CHELAN COUNTY & CASCADIA CONSERVATION DISTRICT, WASHINGTON

COMMUNITY WILDFIRE PROTECTION PLAN

2025 UPDATE

CHELAN COUNTY & CASCADIA CONSERVATION DISTRICT COMMUNITY WILDFIRE PROTECTION PLAN 2025 UPDATE

Prepared for Chelan County & Cascadia Conservation District

411 Washington St Ste 201, Wenatchee, WA 98801

Prepared by The Ember Alliance

1631 E Lincoln Ave, Fort Collins, CO 80524

Cover photo credit: Christina Wollman

Table of Contents

Acronyms

CCD	Cascadia Conservation District
BLM	Bureau of Land Management
CCDNR	Chelan County Department of Natural Resources
CWPP	Community Wildfire Protection Plan
DEM	Department of Emergency Management
FAC	Fire Adapted Community
FEMA	Federal Emergency Management Agency
FD	Fire District
FPD	Fire Protection District
GUI	Grassland Urban Interface
HIZ	Home Ignition Zone
HOA	Homeowner's Association
IIBHS	Insurance Institute for Business & Home Safety
NFPA	National Fire Protection Association
NHMP	Natural Hazard Mitigation Plan
NRCS	Natural Resources Conservation Service
NWCG	National Wildfire Coordinating Group
OCLTRG	Okanogan County Long Term Recovery Group
PNW	Pacific Northwest
POD	Potential Operational Delineation
QWRA	Quantitative Wildfire Risk Assessment
TEA	The Ember Alliance
USFS	U.S. Forest Service
WA DNR	Washington Department of Natural Resources
WDFW	Washington Department of Fish and Wildlife
WRCD	Washington Resource Conservation and Development Council
WSDOT	Washington Department of Transportation
WSP	Washington State Parks
WUI	Wildland-Urban Interface
WVFD	Wenatchee Valley Fire Department

Refer to the Glossary of Terms for definitions of the words and phrases used throughout this document.

1. Foreword

The process of developing a Community Wildfire Protection Plan (CWPP) can help a community clarify and refine its priorities for the protection of life, property, and critical infrastructure in the wildland–urban interface on both public and private land. It also can lead community members through valuable discussions regarding management options and implications for the surrounding land base. Local fire service organizations help define issues that may place the county, communities, and/or individual homes at risk. Through the collaborative process, the CWPP planning team discussed potential solutions, existing documents, funding opportunities, and regulatory concerns recommendations to help build the CWPP update. The CWPP planning process also incorporated an element for public outreach to facilitate public input and recommendations.

The idea for community-based wildland fire planning and prioritization is neither novel nor new. However, the incentive for communities to engage in comprehensive forest planning and prioritization was given new and unprecedented impetus with the enactment of the Healthy Forests Restoration Act (HFRA) in 2003. This landmark legislation includes the first meaningful statutory incentives for the US Forest Service (USFS) and the Bureau of Land Management (BLM) to consider the priorities of local communities as they develop and implement forest management and hazardous fuel reduction projects. For a community to take full advantage of this new opportunity, it must first prepare a Community Wildfire Protection Plan (CWPP). Once the CWPP is approved by the Chelan County Commissioner's and the State Forester, the planning team will begin further refining proposed project boundaries, feasibility, and public outreach as well as seeking funding opportunities.

*The **2025 Chelan County Community Wildfire Protection Plan (CWPP) Update** is an update of the 2019 CWPP. Some portions are original to the 2019 CWPP and some portions were updated by The Ember Alliance for the 2025 plan.*

2. Signature Pages

This Chelan County Community Wildfire Protection Plan Update has been developed in cooperation and collaboration with representatives of the following organizations and agencies.

2.a. Chelan County Board of Commissioners (see next page)

This Chelan County Community Wildfire Protection Plan has been developed in cooperation and collaboration with representatives of the Chelan County Board of Commissioners and was approved on April 3, 2025.

RESOLUTION NO. 2025-32

ADOPTION OF THE 2025 CHELAN COUNTY COMMUNITY WILDFIRE PROTECTION PLAN

WHEREAS, Chelan County faces an increasing risk to wildfires which threaten public health and safety and could result in property loss and economic hardship to individuals and business owners and loss of critical infrastructure; and

WHEREAS, a Community Wildfire Protection Plan offers a positive, solution-oriented environment in which to address challenges such as local firefighting capability, the need to defensible space, and where to prioritize fuels management on both federal and non-federal lands; and

WHEREAS, CWPPs bring together diverse local interests to discuss their mutual concerns for public safety, community sustainability, and natural resources; and

WHEREAS, in 2024, Chelan County commenced an update to the 2019 CWPP; and

WHEREAS, the CWPP was updated in collaboration with Cascadia Conservation District, Chelan County fire districts, the US Forest Service, Washington Department of Natural Resources, Chumstick Wildfire Stewardship Coalition, Chelan-Douglas Health District, Chelan PUD, and other agencies and community organizations; and

WHEREAS, the CWPP was updated in accordance with the Healthy Forest Restoration Act of 2003 and Washington State requirements; and

WHEREAS, the County affirms their intent to update the plan every five years; and

NOW THEREFORE BE IT RESOLVED, that the Board of Chelan County Commissioners, in the interest of public health and safety, does hereby adopt the 2025 Chelan County Community Wildfire Protection Plan.

Dated this 3rd day of April, 2025.

BOARD OF CHELAN COUNTY COMMISSIONERS

SHON SMITH, CHAIRMAN

BRAD HAWKINS, COMMISSIONER

KEVIN OVERBAY, COMMISSIONER

ATTEST: ANABEL TORRES

Clerk of the Board

CHELAN COUNTY Commissioners SEAL STATE OF WASHINGTON

2.b. Signatures of Participation by Chelan County Fire Protection Districts and Departments

This Community Wildfire Protection Plan and all its components identified herein were developed in close cooperation with the participating entities listed. These members of the CWPP planning team formally recommended that this document be adopted by the County Commissioners.

Name, Position Wenatchee Valley Fire Department (WVFD)	Date
Name, Position Chelan County F. P. D. #3	Date
Name, Position Chelan County F. P. D. #5	Date
Name, Position Chelan County F. P. D. #6	Date
Name, Position Chelan County F. P. D. #7	Date

Name, Position Chelan County F. P. D. #8	Date
Name, Position Lake Wenatchee Fire & Rescue (LWFR)	Date
Patrick Haggerty, Program Manager Cascadia Conservation District	Date

2.c. Signatures of Participation by other Chelan County CWPP Planning Team Entities

This Community Wildfire Protection Plan and all its components identified herein were developed in close cooperation with the participating entities listed. These members of the CWPP planning team formally recommended that this document be approved by the Chelan County Commissioners.

Name, Local Fire Management	Date
Name, Local City/County/Tribal	Date
Name, State Forester	Date

3. How to use this CWPP Document

This document is designed for everyone that lives or works within and around Chelan County. Different sections will be most helpful to different people; please use this guide to find the resources most relevant to you.

I want to learn the basics about wildfire, my community, and CWPPs.	• Sections 8.a and 8.d to learn about wildfire threats in Chelan County. • Section 7 to learn about Chelan County • Sections 5.a and 5.b to learn about CWPPs.
I want to learn about protecting my home and family.	• Sections 9.b, 11.l, 11.m, 13.b and 13.c to learn about the actions you can take, including research-backed guidance for protecting your home and family. • Sections 13.e-12.n to find detailed recommendations for your neighborhood.
I want to learn about community-led action.	• Section 4 and Appendix 4 to learn about the actions communities can take together to better protect everyone, including funding opportunities. • Section 13.e to find all specific recommended actions for the community.
I want to learn about fire history in Chelan and smoke impacts.	• Sections 8.b, 8.d, and 8.e to learn about fire history and smoke in the area. • Sections 13.c and 11.a-g for general recommendations for the community.
I want to learn about the science behind these recommendations.	• Sections in the Appendix (A) A2.1 and A2.3 to learn about modelling methodology for fire behavior and smoke modeling. • Section 13 to see all sources helping to mitigate wildfire in Chelan County.

4. Community and Partner Engagement

Wildfires occur annually in Chelan County, making programs and projects that mitigate their impacts crucial for protecting residents, property, infrastructure, and the local economy.

Collaboration is at the heart of Community Wildfire Protection Plans (CWPPs). Successful CWPPs rely on strong community engagement, committed partners, and dedicated follow-through. To support this effort, Perteet contracted The Ember Alliance (TEA)-a Colorado-based nonprofit specializing in fire management and community engagement—to facilitate meetings, lead assessments, and update the document.

Cascadia Conservation District (CCD), Chelan County, and TEA collaborated with local partners and agency personnel from across the landscape and neighboring districts to develop the recommendations outlined in this CWPP. The team incorporated lessons learned from recent challenging wildfire seasons in Washington and across the United States, while also drawing on valuable insights from community members and other stakeholders.

Recommendations in this CWPP also consider overlapping and related plans and prioritization such as the 2019 Chelan County Community Wildfire Protection Plan, the 2017 20-Year Forest Health Strategic Plan, the 2019 Washington State Wildland Fire Protection 10-Year Strategic Plan, and the 2021 Multi-Hazard Mitigation Plan.

The Chelan County Community Wildfire Protection Plan 2025 Update is supported with funding from Chelan County Department of Natural Resources (DNR), Cascadia Conservation District (CCD), and Washington State Conservation Commission.

*The **Chelan County Community Wildfire Protection Plan Update** was developed in compliance with the Healthy Forest Restoration Act of 2003. It was developed in conjunction with the wildfire chapter of the Hazard Mitigation Plan for the county.*

TEA and Chelan County would like to thank the following partners for their time and effort in developing content, providing data, providing feedback, and planning implementation projects for this CWPP:

- Bureau of Land Management
- Cascadia Conservation District
- Chelan County Board of Commissioners
- Chelan County Citizens
- Chelan County Emergency Management Department
- Chelan County Fire District #3
- Chelan County Fire District #5
- Chelan County Fire District #6
- Chelan County Fire District #7

- Chelan County Fire District #8
- Chelan County Flood Control Zone District
- Chelan County Sheriff's Department
- Chelan County Natural Resources Department
- Chelan Douglas Health District
- Chelan Public Utilities (P.U.D.)
- Chumstick Wildfire Stewardship Coalition
- Cities of Cashmere, Entiat, Chelan, Wenatchee, Leavenworth
- Communities of Holden Village and Lake Wenatchee
- Lake Wenatchee Fire & Rescue
- National Park Service
- PERTEET Inc.
- Resident Coalition of Chelan County
- Sustainable North Central Washington
- United States Forest Service
- Washington Department of Natural Resources
- Washington State Department of Fish and Wildlife
- Washington State Department of Transportation
- Wenatchee Valley Fire Department

5. Goals and Guiding Principles

5.a. Planning Philosophy and Goals

The goals of the planning process include integration with the National Fire Plan, the Healthy Forests Restoration Act, and the Disaster Mitigation Act. The plan utilizes the best and most appropriate science from all partners as well as local and regional knowledge about wildfire risks and fire behavior while meeting the needs of local citizens and recognizing the significance wildfire can have to the regional economy.

Mission Statement

To promote sound public policy designed to protect citizens, critical facilities, infrastructure, private property, and the environment from wildfire hazards by increasing public awareness, documenting the resources for risk reduction and loss-prevention, and identifying activities to guide Chelan County towards building a safer, more sustainable community.

Goals

- **To Improve Response Capabilities** of local fire protection services and other emergency responders to protect people and property through training, addressing equipment needs, utilizing the best available technologies, and increasing collaboration and coordination among public agencies, non-profit organizations, business, and industry.
- **To Create Fire Resilient Landscapes** through partnerships by preserving, rehabilitating, reducing fuels, and enhancing natural systems to serve natural hazard mitigation functions.
- **To Promote Fire Adapted Communities** through public education and outreach informing residents what they can do before, during, and after a wildfire and/or smoke event. Providing tools and funding resources to assist in implementing pre- and post-disaster mitigation activities and mitigating smoke health effects.
- **To Protect Economy** by developing mechanisms that minimize impacts to commerce, trade, agriculture, recreation, tourism, and essential business activities in the event of a wildfire and/or smoke event.
- **To Develop a Short and Long-Term Wildfire Recovery Plan** to equitably address the natural, social, and economic challenges associated with recovering from a wildfire and/or smoke event.
- **To Utilize Existing Plans and Guidelines** when developing and implementing mitigation strategies by referring to the tenants of the National Cohesive Strategy and other pertinent federal, state, tribal, and local plans.
- **To Create Recommendations** to guide and inform future complimentary planning efforts.
- **To Provide a Platform** for the community and partner organizations to track success, troubleshoot roadblocks, and initiate project collaboration.

5.b. Integration with Local Planning Documents

During the development of this CWPP, several planning and management documents were reviewed to ensure alignment and avoid conflicting goals or objectives. Existing programs and policies were also assessed to determine their impact on the mitigation objectives outlined in this plan.

The following sections highlight Chelan County planning documents and ordinances that were considered in the development of this CWPP, providing a brief overview of their relevance to wildfire mitigation efforts.

Chelan County Natural Hazard Mitigation Plan: (2024 Update)

The Disaster Mitigation Act of 2000 amended the Robert T. Stafford Disaster Relief and Emergency Assistance Act by, among other things, adding a new section, 322-Mitigation Planning. Section 322 requires local governments to develop and submit mitigation plans as a condition of receiving Hazard Mitigation Grant Program and Pre-Disaster Mitigation Program Funds.

The Federal Emergency Management Agency (FEMA) regulatory directive included in Mitigation Planning, which outlines the key responsibilities of local governments in carrying out Section 322, under 44 CFR 201.1 subpart (b) states that:

"The purpose of mitigation planning is for State, local, and Indian tribal governments to identify the natural hazards that affect them, to identify actions and activities to reduce losses from those hazards, and to establish a coordinated process to implement the plan, taking advantage of a wide range of resources"(United States: National Archives and Records Administration: Office of the Federal Register, 2023)
.

The Chelan County Multi-Jurisdiction Natural Hazard Mitigation Plan (NHMP) meets the federal requirements outlined under the Act for the local governments Washington, including Chelan County (including the unincorporated areas of Chelan County) and the cities of Cashmere, Chelan, Entiat, Leavenworth, and Wenatchee.

Chelan County Comprehensive Emergency Management Plan (2020)

The purpose of the Comprehensive Emergency Management Plan (CEMP) is to guide the Chelan County Department of Emergency Management in its responsibility to preserve lives, protect property and the environment, and to ensure public health in times of natural or technological disasters. The organization also provides for the coordination of recovery efforts following disasters and will provide actions to mitigate the effects of such disasters, to the extent possible.

The CEMP is an all-hazard plan that applies to all local public and private entities and organizations participating in and included in the plan. The plan is an all-hazard approach to emergency and disaster situations likely to occur in the county, as described in the Chelan County Hazard Identification/Vulnerability Analysis (HIVA), and provides the foundation for:

1. The establishment of an organization and guidelines for efficient and effective use of government, private sector, and volunteer resources.
2. An outline of local government responsibilities in emergency management activities as described under RCW 38.52 and other applicable laws.
3. An outline of other participants' responsibilities in emergency management activities as agreed upon by the participating agencies and organizations.

Washington Department of Natural Resources Wildfire Strategic Plan

Washington's Wildland Fire Protection Strategic Plan addendum, updated in November of 2024, "built a blueprint for effective wildland fire protection in Washington and informed associated policy and resource decisions. It followed the recent roll-out of the state's 20-Year Forest Health Strategic Plan, which establishes a framework to systematically treat broad forest landscapes to improve forest health and reduce the risk of

uncharacteristic wildfires. The plan is also anchored in the National Cohesive Wildland Fire Management Strategy and shares its focus on resilient landscapes, fire-adapted communities, and safe, effective wildfire response (*Wildland Fire Protection Strategic Plan | WA - DNR*, n.d.)." The plan listed the top 25 places in Washington likely to be exposed to wildland fire and 7 of the 25 are in Chelan County; (#1 is Leavenworth, #5 is Wenatchee, #6 is Chelan, #9 is Cashmere, #18 is Sunnyslope, #21 is Entiat, and #25 is Manson).

2020 Forest Action Plan

This plan sets goals to address pressing threats to Washington's forest ecosystems and integrates the 20-Year Forest Health Strategic Plan: Eastern Washington. The need for treatments to increase resilience in the Chelan landscape is dependent upon what treatments have been done and what treatments are planned. Washington has 558 rural fire departments to help treat the 12 million acres of private land under state fire protection (*2020 Washington Forest Action Plan | WA - DNR*, n.d.).

6. Documenting the Planning Process

Documentation of the planning process, including public involvement, is necessary to meet FEMA's DMA 2000 requirements (44CFR§201.4(c)(1) and §201.6(c)(1)). This section includes a description of the planning process used to develop the plan, including how it was prepared, who participated in the process, and how all the agencies involved participated.

6.a. Description of the Planning Process

The Chelan County Community Wildfire Protection Plan was developed through a collaborative process involving all the organizations and agencies detailed in Chapter 1 of this document. The planning process included five distinct phases which were in some cases sequential and in some cases intermixed:

1. **Collection of Data** about the extent and periodicity of the wildfire hazard in and around Chelan County.
2. **Estimations** about risks, location of structures and infrastructure relative to risk areas, access, and potential treatments.
3. **Mapping** of data relevant to pre-wildfire mitigation and treatments, structures, resource values, infrastructure, risk assessments, and related data.
4. **Facilitation of Public Involvement** from the formation of the planning team to news releases, public meetings, public review of draft documents, and acknowledgement of the final plan by the signatory representatives.
5. **Analysis and Drafting of the Report** to integrate the results of the planning process, provide ample review and integration of team and public input, and signing of the final document.

6.b. The Planning Team

The 2025 CWPP Update was planned with a focus on openly sharing information with everyone involved. Team meetings were held regularly to ensure everyone could exchange information. During public meetings, many team members attended to show their support and share their experiences and interpretations of the results.

Various areas were represented on the planning team and with a public survey, either directly or through their local fire department or district. These helped to create hazard profiles, assess risks, and develop safety measures. The planning team meetings were the main place where the planning records were confirmed.

6.c. Public Involvement

Public involvement was made a priority from the inception of the project. There were several ways that public involvement was sought and facilitated. The idea was to allow members of the public to provide information and seek an active role in protecting their own homes and businesses, and in some cases, it may lead to the public becoming more aware of the process without becoming directly involved in the planning.

6.d. Public Meetings

A Public meeting was scheduled during the wildfire risk assessment phase of the planning process to share information on the plan, obtain input on the details of the wildfire risk assessments, and discuss potential mitigation treatments to generate more public interest and streamline the process for residents. Also, a public survey, that was approved by the county Public Information Officer (PIO), was sent out in September of 2024 that was designed to help gauge the level of knowledge and concern that citizens have about natural hazard issues.

6.e. Documented Review Process

The opportunity to review and comment on this plan has been provided through several avenues for the team members as well as the members of the public.

During regularly scheduled team meetings in the summer and fall of 2024, the team met to discuss findings, review mapping and analysis, and provide comments on draft sections of the document. During the Action Planning meetings that Patrick Haggerty held in Chelan on nine different occasions, attendees were able to observe map analyses and photographic collections, discuss general findings from the community assessments, and make recommendations on potential project areas.

The first draft of the document was prepared and presented to the team in January 2025 for a full team review.

6.f. Continued Public Involvement

Chelan County is dedicated to involving the public directly in review and updates of the CWPP. The Chelan County Commissioners, working through the Chelan County Department of Natural Resources, are responsible for reviewing and updating the CWPP.

The public will have the opportunity to provide feedback annually on the anniversary of the adoption of this plan, at an open meeting of the planning team. Copies of the Chelan County Wildfire Protection Plan will be catalogued and kept at all the appropriate agencies in the county. The Plan also includes the address and phone number of Chelan County Conservation District, who is responsible for keeping track of public comments on the Plan.

A public meeting will also be held as part of each annual evaluation, or when deemed necessary, by the planning team. The meetings will provide the public a forum for which they can express its concerns, opinions, or ideas about the Plan.

