [95th Percentile Fire Intensity Scale](#)
- [Characteristic Flame Length](#)
- [95th Percentile Flame Length](#)
- [Characteristic Rate of Spread](#)
- [95th Percentile Rate of Spread](#)
- [Probability of Crown Fire](#)

# Fire Behavior Overview

## Description

**Fire behavior is the manner in which a fire reacts to the following environmental influences:**

1. **Fuels**
2. **Weather**
3. **Topography**



Fire behavior characteristics are attributes of wildland fire that pertain to its spread, intensity, and growth. Fire behavior characteristics utilized in the Southern Wildfire Risk Assessment (SWRA) include fire type, rate of spread, flame length and fire intensity scale. These metrics are used to determine the potential fire behavior under different weather scenarios. Areas that exhibit moderate to high fire behavior potential can be identified for mitigation treatments, especially if these areas are in close proximity to homes, business, or other assets.

## Fuels

The SWRA includes composition and characteristics for both surface fuels and canopy fuels. Significant increases in fire behavior will be captured if the fire has the potential to transition from a surface fire to a canopy fire.

Fuel datasets required to compute both surface and canopy fire potential include:

- **Surface Fuels**, generally referred to as fire behavior fuel models, provide the input parameters needed to compute surface fire behavior.
- **Canopy Cover** is the horizontal percentage of the ground surface that is covered by tree crowns. It is used to compute wind reduction factors and shading.
- **Canopy Ceiling Height/Stand Height** is the height above the ground of the highest canopy layer where the density of the crown mass within the layer is high enough to support vertical movement of a fire. A good estimate of canopy ceiling height would be the average height of the dominant and co-dominant trees in a stand. It is used for computing wind reduction to midflame height and spotting distances from torching trees (Fire Program Solutions, L.L.C, 2005).
- **Canopy Base Height** is the lowest height above the ground above which there is sufficient canopy fuel to propagate fire vertically (Scott & Reinhardt, 2001). Canopy base height is a property of a plot, stand, or group of trees, not of an individual tree. For fire modeling, canopy base height is an effective value that incorporates ladder fuel, such as tall shrubs and small trees. Canopy base height is used to determine if a surface fire will transition to a canopy fire.
- **Canopy Bulk Density** is the mass of available canopy fuel per unit canopy volume (Scott & Reinhardt, 2001). Canopy bulk density is a bulk property of a stand, plot, or group of trees, not of an individual tree. Canopy bulk density is used to predict whether an active crown fire is possible.

## **Weather**

Environmental weather parameters needed to compute fire behavior characteristics include 1-hour, 10-hour, and 100-hour timelag fuel moistures, herbaceous fuel moisture, woody fuel moisture, and the 20-foot wind speed.

Weather variables were acquired from gridded weather data to generate 216 weather scenarios comprised of 9 wind speeds, 8 wind directions, and 3 moisture scenarios. Rather than employing multiple percentile weather categories (as previously used in the SWRA fire behavior calculations), the fire behavior modeling in the SWRA update is calculated with the Wildfire Exposure Simulation Tool (WildEST).

WildEST is a cloud-based system that uses a custom implementation of the FlamMap fire modeling system (Finney 2006) to produce simulations under a range of weather types (wind speed, wind direction, fuel moisture content). The 216 FlamMap runs are combined into a single output by weighting each scenario according to weather type probabilities that reflect how often each weather scenario occurs in the record, its co-occurrence with historical fire ignitions, and the influence of high-spread conditions (such as the disproportionate impact of hot, dry, and windy conditions on fire growth).

Two sets of results are provided for each of the Flame Front Characteristic layers. Results using all 216 weather scenarios are labeled “Characteristic” while “95<sup>th</sup> Percentile” or average-worst Flame Front Characteristics demonstrate the impact of the top five percent of weather types. These results represent an average of the worst 5% of weather types, weighted according to the frequency of the weather type and the influence of high-spread conditions.

## **Topography**

Topography datasets required to compute fire behavior characteristics are elevation, slope and aspect.

# Characteristic Fire Intensity Scale

Characteristic Fire Intensity Scale (FIS) specifically identifies where significant fuel hazards and associated dangerous fire behavior potential exist based on fuel and weighted across a full range of wind and weather conditions calculated using WildEST. Rather than weighting results solely by how frequently the weather conditions occur, the WildEST process factors the greater influence of high-spread conditions into the weighting calculations. These estimates include the contribution of crown fuel and crowning fire intensity.

Similar to the Richter scale for earthquakes, FIS provides a standard scale to measure potential wildfire intensity. FIS consist of 5 classes where the order of magnitude between classes is ten-fold. The minimum class, Class 1, represents very low wildfire intensities and the maximum class, Class 5, represents very high wildfire intensities. Refer to descriptions below.

1. Class 1, Very Low:

Very small, discontinuous flames, usually less than 1 foot in length; very low rate of spread; no spotting. Fires are typically easy to suppress by firefighters with basic training and non-specialized equipment.

2. Class 2, Low:

Small flames, usually less than two feet long; small amount of very short range spotting possible. Fires are easy to suppress by trained firefighters with protective equipment and specialized tools.

3. Class 3, Moderate:

Flames up to 9 feet in length; short-range spotting is possible. Trained firefighters will find these fires difficult to suppress without support from aircraft or engines, but dozer and plows are generally effective. Increasing potential for harm or damage to life and property.

4. Class 4, High:

Large Flames, up to 40 feet in length; short-range spotting common; medium range spotting possible. Direct attack by trained firefighters, engines, and dozers is generally ineffective, indirect attack may be effective. Significant potential for harm or damage to life and property.

5. Class 5, Very High:

Flames exceeding 200 feet in length; expect extreme fire behavior.

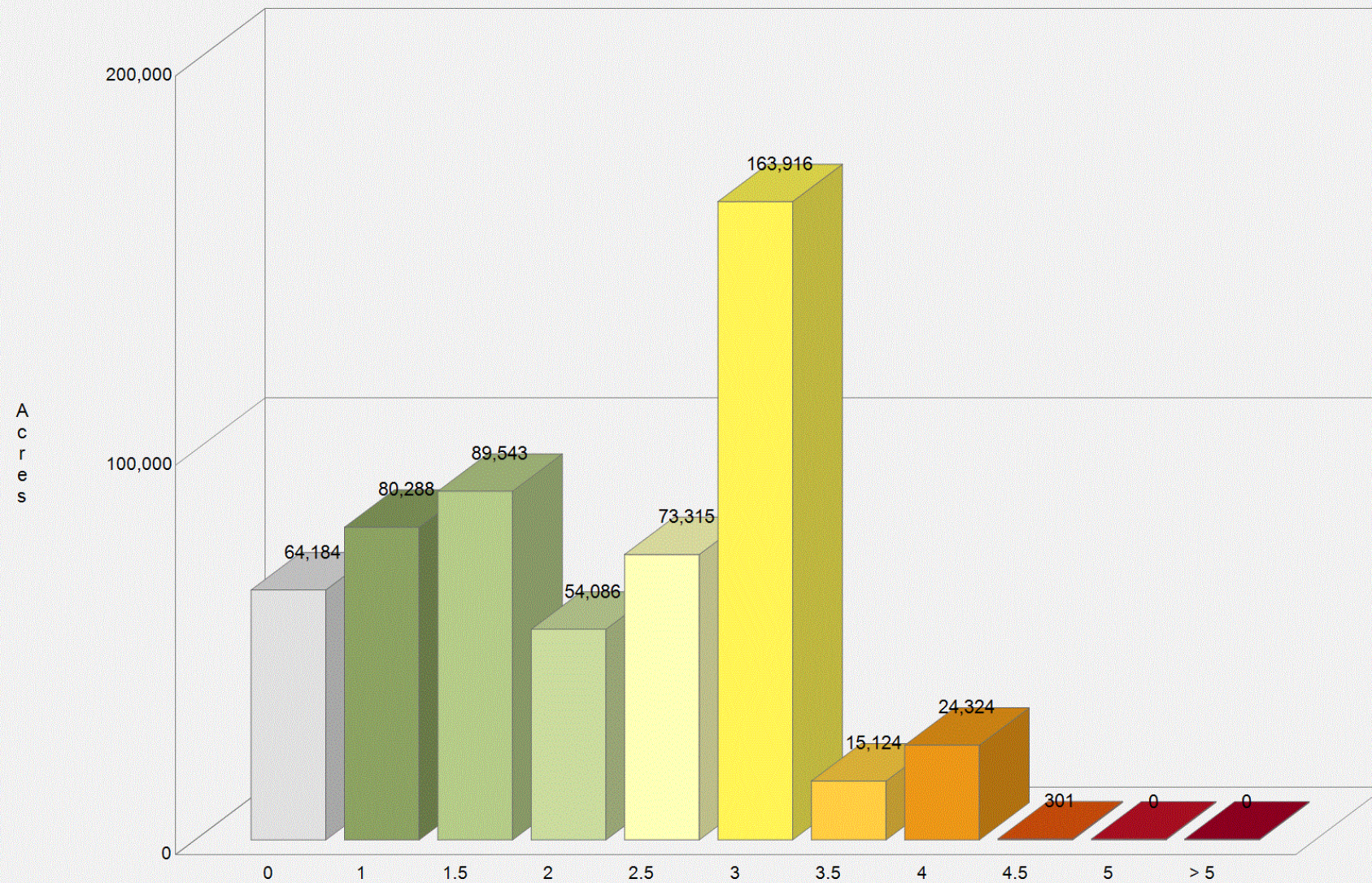
To aid in viewing on the map, FIS is presented in 1/2 class increments. Please consult the SouthWRAP User Manual for a more detailed description of the FIS class descriptions.

Data Source: Southern Wildfire Risk Assessment, Pyrologix 2023 (includes fuel disturbances through 2022)

|  | Characteristic Fire Intensity Scale Category | Acres          | Percent      |
|--|----------------------------------------------|----------------|--------------|
|  | 0                                            | 64,184         | 11 %         |
|  | 1                                            | 80,288         | 14 %         |
|  | 1.5                                          | 89,543         | 16 %         |
|  | 2                                            | 54,086         | 10 %         |
|  | 2.5                                          | 73,315         | 13 %         |
|  | 3                                            | 163,916        | 29 %         |
|  | 3.5                                          | 15,124         | 3 %          |
|  | 4                                            | 24,324         | 4 %          |
|  | 4.5                                          | 301            | 0 %          |
|  | 5                                            | 0              | 0 %          |
|  | > 5                                          | 0              | 0 %          |
|  | <b>Total</b>                                 | <b>565,082</b> | <b>100 %</b> |



Columbia v3  
Characteristic Fire Intensity Scale









# 95th Percentile Fire Intensity Scale

This layer represents the "average-worst" 95th Percentile Fire Intensity Scale at the flaming front of the fire. Here, fireline intensity is represented as the standard Fire Intensity Scale (Log10 of fireline intensity) as determined by fuel and weather characteristics. These results are weighted according to the Weather Type Probabilities (WTPs) from the highest five percent of possible wind and weather conditions and include the contribution of crown fuel and crowning fire intensity, if applicable. Fireline intensity is calculated using WildEST. Rather than weighting results solely by how frequently the weather conditions occur, the WildEST process factors the greater influence of high-spread conditions into the weighting calculations.

Similar to the Richter scale for earthquakes, FIS provides a standard scale to measure potential wildfire intensity. FIS consists of 5 classes where the order of magnitude between classes is ten-fold. The minimum class, Class 1, represents very low wildfire intensities and the maximum class, Class 5, represents very high wildfire intensities. Refer to descriptions below.

1. Class 1, Very Low:

Very small, discontinuous flames, usually less than 1 foot in length; very low rate of spread; no spotting. Fires are typically easy to suppress by firefighters with basic training and non-specialized equipment.

2. Class 2, Low:

Small flames, usually less than two feet long; small amount of very short range spotting possible. Fires are easy to suppress by trained firefighters with protective equipment and specialized tools.

3. Class 3, Moderate:

Flames up to 9 feet in length; short-range spotting is possible. Trained firefighters will find these fires difficult to suppress without support from aircraft or engines, but dozer and plows are generally effective. Increasing potential for harm or damage to life and property.

4. Class 4, High:

Large Flames, up to 40 feet in length; short-range spotting common; medium range spotting possible. Direct attack by trained firefighters, engines, and dozers is generally ineffective, indirect attack may be effective. Significant potential for harm or damage to life and property.

5. Class 5, Very High:

Flames exceeding 200 feet in length; expect extreme fire behavior.

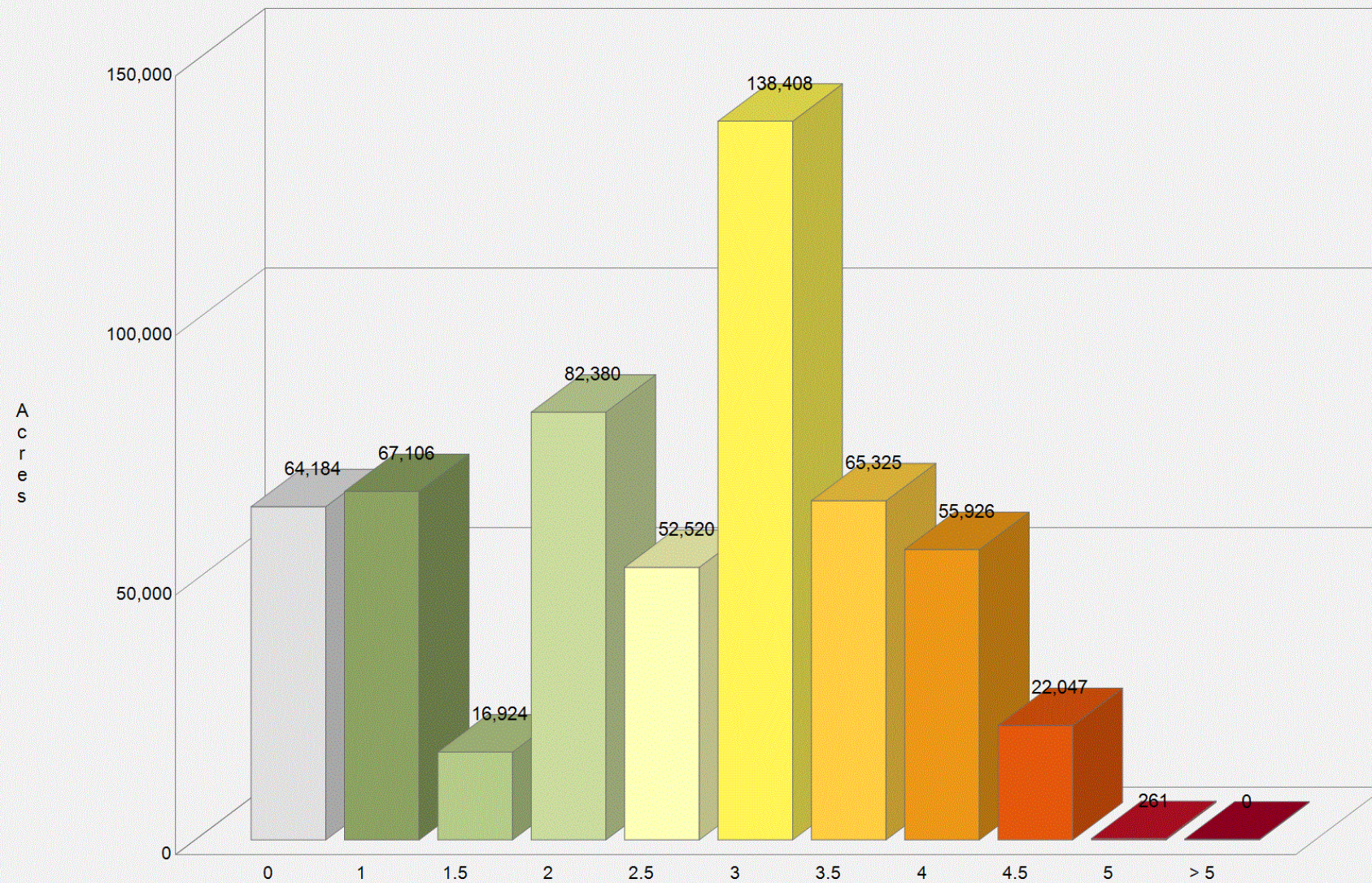
To aid in viewing on the map, FIS is presented in 1/2 class increments. Please consult the SouthWRAP User Manual for a more detailed description of the FIS class descriptions.

