South Thurston County Wildfire Community Protection Plan

Prepared for Thurston County Conservation District

Draft: May 2025

Thurston Conservation District EST 1947

FUNDED BY WASHINGTON'S CLIMATE COMMITMENT ACT

ross STRATEGIC

CONTENTS

Abbreviations & Acronyms

AQI	Air Quality Index
CWPP	Community Wildfire Protection Plan
DNR	Department of Natural Resources
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESF-13	Emergency Support Function 13: Public Safety, Security, and Law Enforcement
FEMA	Federal Emergency Management Agency
FLRA	Federal Labor Relations Act
HFRA	Healthy Forest Restoration Act
HIZ	Home Ignition Zone
HMP	Hazards Mitigation Plan for the Thurston Region
HSR3	Homeland Security Region 3
NAAQS	National Ambient Air Quality Standards
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NWCG	National Wildfire Coordinating Group
PM	Particulate Matter
Point-In-Time Count	PIT
SETFA	Southeast Thurston Fire Authority
South Thurston	South Thurston County
STF	South Thurston Fire & Emergency Medical Services
Stakeholder(s)	Stakeholder Advisory Group
TC Alert	Thurston Community Alert
TCEM	Thurston County Emergency Management
TRPC	Thurston Regional Planning Council
USFS	United States Forest Service
USGS	United States Geologic Survey
WFPA	Washington Forest Protection Association
WTRFA	West Thurston Regional Fire Authority
WDFW	Washington Department of Fish & Wildlife
WUI	Wildland-Urban Interface

Executive Summary

The Goal of the South Thurston CWPP

The primary goal of the South Thurston County (South Thurston) CWPP is to reduce the risk of wildfire to the community, enhance public safety, and protect natural resources. This plan aims to foster collaboration among local, state, and federal agencies, as well as community stakeholders, to implement effective wildfire mitigation strategies.

This 2025 Plan was compiled from reports, documents, and data, as Thurston County's first CWPP. Because of the overall size and higher probability of wildfire in South Thurston, the decision was made to focus on that region. This CWPP has been developed in response to the federal Healthy Forests Restoration Act of 2003 (HFRA). It meets the requirements of the HFRA by addressing the following: 1) The CWPP was developed collaboratively by multiple agencies at the state and local levels in consultation with federal agencies and other interested parties, including a group of stakeholders from the community. The stakeholders prioritized and identified fuel modification treatments and recommended the types and methods of treatments to protect at-risk communities and pertinent infrastructure. The plan recommends multi-party mitigation, monitoring, and outreach. It also recommends measures and action items that residents and communities can take to reduce the ignitability of structures. Finally, the authors of the plan solicited input from the public on the draft CWPP, before finalizing it.

Core Values

Throughout the course of producing the South Thurston CWPP, the project team, Advisory Group, stakeholders, and committee members all held the following as core values of the plan, guiding our work.

- **Safety:** Ensuring the protection of human life and property.
- **Collaboration:** Fostering partnerships among various stakeholders.
- **Sustainability:** Promoting practices that protect and preserve natural resources.
- **Resilience:** Building a community that can withstand and recover from wildfire events.
- **Education**: Raising awareness and providing resources to the community about wildfire risks and prevention.

Key Issues Addressed

Fuels-Related Issues:

The CWPP plans for future fire risk with attention to climate change and its effects on vegetation and the wildland fire environment. The CWPP maps wildfire risk across the county and assesses communities for structural ignitability and wildfire risk, while raising awareness about the natural role fire plays in ecosystems and maintaining resilient landscapes. The plan recommends fuel treatments for land management agencies and homeowners to mitigate hazard and risk and aims to ensure that residents are not complacent regarding wildfire risk. The CWPP prioritizes hazardous fuels reduction in the wildland-urban interface (WUI), while addressing fuel loads on and adjacent to roadways. The plan provides landscaping and defensible space guides to aid residents in making their homes and landscapes fire resilient. Large portions of South Thurston are owned

by timber and ranching companies, providing potential fuels in forested areas and grasslands, respectively. The CWPP is designed to help reduce the potential impact of wildfire on valuable timber and ranching resources.

Fire Response:

The CWPP prioritizes Investing in and supporting fire response at all levels, especially bolstering fire response in rural areas. The CWPP also recognizes the importance of coordination between response agencies and the need for cooperation when preparing for and responding to wildfires. The plan assesses evacuation routes and emergency notifications, both of which will provide instruction and clarification during a wildfire.

People and Fire-Adapted Communities:

The CWPP supports managing fire to protect values and accomplish resource management goals, including protection and enhancement of wildlife habitat, water supply and quality, and mitigation against forest insects and disease outbreaks. The plan also recommends managing fire to address community concerns and vulnerable locations. Fuels treatment plans and projects should be collaborative and address mitigation actions across jurisdictions and with multiple agencies. The CWPP recommends using constant and consistent messaging for residents and visitors, identifying approaches and resources for educating tourists on the fire environment and their role in protecting resources.

The CWPP recommends conducting public education and outreach to homeowners and residents to help individuals reduce the risk of fire to their properties. Home hardening programs, like Firewise USA (Firewise | Thurston County) and Wildfire Ready Neighbors (Wildfire Ready Neighbors Firewise USA Site Micro Grants - FundHubWA), provide the foundation for communities to become “fire adapted” (Washington Fire Adapted Communities LearningNetwork – Learning Network)

These programs focus on the importance of personal and community responsibility in rural areas, where response times to wildfires can be longer.

Organization of the CWPP

The CWPP provides an assessment of the WUI and wildfire risk assessment, action items, mitigation approaches, project recommendations, and background information about South Thurston County’s wildland fire environment as well as land ownership and management. Much of the background information is housed in the appendices.

Chapter 1 – Provides an overview of the purpose of the plan, descriptions of the Stakeholder Advisory Group, engagement with the community which fostered the development of this plan, and a description of the four committees created to support the development of this plan.

Chapter 2 – Discusses the South Thurston community profile including land and road ownership, the population, vulnerable populations, recreation and topography.

Chapter 3 – Describes the Wildland-Urban Interface, climate patterns, fuels, and wildfire history and response.

Chapter 4 – Provides an understanding of air quality impacts, wildfire risk assessments for the four fire districts in the region, and community values.

Chapter 5 – Describes fire adapted community opportunities and ongoing and recommended wildfire mitigation projects.

Chapter 6 – Outlines monitoring strategies and a timeline for updating the plan.

Acknowledgements

Thurston Conservation District and Ross Strategic sincerely thank the Washington State Conservation Commission for funding the South Thurston CWPP process. This project could not have been accomplished without the significant contributions and dedication from the Stakeholder Advisory Group as well as time and participation from community members.

Chapter 1 – Background

1.1 Community Wildfire Protection Plan Purpose

The purpose of the South Thurston CWPP is to help local communities assess wildfire hazards and identify strategic investments to mitigate wildfire risk and promote preparedness. Assessments and recommendations from community members and stakeholders during the planning process can assist fire districts with fire operations when responding to wildfires and help residents prioritize mitigation actions. These plans also assist with funding gaps for fuel reduction, community outreach, and wildfire response projects since many grants require an approved CWPP.

This Plan has been developed in accordance with the 2003 Healthy Forest Restoration Act (HFRA) which established minimum requirements for a CWPP including ("Community Wildfire Protection Plan Guidance," 2023):

1. **Collaboration:** A CWPP must be collaboratively developed by local and state government representatives, in consultation with federal agencies and other interested parties.
2. **Prioritize Fuel Reduction:** A CWPP must identify and prioritize areas for hazardous fuel reduction treatments and recommend the types and methods of treatment that will protect one or more at-risk communities and essential infrastructure
3. **Treatment of Structural Ignitability:** A CWPP must recommend measures that homeowners and communities can take to reduce the ignitability of structures throughout the area addressed by the plan.

The objectives of this project are to:

1. Increase education and outreach to the public to encourage community engagement and public awareness.
2. Strategically identify regional and topical areas for fuel reduction and establish and implement wildfire mitigation priorities in South Thurston County.
3. Prioritize the protection of people, structures, sensitive ecosystems, and values that are central to the culture and local economy in South Thurston County.
4. Meet or exceed the CWPP requirements set by the HFRA.

1.2 Plan Organization

This CWPP encompasses background information regarding South County's community and wildfire environment, risk assessments, and project recommendations. Additional background information is included in the appendices.

Chapter 1 – Provides an overview of the purpose of the plan, descriptions of the Stakeholder Advisory Group, engagement with the community which fostered the development of this plan, and a description of the four committees created to support the development of this plan.

Chapter 2 – Discusses the South Thurston community profile including land and road ownership, the population, vulnerable populations, recreation and topography.

Chapter 3 – Describes the Wildland-Urban Interface, climate patterns, fuels, and wildfire history and response.

Chapter 4 – Provides an understanding of air quality impacts, wildfire risk assessments for the four fire districts in the region, and community values.

Chapter 5 – Describes fire adapted community opportunities and ongoing and recommended wildfire mitigation projects.

Chapter 6 – Outlines monitoring strategies and a timeline for updating the plan.

Appendix A: TBD

Appendix B: TBD

Appendix C: TBD

Appendix D: TBD

1.3 CWPP Geography: South Thurston County

The CWPP boundary area is represented in Figure 1.1 and encompasses the southern portion of Thurston County, Washington, as delineated by Thurston County Fire Protection Districts. These include Fire Districts 1 and 11 (West Thurston Regional Fire Authority), 12 and 16 (South Thurston Fire & EMS), 2 and 4 (Southeast Thurston Regional Fire Authority), and 17 (Bald Hills).

According to the "4th Edition of the Hazards Mitigation Plan for the Thurston Region" developed by the Thurston Regional Planning Council, 305 wildland fires burned 531 acres between 2018 to 2022 in Thurston County (2023). A majority of these wildfires have taken place in South County, which also account for the three largest fires in the county during this timeframe which include the Mima Road Fire in 2018 affecting around 100 acres, the Bordeaux Fire in 2020 burning close to 300 acres, and the 2021 Scatter Creek Fire impacting over 300 acres. This history has emphasized the need to focus this CWPP on South Thurston due to the wildfire impacts and higher likelihood of wildfire compared to the northern portion of the county. This CWPP can lay the foundation for a Thurston County-wide Plan in the future.

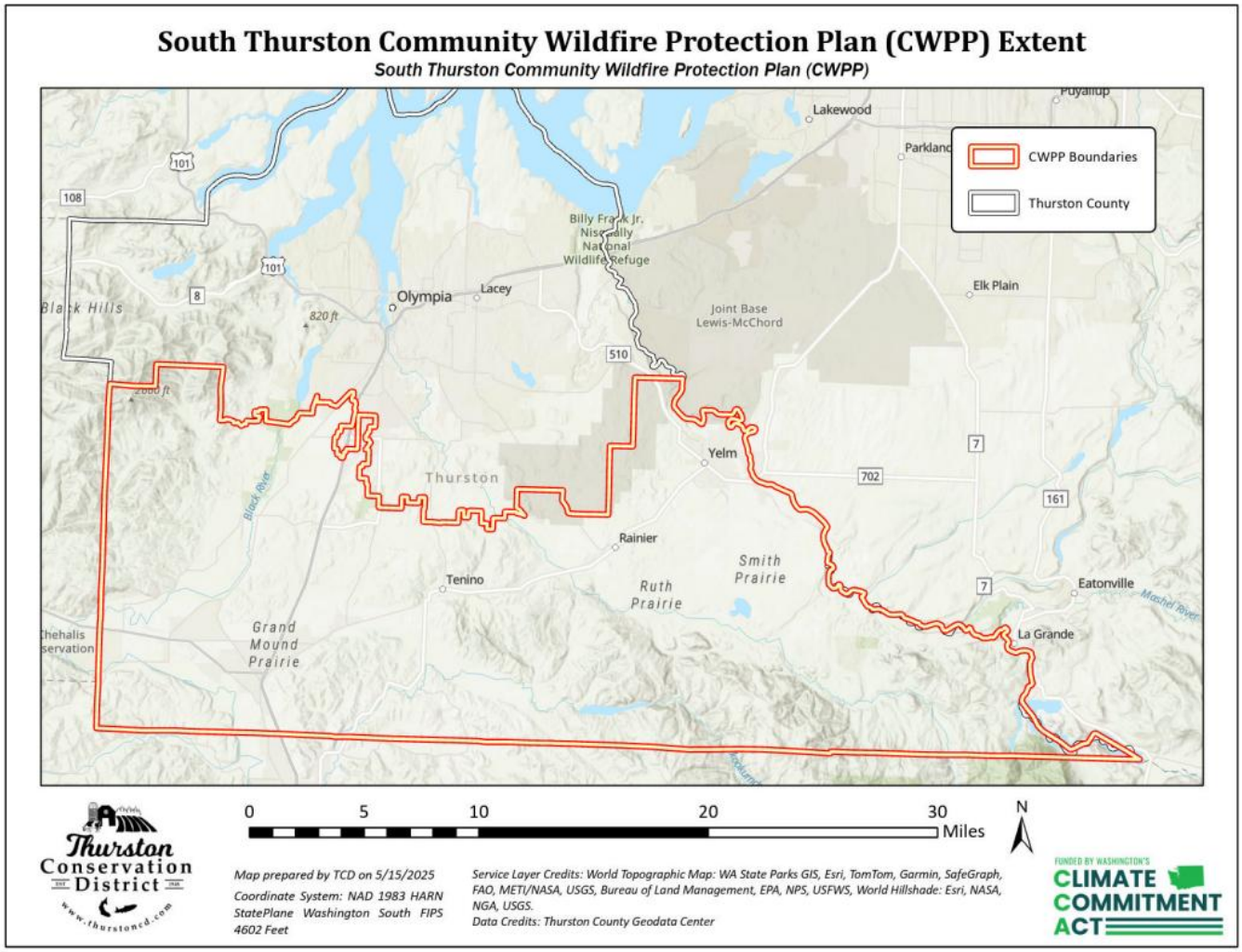

Figure 1.1. South Thurston County CWPP Boundary

1.4 Stakeholder Advisory Group Engagement

On September 20, 2024, the Thurston Conservation District (TCD) invited prospective fire district representatives, state agencies, city and county governments, utility districts, conservation agencies, Tribes, non-profit organizations, landowners, among other entities who contribute to or could be impacted by wildfire mitigation efforts to serve as the Stakeholder Advisory Group for the South Thurston County CWPP. Stakeholder engagement is critical in ensuring that this CWPP prioritizes collaboration and contains a range of diverse perspectives. The kickoff stakeholder meeting took place in Yelm on November 14. The second meeting was held virtually on January 14, the third virtual meeting was on March 26, and the fourth virtual meeting was on April 18. The final Stakeholder meeting combined with the Community Engagement meeting was held in Tenino on May 17. Stakeholders are listed below in Table 1.1.

Image 1.1. The City of Yelm

Name	Organization
Aimee Richardson	Creekside Conservancy
AJ Fiest	Washington State Parks
Alex Chacon	Thurston Conservation District
Andrew Schaffran	South Thurston Fire & EMS
Bill Kronland	WA Department of Fish and Wildlife
Brandon Cheney	Thurston County Emergency Management
Clint Davis	Chehalis Tribe
Dan Calvert	JBLM – Sentinel Landscapes
Dan Nelson	Olympic Regional Clean Air Agency
Dave Watterson	City of Tenino Mayor
David Wilderman	Department of Natural Resources
Emily Schoendorf	Thurston County Emergency Management

Name	Organization
Fiona Edwards	Washington Department of Fish and Wildlife
George Sharp	Thurston Economic Development Council
Jack Lane	Thurston County Public Works
Jae Townsend	Thurston Conservation District
Janet Halstead	Washington State Parks
Jason Roberts	Lacey Frie District 3
Jeff Choke	Nisqually Tribe
Jennifer Coe	Washington State Conservation Commission
Jennifer Colvin	Colvin Ranch (Landowner)
Jesse Duvall	Department of Natural Resources
John Richardson	Joint Base Lewis McChord
Justin Weisser	Thurston County Environmental Health Division
Kelly Corey	Southeast Thurston Fire Authority
Kevin Jensen	Riverbend Ranch
Key Foss	Washington State Department of Natural Resources
Kiana Sinner	Thurston Conservation District
Kim Gubbe	Thurston Public Utility District
Kyle Bustad	Thurston County Emergency Management
Leonard Johnson	McLane Black Lake Fire Department
Lit Dudley	Washington State Department of Transportation
Mark Gregory	Bald Hills Fire Department
Mason Mckinley	Southwest Washington Grazing Association
Matt Axe	Washington State Department of Natural Resources
Matt Blankenship	Washington Department of Fish and Wildlife
Matt Russell	Southeast Thurston Fire Authority
Miles Wenzel	Washington State Parks
Myles Reed	Washington State Department of Natural Resources
Nathan Drake	West Thurston Regional Fire Authority
Nicholas Frye	Washington State Department of Natural Resources
Pamela Maciel	Wolf Haven International

Name	Organization
Paul Brewster	Thurston Regional Planning Council
Rob Carlson	City of Yelm Police Chief
Shannon Glenn	Puget Sound Energy
Stephanie Bishop	Thurston Conservation District
Zach Heinemeyer	Intercity Transit

Table 1.1. Stakeholder Advisory Group

1.5 Community Involvement

Collaboration with community members was an essential component of the South Thurston CWPP to ensure priorities regarding local wildfire protection were received from a broad audience. Community input was captured through Community Engagement meetings held on March 5 and May 17. The first Community Engagement meeting was focused on informing the public of this CWPP and understanding the community's priorities pertaining to wildfire planning and mitigation. The second Community Engagement meeting was combined with the final Stakeholder Advisory Group meeting focused on May 17 to provide an overview of the draft plan, receive final input from Stakeholders and the community, and notify the public of intended updates and evaluation of the CWPP.

Community Survey

A community survey (Appendix) was also distributed via the Thurston Conservation District website, at CWPP Community Engagement and Stakeholder meetings mentioned above, on physical flyers at additional community events such as the Wildfire Ready Neighbors Launch on April 26 hosted by the SETFA (Appendix) and a film screening hosted by TCD on May 2nd. A QR code linking to the survey was also distributed to over 800 residents in Tenino through the public utility mailer.

1.6 Committees

Five committees were developed to convene Stakeholders outside of normal Stakeholder meetings to delve into specific topics that certain folks hold expertise in. TCD and Ross Strategic would like to thank the following partners outlined in Table 1.2 for their time and effort in developing CWPP materials, providing feedback on drafted content, and coordinating with the correct parties to ensure the right people were involved in this process. Below is a description of the committees as well as a roster for each committee:

Communications Committee – Set the communications strategy, developed outreach materials and public notices, identified community events to attend, and identified the appropriate community members to contact regarding involvement and input on the CWPP process.

Content Contribution Committee – Reviewed and added content to drafted chapters.

Signatories Committee - Facilitated the signatures at the city, county and State Forester levels.

Technical Committee – Fire district representatives and state agencies provided content expertise on necessary information and data to include in the CWPP.

Committee	Name	Affiliation
Communications Committee	Dan Nelson	Olympic Regional Clean Air Agency
	George Sharp	Thurston Economic Development Council
	Jae Townsend	Thurston Conservation District
	Jason Roberts	Lacey Fire District 3
	Jennifer Colvin	Colvin Ranch
	Pam Maciel	Wolf Haven International
	Stephanie Bishop	Thurston Conservation District
Content Contribution Committee	Aimee Richardson	Creekside Conservancy
	David Wilderman	Department of Natural Resources
	Fiona Edwards	Washington Department of Fish & Wildlife
	Hogan Sherrow	Ross Strategic
Map Committee	Alex Chacon	Thurston Conservation District
	Haley Morris	Ross Strategic
	Jesse Duvall	Washington State Department of Natural Resources
	Nathan Drake	West Thurston Regional Fire Authority
Signatories Committee	Andrew Schaffran	South Thurston Fire & EMS
	Emily Schoendorf	Thurston County Emergency Management
	Stephanie Bishop	Thurston Conservation District
Technical Committee	Andrew Schaffran	South Thurston Fire & EMS
	Fiona Edwards	Washington Department of Fish & Wildlife
	Jesse Duvall	Washington State Department of Natural Resources
	Kelly Corey	Southeast Thurston Fire Authority
	Mattew Axe	Washington State Department of Natural Resources
	Nathan Drake	West Thurston Regional Fire Authority
	Paul Brewster	Thurston Regional Planning Council

Table 1.2. Committee Teams

Chapter 2 – Community Profile

2.1 Land Ownership

As outlined in Figure 2.1, landownership in South Thurston County consists of federally owned land which is primarily made up of Joint-Base Lewis McChord property, state-owned land such as Capitol State Forest, city and County owned land, and Nisqually and Chehalis Tribal land. South Thurston County private landowner property consists of timber and agriculture lands, commercial buildings, and residential buildings.

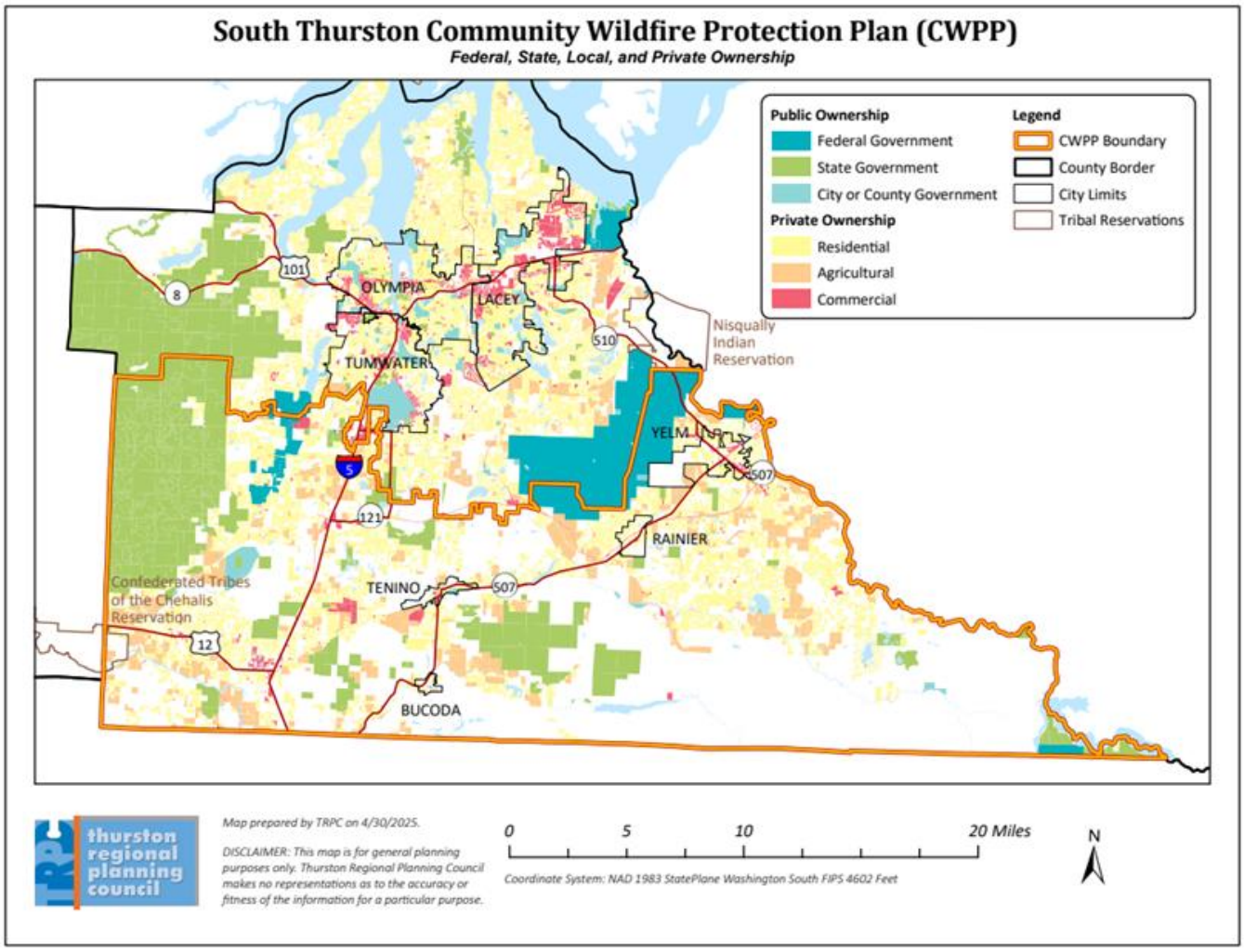

Figure 2.1. Land Ownership in South Thurston County

2.2 Roads and Transportation

Image 2.1. Downtown Tenino

A large portion of the roads surrounding the five major cities in South Thurston (Tenino, Rainier, Bucoda, Yelm, and Rochester) consist of County roads which also dip into the southwestern portion of Capitol State Forest which is demonstrated in Figure 2.2. The remainder of the roads in the state forest are made up of state roads. The remainder of the state routes include state route 507 connecting Yelm, Rainier, Tenino, and Bucoda, and extending 43.52 miles. Rochester, located in the Southwest corner of Thurston County is separated from route 507 but instead contains U.S. route 12 running horizontally through the town. Interstate 5 vertically transects the western portion of Rochester and runs the length of the western side of Thurston County. Private roads make up much of the southeast corner of South Thurston which is densely forested private property.