7. Chelan County Characteristics

The original inhabitants of the region were Indigenous Peoples from the Wenatchi Tribe residing along the Wenatchee River, as it flows from the Cascade Mountains to the Columbia River. The culture and economy of the tribe centered on fishing, hunting, and gathering. Trappers and Chinese gold prospectors were among the first non-natives who arrived in the area during the early 1800s. White settlers followed, beginning in the 1870s.

After 1888, the current Chelan Valley was a designated part of Okanogan County, and the current Wenatchee Valley was part of Kittitas County. In 1899, the State Legislature created Chelan County, taking portions from both counties. Wenatchee became the county seat. The county name was derived from the traditional Wenatchi name “Tsi-Laan” meaning "deep water” and refers to the longest and deepest alpine lake in the country, Lake Chelan (Confederated Tribes of the Colville Reservation, 2024).

7.a. Geography and Climate

Chelan County (Figure 1) is located on the eastern slopes of the Cascade Mountain range in central Washington. The County embraces the drainages of the Wenatchee River, the Entiat River, Lake Chelan, and the Chelan River. According to the U.S. Census Bureau, the county has a total area of 2,994 square miles (7,750 km^2), of which 2,921 square miles (7,570 km^2) is land and 73 square miles (190 km^2) (2.5%) is water. It is the third-largest county in Washington by area.

Chelan County receives nine inches of rainfall, on average per year, and averages 21 inches of snow. On average, there are 199 days of sunshine each year, and some type of precipitation (rain, snow, sleet) 29 days per year. The annual average high temperature is 59.8 degrees with an average summer high of 85 degrees. The annual average low temperature is 41.3 degrees with a winter average low of 24 degrees.

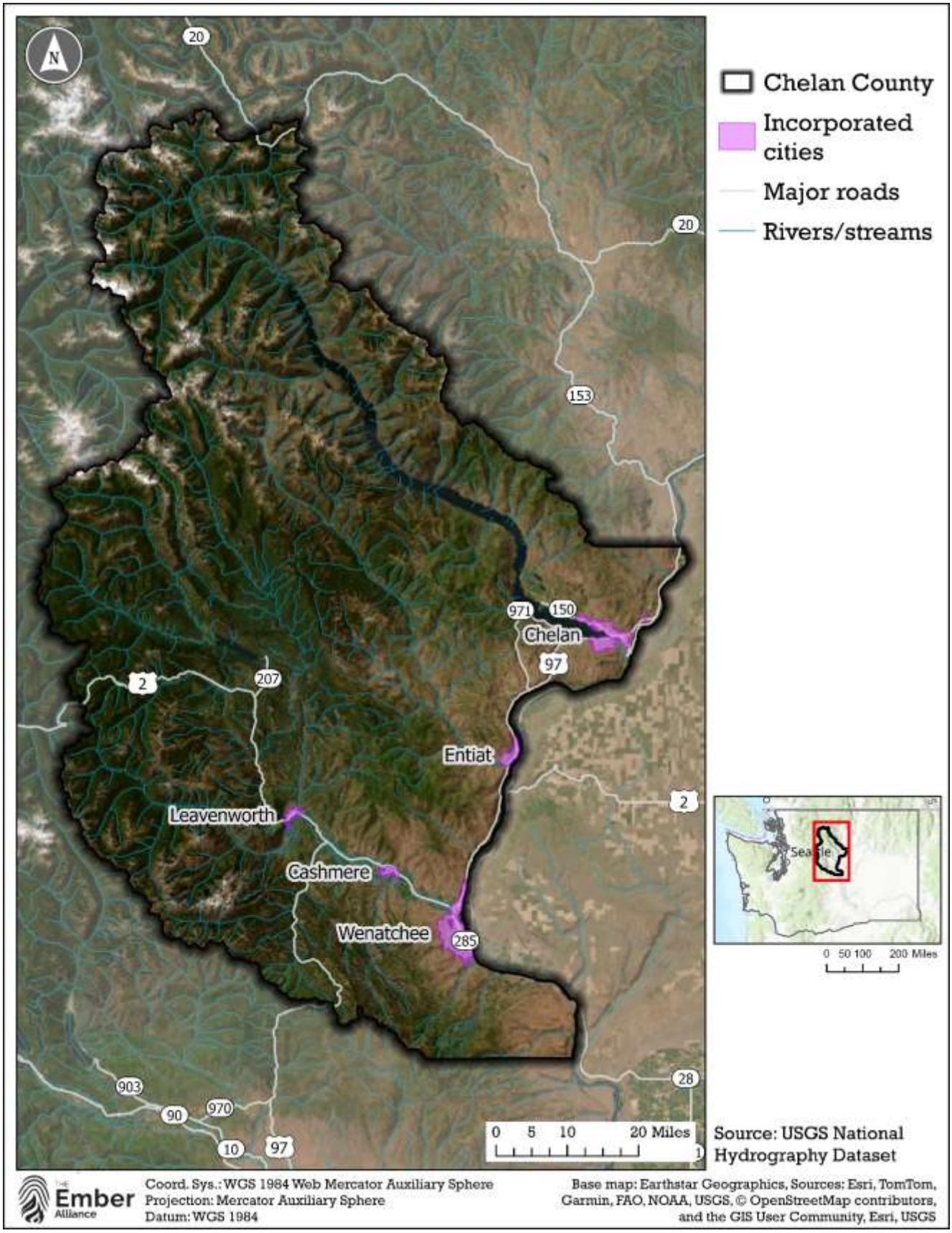


Figure 1. *Aerial map of Chelan County. Source: USGS National Hydrography Dataset.*

7.b. Population and Demographics

The 2020 Census established the Chelan County population at 79,074, which shows an increase from a population of 66,616 in 2000. Since 1900, the population of Chelan County has been increasing with every census with the highest percentage (+284%) increase occurring between 1900 and 1910 (Table 1). Over 27% of the population is of Hispanic or Latino descent. The U.S. Census Bureau estimates that Chelan County has only experienced an 8.8% increase in population since 2000 compared to a 13% increase statewide.

The Census Bureau also reported that there were 37,267 households. The median income for a household in Chelan County is $76,722, which is less than the statewide median of $94,605. Health care, educational services, and social assistance employ 23.1% of the working population while agriculture, forestry, fishing and hunting employ 9.5%; a large decrease from 12.7% in 2010 (U.S. Census Bureau, 2024).

Table 1. *Chelan County historical population data. Source: Census Bureau.*

Chelan County Historical Population Data.	
Census	**Population**
1900	3,931
1910	15,104
1920	20,906
1930	31,634
1940	34,412
1950	39,301
1960	40,744
1970	41,355
1980	45,061
1990	52,250
2000	66,616
2010	72,453
2020	79,074

Landownership:

Chelan County encompasses nearly 3,000 square miles. The clear majority (82%) of Chelan County is federally managed (Figure 2; Table 2). Most of the privately-owned land (13%) is used for agriculture purposes; although, more and more residents are moving into the rural areas along the eastern slopes of the Cascade Range. Numerous subdivisions and housing clusters are developing in the more rural portions of the county.

Table 2. *Ownership categories in Chelan County as of December 2024. Source: U.S. Geological Survey, PAD v.3.0.*

Ownership Categories in Chelan County.	
Landowner	**Percent**
US Forest Service	70%
Private	13%
US National Park Service	7%
Washington Department of Natural Resources	3%
Washington Department of Fish and Wildlife	2%
US Bureau of Land Management	1%
U.S. Fish & Wildlife Service	<1%
Washington State Parks and Recreation Commission	<1%
Chelan County	<1%
City / municipality	<1%
Public school district	<1%
Water	3%
Total	**100%**

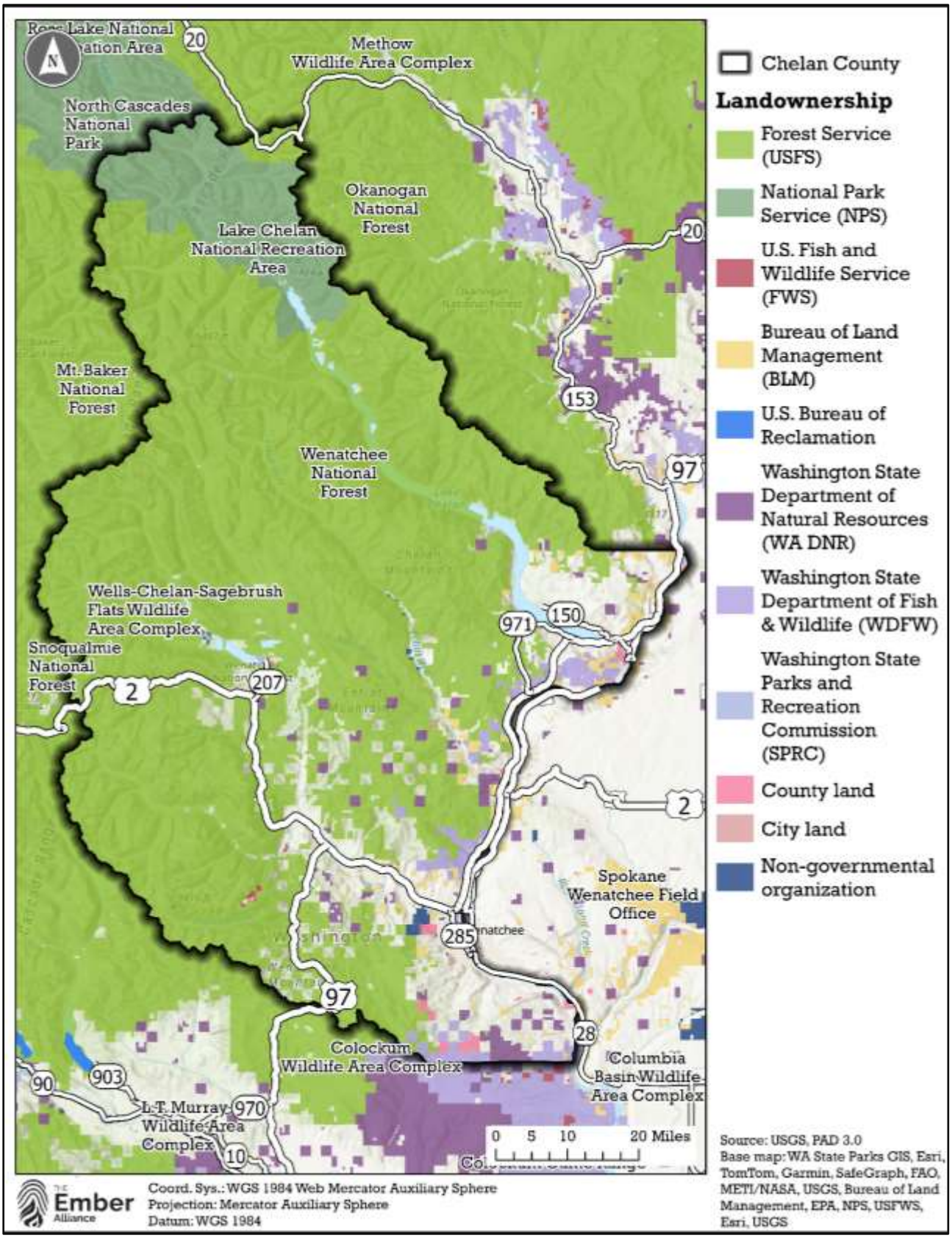


Figure 2. *Current landownership in Chelan County. Source: U.S. Geological Survey, PAD 3.0.*

Development Trends

The following section was taken from the 2017 Chelan County Comprehensive Plan.

Land available for development, approximately 279,000 acres or 436 square miles, is generally found along the valleys and rolling hills associated with Chelan Lake, the Entiat River, the Wenatchee River and the Columbia River. The largest populated area is located at the southeast corner of the County, around the City of Wenatchee.

The current County lands can meet current and projected population needs; however, due to constrained transportation facilities and funding resources for rural utilities, it is common to find development occurring adjacent to built-out infrastructure, such as roads and power lines, and where travel to services (such as grocery stores, churches or schools) is easily accessible. This type of development is not sprawl but rather follows the pattern of rural living in Chelan County with larger lot sizes used for residential living and often agricultural activities or clustered lots with large areas of protected open space.

As the population increases, conflicts between resources and more intense land uses will continue to arise. Chelan, Manson, Stehekin, Leavenworth, Plain, Lake Wenatchee and properties located along the shorelines are becoming increasingly popular as recreational and retirement property. Therefore, the County will continue to experience growth pressures on developable land.

The numerous water bodies of Chelan County provide opportunity for a mix of recreational and residential living adjacent to the water. It is common to find small lot development, primarily residential uses, along the shoreline. These areas were commonly platted prior to the Growth Management Act and reflect the County's character of rural recreational lifestyle. It is appropriate that newer developments provide for smaller lots and public access when consistent with the Shoreline Master Program.

Development among the hills and hilltops is relatively new but is consistent with the rural area, especially when developed in a manner which reduces road cuts and visual impacts, preserves open space, provides agriculture and/or recreational opportunities and protects critical areas.

Agriculture

Agricultural uses continue to serve as a rural economic benefit to the County. It should be noted that some historical agricultural activities, primarily orchards, are changing to vineyards, wineries and other non-traditional agricultural activities. It is the County's tradition to provide agricultural opportunities at a variety of scales, including various parcels sizes. Many of the new agricultural activities can and are occurring on smaller parcels of land near tourist communities. Other agricultural operations include organic farms, dairy production, row-crops, and, where appropriate, fish farms. The federal Reclamation Act of 1902 (Newlands Act) provided for the organization and funding of irrigation districts that had the government authority in acquiring land and issuing bonds. Irrigation along with railroads spurred agricultural development in Chelan County, particularly fruit orchards. Wineries play an increasing role in both agriculture and tourism. Agricultural employment directly links to non-farm employment through nondurable goods manufacturing (i.e. food processing), wholesale trade (i.e. fresh fruit packinghouses) and transportation.

7.c. Natural Resources

Chelan County encompasses a diverse ecosystem with a complex mix of vegetation, wildlife, and fisheries - many of which have evolved alongside fire as a natural disturbance process. However, nearly a century of wildland fire suppression, combined with past land-use practices such as timber harvesting and agriculture, has disrupted natural plant succession. These changes have led to significant shifts in fire regimes and species composition. As a result, some forests and rangelands in Chelan County are now more vulnerable to large, high-intensity wildfires, posing risks to life, property, and natural resources, including wildlife and plant populations. Stand-replacing fires of this intensity can severely damage soil and native vegetation. Additionally, the nationwide increase in large, high-intensity wildfires has heightened safety risks for firefighters and driven up fire suppression costs. (House of Representatives, Committee on Agriculture, Washington, DC, 1997).

Vegetation

Vegetation also varies greatly throughout the county as seen in Table 3 and Figure 3. The high western portion of the county abounds in dense pine, fir, cedar and sometimes larch, whereas the arid eastern portion is covered primarily by sagebrush and native grasses. Areas located between western and eastern portions of the county are comprised of varying amounts of coniferous forests, sagebrush, and native grasses. Deciduous tree species such as cottonwood, willow, red osier dogwood, and aspen are mostly concentrated in stream valleys or along lakes. Additionally, fruit tree orchards are located on irrigable lands along the rivers and stream valley bottoms.

Table 3. *Vegetative cover types in Chelan County. Source: 2023 LANDFIRE.*

Vegetative Cover Types in Chelan County	
Cover Type	**Percent**
Conifer forest	56%
Shrubland	13%
Grassland	10%
Sparsely vegetated	9%
Developed	4%
Water	3%
Agriculture	2%
Riparian vegetation	2%
Exotic herbaceous vegetation	1%
Total	**100%**

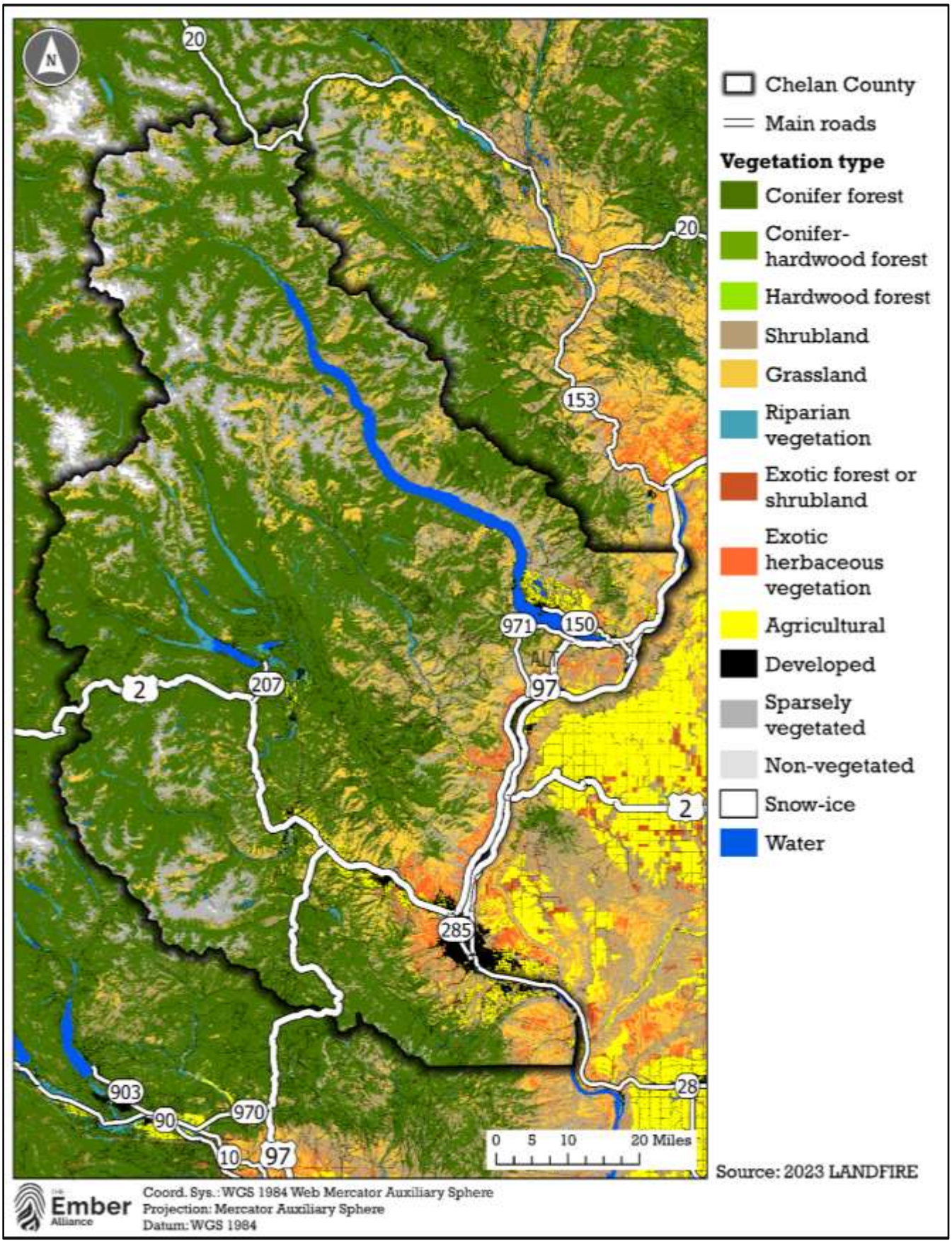


Figure 3. *Current vegetation in Chelan County. Source: 2023 LANDFIRE.*

Hydrology

The Washington Department of Ecology & Water Resources Program is charged with the development of the Washington State Water Plan. Included in the State Water Plan are the statewide water policy plan and component basin and water body plans, which cover specific geographic areas of the state (WDOE 2005). The Washington Department of Ecology has prepared general lithologies of the major ground water flow systems in Washington.

The state may assign or designate beneficial uses for certain Washington water bodies to support. These beneficial uses are identified in section WAC 173-201A-200 of the Washington Surface Water Quality Standards (WQS). These uses include:

- **Aquatic Life Uses:** char; salmonid and trout spawning, rearing, and migration; non-anadromous interior Redband trout, and indigenous warm water species
- **Recreational Uses:** primary (swimming) and secondary (boating) contact recreation
- **Water Supply Uses:** domestic, agricultural, industrial, and stock watering

While there may be competing beneficial uses in streams, federal law requires protection of the most sensitive of these beneficial uses.