Data Source: Southern Wildfire Risk Assessment, Pyrologix 2023 (includes fuel disturbances through 2022)

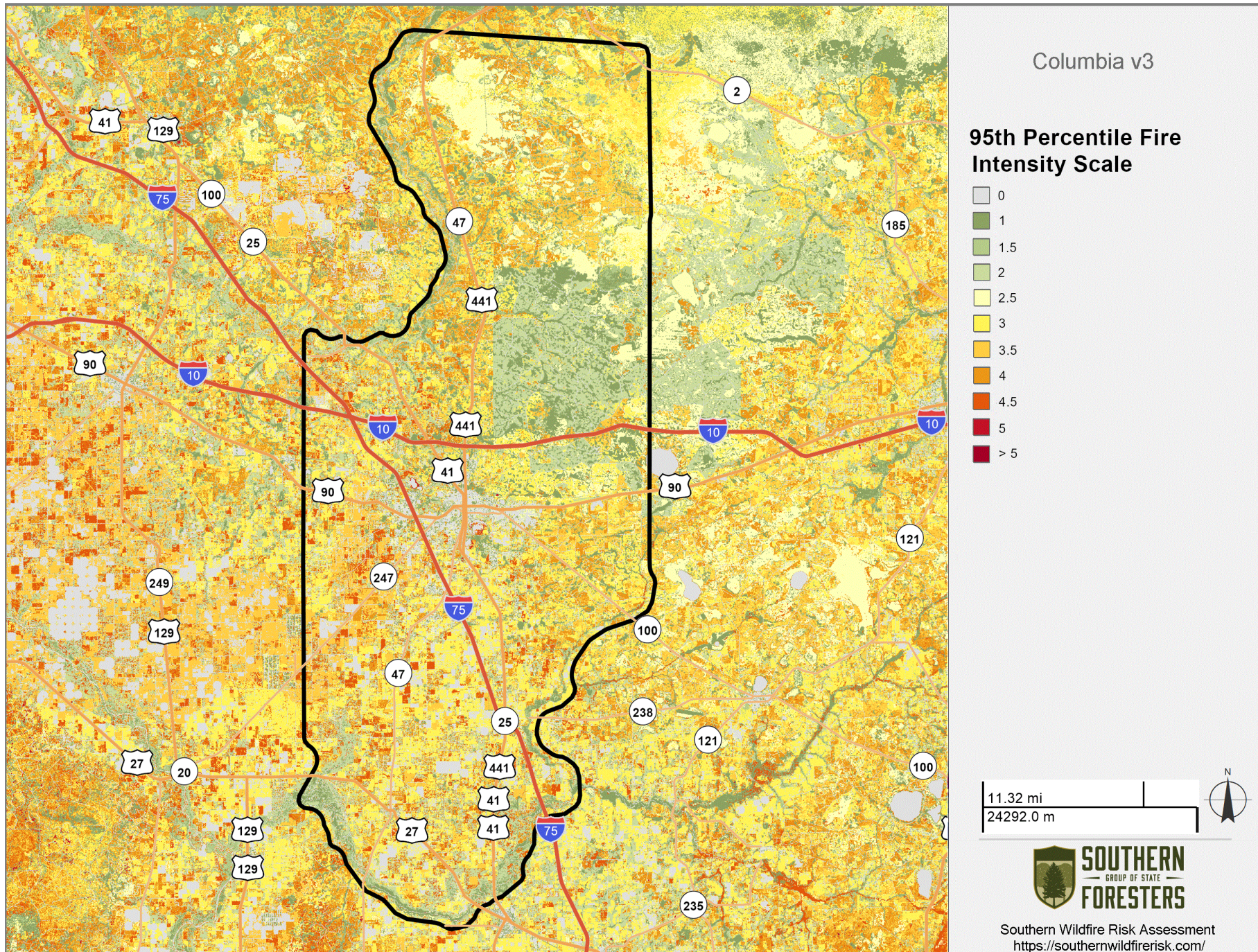
|  | 95th Percentile Fire Intensity Scale Category | Acres          | Percent      |
|--|-----------------------------------------------|----------------|--------------|
|  | 0                                             | 64,184         | 11 %         |
|  | 1                                             | 67,106         | 12 %         |
|  | 1.5                                           | 16,924         | 3 %          |
|  | 2                                             | 82,380         | 15 %         |
|  | 2.5                                           | 52,520         | 9 %          |
|  | 3                                             | 138,408        | 24 %         |
|  | 3.5                                           | 65,325         | 12 %         |
|  | 4                                             | 55,926         | 10 %         |
|  | 4.5                                           | 22,047         | 4 %          |
|  | 5                                             | 261            | 0 %          |
|  | > 5                                           | 0              | 0 %          |
|  | <b>Total</b>                                  | <b>565,081</b> | <b>100 %</b> |



Columbia v3  
95th Percentile Fire Intensity Scale









## Characteristic Flame Length

This layer represents the flame length (in feet) as determined by fuel and weather characteristics. These results are weighted across a full range of possible wind and weather conditions and include the contribution of crown fire flame lengths, if applicable. Flame length is calculated using WildEST, a process used to perform and combine multiple fire behavior simulations under a range of weather types (wind speed, wind direction, fuel moisture content). Rather than weighting results solely by how frequently the weather conditions occur, the WildEST process factors the greater influence of high-spread conditions into the weighting calculations.

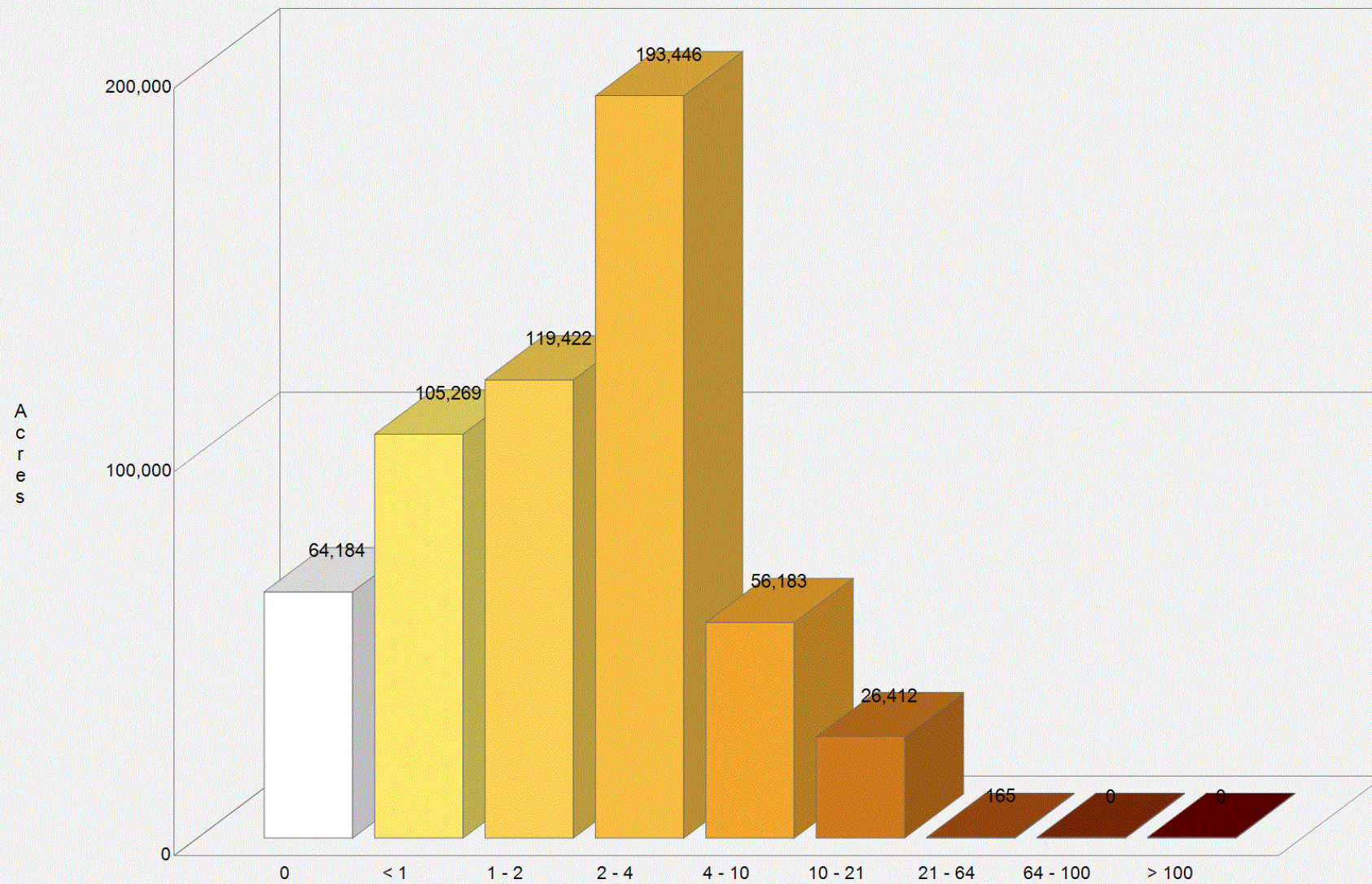
Uses for this flame length dataset include comparison of expected flame-lengths across the landscape for identifying wildfire hazards to the public and exploring hazard mitigation opportunities for communities and land management agencies.

Data Source: Southern Wildfire Risk Assessment, Pyrologix 2023 (includes fuel disturbances through 2022)

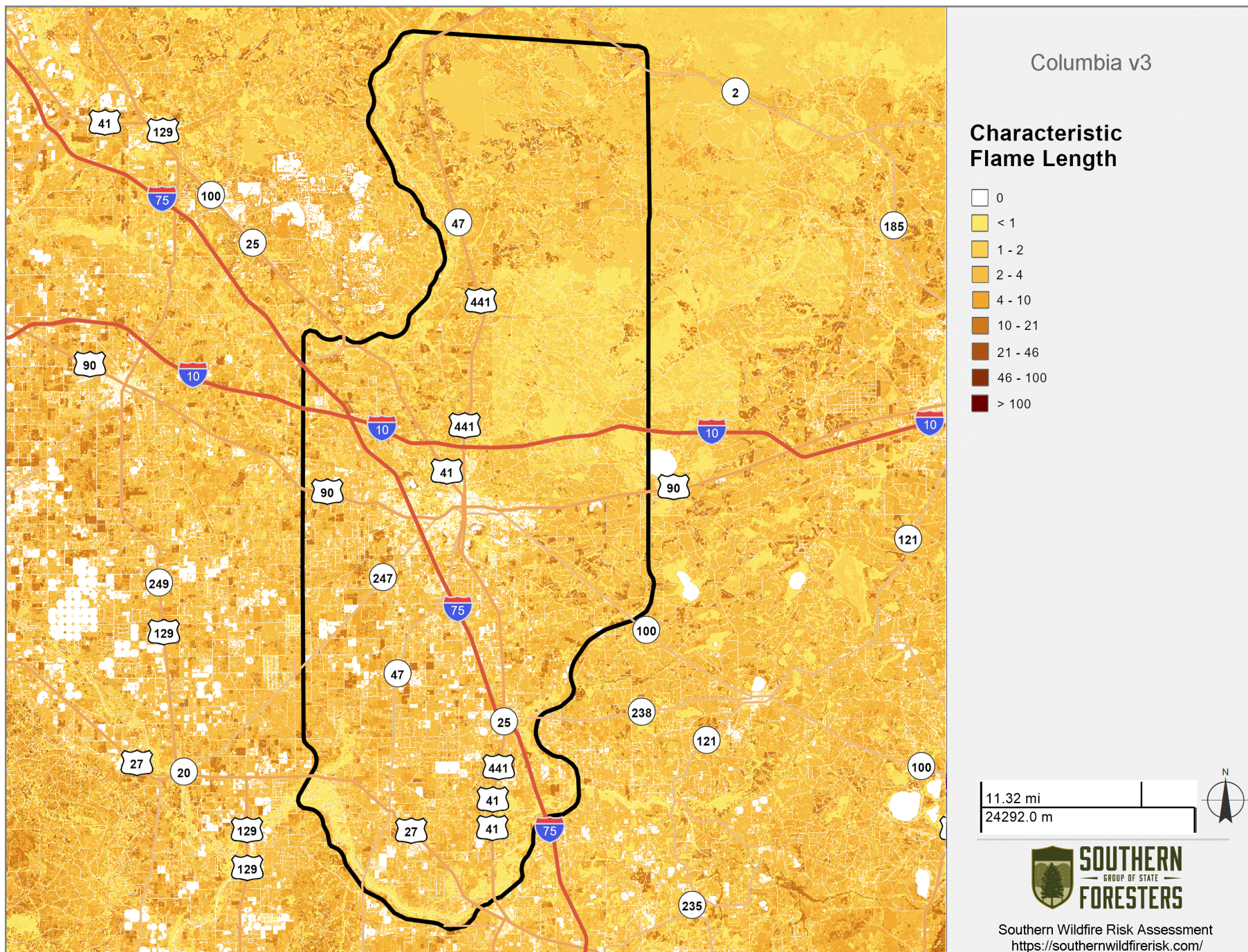
|  | Characteristic Flame Length Category | Acres          | Percent      |
|--|--------------------------------------|----------------|--------------|
|  | 0                                    | 64,184         | 11 %         |
|  | < 1                                  | 105,269        | 19 %         |
|  | 1 - 2                                | 119,422        | 21 %         |
|  | 2 - 4                                | 193,446        | 34 %         |
|  | 4 - 10                               | 56,183         | 10 %         |
|  | 10 - 21                              | 26,412         | 5 %          |
|  | 21 - 46                              | 165            | 0 %          |
|  | 46 - 100                             | 0              | 0 %          |
|  | > 100                                | 0              | 0 %          |
|  | <b>Total</b>                         | <b>565,081</b> | <b>100 %</b> |



Columbia v3  
Characteristic Flame Length









## 95th Percentile Flame Length

This layer represents the "average-worst" 95th Percentile Flame Length (in feet) at the flaming front of the fire as determined by fuel and weather characteristics. These results are weighted according to the Weather Type Probabilities (WTPs) from the highest five percent of possible wind and weather conditions and include the contribution of crown fire flame lengths, if applicable.

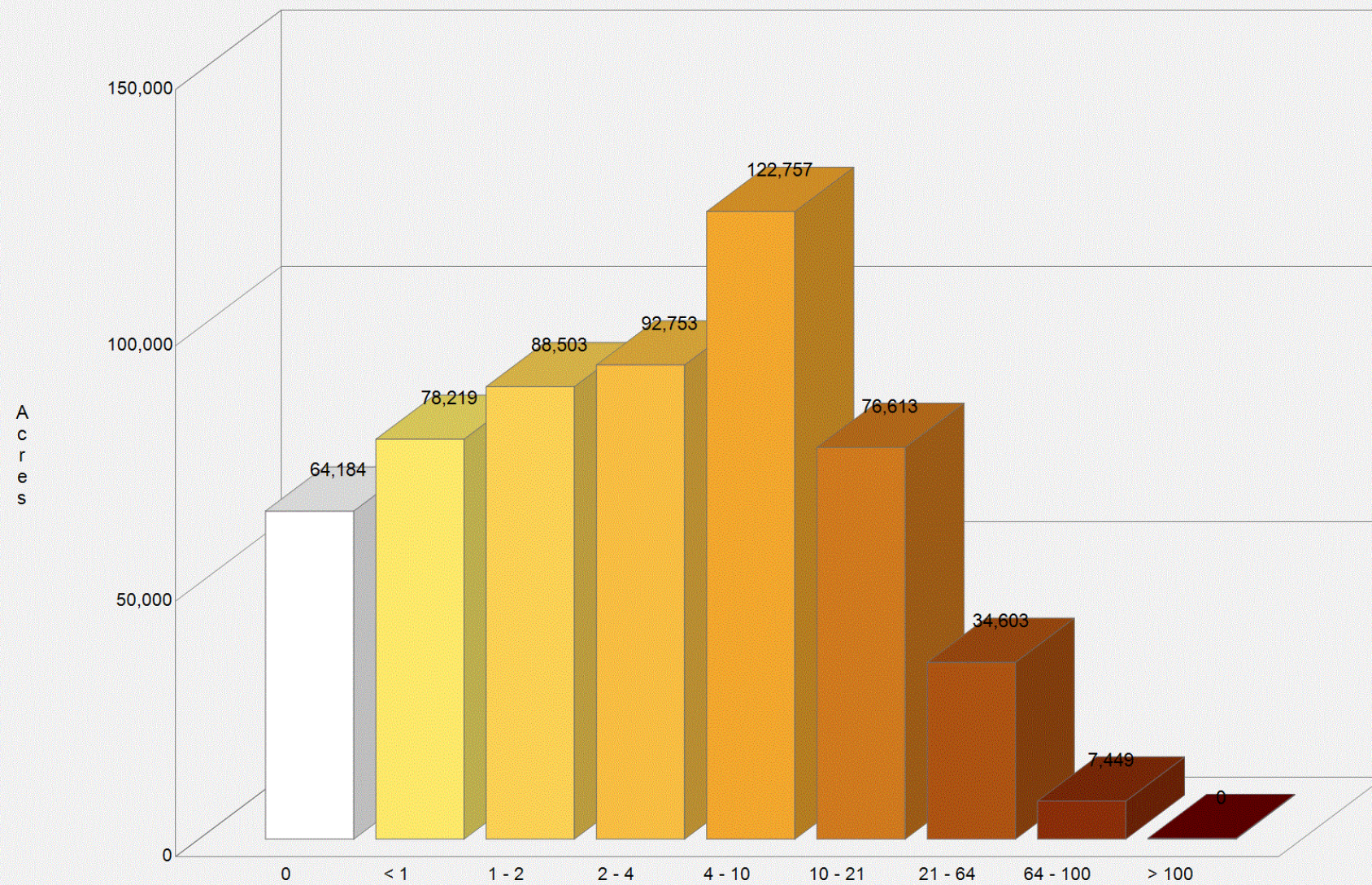
Flame length is calculated using WildEST, a process used to perform and combine multiple fire behavior simulations under a range of weather types (wind speed, wind direction, fuel moisture content). Rather than weighting results solely by how frequently the weather conditions occur, the WildEST process factors the greater influence of high-spread conditions into the weighting calculation.

Data Source: Southern Wildfire Risk Assessment, Pyrologix 2023 (includes fuel disturbances through 2022)

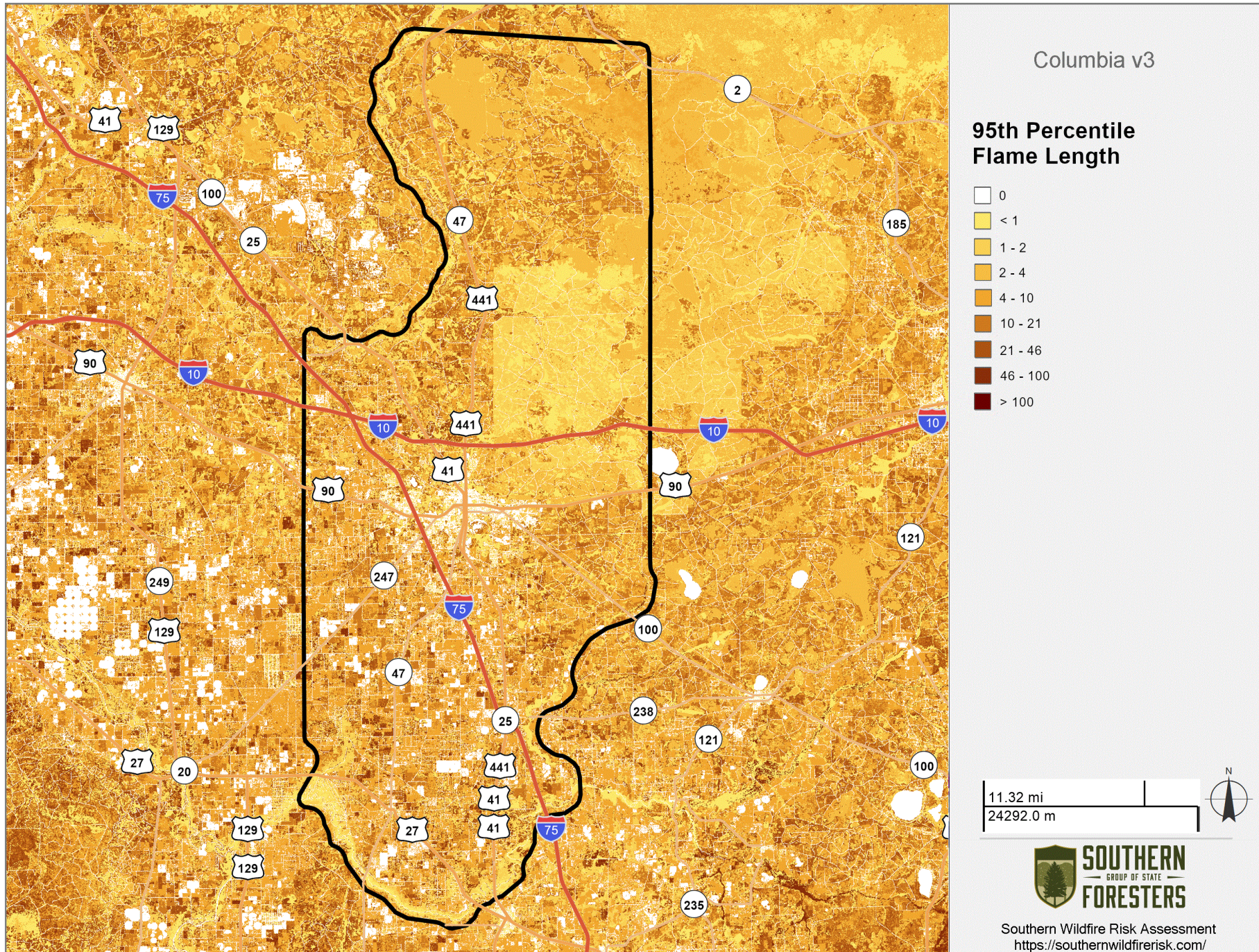
|  | 95th Percentile Flame Length Category | Acres          | Percent      |
|--|---------------------------------------|----------------|--------------|
|  | 0                                     | 64,184         | 11 %         |
|  | < 1                                   | 78,219         | 14 %         |
|  | 1 - 2                                 | 88,503         | 16 %         |
|  | 2 - 4                                 | 92,753         | 16 %         |
|  | 4 - 10                                | 122,757        | 22 %         |
|  | 10 - 21                               | 76,613         | 14 %         |
|  | 21 - 46                               | 34,603         | 6 %          |
|  | 46 - 100                              | 7,449          | 1 %          |
|  | > 100                                 | 0              | 0 %          |
|  | <b>Total</b>                          | <b>565,081</b> | <b>100 %</b> |



Columbia v3  
95th Percentile Flame Length









## Characteristic Rate of Spread

This layer represents the rate of spread as determined by fuel and weather characteristics. These results are weighted across a full range of possible wind and weather conditions and include the contribution of crown fire spread rate, if applicable.