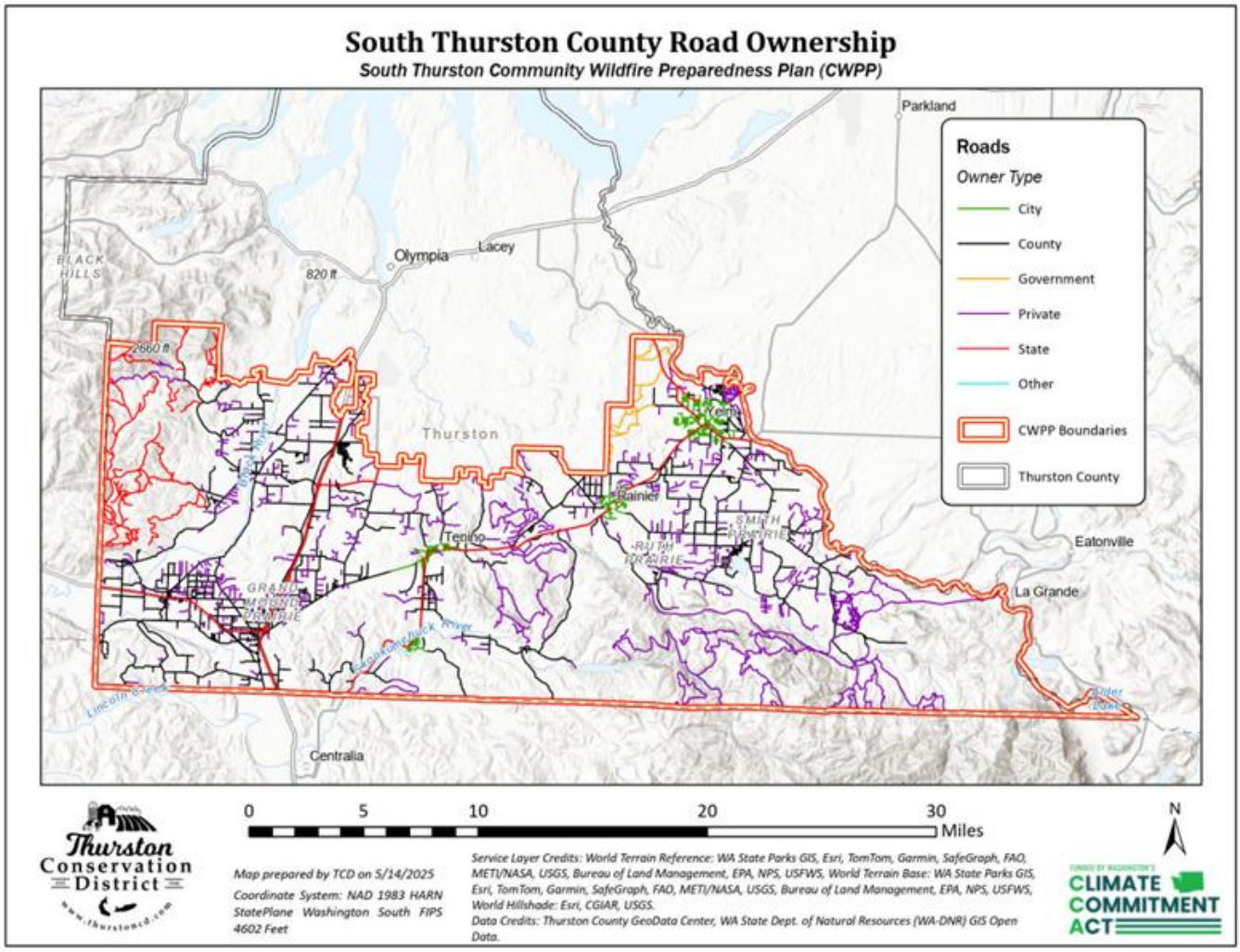

Figure 2.2. Road Ownership in South Thurston County

2.3 Population

According to the US Census Bureau, the population of South Thurston in 2020 was 43,379, with 25% (10,810) aged 60 or older ("Thurston South CCD, Thurston County, Washington," n.d.). The population is spread unevenly across the region, with nearly half the population in Yelm, Rochester, Rainier, Tenino, and Grand Mound which is demonstrated in Figure 2.3. The rest of the residents of South Thurston live in smaller towns like Bucoda, the two Reservations whose land overlaps the region, Chehalis and Nisqually, and unincorporated cities and towns.

According to the Thurston Regional Planning Council populations are expected to increase most in and around the cities and towns where they are currently concentrated the most (Appendix) ("Population, housing, and employment data," n.d.). The dispersed nature of the South Thurston provides unique challenges for the fire districts.

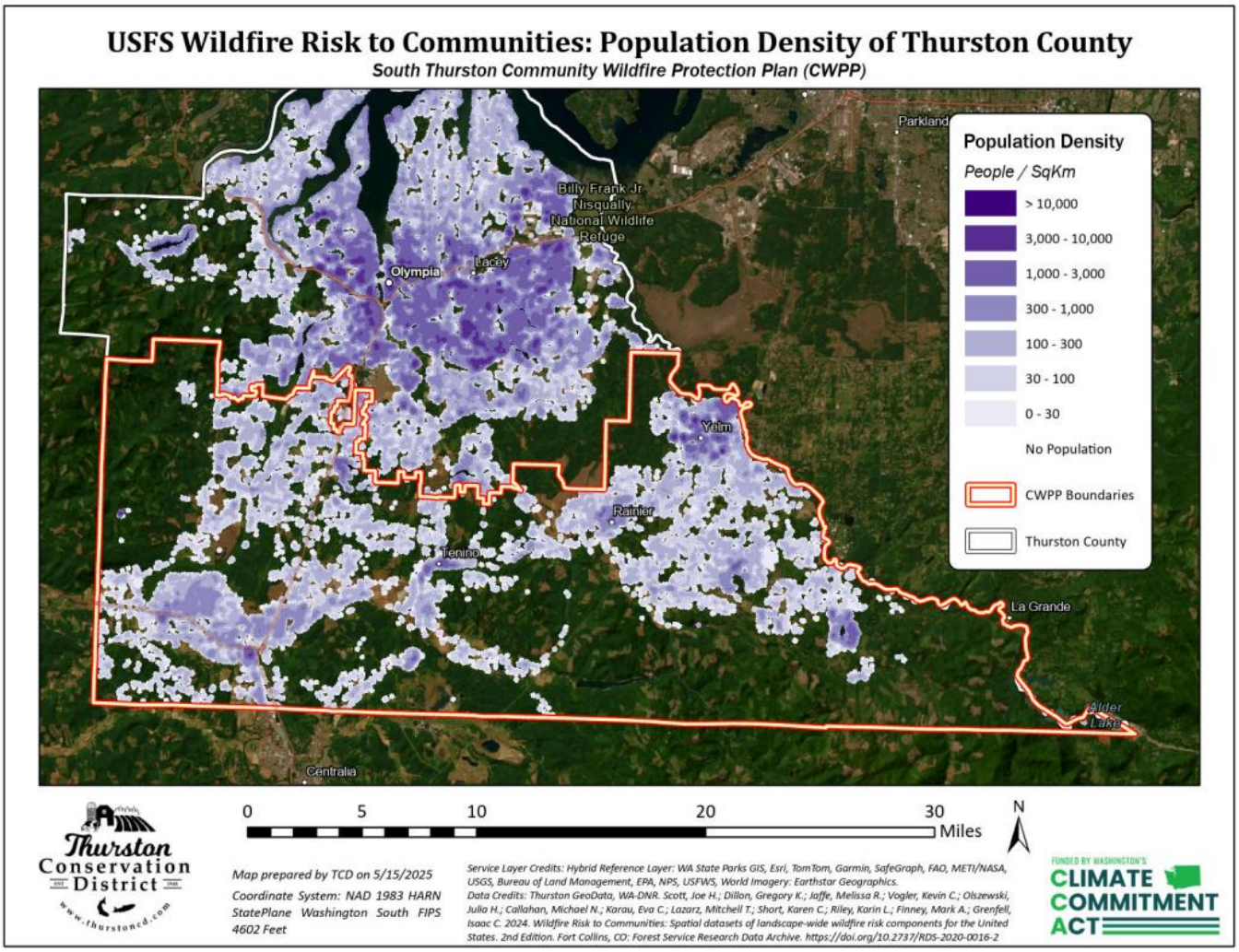

Figure 2.3. Population Density in South Thurston County

2.4 Social Vulnerability

Pre-fire

According to the Federal Emergency Management Agency (FEMA), "social vulnerability is the susceptibility of social groups to the adverse impacts of natural hazards (e.g., wildfire), including disproportionate death, injury, loss, or disruption of livelihood" ("Social vulnerability," n.d.). Social and economic factors can increase the challenges faced by certain individuals and communities when it comes to wildfire preparation, defense, and mitigation. For this reason alone, it is critical to include the perspectives of as many community members as possible when building a CWPP. According to the Wildfire Risk to Communities, the most vulnerable populations in any community experience cultural and institutional barriers, have limited mobility, or have medical conditions exacerbated by stress or smoke ("Vulnerable populations," n.d.)

The Stakeholder Advisory Group has identified the most vulnerable populations in South Thurston as: non-English speakers, the elderly, rural and lower-income households, and children, which aligns with Wildfire Risk to Communities national social vulnerability assessments. Interestingly, the FEMA Social Vulnerability Index assigned Thurston County a Social Vulnerability score of 37.24, which is relatively low when compared to other parts of the U.S. However, when considering the most vulnerable populations in a community, it's important to

remember that it is a relative measurement, and only valid when compared to other populations within the same community.

The ability to do the work recommended in the CWPP to fire harden homes can be a major barrier to preparing for, protecting from, and mitigating the impacts of wildfire. Lower income households, aging populations, and children face limitations when it comes to fire-hardening their homes or preparing exit strategies. Replacing roofs, siding and decks with fire-resistant materials can be costly and require extensive labor and/or hiring professionals. Similarly, replacing landscaping around homes with fire-resistant plants and materials to create buffers against wildfires can incur costs and labor that make it prohibitive for these groups. Lower income households may face cost associated barriers, while children are dependent on the adults in their lives to ensure the work is done. Aging populations may face costs associated with barriers, along with the physical ability to do the work.

To eliminate the barriers around wildfire preparation, protection, and mitigation faced by the most vulnerable populations, communities should embrace programs that address accessibility and enhance inclusion for all income brackets and physical abilities. Mitigation services, such as free trimming and chipping programs, can encourage residents in vulnerable populations to fire-harden their properties. Dedicated education and evacuation programs should be provided to senior communities, schools, and lower-income neighborhoods. Detection and communication devices should be provided free of charge to lower income households, seniors, schools, and community centers that work with the most vulnerable populations. Similarly, volunteer and community days can bring together neighbors and neighborhoods to help them build fire-hardened communities and be better prepared for wildfire.

Post-fire

While post-fire recovery is not the primary focus of this CWPP, it is essential to recognize that fostering strong community connections before a wildfire occurs significantly enhances a community's ability to rebuild in its aftermath. An important outcome of this plan should be the development of more resilient communities, equipped with the knowledge and experience necessary to identify and support populations requiring the most assistance after a fire. Historically, homeowners, business owners, and property owners have often faced wildfire recovery efforts alone, which can be particularly devastating for the most vulnerable members of a community. Ensuring these populations have access to recovery resources—such as federal assistance from FEMA, state and local funding (when available), and insurance—is critical to mitigating the long-term impacts of wildfire disasters. This is even more pressing with the most vulnerable populations in South Thurston.

2.5 Unhoused Populations

A particularly vulnerable segment of the community in South Thurston is those who are unhoused. The Thurston Regional Planning Council defines homelessness as living unsheltered, in a vehicle, or in emergency or transitional housing ("Homeless census," n.d.). The Thurston County Homeless Crisis Response System, in partnership with community volunteers, conducts an annual count of homeless individuals living in the county called a Point-In-Time Count (PIT). The Point-In-Time Count takes place over one week starting on the third Thursday of January and is made up of a series of events where unsheltered community members can complete surveys specifically asking where they stayed on the third Thursday night of January to count the unsheltered population at a specific point in time ("2024 Point-in-time," 2024). According to the PIT, as of August 2024, 864 individuals were experiencing homelessness in Thurston County. Out of approximately 300,000 residents across Thurston County, 864 is a relatively low number. However, those individuals and groups have very little, to no control over their immediate environment and are most susceptible to the impacts of wildfire. If they are unfortunate enough to experience wildfire, the results are usually devastating. Providing fire-safe spaces as well

as fire education opportunities to reduce the risk of accidental fires, set by these communities are important considerations of the CWPP.

2.6 Outdoor Recreation

Outdoor recreation is an important part of the South Thurston economy and the culture of the region. Almost a half a billion dollars are spent throughout Thurston County on outdoor recreation activities including equipment, tourism, jobs, and taxes ("Economic benefit," 2016). While data is not available for South Thurston, a large portion of the money spent across the county is spent in South Thurston. Much of the outdoor recreation in South Thurston is water-focused, with other important areas being developed and undeveloped forested areas. South Thurston has one state forest on the west side of the county, Capitol State Forest which offers 150 miles of trails for various activities and campgrounds. Swimming, boating, water-skiing, rowing, hiking, mountain biking, horseback riding, and camping are some of the many activities that locals and visitors enjoy. The Scatter Creek Wildlife Recreation Area, owned and managed by the Washington Department of Fish and Wildlife (WDFW) offers additional trails and opportunities for day-use activities similar to those offered by the State Forest.

Due to their undeveloped nature, many of the areas utilized for outdoor recreation are vulnerable to wildfire. Access to these areas is often limited, due to their rural locations making the potential for fuel concentration higher than other areas. Further, the potential impact of wildfire and wildfire smoke on outdoor recreation could devastate this seasonal part of the regional economy and endanger health, jobs, and livelihoods across South Thurston. This CWPP can help the residents of South Thurston prepare for the potential impacts of wildfire on Outdoor Recreation by providing a plan that takes into consideration this important aspect of the region's economy and culture.

2.7 CWPP Region Geography

2.7.1 Topography – vegetation and land cover

South Thurston features a varied topography that includes rolling hills, prairies, and forested areas. The region is characterized by glacial outwash plains resulting from the receding Puget lobe of the Vashon glacier approximately 15,000 years ago (Ott, 2012). This geologic event left behind gravelly soils that created unique prairie ecosystems and dense forests.

The prairies of South Thurston are among the rarest ecosystems in the region. Historically, these prairies covered nearly 150,000 acres, but today only about 3% of the original landscape remains ("Westside prairie," n.d.). The prairies are home to a variety of rare and endemic species, including butterflies, birds, and mammals. Notable prairie sites in South Thurston include Glacial Heritage, Violet Prairie, Deschutes Prairie, Wolf Haven, Cavness Ranch, and Tenalquot Prairie located on Joint Base Lewis McChord. Conservation efforts are ongoing to restore and maintain these vital habitats, which contribute significantly to regional biodiversity and cultural history.

One of the most prominent areas in South Thurston is Capitol State Forest, mentioned in section 2.8, is known for its rich biodiversity, including numerous species of trees, plants, and wildlife. This forest spans 110,000 acres and is managed by the Washington State Department of Natural Resources ("Capitol state forest," n.d.). In addition to Capitol State Forest, South Thurston features smaller private, city, and federally owned forest lands that contribute to the region's natural beauty and ecological health. These forests provide critical habitats for wildlife, support local timber industries, and offer residents and visitors opportunities for outdoor recreation and nature appreciation.

Elevations in this area range from lowland valleys to higher ridges, with notable sites such as Capitol Peak and the Black Hills providing elevated terrain. The Deschutes River and Black River along with many tributaries meander through the landscape, contributing to the area's rich biodiversity and scenic beauty. Inland, the terrain rises to an average elevation of approximately 492 feet, with the highest point at Quiemuth Peak, with an elevation of 2,922 feet ("Quiemuth peak," n.d.). This diverse topography supports a mix of agricultural lands, natural habitats, and recreational areas, making it a vibrant part of South Thurston.

2.7.2 Threatened and Endangered Wildlife

South Thurston is home to several at-risk wildlife species, primarily due to habitat loss and fragmentation. Some of the notable species are included in Table 2.1 below ("Violet Prairie Wildlife Area Unit," n.d.) and represented in Figure 2.4. Treatments on federal land are subject to the National Environmental Policy Act (NEPA) and associated analysis of impacts to these species. Wildfire mitigation treatments in areas that may impact threatened and endangered species require application of certain mitigation measures to prevent degradation to habitat. Please note that the table below is not exhaustive and only includes a selection of species that occur within the area. For a more comprehensive list, please visit the WDFW threatened and endangered species page.

Species Name	State Status	Federal Status
Oregon spotted frog	Endangered	Threatened
Mazama pocket gopher	Threatened	
Oregon vesper sparrow	Endangered	
Taylor's checkerspot butterfly	Endangered	Endangered

Table 2.1. Federally and State Listed Species that may Occur in South Thurston County

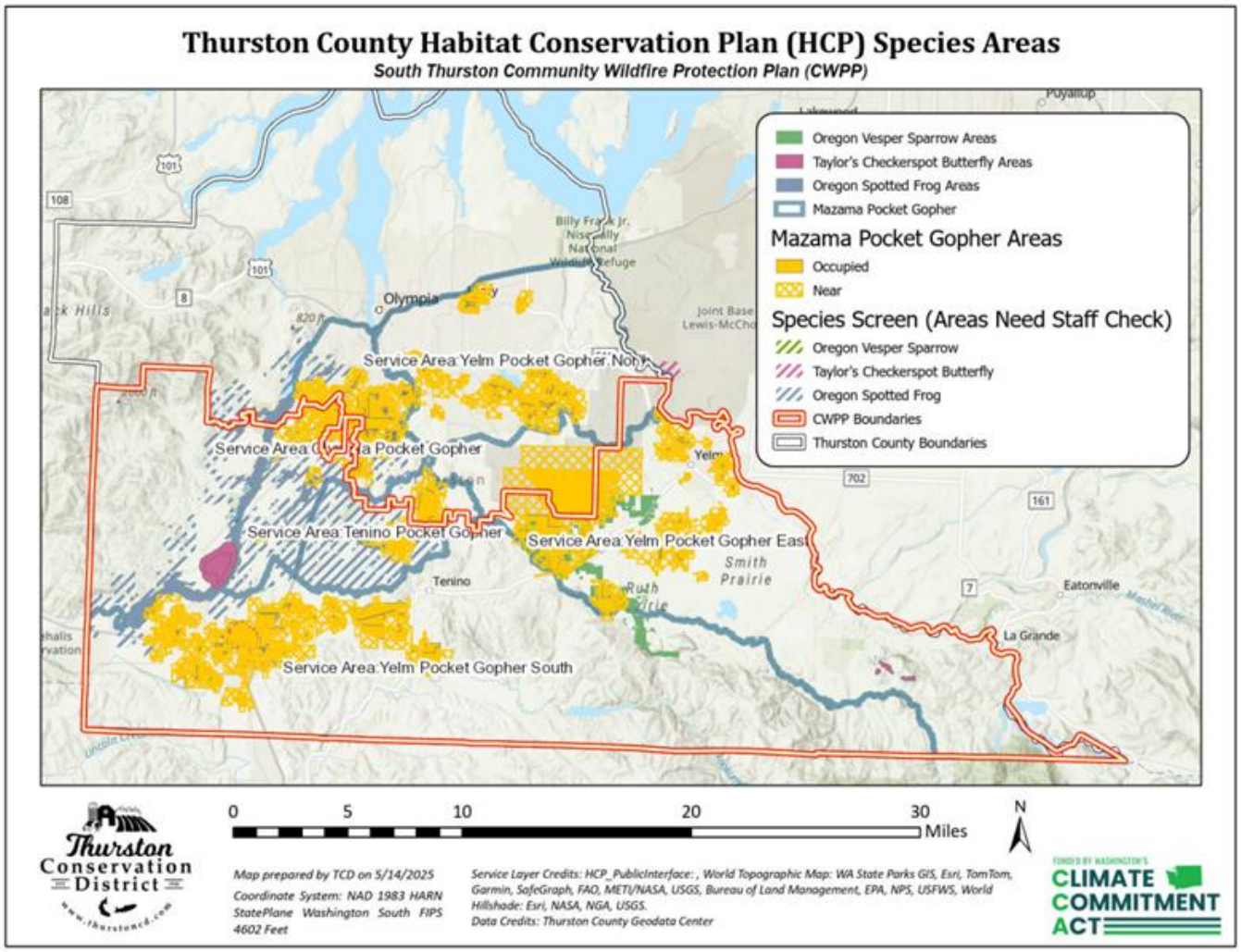

Figure 2.4. Threatened & Endangered Species in South Thurston County

2.8 Forest Health Considerations

2.8.1 Invasive Species

A number of invasive plant species are found in South Thurston County. These species, not native to the region, often lack predators and are otherwise able to outcompete native vegetation. It's important to note that scotch broom is both invasive and noxious, meaning that not only are they non-native but they are also very difficult to control as their seeds can remain viable for many years ("Noxious weeds," n.d.). An overabundance of certain invasive plants can reduce biodiversity and ecological health and increase fuel loads in fire prone areas ("Scotch broom prevention & control," n.d.). According to Montana State University Extension, scotch broom (Cytisus scoparius) forms dense thickets on open prairies that increase the potential and intensity of fire and reduce biodiversity by crowding out native grasses and wildflowers, which are essential for the survival of local wildlife (Graves et al., 2010). Scotch broom's aggressive growth can alter soil composition and structure, making it difficult for native plants to reestablish.

