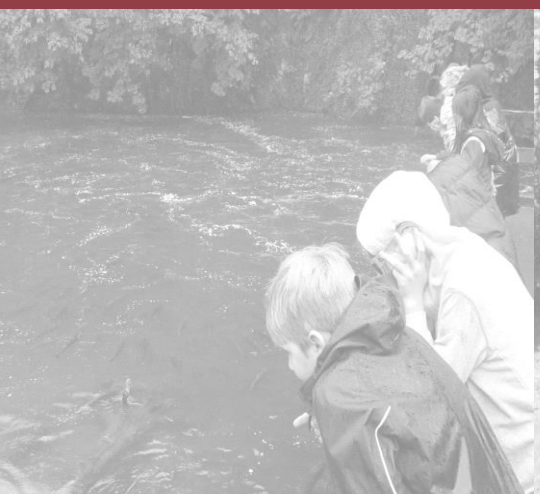
Attachment C

Tumwater City Plan 2036
Conservation Element



CITY OF TUMWATER

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1. INTRODUCTION

1.1 Background

The Conservation Element is part of Tumwater's Comprehensive Plan. It was created to meet the state Growth Management Act (Chapter 36.70A RCW) requirements to identify and protect critical environmental areas and valuable natural resources. The Conservation Element specifically addresses the above-mentioned topics in the following order:

Natural Resource Lands Conservation:

- Agricultural Lands
- Forest Lands
- Mineral Resource Lands

Critical Areas Protection:

- Wetland Areas
- Critical Aquifer Recharge Areas
- Frequently Flooded Areas
- Geologically Hazardous Areas
- Fish and Wildlife Habitat Conservation Areas

As drafted, the Growth Management Act provides the possibility of conflict between its two goals of protecting critical areas and effectively conserving while utilizing natural resources. The two goals are:

> *8. Natural resource industries. Maintain and enhance natural resource-based industries, including productive timber, agricultural, and fisheries industries. Encourage the conservation of productive forest lands and productive agricultural lands, and discourage incompatible uses.*

> *10. Environment. Protect the environment and enhance the state's high quality of life, including air and water quality, and the availability of water.*

In the event that conflict does occur in the implementation of planning and development regulations, the priority of protecting critical areas will be superior to conserving while utilizing natural resources.

This Element and implementing ordinances were developed with public input as described in the Public Outreach Plan required by the Growth Management Act. This chapter is also based on the updated list of additional supporting plans, documents, and best available science shown in Table 1.

In addition, this Element serves as the policy basis for enacting Goal #4 of the *City of Tumwater Strategic Plan* in future land development, which states:

> *Promote Development that is Environmentally Sustainable and Provides for a Healthy Community.*

In concert with the *Natural Hazard Mitigation Plan for the Thurston Region* and the Land Use Element, this Element reviews drainage, flooding, and storm water run-off in the area and provides guidance for corrective actions to manage and cleanse those discharges that pollute waters of the state, including Puget Sound and waters entering Puget Sound.

Table 1. Foundational Plans, Documents, and Best Available Science (BAS)

Topic Index	Supporting Plans and Materials
General Policy	• Land Use Element (2015) • County-Wide Planning Policies, Thurston County (2015) • Sustainable Thurston, Thurston Regional Planning Council (2013)
Agricultural Lands	• Custom Soil Resource Report for Thurston County Area, Washington – 2016 Tumwater Soil Survey, U.S. Department of Agriculture (2016) • Handbook No. 210, U.S. Department of Agriculture (1961) • Soil Conservation Service Soil Survey of Thurston County, U.S. Department of Agriculture (1958)

Topic Index	Supporting Plans and Materials
Forest Lands	• Private Forest Land Grades (WAC 458-40-530), State Department of Revenue
Mineral Resource Lands	• Correspondence with the State Department of Natural Resources Staff (1992) • Geologic Map of the Centralia Quadrangle, Washington, State Department of Natural Resources (1987) • Inventory of Abandoned Coal Mines in the State of Washington, US Department of Interior / State Department of Natural Resources (1985) • Mineral Resource Land Classification System (WAC 365-190-070), State Department of Natural Resources • Tumwater Aerial Photographs (1989) • Tumwater Land Use Inventory (1991) • Washington State Coal Mine Map Collection, State Department of Natural Resources (1983)
Wetland Areas	• Best Available Science for Freshwater Wetlands, State Department of Fish and Wildlife and State Department of Ecology (2005, 2013) • Custom Soil Resource Report for Thurston County Area, Washington – 2016 Tumwater Soil Survey, U.S. Department of Agriculture (2016) • Priority Habitats and Species Data Base, State Department of Fish and Wildlife (Updated annually) • Priority Habitats and Species List, State Department of Fish and Wildlife (1999) • Shoreline Master Program (2014) • Soil Conservation Service Soil Survey of Thurston County, U.S. Department of Agriculture (1958) • Wetland Mapping for the Thurston Region, Thurston Regional Planning Council (2004)

Topic Index	Supporting Plans and Materials
Critical Aquifer Recharge Areas	• Lands for Public Purposes Element • Thurston County On-Site Sewage Management Plan (2014) • Wastewater Resource Management Plan, LOTT Clean Water Alliance (2015) • Water System Plan (2010-2015) • Wellhead Protection Plan (2010 informal update, 2016 update underway)
Frequently Flooded Areas	• Comprehensive Stormwater Implementation Plan (2002, 2016 Plan in development) • Flood Hazard Maps • Flood Insurance Studies and the Flood Insurance Rate Maps, Federal Emergency Management Agency (2012 – 2016) • Floodplain Overlay Ordinance (2016) • GIS Thurston County Floodplain Mapping • Littlerock-70th Avenue Annexation Area Drainage Study (Part of the Littlerock-70th Avenue Annexation in 2008) (2011) • Natural Hazards Mitigation Plan for the Thurston Region (2009) • Salmon Creek Comprehensive Drainage Basin Plan (2004)
Geologically Hazardous Areas	• Coastal Zone Atlas, State Department of Ecology (2014) • Custom Soil Resource Report for Thurston County Area, Washington – 2016 Tumwater Soil Survey, U.S. Department of Agriculture (2016) • Geologic Map of the Centralia Quadrangle, Washington, State Department of Natural Resources (1987) • Liquefaction Hazards Map, State Department of Natural Resources • Natural Hazards Mitigation Plan for the Thurston Region (2009) • Steep Slopes Map, State Department of Natural Resources

Topic Index	Supporting Plans and Materials
Fish and Wildlife Conservation Areas	• Habitat Conservation Plan (In development 2016-17) • Landscape Planning for Washington's Wildlife: Managing for Biodiversity in Developing Areas, State Department of Fish and Wildlife (2009) • Management Recommendations for Priority Habitat and Species (Multiple Documents), State Department of Fish and Wildlife (1991 – 2011) • Priority Habitats and Species Data Base, State Department of Fish and Wildlife (Updated annually) • Priority Habitats and Species List, State Department of Fish and Wildlife (1999) • Determination of Threatened Status for Bull Trout in the Coterminous United States, Federal Register (64):58910-58933, U.S. Fish and Wildlife Service (1999) • Endangered and Threatened Species: Regulations Consolidation, Final Rule, Code of Federal Regulations Volume 50 Part 223.102, National Oceanic and Atmospheric Administration (1999) (Chinook Salmon) • Endangered and Threatened Wildlife and Plants, Threatened Status for Oregon Spotted Frog, Final Rule, Federal Register Volume 79:51658, U.S. Fish and Wildlife Service (2014) • Threatened Species Status for the Olympia Pocket Gopher, Roy Prairie Pocket Gopher, Tenino Pocket Gopher, and Yelm Pocket Gopher, With Special Rule, Federal Register Volume 79:19759, U.S. Fish and Wildlife Service (2014) • Endangered and Threatened Wildlife and Plants, Endangered Status for Taylor's Checkerspot Butterfly and Threatened Status for the Streaked Horned Lark, Final Rule, Federal Register Volume 78:61452, U.S. Fish and Wildlife Service (2013) • Multiple Additional ESA Documents described in the Environmental Conservation Online System

1.2 Best Available Science

RCW 36.70A.172 and WAC 365-195-900 through WAC 365-195-925 require jurisdictions to use Best Available Science (BAS) in revising or adopting new policies and regulations related to critical areas. Utilization of BAS is particularly important to salmon recovery efforts required under the Endangered Species Act. BAS is essentially a process to assist jurisdictions in ascertaining what science is appropriate for use in basing policy and regulatory decision-making. Tumwater will use BAS in all revisions and additions to critical areas policies and regulations to protect the functions and values of critical areas.

1.3 Shorelines

Tumwater's shorelines of the state as identified by the Shoreline Management Act within City limits include the Deschutes River, and Black Lake Drainage area as well as lake shorelines including: Trosper Lake, Barnes Lake, Lake Susan, and Munn Lake. Shorelines of the state within Tumwater's potential annexation area include Black Lake. Shorelines of the state also include the upland or shorelands that generally extend 200-feet landward from the edge of these waters, and any wetlands, floodways, and/or floodplain areas associated with such waters.

The updated Shoreline Master Program was adopted in 2014 following review and approval from the State Department of Ecology. The regulations were incorporated into TMC 16.20 Geologically Hazardous Areas, TMC 16.28 Wetland Protection Standards, and TMC 16.32 Fish and Wildlife Habitat Protection. For shorelines of the state, the goals and policies of the Shoreline Management Act (RCW 90.58.020) were added as one of the goals of the Growth Management Act (RCW 36.70A.020) without creating an order of priority among the fourteen goals. The goals and policies of the City's Shoreline Master Program approved under RCW 90.58 shall be considered an element of the comprehensive plan.

1.4 County-Wide Planning Policies

The Growth Management Act requires that comprehensive plans be consistent with Thurston County's County-Wide Planning Policies, as amended in 2015. The following is a list of the relevant policies that apply to this Element of the Comprehensive Plan. All County-Wide Planning Policies are adopted as Appendix B to the Comprehensive Plan. The relevant sections of the County-Wide Planning Policies to this Element are cited below.

The Conservation Element contains goals, policies, and actions that address County-Wide Planning Policies 1.1 through 1.14. These goals, policies, and actions support

Tumwater and Thurston County's vision for compact, efficient urban development that phases outward from the urban core while preserving the natural and critical areas in and around Tumwater.

II. Urban Growth Areas

2.2 The boundaries of designated urban growth areas must meet the following criteria:

[…]

d. be compatible with the use of designated resource lands and critical areas.

Each resource land and critical area chapter in the Element describes what kinds of development are compatible with the resource or area that chapter covers.