Rate of Spread is calculated using WildEST, a process used to perform and combine multiple fire behavior simulations under a range of weather types (wind speed, wind direction, fuel moisture content).

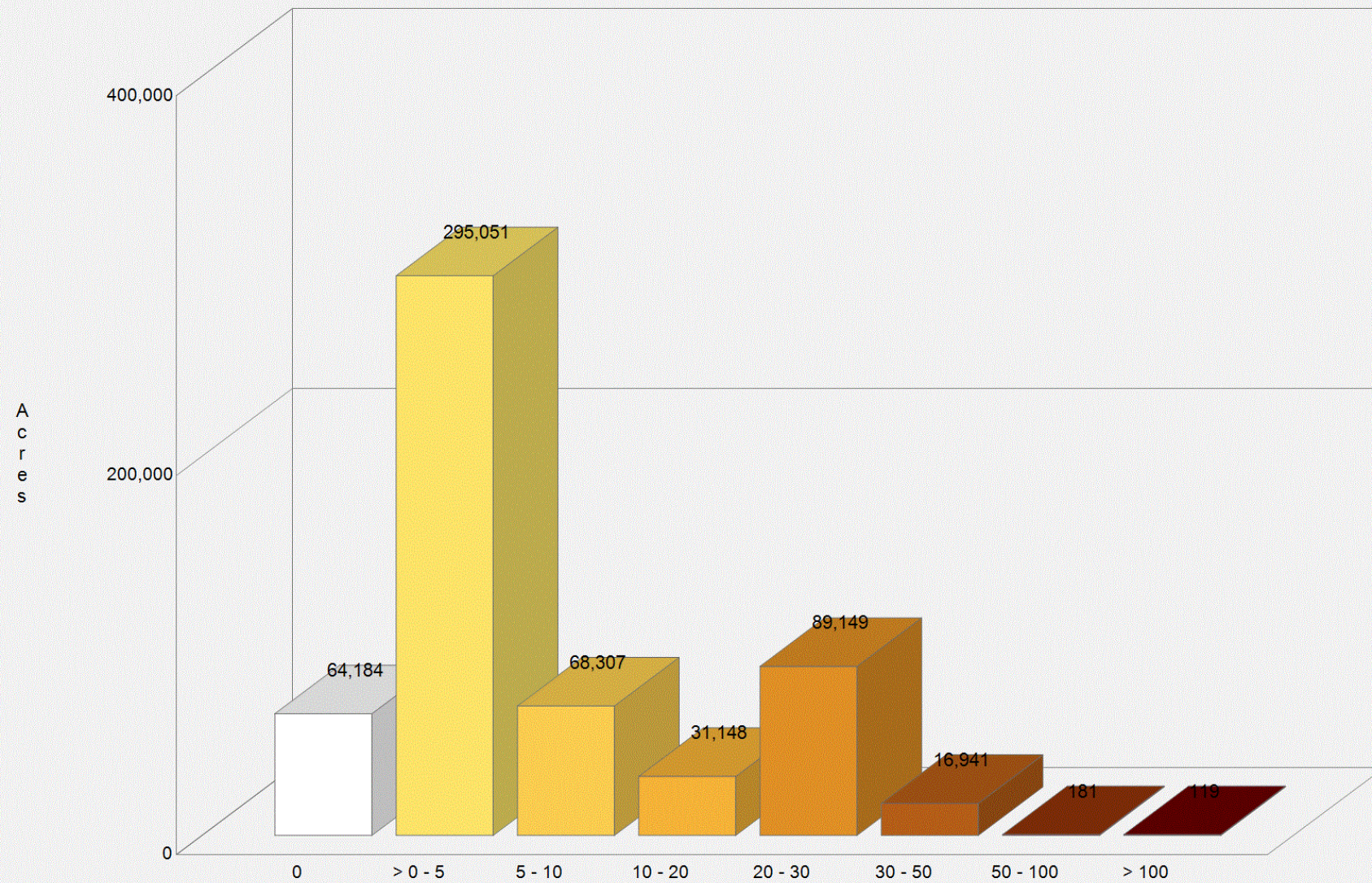
Rather than weighting results solely by how frequently the weather conditions occur, the WildEST process factors the greater influence of high-spread conditions into the weighting calculations.

Data Source: Southern Wildfire Risk Assessment, Pyrologix 2023 (includes fuel disturbances through 2022)

|  | Characteristic Rate of Spread Category | Acres          | Percent      |
|--|----------------------------------------|----------------|--------------|
|  | 0                                      | 64,184         | 11 %         |
|  | > 0 - 5                                | 295,051        | 52 %         |
|  | 5 - 10                                 | 68,307         | 12 %         |
|  | 10 - 20                                | 31,148         | 6 %          |
|  | 20 - 30                                | 89,149         | 16 %         |
|  | 30 - 50                                | 16,941         | 3 %          |
|  | 50 - 100                               | 182            | 0 %          |
|  | > 100                                  | 119            | 0 %          |
|  | <b>Total</b>                           | <b>565,081</b> | <b>100 %</b> |



Columbia v3  
Characteristic Rate of Spread









## 95th Percentile Rate of Spread

This layer represents the "average-worst" 95th Percentile Rate of Spread (ch/h) at the flaming front of the fire as determined by fuel and weather characteristics. These results are weighted according to the Weather Type Probabilities (WTPs) from the highest five percent of possible wind and weather conditions and include the contribution of crown fire spread rate, if applicable.

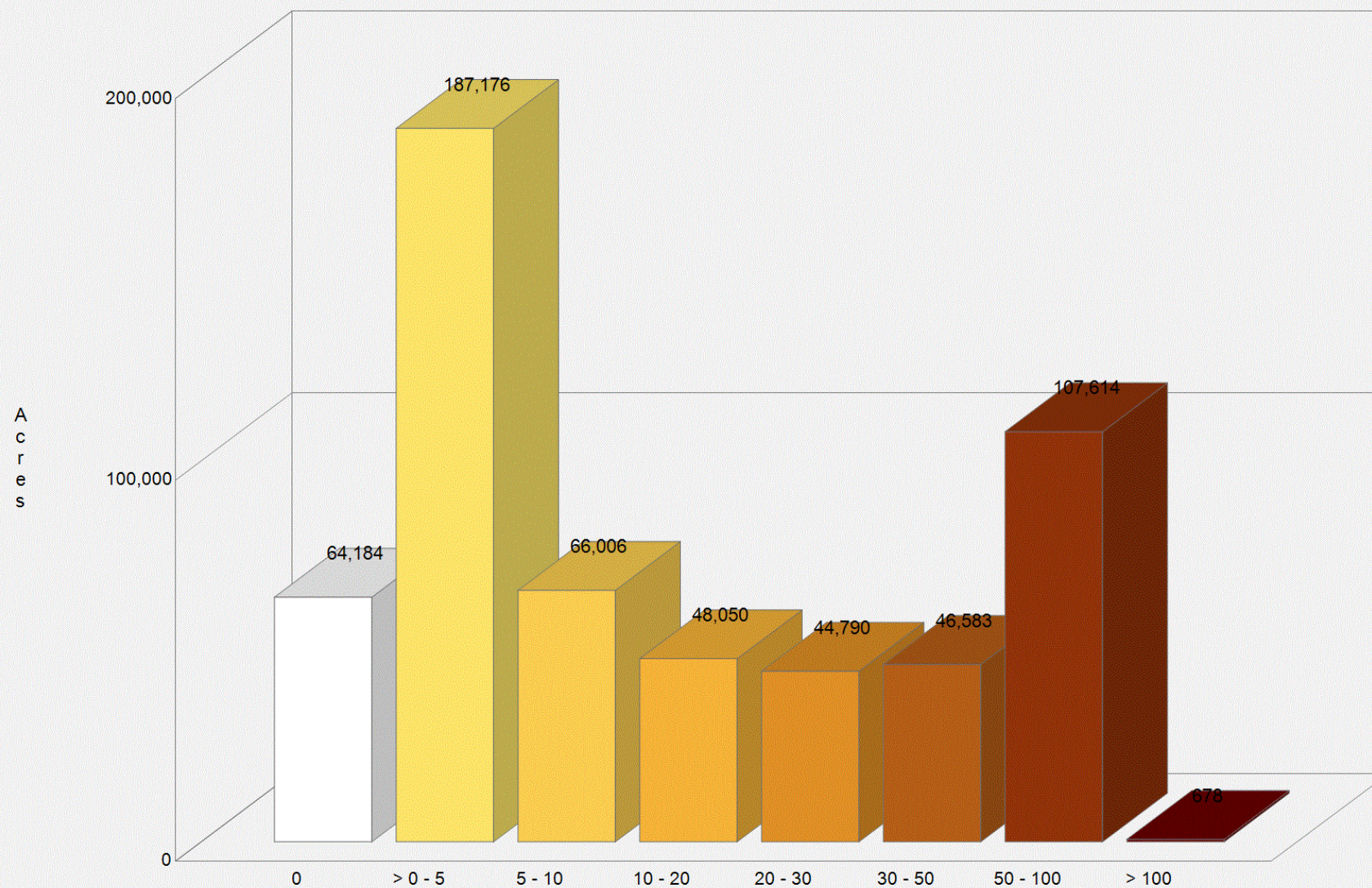
Rate of Spread is calculated using WildEST, a process used to perform and combine multiple fire behavior simulations under a range of weather types (wind speed, wind direction, fuel moisture content). Rather than weighting results solely by how frequently the weather conditions occur, the WildEST process factors the greater influence of high-spread conditions into the weighting calculations.

Data Source: Southern Wildfire Risk Assessment, Pyrologix 2023 (includes fuel disturbances through 2022)

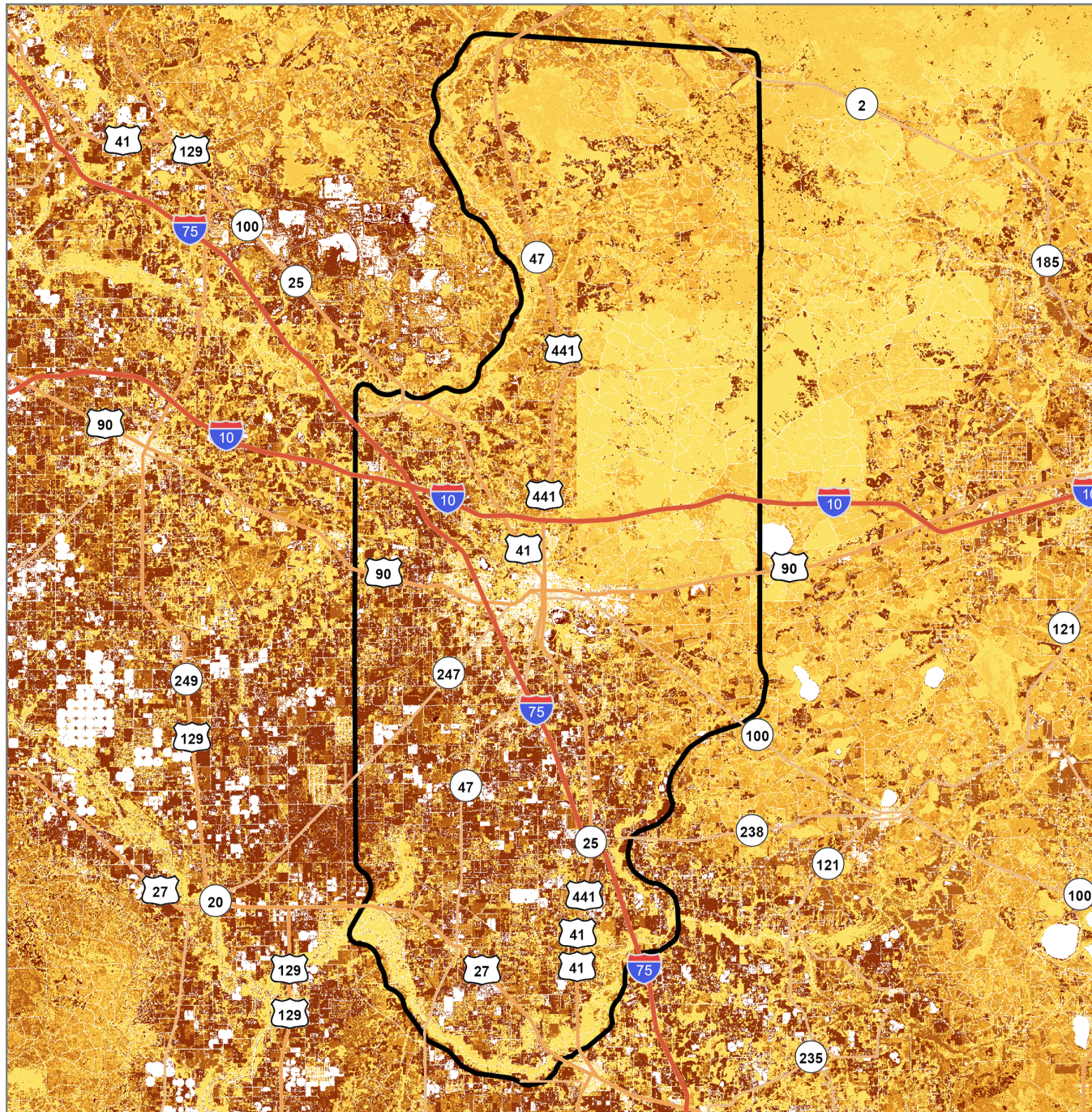
|  | 95th Percentile Rate of Spread Category | Acres          | Percent      |
|--|-----------------------------------------|----------------|--------------|
|  | 0                                       | 64,184         | 11 %         |
|  | > 0 - 5                                 | 187,177        | 33 %         |
|  | 5 - 10                                  | 66,006         | 12 %         |
|  | 10 - 20                                 | 48,050         | 9 %          |
|  | 20 - 30                                 | 44,790         | 8 %          |
|  | 30 - 50                                 | 46,583         | 8 %          |
|  | 50 - 100                                | 107,614        | 19 %         |
|  | > 100                                   | 678            | 0 %          |
|  | <b>Total</b>                            | <b>565,081</b> | <b>100 %</b> |



Columbia v3  
95th Percentile Rate of Spread

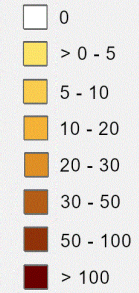






Columbia v3

### 95th Percentile Rate of Spread



11.32 mi  
24292.0 m



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## Probability of Crown Fire

This layer shows the likelihood of the head of the fire experiencing crown fire (at least mid-grade passive crown fire). The head of the fire exhibits the most extreme fire behavior, demonstrating the highest intensity and fastest spread rates.

Crown (or canopy) fires are very dangerous, destructive, and difficult to control due to their increased fire intensity. From a planning perspective, it is important to identify where these conditions are likely to occur on the landscape so that special preparedness measures can be taken if necessary.