While scotch broom is widespread throughout South Thurston, the available data of scotch broom locations underrepresents the aggressiveness of this invasive species. Figure 2.5 demonstrates the need for updated

scotch broom data to aid in eradication as scotch broom sites extend far beyond the two locations included in the figure below.

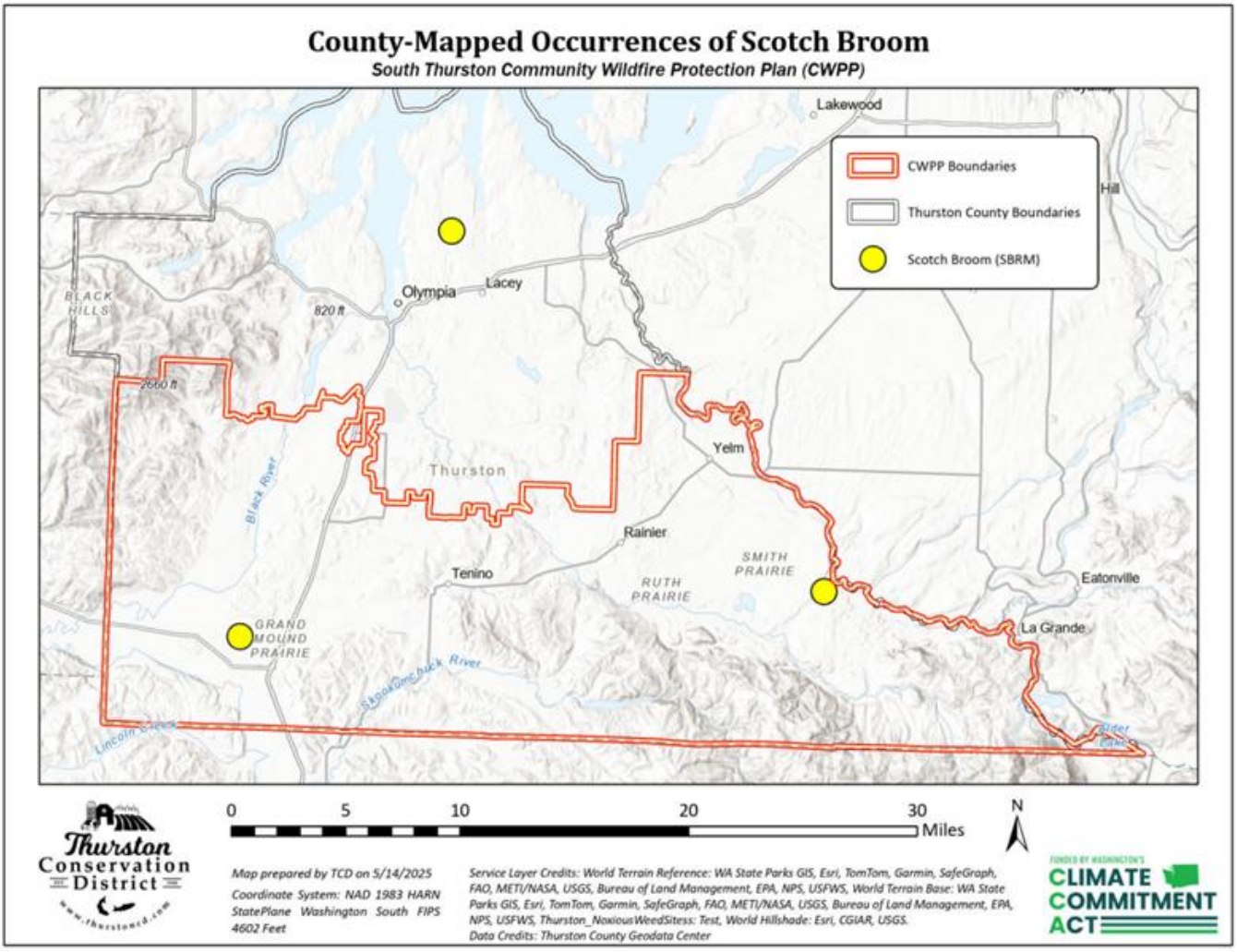

Figure 2.5. Scotch Broom Locations in South Thurston County

Other invasive species of note that Thurston County has deemed as noxious weeds due to their toxicity to humans and animals, risk of causing wildfires, and non-native nature include spurge laurel, tansy ragwort, wild chervil, poison hemlock, knotweed, and knapweeds ("Noxious weeds," n.d.). Washington state has three classes of noxious weeds, class A, B, and C. Class A noxious weeds have limited distribution throughout the state, Class B contains limited distribution in portions of the state, while Class C noxious weeds are widespread in Washington ("Noxious weeds index," n.d.). All of the invasive species mentioned in this section are Class B noxious weeds.

2.8.2 Tree Mortality

Climate change is contributing to tree mortality in Western Washington State through several mechanisms (Littell et al., 2010):

- Increased temperatures: Higher temperatures can lead to heat stress in trees, making them more vulnerable to diseases and pests.

- Drought conditions: Reduced precipitation and prolonged droughts during the growing season can weaken trees, particularly species like the Western redcedar, which are sensitive to water availability.
- Altered precipitation patterns: Changes in the timing and amount of rainfall can disrupt the water balance in forest ecosystems, affecting tree health and growth.
- Pest outbreaks: Warmer temperatures can expand the range and increase the activity of pests like the mountain pine beetle, leading to higher rates of tree mortality.
- Wildfires: Increased frequency and intensity of wildfires, driven by hotter and drier conditions, can result in significant tree loss and damage.

Although tree mortality is a natural process, climate impacts as described above can collectively exacerbate the decline of tree species and alter the composition and structure of forest ecosystems in Western Washington (Audie, 2020). When tree mortality occurs across a region in a relatively short period of time, it can increase fuels and thereby increase the likelihood of wildfires.

Chapter 3 – The Wildland Urban Interface (WUI), Climate Patterns and Climate Change Impacts, Fuels, Fire Behavior, History, and Response

3.1 The WUI – Purpose, definition, implications

The Wildland Urban Interface, or WUI, is one of the most important, and varied, definitions used in wildfire protection plans. Multiple definitions have been used by communities and organizations to designate this critical area between humans and the "wild." For some the WUI is where wild areas meet housing. For others, the WUI is the area where human development meets wild lands. Still others reject the "urban" component of the name, claiming that it doesn't represent the rural landscape they live in. Instead, those communities tend to talk about a Wildland Residential Interface, or WRI. One of the most common definitions is, "The WUI is an area where the built environment meets wildfire-prone areas – where wildland fire can move between natural vegetation and the built environment and negatively impact the community" (Forge, 2018; Paveglio et al., 2015). The WUI definition used in a particular wildfire protection plan can have important ramifications, including evacuation planning, resource allocation, resiliency planning, and public perceptions of safety.

When deciding on a WUI definition for this CWPP, the steering committee reviewed multiple examples from a variety of sources. They considered the WUI definitions used by the Washington Department of Natural Resources, "The area where homes are built near or among lands prone to wildland fire," the definition provided by the US Forest Service, "This area where human settlement mixes with and meets natural landscapes," and several others. The group finally settled on the definition provided by the U.S. Fire Administration:

> *The WUI is the zone of transition between unoccupied land and human development. It is the line, area or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.*

The committee determined that this definition is broad enough in its approach to include everything that should be covered by the WUI, and allows for flexibility moving forward, an important component of this "living document." The committee also decided not to include an "extended" or "secondary" WUI, as they determined that this would confuse potential users. Instead, the WUI, as defined, is expansive enough to cover all areas of interest.

People who work and live in and near the WUI need to understand the potential impacts of wildland fires on their lives. Worldwide, the WUI has been increasing in all populated continents from 2001 to 2020 and the global relative increase is 24% (Tang et al, 2024). The WUI is made up of heterogenous ecologies that range from wild habitats to human-made and dominated suburban and urban neighborhoods (Figure 3.1).

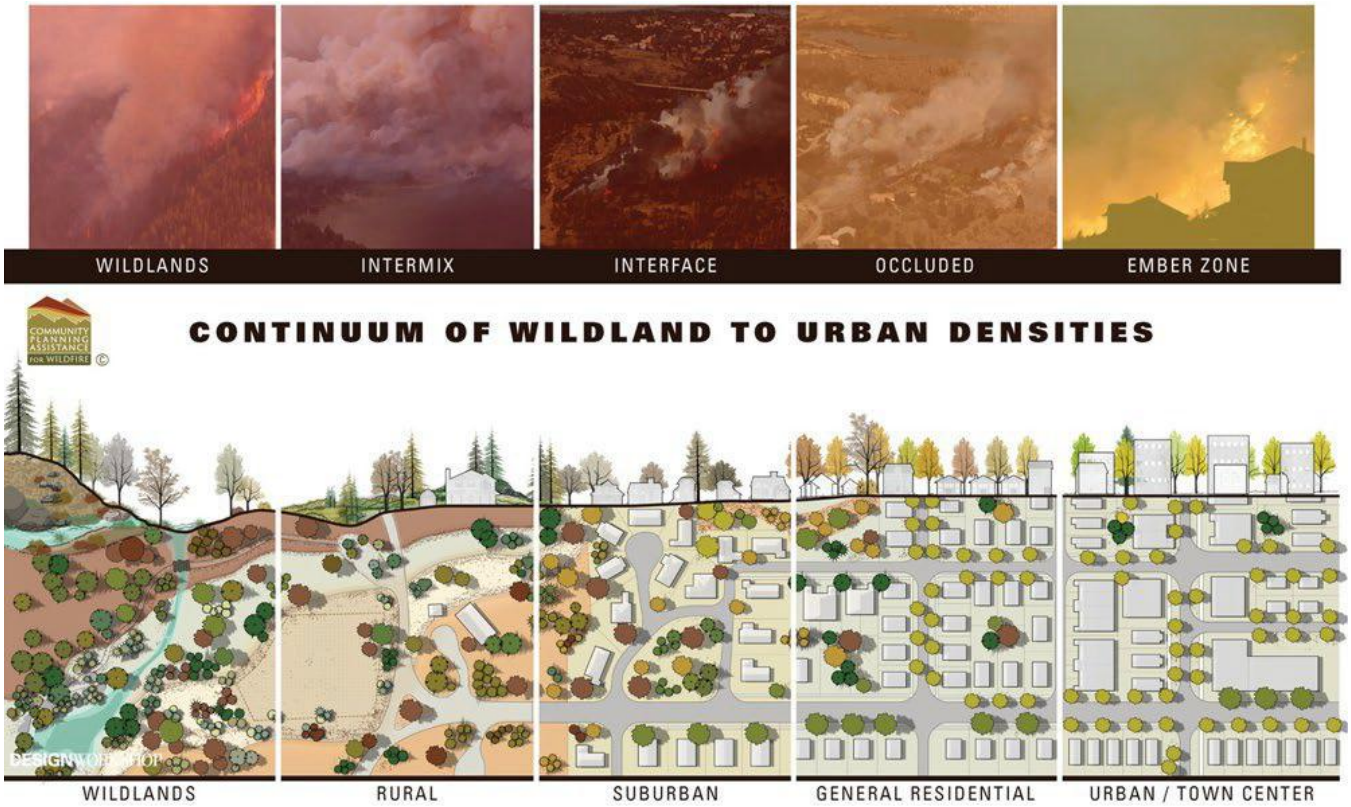

Figure 3.1. The WUI exists along a spectrum from wildlands to urban densities. (Source: Community Planning Assistance for Wildfire).

The WUI contains the areas that about human development as well as the surrounding vegetation and geography. The WUI is often made up of disconnected human developments, activities, and communities, interwoven together on the landscape (Paveglio et al., 2016). Importantly, the WUI reflects the social, political, and economic characteristics of a landscape, incorporating unique local conceptions, capacities, and other challenges that need to be considered when working toward greater wildfire resiliency (Carroll et al., 2004; Paveglio et al., 2009).

Thurston County is a mix of urban and suburban areas in North Thurston, including the state's Capitol, and smaller cities, towns, and rural areas in South Thurston. While Thurston County has a lower risk of wildfire than 72% of the counties across the U.S. (Wildfire Risk in Thurston County, WA - Wildfire Risk to Communities) the areas of highest risk are in South Thurston (Figure 2.a.2)

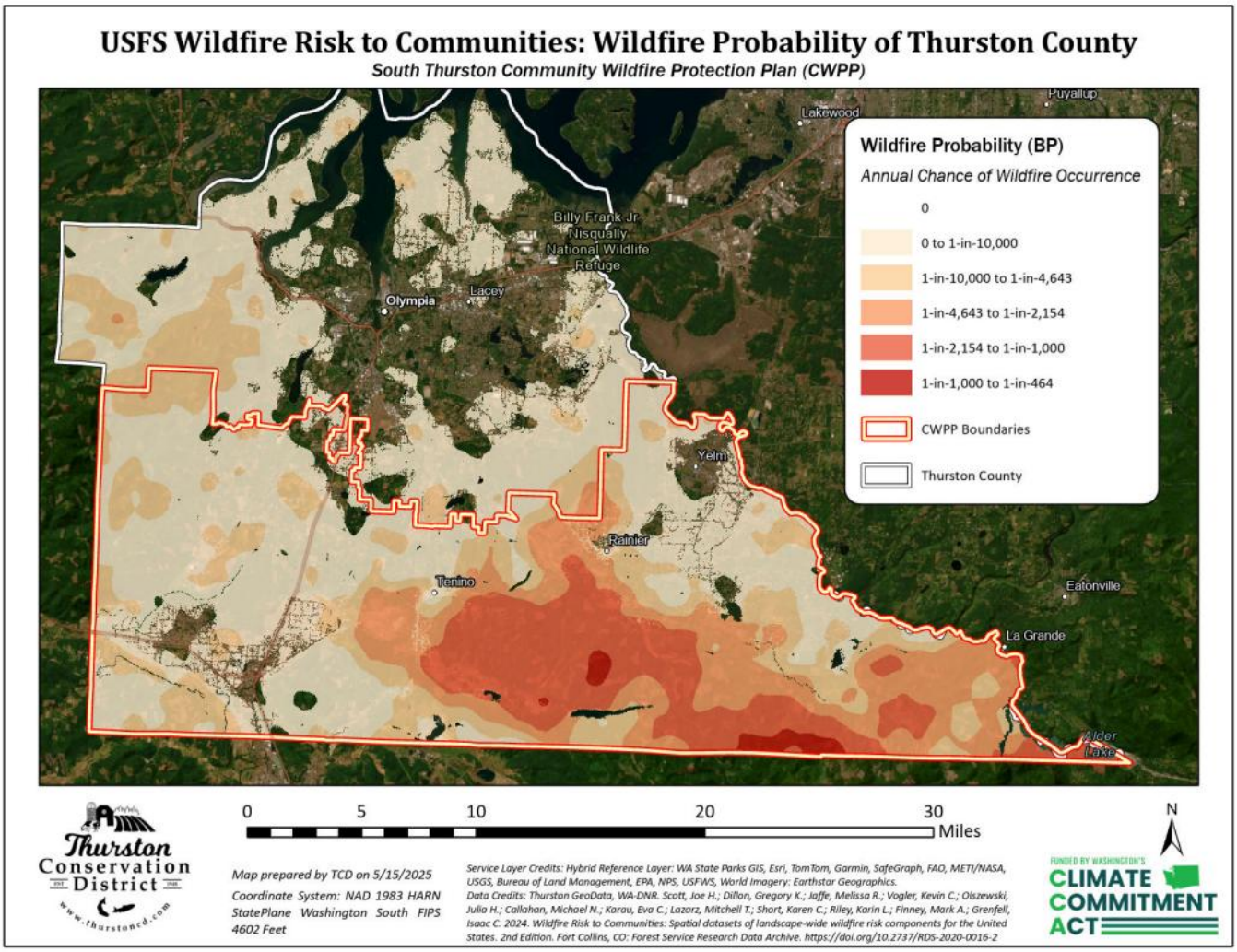

Figure 3.2. Wildfire risk in Thurston County.

The higher risk of wildfire in South County, combined with recent fire history (see below) were the driving forces behind the decision to start this CWPP in the southern part of the county. To protect residents and human development in South Thurston County, hazards within the WUI need to be identified and treated. Coordination and cooperation of federal, state, and local agencies and private individuals are key in reducing the hazard in the WUI (Norton, 2002). *"The role of [most] federal agencies in the WUI includes wildland firefighting, hazard fuels reduction, cooperative prevention and education, and technical experience. Structural fire protection [during a wildfire] in the WUI is [largely] the responsibility of Tribal, state, and local governments"* (Glickman and Babbit, 1995).

Property owners share a responsibility to protect their residences and businesses and minimize the danger by creating defensible areas around them and taking other measures to minimize the risks to their structures (Glickman and Babbit, 1995). Treatments within the WUI can assist in creating defensible spaces and facilitate easier access and maneuverability for firefighters. In addition, a WUI that is properly treated will be less likely to sustain a crown fire that enters or originates within it (Norton, 2002). The HFRA allows local communities to determine the precise boundaries of their WUI based on their specific risks and requires federal agencies to recognize those boundaries.

3.2 The WUI Boundary for South Thurston County

Mitigation efforts across the WUI can increase the safety of residents and firefighters while reducing the chances of home loss. While a formal WUI map currently exists for Thurston County (Figure 3.3)

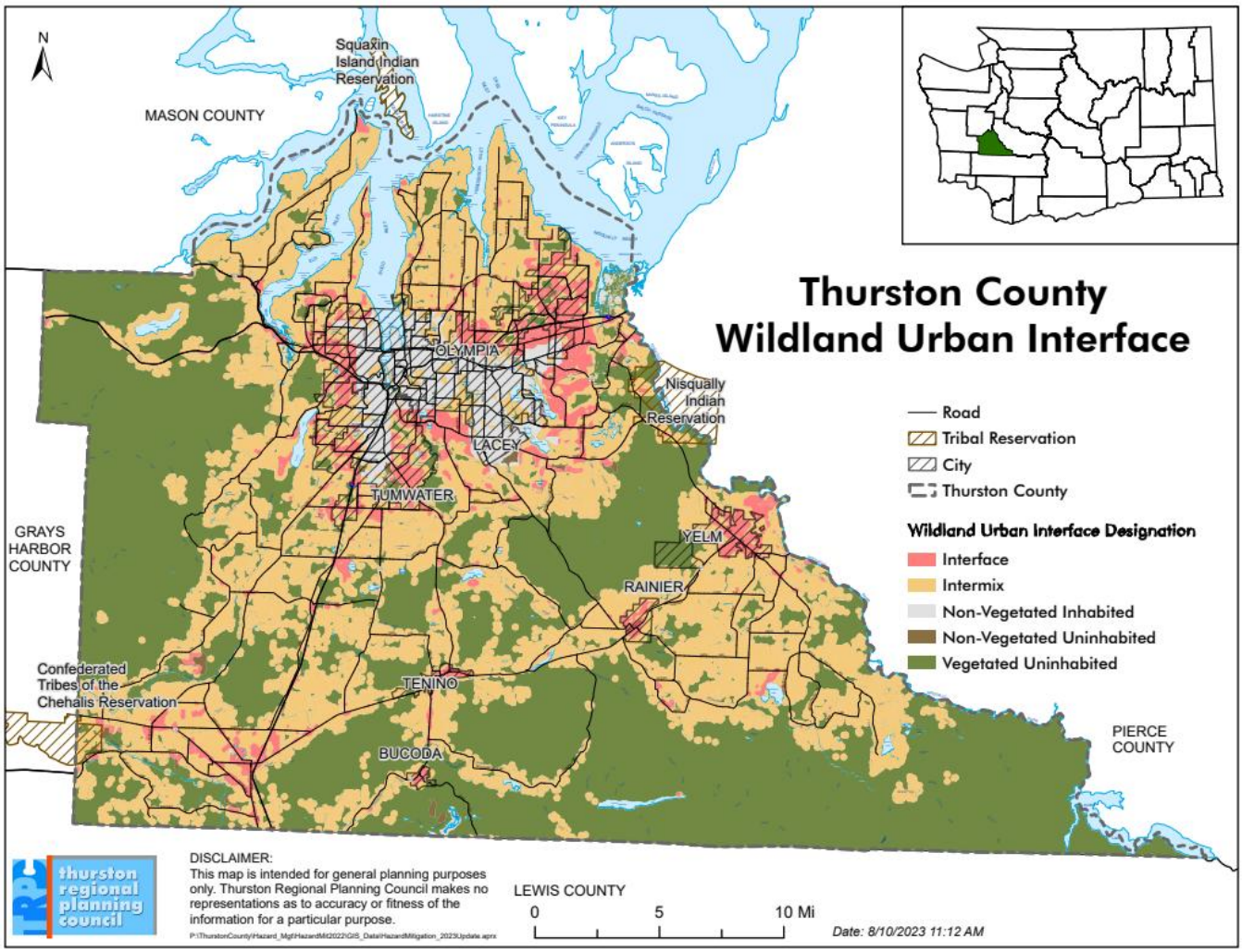

Figure 3.3. Wildland Urban Interface (WUI) for Thurston County

and is used by federal agencies, the CWPP steering committee developed a new WUI map for South County, based on the adopted definition. The committee hopes that this WUI map will serve as a current and future planning tool for local fire districts, residents, organizations, and other entities with a stake in fire safety in South Thurston County. The map should also serve as the foundation for a new WUI map for the entire county moving forward. For the purpose of this CWPP, the WUI boundary includes areas that are designated as “Interface” and “Intermix” on the Thurston County WUI map. The “Intermix” area is particularly important because communities in intermix areas are at a higher risk of wildfire damage. The presence of homes within or near wildland vegetation means that residents are more likely to be affected by wildfires, necessitating better preparedness, evacuation plans, and mitigation strategies (Hanberry, 2020). Understanding the importance of the intermix in the WUI helps in developing targeted strategies for wildfire prevention, risk reduction, and community resilience. This includes some agricultural and high-risk areas that have the potential of spreading wildfire to human developments (Figure 2.b.2).