III. Promotion of Contiguous and Orderly Development, Provision of Urban Services, and Protection of Rural Areas

3.4 Provide Capacity to accommodate planned growth by:

[…]

b. Protecting ground water supplies from contamination and maintaining groundwater in adequate supply by identifying and reserving future supplies well in advance of need.

The critical aquifer recharge area policies in Chapter 6 of the Element support this policy.

VII. Economic Development and Employment

7.2 Support the recruitment, retention, and expansion of environmentally sound and economically viable commercial, public sector, and industrial development and resource uses, including the provision of assistance in obtaining funding and/or technical assistance.

Resource uses and resource land protection are addressed in Chapters 2 through 4.

7.5 Build a vital, diverse, and strong local economy, including job opportunities that support community and household resilience, health, and well-being, by;

[…]

f. Nurturing urban and rural agricultural and food-oriented businesses.

g. Protecting resource lands.

h. Encouraging the utilization and development of areas designated for industrial use, consistent with the environmental policies in these countywide policies.

i. Connecting economic health with personal health and well-being and the advancement of environmental health.

j. Adding incentives for business to demonstrate their environmental sustainability including reduction in greenhouse gas emissions.

Urban and rural agriculture are discussed in Chapter 2. The critical areas chapters (Chapters 5 – 9) address the protection of crucial areas for both environmental and public health reasons. Action C-2.2 provides incentives for increased sustainability measures.

X. Environmental Quality

10.1 Recognize our dependence on natural systems and maintain a balance between human uses and the natural environment.

10.2 Establish a pattern and intensity of land and resource use that is in concert with the ability of land and resources to sustain such use, reduce the effects of the built environment on the natural environment, conserve natural resources, and enable continued resource use, through:

[…]

c. Planning for the amount of population that can be sustained

by our air, land and water resources without degrading livability and environmental quality.

[…]

10.3 Protect the soil, air, surface water, and groundwater quality, including through:

a. Reducing dependence on the use of chemicals and other products that pollute and, when their use is necessary, minimizing releases to the environment.

b. Ensuring adequate clean water is available to support household and commercial needs while sustaining ecological systems through conservation, balancing of uses, and reuse.

c. Protecting ground and surface water and the water of the Puget Sound from further degradation by adopting and participating in comprehensive, multi-jurisdictional programs to protect and monitor water resources for all uses.

10.5 Acknowledge that changing weather and climate patterns will impact the human, natural, and built environments and plan for impact such as increase wildfire, flooding, and sea-level rise.

10.6 Protect and restore natural ecosystems, such as, forests, prairies, wetlands, surface and groundwater resources, that provide habitat for aquatic and terrestrial plants and animals.

10.7 Provide for public access to natural resource lands, while ensuring that uses and economic activity, which are allowed within those lands, are sustainable.

10.8 Provide for parks and open space and maintain significant wildlife habitat and corridors.

The Conservation Element is based upon the theme of the importance of natural systems and resources to human uses. Chapters related to water resources (Chapters 5 - 7) cover the issues surrounding the balance between meeting future needs for water and protecting water resources. Groundwater is specially addressed in Chapter 6.

1.5 Sustainable Thurston Policies

Tumwater adopts the following Sustainable Thurston Goals as part of the Conservation Element:

1.2.1 Priority Goals

Priority Goal 2: Preserve environmentally sensitive lands, farmlands, forest lands, prairies, and rural lands and develop compact urban areas.

Priority Goal 4: Protect and improve water quality, including groundwater, rivers, streams, lakes, and the Puget Sound.

Priority Goal 7: Support local food systems to increase community resilience, health, and economic prosperity.

1.2.2 Leadership & Participation Goals

L-1: Become a model for sustainability and livability. Identify resources, organizational structure, and educational opportunities to achieve regional sustainability goals.

L-2: Develop regional plans and strategies essential to meeting sustainability priority goals and targets.

L-3: Increase regional, multi-regional, and state coordination and collaboration.

1.2.3 Environment Goals

E-4: Protect, preserve, and restore streams, wetlands, and shorelines to protect water quality.

2. AGRICULTURAL LANDS

2.1 Introduction

Access to healthy food choices is an important public health issue. Lack of healthy food choices contributes to obesity and other health problems such as diabetes, heart disease, and cancer. Access to healthy food and local food production are clearly part of planning for a vital, healthy community.

The *City of Tumwater Strategic Plan* has a number of goals and policies directly related to environmental sustainability and increasing the availability of healthy food. According to the Worldwatch Institute,[1] produce found in an average grocery store has traveled 1,500 miles. Long distance transportation consumes an enormous amount of fossil fuel and generates a great deal of greenhouse gases. Increased local food production has a direct beneficial effect on the environment by reducing greenhouse gas emissions. Transportation costs are much lower for local food producers. In addition, a direct benefit to the community is the provision of fresh, healthy, locally grown food. Decreasing regulatory barriers and encouraging a wide range of local food production options compatible in an urban environment are important policy decisions in furthering the sustainability goals of the City.

The conservation and protection of prime agricultural lands are essential to our economic and nutritional needs. Food, feed, forage, fiber, and oil seed crops are all best produced on prime farmland soils, which provide superior physical and chemical characteristics. Historically, valuable agricultural lands have been pushed out and eliminated by urbanization in the form of low-density suburban sprawl located outside cities and their urbanized environments.

2.2 Sustainable Urban Agriculture

Sustainable urban agriculture meeting the goals of the *City of Tumwater Strategic Plan* and the Conservation Element takes a variety of forms.

1. Urban Farm: An urban farm is where plants and/or some animals are grown for sale of the plants and animals or their products, and in which the plants and animals or their products are sold either on the lot where they are grown or off site, or both. Examples may include flower and vegetable raising, orchards and vineyards. Urban farms are small-scale agricultural uses and are listed in the Conservation Element for informational purposes in order to show a complete picture of food

[1] http://www.worldwatch.org/globetrotting-food-will-travel-farther-ever-thanksgiving

production options. It is not intended that urban farms be separated from "agriculture" in the zoning code.

2. Community Garden: A community garden means land managed by a public or nonprofit organization, or a group of individuals, that is used to grow plants and harvest food or ornamental crops from them for donation or use by those cultivating the land and their households.

3. Individual Home Garden: A home garden simply means a garden grown on a residential lot as an accessory use to the principal structure for the use of the occupants. Home Gardens are listed in the Conservation Element for informational purposes in order to show a complete picture of food production options. It is not intended that home gardens be treated any differently in the zoning code.

4. Farmers Market: A farmers market consists of a group of individual venders primarily selling locally grown produce and products. This use typically is seasonal and may be temporary. Some examples are set up on closed streets or on portions of sites used for other primary uses.

2.3 Agricultural Lands Classification

This plan's classification and identification of agricultural lands of long-term significance is based partially upon the land-capability classification system of the United States Department of Agriculture Handbook No. 210. The classes of agricultural lands are based upon consideration of growing capacity, productivity, and soil composition of the land.

In further defining categories of agricultural lands of long-term significance, the reference standard is the use of the classification of prime and unique farmland soils as mapped by the Soil Conservation Service. Lastly, the Conservation Element recognizes that prime agricultural lands in the City have been substantially overlaid by urban uses and zones. These circumstances do not allow for a classification of long-term significance to be applied.

2.4 Agricultural Lands Conservation

Of prime importance in defining the long-term significance of agricultural lands is taking into account the proximity to populated areas and the possibility of more intense uses of the land as indicated by:

- The availability of public facilities (available);

- Tax status (special tax status available);
- The availability of public services (available);
- Relationship or proximity to urban growth areas (within the Thurston UGA);
- Predominant parcel size (moderate);
- Land use settlement patterns and their compatibility with agricultural practices (surrounding land uses of urban/suburban densities);
- Intensity of nearby land uses (urban or soon-to-be urban density);
- History of land development permits issued nearby (an urbanizing area);
- Land values under alternative uses (urbanized and urbanizing based upon highest and best use market driver); and
- Proximity of markets (local and regional).

2.5 Agricultural Lands Identification

Within Tumwater, the soil types shown in Table 2 meet the definition of the Soil Conservation Service (SCS) as prime and unique farmland soils.

A review of the Soil Conservation Service Soil Survey Maps (13 and 18) covering Tumwater and its Urban Growth Area shows the prime and unique farmlands in Table 2 to be present. In many cases the soils are covered by urbanized, open space or agricultural land uses. The following chart is developed from the SCS Soil Survey of Thurston County. When soils are shown as prime/unique farmland, "where drained" does not imply that the Conservation Element encourages such action.

Table 2. Tumwater Farmlands Soil Composition

Map Unit	Prime/Unique Farmland Soil Description	In Tumwater?
41	Godfrey silty clay loam (where drained)	Yes
69	Mukilteo muck (where drained)	Yes
73	Nisqually loamy fine sand, 0 to 3 percent slopes where irrigated	Yes

Map Unit	Prime/Unique Farmland Soil Description	In Tumwater?
76	Norma silt loam (where drained)	Yes
88	Puget silt loam (where drained)	Yes
89	Puyallup silt loam	Yes
106	Shalcar Variant muck (where drained)	Yes
115	Sultan silt loam	Yes
126	Yelm fine sandy loam, 0 to 3 percent slopes	Yes

2.6 Agricultural Lands Protection

While an urban area is generally not conducive to large-scale farming, there is certainly a role for smaller scale urban farms and community gardens. Because of the importance of food access, food security, and overall environmental sustainability, there is a role for Tumwater in encouraging a wide range of farming and gardening within Tumwater. This role may evolve over time, but can begin with analyzing the existing regulatory barriers that do not foster the healthy food security and environmental goals of the City. TMC 16.12, Right-to-Farm protects legally established agricultural facilities.

2.7 Regulatory Barrier Assessment

The Growth Management Act requires a thorough review of the City's zoning and development codes every eight years. It may be appropriate to consider scheduling reviews more often to eliminate existing regulatory barriers to increasing the supply of healthy, locally grown food. The following Tumwater Municipal Code amendments support the goals of this plan should be evaluated and refined or implemented:

To implement:

- Consider allowing roadside stands as a part of an agricultural operation that would allow sales directly at or from the farm.

- Change the regulated amount of apiaries on a lot from a set number to a ratio based of lot size.

Implemented but open to refinement:

- Definitions for key terms such as "Community Garden" and "Farmers

Market."

- Community gardens as a permitted use in the Residential/Sensitive Resource, Single Family Low density, Single Family Medium density, Multi-Family Medium density, Multi-Family High density, Neighborhood Commercial, Community Service, Mixed Use, Capitol Boulevard Community, General Commercial, Town Center, Light Industrial, Heavy Industrial, Historic Commercial, Brewery District, Business Park, Open Space, and Airport Related Industrial zone districts.