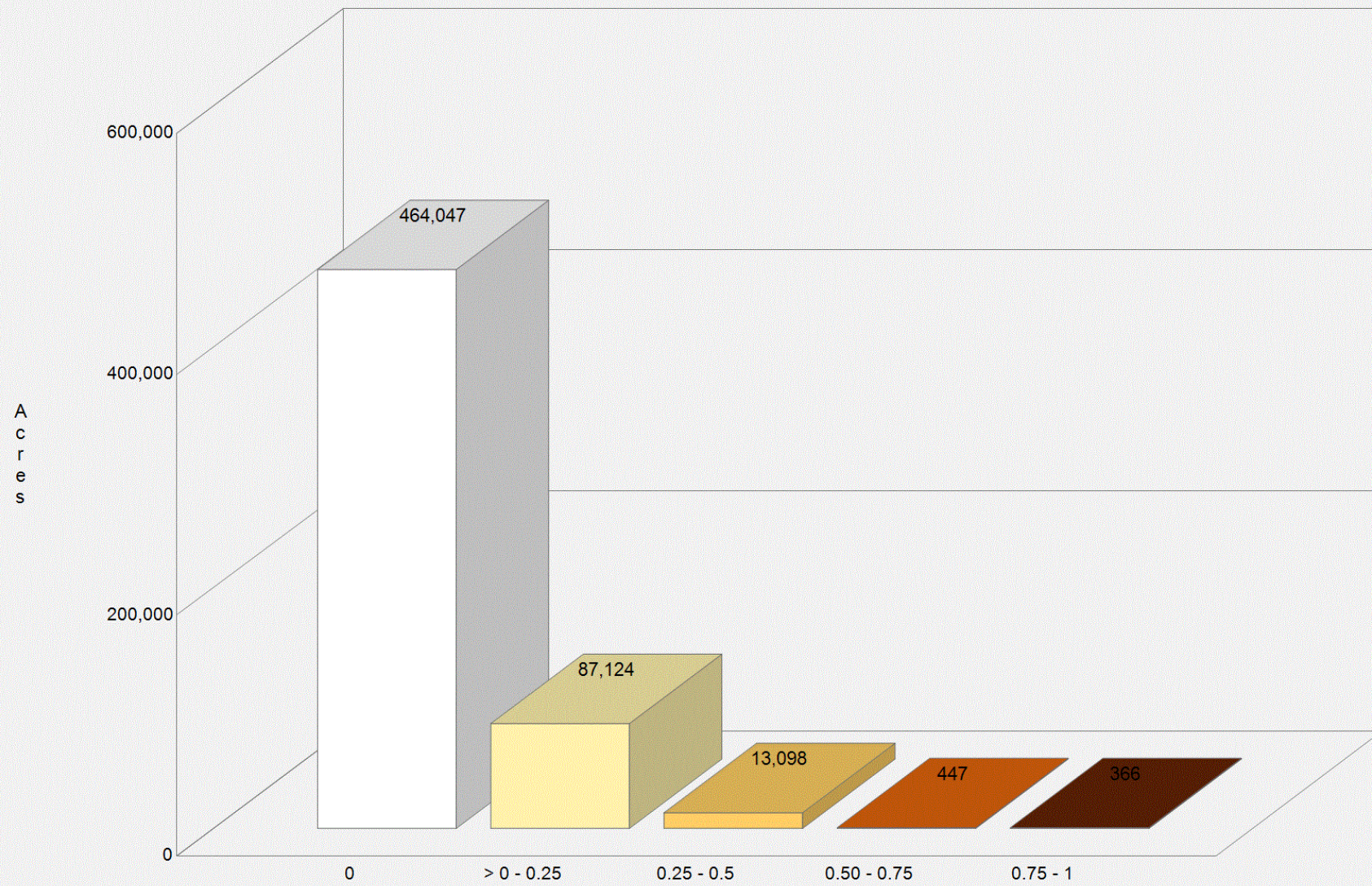
Higher probability values indicate a high likelihood of crown fire. Probability results reflect fuel characteristics and the flame lengths produced under a range of weather conditions. These probabilities do not include the likelihood of a wildfire occurring, rather, they provide information about the likelihood of a location experiencing crown fire, if a wildfire were to occur.

Data Source: Southern Wildfire Risk Assessment, Pyrologix 2023 (includes fuel disturbances through 2022)

|  | Probability of Crown Fire Category | Acres          | Percent      |
|--|------------------------------------|----------------|--------------|
|  | 0                                  | 464,047        | 82 %         |
|  | > 0 - 0.25                         | 87,124         | 15 %         |
|  | 0.25 - 0.5                         | 13,098         | 2 %          |
|  | 0.50 - 0.75                        | 447            | 0 %          |
|  | 0.75 - 1                           | 366            | 0 %          |
|  | <b>Total</b>                       | <b>565,081</b> | <b>100 %</b> |



**Columbia v3**  
**Probability of Crown Fire**







# Challenges to Fire Operations

The information in this section of the report describes fire behavior information useful in operational fire planning and for identifying fuel treatment opportunities.

## Contents:

[Probability of Exceeding Manual Control](#)

[Probability of Exceeding Mechanical Control](#)

[Probability of Extreme Fire Behavior](#)

[Suppression Difficulty Index](#)

[Wildfire Hazard Potential](#)

## Probability of Exceeding Manual Control

This layer shows the likelihood that flames at the head of the fire will exceed 4 feet, which is generally considered the limit for manual fire control. The head of the fire exhibits the most extreme fire behavior, demonstrating the highest intensity and fastest spread rates.

Higher probability values indicate a lower chance of success using manual control measures (i.e. hand crews and hand line). Probability results reflect fuel characteristics and the flame lengths produced under a range of weather conditions. These probabilities do not include the likelihood of a wildfire occurring, rather, they provide information about flame lengths if a wildfire were to occur.

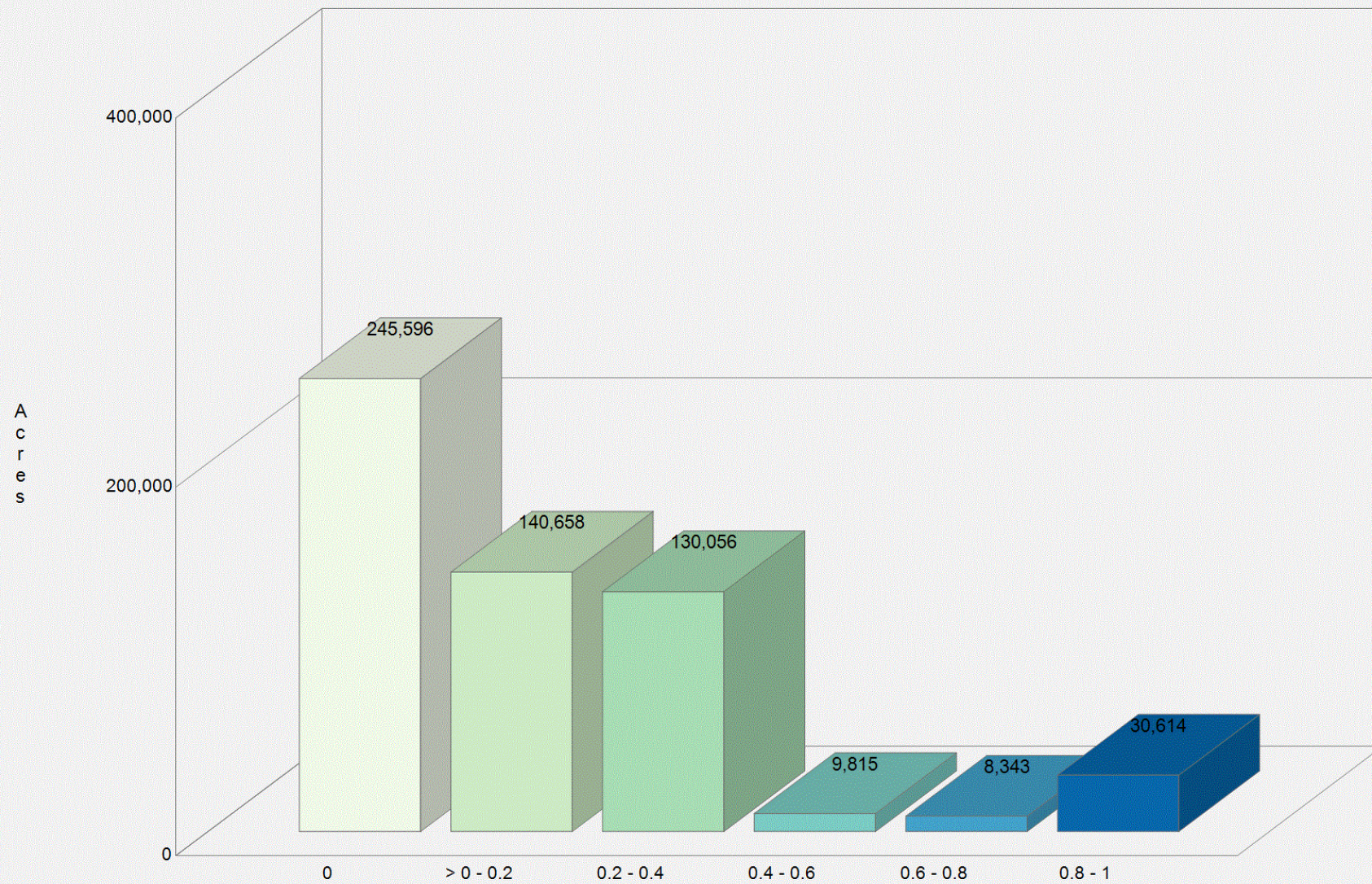
Flame length exceedance probabilities refer to the likelihood of flames reaching or surpassing a certain height, typically measured from the leading edge or "head" of a fire. These probabilities provide insight into the range of potential flame lengths under various weather conditions. For example, if the probability of exceeding a certain flame length threshold is 0.2 (20%), it means there is a 20% chance that flames exceed that height under the range of modeled weather scenarios. It also means that 80% of flame lengths are expected to be below the threshold. These probabilities help fire management personnel anticipate and plan for the potential intensity of wildfires in a specific area.

Data Source: Southern Wildfire Risk Assessment, Pyrologix 2023 (includes fuel disturbances through 2022)

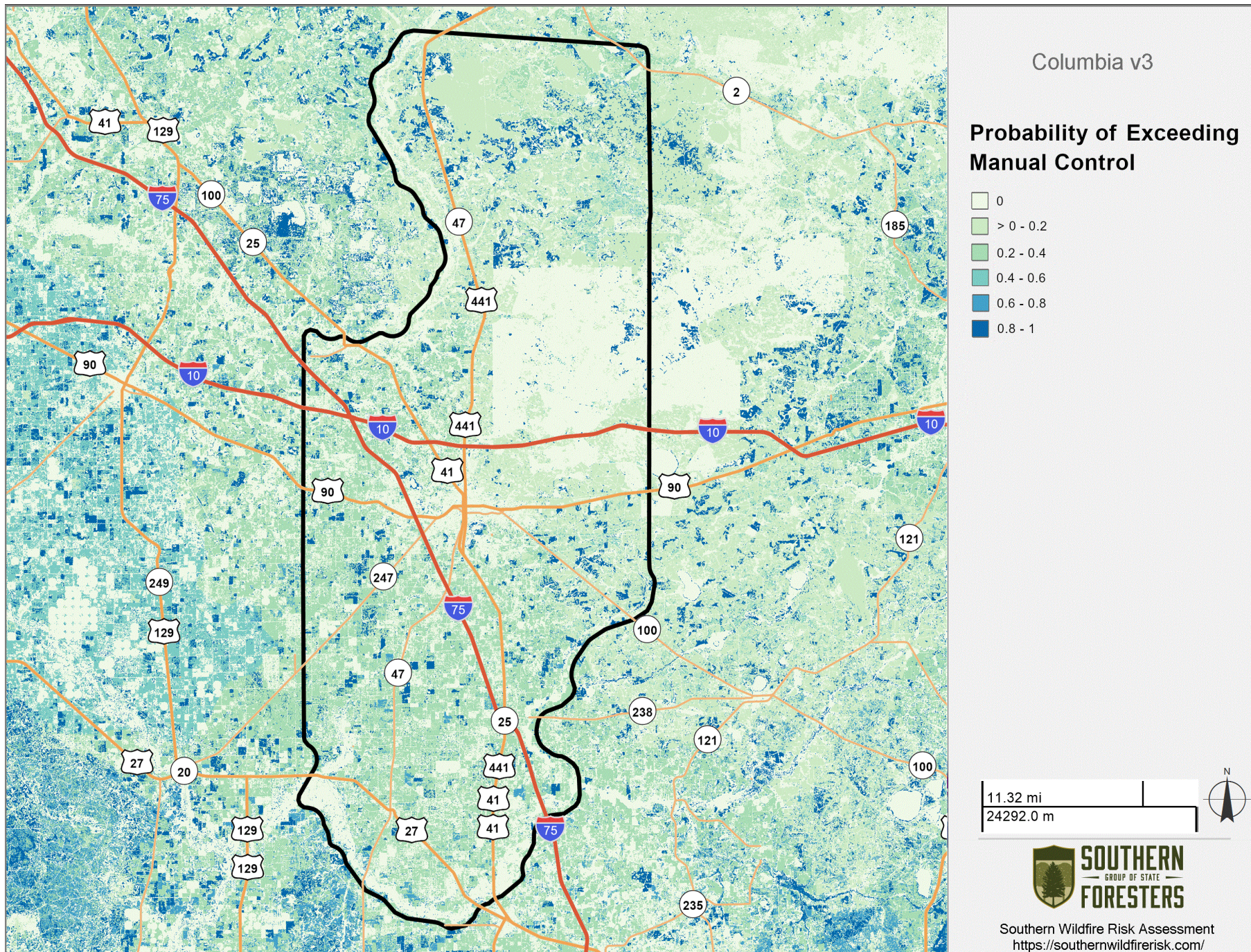
|  | Probability of Exceeding Manual Control Category | Acres          | Percent      |
|--|--------------------------------------------------|----------------|--------------|
|  | 0                                                | 245,596        | 43 %         |
|  | > 0 - 0.2                                        | 140,658        | 25 %         |
|  | 0.2 - 0.4                                        | 130,056        | 23 %         |
|  | 0.4 - 0.6                                        | 9,815          | 2 %          |
|  | 0.6 - 0.8                                        | 8,343          | 1 %          |
|  | 0.8 - 1                                          | 30,614         | 5 %          |
|  | <b>Total</b>                                     | <b>565,081</b> | <b>100 %</b> |



**Columbia v3**  
**Probability of Exceeding Manual Control**









## Probability of Exceeding Mechanical Control

This layer shows the likelihood that flames at the head of the fire will exceed 8 feet, which is considered the limit for mechanical fire control in fire operations. The head of the fire exhibits the most extreme fire behavior, demonstrating the highest intensity and fastest spread rates.

Higher probability values indicate a lower chance of success using mechanical control measures such as dozers and engines. Probability results reflect fuel characteristics and the flame lengths produced under a range of weather conditions. These probabilities do not include the likelihood of a wildfire occurring, rather, they provide information about flame lengths if a wildfire were to occur.

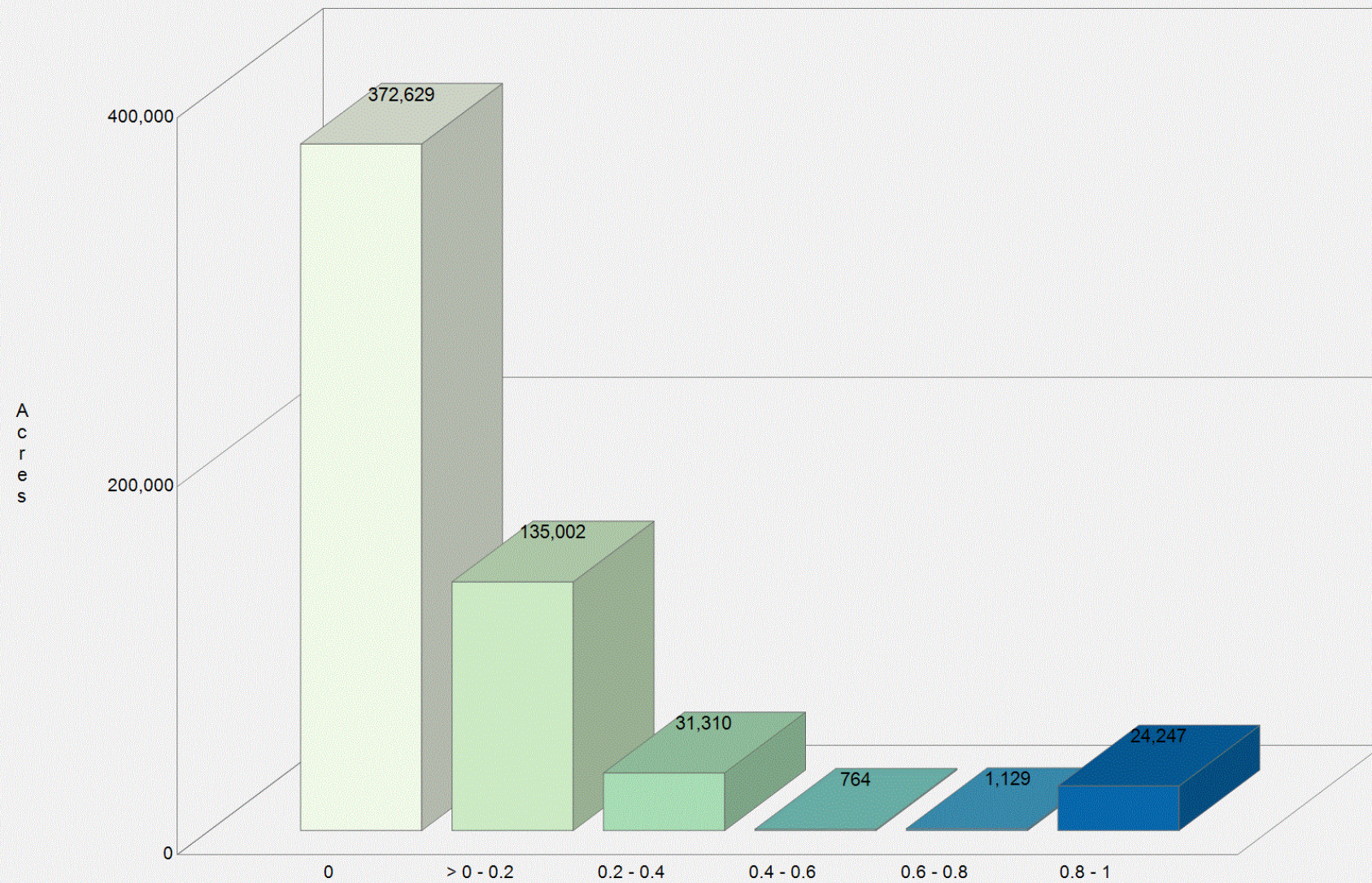
Flame length exceedance probabilities refer to the likelihood of flames reaching or surpassing a certain height, typically measured from the leading edge or "head" of a fire. These probabilities provide insight into the range of potential flame lengths under various weather conditions. For example, if the probability of exceeding a certain flame length threshold is 0.2 (20%), it means there is a 20% chance that flames exceed that height under the range of modeled weather scenarios. It also means that 80% of flame lengths are expected to be below the threshold. These probabilities help fire management personnel anticipate and plan for the potential intensity of wildfires in a specific area.

Data Source: Southern Wildfire Risk Assessment, Pyrologix 2023 (includes fuel disturbances through 2022)

|  | Probability of Exceeding Mechanical Control Category | Acres          | Percent      |
|--|------------------------------------------------------|----------------|--------------|
|  | 0                                                    | 372,629        | 66 %         |
|  | > 0 - 0.2                                            | 135,002        | 24 %         |
|  | 0.2 - 0.4                                            | 31,310         | 6 %          |
|  | 0.4 - 0.6                                            | 764            | 0 %          |
|  | 0.6 - 0.8                                            | 1,129          | 0 %          |
|  | 0.8 - 1                                              | 24,247         | 4 %          |
|  | <b>Total</b>                                         | <b>565,081</b> | <b>100 %</b> |



Columbia v3  
Probability of Exceeding Mechanical Control









# Probability of Extreme Fire Behavior

This layer shows the likelihood that flames at the head of the fire will exceed 11 feet, which is considered threshold for extreme fire behavior in fire operations. The head of the fire exhibits the most extreme fire behavior, demonstrating the highest intensity and fastest spread rates. Flames of this height can indicate extreme fire behavior and present significant challenges for suppression efforts.