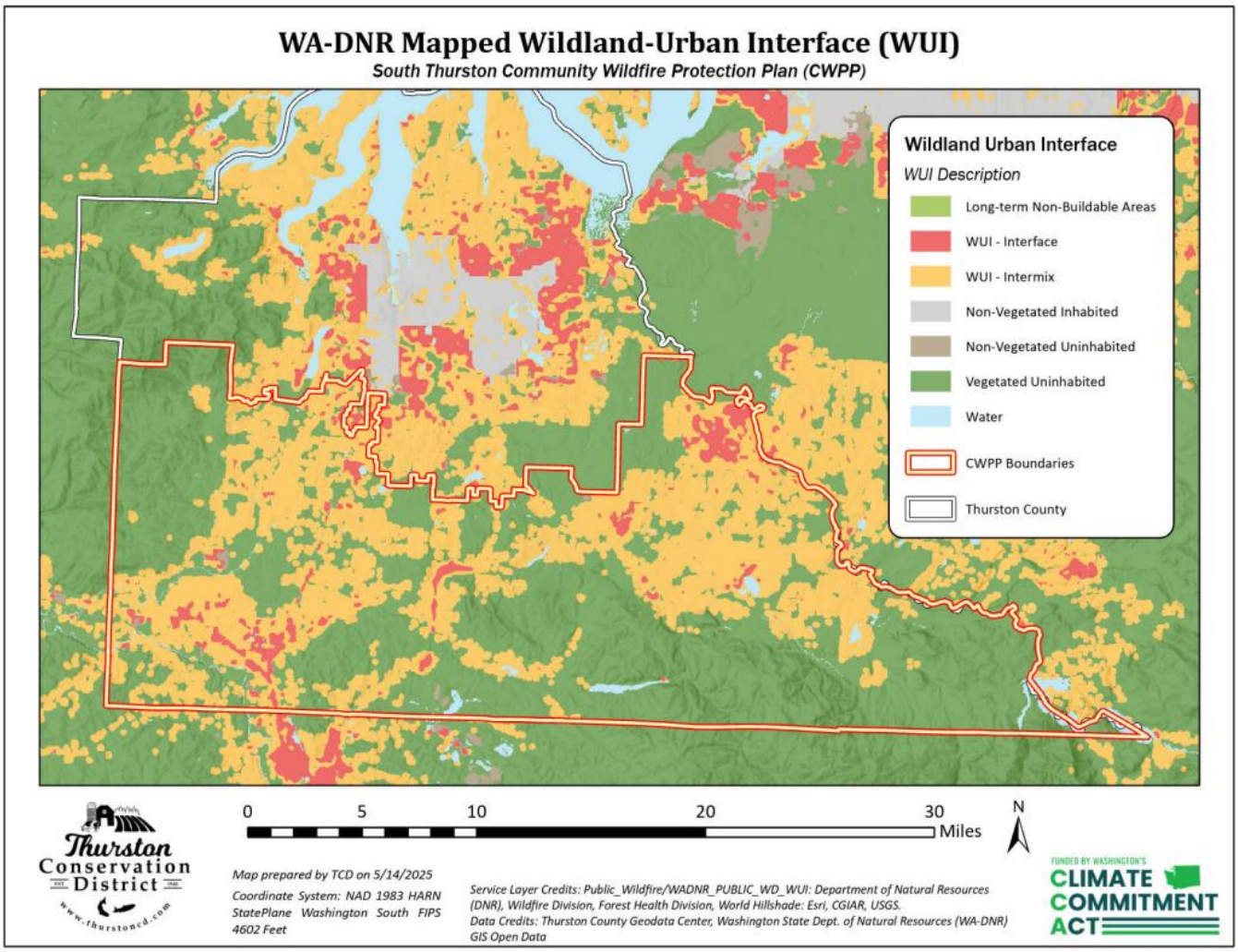

Figure 3.4. Wildland Urban Interface – Updated

This document is intended for planning purposes and should not be seen as prescriptive. For example, just because an area is identified as being within the WUI, it does not mean that it will receive treatments or projects. Those will be determined on a case-by-case basis. Each location targeted for treatments or projects has to be evaluated on its own merits: factors of structural ignitability, access, resistance to control, population density, resources for response by fire districts, and other site-specific factors. Similarly, WUI designation on national or state lands doesn't automatically signify a treatment area. Federal and state agencies still have to manage lands under their control, in compliance with relevant state and federal laws, and according to the standards and guides listed in their respective management plans, including the National Environmental Policy Act (USFS, 1970).

Treatments and projects on private lands have more flexibility, but should follow the same general procedure of local, state, and federal entities. For areas on residential land, a starting point may be a home ignition zone (HIZ) assessment, which can be acquired from the TCD or WA DNR, and addresses implicit factors of structural ignitability such as roofing, siding, deck materials, and vegetation that abut or are adjacent to structures. For more information on the HIZ, please see Chapter 5.

Home ignitability has a significant impact on wildfire and wildfire disasters in the WUI (Cohen, 2000). Treatments or projects in low population, rural areas may focus on access and evacuation routes, and alternative means of

widespread communication. Conversely, a neighborhood, with densely packed homes, surrounded by trees and dense underbrush, requires more planning and implementing of treatments and projects beyond the immediate home site. That will reduce the likelihood of a crown fire, which could put the entire neighborhood at risk (Okanagan, 2024).

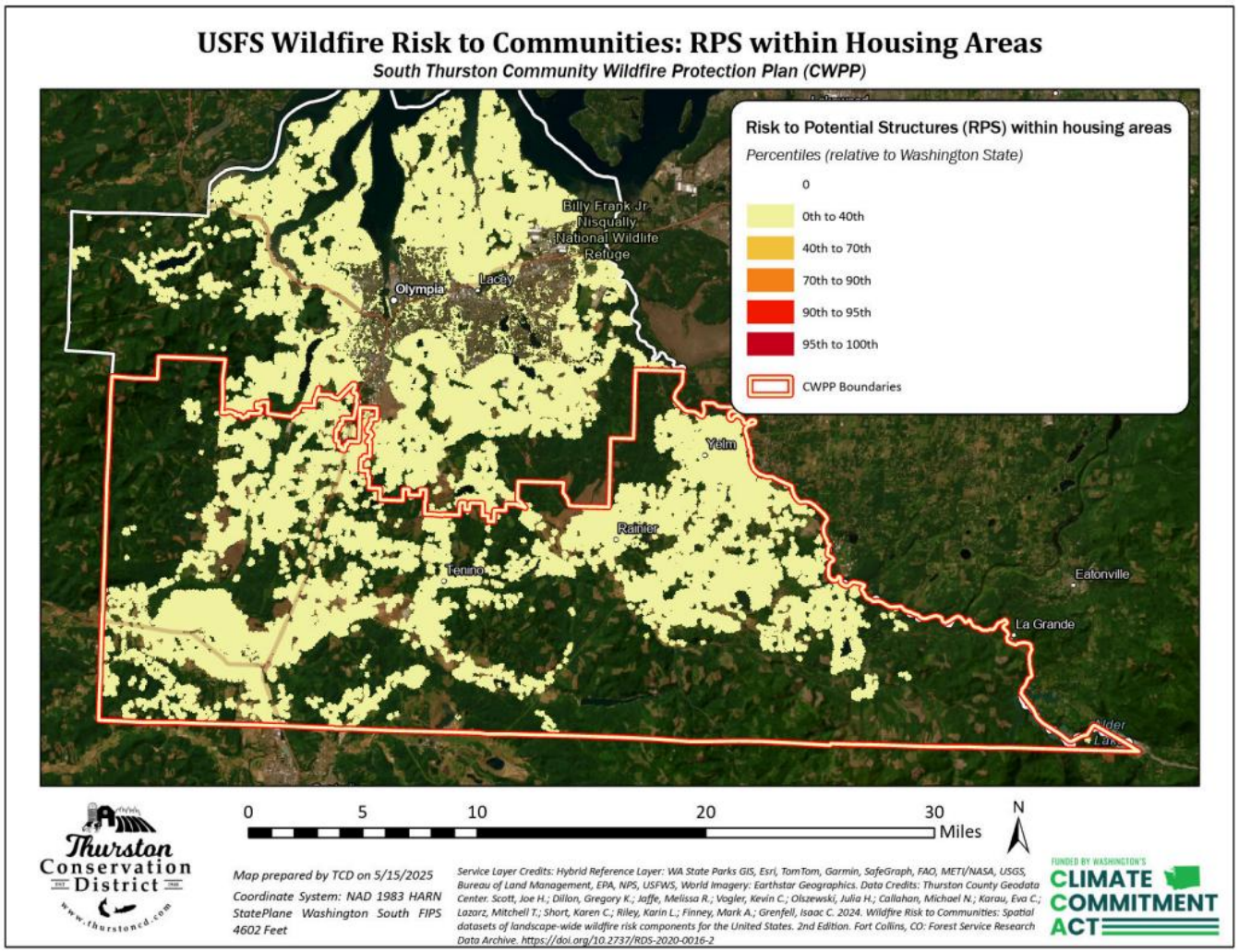

Figure 3.5. Wildfire risk to communities.

3.3 Climate Patterns and Climate Change Impacts

Climate Patterns

Thurston County experiences a temperate maritime climate characterized by mild, wet winters and warm, dry summers, with fall and spring experienced as transitional between the two extremes. With the continued impacts of climate change, winters are expected to become drier overall, but with more extreme weather events, while summers will be longer, drier, and hotter. While spring and fall will most likely be shortened and experience less rainfall, overall. Currently, winter temperatures range from the mid-30s to mid-40s Fahrenheit, with temperatures reaching their coldest in January (average lows hover around 35 Fahrenheit). Winters are wet, with the majority of the county's annual rainfall occurring between November and March (noaa.gov). Annual precipitation for Thurston County is about 50 inches, with only occasional snowfall, which averages around 6

inches per year. Those averages are expected to decrease, with weather events becoming more and more extreme, over the next few years. Summers are warmer and drier in Thurston County, with average temperatures in the mid 60's and 70's. The hottest summer month is usually July, with average highs around 77. Meanwhile, summer months see significantly less rainfall, compared to winter. While temperatures are moderate, compared to much of the rest of the state, conditions can still become hot and dry, increasing wildfire risk.

Climate Change Impacts

Overall, Thurston County's climate is influenced by its proximity to the Pacific Ocean, resulting in moderate temperatures and significant seasonal rainfall. Despite the influence of the Pacific Ocean, Thurston County is already experiencing the effects of climate change (Climate Impacts Group). Record temperatures, with previously unheard-of triple digit temperatures are now the norm throughout much of the county. In 2021, Thurston County experienced the heat bubble that enveloped much of the Pacific Northwest, with temperatures reaching 110+ in a deadly heatwave that claimed lives and threatened the entire region. While periods with triple digit temperatures are typically short-lived in Thurston County, they are a harbinger of future conditions and a symptom of current climate change impacts. Combined with overall reductions in rainfall, they increase the potential for droughts and wildfires throughout the county.

Drought is an unfamiliar term for most Thurston County residents, as historically they have enjoyed a temperate, wet climate, heavily influenced by its proximity to the Pacific Ocean. However, due to the impacts of climate change, drier months and drought conditions are becoming more frequent (Figure 3.6)

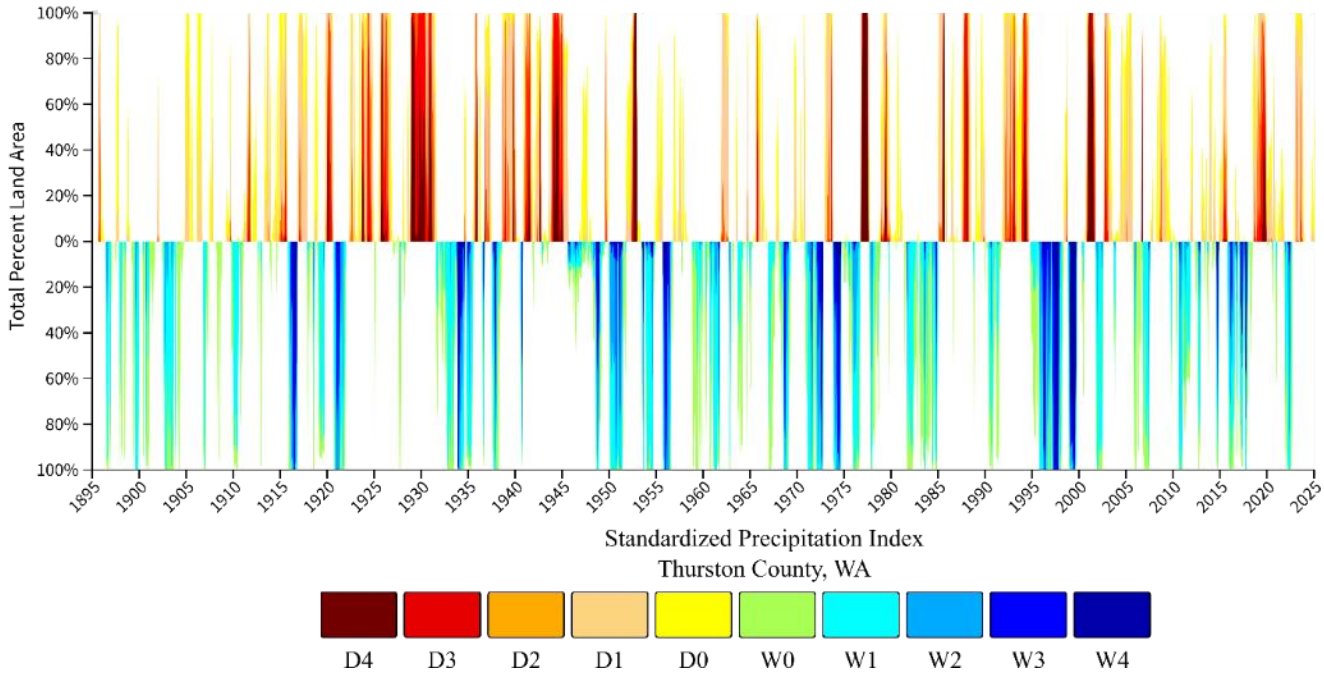

Figure 3.6. Drier than normal years have become more frequent over recent years, as the impacts of climate change have increased. (*Thurston County Conditions | Drought.gov*)

Coastal flooding and erosion are likely outcomes of rising sea leves and intensifying storms, due to climate change. While Thurston County does not have vast stretches of coastal areas, the greater Olympia region is particularly at risk of coastal flooding and erosion (Figure 3.7).

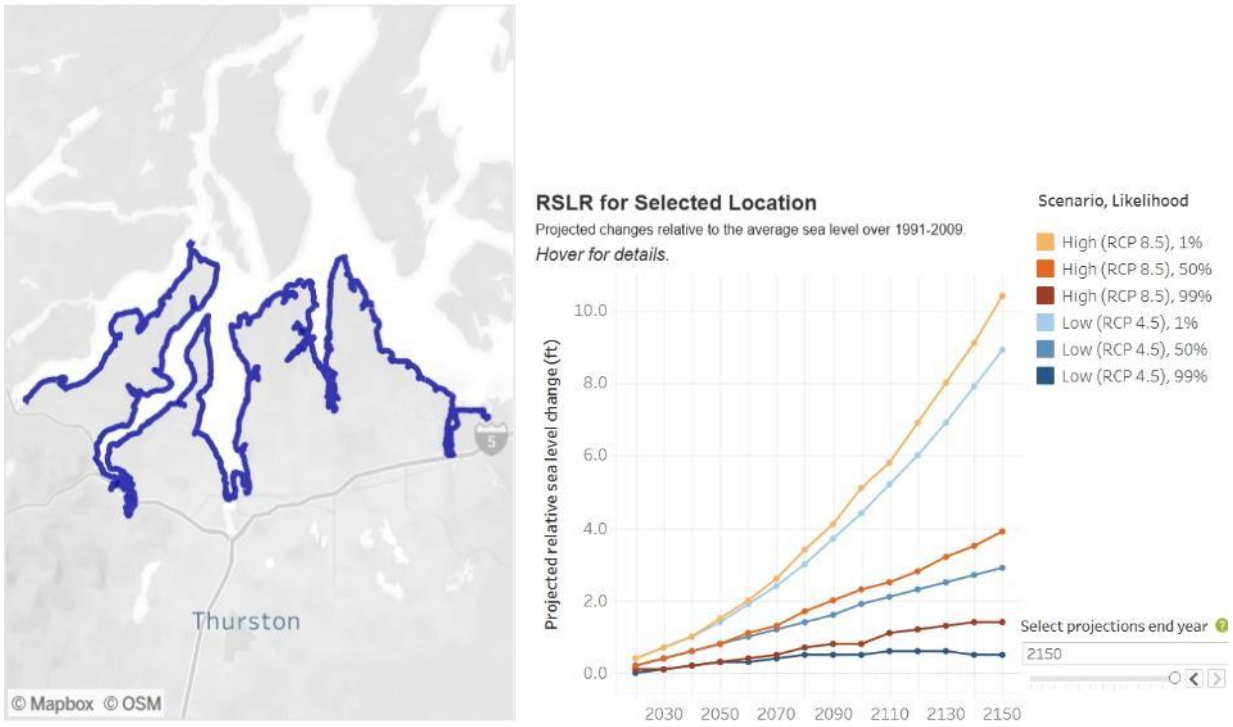

Figure 3.7 Areas in Thurston County most susceptible to coastal flooding and erosion due to sea level rise and intense storms, with projected relative sea level change through 2150. (*Interactive Sea Level Rise Data Visualizations*)

Another outcome of climate change is extreme weather throughout the year, with particularly intense storms occurring more frequently during the winter months. Intense storms destroy infrastructure and make rural roads more difficult to maintain, resulting in access issues for first responders and potential evacuation issues for residents during wildfire events. Intense storms can also hinder or damage communication infrastructure, making it more difficult to convey reliable information during wildfire events.

Mitigation and Adaptation Efforts

While very little can be done to avoid the impacts of climate change, short of drastic reductions in greenhouse gas concentrations in the atmosphere, Thurston County is actively working to mitigate the effects of climate change when possible and adapt to them when necessary to ensure a sustainable future. Thurston County has implemented several initiatives to address the impacts of climate change to ensure a sustainable future:

- **Thurston Climate Mitigation Plan**: A collaborative effort with local cities to reduce greenhouse gas emissions by 45% by 2030 and 85% by 2050 (from 2015 levels). The plan includes actions across various sectors such as buildings, energy, transportation, land use, water, waste, agriculture, and forests (Thurston Climate Mitigation Plan | Thurston Regional Planning Council, WA)
- **Thurston Climate Adaptation Plan**: Developed in 2018, this plan outlines 91 actions to help the region prepare for and adjust to the impacts of climate change (Thurston Climate Adaptation Plan | Thurston Regional Planning Council, WA)

3.4 Fuels and fire behavior, and fire history and response

Fuels and fire behavior

Wildfire is a dynamic force that requires a thorough understanding of governing fire behavior, including fuels supporting the fire, the topography of the area that is burning, and atmospheric and weather conditions during a fire. While topography and weather are beyond the control of responders, different strategies are needed for different topographies and atmospheric/weather conditions. Responders can also impact fuels that support fires. By altering fuel loads and types, including how they are configured, their condition, and their continuity in a region, we can positively impact how fires burn. Fuel is the driving force of wildfires, providing the energy needed for ignition and spread and includes anything that can burn such as live or dead vegetation or structures that can be influenced by land managers directly ("Fuels management," 2019). While Thurston County has a lower probability of wildfire than counties east of the Cascades, it still has a history of fire and important fuel sources, particularly in South County. Wildfire fuels typically include a variety of vegetation and materials that can easily ignite, sustain, and spread fire.

Fuels are organic or non-organic materials, found in the fire environment that ignite and burn. Grasses, brush, branches, logs, forest floor litter, and building materials are all examples. Fuel loading, size, shape, moisture content, continuity, and arrangement all impact fire behavior. In general, smaller and finer fuels burn faster, increasing the potential rate of fire spread. Small fuels such as grass, needle litter, and other fuels that are less than a quarter inch in diameter are most responsible for fire spread. The Labor Day fires in Southern Oregon were so destructive and spread so rapidly, in part, because they were primarily grass fires. In total, those fires destroyed more than 3,000 structures and caused millions of dollars of damage. In Thurston County, the Scatter Creek fire, fueled by grasses and young forests, destroyed 384 acres, several homes, and a historic building in the region (Chronicle, 2017).

Image 3.1. Scatter Creek Fire (4 homes destroyed in Thurston County brush fire | king5.com)

As fuel size increases, so does surface-to-volume ratio, decreasing the rate of spread. Fires in large fuels generally burn slower but release much more energy and burn with much greater intensity. This increased energy release, or intensity, makes these fires more difficult to control. Thus, it is much easier to control a fire burning in grass than to control a fire burning in timber.

When burning under a forest canopy, the increased intensity can lead to torching (single trees becoming completely involved) and the potential development of crown fires. That is, they release much more energy. Fuels are found in combinations of types, amounts, sizes, shapes, and arrangements. The unique combination of these factors and the topography and weather determines how fires will burn. Hot, dry, windy days are more likely to experience increased fire activity (Department for Environment and Water - The science behind fire...). The hotter a day becomes the more moisture the air can hold, and so the relative humidity drops (how much moisture is in the air is relative to how much total moisture the air can hold). As night air usually holds more moisture than daytime, fuels will absorb moisture from the damp night which means a decrease in fire activity. The stronger the wind, the faster the spread of the fire. It does this by providing extra oxygen to feed the fire and it also lays over the flames, which results in pre-heating and drying the fuel ahead of the fire front. Wind also carries sparks and embers ahead of the main fire, causing spot fires. An unstable atmosphere can also cause warmer air at the ground to rise, increasing wind speed and sometimes resulting in lightning activity (Department for Environment and Water - The science behind fire...).

The study of fire behavior recognizes the dramatic and often unexpected effect small changes in any single component have on how fires burn. It is impossible to speak in specific terms when predicting how a fire will burn under any given conditions. However, through countless observations and repeated research, some principles governing fire behavior have been identified and recognized and are used as best practices by fire crews throughout South County.

Grasslands

The prairielands of the South Puget Sound area once provided a natural fuel break that prevented the spread of wildfire. However, now less than 10% of Thurston County's prairies remain and in turn, increases the risk of high-intensity fires as the prairies can no longer act as fuel breaks (Franklin, 2022). Bluebunch Wheatgrass (*Pseudoroegneria spicata*),

Image 3.2. Bluebunch wheatgrass (bluebunchwheatgrass380.jpg (380×285))

a native grass that used to dominate the grasslands and prairies of South Thurston County, can also become highly flammable when dry. Combined with the invasives of Scotch broom (Cytisus scoparius) and cheatgrass (Bromus tectorum) bluebunch wheatgrass has turned South Thurston County's grasslands and prairies into the highest threats of wildfire. Scotch broom is an invasive shrub native to Europe and is prevalent along roads and prairies in South Thurston County. It secretes oils that enhance its ignitability and increase its danger as a fuel for wildfires. In Southwestern Thurston County, "WDFW uses an integrated management approach to controlling Scotch broom that utilizes cutting, hand-pulling, herbicide treatments, prescribed fire, and seeding/planting with native vegetation" to minimize the fire risk (Washington State Department of Fish and Wildlife, p. 2).

Image 3.3. Scotch broom, which is a widespread, invasive throughout South Thurston.

Cheatgrass is less successful than Scotch broom but dries out quickly and ignites easily. The Scatter Creek Wilderness Area is dominated by grasslands and prairies. The unusual circumstances of 2017, which are becoming more common due to climate change, resulted in the devastating fire mentioned above. The results from this historic wildfire event are consistent with research that Radeloff et al. (2023, p. 5) conducted, determining that "grassland and shrubland fires destroyed far more houses than forest fires, mainly because so much of the WUI in the West is dominated by grasslands and shrublands. According to the National Wildfire Coordinating Group (NWCG) grass fuels can vary from heavily grazed grass or sparse natural grass to dense grass more than 6-feet tall. In tall prairielands, fire behavior can be extreme in regard to spread rate and flame length particularly in the summer when the moisture content is low.

Brush and Shrubs

Brushes and shrubs in South Thurston County are represented by native species such as manzanita (*Arctostaphylos spp*.), known for its dense, oily foliage, it burns intensely.

Image 3.4. Manzanita shrubs

Salal (*Gaultheria shallon*) is a common understory shrub that can contribute to fire spread.

Image 3.5. Salal shrubs

While Oregon Grape (*Mahonia aquifolium*) another native shrub that can act as a ladder fuel, helping fire climb into the tree canopy.

Image 3.6. Oregon grape

Trees

Thurston County, Washington, is home to diverse tree species that dominate different regions of the county. The northern and western parts of Thurston County are dominated by conifer forests, including Douglas fir (*Pseudotsuga menziesii*), Western red cedar (*Thuja plicata*), and Western hemlock (*Tsuga heterophylla*) (Healthy Forest Project | Thurston County).