- Farmers markets as a permitted use in the Neighborhood Commercial, Community Service, Mixed Use, Capitol Boulevard Community, General Commercial, Town Center, Light Industrial, Heavy Industrial, Historic Commercial, Brewery District, Business Park, Open Space, and Airport Related Industry zone districts.

Agriculture on lots 30 acres or less in size as a permitted use in Residential/Sensitive Resource, Single Family Low density, Single Family Medium density, and Multi-Family Medium density zone districts.

- Signage requirements regarding urban farms. Currently farms on lots smaller than one acre are allowed a single 12 ft^2 sign and farms on lots larger than one acre are allowed one 32 ft^2 sign on each street frontage.

- Requirements for permitted farms stated clearly in their own section.

- Agriculture uses exempt from standard fence requirements to protect crops better from wildlife. Currently agriculture uses are allowed to have taller fences given that they resemble common deer fences.

- Egg-laying fowl are permitted under certain restrictions such as lot size and compulsory sanitary enclosures. Loud fowl such as roosters, geese, and peacocks are prohibited.

3. FOREST LANDS

3.1 Introduction

Forest lands are a paramount economic raw resource for the state's economy. This valuable resource must be husbanded to insure that a continuous production of timber and forest products is assured for the future. It is the state's policy to encourage forestry and restocking and reforesting of forests (RCW 84.33.010). Proper management of forestry creates environmental benefits such as enhanced water and air quality, reduction of soil erosion, lessening of storm and flood damage, protection of valuable wildlife habitats, provision of scenic and recreational spaces, and providing a valuable buffer of a natural ecological equilibrium.

3.2 Forest Lands Identification

The Growth Management Act requires cities and counties to classify and conserve resource lands, including forest lands. The classification of the forest lands is to be based upon the private forest land grades of the State Department of Revenue (WAC 458-40-530).

This classification system incorporates consideration of growing capacity, productivity, and soil composition of the land. Forest lands of long-term commercial significance will generally have higher private forest land grades. However, the presence of lower private forest land grades within the areas of predominately higher grades need not preclude designation as forest land.

Worked into this plan's identification of forest lands are considerations of long-term commercial significance, proximity to urbanized areas and the possibility of more intense uses of land. Forest lands can most often be identified by reviewing the land parcel tax base to discover large tracts of land, which declare themselves "open space" or "designated forest land" thereby acquiring a reduced tax rate.

In defining what lands could be identified by the state classification system as forest lands, the beginning point of definition is a cross-reference of species, site index and land grades:

Table 3. State Private Forest Land Grades (WAC 458-40-530)

Washington State Species: Westside	Private Forest Site Index	Land Grade
Douglas Fir	136 ft. and over	1
	118-135 ft.	2
	99-117 ft.	3
	84-98 ft.	4
	Under 84 ft.	5
Western Hemlock	136 ft. and over	1
	116-135 ft.	2
	98-115 ft.	3
	83-97 ft.	4
	68-82 ft.	5
	Under 68 ft.	6
Red Alder	117 ft. and over	6
	Under 117 ft.	7
	Marginal forest productivity	7 or 8
	Noncommercial	8

Notes: Land Grade 1 = highest, Land Grade 8 = lowest
Marginal forest productivity in Tumwater is Land Grade 8

Forest lands are further defined by operability classes based upon characteristics of soils and geomorphic features. The criteria are applied as follows:

- **Class 1 - Favorable**. Stable soils that slope less than thirty percent. Forest operations do not significantly affect soil productivity and soil erosion. Forest operations, such as road building and logging, are carried out with minimal limitations.

- **Class 2 - Average.** Stable soils that slope less than thirty percent, but on which significant soil erosion, compaction, and displacement may occur

because of forest operations.

- **Class 3 - Difficult**. Soils with one or both of the following characteristics:

  a. Stable soils that slope between thirty and sixty-five percent; and

  b. Soils that slope between zero and sixty-five percent, but display evidence that rapid mass movement may occur as a direct result of forest operations.

- **Class 4 - Extreme**. All soils that slope more than sixty-five percent.

3.3 Forest Lands Conservation

When considering the effects of proximity of Tumwater's populated areas on the successful conservation of forest lands, the following items are considered. Comments in parentheses indicate the conditions found in Tumwater:

- The availability of public services and facilities conducive to the conversion of forest land (available);

- The proximity of forest land to urban and suburban areas and rural settlements: forest lands of long-term commercial significance are located outside the urban and suburban areas and rural settlements (located within an urban area);

- The size of the parcels: forest lands consist of predominantly large parcels (parcels identified are modest in size);

- The compatibility and intensity of adjacent and nearby land use and settlement patterns with forest lands of long-term commercial significance (adjacent land uses of urban land use intensity);

- Property tax classification: Property is assessed as open space or forest land pursuant to Chapter 84.33 RCW or Chapter 84.34 RCW (Two parcels identified);

- Local economic conditions which affect the ability to manage timberlands for long-term commercial production (judged not to be supportive in the long term); and

- History of land development permits issued nearby (other large tracts in

the City have been harvested under Class 4 DNR permits indicating land use conversions are to occur, which are processed by the City).

3.4 Forest Land Identification

Thurston County Assessor public records show that only one parcel within Tumwater and its Urban Growth Area is designated forest land. This parcel is 36.01 acres in size. The surrounding zoning/land uses adjacent to this parcel is shown in Table 4.

Table 4. Forest Lands Designation

Parcel #	Adjacent Zoning	Adjacent Land Use
Parcel Number 12829410000 Sec. 29, Township 18, Range 2W	North – GB, LI, and SFL	Gravel Pit Extraction
	South – LI and SFL	Low-density Residential
	East – GB and LI	Gravel Pit Extraction
	West – GB, LI, HI, and SFL	Open Space/Low-density Residential

Notes: GB – Greenbelt; HI – Heavy Industrial; LI – Light Industrial; and SFL – Single-Family Low Density Residential

While only one parcel was identified by the Assessor's office as having forest land tax status, this does not preclude the possibility of other parcels, not so identified, intended to be used as forest land.

3.5 Forest Lands - Long Term Urbanization

The Growth Management Act (WAC 365-190-060(2)) states that forests of long-term commercial significance are located outside the urban areas/suburban areas and rural settlements. Therefore, within Tumwater, the one identified parcel of forest land, as well as any others now or in the future, are not considered by the Conservation Element to be of long-term significance and it will not be designated protected resource lands. As future parcels of property are annexed or planned for within context of the Thurston County Urban Growth Management Agreement, this method of designating commercial forest lands of long-term significance will be pursued as a goal of this plan.

No subsequent implementing ordinance is needed to implement the Forest Land Resources chapter of this plan.

Given no incentive to continue forestry of the one designated forest land parcel within the City limits of Tumwater, it is highly likely that as urbanization trends continue,

this parcel ultimately will be logged and converted to the predominant adjacent land uses of Greenbelt, Industrial, or Low-Density Residential.

While no forest lands of long-term significance are currently identified, the parcels of land that are currently forested are encouraged to remain forested for their environmental and open space benefits, as long as possible, before converting to urbanized land uses.

4. MINERAL RESOURCE LANDS

4.1 Introduction

As with other types of resource lands discussed in this plan, the identification and conservation of mineral resource lands is a requirement placed upon Tumwater by the Growth Management Act. The Conservation Element will identify and classify mineral resource lands from which the extraction of minerals can be anticipated. In addition, a strategy to ensure a future supply of these minerals will be discussed. As a definition, minerals and the resource lands within which they are mined apply to resources including gravel, sand, and valuable metallic substances that have a known or potential long-term commercial significance.

4.2 Mineral Resource Lands Classification

In defining what lands qualify as "mineral resource lands," the Conservation Element bases its methodology upon the "Mineral Resource Land Classification System" developed by the State Department of Natural Resources with modification to include consideration of environmentally-sensitive areas, existing land use, and land ownership factors.

The Mineral Resource Lands Classification Criteria is as follows:

Marketability - Strategic (in short domestic supply) and non-strategic minerals that are minable, recoverable, and marketable in the present or foreseeable future (50 years).

Threshold Value – This is the gross selling price of the first marketable product from an individual mineral deposit. For those that meet the marketability criteria, only those that exceed the following threshold values in 1990 equivalent dollars should be considered significant:

- **Construction Materials** - Sand, gravel, or crushed rock that normally receive minimal processing (commonly washing and grading): **Minimum Value $5,000,000**

- **Industrial and Chemical Mineral Materials** – These are non-metallic mineral materials that normally receive extensive processing such as heat or chemical treatment or fine sizing. Examples include limestone, marble, specialty sands, clays, peat, coal, borates, gypsum, talc, feldspar, building and dimension stone, rock varieties produced into granules, rock floor, mineral wool and

similar commodities: **Minimum Value $1,000,000**

- **Metallic and Rare Minerals** - These are metallic elements, minerals, and gemstones that possess special properties valuable to science and industry. Examples include ores, deposits, or crystals of precious metals (such as gold), iron and ferro-alloy metals (such as tungsten), base metals, mercury, uranium, rare earths, minor metals (such as rubidium), gemstones: **Minimum Value $500,000**

- **Non-Fluid Mineral Fuels** - These are non-hydrothermal mineral fuels occurring in sedimentary rocks such as coal, coal bed methane, lignite, peat, organic shale, tar sand, uranium, and thorium: **Minimum Value $1,000,000**

- **Unique or Rare Occurrences** of rocks, minerals or fossils that are of outstanding scientific significance: **No Minimum Value**

4.3 Mineral Resource Lands Identification

The Conservation Element identifies lands with long-term commercial significance for extracting the mineral resources outlined in Section 4.2.

The following Mineral Resource Areas (MRA) and Scientific Resource Sites (SRS) categories are used in classifying lands:

- **MRA-1**: Areas where adequate information indicates that no significant mineral deposits are present, or where it is judged that there is little likelihood for their presence. This area should be applied where well-developed lines of reasoning, based upon economic geological principles and adequate data, demonstrate that the likelihood for occurrence of significant mineral deposits is nil or slight.

- **MRA-2**: Areas where adequate information indicates that significant mineral deposits are present or where it is judged that there is a high likelihood for their presence. This area should be applied to known mineral deposits or where well-developed lines of reasoning, based upon economic geologic principles and adequate data, demonstrate that the likelihood for occurrence of significant mineral deposits is high.

- **MRA-3**: Areas containing mineral deposits the significance of which cannot be evaluated from available data.

- **MRA-4**: Areas where available information is inadequate for assignment to any other MRA.

- **SRS**: Areas containing unique or rare occurrences of rocks, minerals, or fossils that are of outstanding scientific significance.