Higher probability values indicate a high likelihood of extreme fire behavior such as crowning and spotting. Probability results reflect fuel characteristics and the flame lengths produced under a range of weather conditions. These probabilities do not include the likelihood of a wildfire occurring, rather, they provide information about flame lengths if a wildfire were to occur.

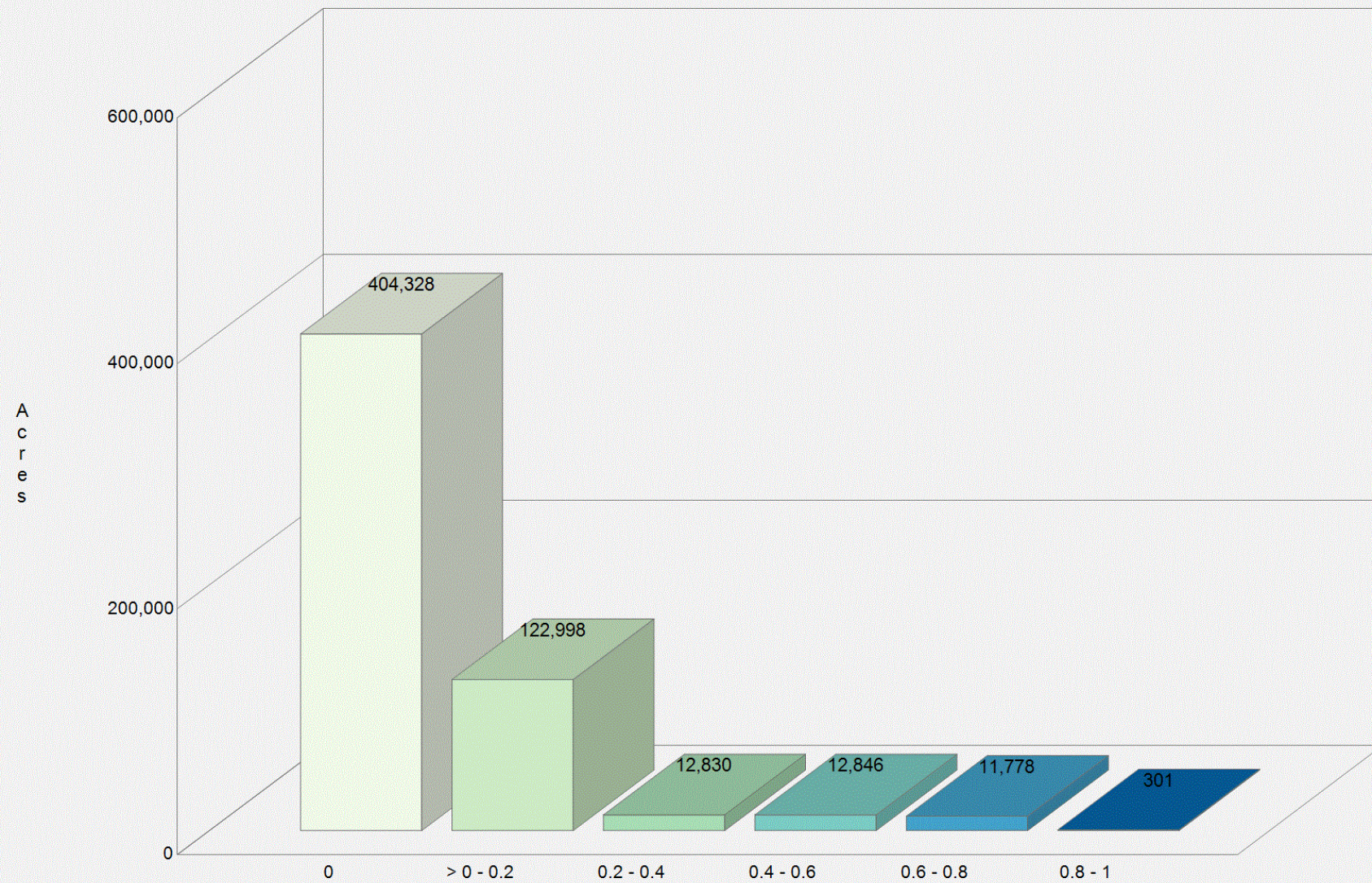
Flame length exceedance probabilities refer to the likelihood of flames reaching or surpassing a certain height, typically measured from the leading edge or "head" of a fire. These probabilities provide insight into the range of potential flame lengths under various weather conditions. For example, if the probability of exceeding a certain flame length threshold is 0.2 (20%), it means there is a 20% chance that flames exceed that height under the range of modeled weather scenarios. It also means that 80% of flame lengths are expected to be below the threshold. These probabilities help fire management personnel anticipate and plan for the potential intensity of wildfires in a specific area.

Data Source: Southern Wildfire Risk Assessment, Pyrologix 2023 (includes fuel disturbances through 2022)

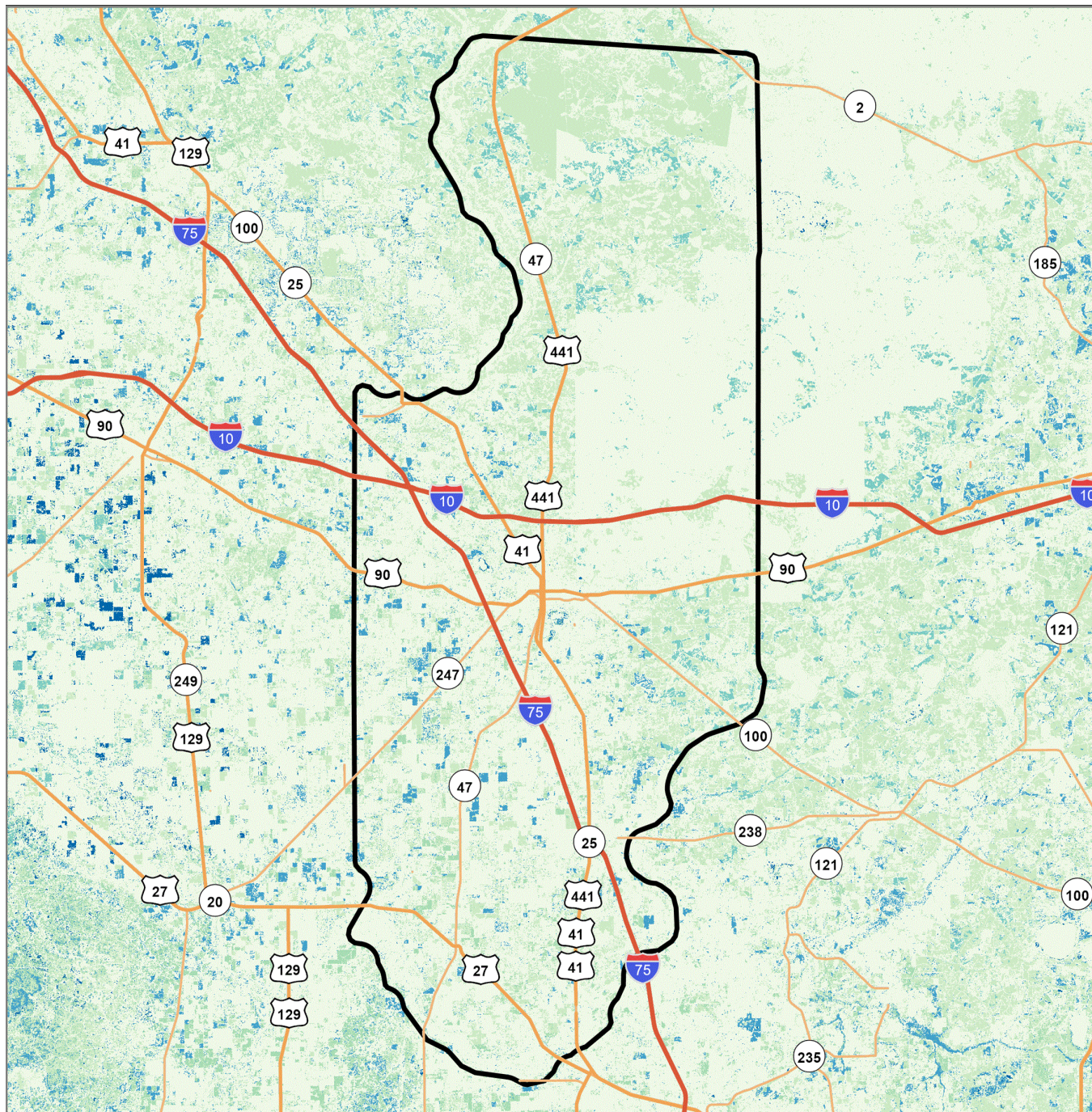
|  | Probability of Extreme Fire Behavior Category | Acres          | Percent      |
|--|-----------------------------------------------|----------------|--------------|
|  | 0                                             | 404,328        | 72 %         |
|  | > 0 - 0.2                                     | 122,998        | 22 %         |
|  | 0.2 - 0.4                                     | 12,830         | 2 %          |
|  | 0.4 - 0.6                                     | 12,846         | 2 %          |
|  | 0.6 - 0.8                                     | 11,778         | 2 %          |
|  | 0.8 - 1                                       | 301            | 0 %          |
|  | <b>Total</b>                                  | <b>565,081</b> | <b>100 %</b> |



Columbia v3  
Probability of Extreme Fire Behavior

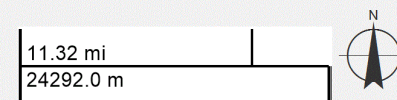
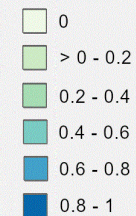






Columbia v3

### Probability of Extreme Fire Behavior



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<https://southernwildfirerisk.com/>



## Suppression Difficulty Index

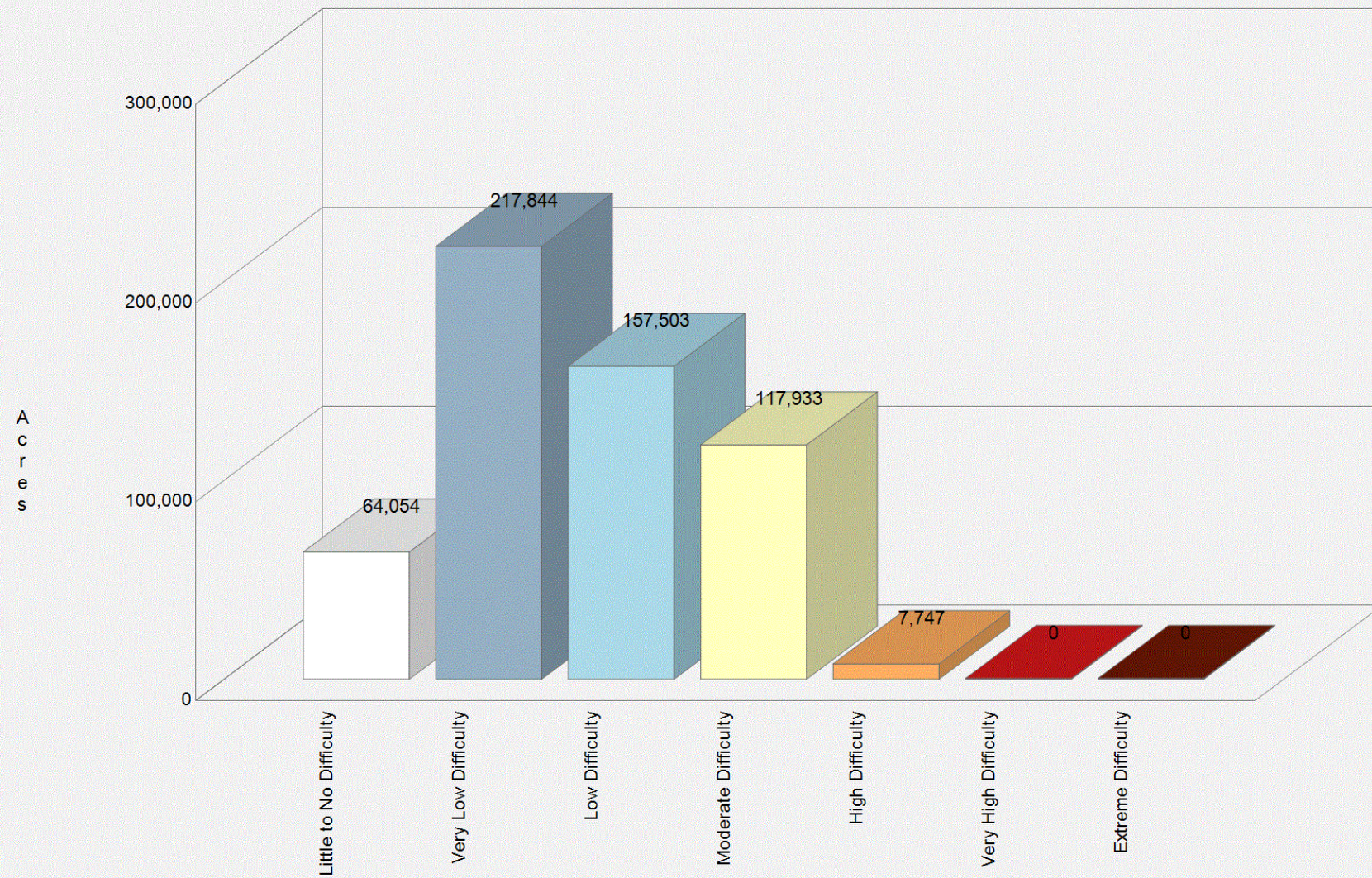
Suppression Difficulty Index can inform fire management decisions related to suppression strategies and resource placement. It classifies fire suppression challenges into six levels, ranging from very low to extreme. Blue areas indicate relatively manageable conditions with some combination of gentle terrain, less resistant fuels, easier access, and milder fire behavior. Red areas highlight tougher conditions with steep terrain, limited access, and more-intense fire activity. This index does not consider aerial suppression strategies, overhead hazards to firefighters like standing dead trees, and does not include the likelihood of a wildfire occurring.

Data Source: Southern Wildfire Risk Assessment, Pyrologix 2023 (includes fuel disturbances through 2022)

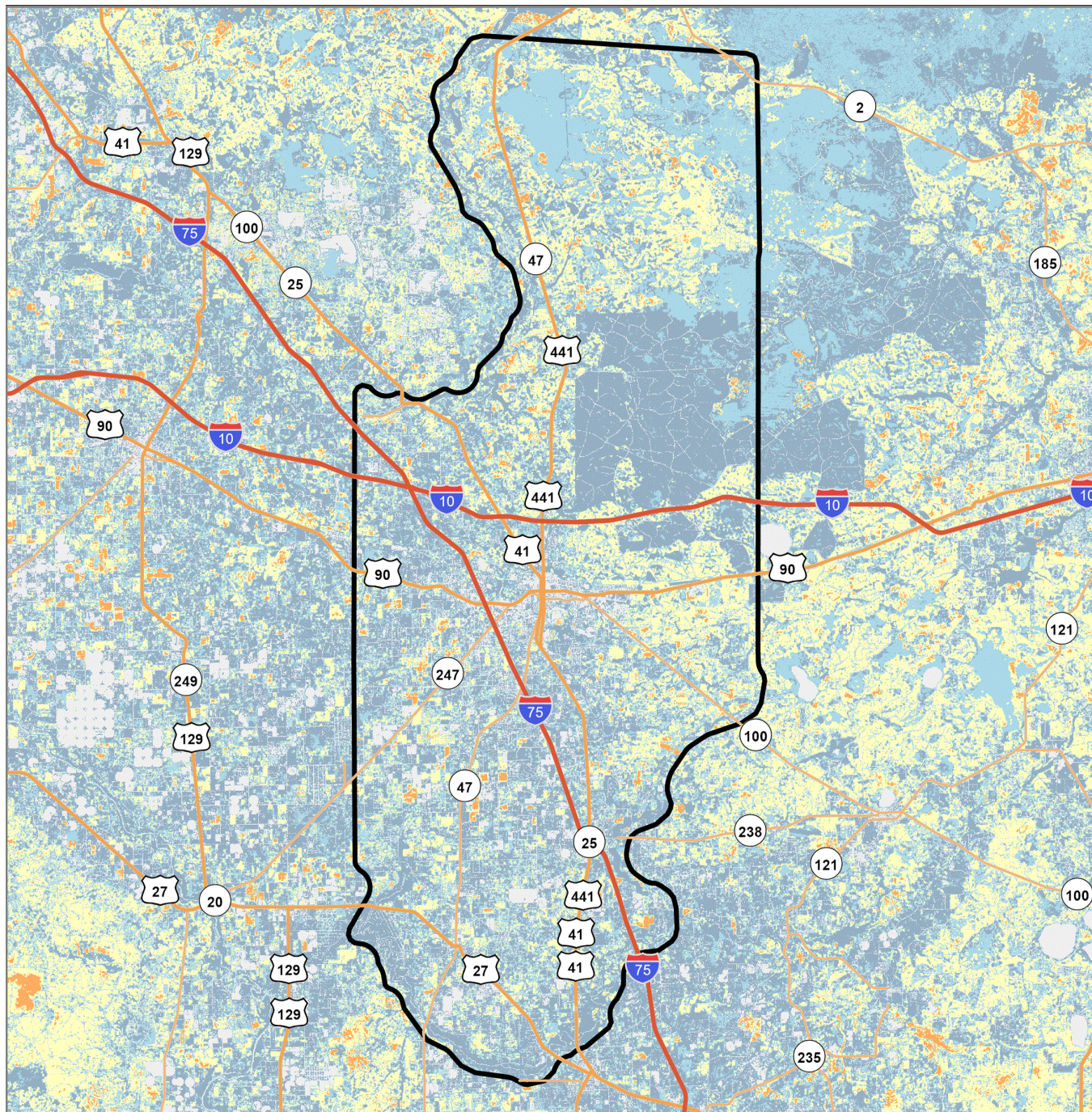
|  | Suppression Difficulty Index Category | Acres          | Percent      |
|--|---------------------------------------|----------------|--------------|
|  | Little to No Difficulty               | 64,055         | 11 %         |
|  | Very Low Difficulty                   | 217,844        | 39 %         |
|  | Low Difficulty                        | 157,504        | 28 %         |
|  | Moderate Difficulty                   | 117,933        | 21 %         |
|  | High Difficulty                       | 7,747          | 1 %          |
|  | Very High Difficulty                  | 0              | 0 %          |
|  | Extreme Difficulty                    | 0              | 0 %          |
|  | <b>Total</b>                          | <b>565,081</b> | <b>100 %</b> |