A correlation to mass wasting due to the removal of vegetation caused by high intensity wildland fire has been documented. Burned vegetation can result in changes in soil moisture and loss of rooting strength that can result in slope instability, especially on slopes greater than 30%. The greatest watershed impacts from increased sediment will be in the lower gradient; depositional stream reaches.

Of critical importance to Chelan County will be the maintenance of the domestic watershed supplies in the Wenatchee Watershed (WRIA 45), Entiat Watershed (WRIA 46), and Chelan Watershed (WRIA 47).

Air Quality

The Department of Natural Resources (DNR), Department of Ecology (DOE), U.S. Forest Service (USDA), National Park Service (NPS), Bureau of Land Management (BLM), U.S Fish and Wildlife Service (USDI), participating Indian nations, military installations (DOD), and small and large forest landowners have worked together to deal with the effect of outdoor burning on air.

Wildfire smoke contains pollutants such as carbon monoxide, dangerous hydrocarbons, and particle pollution. Fine particulate matter is the main pollutant in wildfire smoke and a significant health concern, as they are small enough to travel through the lungs and into the bloodstream. Short-term exposure to wildfire smoke can affect both the respiratory system (such as difficulty breathing, reduced lung function, and exacerbation of existing respiratory illnesses) and the cardiovascular system (including heart attack and stroke)(EPA, 2019).

The primary means by which the protection and enhancement of air quality is accomplished is through implementation of National Ambient Air Quality Standards (NAAQS). Under the Clean Air Act, the Office for Air Quality Planning and Standards (OAQPS) is responsible for ensuring these air quality standards are met,

or attained (in cooperation with state, Tribal, and local governments) through national standards and strategies to control pollutant emissions from automobiles, factories, and other sources (Louks, 2001).

Studies show that certain populations are more vulnerable to smoke from wildfires. Communities that are older, infants, pregnant people, people with preexisting medical conditions, and people of lower socio-economic status are more at risk of negative health effects than the general population (Joseph et al., 2020). Extended exposure to medium or heavy wildfire smoke (two weeks or more per year) is linked with symptoms of mental health issues such as anxiety for people of all demographics (Mirabelli et al., 2022).

Certain types of material produce more impactful emissions than others. Smoke from burning pine species can cause genetic mutations in bacteria, which is connected to cancer risk. Fire in areas with pine may be worse than in forests without pine (EPA, 2018).

Climatic conditions affecting air quality in northeast Washington are governed by a combination of factors. Large-scale influences include latitude, altitude, prevailing hemispheric wind patterns, and mountain barriers. At a smaller scale, topography and vegetation cover also affect air movement patterns. Air quality in the area is generally moderate to good. According to the U.S. Environmental Protection Agency (EPA), smoke from wildfires is a major component of air pollution (EPA, 2018).

Wildfires and prescribed fires produce the same types of emissions and can have the same effects on populations as wildfires of the same size and location. However, prescribed fires are managed and pre-planned events that can offer the opportunity for managers to choose strategic locations and give appropriate notifications to the public that do the least harm to vulnerable populations, as they are time-limited events which minimize burn periods as opposed to unplanned, long-term duration wildfire events. Land managers can selectively implement the prescribed burns during favorable weather and fuel conditions to promote improved air quality conditions to mitigate the impact to residents. The use of prescribed fire has been demonstrated and has the potential to reduce the size, intensity, and smoke impacts of wildfires and allow more decision space for effective wildland fire suppression efforts that can therefore reduce the negative health impacts of smoke and/or wildland fires.

Washington Department of Ecology

The Washington Department of Ecology Air Quality Program protects public health and the environment from pollutants caused by vehicles, outdoor and indoor burning, and industry. The DOE oversees permitting non-forested (i.e. agriculture and rangeland) burning. Chelan County falls under the jurisdiction of the Central Regional Office (CRO). The CRO can be reached at: 509-575-2490.

8. Wildfire Risk and Preparedness Assessments

8.a. Wildland Fire Characteristics

Fire behavior models provide reasonable estimates of relative wildfire behavior across a landscape. However, wildfire behavior is complex, and models are simplifications of reality. They can fail to account for the influence of structures on fire spread and home-to-home ignitions. The fire behavior analyses presented in this document should be used to assess relative risk at a landscape scale rather than to determine the risk to any single property.

Increasingly frequent hot, dry, and windy conditions - driven in part by climate change - could result in even more extreme fire behavior across Chelan County than predicted by this analysis. This CWPP primarily relies on fire behavior modeling from the 2023 Pacific Northwest Quantitative Wildfire Risk Assessment (PNW QWRA) (McEvoy et al., 2023).

At its core, wildland fire behavior describes how fires burn - how fuels ignite, how flames develop, and how fire spreads across the landscape. Three primary physical components determine fire behavior:

1. Weather - Atmospheric Conditions such as wind, temperature, relative humidity, and atmospheric instability that influence fire intensity and spread.
2. Topography - The landscape features where the fire is burning, including slope, aspect, and elevation.
3. Fuels - The type, arrangement, and moisture content of the vegetation or other combustible materials supporting the fire.

At the landscape level, topography and weather are beyond human control - we cannot manipulate wind, temperature, humidity, slope, or other environmental conditions. However, we *can* influence fire behavior by managing the third component: fuels. By modifying fuel loads and continuity across the landscape, we have the greatest opportunity to influence how fires burn and mitigate their impact.

The following sections provide a brief overview of these fire environment elements and their effects on fire behavior.

Weather

Weather conditions contribute significantly to determining fire behavior. Wind, moisture, temperature, and relative humidity ultimately determine the rates at which fuels dry and vegetation cures, and whether fuel conditions become dry enough to sustain an ignition. Once conditions can sustain a fire, atmospheric stability and wind speed and direction can have a significant effect on fire behavior. Winds fan fires with oxygen, increasing the rate at which fire spreads across the landscape. Weather is the most unpredictable component governing fire behavior, constantly changing in time and across the landscape.

Topography

Fires burning in similar fuel types will burn differently under varying topographic conditions. Topography alters heat transfer and localized weather conditions, which in turn influences vegetative growth and

resulting fuels. Changes in slope and aspect can have significant influences on how fires burn. North slopes tend to be cooler, wetter, and more productive sites. This can lead to heavy fuel accumulations, with high fuel moisture, later curing of fuels, and lower rates of spread. In contrast, south and west slopes tend to receive more direct sun, and thus have the highest temperatures, lowest soil and fuel moisture, and lightest fuels. The combination of light fuels and dry sites leads to fires that typically display the highest rates of spread. These slopes also tend to be on the windward side of mountains. Thus, these slopes tend to be "available to burn" a greater portion of the year.

Slope also plays a significant role in fire spread, by allowing preheating of fuels upslope of the burning fire. As slope increases, the rate of spread and flame lengths tend to increase.

Fuels

Fuels refer to any material that can ignite and burn, including both living and dead organic matter. Examples include grasses, brush, branches, woody debris, forest floor litter, conifer needles, and even buildings. Fire behavior is determined by a combination of fuel type, size, moisture content, arrangement, topography, and weather conditions.

Fine fuels, such as grass and needle litter, ignite readily and spread fire quickly due to their high surface-area-to-volume ratio. These fuels are the primary carriers of surface fires. In contrast, larger fuels burn more slowly but release greater energy, resulting in more intense and difficult-to-control fires. Typically, grass fires are more easily managed than timber fires, which burn hotter and longer, posing significant suppression challenges. Fires in grass and rangeland typically burn at lower intensities with moderate flame lengths and short-range spotting. When suppression resources have good access, containment is usually effective. However, wind-driven fires can spread rapidly, especially under extreme drought conditions, making suppression difficult.

In eastern Chelan County, wide valley bottoms and irrigation support extensive agriculture, particularly fruit orchards. Agricultural fields and orchards rarely serve as significant fuel sources, as most remain irrigated late into the fire season, reducing ignition risk. Other crops, such as hay, burn similarly to low-growing grasses, producing lower-intensity fires.

Fires burning in forested areas generate much higher intensities, often leading to *torching* (individual trees becoming fully engulfed) and, in some cases, *crown fires* that release vast amounts of energy. Many mid-elevation forests, particularly dry Douglas-fir and ponderosa pine stands, have become overstocked, creating multi-storied conditions with abundant ladder fuels. These conditions increase the likelihood of both passive and active crown fires, producing embers that can ignite new spot fires.

Forests actively managed for fire resilience are less likely to sustain torching and crowning. By modifying fuels—such as reducing ladder fuels and thinning dense stands—the risk of severe fire behavior and ember-driven ignitions can be significantly reduced. Tree mortality from insects and disease increases the amount of dead and downed fuel on the landscape. Overstocked forests with high fuel continuity, combined with Chelan County's arid and often windy conditions, create ideal conditions for *stand-replacing fires*—high-

intensity wildfires that generate large flame lengths and loft embers over long distances. These fires pose serious suppression challenges and often result in large-scale destruction.

Recently burned areas, such as the 38,730-acre 2024 Pioneer Fire, will have reduced wildfire risk for several years as fine fuels were consumed. However, in dense, multi-storied Douglas-fir and ponderosa pine forests, the long-term reduction in hazardous fuels is minimal. Over the next 10–20 years, snags will fall, creating heavy accumulations of downed branches and logs. Meanwhile, fine fuels will return as understory vegetation re-establishes. This combination can lead to severe fire potential 20–30 years post-wildfire, as seen in areas burned by the 1994 Tyee, Rat Creek, and Hatchery Creek Fires.

Homes can act as additional fuel sources, generating high-intensity flames, embers, and initiating home-to-home ignitions. Wildfires ignite homes through radiant heat, convective heat, and direct flame or ember contact:

- Radiant heat can ignite homes based on material type (e.g., wood, metal, brick), flame temperature, ambient air temperature, and proximity to fire. (Caton et al., 2016)
- Convective heat is a greater risk for homes in steep terrain, ravines, or draws.
- Direct flame contact occurs when fire burns close enough to ignite a structure, such as flames from firewood stacks or shrubs near the home.

Fires can also spread between structures through connected fuel pathways, such as wooden fences or landscaping (Maranghides et al., 2022). Some building materials burn hotter than surrounding vegetation, increasing wildfire intensity and facilitating home-to-home ignition (Mell et al., 2010).

Research shows that 50–90% of homes that ignite during wildfires do so because of embers, rather than direct flame contact or radiant heat (Gropp, 2019; Johnston, 2018). Embers can enter through vents, land on roofs, or accumulate under decks, igniting nearby vegetation or flammable materials. Once homes catch fire, they can produce additional embers that ignite neighboring structures, creating a dangerous cycle of destruction. Homes with combustible features—such as wood-shingle roofs, unenclosed eaves, and exposed vents—are at significantly higher risk (Hakes et al., 2017; Syphard & Keeley, 2019). Additionally, radiant or convective heat can shatter windows, allowing embers to enter and ignite the interior.

Strategic fuel management, home hardening, and defensible space measures are critical for reducing wildfire risk. Managing fuels—through thinning, prescribed fire, and reducing ladder fuels—helps mitigate high-intensity fire behavior in forests. Likewise, retrofitting homes with fire-resistant materials, maintaining defensible space, and sealing ember entry points can drastically improve a structure's chances of surviving a wildfire.

8.b. Historic Fire Regimes

Fire was once an integral function within most ecosystems in Washington before the era of fire suppression. Many Indigenous peoples utilized fire to steward the land, including the Nimiipuu (Nez Perce), Cayuse, Umatilla and Walla Walla Nations and the Confederated Tribes of the Colville Reservation, which played an important role in shaping the vegetation throughout the County (*Forest Fire in Washington State*, n.d.). Native plant communities in this region developed under the influence of fire, and adaptations to fire are evident at the species, community, and ecosystem levels.

Understanding the natural role of fire in ecosystems is necessary for proper fire management and ecological restoration. Fire is one of the dominant processes in terrestrial systems that constrain vegetation patterns, habitats, and ultimately, species composition. Land managers need to understand historical fire regimes, the fire return interval (frequency), and fire severity prior to settlement by Euro-Americans to define ecologically appropriate goals and objectives for an area. Moreover, managers need spatially explicit knowledge of how historical fire regimes vary across the landscape.

Depending on the plant community composition, structural configuration, and buildup of plant biomass, fire resulted from ignitions with varying intensities and extent across the landscape. Frequent, low-severity fires were common in grasslands, shrub-steppe, and ponderosa pine and dry-mixed conifer forests before Euro-American settlement starting around the 1850's. Fires in dry ponderosa pine ecosystems burned every 5 to 20 years apart and helped maintain forests with low tree densities (Reilly et al., 2021). Few overstory trees were killed by low-severity wildfires, but small trees, shrubs, and grasses would burn. Mixed-severity fire regimes with varying frequencies (fires occurring about every 35 to 200 years) occurred in mixed evergreen forests at mid- to high-elevations. These forests experienced patches of low-severity and high-severity fire behavior. High-severity fires killed a majority of overstory trees and more common on south and west-facing upper slopes and ridges where tree densities were higher. Other forest types, particularly subalpine forests at higher elevations, experienced infrequent (>200 years between fires) and high-severity wildfires. With infrequent return intervals, plant communities tended to burn more severely and be replaced by vegetation different in composition, structure, and age (Reilly et al., 2021).

Some plant species evolved adaptations to wildfire, for example, the heat from wildfires open the cones of lodgepole pine and knobcone pine, and mortality from wildfire triggers propagation of quaking aspen populations. Large-diameter Ponderosa pine and Douglas fir have thick bark that insulates against damaging heat from wildfires. Some wildlife benefit from recently burned ecosystems with lower tree densities and a greater abundance of understory plants (Kalies et al., 2012; Pilliod et al., 2006).

According to estimates of historic fire regimes produced by the U.S. Forest Service, Department of Interior, and other partners with the LANDFIRE program, the most common historic fire regimes in Chelan County were frequent, low- and mixed-severity fires at lower elevations, infrequent, low- and mixed-severity fires at mid elevations, and infrequent, variable severity fires at higher elevations (Table 4; Figure 4). Fire regime groups from LANDFIRE characterize the presumed historical fire regimes within landscapes based on interactions between vegetation dynamics, fire spread, fire effects, and spatial context (Hardy et al., 2001).

Table 4. *Historic fire regimes in Chelan County. Source: 2023 LANDFIRE. Methodology for defining and determining historic fire regime group provided by (Hardy et al., 2001).*

Historic Fire Regime Group	Fire Return Interval	Fire Severity	Percent of Total Area
Group I	≤35 years	Low- and mixed-severity	28%
Group II	≤35 years	High severity (replacement severity)	1%
Group III	35 - 200 years	Low- and mixed-severity	27%
Group IV	35 - 200 years	High severity (replacement severity)	9%
Group V	> 200 years	Low-, mixed-, or high-severity	26%
Water			3%
Non vegetated, sparsely vegetated, or snow/ice			6%
Total			**100%**

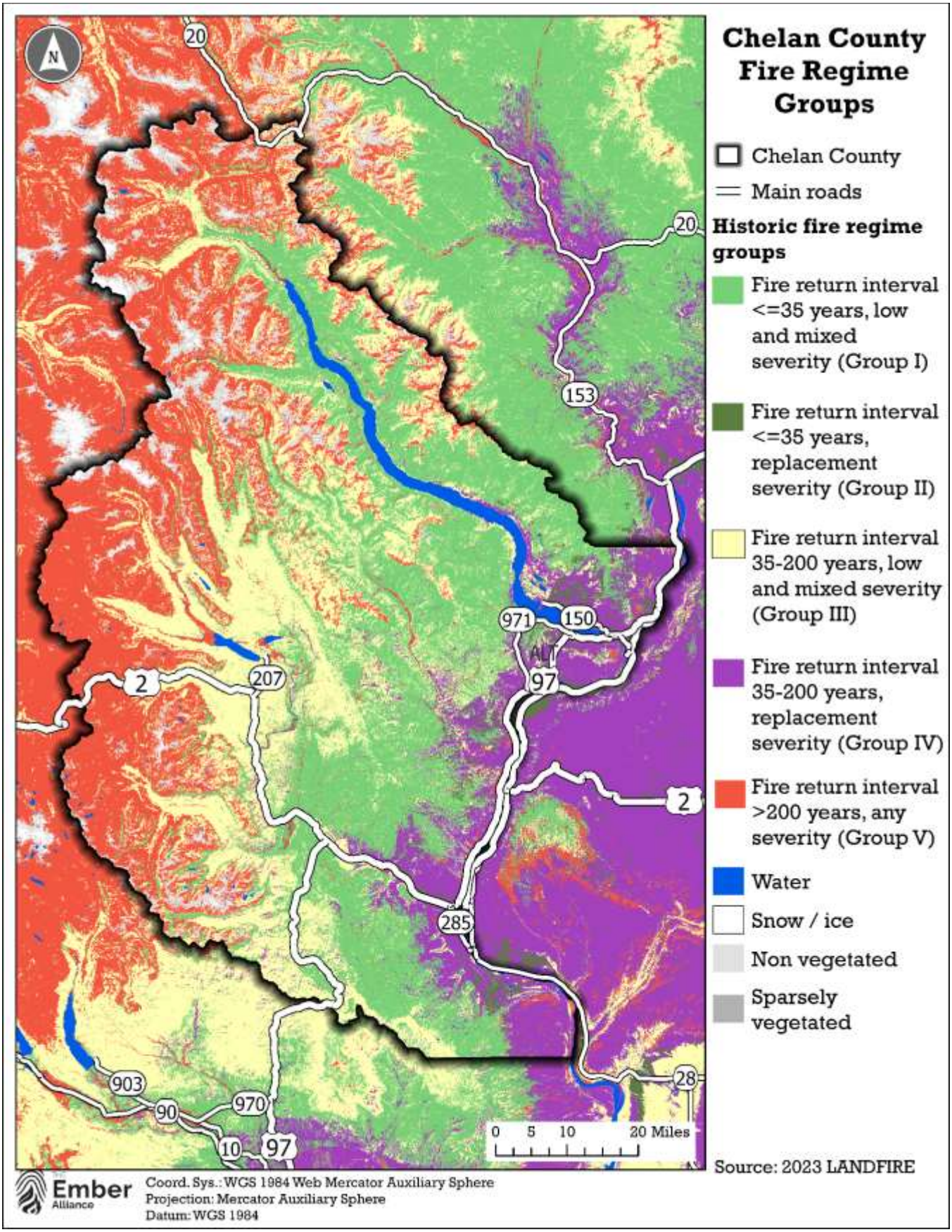


***Figure 4**. Historic fire regime groups in Chelan County. Source: 2023 LANDFIRE.*

8.c. Current Wildfire Behavior and Wildfire Risk

Departure from Historic Fire Regimes

Wildfire behavior is vastly different today than it was over a century ago in many ecosystems in Washington. As the initial ranching and logging activities of Euro-American settlers subsided in the region and government-mandated fire suppression began in the late 1800's, forests filled in with trees (Reilly et al., 2021). Although many residents consider dense forest as "natural," these conditions are vastly different from the fire-resilient ecosystems that existed before.

According to estimates of historic fire regimes produced by the U.S. Forest Service, Department of Interior, and other partners with the LANDFIRE program, vegetation conditions across two thirds of Chelan County have a moderate departure from historic conditions (Figure 5; Table 5). These areas experience less frequent fire and have experienced a build-up of fuels that can contribute to high-severity wildfires in the future. The highly departed condition class occurs around the higher concentrations of human development and along the ridges in the more remote western portions of the County. Only 7% of the area in Chelan County has vegetation conditions that are within the natural (historic) range of variability. Estimates of vegetation condition class are based on vegetation characteristics (species composition, structural stages, stand age, canopy closure, and mosaic pattern), fuel composition, fire frequency, severity, and pattern, and other natural disturbances (Hardy et al., 2001).