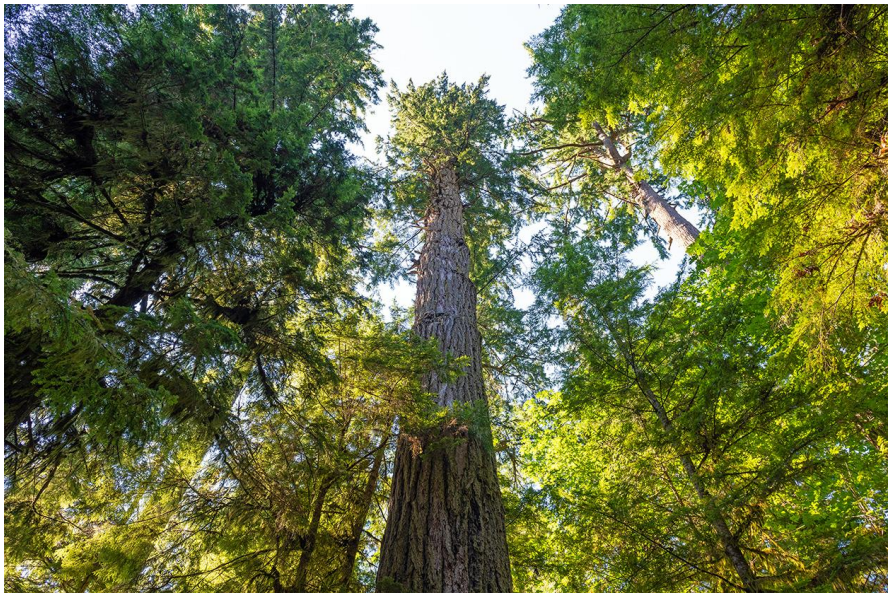

Image 3.7. Douglas Fir

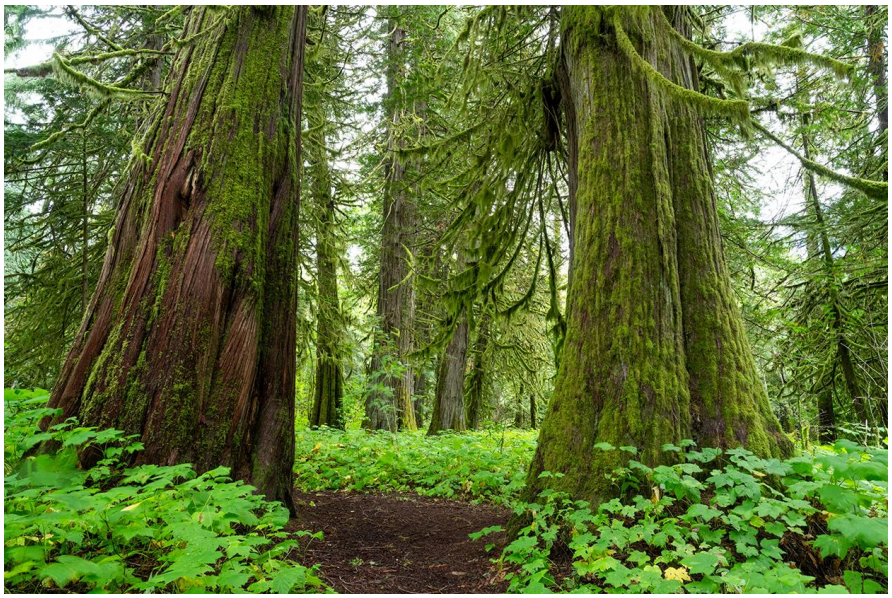

Image 3.8. Western Red Cedar

Image 3.9. Western Hemlock

While the southern area is dominated by the grasses mentioned above, they are found primarily in prairies. In those areas the most abundant tree species are Douglas fir and Lodgepole pine (*Pinus contorta*) which can take over when fire is completely suppressed.

Image 3.10. Lodgepole Pine

The southeast corner of Thurston County consists of densely forested private lands, cultivated by the timber industry. South Thurston County consists of state-and privately-owned forests, which are well-managed and monitored. A well-managed forest includes thinning to selectively remove trees to decrease density and reduce competition for resources, brush removal to clear underbrush and dead vegetation to lower fuel loads and pruning to trim lower branches to prevent ground fires from reaching the canopy (Washington Forest Protection Association). Because the forests in South Thurston County are well-maintained, fire ignitions are infrequent in these areas but do occur. In September 2023, there was a 40-acre fire in Capitol Forest due to the hot and dry conditions that can support rapid fire spread (The Olympian).

Dead and Downed Vegetation

Forested areas are habitats that present different types of fuels and resultant different fire hazards. Beyond the dominant and other tree species, dead and downed vegetation are potentially significant sources of fuels that can spark ground and canopy fires. Table 2.d.1 outlines the various fuels within forested areas that contain various levels of ignitability and fire intensity.

	Timber-Understory	Timber Litter	Slash-blowdown
Material Type	Smaller plants and forest litter beneath larger trees	Dead organic material on the forest floor (needles, leaves, and branches)	Downed trees, branches, and other debris from storms or logging
Ignitability	Can potentially ignite crown fires if conditions allow flames to reach the canopy	Dependent on the species.	Takes longer to ignite
Fire Intensity	Varies in intensity	Burns slower but will sustain a fire for a long period of time, producing heat that can persist and spread	High intensity once burning that can smolder and spread

Table 3.1. Forested habitats, fuels, and fire risks. (Western Fire Chiefs Association, n.d.)

Human Structures

Human structures that are made of wood or other organic materials are fuel sources that can help spread a wildfire once it breaches the WUI and interacts with homes, businesses, etc. Wooden fences, decks, roofs, and other structures have high ignitability and can contribute to the spread of fire. According to the National Fire Protection Association, embers and small flames from airborne wood and/or vegetation in close proximity to buildings can cause spot fires and ignite homes, debris, and other objects. Similarly, organic mulches and other landscaping plants and materials dry out and become flammable during droughts and prolonged dry periods.

Fire history and response

Compared to much of the rest of the state, wildfires are rare in Thurston County. The combination of a relatively moderate and wet climate, and effective management practices have kept the impacts of wildfire to a minimum. In total, there are 63 wildfires, on average, across the county. Most fires are caused by lightning, accidents, or arson. Accidental fires are usually caused by campfires, discarded cigarettes, and mishandled fireworks. Although most of the wildfires that break out in Thurston County are suppressed by effective local fire districts. Despite the overall favorable conditions for minimizing the impacts of wildfires, Thurston County has experienced some wildfires in recent years.

The 2017 Scatter Creek Fire (mentioned above) is one of the largest and impactful fires experienced in Thurston County. Occurring near Grand Mound, the fire began to spread rapidly, resulting in multiple evacuations. Multiple agencies responded, including air support, limiting the impact of the fire. The Mima Road Fire of 2018 near Littlerock impacted around 100 acres and was limited thanks to quick containment by local fire districts, which prevented the fire from spreading to residential areas. In 2020, the Bald Hill Fire near Yelm burned over 200 acres and forced local residents to evacuate for safety, before coordinated efforts by multiple fire departments and the Washington State Department of Natural Resources got the fire under control. That same year, the Bordeaux Fire west of Littlerock and north of Rochester burned nearly 300 acres and forced a Level III evacuation, before fire crews got it under control. The 2021 Scatter Creek Fire (reburn) impacted over 300 acres before Firefighters from Thurston and neighboring counties, including air support, managed to contain it. Figure 3.8 shows the locations of recent fires on a map of Thurston County.

NEED TO INSERT A MAP OF THESE FIVE FIRES ON THE MAP OF S. THURSTON CO.

Local Fire Agencies

- *West Thurston Regional Fire Authority* (Home | westthurstonfire) – The West Thurston Regional Fire Authority (WTRFA) is located just south of Olympia, Washington. The 158 square mile response zone stretches approximately 12 miles east and west along Interstate Five from the city limits of Tumwater to the Lewis County Line. The RFA began from the partnership between Thurston County Fire District 1 and Thurston County Fire District 11. The goal of the partnership was to maximize efficiencies and improve service delivery to the citizens of the region. The successful partnership created the fourth Regional Fire Authority (RFA) in the state of Washington.
- *South Thurston Fire EMS* (Fire Department | South Thurston Fire & EMS | United States) - South Thurston Fire & EMS (STF) is a combination fire district in western Washington, centrally located between Seattle and Portland, OR. The district protects residents in rural communities and the City of Tenino. Our area is mostly rural residential with a mixture of farmland and forest. The district's geographical location is a major thoroughfare for critical infrastructure, such as major freight and passenger rail lines, petroleum pipelines, and Bonneville Power Administration regional high voltage distributions systems. We also protect a 11,000-acre water reservoir for the nearby power plant, which our district also provides mutual aid for large incidents. South Thurston has 6 full time firefighter/EMTs

and are supported by 28 volunteers that come together to help keep our community safe. Our coverage area includes the city of Tenino, unincorporated Tenino, Skookumchuck, Gibson Valley, and Violet Prairie.

- *Southeast Thurston Fire Authority* (SETFA -) - S.E. Thurston Fire Authority (SETFA) is responsible for fire suppression, emergency medical services, rescue activities, mitigation of disasters and hazardous materials. In addition to emergency work, SETFA firefighters provide a wide range of services to the community including blood-pressure screening, tours of fire stations and apparatus, and fire and life safety presentations within the community. The Operations Division is comprised of six career fire fighters (plus volunteers) per shift operating two fire stations (Station #21 in Yelm and Station #24 in Rainier) who work alternating schedules. Fire fighters and volunteers have A, B, and C shifts; each are 48 hour shifts with 96 hours off. SETFA serves approximately 33,750 citizens who reside in the surrounding 84 square miles.
- *Bucoda FD* (Bucoda Volunteer Fire Department - Bucoda, WA (Address, Phone, and Fax)) - Bucoda Volunteer Fire Dept., located in Bucoda, Washington, is a local fire department dedicated to protecting the community from fire and other emergencies. With a commitment to safety and operational excellence, the department provides fire suppression services and responds to a variety of emergency situations.
- *Bald Hills FD 17* (*Bald Hills Fire Department – Honor, Courage, Compassion, Commitment.*) – Our, primarily, volunteer fire district is comprised of roughly 20 volunteers and 3 paid employees (1 full-time fire chief, 1 full-time captain, and 1 part-time district secretary) and is located in the rural southeast corner of Thurston County. We serve a local community of approximately 4,190 citizens, within approximately 70 square miles. We provide fire suppression and basic life support emergency medical services. Our core values are honor, courage, compassion and commitment.

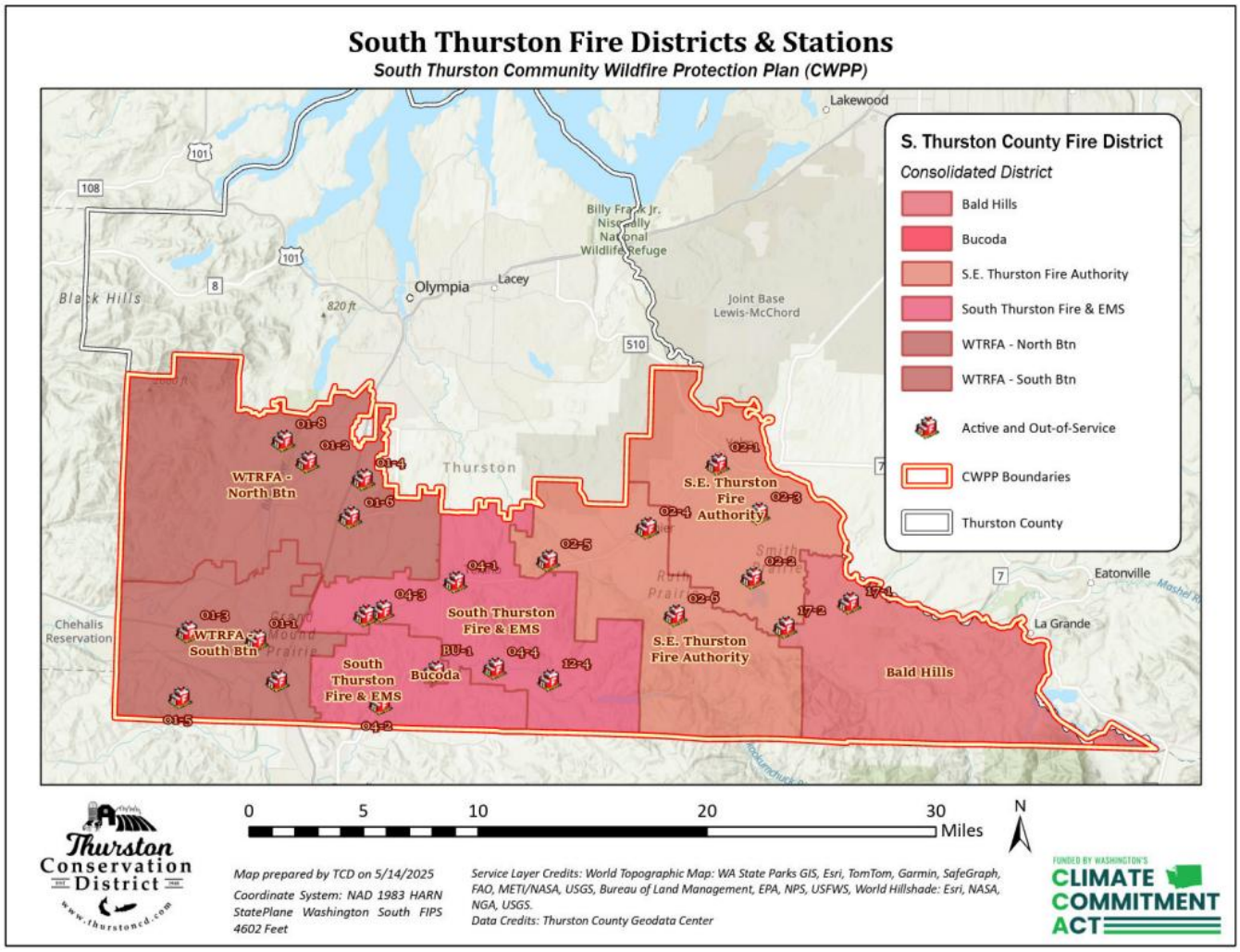

Figure 3.8. South Thurston Fire Districts

State Fire Agencies and Management

Washington Department of Natural Resources (WA - DNR) – The Washington Department of Natural Resources (DNR) has divided the state into regions to aid in management practices. Thurston County is part of the South Puget Sound Region (DNR Regions and Districts | WA - DNR). The South Puget Sound Region covers King, Pierce, Kitsap, Mason, Thurston, and parts of Snohomish, Lewis and Grays Harbor counties. Sitting between the central Cascades and the Olympic Mountains, this region is trisected north and south by Puget Sound, Hood Canal, and Lake Washington, and includes the popular Tahoma, Elbe Hills, Capitol, Green Mountain, Tahuya and Tiger Mountain State Forests. The region includes 360,000 acres of state forest, agriculture, urban, and 38,000 acres of conservation lands including Mount Si and Woodard Bay Natural Resources Conservation Areas. DNR staff manage approximately 2.5 million acres and lead wildfire prevention and fighting efforts on 1.9 million acres of state and private forestland.

3.5 Summary

The WUI in South Thurston County is defined as, "The zone of transition between unoccupied land and human development. It is the line, area or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels." A clear definition of the WUI allows for better risk assessment

and wildfire protection. Although Thurston County has, historically, enjoyed a temperate, wet climate and little danger of wildfire, climate change is increasing temperatures and dry periods throughout the region. The result is ever-increasing risks of wildfires throughout South Thurston County. South Thurston County is dominated by prairies and grasslands, which can dry out and become ignition sites and spread wildfires rapidly. There are forested areas in the region, but with proper management, these can remain low risks for wildfire. Despite several wildfires over the past few years, quick response times by multiple agencies resulted in very little damage to human life or property.

Chapter 4 – Wildfire Risk and Hazard Assessment

4.1 Purpose and Definition

Wildfires are the most frequently occurring hazard in Thurston County with a majority of these fires happening in the southern region of the county, emphasizing the need to identify wildfire risk and hazards in order to guide wildfire mitigation efforts. A wildfire risk assessment is critical to ensure that land managers and fire districts are considering the wildfire hazard potential in order to identify wildfire threats and risks to communities ("Wildfire hazard and risk assessment," 2017). Scott (2013) explains that wildfire risk is driven by the fundamental components for quantifying wildfire intensity, likelihood, and estimating the exposure and susceptibility of valued resources to wildfire. While wildfire hazard is driven by complex interactions between ignitions, fuel, topography, and weather (Scott, 2013). It's important to note that there are not universally agreed upon definitions for wildfire hazard and risk, but for the purpose of this plan, the definitions used by the fire response community are:

Wildfire Hazard: "Any real or potential condition that can cause damage, loss, or harm to people, infrastructure, equipment, natural resources, or property" (Thompson, 2016, p. 8).

Wildfire Risk: "Wildfire risk is the likelihood of a wildfire occurring and the potential effects it would have on things we care about" (U.S. Department of Agriculture, 2024, p.2).

Risk Assessment: According to the United States Department of Agriculture, a risk assessment is the "product or process that collects information and assigns values (relative, qualitative, or quantitative) to risks for the purpose of informing priorities, developing or comparing courses of action, and informing decision making" (Thompson, 2016, p. 8).

4.2. Vulnerable Communities

While the risk of wildfire can be dangerous to all affected, social and economic factors can disproportionately affect certain populations who may lack access to resources, face institutional and cultural barriers, experience limited mobility, or have pre-existing medical conditions that can be exacerbated by stress or smoke. Vargo et al. (2023) suggest that demographic, economic, institutional, and sociocultural characteristics such as socioeconomic status, household composition, racial or ethnic minority status, language, and housing type may affect an individual's ability to prepare for, respond to, and recover from wildfire smoke (p. 3).

According to the Wildfire Risk to Communities risk index, compared to the rest of the United States, South Thurston has a high percentage of vulnerable populations based on its ability to prepare for, respond to, and recover from a wildfire. As of 2023, Rochester, Grand Mound, Tenino, and their surrounding areas experience higher rates of vulnerable populations compared to the communities in Yelm, Rainier, and unincorporated towns as represented in Figure 4.1.

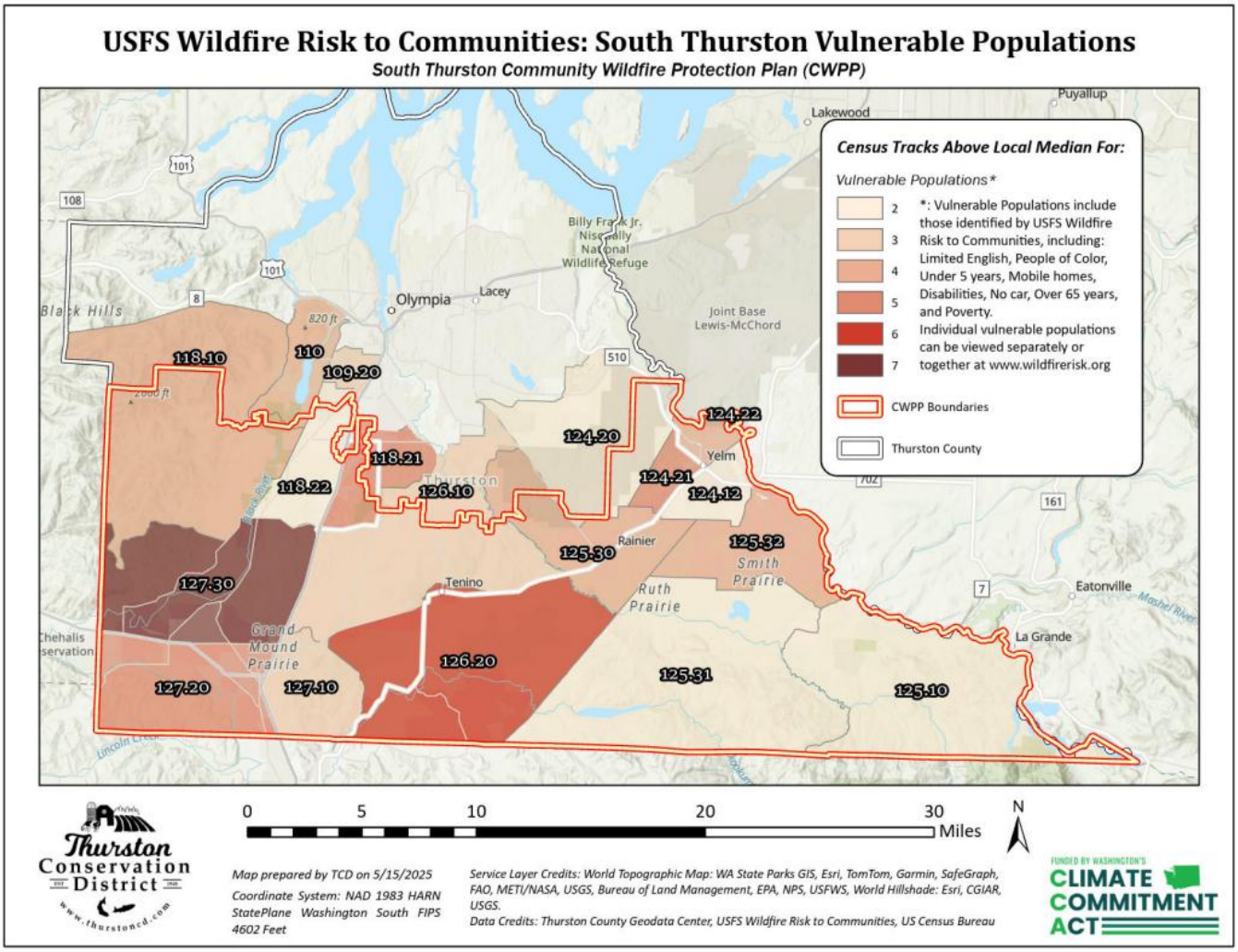

Figure 4.1. South Thurston County Vulnerable populations

4.3 Air Quality Impacts

Color (Values)		Activities
	Green – Good (0-50)	Air pollution is low
	Yellow – Moderate (51-100)	Some people are more sensitive to lower levels of particle pollution.
	Orange – Unhealthy for sensitive groups (101-150)	Unhealthy for sensitive groups
	Red – Unhealthy (151-200)	Everyone should reduce exposure (spend less time outside)
	Purple – Very unhealthy (201-300)	Everyone should reduce exposure (avoid outdoor activity)
	Dark Red – Hazardous (301+)	Everyone should reduce exposure (stay inside)

Table 4.1. Air Quality Index for PM 2.5

It's important to recognize the threat of air quality that accompanies wildfire and the harmful effects it causes for communities. The EPA warns that Particulate Matter (PM), specifically PM2.5 which is less than 2.5 micrometers and is made up of combustion particles and organic compounds is the air pollutant of greatest concern to public health from wildfire smoke as it can travel deep into the lungs and may even enter the bloodstream ("Why wildfire smoke is a health concern," 2025). As demonstrated in Table 4.1, an air quality index (AQI) higher than 150 can be hazardous to all groups regardless of age and health. Those with respiratory or cardiovascular disease, older adults, pregnant women, children, outdoor workers, and those with lower socio-economic status are at greatest risk of health effects from wildfire smoke.