The sources of mineral resource distribution have identified the following sites, which now or in the future, will provide valuable mineral resources:

Table 5. Mineral Resource Designations

Mineral Resource	Section	Township	Range	Status	Land Use Designation and Zoning
Igneous Rock Quarry (Black Lake Boulevard)	29	18	2W	MRA-2	Heavy Industry
Sand/Gravel Pit (State Route 101)*	28	18	2W	MRA-2	Light Industry
Sand/Gravel Pit (R.W. Johnson)*	21	18	2W	MRA-2	Light Industry
Sand/Gravel Pit (26th Avenue)*	29	18	2W	MRA-2	Light Industry
All Mineral Resources	Locations City-Wide Unknown			MRA-4	Various

Notes: *These deposits have been mostly mined out and are now developed properties.

The Heavy Industry land use designation and associated zoning district was specifically created to support the existing rock quarry use on Black Lake Boulevard. New mineral extraction uses are not permitted in the Light Industry zoning district.

Mineral resource lands identified are subject to consideration of the effects of proximity to population areas and the possibility of more intense uses of land as indicated by:

- General land use patterns in the area (urban);

- Availability of utilities (available);

- Availability and adequacy of water supply (available);

- Surrounding parcel sizes and surrounding uses (small-medium sized parcels, land uses industrial and commercial in nature);
- Availability of public roads and other public services (yes);
- Division or zoning for urban or small lots (yes);
- Accessibility and/or distance from point of use (in close proximity);
- Physical and topographic characteristics of the mineral resource site (accommodating to low operating costs);
- Depth of the resource (exposed at surface);
- Depth of the overburden (exposed materials);
- Physical properties of the resource (high grade gravel, sand and rock);
- Life of the resource (10 to 100 years); and
- Resource availability in the region (good for sand/gravel, limited on rock).

4.4 Mineral Resource Lands Protection

There also exists the possibility that future discoveries of mineral resources, or market conditions that are conducive, may encourage the opening of new mineral resource extraction operations. What or where these facilities would locate cannot be accurately gauged. The Conservation Element proposes to treat existing and future emerging mineral resource extraction sites in the following manner:

1. A newly established mineral resource extraction facility must be a land use identified within the zone(s) applying to the site.
2. TMC 16.16 Right-to-Mine protects legally established mineral resource extraction facilities.

5. WETLAND AREAS

5.1 Introduction

Wetlands serve many important ecological functions. Tumwater's wetlands act as natural reservoirs for flooding and stormwater runoff; protect water quality by filtering out pollutants; help stabilize shorelines with their root systems; provide areas for groundwater recharge; provide habitat areas for fish, wildlife, and vegetation; provide open space and recreation opportunities; and provide areas for scientific study and natural resource education.

Wetlands preservation can significantly reduce public and private costs associated with downstream flooding, poor water quality, and diminishing wildlife habitat.

Tumwater intends to do the following:

- Preserve, protect, manage, and regulate wetlands for the purpose of promoting public health, safety and general welfare while conserving fish, wildlife and other natural resources;
- Protect the ecological and economic benefits to the public of wetlands functions and values;
- Regulate property use and development to maintain the natural and economic benefits provided by wetlands;
- Protect private property rights consistent with the public interest; and
- Provide for protection against direct and indirect wetlands impacts by providing regulatory authority for management of wetland buffers.

It is the short-term goal of this policy to achieve no net loss of the remaining wetlands in Tumwater, defined by acreage and function. It is the long-term goal to create wetlands, where feasible, to increase the quantity and quality of wetlands in Tumwater.

5.2 Existing Wetland Policies, Regulations, and Inventories

A number of federal, state, and local wetland policies, regulations, and inventories currently form a patchwork for wetlands protection.

5.2.1 Federal Clean Water Act

This is broad-based law covering water pollution control in general. Section 404 of the Act requires the Army Corp of Engineers to regulate the dredging and filling of waters of the United States, including the tributaries and wetlands. However, the dredging, draining or land clearing of wetlands without a nexus to waters of the United States, including their tributaries and wetlands, is not addressed by the Act.

5.2.2 Washington State Shoreline Management Act

Regulates activities in shorelines of the state, which include lakes over 20 acres in size, rivers and streams with flows in excess of 20 cubic feet per second (c.f.s.), and all lands within 200 feet of the ordinary high water mark and any wetlands, floodways, and/or floodplain areas associated with such waters.

The Act excludes wetlands not "associated" with waters of the state, including isolated wetlands and riparian wetlands associated with lakes less than 20 acres and streams with flows less than 20 c.f.s. It also exempts most agricultural and forest practices from permit requirements.

5.2.3 Washington State Hydraulics Code

Any work that uses, diverts, obstructs, or changes the natural flow or bed of any salt or freshwaters of the state requires a Hydraulics Project Approval. The State Department of Fish and Wildlife administers the State Hydraulics Code through Hydraulic Project Approval process. The intent of the Code is to protect fish and fish habitat.

Wetlands outside the Ordinary High Water Mark and isolated wetlands without fish life are excluded. A Hydraulic Project Approval does not address impacts to wetland functions and values other than fish and fish habitat.

5.2.4 Washington State Wetland Rating System for Western Washington

This manual is currently the definitive methodology for determining when a wetland is present and where a wetland boundary is located. It is based on the functional values present in the wetland, sensitivity to disturbance, significance, rarity, and ability to replace.

5.2.5 National Wetlands Inventory

Conducted on a national level using aerial photographs, the National Wetlands Inventory depicts wetland locations, approximate boundaries, and includes classification by wetland type. The inventory is available for Tumwater but it should not be presumed to locate every wetland area in Tumwater. Often the only reliable

method for wetland identification is a site visit by a qualified wetland biologist. This is typically done in conjunction with a development proposal.

5.2.6 Wetland Mapping for the Thurston Region

The Thurston Regional Planning Council has identified wetlands in Thurston County based on color infrared aerial photographs. In many cases, the results of the aerial photography have been verified by field surveys. The result is digitized maps showing wetlands boundaries and types. This inventory must be supplemented with site specific field surveys to verify wetland boundaries at the time of development permit review.

5.2.7 Tumwater Environmental Policy

Chapter 16.04 of the Tumwater Municipal Code adopts the State Environmental Policy Act by reference. The intent of this code is to identify and if necessary, mitigate the environmental impacts associated with a variety of actions.

5.2.8 Tumwater Wetlands Protection Standards

Chapter 16.28 of the Tumwater Municipal Code establishes standards for the protection of wetlands. Most wetlands are regulated under this Chapter. Exemptions include intentionally created wetlands, such as stormwater treatment ponds, and certain unintentionally created wetlands.

5.2.9 Tumwater Protection of Trees and Vegetation

Chapter 16.08 of the Tumwater Municipal Code regulates the clearing of land in Tumwater, including tress and vegetation located in wetlands.

5.2.10 Tumwater Shoreline Master Program

Tumwater's Shoreline Master Program requires that wetland buffers are determined by the category and function level of the wetland as stated in the Tumwater Municipal Code. The buffer widths range from 25 feet to 300 feet depending on the wetland's rarity, sensitivity to disturbance, and ecological importance. See TMC 16.28.170 for detail on wetland buffer requirements.

5.2.11 Tumwater Floodplain Regulations

The Floodplain Zone Overlay District in the Tumwater Zoning Code prohibits or strictly limits filling and development in designated floodplains, including wetlands located

within these areas. This reduces the height and velocity of floods and lessens bank erosion.

5.3 Wetland Values and Benefits

Wetlands serve many important ecological and social functions. In the past, wetlands were regarded as a nuisance to be drained and filled to accommodate development. As wetlands have disappeared, we have come to realize that the loss of wetlands comes at a severe cost; therefore, public policy has begun to change to reflect an appreciation of wetlands and their functions. A summary of wetland benefits follows:

- Wetlands are very important for slowing and storing floodwaters. Riverine wetlands and floodplains provide flat areas where floodwaters can spread out and slow down, reducing the height and velocity of floods. Flood waters trapped in wetlands may then slowly drain, reducing stream bank erosion and downstream peaks;

- Wetlands provide erosion control for shorelines by dissipating the water's energy and stabilizing shorelines with the root systems of plants commonly found in wetlands;

- Wetlands improve water quality by their ability to filter out sediments, nutrients, and toxic chemicals. Moving water carries suspended sediments and other materials. As the water enters a wetland and slows down, these sediments tend to settle down. The sediments are then trapped by the wetland vegetation, which in turn reduces the amount of siltation deposited in lakes and reservoirs;

- Wetlands allow water to soak into the underlying soil, which adds to the supply of groundwater;

- Wetlands provide essential areas for waterfowl and migratory shorebirds to rest and feed;

- Wetlands provide essential escape cover and feeding, nesting, and breeding habitat for many species of fish and wildlife. Wetland plants help protect juvenile fish, thereby serving to increase the anadromous fish population;
- Wetlands furnish areas for education and research of a variety of flora and fauna that cannot be found in other environments;

- Wetlands provide open space and recreation opportunities, including

fishing, hiking, boating, and bird watching.

5.4 Wetland Protection Areas Classification

The Growth Management Act requires cities and counties to classify wetlands according their sensitivity to disturbance, rarity, functions, and irreplaceability. Tumwater will use the *Washington State Wetland Rating System for Western Washington* for classifying wetlands as outlined below, which is further identified in TMC 16.28 Wetland Protection Standards.

5.4.1 Category I Wetlands

Those regulated wetlands that are unique or rare, are more sensitive to disturbance than most wetlands, are relatively undisturbed, and contain ecological attributes that are impossible to replace within a human lifetime, and/or provide a high level of functions. Degradation of these wetlands should be avoided due to their functions and values being too difficult to replace.

5.4.2 Category II Wetlands

Those regulated wetlands that are difficult but not impossible to replace and provide high levels of some functions. These wetlands occur more commonly than Category I wetlands, but still need a relatively high level of protection.

5.4.3 Category III Wetlands

Those regulated wetlands that provide a moderate level of functions, can often be adequately replaced with a well-planned mitigation project. These wetlands generally have been disturbed in some ways and are often less diverse or more isolated from other natural resources in the landscape than category II wetlands.

5.4.4 Category IV Wetlands

Those regulated wetlands that have the lowest levels of functions and are often heavily disturbed. These are wetlands that we should be able to replace, or in some cases to improve. However, experience has shown that replacement cannot be guaranteed in any specific case. These wetlands may provide some important functions, and they should be protected to some degree.

5.5 Wetlands Identification

Identification of wetlands will be undertaken primarily on a case-by-case basis at the time an application for development is made, using the *Washington State Wetland Rating System for Western Washington* in their current form and as hereafter amended.

The development applicant should employ a qualified wetland biologist, at their cost, to identify wetland areas and delineate wetland boundaries. A list of qualified wetland biologists is available for use by applicants. Use of a qualified wetland biologist not on the list is subject to review and approval by the Community Development Director, or designee.