Table 5. *Vegetation condition class for Chelan County. Source: 2023 LANDFIRE. Methodology for defining and determining historic fire regime group provided by (Hardy et al., 2001).*

Vegetation Condition Class in Chelan County.		
Fire Regime Condition Class	**Description**	**Percent of Total Area**
Condition Class I.A and I.B	Low vegetation departure	7%
Condition Class II.A and II.B	Moderate vegetation departure	66%
Condition Class III.A and III.B	High vegetation departure	8%
Water		3%
Agriculture		2%
Developed		4%
Non vegetated or sparsely vegetated		10%
	Total	**100%**

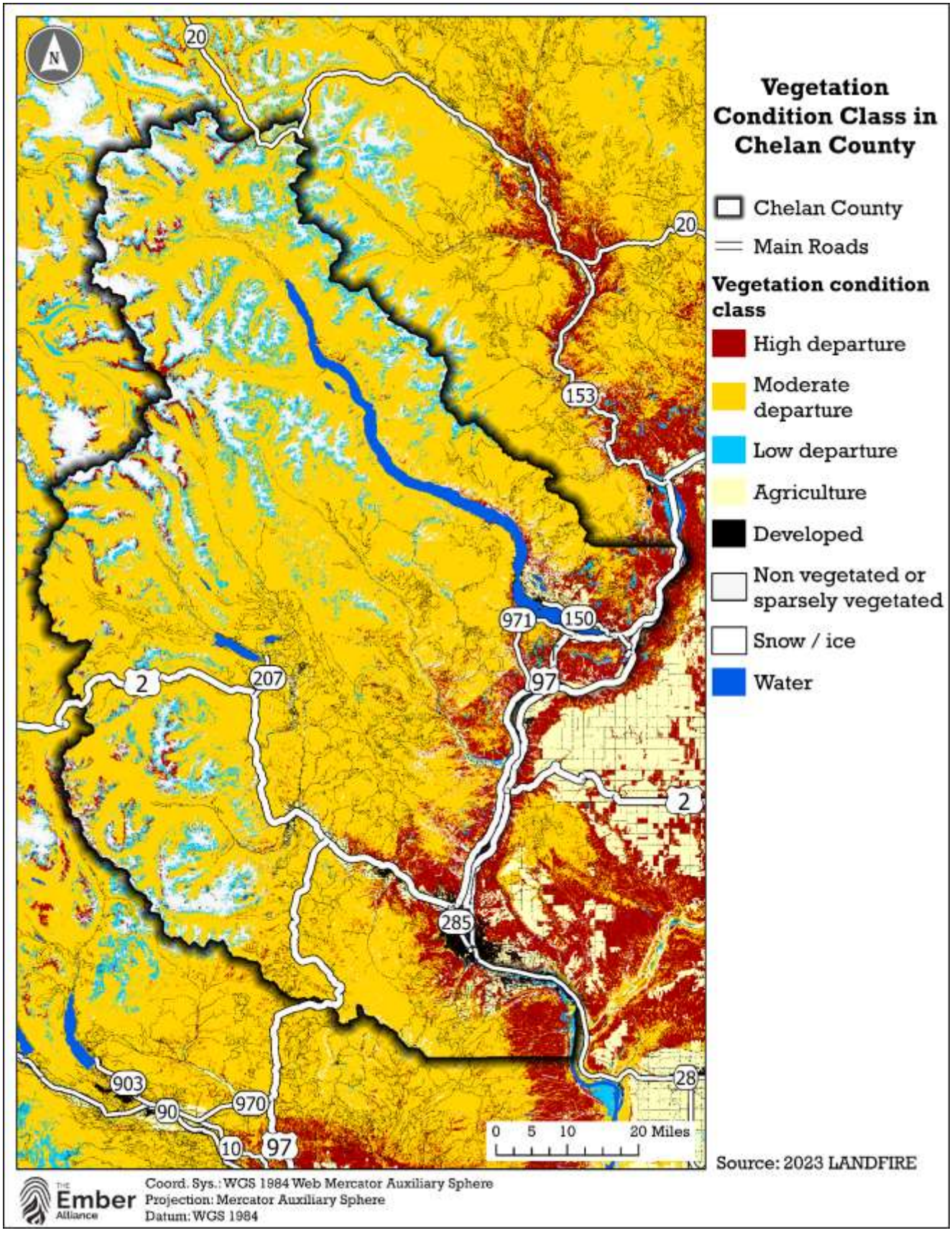


Figure 5. *Vegetation condition classes in Chelan County. Source: 2023 LANDFIRE.*

Recent Wildfire Occurrence

Large wildfires are common across Chelan County due to the area's dry summer climate, steep terrain, complex topography, dense forests, and open grasslands, combined with limited road access and heavy recreational use (Figure 6). Many wildfires in Washington's history have occurred on dry and windy days, resulting in rapidly spreading fires that outpace the ability of firefighters to respond. The recent 2024 Pioneer Fire along Lake Chelan covered almost 40,000 square miles and triggered evacuations that forced families to evacuate from their communities.

Wildfires burned about 1,155,000 acres in Chelan County between 1990-2024, with some of these acres burning more than once during that time frame (Table 6).[1] Between 1990-2024, fire response agencies recorded an average of 73 wildfire ignition per year in Washington resulting in an average total burn area of 33,000 acres per year. Particularly high numbers of acres burned in wildfires in Chelan County in 1994, 2013 2014, and 2015 (Figure 7). The largest wildfire during that time was the 1994 Tyee Creek Fire (140,000 acres), and the greatest number of acres burned in a single year was in 2015 at about 254,800 acres. The highest number of reported ignitions was 120 in 1999 (Figure 7).

More ignitions were caused by lightning than human activity in Chelan County from 1990 to 2024, but it is significant that 43% of ignitions during that timeframe were caused by humans (Table 6; Figure 7). Human-caused and lightning ignitions are most prevalent in July and August (Figure 8).

Wildland firefighters suppress almost 90% of ignitions in Chelan County before they exceed 10 acres in size, but fires can escape the initial capacity of firefighters under high, dry, and windy conditions. Wildfires that exceed initial attack capabilities of firefighters are uncommon, but they account for most suppression expenditures and destruction of homes and property. Large fires are characterized by a size and complexity that require special management organizations drawing suppression resources from across the nation. These fires create unique challenges to local communities by their quick development and the scale of their footprint.

Significant recent wildfires in Chelan County:

2024 Pioneer Fire

On June 8th of 2024, a human caused fire started and burned until October charring 38,730 acres (*Northwest Large Fire Interactive Map*, 2024). Fuels involved in the wildland fire included lodgepole pine and mixed conifer stands.

[1] Data on wildfire ignitions and extents were compiled and quality controlled across several data sources from National Interagency Fire Center, Fire Program Analysis fire-occurrence database, InFORM, and FIRESTAT. The data represents only ignitions reported by agencies on land protected by that agency, and the data may not include all fires in areas covered only by local fire departments or city or county agencies. Data presented in the 2025 CWPP differs from that presented in the 2019 CWPP because the updated numbers are based on a more comprehensive dataset that combines information from multiple sources.

2023 Airplane Lake Fire

On July 7, 2023, a fire caused by lightning was reported and burned 6,956 acres.

2022 Irving Peak Fire

11,179 acres burned due to a fire caused by lightning on 8/11/2022 and burned until 11/4/2022.

2022 Minnow Ridge Fire

On 9/9/2022 a fire of unknown cause burned 5,130 acres.

2021 Twenty-Five Mile Fire

On 8/15/2021 a fire of unknown cause burned down 22,217 acres burned. This fire burned most of (more than 80% of) the Twenty-Fire Mile Creek watershed, resulting in degraded soils and high risk of flooding and debris flows.

2021 Nason Ridge Fire

The Nason Fire was ignited by a lightning storm on August 3, 2021 and was is in steep, difficult to access timbered terrain 17 miles NW of Plain, WA (*Okanogan-Wenatchee National Forest - News & Events*, 2021). 1,318 acres burned (Washington Large Fires 1973-2023, Washington State DNR).

2020 Apple Acres Fire

The Apple Acres Fire was located just four miles north of Chelan, WA and burned 5,880 acres. Chelan Douglas Health District reported that air quality in Chelan and Wenatchee areas was considered hazardous for everyone. They recommended staying indoors, using a HEPA filter if possible, and to wear a mask if outdoors (loni, 2020). Evacuation notices were issued to residents of Apple Acres, Washington Creek, Antoine Creek and Howard Flats

2018 Cougar Creek Fire

A fire was reported 10 miles northwest of the Entiat on July 28th. The fire was ignited by lightning and burned over 42,000 acres according to InciWeb (*Home | InciWeb*, 2024). Fuels involved in the wildland fire included lodgepole pine/mixed conifer stands and stands of beetle killed trees. This fire also burned through an old fire scar (*Forest Fire in Washington State*, n.d.) with dense lodgepole regeneration, snags and dead/down material.

2015 Chelan Complex Fires

"These fires burned over 95,000 acres and destroyed over 50 homes in the First Creek Neighborhood and the City of Chelan. The entire Lake Chelan area lost power for three days, which affected their communications network and their ability to pump water from the city fire hydrants"(Mowrey M., Johnston K., Yellin B., 2018).

2015 Sleepy Hollow Fire

Over 3,000 acres were burned and 30 residences destroyed in the Broadview neighborhood located in the western foothills of Wenatchee. The city also experienced fire starts in the center of town at several warehouses due to embers from the burning homes.

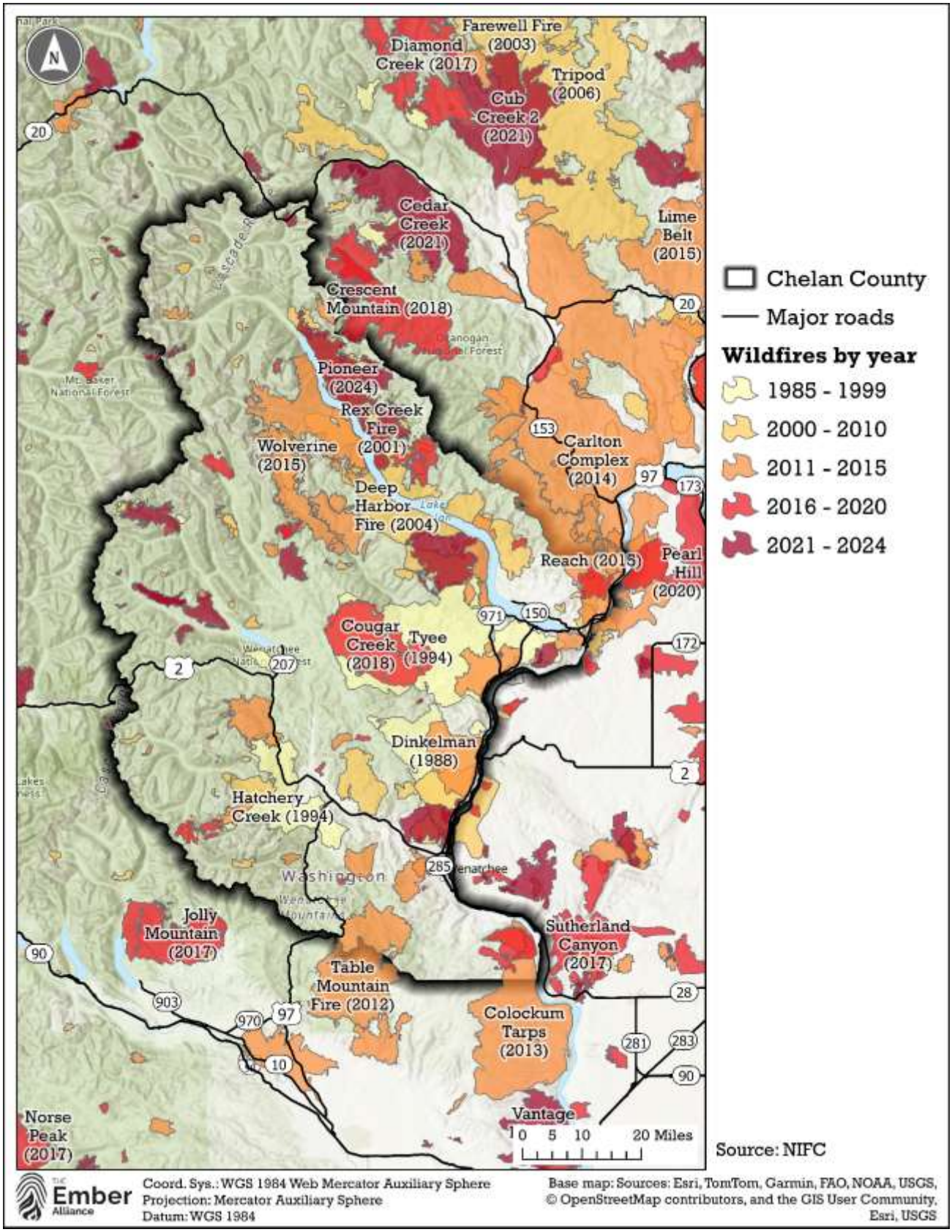


***Figure 6**. Recent wildfires in and around Chelan County from 1985 - 2024. Source: National Interagency Fire Center.*

Table 6. *Causes of wildfire ignitions from 1990-2024 in Chelan County. Sources: National Interagency Fire Center, Fire Program Analysis fire-occurrence database, InFORM, and FIRESTAT.*

Summary of Cause from State and Federal Databases 1990-2024 (sources: NIFC, FOD, InFORM, FIRESTAT).				
General Cause	**Number of Ignitions**	**Percent of Total Ignitions**	**Acres Burned**	**Percent of Total Acres**
Lightning	1,333	52%	695,385	60%
Human-Caused	1,117	43%	305,983	27%
Unknown	119	5%	153,910	13%
Total from 1990-2024	**2,569**	**100%**	**1,155,278**	**100%**
Average / year	**73**		**33,008**	

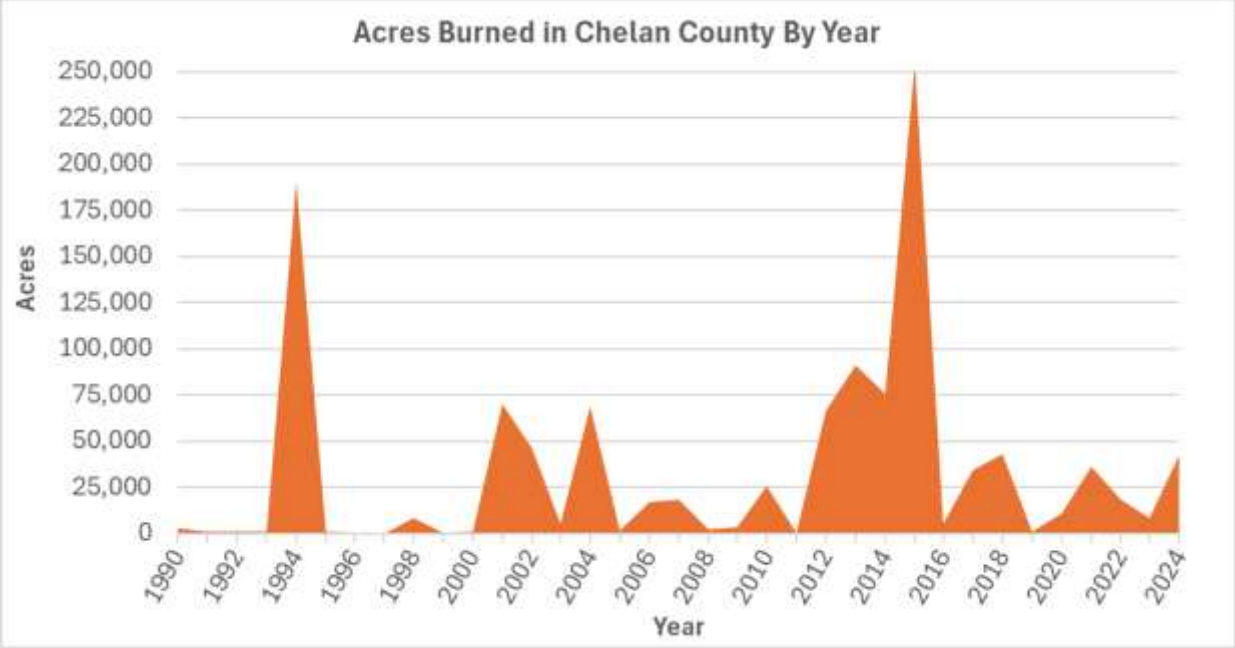


Figure 7*. Reported acres burned by wildfire in Chelan County from 1990 - 2024. Source: National Interagency Fire Center.*

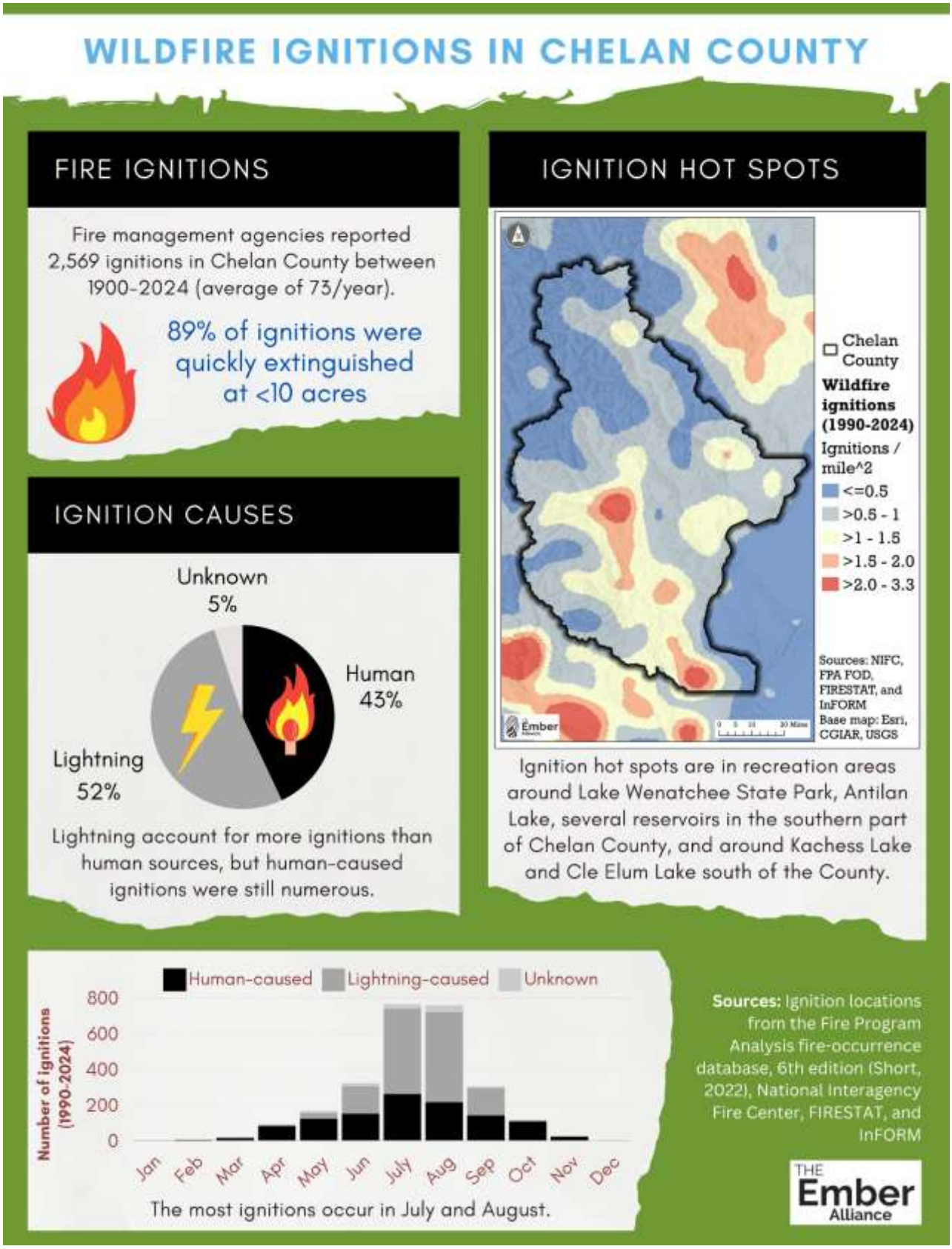


Figure 8. *Summary of reported ignitions in Chelan County. Source: NIFC, FOD, InFORM, FIRESTAT. Infographic by The Ember Alliance.*

8.d. Wildfire Risk Analysis

Wildfires, especially in the wildland-urban interface, are among Chelan County's most significant natural hazards. According to the Washington State Wildland Fire Protection 10-year Strategic Plan, seven of the top 25 places most likely to be exposed to wildland fire in the state of Washington occur in Chelan County—the cities of Cashmere, Entiat, Leavenworth, and Wenatchee, as well as the rural communities of Stehekin, Peshastin, and Manson. A combination of dense wildland vegetation, extreme heat and high winds, unplanned ignitions, and housing developments in the WUI can create catastrophic wildfire scenarios (Haas et al., 2015).