According to the Washington State Department of Health, data from 2016-2022 suggests that the wildfire smoke cumulative score in Thurston County based on summer days with higher concentrations of smoke is considered low. This information suggests that air quality is not a high concern in South Thurston, but it is important to assess the conditions in the event of wildfire. PM2.5 concentrations are one of the top pollutants of concern in Thurston County and are below the National Ambient Air Quality Standards (NAAQS) for PM2.5 set by the Clean Air Act as outlined in Figure 4.2. The NAAQS identifies two types of air quality standards, *primary standards* which provide public health protection and *secondary standards* which provide public welfare protection against decreased visibility and damage to animals, crops, vegetation, and buildings ("Air Quality," n.d.). The EPA strengthened the NAAQS standards on February 7, 2024, by lowering the annual level of the PM2.5 standard from 12.0 micrograms per cubic meter to 9.0 micrograms per cubic meter to increase public health protection.

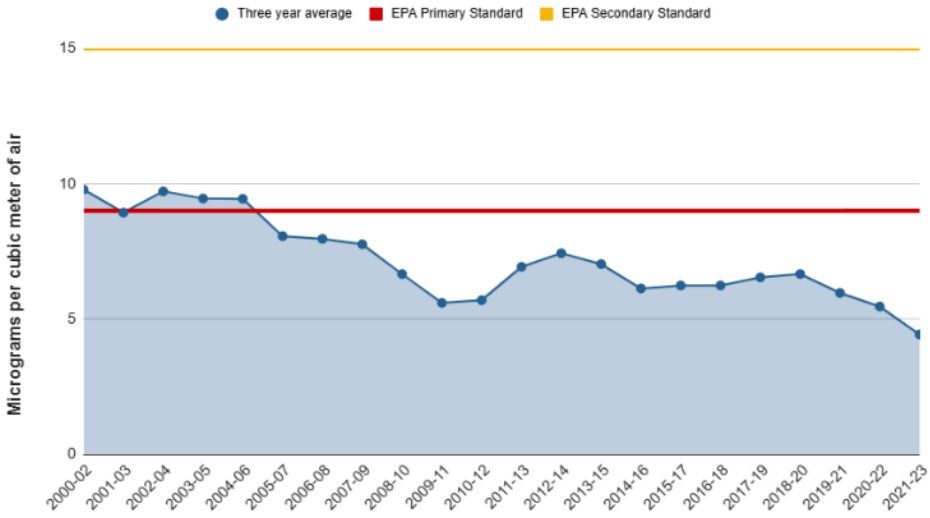

Figure 4.2. Thurston Regional Planning Council PM2.5 Data

4.4 South Thurston County Risk Assessments

Fire district representatives within South Thurston and WA DNR in conjunction with the Stakeholder Advisory Group established the following fire districts in South Thurston as the highest risk regions for wildfire: The S.E. Thurston Fire Authority (SETFA), South Thurston Fire and EMS (STF), West Thurston Regional Fire Authority (WTRFA), and Bald Hills Fire. These four major fire districts in the region were identified as the highest need areas for risk assessments due to the variance in fuel types from WTRFA district which is home to many grass and prairie lands which become increasingly forested as you go east through STF district to the SETFA district. Each fire district also encompasses different community assets, faces various vulnerabilities, works with a variety of different jurisdictions, and has its own plan for evacuation and shelter in the event of a wildfire. Fire

district representatives associated with each fire district provided the following assessments of wildfire risk for their departments:

4.4.1 Wildfire Risk Assessment: South Thurston Fire & EMS

Image 4.1. South Thurston Fire & EMS Fire Engine

Community Assets

STF encompasses a variety of community assets ranging from water towers in Tenino to the Bonneville Power Administration high voltage transmission lines that run through the fire district. Further STF protects an 11,000-acre water reservoir located at the Skookumchuck Dam for the Centralia Coal Plant, residential homes and home development sites, and private forest land holdings.

Challenges

As the years progress, the number of wildfires continue to increase, which is coupled with limited resources and funding, presenting a major challenge for the fire district. This puts a large responsibility on the public to harden their homes and reduce fuel loads, which calls on the fire district to educate the public on these procedures, requiring resources for training. Additionally, access to private timber holding lands presents a challenge for STF as there are not shared keys to their gates.

Vulnerabilities

A lack of resources plagues many of the fire districts including STF which affects the ability of initial deployment on a wildfire due to limited staffing when a wildfire call initially goes out. Additionally, many communities in this fire district live in one-way-in and one-way-out presenting vulnerabilities for evacuation.

Multi-Jurisdiction Response

STF works with WTRFA, SETFA, and East Olympia Fire District 6 on initial callouts for larger fires. Mutual Aid is also called to DNR if a fire occurs on DNR land or threatens DNR Land.

Evacuation Plans

STF does not have maps of pre-planned large evacuation routes should a wildfire occur which has been identified by the Fire Chief as a top priority to address for this fire district. While there is not a wildfire-specific

evacuation plan, Thurston County Emergency Management's (TCEM) Emergency Support Function 13: Public Safety, Security, and Law Enforcement (ESF-13) outlines public safety responsibilities during emergencies. This includes coordinating evacuations of residents, when necessary, to protect the public. Thurston County Sheriff's Office is the lead agency for evacuations in unincorporated Thurston County. Thurston County Emergency Management is responsible for the county's mass notification system, TC Alert, to issue risk communications (Appendix). "Evacuation", to ESF-13 offers the following additional details:

- Standard procedures for evacuation
- Job aids
- Templates for tactical planning
- Pre-scripted public messaging regarding evacuation levels in English, Spanish, and Vietnamese

4.4.2 Wildfire Risk Assessment: S.E. Thurston Fire Authority

Image 4.2. S.E. Thurston Fire Authority Fire Engine

Community Assets

In the Yelm and Rainier areas, key assets at risk from wildfire include residential neighborhoods in the urban-wildland interface, schools, critical infrastructure (power lines, water towers, and communication towers), agricultural lands, and forested recreational areas. The region also includes vulnerable populations, such as elderly residents and families living in rural areas with limited access to emergency services.

Challenges

Some potential challenges include limited staffing and resources during peak wildfire season, because of EMS calls happening along with long response times in remote areas, and access issues due to limited roadways and private property restrictions. Public awareness and preparedness can also be inconsistent, especially in newly developed neighborhoods near forested areas.

Vulnerabilities

Yelm and Rainer have a significant wildland-urban interface (WUI), with homes and structures built close to dense vegetation and forests. There are also areas with heavy fuel loads, lack of defensible space, and older infrastructure not designed to withstand wildfire conditions. Some neighborhoods have single access roads, increasing the risk during evacuations.

Multi-Jurisdiction Response

SETFA works closely with neighboring fire districts, DNR, and local law enforcement for larger wildfire incidents. The fire district commonly coordinates with Lacey Fire District 3, East Olympia Fire District, Bald Hills Fire Department, South Thurston Fire and the occasional JBLM Fire. Geographically, the department has overlapping response areas in rural Thurston County and portions of southern Pierce County, especially in areas with limited coverage.

Evacuation Routes

Evacuation planning varies depending on the area. In general, major highways like SR 507 and SR 510 serve as primary evacuation routes, but many residential areas, particularly in rural Rainier and outskirts of Yelm, have only one way in or out. We would like to shore up communications on identifying alternative routes, pre-planning evacuation zones, and coordinating with law enforcement and emergency management to improve evacuation procedures.

4.4.3 Wildfire Risk Assessment: West Thurston Regional Fire Authority

Image 4.3. West Thurston Regional Fire Authority Fire Engine

Community Assets

WTRFA has several community assets at risk from wildfire including many residential neighborhoods and commercial buildings within the WUI. Wildfires are also a threat to key community infrastructure with several

schools, power infrastructure (powerlines and substations), telecommunication tower and our own fire stations at risk. Other economic assets at risk include agricultural lands, timber land, recreational areas, and local tourism. With main throughfares through the area including the I-5 freeway and State Highway 12, economic impacts may be felt through the region outside the fire area. The region also includes vulnerable populations, such as elderly residents and families living in rural areas with limited access to emergency services.

Challenges

Staffing is a significant challenge for this fire district. WTRFA staffs three fire stations 24/7 with a fire engine, a water tender, a brush truck, and an ambulance at each station. WTRFA uses a cross-staffing approach which can prohibit timely response to a wildfire if a unit is out of service for a call when a wildfire occurs. Additionally, WTRFA is a medical transport agency that requires fire personnel to transport patients to distant locations which can lengthen the response time to a wildfire.

Water supply is also a challenge for WTRFA as the fire hydrants in this fire district are concentrated in neighborhoods and population centers such as Rochester and Grand Mound, creating a lack of hydrants in the more rural areas. Additionally, there is not an adequate water supply for larger fires such as the Bordeaux fire which required water tenders to fill up five miles from the fire.

Vulnerabilities

WTRFA faces a variety of wildfire-related community vulnerabilities that elevate the risk of severe wildfire events. Much of the region lies within the wildland-urban interface (WUI), where homes and infrastructure are closely integrated with grass and forest lands, increasing the likelihood of wildfire impacts. With in these WUI areas many properties lack defensible space, and some areas have limited water supply or narrow roads that hinder firefighting access. The presence of overgrown vegetation and accumulated fuel loads further elevates wildfire risk. Additionally, growing residential development and high-traffic transportation corridors like I-5 and U.S. Route 12 add complexity to emergency response efforts. Recent residential and commercial developments, and surrounding infrastructure have increased population density potentially straining emergency services and resources. Our community also has parts of the population that may lack awareness or resources to adequately prepare for wildfire events.

Multi-Jurisdiction Response

WTRFA receives mutual aid response from neighboring fire districts in Thurston County as well as Grays Harbor and Lewis Counties. DNR also assists WTRFA in responding to wildfires by supplying fire engines, hand crews, and helicopters for larger fires. WTRFA may also receive regional mobilization from Pierce, Mason, Lewis, and Grays Harbor Counties which provides quick response for incidents that are rapidly escalating. In extreme cases, WTRFA can request state mobilization which provides more resources for a longer duration that can last up to days.

Evacuation Routes

There are several communities in WTRFA's fire district that that have only one way in and one way out without any formal evacuation plans. One example is the Bordeaux Ranch housing community which was affected by the 2020 Bordeaux Fire that destroyed around 290 acres of land and forced over 100 homes in this community to evacuate. Since then, the Bordeaux Homeowners Association has partnered with DNR to help develop agreements with adjacent property owners to allow emergency access in the event of a wildfire to provide an additional egress option beyond the one way in and one way out road.

4.4.4 Bald Hills Fire Department

Image 4.4. Bald Hills Fire Department Water Tender

Community Assets

Regarding structure protection, Bald Hills protects approximately 3,710 single family residences, which includes communities in the Clearwood Community Association, Single Tree Estates, Driftwood Valley Association, Trails End/Falling Horseshoe Community, and Cougar Mountain. Not only does the fire district protect structures in these communities but they also protect Clearwood Community Association's two reservoir tanks which provide 605,000 gallons of potable water storage for roughly 1,400 residences. There is also an active elementary school on the National Historic Registry with a student body of roughly 500 children, a small convenience store, and a camp and conference center (which hosts first through twelfth grade groups, families, church groups and weekend to multi-week events involving 300 to 1,000 additional people). Additionally, Bald Hills serves a portion of the Snoqualmie National Forest, portions of Tacoma Power, Alder and La Grande hydroelectric dams, Elbow Lake State Park, Deschutes Falls County Park, and three private airfields.

Challenges

Like most fire agencies in Thurston County, Bald Hills budget is derived from assessed property values. Of the 70 square miles of response area, 44 square miles is unimproved forestland which is taxed when the timber is harvested and is based on a 70-year timber growth cycle. Further, the highest value properties the fire district protects are tax-exempt, meaning that the fire district does not receive funding for a significant portion of the services they provide.

Vulnerabilities

Bald Hills vulnerabilities regarding wildfire include limited routes of access and egress. Bald Hills Road SE is the primary route in and out of the district, leaving communities in a vulnerable situation during a wildfire due to congestion on Bald Hills Road SE. Additionally, communities in remote locations would be particularly compounded by the number of small farms and residents with large animals attempting to evacuate.

Multi-Jurisdiction Response

Bald Hills receives mutual aid from neighboring fire districts within Thurston County and Pierce County. Additionally, the Fire District is a signed participant in the Washington State Homeland Security Region 3 (HSR3) Mutual Aid Omnibus Agreement, which authorizes Grays Harbor, Lewis, Mason, Pacific, and Thurston counties to provide assistance to each other as requested (Homeland Security, 2024). Bald Hills also receives

mutual aid from JBLM and has signed an agreement with DNR to receive mutual aid through the Federal Labor Relations Act (FLRA).

Evacuation Routes

While Bald Hills does not have any formal evacuation routes, the fire district has engaged with landowners such as Weyerhaeuser to discuss the potential of utilizing their privately owned gravel roads in the event of an emergency, but there is no standing agreement. If an agreement does get formalized with Weyerhaeuser, the standard response would be for Weyerhaeuser engineers to first assess road conditions, before authorizing their employees to mark egress routes prior to public use.

4.5 Community Values

Community surveys, community engagement meetings, and input from the Stakeholder Advisory Group have aided in identifying community values that are at risk of destruction due to wildfires. These include natural, socioeconomic, and cultural values that communities within South Thurston represent which are at risk of potential exposure should a wildfire occur. While these values to the community have been identified, it's important to note that there are a number of factors to be considered in order to fully prioritize areas for treatment including but not limited to funding available, land ownership constraints, and other relevant barriers to treatment.

4.5.1 Ecological Values (add descriptions)

South Thurston is home to many natural resources that face risk from wildfires such as threatened and endangered species, sensitive habitats, watersheds, forests, parks and open spaces. The following have been identified as notable ecological values by the general public and land managers:

Washington State Forest Land

As mentioned in Chapter 2.9.1, Capitol State Forest provides endless recreation opportunities and is home to many native species. Additionally, the state forest encompasses trust lands which are managed to provide sustainable revenue to support schools, state universities, and local county public services. The state forest is also a timber-producing forest which is used as a source of trust land revenue through timber production and biomass products.

Prairie/Grasslands Home to Native Threatened Species, Endangered, and Sensitive Species

Some of the most valuable native Puget Sound prairies remain in existence today in South Thurston including Mima Mounds Natural Area Preserve and Bald Hills Natural Area Preserve managed by Washington State Department of Natural Resources. Additionally, Scatter Creek Preserves are managed by Washington Department of Fish & Wildlife, and Glacial Heritage Preserve is managed by the Center for Natural Lands Management.

Wildlife managers aim to protect the Mima Mound geologic landforms, prairielands, and forest and oak woodland at Mima Mounds. The Mima Mounds was designated as a National Natural Landmark in 1966 by the National Park Service which is only 1 of 17 landmarks in Washington State. Bald Hills Natural Area Preserve supports grasslands in addition to Oregon White Oakland and streams. The 314-acre site protects four state Sensitive plant species, including common blue-cup, nuttall's quilwort, California sword fern, and small flowered trillium.

The Scatter Creek Preserves includes the Violet Prairie Wildlife Area which covers about 1,040 acres and is home to the threatened Mazama Pocket Gopher. West Rocky Prairie Wildlife Area is also part of Scatter Creek

which encompasses riparian, wetland, forest habitats, and native Oregon White Oak. The above prairielands offer habitat for the Taylor's checkerspot butterfly and Oregon Vesper Sparrow which are both endangered.

Water Resource Inventory Areas 11 and 13

Washington is divided into 62 Watershed Inventory Areas (WRIAs) based on the natural flow and geography of watersheds. WRIAs are defined by higher elevation areas that capture precipitation and funnel rain and snowmelt through smaller subbasins into streams, tributaries, and rivers which results in varied water availability from location to location. There are two WRIAs that run through South Thurston, the Nisqually Watershed (WRIA 11) and the Deschutes Watershed (WRIA 13).

In South Thurston, The Nisqually Watershed flows through JBLM and the Nisqually Tribal Reservation which is the home of the ancestral Nisqually people, to Yelm, and bypasses Rainier encompassing a broad range of land uses and jurisdictions. The basin originates from five separate glaciers on Mount Rainier and is one of the least developed and most pristine rivers in Washington (Nisqually Indian Tribe, 2016).

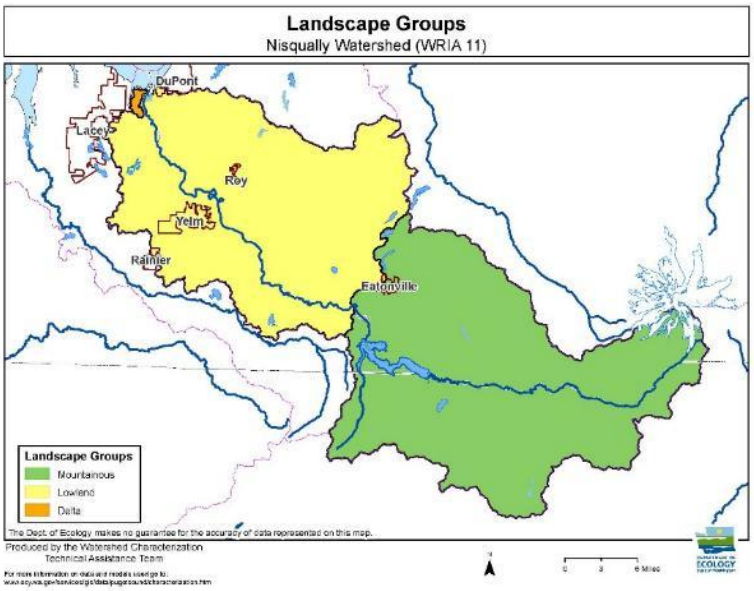

Figure 4.3. Nisqually Watershed WRIA 11

According to the Capitol Land Trust, the Deschutes River is one of the largest rivers in Thurston County and flows over 57 miles from its headwaters in the Snoqualmie National Forest into Capitol Lake. WRIA 13 is located in the lower Puget Sound, primarily in Thurston County and includes Johnson, Lincoln, and Michell Creeks which are all South Thurston tributaries ("WRIA 13 Deschutes Watershed Water Availability," 2022).

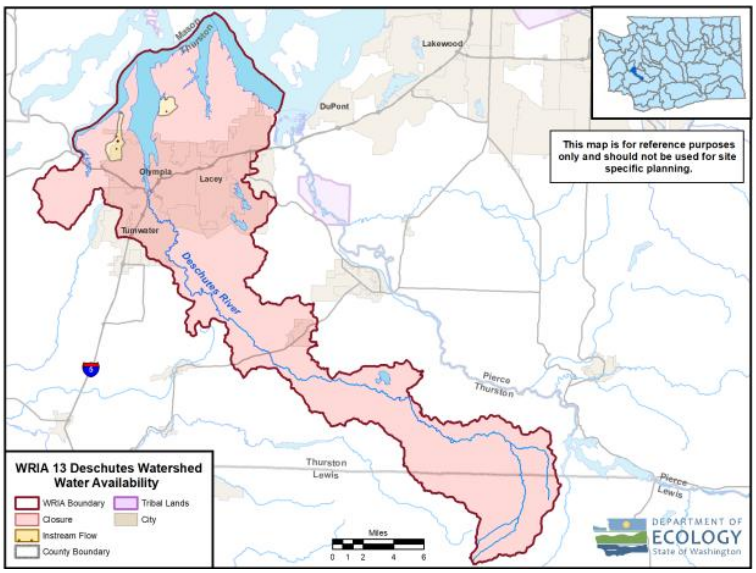

Figure 4.4. Deschutes Watershed WRIA 13

4.5.2 Socioeconomic Values

Agriculture and livestock have remained a staple in South Thurston since the mid-1800's, which is recorded as the timeframe when Ignatius Colvin started his homestead now known as the Colvin Ranch. In South Thurston agricultural products range from grain and beans, vegetables, fruits and berries, eggs and meat, nursery plants, and other crops including hay.

Many of the ranches and farms in South Thurston exist in rural areas, resulting in unique fire response challenges including longer response times to rural locations which extend the burn time and lack of water access due to a limited number of fire hydrants (Carrilo, n.d.). Ranchers in South Thurston have identified the need to develop wildfire planning and mitigation strategies specific to rural farms and ranches due to the additional challenges they face. Many of the farms and ranches in the region have prairie habitat which cattle rely on for forage for up to half of the year. Destruction of prairie lands could result in a significant cost for ranchers to switch to hay for livestock consumption.

Most ranches in South Thurston are also situated on timberlands which Figure 4.5 provides a conceptualization of, presenting another wildfire risk for ranchers. Highway 507 runs through the Riverbend Ranch, a three-generation cattle ranch requiring regular maintenance of grasses to ensure grass length is kept short along the highway to reduce the risk of wildfire ignition from roadway fires which have the potential to spark long grasses along the road.

Wildfire risk will vary for each agricultural business in South Thurston depending on the variables such as the size of the farm or wellbeing needs for livestock. While wildfire destruction to any size of farm or ranch in South Thurston would be devastating, the smaller ranches and farms will likely face increased devastation as a wildfire can easily wipe out a 1–3-mile parcel of land or livestock which could significantly impact the socioeconomic state of a small farming or ranching operation. Further, wildfire smoke poses a huge concern for ranchers and farmers with cattle and other livestock making the animals more susceptible to respiratory and stress-induced diseases and requires extra monitoring.

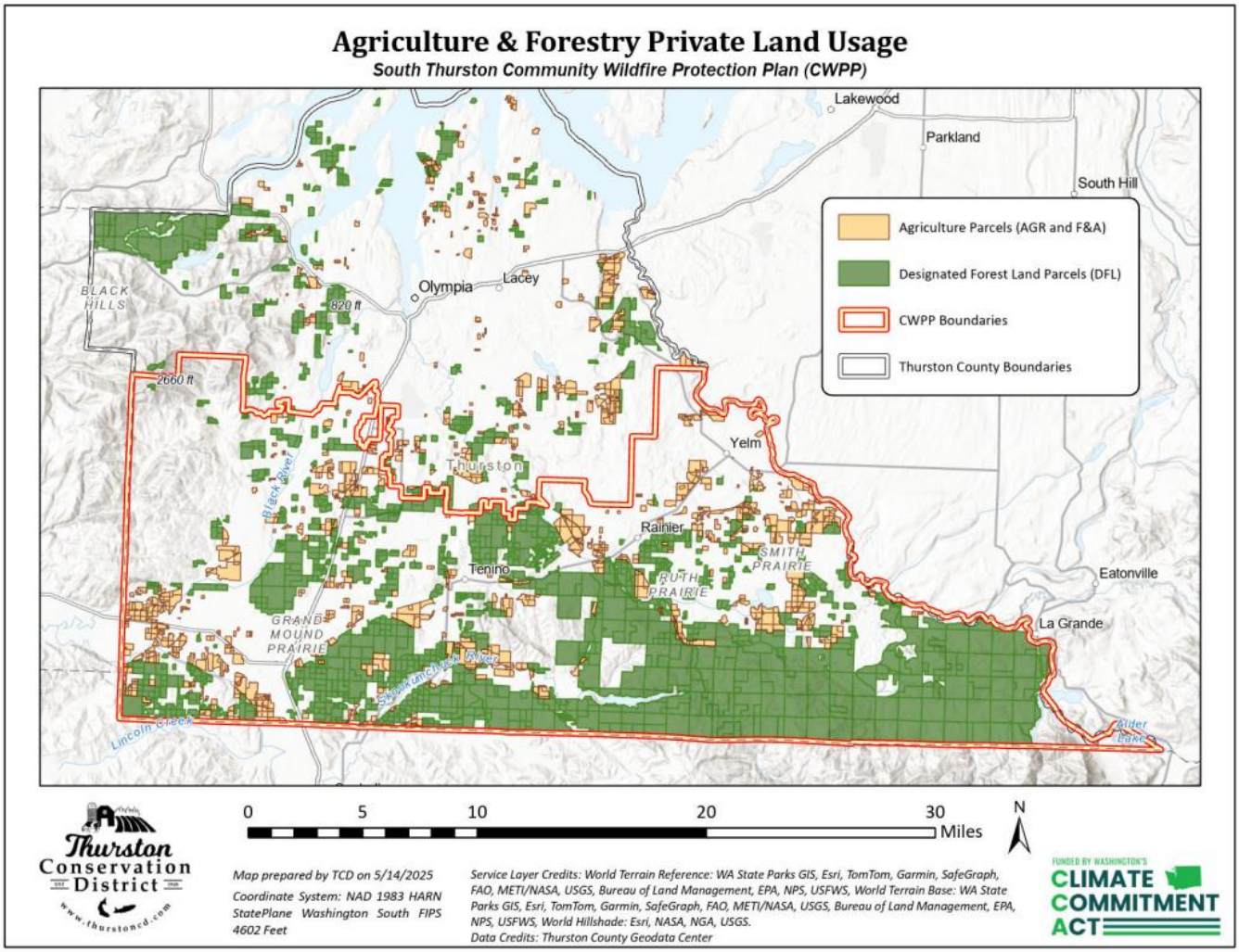

Figure 4.5. Agriculture and Forest Lands in South Thurston County

4.5.3 Cultural Values

South Thurston is home to twelve historic buildings that are registered through the National Register of Historic Places, serving as cultural touchstones for many. Many of these historic buildings have been preserved to hold the same charm they once held, making these culturally and historically valuable features to Southern Thurston County residents. Many of the homes outlined in Table 4.2 are associated with famous people such as Ignatius Colvin.