**Columbia v3**  
**Suppression Difficulty Index**



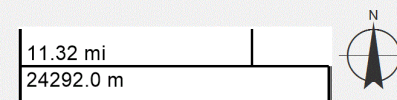




Columbia v3

### Suppression Difficulty Index

- Little to No Difficulty
- Very Low Difficulty
- Low Difficulty
- Moderate Difficulty
- High Difficulty
- Very High Difficulty
- Extreme Difficulty



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<https://southernwildfirerisk.com/>



# Wildfire Hazard Potential

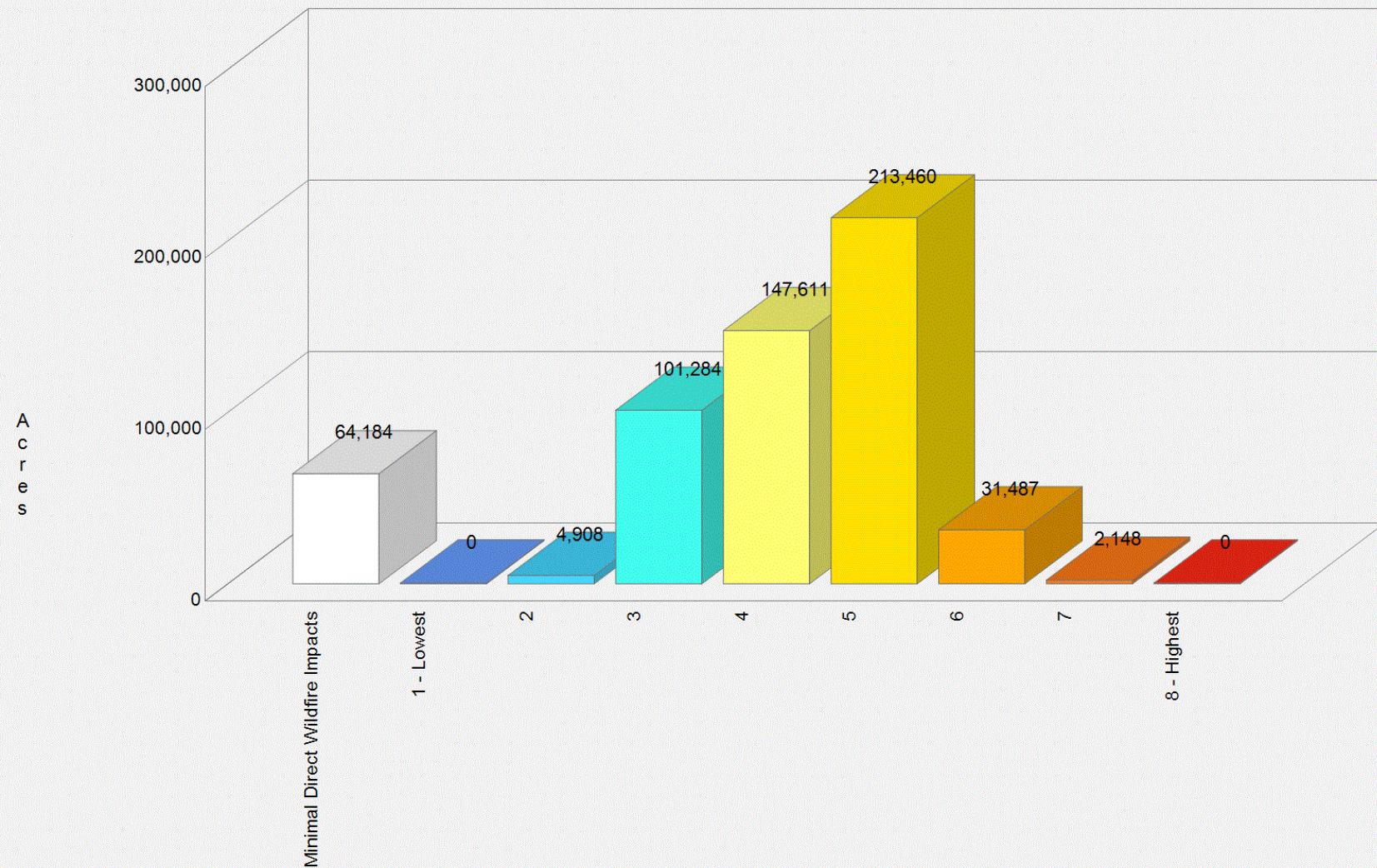
Wildfire Hazard Potential is mapped with eight classes, ranging from low (blue) to high (red) hazard levels. The highest classes indicate areas with fuels more prone to experiencing extreme fire behavior during severe fire-weather conditions. Although Wildfire Hazard Potential is useful for long-term planning purposes, it does not incorporate current or forecasted weather conditions and should not be relied upon as a seasonal outlook.

Data Source: Southern Wildfire Risk Assessment, Pyrologix 2023 (includes fuel disturbances through 2022)

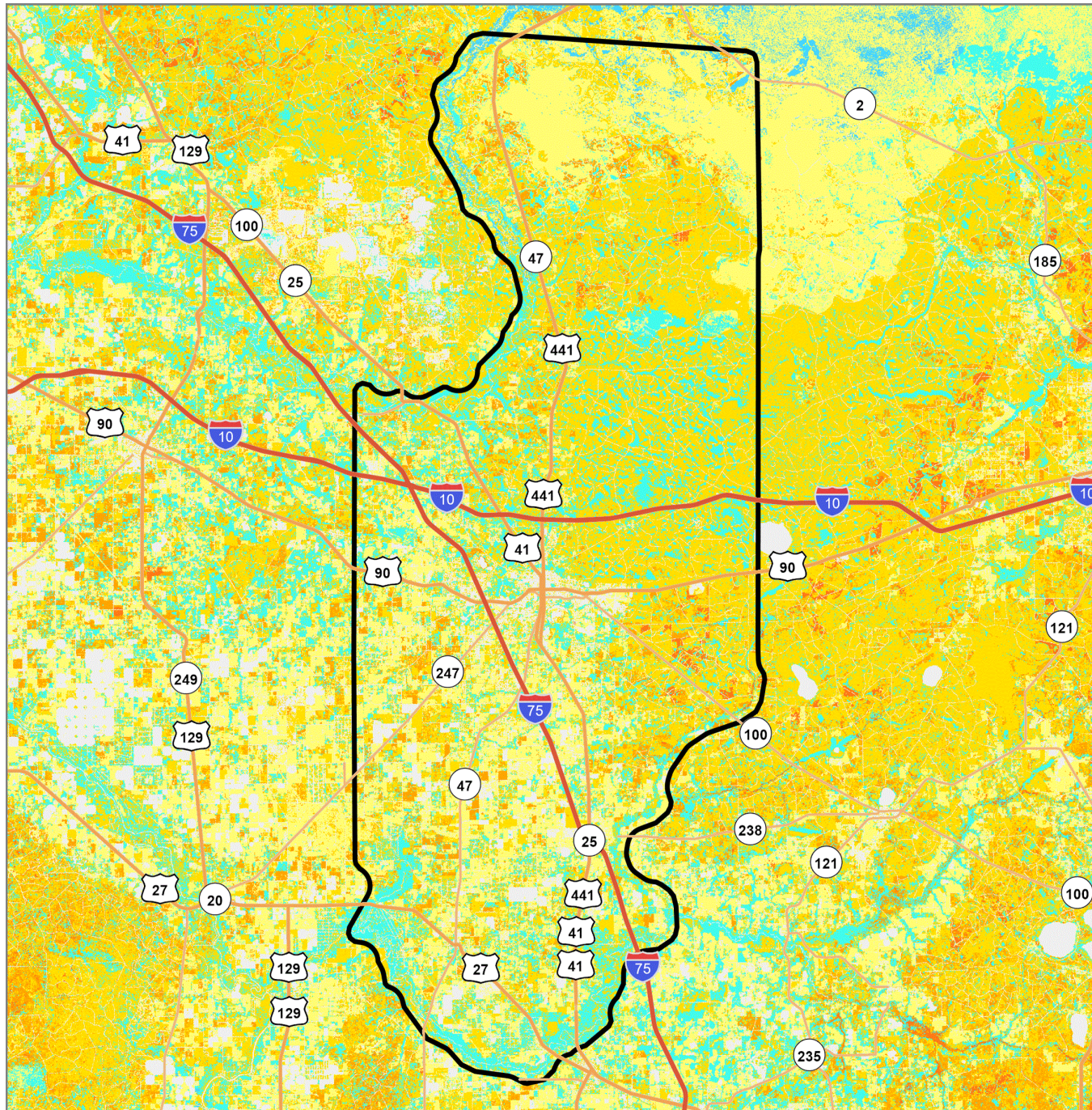
|  | Wildfire Hazard Potential Category | Acres   | Percent |
|--|------------------------------------|---------|---------|
|  | Minimal Direct Wildfire Impacts    | 64,184  | 11 %    |
|  | 1 - Lowest                         | 0       | 0 %     |
|  | 2                                  | 4,908   | 1 %     |
|  | 3                                  | 101,284 | 18 %    |
|  | 4                                  | 147,611 | 26 %    |
|  | 5                                  | 213,460 | 38 %    |
|  | 6                                  | 31,487  | 6 %     |
|  | 7                                  | 2,148   | 0 %     |
|  | 8 - Highest                        | 0       | 0 %     |
|  | Total                              | 565,081 | 100 %   |



Columbia v3  
Wildfire Hazard Potential







Columbia v3

### Wildfire Hazard Potential

- Minimal Direct Wildfire Impacts
- 1 - Lowest
- 2
- 3
- 4
- 5
- 6
- 7
- 8 - Highest

11.32 mi  
24292.0 m



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<https://southernwildfirerisk.com/>



# Ember Characteristics

The information in this section of the report identifies the locations most likely to produce embers and the areas most likely to receive embers, given a wildfire occurs. Ember modeling is based on fuel characteristics, climate, and topography.

Contents:

[Conditional Ember Production Index](#)

[Conditional Ember Load Index](#)

# Conditional Ember Production Index

Conditional Ember Production Index (cEPI) provides a relative index of embers produced at a location, given that a fire occurs.

Ember production is based on surface and canopy fuel characteristics, climate, and topography within the pixel. Units are an index of the relative number of embers rather than a count of embers produced. Conditional EPI is based on heading-only fire behavior and does not include the likelihood of wildfire.

Embers can be produced from any burnable fuel source in the fuelscape, dependent on the wind and weather characteristics that lead to lofting embers.

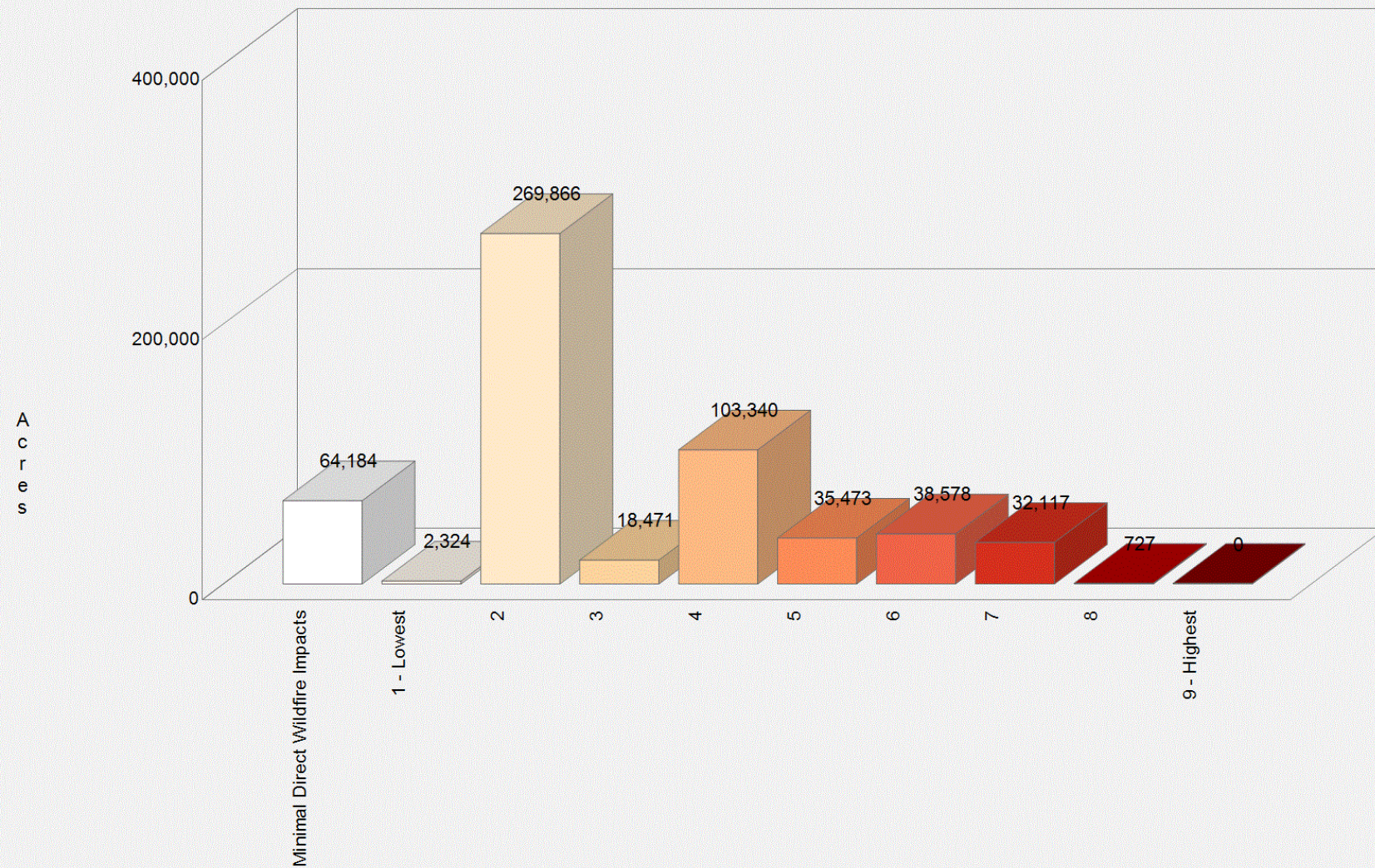
Conditional EPI is useful for prioritizing fuel treatments to reduce the potential for ember production in volatile fuel types.

Data Source: Southern Wildfire Risk Assessment, Pyrologix 2023 (includes fuel disturbances through 2022)

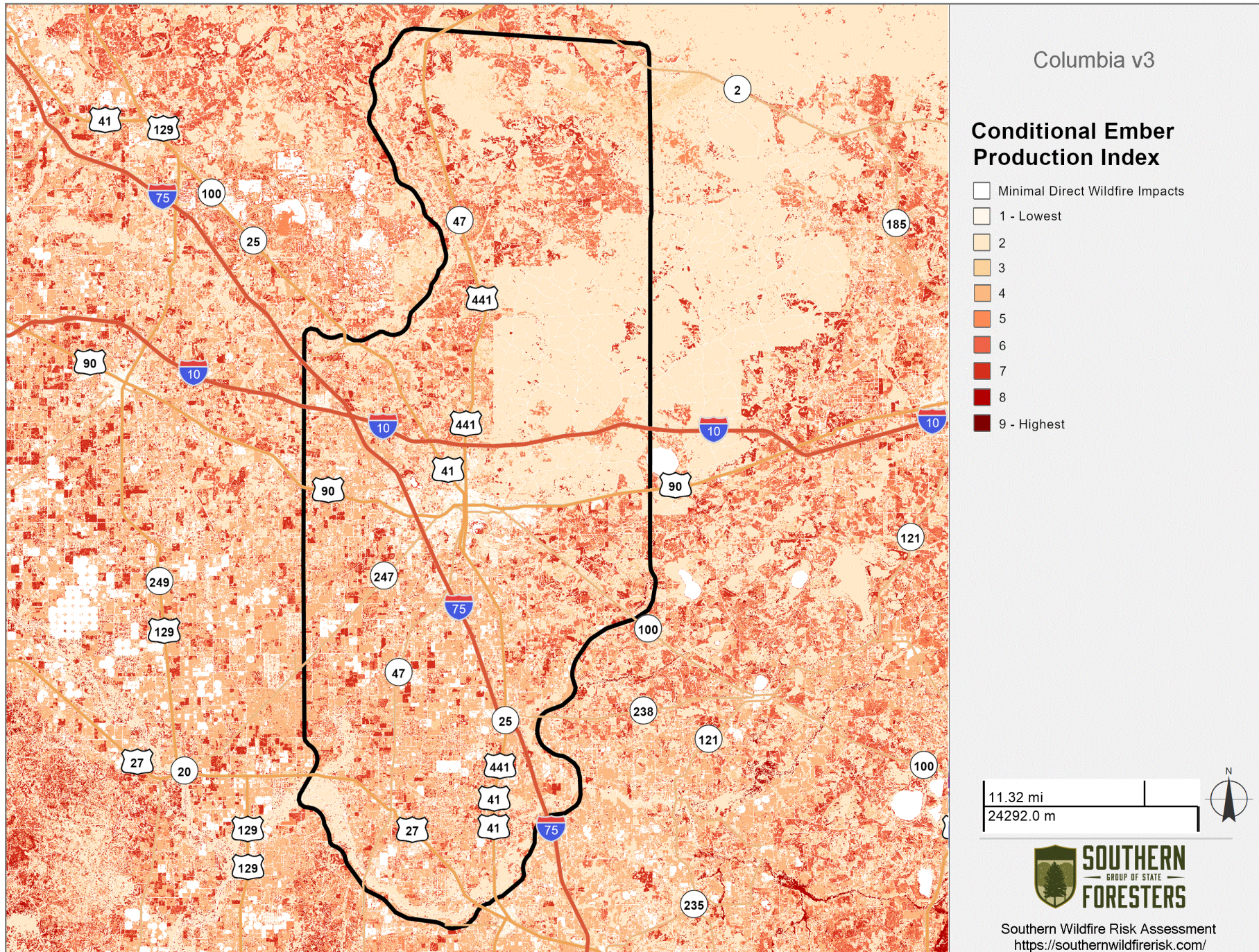
|  | Conditional Ember Production Index Category | Acres          | Percent      |
|--|---------------------------------------------|----------------|--------------|
|  | Minimal Direct Wildfire Impacts             | 64,184         | 11 %         |
|  | 1 - Lowest                                  | 2,324          | 0 %          |
|  | 2                                           | 269,866        | 48 %         |
|  | 3                                           | 18,471         | 3 %          |
|  | 4                                           | 103,340        | 18 %         |
|  | 5                                           | 35,473         | 6 %          |
|  | 6                                           | 38,578         | 7 %          |
|  | 7                                           | 32,117         | 6 %          |
|  | 8                                           | 727            | 0 %          |
|  | 9 - Highest                                 | 0              | 0 %          |
|  | <b>Total</b>                                | <b>565,081</b> | <b>100 %</b> |



Columbia v3  
Conditional Ember Production Index









# Conditional Ember Load Index

Conditional Ember Load Index (cELI) provides a relative index of embers received at a location, given that a fire occurs.