Fire behavior models can provide reasonable estimates of relative wildfire behavior and likelihood across a landscape. However, wildfire behavior is complex, and models are a simplification of reality. Models also struggle to capture the impacts of structures on wildfire spread and home-to-home ignitions. It is recommended to use the fire behavior analyses within this document to understand relative risk at a landscape scale, and not as an indication of a single property's risk.

This CWPP primarily uses fire behavior modeling from the 2023 Pacific Northwest Quantitative Wildfire Risk Assessment (PNW 2023 QWRA) (McEvoy et al., 2023). Modeling was completed prior to the 2024 Pioneer Fire in Chelan County, so post-fire conditions are not reflected in the maps shown here. Climate change is making high-severity wildfires more frequent, intense, and larger in extent (Parks, Miller, Abatzoglou, et al., 2016), so future fire behavior might be even more extreme across Chelan County than predicted by this analysis. For details on fire behavior modeling used for this CWPP see **Appendix 2 - Risk Analysis Models**

Potential Fire Behavior

Topography and fuel conditions are highly variable across Chelan County, and this variation, plus alignment between wind patterns and topography, helps explain the patterns of potential fire behavior across the landscape (Figure 9). Under hot, dry, and windy weather, 40% percent of Chelan County could experience very high to extreme fire behavior. Very high to extreme fire behavior includes ember production that ignites additional fires away from the main fire and the movement of high-intensity fire from treetop to treetop. Such fires are extremely challenging if not impossible to control until winds die down and fuel moisture increases. High-intensity wildfires and active crown fires are most likely on steep, forested slopes across Chelan County, including along Icicle River, all around Lake Wenatchee and Leavenworth, east of Chumstick, near Blewett Pass, the center of the Entiat valley, north and south of the middle of Lake Chelan, and up valley from Stehekin.

In general, large fires that start in the western portion of the county start high in elevation and move toward populations and centers of town, usually lower in elevation. Rolling embers and spot fires are a common method of downhill fire spread. Spot fires ignited on slopes trigger uphill runs that throw more spot fires,

expanding the downward fire progression. Large fires may easily produce spot fires even miles away from the main fire. Most of Chelan County is susceptible to embers, including most populated areas, which creates an increased risk for home-to-home fire spread and urban conflagrations.

As fires move down in elevation in Chelan County, they burn into grassland and shrublands in the lower elevations. Many of the valley bottoms and flat lands to the east of the county are predicted to have low fire behavior with shorter flame lengths that could be controlled by firefighters using hand tools under most conditions. However, under extremely hot, dry, and windy conditions, wildfires can travel rapidly through grasses and shrubs and outpace the ability of initial firefighting resources to suppress. Homes serve as an additional source of fuel that could produce high-intensity flames, emit embers, and initiate home-to-home ignitions. With respect to specific emissions, more information can be found at The Chemistry of Fires at the Wildland-Urban Interface | The National Academies Press.

Likelihood of Wildfire

Wildfire risk is composed of hazard (potential intensity of wildfire and likelihood of wildfire) and vulnerability (exposure of highly valued resources and their susceptibility to damage). Burn probability is the annual probability of a wildfire burning a location. Most of Chelan County has high to very high burn probability relative to the state of Washington (Figure 10).

The areas with the highest burn probabilities include the mountains from northeast of Lake Wenatchee down east of Chumstick and to the Wenatchee River by Cashmere, along the Icicle River and up into the Alpine Lakes Wilderness, and the area south of Leavenworth and Cashmere heading toward Blewett Pass. Other populated areas with higher burn probability include the Wenatchee National Forest land north of eastern Lake Chelan around Chelan and Manson, and the Wenatchee National Forest and Washington DNR land north and west of Entiat.

Areas with lower relative burn probability are high-elevation alpine areas with low amounts of fuel in the western part of Chelan County and areas that burned in the past 10 years, such as the 2015 Wolverine Fire, 2018 Cougar Creek Fire, and 2021 Twenty-five Mile Fire. For years to decades following a wildfire, altered fuels in burned areas can reduce the size, severity, spread, and occurrence of subsequent fires, in effect acting like large fuel treatments (Parks, Miller, Holsinger, et al., 2016).

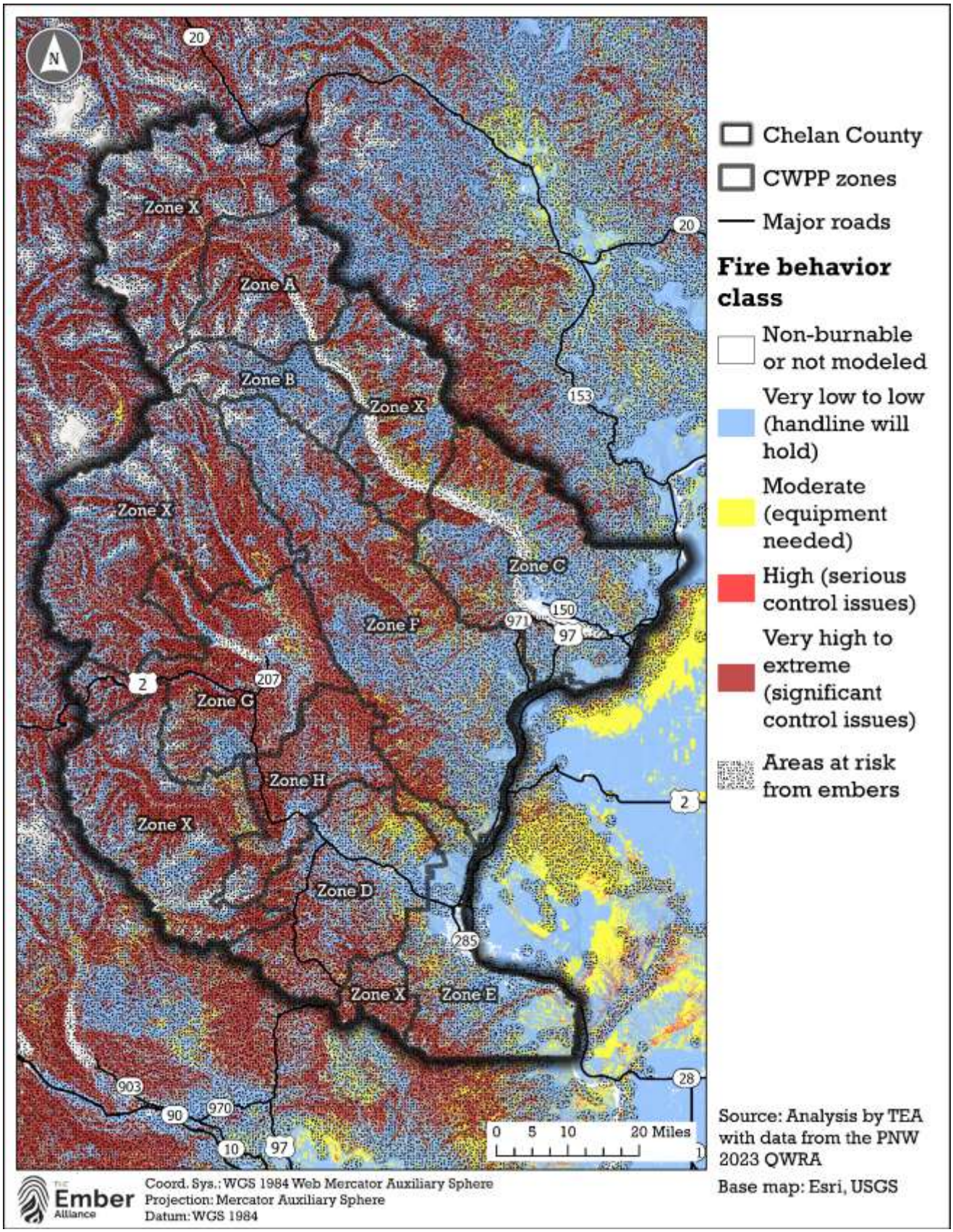


Figure 9. *Predicted fire behavior class in Chelan County. Source: PNW 2023 QWRA.*

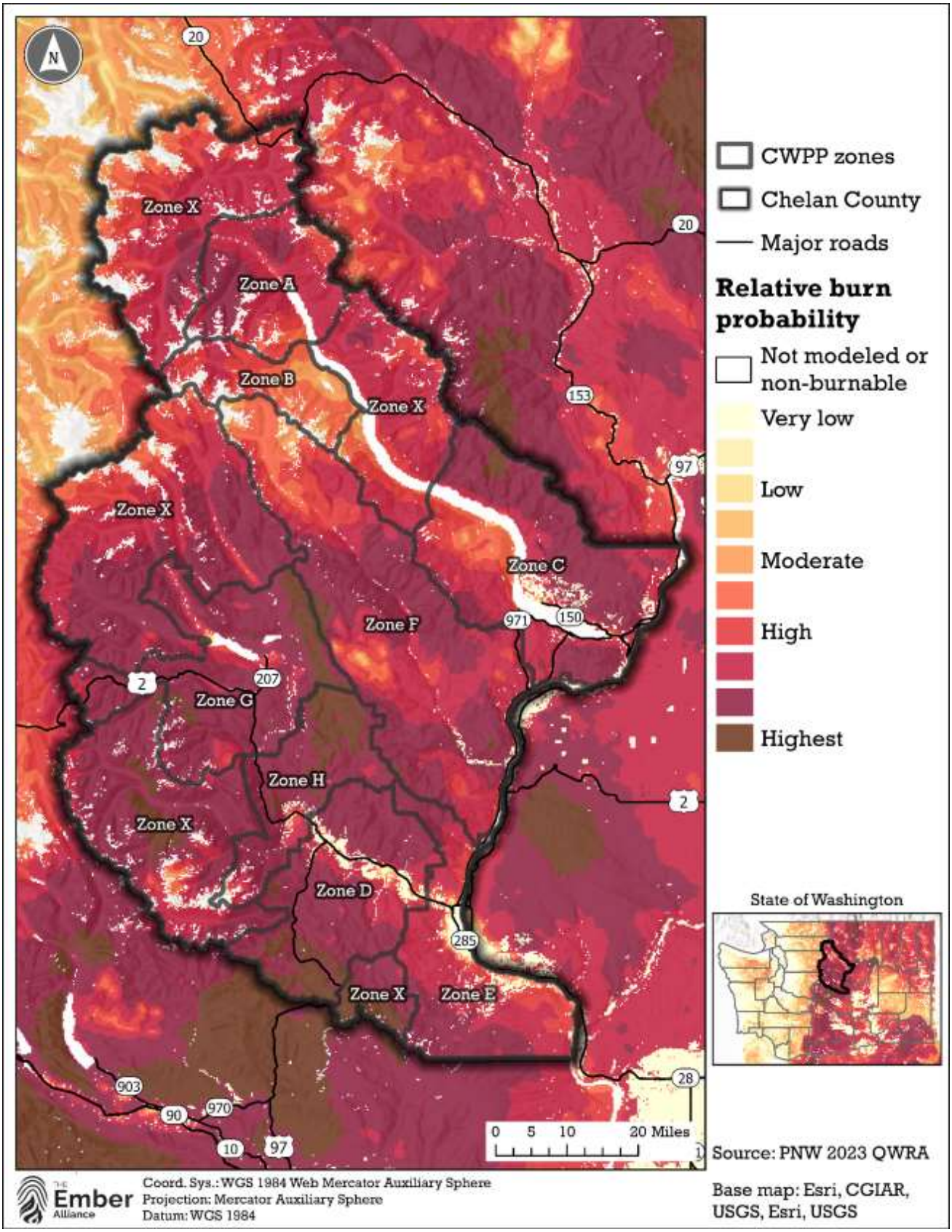


***Figure 10**. Relative likelihood of wildfire in Chelan County. Source: PNW 2023 QWRA.*

Potential Consequences to the Community

Wildfires can threaten lives and property, and they can be expensive. Not only are there direct costs associated with suppression and rebuilding, but there are indirect costs before a fire including the costs of planning, education, mitigation, and training. Indirect costs following wildfire include disrupted business income, lower property values, higher insurance premiums, long-term healthcare costs from smoke impacts, and post-fire debris flows and sedimentation (Troy et al., 2022).

High-intensity wildfires, rapid rates of spread, and embers can threaten structures across Chelan County. Radiant heat from burning vegetation can ignite nearby homes, and embers emitted from burning vegetation or other homes can travel long distances and ignite vegetation and homes away from the main fire. Based on the analysis for this CWPP, 6% of addresses in Chelan County could be exposed to radiant heat, but 66% of addresses could be exposed to embers from burning vegetation (Figure 11). Communities with high exposure to radiant heat include Lake Wenatchee, Leavenworth, Chumstick, Cashmere, and the rest of the communities along US Highway 2 from Berne to Monitor, the Entiat valley, much of the Chelan and Manson area, Stehekin, and the South Wenatchee and Malaga communities.

Addresses interior to communities on the eastern edge of the county, including Wenatchee and Entiat, have a lower potential of receiving embers from burning vegetation, but they could be at risk from structure-to-structure ignitions were fire to enter the community. On average, structures in Chelan County could receive abundant embers from 16 other structures and up to 85 other structures. This CWPP outlines steps that residents and business owners can take to protect their property and increase the chance of their homes, businesses, and other structures standing strong against wildfires (see Section 13.b. Recommendations for Residents). **Do not count on firefighters staying to defend your home—your home should be able to stand strong on its own during a wildfire. There are never enough firefighters to stay and defend every single home during large incidents.**

Radiant heat and embers not only affect homes but also the critical infrastructure that communities in Chelan County rely on. Much of the infrastructure along the Columbia River could be indirectly exposed to wildfire through embers, and infrastructure located in the mountains and along US Highway 2 could be exposed to radiant heat as well as embers (Figure 12). At-risk infrastructure includes various communication towers, transportation infrastructure (e.g., bridges), water systems, healthcare facilities, facilities that provide food, hydration, or shelter (e.g., nursing homes, convention centers), power and fuel infrastructure, facilities with hazardous materials, and safety and security infrastructure (e.g., fire stations, schools).

High to extreme fire behavior can create hazardous and potentially non-survivable conditions along 14% of roadways in the Chelan County (Figure 13). Roads with long segments of hazardous conditions include Stehekin Valley Road, Entiat River Road, S. Lakeshore Road, 1st Creek Road, Union Valley Road, Lower Chiwawa River Road, White River Road, Lake Wenatchee Highway, Merritt Winton Road, Number 2 Canyon

Road, Mountain Home Road, Olalla Canyon Road, Squilchuck Road, and Colockum Road. Evacuation preparedness is of the utmost importance for residents in neighborhoods with hazardous conditions along roadways, as are strategic fuel treatments along evacuation routes and other major roads.

Smoke from wildfire could impact residents across the county depending on the location of the fire, wind direction, and smoke dispersal. While the flaming front of a wildfire can be a major concern, the smoke emitted can travel faster and farther than the fire itself and impact people nearby and thousands of miles away. According to the U.S. Environmental Protection Agency (EPA), smoke from wildfires is a major component of air pollution (EPA, 2018).

Fine particle pollution is the principal pollutant of concern in wildland fire smoke for the relatively short-term exposures typically experienced by the public. The individual particles in wildland fire smoke are very small; collectively, they are visible to the naked eye as smoke. Particles in wildland fire smoke are primarily PM2.5 and can be inhaled into the lungs (NWCG, 2020).

Besides PM, components of smoke with implications for human health include carbon monoxide (CO). Smoke also contains multiple toxic air pollutants such as aldehydes (including formaldehyde and acrolein) and organic compounds such as polycyclic aromatic hydrocarbons (PAHs) and benzene (Stone et al., 2019). Ground level ozone (O3) is a secondary pollutant in that it is not emitted directly from wildland fires but can form downwind when volatile organic compounds (VOC's) and nitrogen oxides (NOx) react in the presence of sunlight (NWCG, 2020).

Studies show that certain populations are more vulnerable to smoke from wildfires. Communities that are older, infants, pregnant people, people with preexisting medical conditions, and people of lower socio-economic status are more at risk of negative health effects than the general population (Joseph et al., 2020). Extended exposure to medium or heavy wildfire smoke (two weeks or more per year) is linked with symptoms of mental health issues such as anxiety for people of all demographics (Mirabelli et al., 2022).

Wildfires and prescribed fires produce the same types of emissions and can have the same effects on populations as wildfires of the same size and location. However, prescribed fires can offer the opportunity for managers to choose locations that do the least harm to vulnerable populations, they are time-limited and do not burn for extended periods of time like some wildfires do, can reduce or redistribute emissions, and managers can time the burn when atmospheric conditions mitigate the impact of reduced air quality (Figure 14). The use of prescribed fire can reduce the size and intensity of wildfires and can therefore reduce the negative health impacts of the wildfires. The amount of smoke emitted by a prescribed burn, the distribution of the smoke, and impacts on communities are impacted by the size of the burn, location of the burn, techniques used to ignite the prescribed burn, fuel moisture, fuel loads, wind speed and direction, atmospheric stability, topography, and interactions among these factors. Fire and fuel managers take these factors into account when planning and implementing prescribed burns to reduce potential impacts to the community (NWCG, 2020).

The purpose of the Washington State Smoke Management Plan is to coordinate and facilitate the statewide regulation of prescribed outdoor burning on lands protected by the DNR and on unimproved, federally managed forest lands and participating tribal lands. The plan is designed to meet the requirements of the Washington Clean Air Act.

The plan provides regulatory direction, operating procedures, and advisory information regarding the management of smoke and fuels on the forest lands of Washington State. The Washington State Smoke Management Plan pertains to DNR-regulated silvicultural outdoor burning only and does not include agricultural outdoor burning or outdoor burning that occurs on improved property.

Much of Chelan County has a high likelihood of experiencing very high to extreme fire behavior. Increasing drought and warming temperatures exacerbate wildfire risk in the area. Proactive work by Fire Protection Districts, partners, and residents is imperative to protect lives and property. This CWPP outlines steps that agencies, landowners, residents, and other partners can take to mitigate wildfire risk and enhance emergency preparedness.