Ignatius Colvin, a well-known homesteader who traveled the Oregon Trail and arrived in Washington in 1851 from Boone County Missouri built the Colvin House in 1877 on land that still operates as a ranch today by the fourth generation of Colvin's (Reeves-Rush, 2021). This is one of only three century-old ranches left in Thurston County. This historic building is not only central to the history of the Colvin family but it's part of a generational ranch that has raised cattle for 170 years and is one of the top grass-fed beef and pork producers in Western Washington.

Building Name	Town	Periods of Significance	Historic Function	Current Function
Rutledge, George Washington, House	Littlerock	1850-1874	Domestic	Domestic
Rutledge, Thomas, House and Barn	Littlerock	1850-1949	Agriculture/Subsistence, Domestic	Agriculture/Subsistence, Domestic
Rainier School	Rainier	1900-1949	School	Vacant/Not in Use
Miller-Brewer House	Rochester	1850-1900	Domestic	Domestic
Erickson, Jonas, and Maria Lovisa, Farmstead	Rochester	1875-1974	Agriculture/Subsistence, Domestic	Agriculture/Subsistence, Domestic
Jaaska House and Warehouse	Rochester	1875-1949	Commerce/Trade, Domestic	Unknown
Gate School	Rochester	1900-1949	School	Meeting Hall
Rochester Elementary	Rochester	1925-1949	School	School
Colvin House	Tenino	1875-1949	Agriculture/Subsistence, Domestic	Agriculture/Subsistence, domestic
Lackamas School	Yelm	1900-1949	School	Domestic, Social, Work in Progress
Rice, L.N. House	Yelm	1900-1949	Domestic	Domestic
Johnson House	Yelm	1925-1949	Domestic	Domestic

Table 4.2 Historic Buildings in South Thurston County

Chapter 5 – Fire Adapted Communities, Wildfire Mitigation, & Adaptation Strategies

5.1 Existing Wildfire Mitigation Projects

Wildfire mitigation and planning is a priority for nonprofit organizations, fire districts, community members, city and county employees, and federal and state agencies in south Thurston County which is emphasized by the 20 projects outlined in table 5.1.1. The Stakeholder Advisory Group identified these existing wildfire mitigation projects in South Thurston County that are ongoing or are implemented for a limited duration to manage fuel loads, support and deploy programs and activities that encourage individual and community action to reduce structural ignitability, or convene wildfire-based community groups, and educate the public on wildfire risk.

5.1.1 Fire Adapted Communities

Fire adapted communities are communities that have accepted the responsibilities that come with living with wildfire. Fire adapted communities take proactive measures to minimize the risks posed by wildfire and to reduce their vulnerability. This includes implementing fire-resistant building practices, creating defensible spaces around properties, and engaging in community-wide preparedness efforts. The development of this Community Wildfire Protection Plan is an important first step for South Thurston County to become a Fire Adapted Community.

Effectively developing a fire-adapted community requires a combination of community outreach and education efforts, activities to aid in reducing structural ignitability, the development of Firewise and Home Hardening practices, and programs for establishing and maintaining defensible space throughout an area. This is often most effectively accomplished by establishing an Advisory Group, which tracks the efforts of the community. The formation of an Advisory Group emphasizes that wildfire resilience requires residents to actively participate in mitigating wildfire risk and not be complacent in their roles and responsibilities.

5.1.2 Public Education and Outreach Recommendations

Like environmental hazards, human hazards must be addressed to reduce the risk of fire loss. Lack of knowledge, lack of positive actions (e.g., failing to create adequate defensible space), and negative actions (e.g., keeping large amounts of flammable debris and rubbish on the property) all contribute to increased risk of loss due to wildfire. Community Outreach and education has been identified by the fire district representatives from WTRFA, SETFA, and STF as one of the most critical priorities for South Thurston County. They note that communities like South Thurston County in Western Washington, in particular, are not accustomed to living with wildfire. However, due to the impacts of climate change, even South County is dealing with droughts, increasing summer temperatures, and a new fire regime, that will require a new cultural approach to fire and preparing for its impacts.

Knowledge and awareness of individual and community impacts on wildfire risk can help with this culture shift, while reducing the occurrence of human caused wildfires. The reduction of human caused wildfires reduces the burden of wildfire response from WTRFA, SETFA, and STF, who face constant staffing challenges. This category of projects encompasses outreach of programs such as Wildfire Ready Neighbors and Firewise USA. It also includes outreach of local wildfire planning and awareness events, which are designed to share priorities around wildfire preparedness and ensure that local communities are aware of current resources and information.

Improving public education and outreach can include various methods and efforts which can range from educating the public about fire departments and their needs to community cleanups of green waste. WTRFA, SETFA, and STF could partner with TCD and TCEM to provide workshops at demonstration sites showing Firewise landscaping techniques or fuels treatment projects. "Model" homes and businesses could be established throughout the area that provide examples of Firewise landscaping and fire-hardening. Agencies should practice "Targeted Outreach" toward seasonal and recreational visitors as well as vulnerable populations, such as elderly resident and communities that may have egress issues. Service agencies and their non-profit partners should build coordination and trust among homeowners/landowners and land management agencies to implement fuel treatments and better maintain existing treatments to improve the interface between public and private land in the area. Importantly, service agencies in Fire Adapted Communities should keep track of and publicize the availability of government funds for treatments on private land.

Each of the fire districts relies heavily on social media to share information on their programs and activities. These efforts have been well received by the South Thurston County community. Further, the Thurston Conservation District regularly updates their Community Wildfire Resilience webpage which contains resources for Wildfire Ready Neighbors and Firewise programs. This webpage also links to the Community Wildfire Protection Plan webpage which has resources on what a CWPP is, what the process looks like, and when the meetings are. One of the elements missing that was recognized by the stakeholder group during our meetings was a centralized location for all wildfire information. While it is important for each of the agencies mentioned above to continue to maintain their efforts online, a centralized location, with verified, reliable information could make a big difference in a rural area like South Thurston County. One possibility would be for Thurston County Emergency Management to provide the community with a webpage that could act as a clearinghouse for all wildfire information for the area.

5.1.3 Reducing Structural Ignitability Recommendations

South County is vulnerable to wildfire due to its dense vegetation and proximity to forested areas. Reducing ignitability of structures is crucial to protect lives and property. A key resource for reducing structural ignitability is participation in community programs like Firewise USA® and Wildfire Ready Neighbors. These programs offer resources and support for homeowners to reduce wildfire risks.

5.1.4 Firewise

Firewise USA® (https://www.nfpa.org/Public-Education/Firewise-USA) is a program that encourages local solutions for wildfire safety by involving homeowners in taking individual responsibility for protecting their homes from the risk of wildfire. The program provides a framework to help neighbors get organized, find direction, and take action to increase the ignition resistance of their homes and community.

5.1.5 Home Hardening

Builders, developers, and homeowners need to ensure that structures are built or retrofitted with fire-resistant materials. Roofs should be built with Class A fire-rated roofing materials like metal, tile, or asphalt shingles. Siding should be non-combustible materials such as stucco, brick, or fiber-cement and windows should be double-pane or tempered glass, which reduces the risk of breakage during a fire. Beyond the construction materials used, installing metal mesh screens over vents and openings and sealing gaps around roofs, eaves, and siding helps prevent embers from entering structures.

Home hardening also includes regular maintenance including cleaning gutters and roofs of debris, inspecting and repairing damage of fire-resistant materials, and trimming trees and shrubs regularly. In addition to home construction and maintenance, homeowners should create evacuation plans and practice them regularly. They

should make sure to install fire alarms and ensure they are functional, and they need to keep emergency supplies readily available.

5.1.6 Defensible Space

Defensible spaces around homes and other structures help slow the progress of approaching wildfires by removing or reducing flammable materials. This buffer zone can significantly alter the fire's intensity and direction, making it less likely to reach and ignite structures. Statistics show that homes with properly maintained defensible space are much more likely to survive wildfire (https://www.ready.gov/wildfires). A well-maintained defensible space provides firefighters with a safer environment to work in, increasing the chances of saving structures. It ensures that firefighters have clear and accessible areas to operate, which is crucial during emergency response efforts.

Defensible spaces are typically divided into three distinct zones, each with specific recommendations for vegetation management and fuel reduction:

> **Zone 1:** Immediate Zone (0-5 Feet): Remove all flammable materials, use non-flammable landscaping materials, and keep plants small and well-watered.
>
> **Zone 2:** Intermediate Zone (5-30 Feet): Reduce vegetation density, prune trees, and create breaks in the vegetation to slow fire spread.
>
> **Zone 3:** Extended Zone (30-100 Feet): Maintain low vegetation, remove dead plants, and ensure trees are spaced to prevent fire from jumping between them.

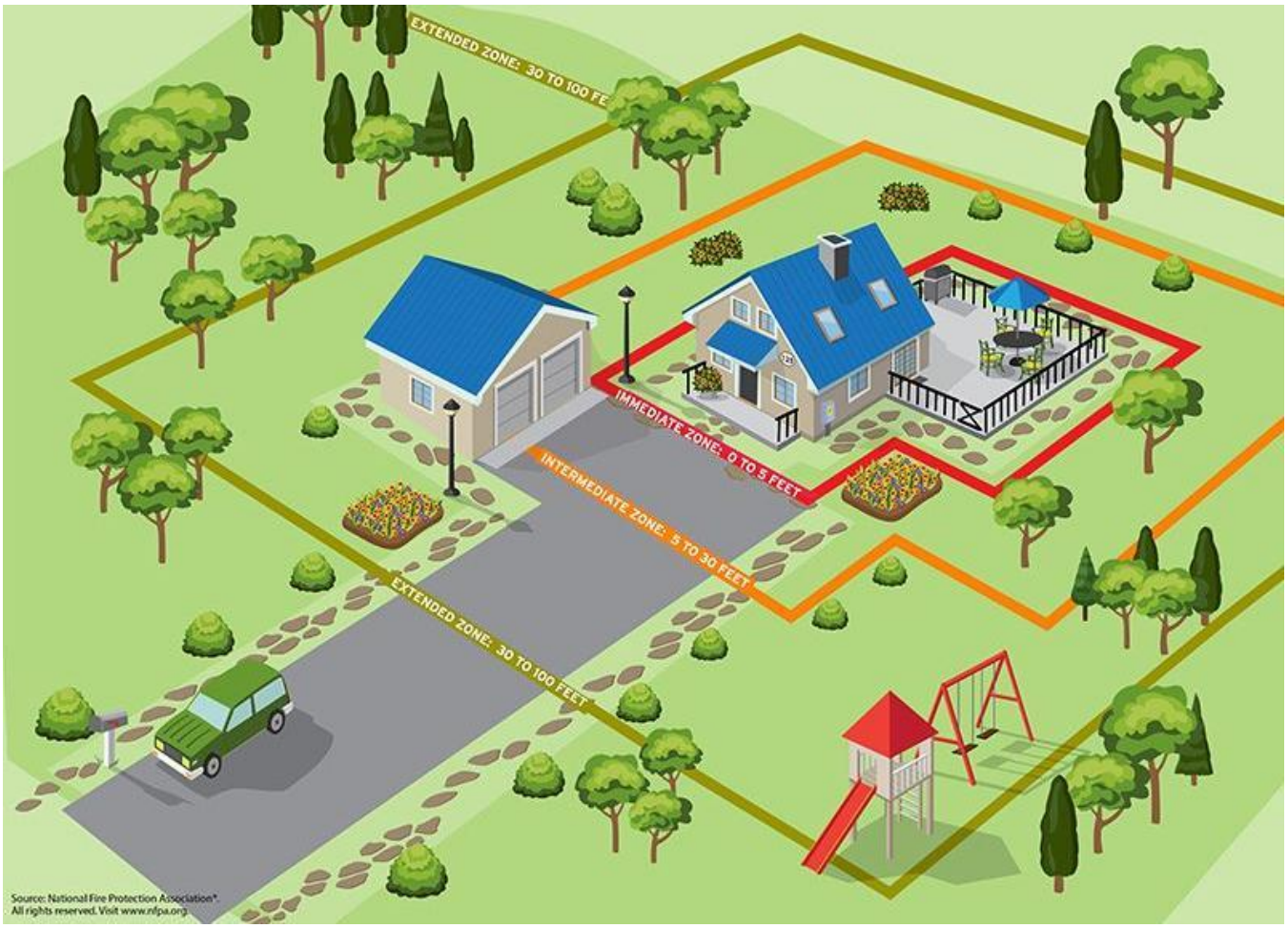

Image 4.1 Home Ignition Zone (HIZ) and Defensible Spaces. (www.nfpa.org)

Defensible spaces are fortified by trimming trees and shrubs regularly and using fire-resistant plants and materials in landscaping. By planting fire-resistant species such as lavender (Lavandula), sage (Salvia), rockrose (Cistus), California fuchsia (Epilobium canum), or red hot poker (Kniphofia) and using non-combustible materials like gravel, stone, or sand further reinforce the defensible space around structures.

Defensible spaces don't just protect property; they safeguard lives. They provide a safer zone for residents and emergency responders during an evacuation or firefighting effort. This can be critical in ensuring everyone's safety during wildfire. Wildfires don't respect property lines. By creating defensible spaces, homeowners collectively reduce the fuel available for fires, protecting entire neighborhoods and communities. This collective effort can significantly lower the overall risk of wildfire damage in an area. Defensible spaces are part of broader strategies that include building design, community education, and proactive land use planning. Together, these measures enhance the long-term resilience of communities against wildfires, ensuring they are better prepared and more resistant to wildfire threats.

5.1.7 Fuel Reduction

As emphasized in section 3.4, south Thurston County contains a variety of vegetative fuels including grasslands/prairies, brush and shrubs, trees, and dead and downed vegetation. State agencies such as WDFW and WDNR are leading the way in managing and reducing vegetative fuels through prescribed burns, mowed fire

breaks, and invasive species management. Current wildfire mitigation projects exist on and adjacent to roadways, near WUI communities, and provide opportunities for private landowner actions.

The Stakeholder Advisory group also identified high-risk areas to wildfires which include communities within the WUI boundary as well as areas outlined in section 3.6 that describes ecological, socio-economic, and cultural values within south Thurston County that are important to the community due to the contribution of essential natural resources, the economic benefits they provide, and historical value they hold.

5.1.8 Table Legend:

The legend below is used to outline elements of wildfire mitigation projects to indicate the timeline and priority of the project as well as the category that the project type falls into. The parameters outlined in this legend are utilized in Tables 5.1.1 and 5.2.1.

Project Status/timeline

Year-Round (YR)	Projects that continue year-round.
Seasonal (S)	Projects that occur only during specific seasons.
Short-term (ST)	Projects that will run from 1-2 years and then end.
Mid-term (MT)	Projects that will run from 2-5 years and then end.
Long-term (LT)	Projects that will run for 5+ years and then end.

Project Priority

Low Priority (L)	Non-urgent projects to be implemented when there is available time, capacity, and resources to limit wildfire risk but will not prevent harm to life and values.
Medium Priority (M)	Projects with a flexible timeline to be implemented as soon as time, capacity, and resources are available due to the potential impact they can play in reducing harm to life and values.
High Priority (H)	Projects that need to be implemented as soon as possible and have the greatest impact to life, critical infrastructure, and coordination.

Project Type

Item A	**Fire Adapted Communities**	Community group engagement and public education efforts and fire prevention and mitigation efforts through programs and activities that encourage individual and community action such as home hardening.
Item B	**Fuel Reduction**	Small and large-scale treatments to mitigate vegetative and structural fuels.
Item D	**Wildfire Response**	Emergency management planning to coordinate people and resources.

5.1.9 Detailed Existing Wildfire Mitigation Projects

Item #	Project Name	Land Ownership	Description	Project Type	Status/ Timeline	Priority
A1	**Community Education - All-hazards, Including Wildfire**	County (Thurston County Emergency Management)	Tabling at public events, public outreach presentations, annual Preparedness Expo, education on TC Alert (mass notification system).	Fire Adapted Communities: Community Outreach and Education	**YR**	**Medium Priority**
A2	**Wildfire Ready Neighbors Launch**	Fire District (SETFA)	Partnering with DNR to promote the Wildfire Ready Neighbors and Firewise Programs. Held a launch event on April 26, 2025, to bring together key stakeholders and provide signup opportunities for home/property wildfire risk assessments.	Fire Adapted Communities: Reducing Structural Ignitability	**YR**	**High Priority**
A3	**Firewise USA – Kerbaugh/76th**	Nonprofit (Thurston Conservation District)	Ingress/egress improvement project. On track for 20% of Kerbaugh/76th residents to receive WRN visits in 2025.	Fire Adapted Communities: Reducing Structural Ignitability	**YR**	**High Priority**
A4	**Firewise USA – Wilderness Property Owners' Association (WPOA)**	Nonprofit (Thurston Conservation District)	Greenbelt invasive species removal, greenbelt chipping and removal of downed woody material, and on track for 10% of WPOA residents to receive Wildfire Ready Neighbors visits in 2025.	Fire Adapted Communities: Reducing Structural Ignitability	**YR**	**High Priority**
B1	**JBLM Prescribed Burns**	Federal (JBLM)	The JBLM Environmental Division conducts prescribed burns every summer at various locations around the base to reduce fuel loads and enhance fire-dependent habitats.	Fuel Reduction	**YR**	**High Priority**
B2	**JBLM Slash Pile Burns**	Federal (JBLM)	Slash pile burns take place in the fall and winter to reduce the risk of fire spreading into fuels around the pile.	Fuel Reduction	**YR**	**High Priority**
B3	**Scatter Creek Wildlife Area Prescribed Burns**	State (WDFW)	Prescribed burns take place in summer. Burn area ranges in size from about 5-30 acres.	Fuel Reduction	**S**	**High Priority**

Item #	Project Name	Land Ownership	Description	Project Type	Status/ Timeline	Priority
B4	**West Rocky Prairie Wildlife Area Prescribed Burn**	State (WDFW)	Prescribed burns take place in summer. Burn area ranges in size from about 5-30 acres.	Fuel Reduction	**S**	**High Priority**
B5	**Violet Prairie WLA Prescribed Burn**	State (WDFW)	Prescribed burns take place in summer. West of Tenino. Burn area ranges in size from about 5-30 acres.	Fuel Reduction	**S**	**High Priority**
B6	**Scatter Creek Unit Mowed Firebreaks**	State (WDFW)	30m property perimeter mow breaks on prairie lands to mow internal roads as internal fire breaks. Deploy portable water tanks.	Fuel Reduction	**S**	**High Priority**
B7	**West Rocky Prairie Unit Mowed Firebreaks**	State (WDFW)	30m property perimeter mow breaks on prairie lands. Mow internal roads as internal fire breaks. Deploy portable water tanks.	Fuel Reduction	**S**	**High Priority**
B8	**Violet Prairie Unit Mowed Firebreaks**	State (WDFW)	30m property perimeter mow breaks on prairie lands. Mow internal roads as internal fire breaks	Fuel Reduction	**S**	**High Priority**
B9	**Scatter Creek Wildlife Area - All Units Invasive Management**	State (WDFW)	Scotch Broom and invasive grass control. Various tactics are used including prescribed fire and mowing on roadside.	Fuel Reduction	**YR**	**High Priority**
B10	**Mima Mounds Natural Area Preserve Prescribed Burns**	State (WDNR)	Burn area ranges in size from about 5-30 acres.	Fuel Reduction	**S**	**High Priority**
B11	**Mima Mounds Natural Area Preserve Firebreaks**	State (WDNR)	10-30 ft contingency and property perimeter mowed breaks. Mow internal road(s). Deploy portable water tanks.	Fuel Reduction	**S**	**High Priority**
B12	**Rocky Prairie Natural Area Preserve Prescribed Burns**	State (WDNR)	Burn area ranges in size from about 1-10 acres.	Fuel Reduction	**S**	**High Priority**

Item #	Project Name	Land Ownership	Description	Project Type	Status/ Timeline	Priority
B13	**Rocky Prairie Natural Area Preserve Firebreaks**	State (WDNR)	10-30 ft contingency and property perimeter mowed breaks - mow perimeter road. Deploy portable water tanks.	Fuel Reduction	**S**	**High Priority**
B14	**Mima Mounds & Rocky Prairie Natural Area Preserves Invasives Management**	State (WDNR)	Scotch Broom and invasive grass control. Various tactics are used including prescribed fire and mowing on roadside adjacent to Bordeaux Estates.	Fuel Reduction	**YR**	**High Priority**
B15	**Tenalquot, Deschutes River Ranch Prescribed Burns**	Nonprofit (Center for Natural Lands Management/Ecostudies Institute)	These sites have been purchased by CNLM to restore and protect this prairie habitat to increase resilience against wildfires.	Fuel Reduction	**YR**	**Medium Priority**
B16	**Conservation Grazing**	Private (Colvin Ranch)	Thurston County Early Blue Site and WDFW Violet Prairie site, rotational grazing to manage excess forage.	Fuel Reduction	**S**	**Medium Priority**

Table 5.1. Existing Wildfire Mitigation Projects

5.2 Recommended Wildfire Mitigation Projects

This section includes recommended projects identified by the Stakeholder Advisory Group and technical experts that are not currently implemented but were determined to aid in reducing wildfire risk in south Thurston County. It's important to note that these projects also address fire adapted communities, fuel reduction strategies, as well as a third category focused on wildfire response.

5.2.1 Wildfire Response Projects

Improving wildfire response capabilities has been identified as an essential project category to incorporate well-coordinated and efficient fire response strategies. These strategies can include the development of formal evacuation plans created in partnership by fire districts and Thurston County Emergency Management. Finding increased capacity for home or community wildfire assessments can increase preparedness and awareness to enhance community wildfire preparedness among communities which is a key factor in supporting local fire department response to ensure that residents are abreast of evacuation plans and emergency protocols. Water availability is also a challenge in south Thurston County that can prohibit departments from executing safe and effective wildfire response so exploring techniques for capturing water to utilize during wildfires will effectively improve wildfire response, particularly in rural areas.