5.6 Wetland Protection Techniques

Techniques that can be used to protect wetland areas include:

- Using the *Washington State Wetland Rating System for Western Washington* for wetland classification based on function and value;
- Requiring a qualified wetland biologist to determine wetland type and boundary for development sites containing wetlands;
- Establishing wetland buffers based on the relative value of the wetland in which no development or disturbance should occur;
- Striving to achieve no net loss of wetland areas and functions;
- Striving to create wetlands in the long term, where feasible, to increase the quantity and quality of wetlands.
- Attempting to avoid impacts to wetlands altogether if practicable;
- If impact avoidance is impossible, attempting to reduce wetland impacts through mitigation;
- If impact avoidance and reduction is impossible, accomplishing wetland compensation
- Preliminary wetland mapping has been completed by the Thurston Geodata Center and is available online. This mapping does not negate the requirement for on-site wetland identification by a qualified wetland biologist in conjunction with development proposals. It does, however, provide a starting point for wetland identification; and

- Providing education on the value of wetlands to developers and homeowners;

5.7 Wetlands Protection

WAC 365-190-040(1) states that when critical areas, including wetland areas, cannot be readily identified, these areas should be designated by performance standards or definitions. In this way, such areas can be specifically identified during the processing of a site-specific permit or development authorization.

The adoption of a "performance standards"-based identification and regulatory process, by its nature, closes out such options as the creation of overlay zones. For the purposes of wetland protection, a "performance standards"-based process will be followed.

TMC 16.28 Wetland Protection Standards was developed to classify, designate, and protect wetlands and their associated buffers from on-site and off-site activities impacts. These regulations have provisions for reasonable wetland buffer areas and the means for avoidance and reduction of wetland impacts. Attributes of TMC 16.28 Wetland Protection Standards include:

5.7.1 Wetland Buffer Areas

Wetland buffer areas should be required adjacent to regulated wetlands in order to protect wetland functions and values. All wetland buffer widths should be measured from the wetland boundary as established by a field survey conducted by a qualified wetland biologist. Wetland buffers are the primary means by which wetland functions and values are protected. For detailed buffer width requirements, please refer to TMC 16.28.170

Wetland buffer widths may be increased, reduced, or averaged on a case-by-case basis in accordance with best available science when an altered buffer is necessary to protect wetland functions and values in accordance with TMC 16.28 Wetland Protection Standards.

5.7.2 Wetland and Wetland Buffer Areas - Allowed Activities

Certain limited low-intensity activities may be permitted in wetland buffer areas without a wetlands permit provided that these activities are not prohibited by any other chapter or law and they are conducted using best management practices.

- Conservation or preservation of soil, water, vegetation, fish, shellfish, and other wildlife that does not entail changing the structure or functions of the existing wetland;

- Outdoor recreational activities, including fishing, bird watching, hiking, boating, horseback riding, swimming, canoeing, and bicycling;

- The harvesting of wild crops in a manner that is not injurious to natural reproduction of such crops and provided the harvesting does not require tilling of soil, planting of crops, or alteration of the wetland by changing existing topography, water conditions, or water sources;

- The maintenance of drainage ditches;

- Education, scientific research, and use of nature trails;

- Navigation aids and boundary markers;

- Site investigative work necessary for land use application submittals such as surveys, soil logs, percolation tests and other related activities. In every case, wetland impacts should be minimized and disturbed areas should be immediately restored;

- Normal maintenance, repair, or operation of existing serviceable structures, facilities, or improved areas. Maintenance and repair does not include any modification that changes the character, scope, or size of the original structure, facility, or improved area and does not include construction of a maintenance road; and

- Minor modification of existing serviceable structures within a buffer zone where modification does not adversely impact wetland functions.

5.7.3 Reasonable Use of Wetlands and Wetland Buffers

If an applicant for a proposed development demonstrates that application of these policies and associated regulations would deny all reasonable use of the property,

conditioned development may be allowed if the applicant demonstrates that the criteria in TMC 16.28.190 are met.

5.7.4 Wetland Replacement Ratios

As a condition of any permit allowing alteration of wetlands and/or wetland buffers, the applicant should engage in the restoration, creation, or enhancement of wetlands and their buffers to offset loss of wetland function and value. It is recognized that the alteration of wetlands and/or wetland buffers is not desirable. Creation, restoration and enhancement of wetlands and/or wetland buffers is extremely difficult to achieve. Wetland alteration should only occur when impact avoidance and reduction is impossible.

Wetland restoration, creation and enhancement acreage replacement ratios are identified in TMC 16.28.280 Compensating for Wetland Impacts.

5.8 Wetland Tracking

As summarized in this Chapter, federal, state, and City of Tumwater regulations provide a strong set of requirements for protection of wetlands. No additional policies or regulations are needed at this time. However, to ensure continued compliance with the goal of no net loss of wetlands, it is recommended that the City maintain a catalogue of the following items:

1. All projects where wetlands have been filled and the acres of wetland filled.

2. All projects where filling or other impacts to wetlands have been mitigated through the creation of new wetlands, the protection and enhancement of existing wetlands, or other methods.

6. CRITICAL AQUIFER RECHARGE AREAS

6.1 Introduction

Potable water is a basic life-sustaining element to be conservatively used and liberally protected. All of Tumwater's drinking water supply comes from underground aquifer areas delivered through such means as the famous artesian wells of the area.

Tumwater and the Thurston region have had extensive study and work done on identification and protection of underground aquifers through coordinated efforts with Thurston County and as a participating member of the Northern Thurston County Groundwater Advisory Committee during the 1990s.

Starting in the late 1990s, Tumwater has continued coordination with the Thurston County Environmental Health to monitor groundwater and report on conditions, including notification of any identified hazards. Periodic inspections have also been completed every few years of businesses that use hazardous materials onsite to ensure they are handled, stored, and disposed of properly.

6.2 Critical Aquifer Recharge Areas Classification

The Growth Management Act requires cities and counties to classify recharge areas for aquifers according to the vulnerability of the aquifer and to include provisions for the protection of the quality and quantity of groundwater used for public water supplies as required by RCW 36.70A.070(1). Vulnerability is the combined effect of hydrogeological susceptibility to contamination and the contamination loading potential. In addition, Chapter 246-290 WAC: Group A Public Water Supplies requires source water protections, such as Tumwater's Wellhead Protection Program that address vulnerable sources of drinking water.

Vulnerability is the combined effect of hydrogeological susceptibility to contamination and the contamination loading potential. High vulnerability is indicated by land uses that contribute contamination that may degrade groundwater and hydrogeologic conditions that facilitate degradation. Low vulnerability is indicated by land uses that do not contribute contaminants that will degrade ground water, and by hydrogeologic conditions that do not facilitate degradation.

Thurston County has completed a regional analysis to characterize hydrogeologic susceptibility of the recharge areas to Tumwater should consider adoption of Thurston County's Critical Aquifer Recharge Areas analysis, which uses the following physical characteristics influencing groundwater recharge, to ensure the highest protections of Tumwater's drinking water are employed:

- Depth to groundwater;
- Aquifer properties such as hydraulic conductivity and gradients;
- Soil (texture, permeability, and contaminant attenuation properties);
- Characteristics of the Vadose Zone including permeability and attenuation properties; and
- Other relevant factors.

The following have been considered to evaluate the contaminant loading potential:

- General land use;
- Waste disposal sites;
- Agriculture activities;
- Well logs and water quality test results; and
- Other information found about the potential for contamination (see Section 6.5 of this Element for further discussion).

The goals of Tumwater's classification strategy for recharge areas and wellhead protection will be to maintain the quality of the groundwater effectively by prevention of contamination, with particular attention to recharge areas of high susceptibility and mobility. Classification of these areas will include:

- Consideration of the degree to which the aquifer is used, now or in the future, as a potable (drinking) water source;
- Protective measures to preclude further degradation;
- Practicability of treatment measures to maintain potability;
- Availability of alternative potable water sources; and
- The degree of sensitivity of contaminants entering the aquifer.

Areas that require a groundwater recharge protection overlay on aquifers used for potable (drinking) water. Examples include:

- Sole source aquifer recharge areas designated pursuant to the federal Safe Drinking Water Act; (There are none in Tumwater)

- Areas established for special protection pursuant to a groundwater management program, Chapter 90.44 RCW, Chapter 90.54 RCW, and Chapter 173-100 RCW; (There are none in Tumwater)

- Areas designated for wellhead protection pursuant to the federal Safe Drinking Water Act.

6.3 Critical Aquifer Protection Concerns

Concerns about ground water in Tumwater and the Thurston region, in general, include:

- Few alternative sources of drinking water exist;

- Geologic conditions in the region leave aquifers unprotected and ground water extremely vulnerable to pollution;

- Septic systems, stormwater runoff, chemical spills, pesticides, and fertilizers can add contaminants to ground water;

- Though the region's ground water is generally of good quality, it is showing increasing effects of human activities; and

- Urbanization and population growth are placing increased demands on limited ground water resources.

Potential sources of ground water (aquifer) pollution include pesticides and fertilizers, septic systems, hazardous materials, contaminated storm water and leaking underground storage tanks.

Recent examples of what happens when pollutants are discharged into the ground include:

- The City's main wellfield, the Palermo well, was shut down site in the 1990s because a drycleaner at Southgate generated hazardous waste and improperly disposed of them down a hole in the floor.

- The State Department of Transportation materials testing labs, the old site at the Albertsons location and the newer one on 2nd Avenue, have

chemicals leaching through the ground that are showing up at the Palermo well.

- The homeowners in Palermo have reported chemicals in their crawlspaces and in some instances inside their houses.

Gas stations and other land uses that utilize hazardous chemicals are now prohibited within the one year and six month wellhead protection areas. The types of hazardous chemicals that need to be addressed are defined in TMC 16.24 Aquifer Recharge Standards and TMC 16.26 Wellhead Protection Standards and are updated based on adopted federal and state standards, whichever is more stringent. Wellhead protection areas are the surface or subsurface area surrounding municipal water wells or well fields through which contaminants are reasonably likely to move toward and reach such water well or well field within six months, one year, five years, and ten years.