Ember load is based on surface and canopy fuel characteristics, climate, and topography within the pixel. Ember load incorporates downwind ember travel. Units are an index of the relative number of embers rather than a count of embers produced. Conditional ELI is based on heading-only fire behavior and does not include the likelihood of wildfire. Embers can be received by any pixel in the fuelscape; including both burnable and nonburnable fuel types.

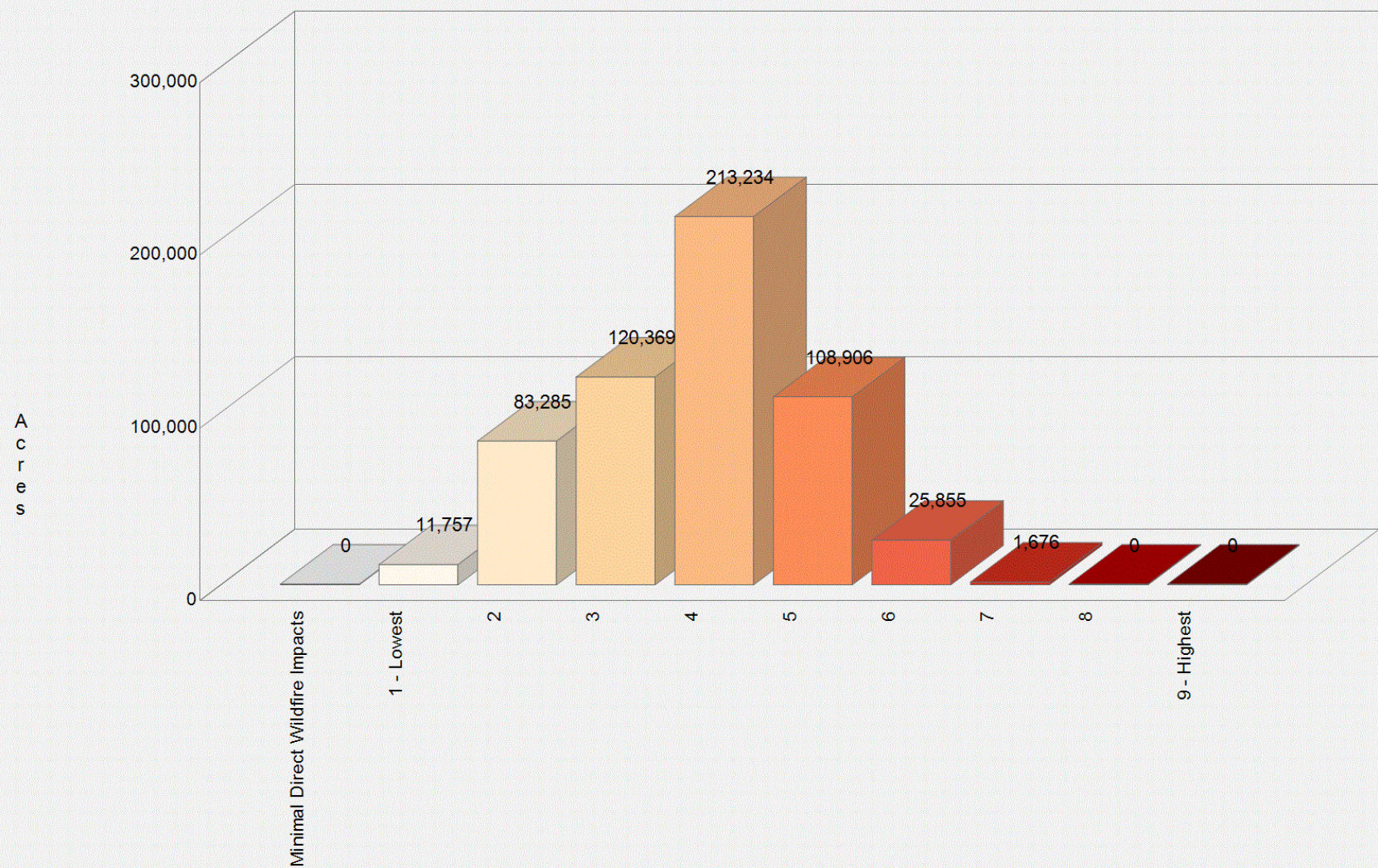
Conditional ELI can be used to prioritize building hardening activities to resist ember ignition.

Data Source: Southern Wildfire Risk Assessment, Pyrologix 2023 (includes fuel disturbances through 2022)

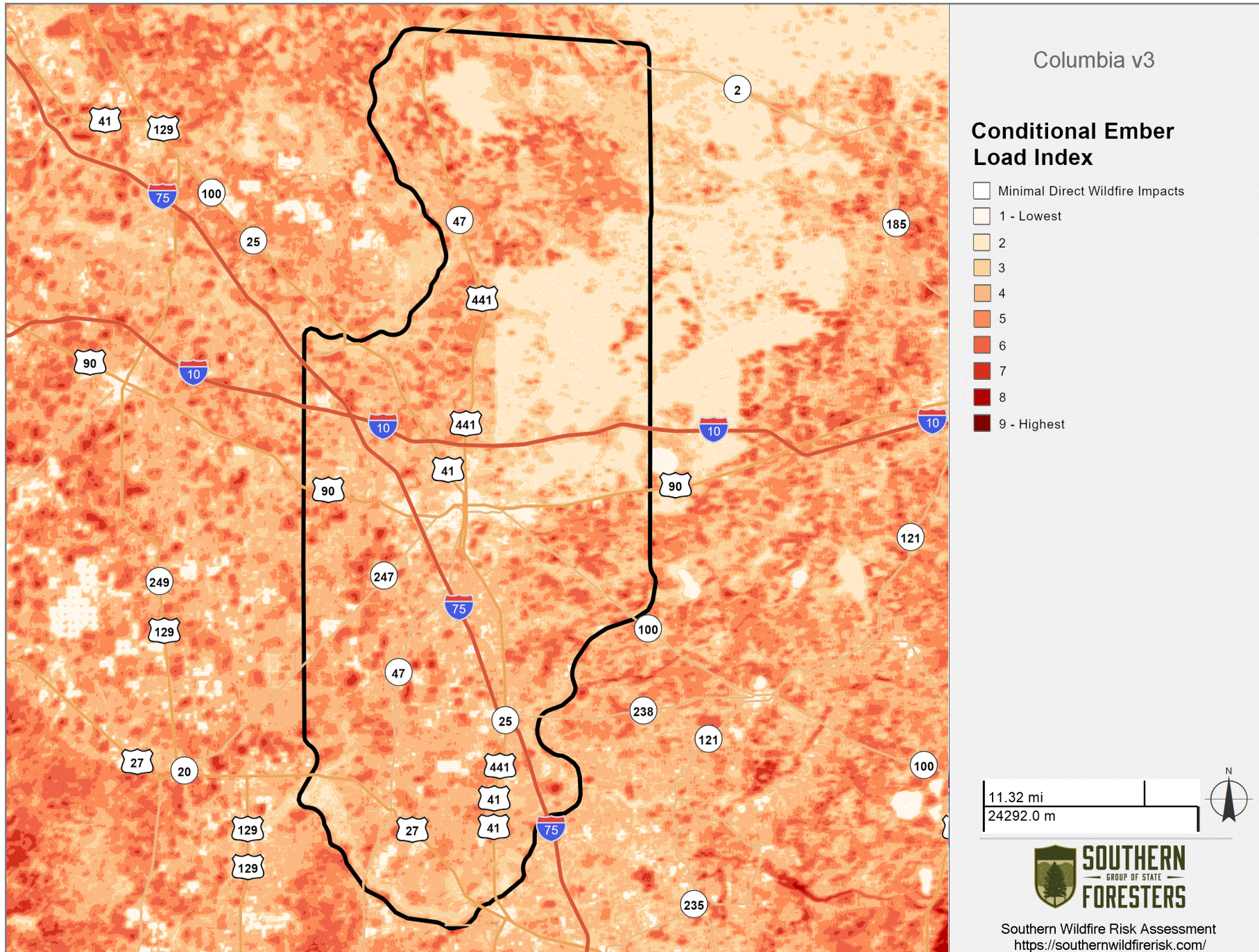
|  | Conditional Ember Load Index Category | Acres          | Percent      |
|--|---------------------------------------|----------------|--------------|
|  | Minimal Direct Wildfire Impacts       | 0              | 0 %          |
|  | 1 - Lowest                            | 11,757         | 2 %          |
|  | 2                                     | 83,285         | 15 %         |
|  | 3                                     | 120,369        | 21 %         |
|  | 4                                     | 213,234        | 38 %         |
|  | 5                                     | 108,906        | 19 %         |
|  | 6                                     | 25,855         | 5 %          |
|  | 7                                     | 1,676          | 0 %          |
|  | 8                                     | 0              | 0 %          |
|  | 9 - Highest                           | 0              | 0 %          |
|  | <b>Total</b>                          | <b>565,081</b> | <b>100 %</b> |



Columbia v3  
Conditional Ember Load Index









# Landscape Characteristics

The information in this section of the report describes the type of fuel characterized by the surface fuel model map and the percent slope, which is useful for characterizing conditions important for operating equipment.

Contents:

[Surface Fuels](#)

[Percent Slope](#)



## Surface Fuels

Surface Fuels, or fire behavior fuel models as they are technically referred to, contain the parameters needed by the Rothermel (1972) surface fire spread model to compute surface fire behavior characteristics, such as rate of spread, flame length, fireline intensity, and other fire behavior metrics. Surface fuels include grass, timber litter, shrub/brush, slash and other dead or live vegetation within about 6 feet of the ground and are shown here at 30-meter resolution.

Surface fuels are typically categorized into one of four primary fuel types based on the primary carrier of the surface fire: 1) grass, 2) shrub/brush, 3) timber litter and 4) slash. There are two standard fire behavior fuel model sets published for use. The Fire Behavior Prediction System 1982 Fuel Model Set (Anderson, 1982) contains 13 fuel models and the Fire Behavior Prediction System 2005 Fuel Model Set (Scott & Burgan, 2005) contains 40 fuel models.

The SWRA Surface Fuels reflect fuel disturbances through 2022 and are based initially on LANDFIRE 2020, calibrated with input from fuel calibration workshops.

A detailed fuels calibration process was undertaken that involved collaboration with Southern state fuels and fire behavior specialists supported by federal partner involvement. Workshops were held to review the LANDFIRE fuels product and calibrate the data by modifying specific vegetation and fuels classes to better reflect local knowledge and input

Data Source: Southern Wildfire Risk Assessment, Pyrologix 2023 (includes fuel disturbances through 2022)

| Surface Fuel                                                                                            | FBPS Fuel Model Set | Description | Acres                                                                                                           | Percent |      |
|---------------------------------------------------------------------------------------------------------|---------------------|-------------|-----------------------------------------------------------------------------------------------------------------|---------|------|
| Non-burnable Fuel Type Models (insufficient wildland fuel to carry a wildland fire under any condition) |                     |             |                                                                                                                 |         |      |
|                                                                                                         | NB1                 | 2005        | Urban or suburban development; insufficient wildland fuel to carry wildland fire. Includes roads.               | 17,025  | 3 %  |
|                                                                                                         | NB3                 | 2005        | Agricultural field, maintained in nonburnable condition.                                                        | 17,667  | 3 %  |
|                                                                                                         | NB8                 | 2005        | Open water                                                                                                      | 2,735   | 0 %  |
|                                                                                                         | NB9                 | 2005        | Bare ground                                                                                                     | 26,757  | 5 %  |
| Grass Fuels Type Models (nearly pure grass and/or forb type)                                            |                     |             |                                                                                                                 |         |      |
|                                                                                                         | GR1                 | 2005        | Grass is short, patchy, and possibly heavily grazed. Spread rate moderate; flame length low.                    | 3,287   | 1 %  |
|                                                                                                         | GR2                 | 2005        | Moderately coarse continuous grass, average depth about 1 foot. Spread rate high; flame length moderate.        | 83,971  | 15 % |
|                                                                                                         | GR3                 | 2005        | Very coarse grass, average depth about 2 feet. Spread rate high; flame length moderate.                         | 30,793  | 5 %  |
|                                                                                                         | GR4                 | 2005        | Moderately coarse continuous grass, average depth about 2 feet. Spread rate very high; flame length high.       | 0       | 0 %  |
|                                                                                                         | GR5                 | 2005        | Dense, coarse grass, average depth about 1 to 2 feet. Spread rate very high; flame length high.                 | 1,209   | 0 %  |
|                                                                                                         | GR6                 | 2005        | Dryland grass about 1 to 2 feet tall. Spread rate very high; flame length very high.                            | 0       | 0 %  |
|                                                                                                         | GR8                 | 2005        | Heavy, coarse, continuous grass 3 to 5 feet tall. Spread rate very high; flame length very high.                | 301     | 0 %  |
| Grass-Shrub Fuels Type Models (mixture of grass and shrub, up to 50 percent shrub coverage)             |                     |             |                                                                                                                 |         |      |
|                                                                                                         | GS1                 | 2005        | Shrubs are about 1 foot high, low grass load. Spread rate moderate; flame length low.                           | 4,312   | 1 %  |
|                                                                                                         | GS2                 | 2005        | Shrubs are 1 to 3 feet high, moderate grass load. Spread rate high; flame length moderate.                      | 899     | 0 %  |
|                                                                                                         | GS3                 | 2005        | Moderate grass/shrub load, average grass/shrub depth less than 2 feet. Spread rate high; flame length moderate. | 5,271   | 1 %  |
|                                                                                                         | GS4                 | 2005        | Heavy grass/shrub load, depth greater than 2 feet. Spread rate high; flame length very high.                    | 0       | 0 %  |

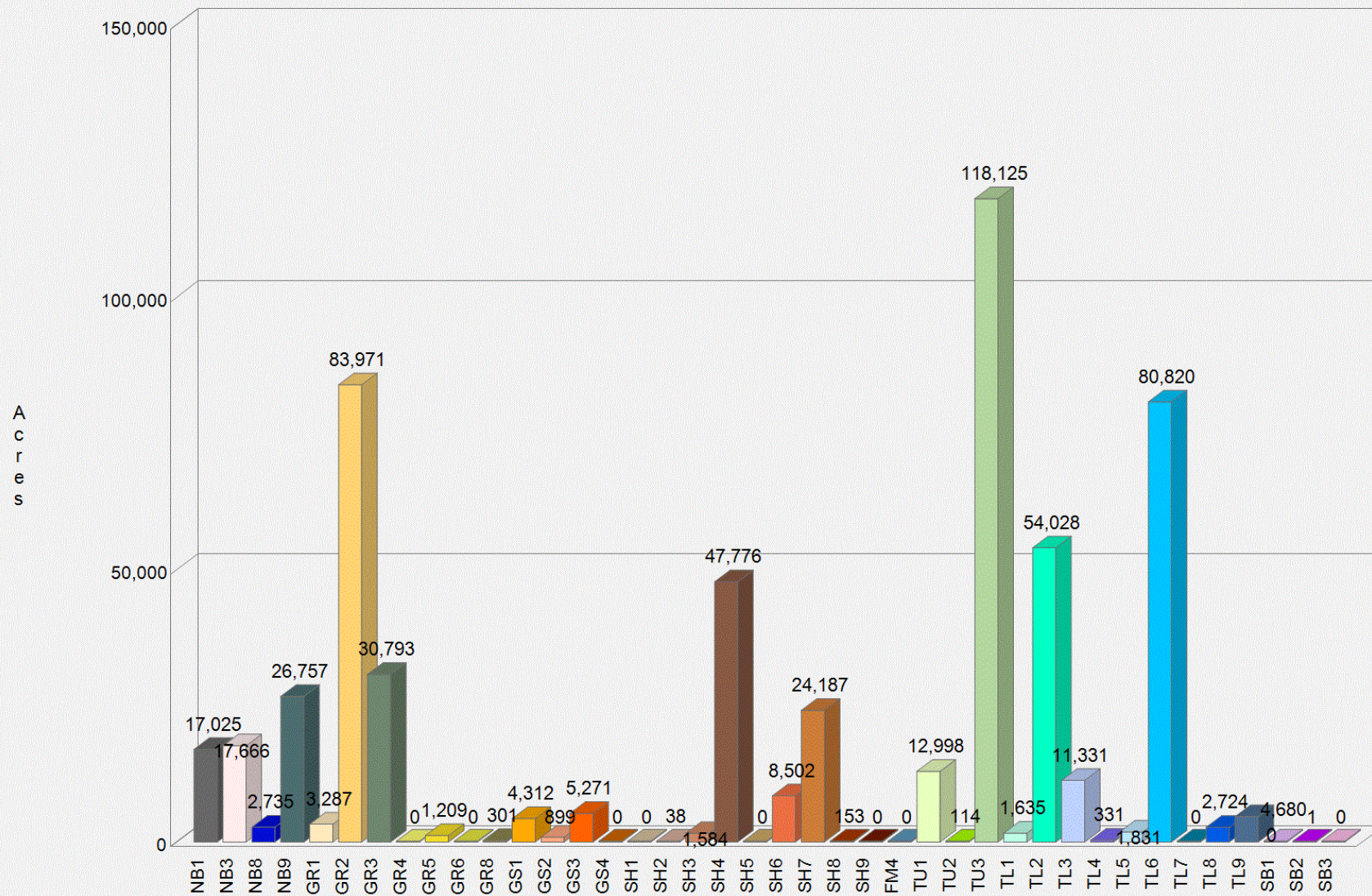
| Surface Fuel                                                                                       |     | FBPS Fuel Model Set | Description                                                                                                                                                           | Acres   | Percent |
|----------------------------------------------------------------------------------------------------|-----|---------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------|---------|
| Shrub Fuel Type Models (Shrubs cover at least 50 percent of the site, grass sparse to nonexistent) |     |                     |                                                                                                                                                                       |         |         |
|                                                                                                    | SH1 | 2005                | Low shrub fuel load, fuelbed depth about 1 foot; some grass may be present. Spread rate very low; flame length very low.                                              | 0       | 0 %     |
|                                                                                                    | SH2 | 2005                | Moderate fuel load (higher than SH01), depth about 1 foot, no grass fuel present. Spread rate low; flame length low.                                                  | 38      | 0 %     |
|                                                                                                    | SH3 | 2005                | Moderate shrub load, possibly with pine overstory or herbaceous fuel, fuel bed depth 2 to 3 feet. Spread rate low; flame length low.                                  | 1,584   | 0 %     |
|                                                                                                    | SH4 | 2005                | Low to moderate shrub and litter load, possibly with pine overstory, fuel bed depth about 3 feet. Spread rate high; flame length moderate.                            | 47,776  | 8 %     |
|                                                                                                    | SH5 | 2005                | Heavy shrub load, depth 4 to 6 feet. Spread rate very high; flame length very high.                                                                                   | 0       | 0 %     |
|                                                                                                    | SH6 | 2005                | Dense shrubs, little or no herb fuel, depth about 2 feet. Spread rate high; flame length high.                                                                        | 8,502   | 2 %     |
|                                                                                                    | SH7 | 2005                | Very heavy shrub load, depth 4 to 6 feet. Spread rate lower than SH05, but flame length similar. Spread rate high; flame length very high.                            | 24,187  | 4 %     |
|                                                                                                    | SH8 | 2005                | Dense shrubs, little or no herb fuel, depth about 3 feet. Spread rates high; flame length high.                                                                       | 153     | 0 %     |
|                                                                                                    | SH9 | 2005                | Dense, finely branched shrubs with significant fine dead fuel, about 4 to 6 feet tall; some herbaceous fuel may be present. Spread rate high, flame length very high. | 0       | 0 %     |
| 1982 Fire Behavior Prediction System – ONLY USED FOR FLORIDA ASSESSMENT                            |     |                     |                                                                                                                                                                       |         |         |
|                                                                                                    | FM4 | 1982                | Chaparral                                                                                                                                                             | 0       | 0 %     |
| Timber-Understory Fuel Type Models (Grass or shrubs mixed with litter from forest canopy)          |     |                     |                                                                                                                                                                       |         |         |
|                                                                                                    | TU1 | 2005                | Fuelbed is low load of grass and/or shrub with litter. Spread rate low; flame length low.                                                                             | 12,998  | 2 %     |
|                                                                                                    | TU2 | 2005                | Fuelbed is moderate litter load with shrub component. Spread rate moderate; flame length low.                                                                         | 114     | 0 %     |
|                                                                                                    | TU3 | 2005                | Fuelbed is moderate litter load with grass and shrub components. Spread rate high; flame length moderate.                                                             | 118,126 | 21 %    |
| Timber Litter Fuel Type Models (dead and down woody fuel litter beneath a forest canopy)           |     |                     |                                                                                                                                                                       |         |         |
|                                                                                                    | TL1 | 2005                | Light to moderate load, fuels 1 to 2 inches deep. Spread rate very low; flame length very low.                                                                        | 1,635   | 0 %     |
|                                                                                                    | TL2 | 2005                | Low load, compact. Spread rate very low; flame length very low.                                                                                                       | 54,028  | 10 %    |