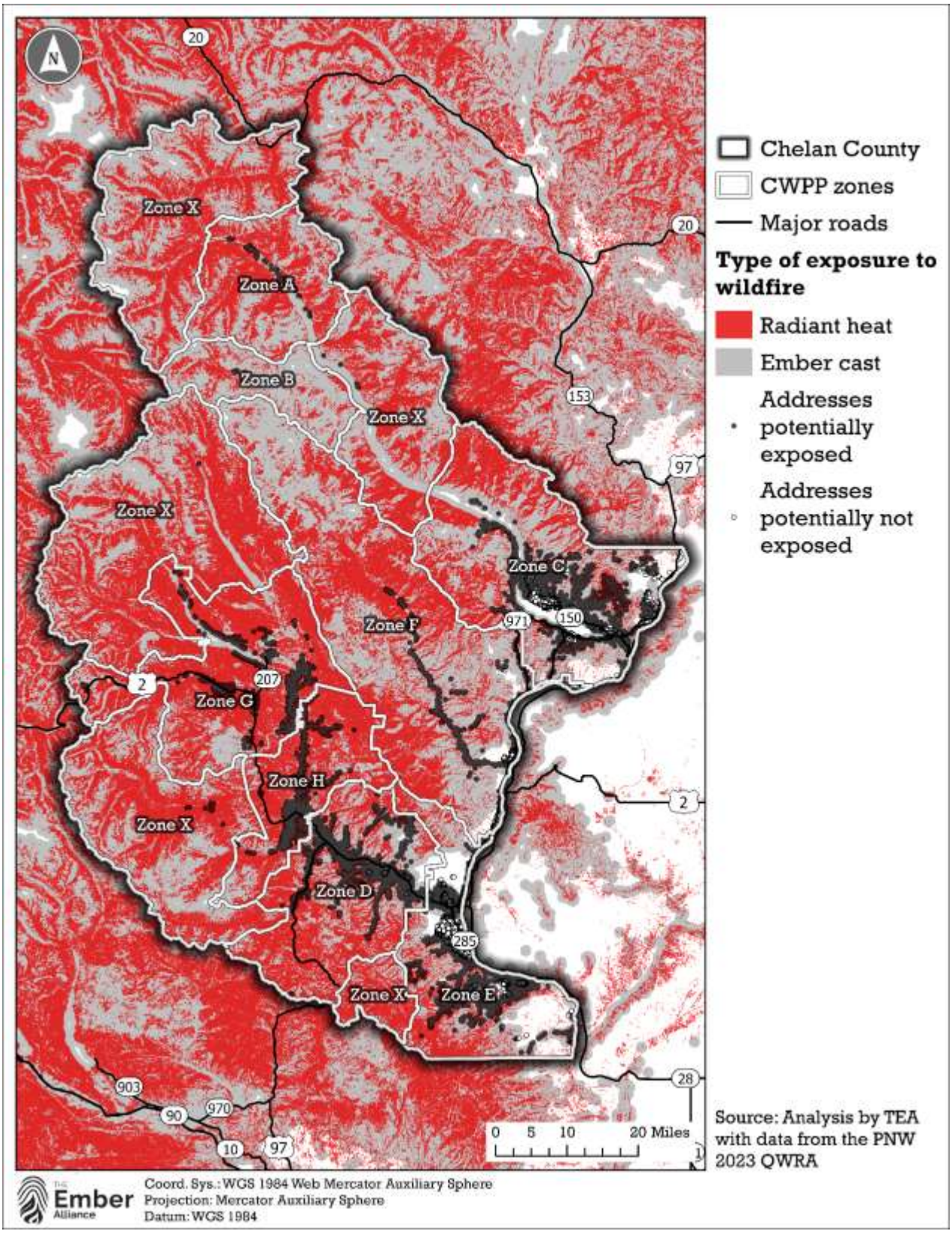


Figure 11. *Potential exposure of addresses to radiant heat and embers from wildfires in Chelan County. Source: Analysis by TEA with data from the PNW 2023 QWRA. See details in Appendix 2-Risk Analysis Models.*

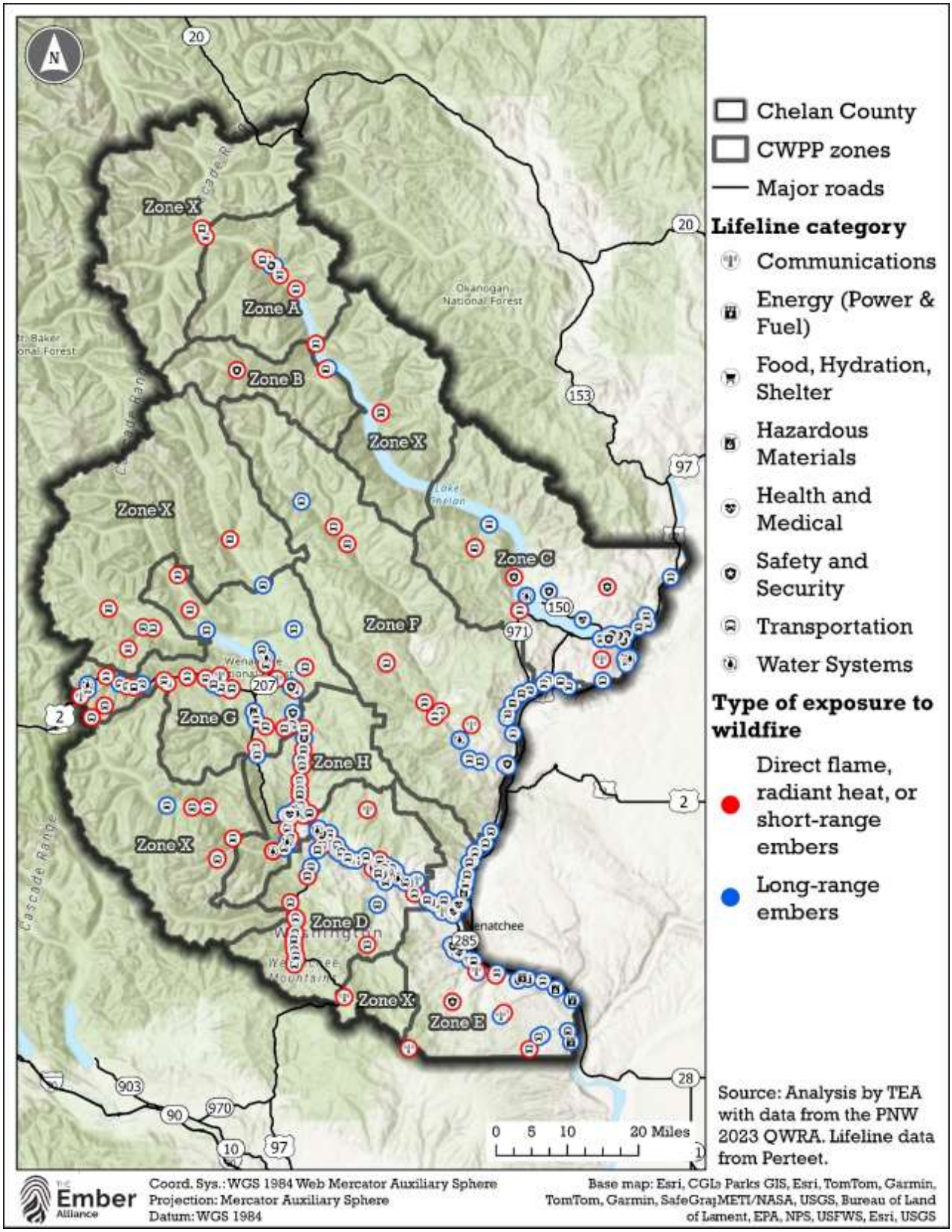


***Figure 12**. Lifelines with potential exposure to wildfires in Chelan County. Source: Perteet and analysis by The Ember Alliance using the PNW 2023 QWRA. See details in Appendix 2-Risk Analysis Models.*

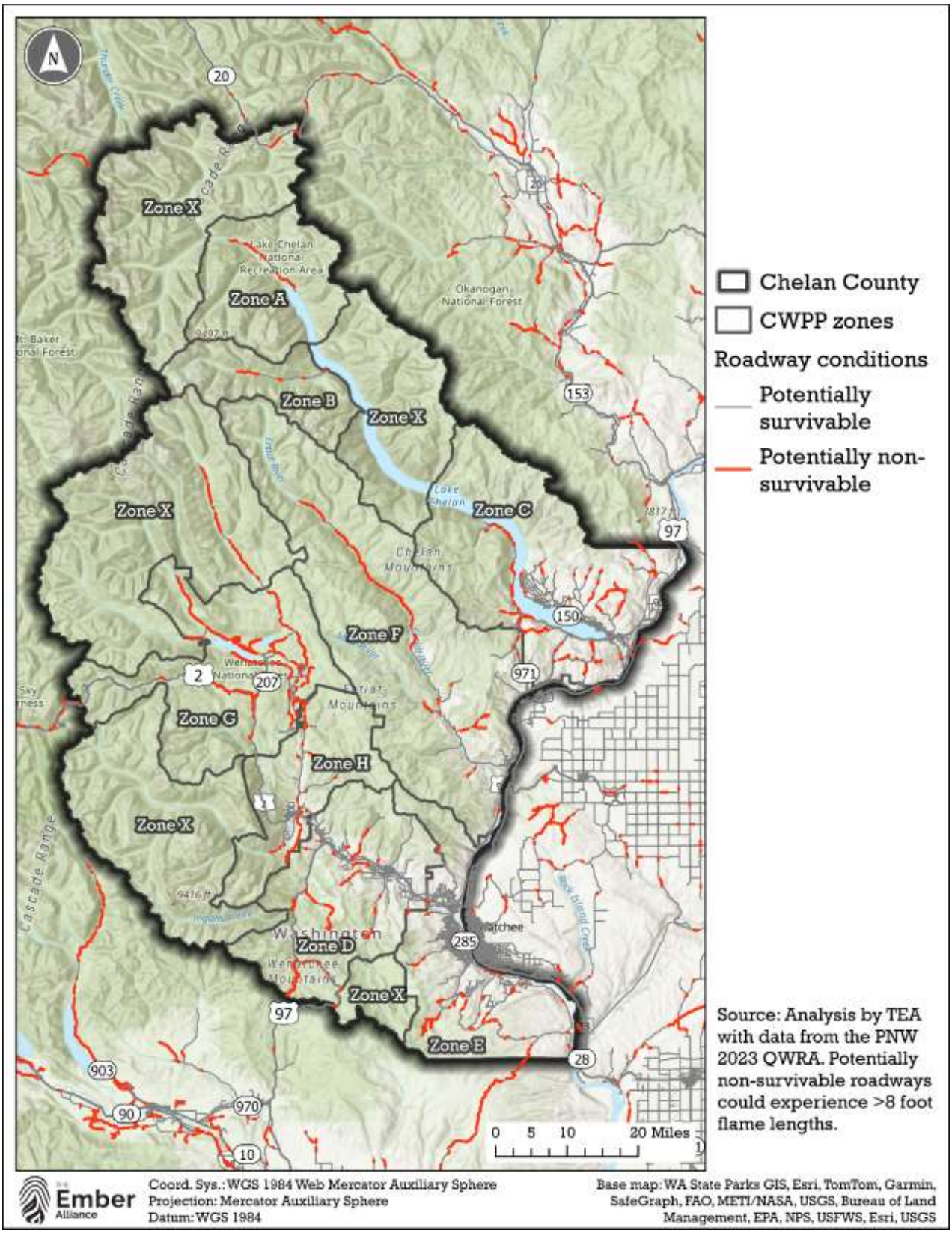


***Figure 13**. Roadways that could experience hazardous, potentially non-survivable conditions during a wildfire in Chelan County. Source: Analysis by TEA with data from the PNW 2023 QWRA. See details in Appendix 2-Risk Analysis Models.*

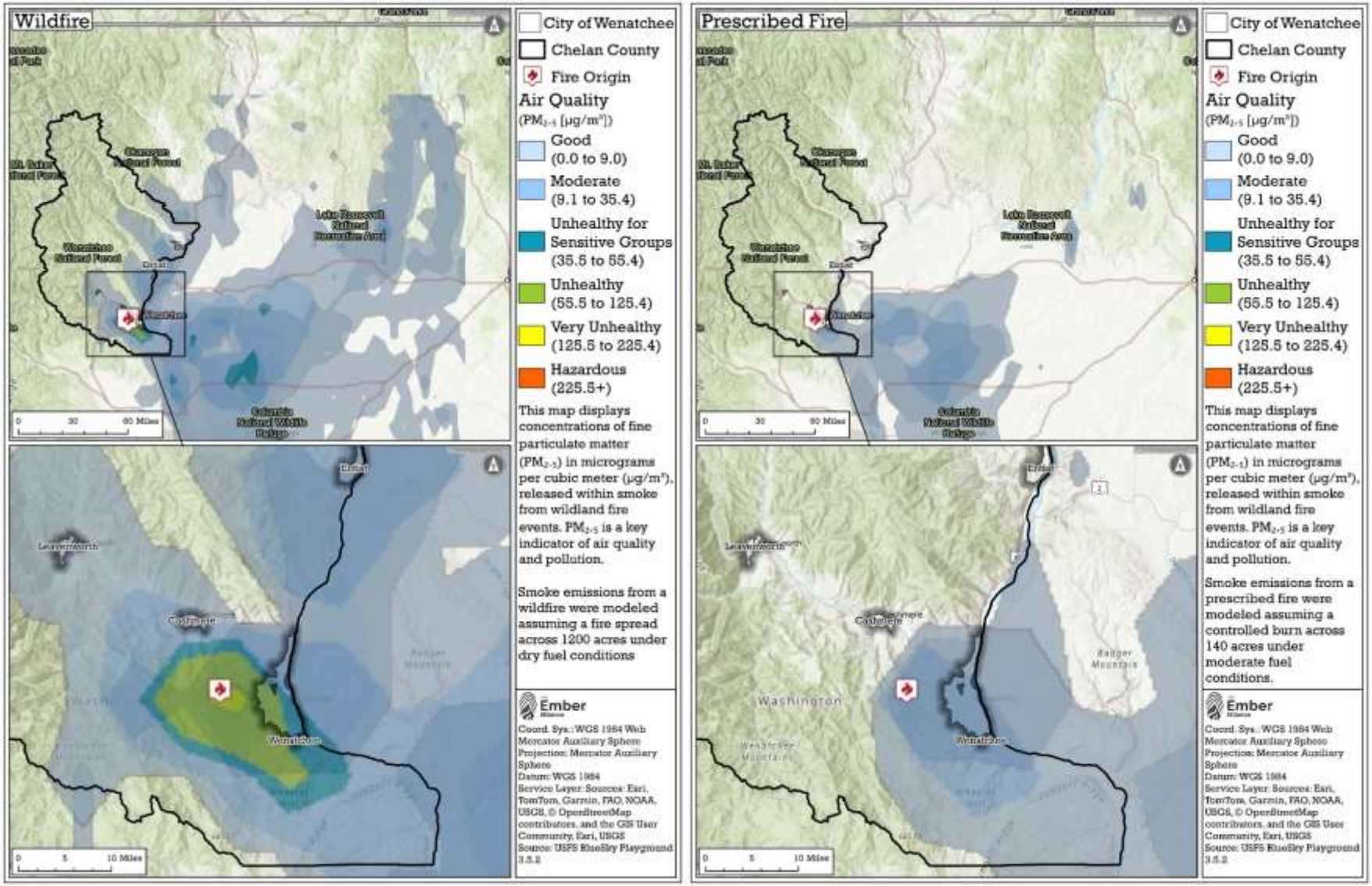


***Figure 14**. Modeled emissions and dispersal of PM2.5 under wildfire and prescribed burning conditions for a simulated ignition outside the City of Wenatchee. Source: Analysis by The Ember Alliance using USFS models. See details in* Appendix 2-Risk Analysis Models.

Potential Benefits of Wildfire

Not all wildfire is damaging or destructive. Many ecosystems in the county have been shaped by wildfire for centuries, and wildfire creates important habitat for wildlife by removing trees and promoting the growth of a diversity of grasses and forbs. Areas burned by wildfires can serve as fuel breaks for decades afterwards and reduce the potential for damaging wildfire both in the burned area and surrounding landscape. According to the 2023 PNW QWRA, wildfire and/or broadcast prescribe burning could benefit portions of Chelan County by restoring ecological conditions and reducing fuel loads. Beneficial fire is more likely in areas without homes and where expected fire behavior is moderate (Figure 15).

8.e. Fuel Treatment History

Fuel treatments reduce the amount of fuel in strategic locations, reducing fire risk to nearby communities and creating tactical opportunities for wildland firefighters to engage with wildland fires. Fuel treatments can also create healthy, restored forest conditions with abundant understory plants, improved wildlife habitat, and lower the risk of high-severity wildfires. Fuel treatments can also create opportunities to return beneficial prescribed fire to the landscape. The effectiveness of fuel treatments is influenced by a variety of factors, including the intensity, quality, and extent of treatment, location of treatments, maintenance of treatments, weather conditions and fire behavior, and actions of firefighters (Agee et al., 2000; Jain et al., 2021). Fuel treatment methods include tree thinning, pruning, pile burning, broadcast prescribed burning, and fuel mastication. *"Strategically placed fuel reduction treatments have been effective in Chelan County, especially when they are followed with prescribed fire. A great example of this is the Upper Squilchuck and Mission Creek Watersheds, where extensive USFS fuels reduction and prescribed burns were critical to the success of fire suppression during the 2012 fires approaching Wenatchee from Ellensburg and Blewett Pass." (Patrick Haggerty, Cascadia Conservation District).*

Over the past 20 years, land management agencies such as the Washington DNR, Washington Department of Fish & Wildlife, U.S. Forest Service and private landowners have conducted fuel treatments across about 159,00 acres in Chelan County (Figure 16). WA DNR and USFS successfully completed several large-scale broadcast prescribed burns on the landscape. Broadcast prescribed burning can be an extremely effective method to reduce hazardous fuels and restore ecological conditions across a variety of grassland, shrubland, and forest ecosystems (Paysen et al., 2000; Stephens et al., 2009). Less than 1% of prescribed burns escape containment lines, and most of these are rapidly suppressed (Weir et al., 2019). The wildland fire community soberly reviews prescribed burn escapes to produce lessons learned and make improvements (Dether, 2005).

An essential component of this CWPP was identifying locations for additional fuel treatments to protect the community. In a community where federal lands neighbor most homes in the WUI, coordination between public and private landowners to conduct cross-boundary fuel reduction treatments is essential. Zone action plans in this CWPP outline priority locations, collaboration opportunities, and the land management agency leading these efforts in the coming years.

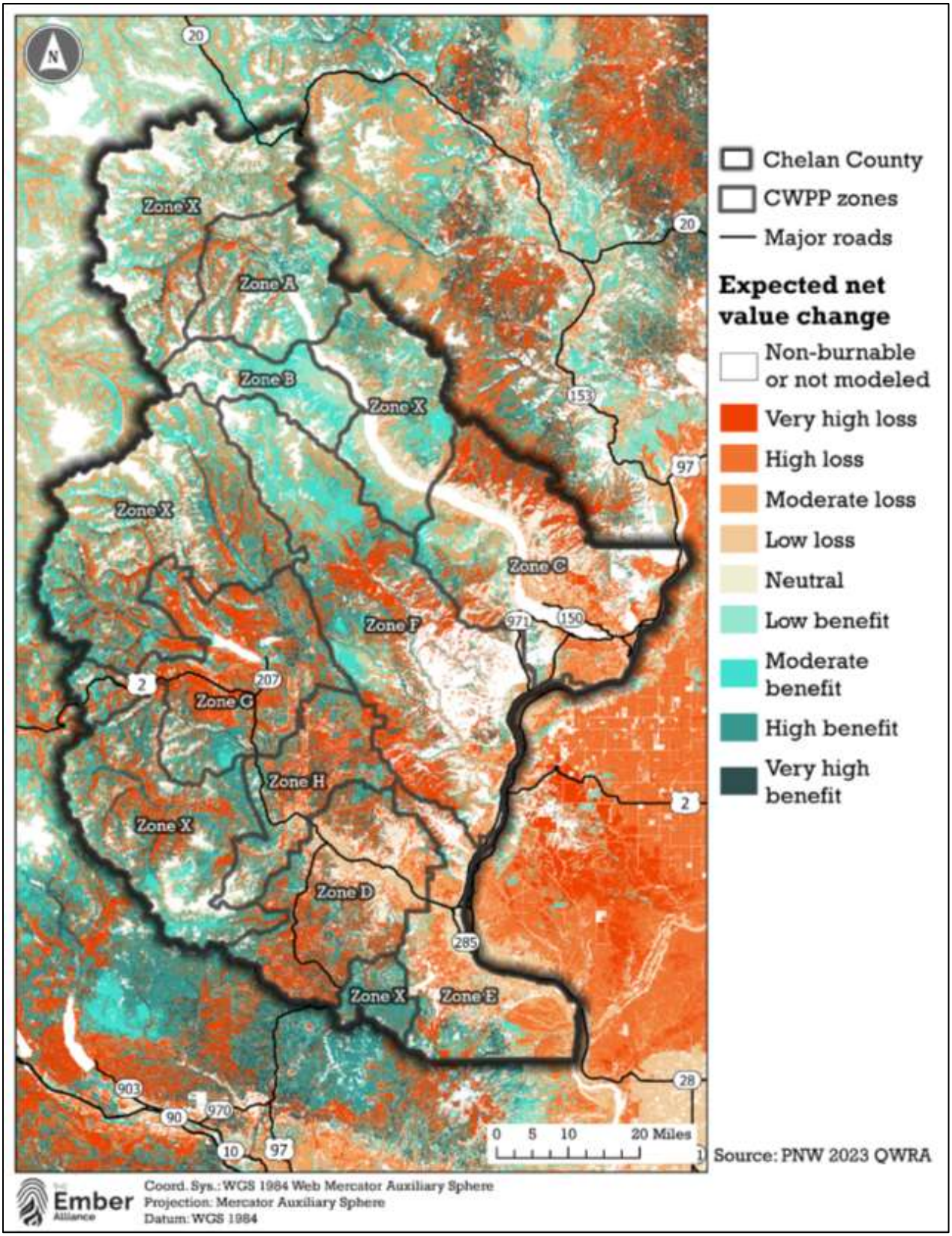


Figure 15. *Overall potential impacts of wildfire on property, drinking water, infrastructure, timber, wildlife, ecosystem conditions, agriculture, and recreation in Chelan County.* ***Source: PNW 2023 QWRA. See details in Appendix 2-Risk Analysis Models****.*