6.4 Critical Aquifer Protection Techniques

Protection of groundwater quantity and quality can best be accomplished by controlling potential contaminant sources and by managing land uses in prime recharge areas. Techniques that can be used to protect geologically sensitive aquifers include:

- Adopting special protection measures to protect drinking water supplies;
- Create water system interties between purveyors to augment supply during emergencies;
- Continue coordination with Thurston County to ensure onsite septic systems are properly sited, operated, and maintained;
- Limit installation of new septic systems when connection to sewer is feasible;
- Continue development of an urban sewer extension and septic conversion program to further protect groundwater supplies from high density septic systems within urban areas;
- Implement a sewer system leak evaluation program to identify leaks within wellhead protection areas, illegal cross connections, and illicit discharges to the stormwater system;
- Review and update zoning so that industry cannot locate storage of significant amounts of hazardous chemicals within the wellhead

protection areas of city wells;

- Continue implementation of stormwater maintenance and inspection program for all stormwater management facilities to ensure effective operation, maintenance, and reduce contaminant loads;

- Require industries that use hazardous chemicals to have containment facilities to capture chemicals that might spill;

- Restrict the use of pesticides and certain fertilizers in aquifer sensitive through coordination between federal, state, and local governments;

- Provide education and technical assistance on pesticides and fertilizers to homeowners and farmers;

- Implement an outdoor water conservation education program to reduce excessive irrigation and fertilization practices to reduce nutrient loading to the aquifer;

- Establish a business and homeowner education program for environmental best management practices, focused on areas of know groundwater sensitivity; and

- Establishing an annual permit and inspection program for all commercial and industrial establishments utilizing underground storage tanks, aboveground bulk plants, and underground vaults.

6.5 Critical Aquifer Vulnerability and Protection

The stratigraphy or layers of aquifers – the water producing geological units – are typically classified as follows:

1. Surficial alluvial sediments (Qal(c)) – Aquifer

2. Vashon glacial sequence:

    a. Recessional outwash (Qgo) – Aquifer

    b. Till (Qgt) – Aquitard[2]

[2] Low potential to supply usable quantities of water.

c. Advance outwash (Qga) – Aquifer

3. Continental fine sediments (historically called the Kitsap Formation (Qpf) – Aquitard

4. An older glacial sequence(s) (locally referred to as the "Sea Level Aquifer") (Qpg) – Aquifer

5. Older undifferentiated sediments (TQu) – Aquifer

6. Bedrock of primarily basaltic or andesitic volcanics, with minor marine sedimentary rocks (Tb) – Aquitard

6.5.1 Surficial Alluvial Sediments

Of primary importance to Tumwater are the surficial alluvial sediments. Surficial alluvial sediments located in the northeast portion of the Tumwater area are interpreted to fill a deep erosional trough roughly paralleling the present day Deschutes River. This trough appears to be as deep as 500 feet below sea level and it extends approximately from the confluence of Spurgeon Creek with the Deschutes River to Budd Inlet of Puget Sound. The erosional trough is believed to have formed because of lowered sea levels during past glaciations.

The Deschutes Valley may have been eroded and infilled several times, to varying degrees, following the past glacial retreats. The sediments infilling the Deschutes Valley are generally coarse reworked alluvial sediments near the surface, underlain by finer-grained sand. Deeper portions of the valley sediment are generally coarser-grained sand. The full sequence varies in grain size distribution and silts and coarse sand pockets are present throughout.

The Palermo Wellfield and many of the productive wells of the former Olympia Brewery are completed in the Surficial Valley Aquifer at approximately 100 feet below ground surface (bgs). These coarse sediments are interlayered with discontinuous lenses of silty sand, silt, and clay.

6.5.2 Vashon Recessional Outwash (Qgo and Qgos)

Surficial deposits overlying much of the upland prairie between the Deschutes and Black Rivers generally consist of loose, fine to coarse-grained sediments of Vashon recessional outwash (Qgo and Qgos). These sediments were deposited by meltwater streams discharging from the Vashon glacial front as it retreated northward at the end of the last ice age. The Qgos sediments are typically finer than the Qgo sediments as they are composed primarily of sand and silt with minor interbeds of gravel.

The Qgo and Qgos units are relatively thin over most of the area, typically about 20 feet thick, with a maximum thickness of approximately 60 feet near the Port Wellfield. The Qgo and Qgos are not significantly used for groundwater supply, with most wells in the area completed in the deeper and more transmissive Qga and Qpg aquifers.

Both of these aquifer groupings exhibit moderate to high rates of water transmission to the aquifer. Of main concern with excessively drained soils are problems on sites used for septic systems, particularly legacy systems at densities higher than current regulations permit, stormwater discharges, or hazardous substance storage. Introduction of contaminants to the soils results in ground water contamination due to the accelerated downward movement of contaminants and lack of aquitard. Discovery of the chlorinated solvents at the Palermo Wellfield in 1993 illustrates the susceptibility of these aquifers.

Additional information on the aquifer system in Tumwater can be found in the 2016 update of the Tumwater's *Wellhead Protection Plan*.

6.6 Critical Aquifer Protection

Wellhead protection is a high priority. Tumwater has worked with the other northern Thurston County jurisdictions to develop regional wellhead protection policies to insure the protection and continued preservation of ground water, which is the source of drinking water to over ninety percent of Thurston County residents. The regional wellhead protection policies were based on recommendations in the *Northern Thurston County Ground Water Management Plan* (1992) and the wellhead protection plans of the individual jurisdictions.

The goal of the regional protection policies is to prevent contamination from occurring and to manage the resource in a cooperative manner. The policies are applicable to water systems with over 1,000 service connections. The following regional policies continue to be implemented by Tumwater:

1. Encourage and allow reuse techniques and reclamation of wastewater where water quality can be protected.

2. Provide technical assistance and education, to the extent resources allow, in designated wellhead protection areas to small businesses, industries, and residents regarding proper storage, handling, and disposal of hazardous materials. Prioritize sites identified within the six-month time of travel.

3. Encourage through education and technical assistance the use of safer, less hazardous products and the reduction of hazardous materials.

4. Participate, as resources allow, in planning and collaborative training and the implementation of regional spill response in designated wellhead protection areas.

5. Consider methods to mitigate the risk from commercial hazardous materials transportation through designated wellhead protection areas when doing transportation planning for new transportation corridors.

6. Consult with the appropriate regional transportation planning agencies and neighboring jurisdictions prior to establishing prohibitions of transportation corridors for commercial hazardous materials transport.

7. Provide, as resources allow, local information to the existing data management program within the State Department of Ecology to develop and maintain an underground storage tank database for commercial underground storage tanks.

8. Incorporate requirements for enhanced protection of wellhead areas when stormwater drainage manuals and ordinances are revised.

9. Encourage the Thurston Conservation District Board and others to continue their voluntary efforts on education, conservation planning, and installation of best management practices on existing farms, golf courses, parks, schools and other facilities, which use pesticides and fertilizers in designated wellhead protection areas.

10. Promote the use of integrated pest management, reduction of pesticide use, and reduction of fertilizer use by residents, businesses, and other governmental agencies in designated wellhead protection areas.

11. Encourage the Solid Waste Advisory Committee to discuss and coordinate activities and programs related to ground water protection and local hazardous waste management with water resource protection staff.

Consider the following recommendations for implementation by Tumwater to protect regional and local groundwater supplies:

1. Regional Policy and Program Recommendations:

    a. Promote revival of an intergovernmental regional groundwater program with agencies, such as Lacey, Olympia, and Thurston County.

    b. Participate in the Water/Wastewater Agency Response Network (ww.wawarn.org), an organization of water and wastewater systems and utilities providing mutual support, aid, and assistance in an emergency.

    c. Participate in regional collection and management of data through the Thurston County Regional Ground Water Program.

    d. Develop procedures to coordinate the environmental review with other jurisdictions when a development proposal is within a designated wellhead protection area.

    e. Work with other jurisdictions to coordinate educational programs to provide a basic wellhead protection message and work with community groups and private parties to incorporate this message whenever possible.

    f. Participate in regional planning to address loss of domestic drinking water supply.

    g. Work with other jurisdictions to maintain and support financially, as resources allow, a coordinated water quality and water quantity-monitoring program through the Thurston County Regional Ground Water Program.

    h. Encourage interjurisdictional water resource management committees to consider wellhead protection during the development of their annual work programs.

2. Local Policy and Program Recommendations:

    a. Adopt updated wellhead protection area boundaries to ensure most protective regulatory boundary around municipal drinking water sources.

    b. Prepare revisions to the Tumwater's *Drainage Design and Erosion Control Manual* to include updated sections related to minimum requirements and best management practices for infiltration that are protective of groundwater.

    c. Prepare revisions to TMC 16.26 Wellhead Protection Standards to reflect updates identified in the *2016 Wellhead Protection Plan* update.

    d. Expand Tumwater's monitoring well network to fully span all identified wellhead protection areas, using public monitoring wells in the City right-of-way to avoid impacts to private property.

    e. Encourage neighborhoods and planning groups to recognize the value of groundwater and promote self-regulation of activities that could potentially contaminate groundwater.

    f. Provide retailers access to educational and promotional materials related to pesticides, herbicides, and fertilizers and Tumwater's Aquifer Protection (AQP) overlay district

    g. Promote, support, and provide guidance to businesses that develop a spill prevention and response plan. A spill response plan prepares owners and employees to deal with small spills and leaks during business operations. A spill plan can also provide a strategy for catastrophic, unexpected spills.

    h. Research programs to assist with the decommissioning of home heating oil tanks within one-year wellhead protection zone areas.

    i. Strengthen code enforcement to eliminate accumulation of garbage, hazardous materials, and unsanitary conditions within the wellhead protection areas for the City of Tumwater's supply wells.

The Conservation Element also recommends that the City Council continue development of a regional program to prioritize potential impacts from urban-density

septic systems, implement a publicly supported septic-to-sewer conversion program, and consider mandatory septic tank maintenance as aquifer protection techniques. It is further recommended that the City explore the implementation of a groundwater discharge permit system with the Thurston County Health Department as lead agency.

The Tumwater aquifer protection classification regime measures susceptibility to pollution in terms of vulnerability. TMC 16.24 Aquifer Recharge Standards and TMC 16.26 Wellhead Protection Standards protect areas of high vulnerability through an overlay zone called "Critical Areas - Aquifer Protection District." This zone is geographically applied Citywide. In addition, these chapters maintain specific standards applied Citywide.

7. FREQUENTLY FLOODED AREAS

7.1 Introduction

Protection of life and property during floods is a vital part of Tumwater's responsibility to public safety. Many of Tumwater's rivers, streams, and lakes are subject to flooding during periods of heavy rainfall.

Tumwater has had extensive research and study completed regarding frequently flooded areas within the City. Since August of 1980, Tumwater has participated in the National Flood Insurance Program, as authorized by the National Flood Insurance Act of 1968 and has recently adopted the Endangered Species Act version of the FEMA Floodplain Model Ordinance instituting best practices.