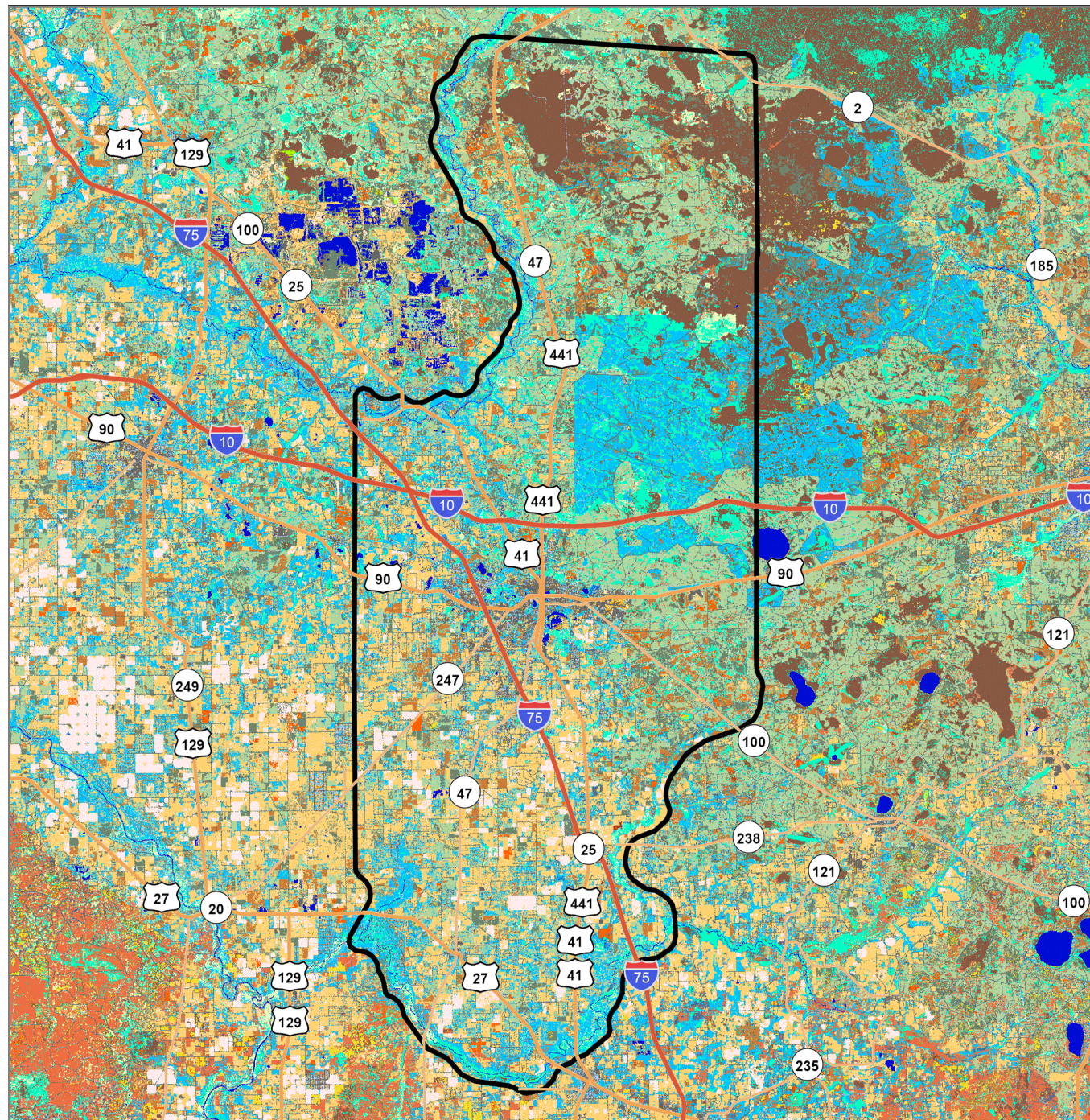
| Surface Fuel                                                                            | FBPS Fuel Model Set | Description                                                                                                                       | Acres          | Percent      |
|-----------------------------------------------------------------------------------------|---------------------|-----------------------------------------------------------------------------------------------------------------------------------|----------------|--------------|
| TL3                                                                                     | 2005                | Moderate load conifer litter. Spread rate very low; flame length low.                                                             | 11,331         | 2 %          |
| TL4                                                                                     | 2005                | Moderate load, includes small diameter downed logs. Spread rate low; flame length low.                                            | 331            | 0 %          |
| TL5                                                                                     | 2005                | High load conifer litter; light slash or mortality fuel. Spread rate low; flame length low.                                       | 1,831          | 0 %          |
| TL6                                                                                     | 2005                | Moderate load, less compact. Spread rate moderate; flame length low.                                                              | 80,820         | 14 %         |
| TL7                                                                                     | 2005                | Heavy load forest litter, includes larger diameter downed logs. Spread rate low; flame length low.                                | 0              | 0 %          |
| TL8                                                                                     | 2005                | Moderate load and compactness may include small amount of herbaceous load. Spread rate moderate; flame length low.                | 2,724          | 0 %          |
| TL9                                                                                     | 2005                | Very high load broadleaf litter; heavy needle-drape in otherwise sparse shrub layer. Spread rate moderate; flame length moderate. | 4,680          | 1 %          |
| <b>Slash-Blowdown Fuel Type Models</b> (activity fuel/slash or debris from wind damage) |                     |                                                                                                                                   |                |              |
| SB1                                                                                     | 2005                | Low load activity fuel. Spread rate moderate; flame length low.                                                                   | 0              | 0 %          |
| SB2                                                                                     | 2005                | Moderate load activity or low load blowdown. Spread rate moderate; flame length moderate.                                         | 1              | 0 %          |
| SB3                                                                                     | 2005                | High load activity fuel or moderate load blowdown. Spread rate high; flame length high.                                           | 0              | 0 %          |
| <b>Total</b>                                                                            |                     |                                                                                                                                   | <b>565,081</b> | <b>100 %</b> |



# Columbia v3 Surface Fuels







Columbia v3

### Surface Fuels

|     |     |
|-----|-----|
| NB1 | SH6 |
| NB3 | SH7 |
| NB8 | SH8 |
| NB9 | SH9 |
| GR1 | FM4 |
| GR2 | TU1 |
| GR3 | TU2 |
| GR4 | TU3 |
| GR5 | TL1 |
| GR6 | TL2 |
| GR8 | TL3 |
| GS1 | TL4 |
| GS2 | TL5 |
| GS3 | TL6 |
| GS4 | TL7 |
| SH1 | TL8 |
| SH2 | TL9 |
| SH3 | SB1 |
| SH4 | SB2 |
| SH5 | SB3 |

11.32 mi  
24292.0 m



Southern Wildfire Risk Assessment  
<https://southernwildfirerisk.com/>



# Percent Slope

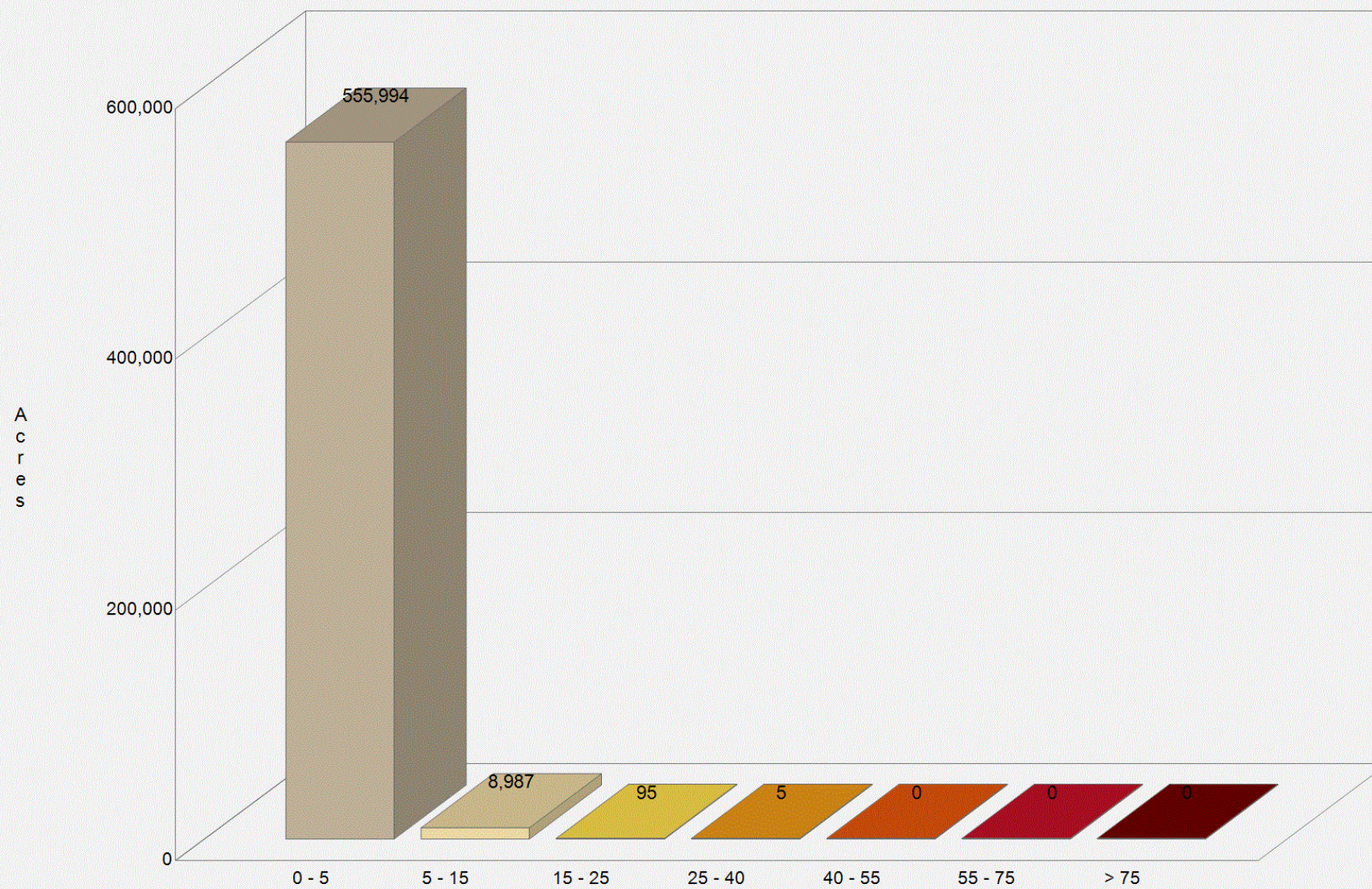
Percent Slope measures the rate of change of elevation over a given horizontal distance (rise over run), expressed as a percent. Percent slope is used to characterize the local conditions for operating equipment. Slope identifies the inclination at a single location based on the adjacent elevation values. Steep local conditions can severely restrict the movement of equipment and resources for suppression and intensify fire behavior.

Data Source: Southern Wildfire Risk Assessment, Pyrologix 2023 (includes fuel disturbances through 2022)

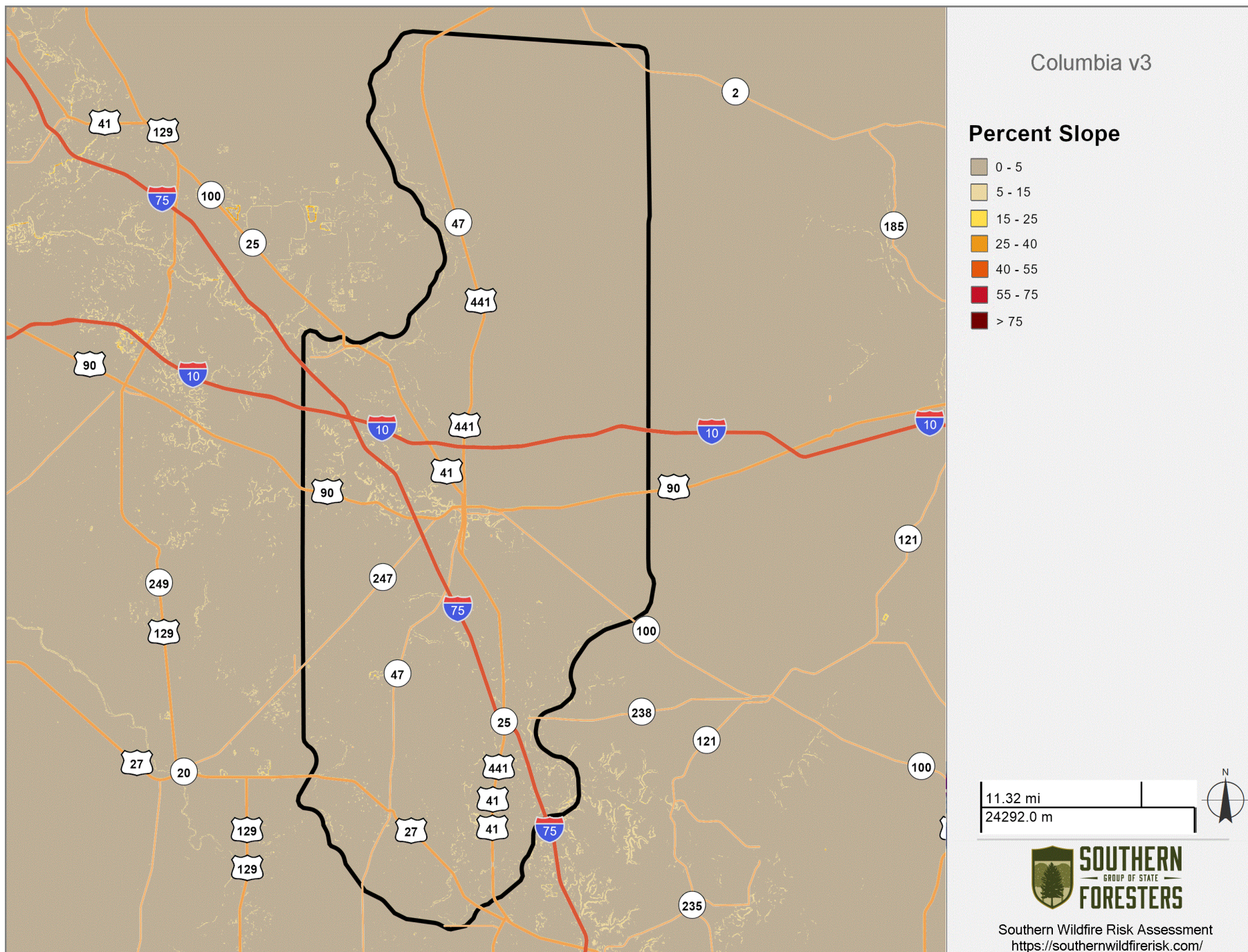
|  | Percent Slope Category | Acres   | Percent |
|--|------------------------|---------|---------|
|  | 0 - 5                  | 555,994 | 98 %    |
|  | 5 - 15                 | 8,988   | 2 %     |
|  | 15 - 25                | 95      | 0 %     |
|  | 25 - 40                | 5       | 0 %     |
|  | 40 - 55                | 0       | 0 %     |
|  | 55 - 75                | 0       | 0 %     |
|  | > 75                   | 0       | 0 %     |
|  | Total                  | 565,081 | 100 %   |



Columbia v3  
Percent Slope









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Scott, J. H., & Reinhardt, E. D. (2001). Assessing the Crown Fire Potential by Linking Models of Surface and Crown Fire Behavior. Ft. Collins, CO, Rocky Mountain Research Station: USDA Forest Service, Research Paper RMRS-RP-29.

Scott, Joe. November 2006. Off the Richter: Magnitude and Intensity Scales for Wildland Fire. A non-published white paper prepared for the AFE Fire Congress, November 2006, San Diego, CA.

More information about the Fire Program Analysis project is available from <https://www.forestsandrangelands.gov/WFIT/applications/FPA/index.shtml>



## SOUTHERN GROUP OF STATE FORESTERS WILDFIRE RISK ASSESSMENT PORTAL