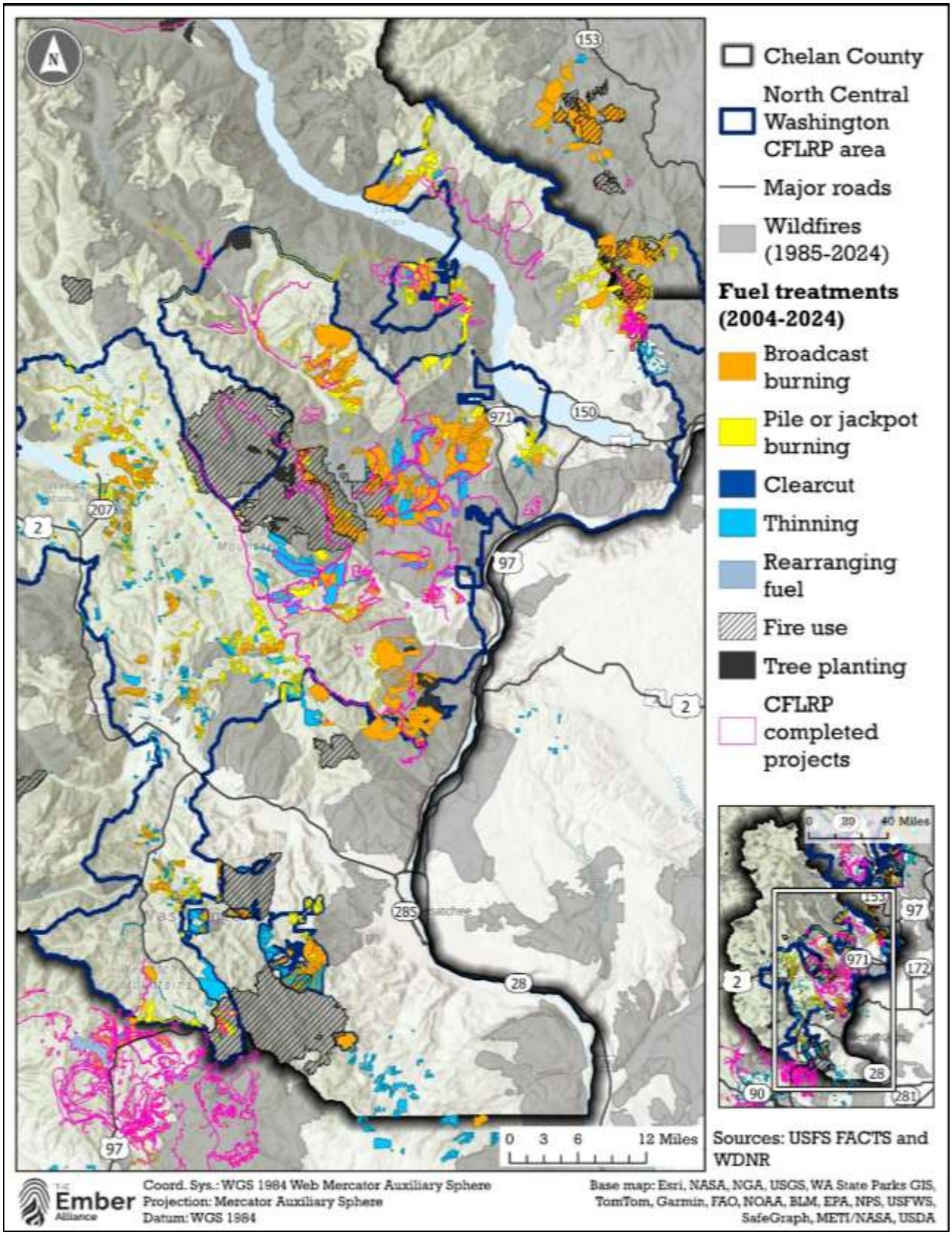


Figure 16. *Fuel treatments in and around Chelan County between 2004 and 2024.* ***Sources: U.S. Forest Service and WA DNR.***

9. Chelan County's Wildland-Urban Interface

9.a. WUI Overview

Every year, wildfires result in billions of dollars in fire suppression costs and destroy thousands of homes across the United States (Bayham et al., 2022; Higuera et al., 2023). Some of the most destructive, deadly, and expensive wildfires occurred in the past several years, partly due to construction of additional homes in the wildland-urban interface (WUI). Wildfire risk in the WUI is further exacerbated by severe fire weather perpetuated by climate change (Caton et al., 2016). Chelan County has experienced several destructive wildfires in the WUI, including the 2015 Sleepy Hollow Fire and 2015 Chelan Complex Fires. People that live and work in the WUI must be aware of the effect that wildland fires have on their lives.

The WUI is any area where the built environment meets wildfire-prone areas—places where wildland fire can move between natural vegetation and the built environment and result in negative impacts on the community (Johnston, 2018). The built environment includes homes, businesses, infrastructure, services such as utilities, roadways, and geographic features that aid in wildfire suppression, such as roads or ridgetops (Healthy Forest Restoration Act, 2003). The WUI encompasses not only the interface (areas immediately adjacent to urban development), but also the surrounding vegetation and topography.

Reducing the hazard in the wildland-urban interface requires the efforts of federal, state, and local agencies and private individuals (*Protecting Structures from Embers during Wildfires*, n.d.). The role of most federal agencies in the wildland-urban interface includes firefighting, hazardous fuels reduction, cooperative prevention and education, and technical experience. Property owners share a responsibility to protect their residences and businesses and minimize danger by mitigating fuels in the home ignition zone and completing home hardening practices to reduce the ignition potential of their structures.

Shared risk in the wildland urban interface calls for shared responsibility and action. Work that residents do to increase the chance of their homes standing strong against wildfire can help make their neighbor's homes safer. Work by neighborhoods and communities to reduce risk can make conditions safer for wildland firefighters. Work by land management agencies to treat hazardous fuels can create opportunities for effective wildfire suppression and proactive management of prescribed fire on the landscape.

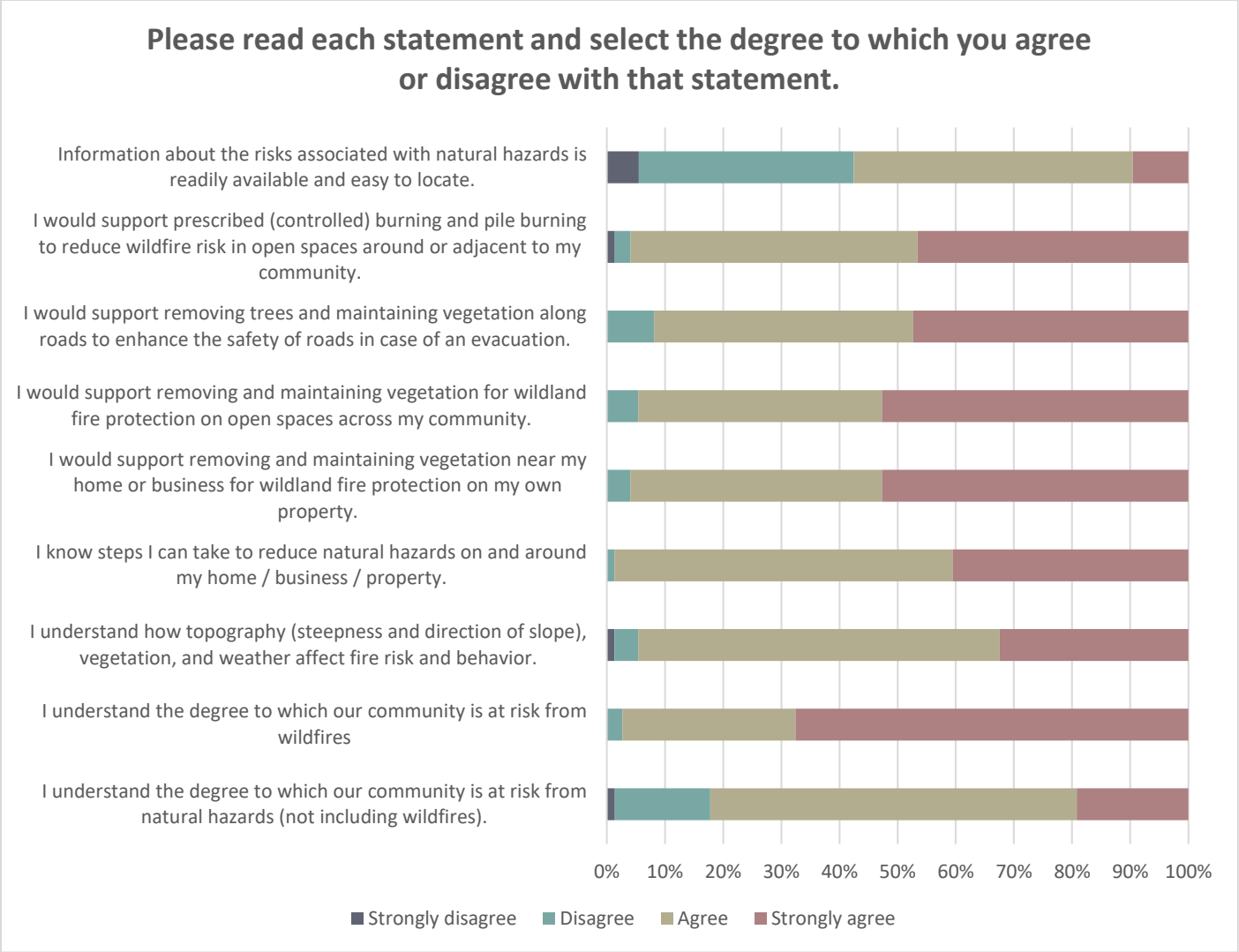


***Figure 17**. Public perspectives of hazards in Chelan County. Source: Chelan Public Survey 2024.*

9.b. WUI Planning & Prevention Area

Delineating the wildland-urban interface (WUI) is a critical component of CWPPs in compliance with the Healthy Forest Restoration Act (HFRA) of 2003. Communities can extend the WUI boundary into adjacent areas that pose a wildfire threat to their community, that can serve as a strategic location for wildland firefighting, and that are adjacent to evacuation routes for the community (HFRA 4 U.S.C. §101.16). Strategic wildfire mitigation across the WUI can increase the safety of residents and wildland firefighters and reduce the chances of home loss. Fortunately, over 90% of Chelan residents understand the degree to which their community is at risk from wildfires as noted in a 2024 public survey (Figure 17).

The Healthy Forests Restoration Act makes a clear designation that the location of the WUI is at the determination of the county or reservation when a formal and adopted Community Wildfire Protection Plan

is in place. HFRA further states that the federal agencies are obligated to use this WUI designation for all Healthy Forests Restoration Act purposes.

WA DNR guidance for CWPPs permits CWPP groups to collaboratively develop a WUI planning and prevention map that differs from the WA DNR WUI map. (At the time of updating this CWPP, WA DNR was currently developing a state-wide WUI map which has a specific purpose of delineating where wildfire related building codes and regulations should be enforced.) The purpose of a WUI planning and prevention map to guide fuel reduction projects and fire prevention planning and is NOT tied to state building codes. Information gathered while developing the WUI planning and prevention map for Chelan County might aid in future efforts by the WA DNR to incorporate local insights into regulatory WUI maps.[2]

The WUI planning and prevention area for the Chelan County CWPP includes populated areas and the surrounding landscape that could transmit wildland fire towards homes, evacuation routes, and other highly valued resources and assets (Figure 18). There is no expectation that hazardous fuel reduction occurs on every acre in the WUI planning and prevention area, and certainly no expectation that treatments occur across the entire WUI planning and prevention area in the next 5 years. This map indicates locations where fuel treatments might reduce risk to lives, property, infrastructure, and ecosystem services that humans depend on, and locations where treatments might create strategic opportunities for wildfire suppression or proactive prescribed burning.

The Chelan County CWPP Core Team developed the WUI planning and prevention map in collaboration with partners and members of the community. The map combines several existing analyses of wildfire hazards and prioritization for strategic action to mitigate wildfire risk (see detailed methodology in Appendix 2 - Risk Analysis Models). The WUI planning and prevention map includes:

- All WUI intermix, WUI interface, and WUI infrastructure areas identified in the 2019 Chelan County CWPP. The WUI delineation in the 2019 CWPP was heavily based on a report generated by the Community Planning and Assistance for Wildfire project conducted in 2017-2018 (Mowrey M., Johnston K., Yellin B., 2018).
- All areas identified as inhabited, non-WUI identified in the 2019 Chelan County CWPP (downtown Wenatchee and downtown Manson) because these areas could be exposed to smoke from wildfire. Were embers from burning vegetation to ignite structures on the perimeter of the cities, even

[2] WA DNR developed a WUI map to guide enforcement of building code in areas of the wildland-urban interface per Chapter 51-55 Washington Administrative Code (WAC): State Building Code Adoption and Amendment of the 2021 Edition of the Wildland-Urban Interface Code. However, Engrossed Senate Bill 6120 was signed by Governor Jay Inslee on March 15, 2024, which requires the WA DNR to create new maps based on hazard and risk in cooperation with local jurisdictions. The State Building Code Council passed an emergency rule to delay the WUI code implementation at their Council Meeting on March 15, 2024. The WA DNR has no set timeline for completing the statewide hazard map but hope to be done by June 30, 2026. Future efforts by the WA DNR to define the WUI will include more input by local agencies and fire districts. In the meantime, the statewide WUI map that is described in a Storymap posted by the WA DNR on May 30, 2024, is not being used for building code enforcement. Section 4, part 4 of Engrossed Senate Bill 6120 specifies that "Counties, cities, and towns may continue to use locally adopted wildfire risk maps until completion of a statewide wildfire hazard map and base-level wildfire risk map for each county of the state per RCW 43.30.580."

structures in downtown Wenatchee and Manson could experience structure-to-structure ignition from radiant heat and embers.

- All potential operational delineations with >33% WUI intermix and WUI interface based on WUI from the 2019 Chelan County CWPP.
- All areas identified as first-priority potential control lines and potential operational delineations from the WA DNR dual hazard analysis. The dual hazard analysis was conducted as part of the 20-year Forest Health Strategic Plan (WA DNR, 2024).
- All high-priority HUC-6 watersheds from the WA DNR 20-year Forest Health Plan for Eastern Washington (WA DNR, 2017).
- All potential operational delineations with very high risk according to the U.S. Forest Service assessment of potential operational delineations within 1 mile of Wildfire Crisis Strategy National Priority Landscapes using the Risk Management Assistance 2023 quantitative wildfire Risk assessment (USFS WO Fire and Aviation Management Strategic Analytics Branch, 2024).
- All areas within 1000 feet of potential control lines (areas with high potential to be utilized during fire suppression) that serve as boundaries for potential operational delineations. Section 16 USC 6592b of the 2021 Infrastructure Investment and Jobs Act permits the U.S. Forest Service to use a categorical exclusion to establish linear fuel breaks up to 1,000 feet in width in the WUI (Infrastructure Investment and Jobs Act, 2021).
- Isolated areas that did not meet the requirements listed above but were surrounded by areas that did meet the requirements were included in the WUI planning and prevention area. Such areas could still be exposed to smoke from wildfire and warranted inclusion in the WUI planning and prevention area.

Federally designated Wilderness was excluded from the WUI planning and prevention area, except for POD boundaries and buffer distances around structures and infrastructure near the Wilderness. It is unlikely that the U.S. Forest Service would consider large-scale fuel treatments in the Wilderness due to environmental regulations. However, some isolated fuels reduction might be undertaken with hand tools along POD boundaries and around structures in accordance with permissible activities and compliance with environmental regulations in the Wilderness. Wilderness areas are physically separated from populated portions of the county, and in most places, there are POD boundaries outside the Wilderness that could be treated to protect communities. Strategic and high-quality fuel mitigation work along POD boundaries that define the WUI planning and prevention area for Chelan County could reduce the exposure of structures and other highly valued resources and assets across the county.

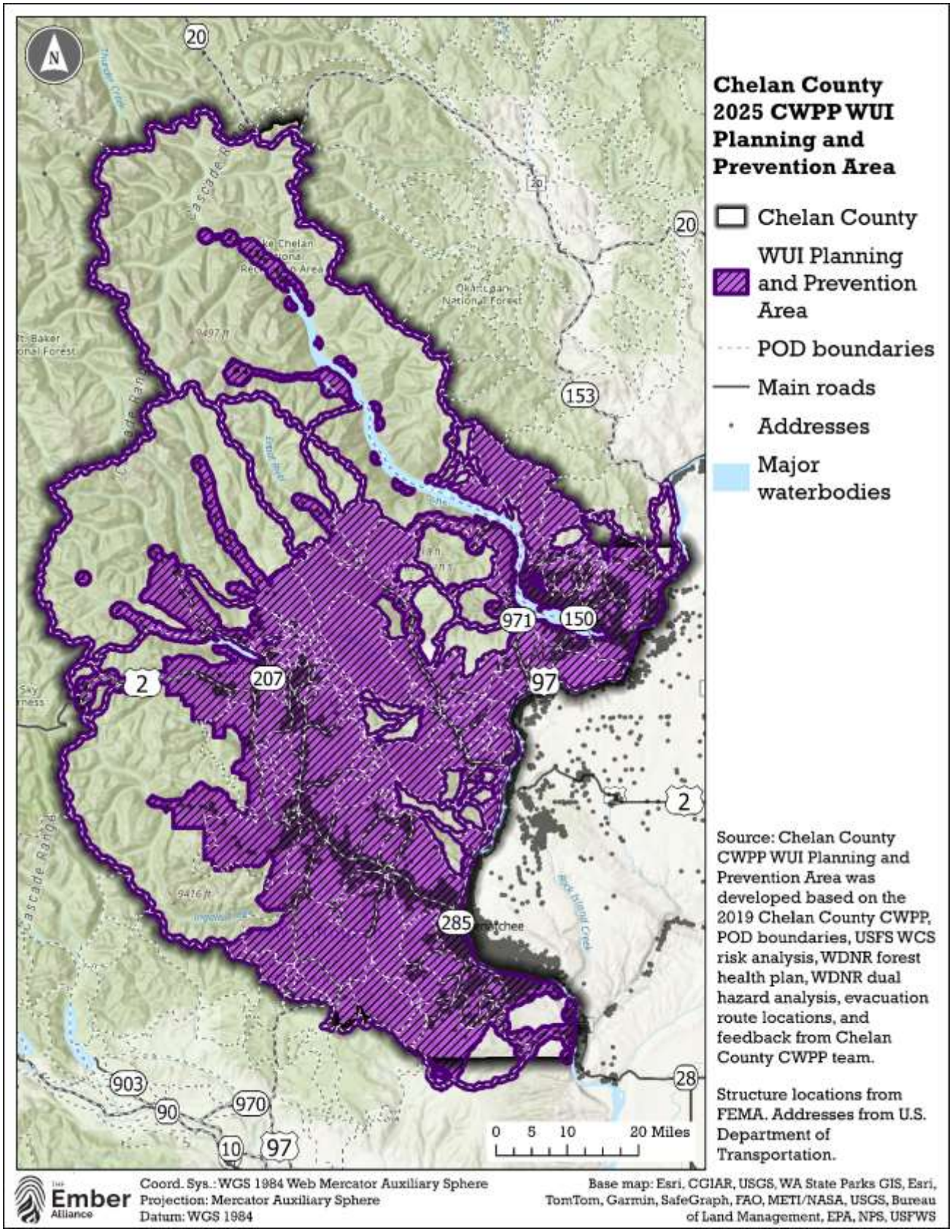


Figure 18. *Wildland Urban Interface Planning and Prevention Area for Chelan County. Source: Chelan County CWPP Core Team.*

10. Overview of Fire Protection System

The DOI, United States Forest Service, state, tribal counties, and local governments maintain operational wildland fire organizations. These are supplemented by volunteer organizations such as volunteer fire departments and rangeland protection associations. Within the DOI, the operational fire organizations reside in Bureau of Land Management, National Park Service U.S. Fish and Wildlife Service, and Bureau of Indian Affairs. Other organizations such as US Fire Administration and U.S. Geological Survey have fire expertise that supports and partners with the operational fire organizations.