7.2 Frequently Flooded Areas Classification

The Growth Management Act requires cities and counties to classify frequently flooded areas based on the 1% flood (100-year floodplain) designations of the Federal Emergency Management Agency and the National Flood Insurance Program and to flooding in the area and nearby jurisdictions. In addition, it requires the City to provide guidance for corrective actions to mitigate or cleanse those discharges that pollute waters of the state.

Tumwater will consider the following when designating and classifying frequently flooded areas:

1. Effects of flooding on human health and safety, and to public facilities and services;

2. Available documentation, including federal, state, and local laws, regulations, and programs, local studies and maps, and federal flood insurance programs;

3. Future flow floodplain, defined as the channel of the stream and that portion of the adjoining floodplain that is necessary to contain and discharge the base flood flow at buildout without measurable increase in flood heights;

4. The potential effects of tsunami, high tides with strong winds, sea level rise resulting from global climate change; and

5. Greater surface runoff caused by increasing impervious surfaces.

7.3 Frequently Flooded Areas Concerns

Concerns about frequently flooded areas in Tumwater include:

1. Heavy seasonal rains generally from November through March can cause sudden river and stream rises and out-of-bank flows;

2. Out-of-bank flows can cause damage to life, dwellings, and industrial, commercial, agricultural, and recreational facilities; and

3. Groundwater flooding of low-lying areas when there are two or more years of higher than normal precipitation.

7.4 Frequently Flooded Areas Protection Techniques

Techniques that can be used to protect life and property in frequently flooded areas include use of a zoning overlay district(s) to do the following:

1. Limit or prohibit, as appropriate, encroachment in floodplains and high groundwater areas that could endanger life and property during periods of flooding; and

2. Preserve the natural functions of floodplains and wetlands to store, carry, and control floodwaters.

7.5 Frequently Flooded Areas Protection

Flood Insurance Rate Maps from the Federal Emergency Management Agency clearly delineate frequently flooded areas. These maps are used to designate the Floodplain Overlay Zone.

The Floodplain Overlay Zone identifies and defines the special flood hazard area within the city. The special flood hazard area is the area subject to flooding by the base flood and subject to the provisions of TMC 18.38. It is identified by the Federal Emergency Management Agency in a scientific and engineering report entitled, "Flood Insurance Study for Thurston County, Washington and Incorporated Areas," dated October 16, 2012, and any revisions thereto, with an accompanying Flood Insurance Rate Map for Thurston County, Washington and Incorporated Areas, dated October 16, 2012, and any subsequent revisions.

The methodology and detail of these studies is accepted as the best available. The Floodplain Overlay Zone has served Tumwater well in minimizing the undesirable

impacts of flooding.

TMC 16.28 Wetland Protection Standards and TMC 18.38 FP Floodplain Overlay are in place and serve to designate frequently flooded areas. If allowed, any structures permitted in the designated flood areas are subject to strict development regulations. The existing regulations were put in place after careful study and they fulfill the requirements of the Growth Management Act regarding designation, classification, and protection of frequently flooded areas.

7.6 Salmon Creek Groundwater Flooding

Above average rainfall caused localized flooding in Salmon Creek Basin in the rainy seasons of 1996-97 and 1998-99. Property owners experienced a range of inconveniences from high water around and under homes to failed septic systems, contaminated drinking water, and restricted access to property. A comprehensive study of the area was completed in late 1999. As a result, the City of Tumwater and several other jurisdictions in Thurston County completed and adopted the *Salmon Creek Comprehensive Drainage Basin Plan*.

The development review process within the *Salmon Creek Comprehensive Drainage Basin Plan* was adopted by resolution but the City of Tumwater should consider incorporating the process into the Tumwater Municipal Code.

8. GEOLOGICALLY HAZARDOUS AREAS

8.1 Introduction

The Conservation Element defines geologically hazardous areas as those areas susceptible to erosion, landslides, earthquakes, and other geological events, which pose a threat to public safety. This chapter discusses the proper design and location of commercial, residential, and industrial development to remove or reduce incompatibility with underlying geology. Appropriate engineering, design, or construction can be used to achieve this goal of land use and geological harmony.

It must also be recognized that even the best of efforts in proper design and application of technology, at times, will not adequately reduce the risks of geological damage. In these instances, building in such extreme geologically hazardous areas is should be avoided.

8.2 Geologically Hazardous Areas Classification

Areas in Tumwater that are prone to one or more of the following hazards are defined as geologically hazardous:

1. Erosion
2. Landslides
3. Earthquakes
4. Volcanic hazards (slight risk)
5. Tsunami Hazard (slight risk)
6. Other geologic events, including mass wasting, debris flows, rock falls, and differential settlement

The Conservation Element identifies areas with the above-described hazards and subsequently classifies areas within Tumwater in one of three categories:

1. Known or suspected risk
2. No risk
3. Risk unknown (because of lack of information)

8.3 Geologically Hazardous Areas Identification

The identification methodology upon which this Element relies to define geologically hazardous areas is as follows:

8.3.1 Erosion

Identified by the United States Department of Agriculture Soil Conservation Service (USDA-SCS) as those areas having a "moderate to severe," "severe," and "very severe" rill, and inter-rill erosion hazard.

8.3.2 Landslides

Identified as those areas susceptible due to combinations of bedrock, soil, slope gradient, slope aspect, hydrology, and other identified factors. Examples of these areas are:

1. Areas of historic failures:
    a. USDA-SCS classified as "severe" limitation for building development;
    b. Areas mapped as unstable (u), unstable old slides (uos), unstable recent slides (urs), by the State Department of Ecology coastal zone atlas; and
    c. Areas designated as quaternary slumps, earthflows, mudflows, lahars, or landslides on maps published by the United States Geological Survey or State Department of Natural Resources.
2. Areas with all three of the following characteristics:
    a. Slopes steeper than 15%;
    b. Hillsides intersecting geologic contacts of relatively permeable sediment overlying a relatively impermeable sediment or bedrock; and
    c. Springs or groundwater seepage.
3. Areas which have shown movement over the last 10,000 years or which are underlain or covered by mass wastage debris from this time.
4. Slopes parallel to planes of weakness in sub-surface materials such as:

a. Bedding planes; and

b. Fault planes.

5. Slopes with 80% or steeper gradients subject to rock fall during earthquakes.

6. Areas unstable because of stream incision, stream bank erosion, and undercutting by wave action.

7. Areas at risk from snow avalanches.

8. Areas located in a canyon or on an active alluvial fan, presently or potentially subject to inundation by debris or catastrophic flooding.

9. Slopes of 40% or steeper with a vertical relief of ten or more feet except areas composed of consolidated rock.

8.3.3 Earthquakes

Earthquake hazard areas are those, which are subject to severe risk of damage because of shaking, slope failure, settlement, soil liquefaction, or surface faulting. Within the state, the historic damage inducement has been ground shaking which results in settlement and soil liquefaction. The amount of ground shaking is affected by earthquake magnitude, distance from the earthquake epicenter, type and thickness of surface geologic materials, and sub-surface geologic structure.

8.4 Geologically Hazardous Areas in Tumwater

8.4.1 Erosion (Known or Suspected Risk Category)

The two major soil groupings within Tumwater are the Alderwood-Everett and Spanaway-Nisqually series. None of these soil types is identified as having severe erosion hazard characteristics when undisturbed.

8.4.2 Landslides (Known or Suspected Risk Category)

Known risk factors measuring probability of landslides are as follows:

- No areas within Tumwater are identified in the State Department of Ecology Coastal Zone Atlas as landslide areas influenced by marine action.

- The major soil groupings for Tumwater (Alderwood-Everett, Spanaway-Nisqually) are identified by the Soil Conservation Service as having limitations for building development in the following table.

Table 6: Landslide and Slope Stability

Soil Name	Dwelling without Basements	Dwellings with Basements	Small Commercial
Alderwood	Severe Limitation	Severe Limitation	Severe Limitation
Everett	Severe Limitation	Severe Limitation	Severe Limitation
Spanaway	No Limitation	No Limitation	Severe Limitation
Nisqually	No Limitation	No Limitation	Severe Limitation

- Areas of slope over 15% and groundwater seepage exist on Tumwater Hill, the Deschutes River valley slopes, and Bush Mountain.

8.4.3 Earthquakes (Known or Suspected Risk Category)

Tumwater is identified in the International Building Code (IBC) as being located within the Zone D (Zone A - lowest, Zone E - highest) seismic zone map of the United States. This is a high-risk area for earthquakes and IBC standards for building construction set out stringent structural performance standards.

8.4.4 Volcanic Hazards (No Risk Category)

Discussions with the State Geologist indicate that Tumwater is not in a Volcanic Hazard zone, and only ash fall could be expected to visit the area.

8.5 Development within Geologically Hazardous Areas

Based upon the previous review of geologically hazardous areas existing within Tumwater, the development regulations are appropriate to safeguard future construction in earthquake and landslide prone areas. TMC 16.20 Geologically Hazardous Areas sets forth standards for construction in areas identified as susceptible to earthquake and landslide conditions.

9. FISH AND WILDLIFE HABITAT CONSERVATION AREAS

9.1 Introduction

Preservation of fish and wildlife habitat is critical to the protection of suitable environments for animal species and in providing a natural beauty and healthy quality of life for Tumwater and its citizens. The conservation of habitat means active land management for maintaining species within their preferred habitats and accustomed geographic distribution. In this way, isolated sub-populations are not created which are more susceptible to predation, dislocation, and inadequate food supplies. Habitat protection does not require that all individuals of all species are protected, but does demand that land use planning be sensitive to the priority of saving and protecting animal-rich environments.

9.2 Fish and Wildlife Habitat Classification

The Growth Management Act requires cities and counties to classify seasonal ranges and habitats that are critical to the survival of endangered, threatened, and sensitive species. Within Tumwater, habitats and species are identified which are of local importance.

A listing of the types of fish and wildlife habitat areas to be protected by state-mandate is:

- Areas with which endangered, threatened and sensitive species have a primary association;
- Habitats and species of local importance;
- Commercial and recreational shellfish areas;
- Kelp and eelgrass beds; herring and smelt spawning areas;
- Naturally occurring ponds under twenty acres and their submerged aquatic beds that provide fish or wildlife habitat;
- Waters of the state (WAC Title 222);
- Lakes, ponds, streams, and rivers planted with game fish by a governmental or tribal entity;

- State natural area preserves and natural resource conservation areas; and

- Areas of rare plant species and high quality ecosystems as identified by the State Department of Natural Resources through the Natural Heritage Program.

All areas within Tumwater meeting one or more of the criteria in this section, regardless of any formal identification, are subject to the provisions of TMC 16.32 Fish and Wildlife Habitat Protection and should be managed consistent with the best available science, such as the State Department of Fish and Wildlife's Management Recommendations for Priority Habitat and Species.