5.2.2 Alignment with CWPP Objectives

The recommended projects in table 5.2.1 align with CWPP core values that aim to accomplish the objectives from Chapter one.

5.2.3 Recommended Project Guidelines

Projects on city, county, and state-owned lands will require coordination with representatives to complete proper documentation and secure necessary permissions by the lead agencies to meet compliance requirements. The recommended projects listed below is not exhaustive and serves to provide a baseline of recommended projects for the future management of south Thurston County. Many projects may be eligible for grant funds available from federal and/or state sources.

5.2.4 Detailed Recommended Wildfire Mitigation Projects

Item #	Project Name	Project Lead	Description	Project Type	Status/ Timeline	Priority
A3	**Increased community outreach**	Stakeholders/Community Members	Broaden outreach to various audiences and increase the frequency of outreach being shared via social media, fliers, newsletters, local news outlets, etc.	Fire Adapted Communities: Community Outreach and Education	**YR**	**High Priority**
A4	**Education on rarely accessed resources**	Thurston Conservation District/State Agencies/Fire District Representatives	Understand what community resources are underutilized and increase outreach and awareness to varying audiences via social media, fliers, newsletters, local news outlets, etc.	Fire Adapted Communities: Community Outreach and Education	**YR**	**High Priority**
A5	**South Thurston CWPP Committee**	Thurston Conservation District	Develop and maintain a committee who will lead annual updates to the CWPP.	Fire Adapted Communities: Community Outreach and Education	**YR**	**High Priority**
A2	**Develop an interagency hazards assessment group**	Stakeholders/Community Members	Quarterly or bi-annual group that meets to discuss projects identified in CWPP and other documents, funding, etc.	Fire Adapted Communities: Community Outreach and Education	**YR**	**Medium Priority**
A6	**Central Location to house wildfire planning resources and information**	Thurston Conservation District	TCD to host and maintain a webpage on their website with wildfire related information so community members know how to respond in the event of a wildfire.	Fire Adapted Communities: Community Outreach and Education	**YR**	**Medium Priority**

Item #	Project Name	Project Lead	Description	Project Type	Status/ Timeline	Priority
A1	**Develop a Prescribed Burn Association**	Thurston Conservation District	TCD to help lead the development of a Prescribed Burn Agency to provide essential information and training.	Fire Adapted Communities: Community Outreach and Education	**YR**	**Low Priority**
A7	**Creating a fire adapted communities' network**	Thurston Conservation District	Convene a network of communities to network and coordinate on wildfire planning programs.	Fire Adapted Communities: Reducing Structural Ignitability	**YR**	**Medium Priority**
B2	**Scotch broom control on properties surrounding Mima Mounds**	State (DNR & USFS)	A few properties near/adjacent to Mima Mounds have large areas of dense, mature broom. Owners may or may not be motivated to control it, but fire prevention reasons and funding programs may help.	Fuel Reduction	**S**	**High Priority**
B1	**Violet Prairie Unit SCWLA - Forest Thinning**	State (WDFW)	Thinning conifer from oak savannah/woodlands; reducing shrub understory and breaking-up fuel structure.	Fuel Reduction	**ST**	**Low Priority**
C1	**Find increased capacity for wildfire assessments**	Individual Landowners/DNR/USWS Partners Program	Research funding opportunities to conduct regular home and business wildfire assessments.	Wildfire Response	**MD**	**High Priority**
C2	**Fire District 2 Evacuation Plan**	SETFA	SETFA to partner with Thurston County Emergency Management to identify primary and secondary evacuation routes.	Wildfire Response	**ST**	**Medium Priority**
C4	**Expand on and develop evacuation management procedures and tools**	Thurston County Emergency Management		Wildfire Response	**MD**	**Medium Priority**

Item #	Project Name	Project Lead	Description	Project Type	Status/ Timeline	Priority
C3	**Water tank to recapture reclaimed water**	Department of Ecology	Department of Ecology to partner with cities quantify the loss of water by creating water tanks to capture reclaimed water to be used for wildfires and emergencies.	Wildfire Response	**YR**	**Low Priority**

Table 5.2. Recommended Wildfire Mitigation Projects

5.3 Summary

The mitigation and adaptation strategies recommended in this chapter have been shown to be effective in protecting against wildfires, and should be employed by residents, communities, and government agencies at every level. However, the projects and approaches listed here are not meant to be an exhaustive list. Nor can any projects or fire-hardening efforts guarantee that any given property will not suffer negative impacts from wildfire. Past experience from wildfires across the U.S. have shown, though, that those communities that are proactive in taking steps to mitigate and adapt to life with wildfires experience less damage and loss due to wildfires.

Chapter 6 - Monitoring & Evaluation Strategies

The Stakeholder Advisory Group, signatories to this plan, and community members involved in the development process desire a living plan that will be regularly updated and monitored. Developing a CWPP requires an investment of time and money, motivating the Stakeholder Advisory Group to track recommended projects, goals, and objectives and ensure they are being accomplished on schedule. As the plan evolves, there may be a need to adjust expectations to recommended projects such as predicted leads, timelines, and project descriptions.

6.1 Monitoring Group: CWPP Committee

Project monitoring and tracking will be a collaborative effort from the CWPP Committee outlined in Table 5.1. Considering that individuals in the current Stakeholder Advisory Group may shift due to changes in jobs, retirement, etc., the Stakeholder Advisory Group will transition into a committee of key delegates from agencies and organizations that will continue monitoring the plan.

Agency/Organization	Committee Role
Cities	
City Representatives (Rainier, Tenino, and Yelm)	Member
County	
Thurston County Emergency Management	Convener/Member
Federal Agencies	
Joint Base Lewis McChord	Member
Fire Districts	
Bald Hills Fire	Member
Southeast Thurston Fire Authority	Member
South Thurston Fire & EMS	Member
West Thurston Regional Fire Authority	Member
Landowners	
Colvin Ranch, Riverbend Ranch, Nelson Ranch, Weyerhaeuser, & Wolf Haven International	Members
Nonprofit	
Thurston Conservation District	Convener/Member
State Agencies	
Washington State Department of Fish & Wildlife	Project Tracker/Member
Washington State Department of Natural Resources	Project Tracker/Member

Agency/Organization	Committee Role
Tribes	
Chehalis Tribe	Member
Nisqually Tribe	Member

Table 6.1. CWPP Committee

6.2 Proposed Monitoring Strategies

Table 6.2 outlines monitoring strategies the Stakeholder group identified to ensure that ongoing and recommended projects from Chapter 4 are being monitored to track project successes.

Strategy	Tool/Task	Lead	Impact
Project Tracking System	Forest Health Tracker to track fuel reduction projects, wildfire response projects, and where WRN home visits are happening	DNR	Track projects implemented on the landscape
Monitor upcoming wildfires: Wildfire acres burned, human injuries/fatalities, infrastructure loss, environmental damage, and suppression costs.	NFIRS Data/DNR Data	CWPP Committee	Compare to 5- or 10-year averages to understand wildfire prevalence
Stakeholder Group to Convene Annually	Report on project progress	CWPP Committee	Monitor project status and updates to the plan
Number of acres treated by fire breaks, prescribed burns, and invasive management.	GIS/GPS? Photographic record?	CWPP Committee members (WDFW, DNR, JBLM)	Evaluate reduction in fuel loads
Number of WRN home assessments	Records on TCD Website	Homeowner/TCD	Structure Protection
Number of Firewise projects	Records on TCD Website	Neighborhoods/DNR/TCD/Fire Districts	Structure Protection
Education outreach: number and types of involvement	Attendance at workshops, classes, and field trips, and participation on surveys	CWPP Committee	Evaluate Culture Change
Number of residents/citizens participating in plan projects and events	Attending events,	CWPP Committee	Evaluate Culture Change
Development of evacuation management procedures and tools	Evacuation Plans Developed with Fire Districts	Thurston County Emergency Management	Improving Coordination and Emergency Preparedness

Table 6.2. Proposed Monitoring Strategies

6.3 Monitoring Strategy Implementation

The goal for this plan is to implement fuel reduction, fire adapted community, and wildfire response projects that have been recommended. There are 20 current and ongoing wildfire mitigation projects that have already been implemented by stakeholders that they will continue to lead, support, and monitor. Implementation of projects will be tailored to the specific needs of the community and will depend on available funding and resources.

6.4 Timeline for Updating the Plan

It's important to acknowledge that while CWPPs are intended to reduce the risk of wildfire for communities in a particular region, those communities will change over time, and an effective plan must be malleable enough to change so that it can meet the community's needs. Growth, expansion, urbanization and the influx of industry can all have significant impacts on wildfire risk. Further, additional factors such as the impacts of climate change can result in higher risk areas emerging over time. It's critical that the CWPP Committee evaluating the plan keeps pace with the changing environment to ensure that the resultant impacts are reflected in plan updates. Periodic, regular evaluations of this plan will allow the CWPP Committee to gather information and identify whether the plans and strategies are on course to meet the desired outcomes or if modifications are needed to meet expectations.

The HFRA does not require a specific timeline for updating the plan, allowing flexibility for the Stakeholder Advisory Group to determine a suitable timeline for making updates. It is recommended that Stakeholders meet annually to review and amend the project list, assess project successes, and strategize project implementation logistics. Further, formal and substantial updates to the plan should take place every five years, beginning with the signing of the document. Substantial updates include making changes to CWPP objectives and goals, wildfire risk assessments, fire regimes, wildfire response data, adding new sections, and updating maps and tables as needed.

References

2016 State of Our Watersheds Report: Nisqually River Watershed. (2016). Nisqually Indian Tribe. Retrieved from https://geo.nwifc.org/sow/SOW2016_Report/Nisqually.pdf

2024 point-in-time count homeless census preliminary data released. (2024, April 1). Thurston County Washington. Retrieved from https://www.thurstoncountywa.gov/news/2024-point-time-count-homeless-census-preliminary-data-released

Abatzoglou, J. T., & Williams, A. P. (2016). Impact of anthropogenic climate change on wildfire across western US forests. *Proceedings of the National Academy of Sciences, 113*(42), 11770-11775. https://doi.org/10.1073/pnas.1607171113

Air Quality. (n.d.). Thurston Regional Planning Council. https://www.trpc.org/438/Air-Quality

Audie, M. (2020). Decline of Western Redcedar: Using Tree Rings to Understand Mortality Patterns and Identify Drought-Resilient Populations Under Climate Change. https://nwcasc.uw.edu/science/project/decline-of-western-red-cedar-using-tree-rings-to-understand-mortality-patterns-and-identify-drought-resilient-populations-under-climate-change/

Bowman, D. M. J. S., Balch, J. K., Artaxo, P., Bond, W. J., Cochrane, M. A., D'Antonio, C. M., ... & Pyne, S. J. (2009). Fire in the Earth system. *Science, 324*(5926), 481-484. https://doi.org/10.1126/science.1163886

Capitol State Forest. (n.d.). Washington State Department of Natural Resources. Retrieved from https://www.dnr.wa.gov/Capitol

Carillo, Barbara. (n.d). *Rural Communities and Fire*. Chumstick Wildfire Stewardship Coalition. Rural Communities and Fire – Chumstick Wildfire Stewardship Coalition

Carroll, M. S., Cohn, P. J., & Blatner, K. A. (2004). Private and tribal forest landowners and fire risk: A two-county case study in Washington State. *Canadian Journal of Forest Research, 32*(12), 2148-2158.

Chronline. (2025). *WDFW discussion on fire-ravaged Scatter Creek Wildlife Area*. Retrieved from https://www.chronline.com/stories/wdfw-to-host-discussion-on-fire-ravaged-scatter-creek-wildlife-area,21367

City of Tumwater. (2025, March 21). *The City of Tumwater releases second Davis Meeker Garry Oak tree-risk assessment*. City of Tumwater, Washington. Retrieved from https://www.ci.tumwater.wa.us/departments/parks-and-recreation/urban-forestry/garry-oak-tree-risk-assessment

Community Wildfire Protection Plan Guidance. (2023). Department of Natural Resources. https://www.dnr.wa.gov/publications/rp_cwpp_guidance_04102023.pdf.pdf

Department for Environment and Water. (n.d.). *The science behind fire*. Government of South Australia. Retrieved from https://www.environment.sa.gov.au/topics/fire-management/fire-science-and-planning/fire-behaviour

Drought.gov. (2025). *Thurston County historical drought conditions*. Retrieved from https://www.drought.gov/states/washington/county/thurston#historical-conditions

Fires in Washington state: Understanding, managing, and preventing wildfire risks. (n.d.). Washington Forest Protection Association. https://www.wfpa.org/fires-in-washington-state/

Forge, P. (2018). *Basics of wildland fire behavior & the wildland-urban interface (CPAW Planner Training Materials)*. Community Planning Assistance for Wildfire, Bozeman and Helena, MT.

Franklin, C. (2022, July 7). *Wildfire risk in Thurston County: How to prepare for the inevitable* [https://storymaps.arcgis.com/stories/87eb107aefae437dbf2a6fb4f6064db7].

Fuels management and wildland fire fuel reduction. (2019, November 19). Western Fire Chiefs Association. https://wfca.com/wildfire-articles/fuels-management-and-wildland-fire-fuel-reduction/

Fuels: Surface Fuel Model Descriptions. (n.d.). National Wildfire Coordinating Group. https://www.nwcg.gov/publications/pms437/fuels/surface-fuel-model-descriptions

Glickman, D., & Babbitt, B. (1995). *Federal wildland fire policy*. Retrieved from https://books.google.com/books?id=XRcFfB6E-wMC&ots=G_TRGff8kS&dq=Glickman%20and%20Babbitt%201995%20wildfire&lr&pg=PP9#v=onepage&q&f=false

Graves, M., Mangold, J., Jacobs, J. (2010). *Biology, ecology and management of scotch broom (cytisus scoparius L.)*. Montana State University Extension. https://www.montana.edu/extension/invasiveplants/documents/mt_noxious_weeds/Scotch_broom.pdf

Hanberry, B. (2020, July). Reclassifying the Wildland–Urban Interface using fire occurrences for the United States. *Land, 9*(7), 225. https://doi.org/10.3390/land9070225.

Homeless census. (n.d). Thurston Regional Planning Council. https://www.trpc.org/457/Homeless-Census

Littell, J. S., Oneil, E. E., McKenzie, D., Hicke, J. A., Lutz, J. A., Norheim, R. A., Elsner, M. M. (2010). Forest ecosystems, disturbance, and climate change in Washington State USA. *Climatic Change*, *102*, 129-158. fseprd1181309.pdf

Moritz, M. A., Batllori, E., Bradstock, R. A., Gill, A. M., Handmer, J., Hessburg, P. F., ... & Syphard, A. D. (2014). Learning to coexist with wildfire. *Nature, 515*(7525), 58-66. https://doi.org/10.1038/nature13946

National Oceanic and Atmospheric Administration. (2025). *NOAA official website*. Retrieved from https://www.noaa.gov/

Norton, P. (2002). *Bear Valley National Wildlife Refuge Fire Hazard Reduction Project: Final Environmental*.

Noxious weeds index. (n.d.). Washington State Noxious Weed Control Board. Washington State Noxious Weed Control Board

Noxious weeds. (n.d.). Central Oregon Irrigation District. Noxious Weeds - Central Oregon Irrigation District

Omnibus Agreement. (2024). *2024 Region 3 Mutual Aid Agreement*. Homeland Security. https://co.pacific.wa.us/commissioner/interlocal-agreements/MAY%202024/5-28-2024-Omnibus-Agreement.pdf#:~:text=This%20OMNIBUS%20AGREEMENT%20is%20made%20and%20entered%20into,to%20provide%20assistance%20to%20each%20other%20as%20requested.

Ott, Jennifer. (2012). *Vashon glacier begins to melt and recede from Puget Sound region and Columbia Basin around 16,900 years ago*. https://www.historylink.org/File/5087

Paveglio, T. B., Moseley, C., Carroll, M. S., Williams, D. R., Davis, E. J., & Fischer, A. P. (2015). Categorizing the social context of the wildland urban interface: Adaptive capacity for wildfire and community "archetypes." *Forest Science, 61*(2), 298-310.

Population, housing, and employment data. (n.d.). Thurston Regional Planning Council. Population, Housing, and Employment Data | Thurston Regional Planning Council, WA

Quiemuth Peak, (n.d.). Summit Post. Retrieved from https://www.summitpost.org/quiemuth-peak/506379

Radeloff, V. C., Hammer, R. B., Stewart, S. I., Fried, J. S., Holcomb, S. S., & McKeefry, J. F. (2005). The wildland-urban interface in the United States. *Ecological Applications, 15*(3), 799-805. https://doi.org/10.1890/04-1413

Radeloff, V. C., Hockrin, M. H., Helmers, D., Carlson, A., Hawbaker, T. J., Martinuzzi, S., Schug, F., Alexandre, P. M., Kramer, A. H., Pidgeon, A. M. (2023). Rising wildfire risk to houses in the United States, especially in grasslands and shrublands. Science 328, 702-707. https://www.fs.usda.gov/nrs/pubs/jrnl/2023/nrs_2023_mockrin_002.pdf

Reeves-Rush, J. (2021, June 6). *Pioneer Ignatius Colvin sought fortune and created the Colvin Ranch legacy*. Thurston Talk. https://www.thurstontalk.com/2021/06/23/pioneer-ignatius-colvin-sought-fortune-and-created-the-colvin-ranch-legacy/

Scatter creek wildfire area. (n.d.). Washington State Department of Fish and Wildlife. https://wdfw.wa.gov/sites/default/files/2024-01/final-scatter-creek-021-22-wla-update.pdf

Scotch broom prevention & control. (n.d.). 10,000 Years Institute. Retrieved from https://www.10000yearsinstitute.org/scotch-broom-prevention-and-control

Scott, J. H., Thompson, M. P., Calkin, D. E. (2013). *A wildfire risk assessment framework for land and resource management* (Report No. RMRS-GTR-315). Rocky Mountain Research Station. https://www.fs.usda.gov/rm/pubs/rmrs_gtr315.pdf

Social vulnerability. (n.d.). Wildfire Risk to Communities. Retried from Vulnerable populations in Thurston County, WA - Wildfire Risk to Communities

SpringerLink. (2009). *Environmental implications of wildfire risk*. Retrieved from https://link.springer.com/article/10.1007/s00267-009-9282-z

Syphard, A. D., Keeley, J. E., Massada, A. B., Brennan, T. J., & Radeloff, V. C. (2012). Housing arrangement and location determine the likelihood of housing loss due to wildfire. *PLOS ONE, 7*(3), e33954. https://doi.org/10.1371/journal.pone.0033954

Taccaliti, F., Marzano, R., Bell, T. L., & Lingua, E. (2023). Wildland–Urban Interface: Definition and physical fire risk mitigation measures, a systematic review. *Fire, 6*(9), 343. https://doi.org/10.3390/fire6090343

Taylor & Francis Online. (2015). *Analyzing wildfire adaptation strategies in the WUI*. Retrieved from https://www.tandfonline.com/doi/full/10.1080/08941920.2015.1132351

The Chronicle. (2017, August 25). Scatter creek wildfire charred 345 acres of wildlife area. https://www.chronline.com/stories/scatter-creek-wildfire-charred-345-acres-of-wildlife-area,24170#:~:text=A%20wildfire%20that%20burned%20a%20total%20of%20494,side%20of%20the%20popular%20site%20until%20further%20notice.

The Olympian. (2025). *Local news article on fire impacts*. Retrieved from https://www.theolympian.com/news/local/article279458039.html

Thompson, M. P., & Calkin, D. E. (2011). Uncertainty and risk in wildland fire management: A review. *Journal of Environmental Management, 92*(8), 1895-1909. https://doi.org/10.1016/j.jenvman.2011.03.015

Thompson, M.P., Zimmerman, T., Mindar, D., Taber, M. (2016). *Risk terminology primer: Basic principles and a glossary for the wildland fire management community* (Report No. RMRS-GTR-349). Rocky Mountain Research Station. https://www.fs.usda.gov/rm/pubs/rmrs_gtr349.pdf

Thurston County. (2025, March 21). *Healthy Forest Project*. Thurston County, Washington. Retrieved from https://www.thurstoncountywa.gov/departments/community-planning-and-economic-development/healthy-forest-project

Thurston County. (2025, March 21). *Urban Forest Canopy Report*. Thurston County, Washington. Retrieved from https://www.thurstoncountywa.gov/departments/community-planning-and-economic-development/urban-forest-canopy-report

Thurston Regional Planning Council. (2023, November). 4th Edition Hazard Mitigation Plan for the Thurston Region. https://www.trpc.org/DocumentCenter/View/12206/BOOK_HazardsPlan2023_FINAL?bidId=

Thurston Regional Planning Council. (2025). *Thurston Climate Adaptation Plan*. Retrieved from https://www.trpc.org/580/Thurston-Climate-Adaptation-Plan

Thurston South CCD, Thurston County, Washington. (n.d). United States Census Bureau. Retrieved from Thurston South CCD, Thurston County, Washington - Census Bureau Profile

U.S. Department of Agriculture. (2024). *Science you can use 101*. Rocky Mountain Research Station. Retrieved from https://www.fs.usda.gov/rm/pubs_journals/rmrs/sycu/2024/sycu101_2024_wildfire_risk.pdf

University of Washington Climate Impacts Group. (2025). *Climate Impacts Group homepage*. Retrieved from https://cig.uw.edu/

University of Washington Climate Impacts Group. (2025). *Interactive sea level rise data visualizations*. Retrieved from https://cig.uw.edu/projects/interactive-sea-level-rise-data-visualizations/#dataviz1

Vargo, J., Lappe, B., Mirabelli, M. C., Conlin, C. K. (2023). *Social Vulnerability in US Communities Affected by Wildfire Smoke, 2011 to 2021*. Social Vulnerability in US Communities Affected by Wildfire Smoke, 2011 to 2021

Violet Prairie Wildlife Area Unit. (n.d.). Washington Department of Fish & Wildlife. Retried from Violet Prairie Wildlife Area Unit | Washington Department of Fish & Wildlife

Washington tracking network: A source for environmental public health data. (n.d.). Washington State Department of Health. https://fortress.wa.gov/doh/wtn/WTNPortal#!q0=8909&q1=8971

Westerling, A. L., Hidalgo, H. G., Cayan, D. R., & Swetnam, T. W. (2006). Warming and earlier spring increase western U.S. forest wildfire activity. *Science, 313*(5789), 940-943. https://doi.org/10.1126/science.1128834

Westside prairie. (n.d.). Washington Department of Fish & Wildlife. Retrieved from https://wdfw.wa.gov/species-habitats/ecosystems/westside-prairie

Whitlock, C., Shafer, S. L., & Marlon, J. R. (2003). The role of climate and vegetation change in shaping past and future fire regimes in the northwestern US and the implications for ecosystem management. *Forest Ecology and Management, 5*-27.

Why wildfire smoke is a health concern. (2025, January 30). Environmental Protection Agency. Retrieved from https://www.epa.gov/wildfire-smoke-course/why-wildfire-smoke-health-concern

Wildfire hazard and risk assessment. (2017). United Nations Office for Disaster Risk Reduction. Retrieved from https://www.unisdr.org/files/52828_06wildfirehazardandriskassessment.pdf

Wildfire Risk Explorer. (2025). *Thurston County wildfire risk overview*. Retrieved from https://wildfirerisk.org/explore/overview/53/53067/

WRIA 13 Deschutes watershed water availability. (2022). Department of Ecology. Retrieved from https://apps.ecology.wa.gov/publications/documents/2011013.pdf

Appendix A

TBD