9.3 Fish and Wildlife Habitat Protection Techniques

After classifying and designating fish and wildlife areas in Tumwater, the following protection techniques will be pursued when appropriate:

- Creating a system of fish and wildlife habitat with connections between larger habitat blocks and open spaces;

- Limiting the level of human activity in such areas including presence of roads and level of recreation type (after site specific analysis and planning passive or active recreation may be appropriate for certain areas and habitats);

- Protecting riparian ecosystems;

- Evaluating land uses surrounding ponds and fish and wildlife habitat areas that may negatively impact these areas;

- Establishing buffer zones around these areas to separate incompatible uses from habitat areas; and

- Restoration of lost salmonid habitat.

9.4 Fish and Wildlife Habitat Identification in Tumwater

A review of state and local records and studies on habitats and species indicates that the following habitat categories exist within Tumwater:

1. Areas with which endangered, threatened and sensitive species have a primary association;

2. Naturally occurring ponds under twenty acres with submerged aquatic beds that provide general fish and wildlife habitat;

3. Waters of the state (WAC Title 222); and

4. Lakes, ponds, streams, and rivers planted with game fish by a governmental or tribal entity.

These four habitat categories are further defined as follows:

1. Seasonal ranges and habitats with which federal and state- listed endangered, threatened, and sensitive species have a primary association and which, if altered, may reduce the likelihood that the species will maintain and reproduce over the long term.

2. Naturally occurring ponds under twenty acres and their submerged aquatic beds that provide fish or wildlife habitat.

   Naturally occurring ponds do not include ponds deliberately designed and created from dry sites, such as canals, detention facilities, wastewater treatment facilities, farm ponds, temporary construction ponds (of less than three years duration) and landscape amenities. However, naturally occurring ponds may include those artificial ponds intentionally created from dry areas in order to mitigate conversion of ponds, if permitted by a regulatory authority.

3. Waters of the state. Waters of the state are defined in WAC Title 222; the forest practices rules and regulations. Tumwater will use the water typing system established in WAC 222-16-030 to classify waters of the state.

   The following factors are considered when classifying waters of the state as fish and wildlife habitats:

   a. Species present that are endangered, threatened, or sensitive, and other species of concern;

   b. Species present which are sensitive to habitat manipulation;

   c. Historic presence of priority species;

d. Existing surrounding land uses that are incompatible with salmonid habitat;

e. Presence and size of riparian ecosystems;

f. Existing water rights; and

g. The intermittent nature of some of the higher classes of waters of the state.

4. Lakes, ponds, streams, and rivers planted with game fish. This includes game fish planted in these water bodies under the auspices of a federal, state, local, or tribal program or which supports priority fish species as identified by the State Department of Fish and Wildlife.

9.5 Sensitive Species Identification in Tumwater

The State Department of Fish and Wildlife maintains a listing of the priority habitats and species (PHS) for Tumwater. This database is the reference document to be used by the City in the protection of habitats and species identified within the City.

9.6 Fish and Wildlife Habitat Protection in Tumwater

Given Tumwater's diversity of fish and wildlife habitats in terms of geographic location, biological sensitivity, species hierarchy, and current/future adjacent land uses, the Conservation Element proposes a regulation and protection process based upon performance standards to be applied to site-specific development.

These performance standards are to be implemented on site-specific projects through TMC 16.32 and associated development permits. If there are any conflicts between the Shoreline Master Program and the standards in TMC 16.32, which apply in shoreline jurisdiction, the requirements of the Shoreline Master Program apply.

In addition, Tumwater's Flood Ordinance incorporates federal recommendations for protection of aquatic species. The City has also upgraded the fish capture facility at the head of Tumwater Falls and is planning a new hatchery with the Department of Fish and Wildlife to help stabilize South Sound salmon populations.

9.7 Threatened and Endangered Species.

Tumwater has critical habitat for several federally designated, threatened, or endangered species including:

- Bull Trout (threatened)
- Chinook Salmon (threatened)
- Oregon Spotted Frog (threatened)
- Mazama Pocket Gopher – Olympia Subspecies (threatened)
- Streaked Horned Lark (threatened)
- Taylor's Checkerspot Butterfly (endangered)

As of 2016, the City of Tumwater is preparing a Habitat Conservation Plan for prairie species. When that plan is completed, the Tumwater Municipal Code will need to be updated.

10. CONSERVATION GOALS, POLICIES, AND ACTIONS

10.1 Introduction

This Chapter of the Conservation Element specifies goals, policies, and actions meant to set forth a direction to identify, protect, and conserve critical environmental areas and valuable natural resources in Tumwater. The goals, policies, and actions also serve to ensure coordination with separate Comprehensive Plan Elements, regional plans, Sustainable Thurston Policies, and County-Wide Planning Policies. Additionally, they serve as an action plan for implementing certain recommendations within the Conservation Element.

10.2 Conservation Goals, Policies, and Actions

Goal C-1: Recognize the significant role played by natural features and systems in determining the overall environmental quality and livability of Tumwater.

Policy	Action
C-1.1	Protect the ecological integrity of the natural environment while allowing for compatible growth and development.
C-1.2	Promote conservation of natural resources and the environment in cooperation with residents, business owners, schools, affected jurisdictions, and tribes.
C-1.3	Encourage and support active measures to protect and enhance Tumwater's natural environment.
C-1.4	Implement the mitigation goals, objectives, and initiatives contained in the most recent version of the adopted *Natural Hazards Mitigation Plan for Thurston County*.
C-1.5	Maximize retention of a healthy tree cover and native vegetation and encourage restoration, replacement, and enhancement of unhealthy trees and disturbed vegetation.
C-1.6	Reduce communitywide greenhouse gas emissions 45 percent below 2015 levels by 2030 and 85 percent below 2015 levels by 2050 to ensure that local communities do their part to keep the global average temperature from rising more than 2°C.

C-1.7 Implement the strategies contained in the most recent version of the accepted *Thurston Climate Mitigation Plan*.

Goal C-2: Designate and protect critical areas including wetlands, critical aquifer recharge areas, frequently flooded areas, geologically hazardous areas, and fish and wildlife habitat conservation areas in accordance with the Growth Management Act to protect the functions and values of these areas as well as to protect against threats to health, safety, and property.

Policy **Action**

C-2.1 Include best available science in developing policies and development regulations to protect the functions and values of critical areas and consider conservation or protection measures necessary to preserve or enhance anadromous fisheries, consistent with the Growth Management Act.

C-2.2 Use incentive programs, acquisition, appropriate regulations, and other techniques to preserve critical areas as permanent open space where development may pose hazards to health, property, or important ecological functions.

C-2.3 Require that prior to any development, critical areas are identified and protected.

C-2.4 Ensure the effectiveness of critical area mitigation by requiring adequate critical area studies and mitigation plans, the application of mitigation sequencing, financial assurances from developers to ensure mitigation success, and by improving City oversight of maintenance and monitoring of mitigation sites.

C-2.5 Require and enforce mitigation to ensure no net loss of critical area functions.

C-2.6 Support restoration of river and stream channels and associated wetland and riparian areas to enhance water quality, improve fish and wildlife habitat, and mitigate flooding and erosion.

C-2.7 Allow public access to wetlands, streams, and lakes for scientific, educational, and recreational use, provided the public access is carefully

sited, sensitive habitats and species are protected, and hydrologic continuity is maintained.

C-2.8 Protect wetlands not as isolated units, but as ecosystems, and essential elements of watersheds.

C-2.9 Protect the quality and quantity of groundwater used for public water supplies.

C-2.10 Prevent land alterations that would increase potential flooding and minimize the alteration of natural surface water features that retain or carry floodwaters, such as wetlands, floodplains, rivers, streams, and lakes.

C-2.11 Require mitigation for adverse environmental impacts from engineered flood control measures.

C-2.12 Work cooperatively to meet regulatory standards for floodplain development as these standards are updated for consistency with relevant federal requirements including those related to the Endangered Species Act.

C-2.13 Regulate development intensity, site coverage, and vegetation removal in geologically hazardous areas in order to minimize drainage problems, soil erosion, siltation, and landslides.

C-2.14 Minimize soil disturbance and maximize retention and replacement of native vegetative cover for any land uses permitted in erosion and landslide hazard areas.

C-2.15 Encourage special building design and construction measures in areas with severe seismic hazards to minimize the risk of structural damage, fire, and injury to occupants during a seismic event and to prevent post-seismic collapse.

C-2.16 Protect and preserve habitats for species, which have been identified as endangered, threatened, or sensitive by the state or federal government, giving "special consideration: to conservation or protection measures necessary to preserve or enhance anadromous fisheries.

C-2.17 Maintain habitats that support the greatest diversity of fish and wildlife through conservation and enhancement of critical areas.

C-2.18 Implement salmon habitat protection and restoration priorities in approved Water Resource Inventory Area 13 and 23 plans.

C-2.19 Coordinate with adjacent jurisdictions and tribes to identify, protect, and develop enhancement plans and actions for habitat networks and wetlands that cross-jurisdictional lines.

C-2.20 Promote the enhancement or restoration of streams, rivers, lakes, and wetlands as adjacent development activities occur.

C-2.21 Protect wildlife corridors to minimize habitat fragmentation, especially along existing linkages and in patches of native habitat by enhancing vegetation composition and structure, and incorporating indigenous plant species compatible with the site.

Goal C-3: In accordance with the Growth Management Act, designate and protect natural resource lands including agricultural, forest, and mineral lands that have long-term significance to conserve and protect these areas.

Policy **Action**

C-3.1 Recognize the importance of farmland conservation and local food production in maintaining the quality of life and long-term sustainability of Tumwater.

C-3.2 Zone designated agricultural lands at very low densities to ensure the conservation of the resource for continued agricultural use.

C-3.3 Limit non-agricultural development within designated agricultural areas to non-prime farmland soils where possible.

C-3.4 Work with community groups to support the continued viability of agriculture and encourage community support for it.

C-3.4.1 Support the efforts of the Thurston Food System Council to develop a vibrant food system through access to healthy, local, affordable, culturally appropriate, sustainably produced food to assist the community in having reliable access to sufficient quantity of affordable nutritious food.

C-3.5 Ensure that harvesting for conversion to other uses occurs in a manner compatible with land uses of the surrounding area and maintenance of water quality and environmentally critical areas.

C-3.6 Allow mineral extraction industries to locate where prime natural resource deposits exist.

C-3-7 Conserve designated mineral resource lands of long-term commercial significance for mineral extraction, and the use of adjacent lands should not interfere with the continued use of the designated mining sites that are being operated in accordance with applicable best management practices and other laws and regulations.

C-3.8 Restore mineral extraction sites as the site is being mined. The site should be restored for appropriate future use and it should blend with the adjacent landscape and contours.