The Office of Wildland Fire at DOI provides budget and policy coordination, leadership, and oversight for operational programs within DOI. Several chartered interagency groups exist to provide coordination and consistency among wildland fire organizations to ensure policy and operational consistency and interoperability. Most populated parts of the County have local fire protection that covers both structural and wildland fire response (Figure 19). Volunteer firefighters make up a significant portion of the fire protection in Chelan County and many districts rely solely on volunteers.

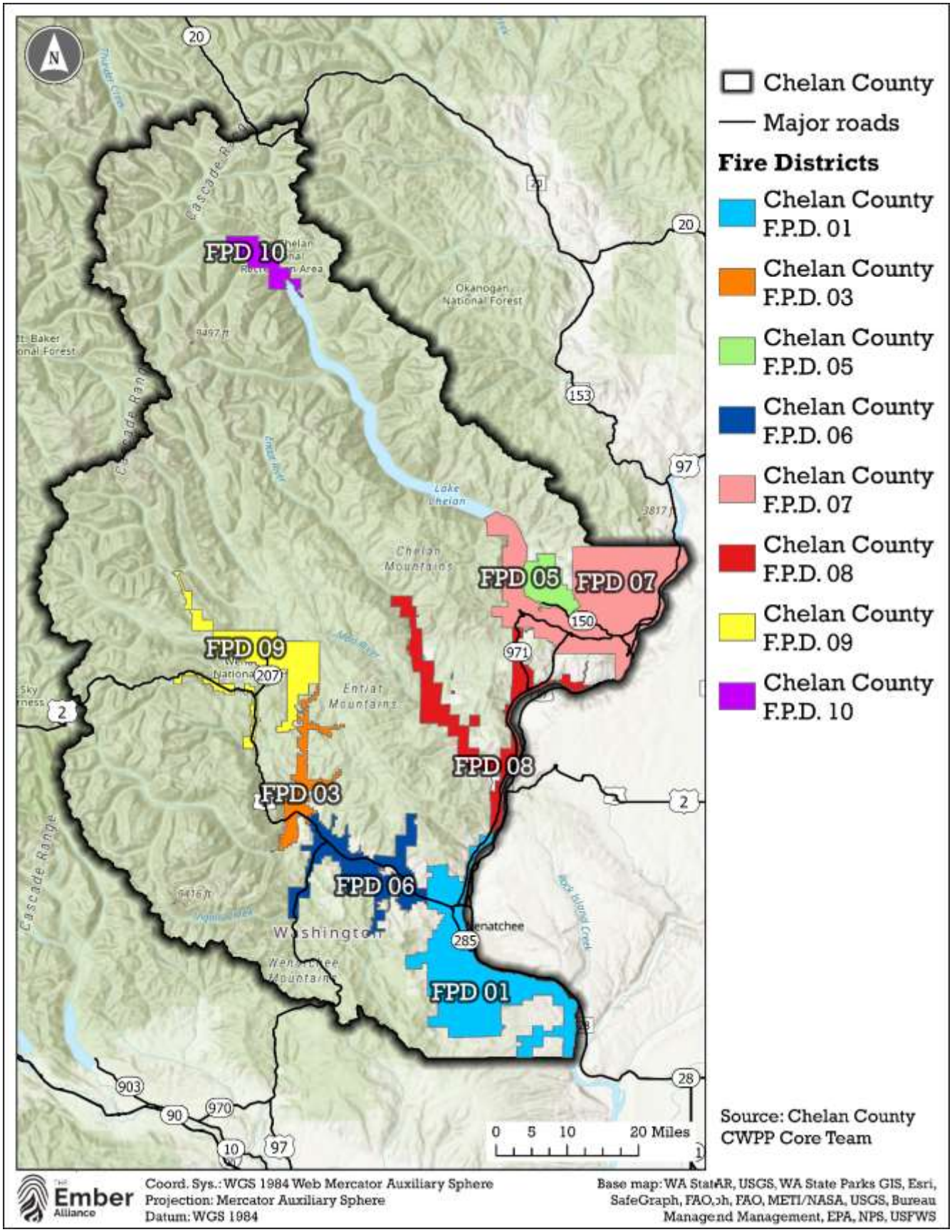


***Figure 19**. Boundaries of Chelan County Fire Protection Districts. Source: Chelan County.*

10.a. Bureau of Land Management

Spokane District Mission Statement: The mission of the Spokane District is to share our unique capability and interest in sustaining the full diversity of natural and cultural landscapes across Washington State and invite their discovery and use. This includes protecting the natural resources, such as water for fish and wildlife; preserving environmental and cultural values on the lands they manage; providing for multiple uses, that include some commercial activities; and enhancing opportunities for safe and enjoyable outdoor recreation. The Spokane District also assesses energy and mineral resources and works to ensure that their development is in the best interest of the public. Another major responsibility is to ensure consideration of Tribal interests and administration the Department of Interior's trust responsibilities for American Indian Reservation communities.

District Summary: Up through the 1970's, BLM's policy was to divest ownership of all federal public (BLM) lands in the state of Washington. But in 1980, at the height of the Sage Brush Rebellion (a social movement to give control over federal lands to the states and local authorities), Washington voted to have the public lands remain under federal ownership and management. In the 1980 general election, the state put a measure on the ballot asking voters if the state constitution should "be amended to provide that the state no longer disclaim all rights to unappropriated federal public lands." Approximately 60% of the people and the majority in every county voted no, signaling to BLM that there was strong support for continued federal management of the public lands in the state.

In response to this vote, the Director of BLM approved a proposal by the district to begin a process of consolidating the scattered BLM lands around the state. Today the Spokane District BLM manages over 425,000 acres across eastern Washington for multiple uses, providing wildfire protection, suppression, support, and training for the BLM managed lands and other federal/state/county agencies.

The Spokane District Fire Management Program currently consists of three type six wildland engines (300 gallons) with three full time Engine Captains, four engine crew members, one ten-person Veterans Module, two Fuels Technician, one Fire Operations Technician (FOT), two Fire Management Specialist, one Assistant Fire Management Officer (AFMO) Fuels, one Assistant Fire Management Officer (AFMO) Operations, and a Fire Management Officer (FMO). The hand crew is stationed in Spokane at the District office and the engines in Wenatchee at the field office. There are approximately 16 other specialists (staff) from across the district that assist the Fire Management Program in wildland and/or prescribed fire efforts. With the District's scattered ownership pattern, the engines are usually on scene after initial attack forces have arrived. Our engines and personnel are available for off District and out of state fire assignments that aide in support, training, and experience.

Cooperative Agreements: The Spokane District BLM has Coop agreements with the Colville National Forest, US Fish and Wildlife Service, WA DNR, Spokane County FDs #3, 4, 9, 10, Spokane Valley FD, Benton County

FD #1, Chelan County FDs #1, 6, Douglas FDs #2, 4, 5, 15, Franklin County FD #5, Grant County FD #5, Chelan County FDs #1, 7, and Yakima County FDs #4, 5.

10.b. US Forest Service – Okanogan-Wenatchee National Forest

District Summary: The Okanogan-Wenatchee National Forest (OWF) encompasses approximately 3.8-million acres in Washington State and stretches North to South from the Canadian border to the Goat Rocks Wilderness - about 180 miles. The Forest lies east of the Cascade Crest, which defines its Western boundary. The Eastern edge of the forest extends into the Okanogan highlands, then South along the Okanogan and Columbia Rivers, and then to the Yakima River valley. In Chelan County, the US Forest Service manages approximately 1.3 million acres of land and contains parts of the Alpine Lakes Wilderness, Henry M. Jackson Wilderness, Glacier Peak Wilderness and Lake Chelan-Sawtooth Wilderness. The OWF borders Federal, State, Non-Government Organization (NGO) and Private Landowners with different land ownership checkerboarded across the Central and Southeastern portions of the landscape.

The Forest manages 6 Ranger Districts, 3 of which are in Chelan County: Chelan Ranger District, Entiat Ranger District, and Wenatchee River Ranger District. The current fire organization hosted in Chelan County is as follows: Chelan and Entiat have the same Fire Management Officer but have separate Assistant Fire Management Officers for Operations and Fuels. Chelan Ranger District has a 20-person Type 2 IA Crew, a Type 3 Wildland Fire Engine, a Prevention Technician and a Fuels Management Technician. Entiat Ranger District hosts the Entiat Interagency Hotshot Crew (20-25 person), has a 20-person Type 2 IA Crew, 2 Type 3 Wildland Fire Engines, a Fire Operation Specialist, a Prevention Technician and 3 Fuels Technicians. Wenatchee River Ranger District has a Fire Management Officer, an Assistant Fire Management Officer Operations and Assistant Fire Management Officer Fuels. In addition, Wenatchee River Ranger District has a 20-person Type 2 IA Crew, a Type 3 Engine, a Type 6 Engine, a Prevention Technician and 5 Fuels Technicians.

The USFS has been, and continues to be, helping to decrease fuels around Chelan County. Projects as can be seen in the Central Washington Initiative (CWI) 10-Year-Plan Map (**Figure 20**).

Issues of Concern:

- Residential Growth Continued WUI expansion and development adjacent to USFS boundaries increases complexity and risk to responders during incident response due to additional values at risk.
- Communications Steep, rugged terrain of the Cascades requires a robust communication network which is critical to the safety of responders and the public. There are still areas within Chelan County and the USFS boundaries that contain cell phone dead spots and other areas that contain dead spots for mobile and handheld radios. Mitigation measures such as human radio repeaters, portable radio

repeaters and portable cell phone towers are periodically utilized for establishing communication on incidents within USFS land.

- Burn Permit Regulations On the OWF, prescribed burning is an important tool in hazardous fuels reduction, forest health and forest restoration work. The USFS follows the NWCG Standards for Prescribed Fire Planning and Implementation guide, which lays out the requirements prior to, during and after executing a prescribed fire. A written and approved Prescribed Fire Plan lists out 21 elements that need to be followed for any prescribed fire on the OWF, it is a legal document that follows NEPA. As outlined in the Smoke Management Plan, the OWF is required to submit for burn permits and smoke approval daily through the WA State DNR for any prescribed fire unit that they are planning on burning, which includes the location of the burn unit. Getting every aspect put into place for a successful prescribed burn day can be challenging and this process is completed consistently in the Spring/Fall on USFS land, within Chelan County.
- Cooperative Agreements: The Okanogan – Wenatchee National Forest has cooperator agreements with fire districts in Chelan County and numerous adjacent counties, with the Washington State DNR, National Park Service, Bureau of Land Management, US Fish and Wildlife Service, and the Bureau of Indian Affairs.
- The OWF is a signatory on the Central and Northeast Washington Fire Danger Operating Plan (FDOP) which helps determine the number and type of resources dispatched to a wildfire incident. The Forest coordinates with partners when implementing Public Use Restrictions (Campfire restrictions and additional rules), Industrial Fire Precaution Levels, and setting the Fire Danger Rating Adjective class. These decisions are made by referencing current and predicted scientific data-recordings obtained from RAWS (Remote Automated Weather Stations) located around the Forest and by taking other important considerations into account like timeframes to effectively inform the public.

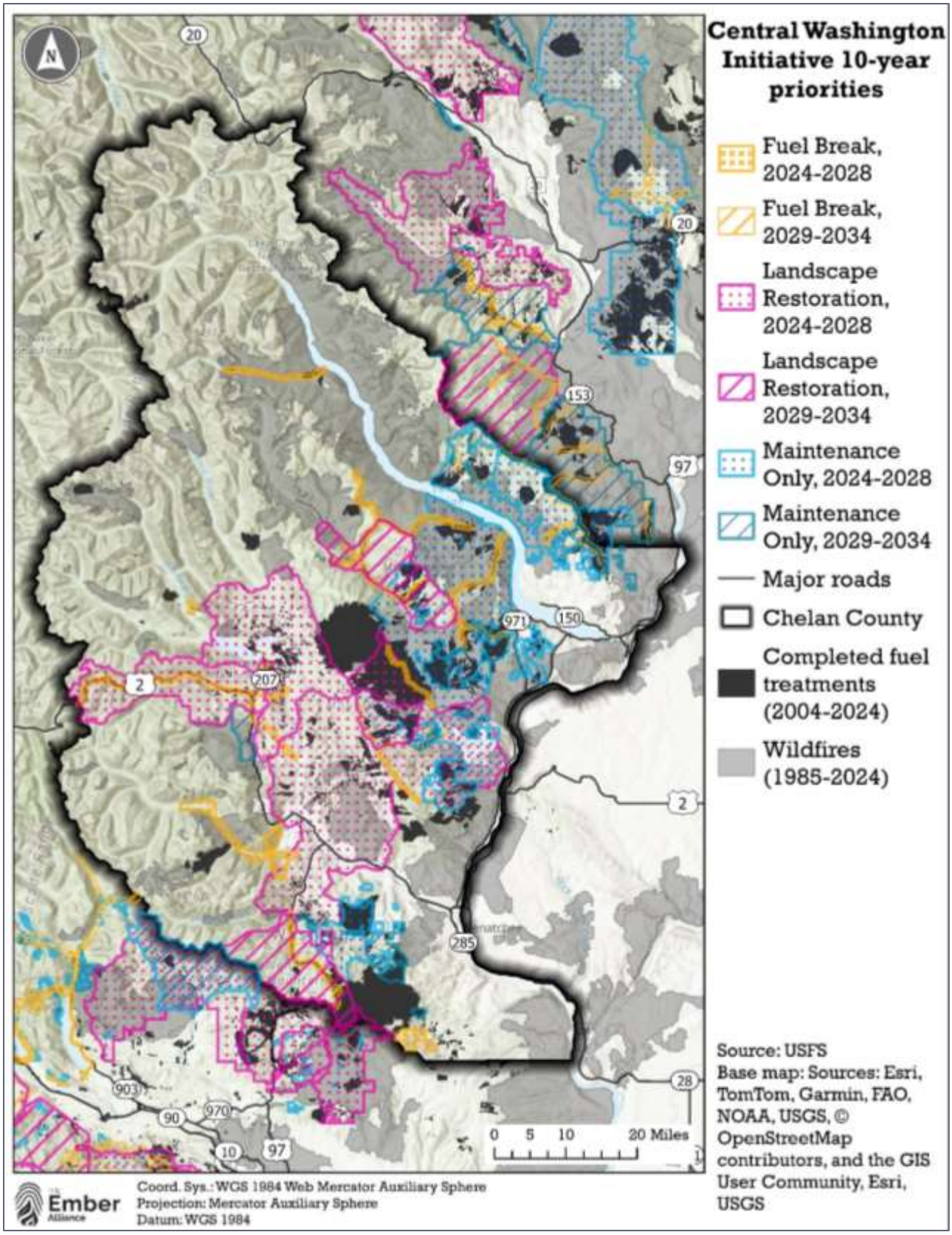


***Figure 20**. Proposed projects in Chelan County as outlined by the Central Washington Initiative (CWI). Source: USFS.*

11. Fire Protection Issues

The following sections provide a brief overview of the many difficult issues currently challenging Chelan County in providing wildland fire safety to citizens. In most cases, the team has developed action items that are intended to begin the process of effectively mitigating these issues.

11.a. Urban and Suburban Growth

One challenge Chelan County faces is the large number of houses in the urban/rural fringe. Since the 1970s, a segment of Washington's growing population has expanded further into traditional forest or resource lands. The "interface" between urban and suburban areas and the resource lands created by this expansion has produced a significant increase in threats to life and property from fires and has pushed existing fire protection systems beyond original or current design or capability. Currently Chelan County has numerous Firewise Communities and many property owners within the interface are aware of the threats they face or resources available to them. However, human activities increase the incidence of fire ignition and potential damage.

It is one of the goals of the Chelan County CWPP to help educate the public on the ramifications of living in the wildland-urban interface, including their responsibilities as landowners to reduce the fire risk on their property and to provide safe access to their property for all emergency personnel and equipment. Homeowners building in a high fire risk area must understand how to make their properties more fire resistant using proven firesafe construction and landscaping techniques and they must have a realistic understanding of the capability of local fire service organizations to defend their property.

11.b. Rural Fire Protection

People moving from mainland urban areas to the more rural parts of Chelan County may have certain expectations for structural fire protection services. Often, new residents do not realize that the services provided are not the same as in an urban area, and fire districts often rely heavily on volunteers. The diversity and amount of equipment and the number of personnel can be substantially limited in rural areas compared to urban areas and cities. "Consequently, in many areas of the country, the WUI can provide conditions favorable for the spread of wildfires and ongoing threats to homes and people. Many individuals move into these picturesque landscapes with urban expectations. They may not recognize wildfire hazards or might assume that the fire department will be able to save their home if a wildfire threatens(National Wildfire Coordinating Group, n.d.)." Fire protection can heavily rely on the landowner's initiative to take measures to protect their property. Furthermore, subdivisions on steep slopes and the greater number of homes exceeding 3,000 square feet are also factors challenging fire service organizations. In the future, public education and awareness may play a greater role in rural or interface areas. Great improvements in fire protection techniques are being made to adapt to large, rapidly spreading fires that threaten large numbers of homes in interface areas.

In most western states, state and federal agencies that have wildland fire protection responsibilities have launched a campaign to reiterate to the public that they do not provide structural fire protection. Much of the increasing costs of wildland fires can be directly related to the increasing number of structures in the wildland urban interface. State and federal agencies are trying to make it clear to the public that land and homeowners are responsible for reducing the fire risk on their property and that the agencies are not responsible for or required to provide structural protection.

The CWPP planning team has made several recommendations targeting increased wildland fire awareness and education for residents living in or moving into the wildland urban interface of Chelan County.

11.c. Fireworks

Due to Chelan County's proximity to Native American Indian Reservations, fireworks are increasingly available to the public in Chelan County. Even with the existing fireworks ban during periods of high wildland fire risk, the use of fireworks is high. There are several documented ignitions due to fireworks within Chelan County, one of which was The July 4th, 2024, Balsamroot Fire (305 acres) in Wenatchee which resulted in evacuations as reported by the Washington Forest Service. **Fireworks are prohibited in national forests at all times.** Violators can be subject to a maximum penalty of a $5,000 fine and/or up to six months in jail (36 CFR 261.52). Fireworks are also prohibited on other public lands managed by the Bureau of Land Management, National Park Service, and Washington State Parks, as well as most county and city parks (*RCW 70.77.495: Forestry,* n.d.).

The CWPP planning committee has identified fireworks as a serious threat to Chelan County, and thus, has made recommendations for strict regulations and active enforcement of all fireworks-related restrictions.

11.d. Pre-planning in High-Risk Areas

Although conducting home, community, and road defensible space projects is a very effective way to reduce the fire risk to communities in Chelan County, recommended projects cannot all occur immediately, and many will take several years to complete. Thus, developing pre-planning guidelines specifying which and how local fire agencies and departments will respond to specific areas is very beneficial. An evacuation could be needed, and according to a 2024 survey of Chelan County residents conducted by Perteet, more than 70% of people noted the ample time needed to evacuate (Figure 21). These response plans should include assessments of the structures, topography, fuels, available evacuation routes, available resources, response times, communications, water resource availability, and any other factors specific to an area. Community-based CWPPs often contain pre-planning information useful to fire managers. All these plans should be in a centralized place to store pre-planning data, that is available to responders and useful to land managers planning landscape level fuels treatment across boundaries.

One of the main goals of this CWPP is to identify areas with a high risk of experiencing wildland fires and take direct actions to mitigate those risks. However, in areas where mitigation may be difficult or will take a long period of time to implement, pre-disaster and emergency planning measures have been recommended.

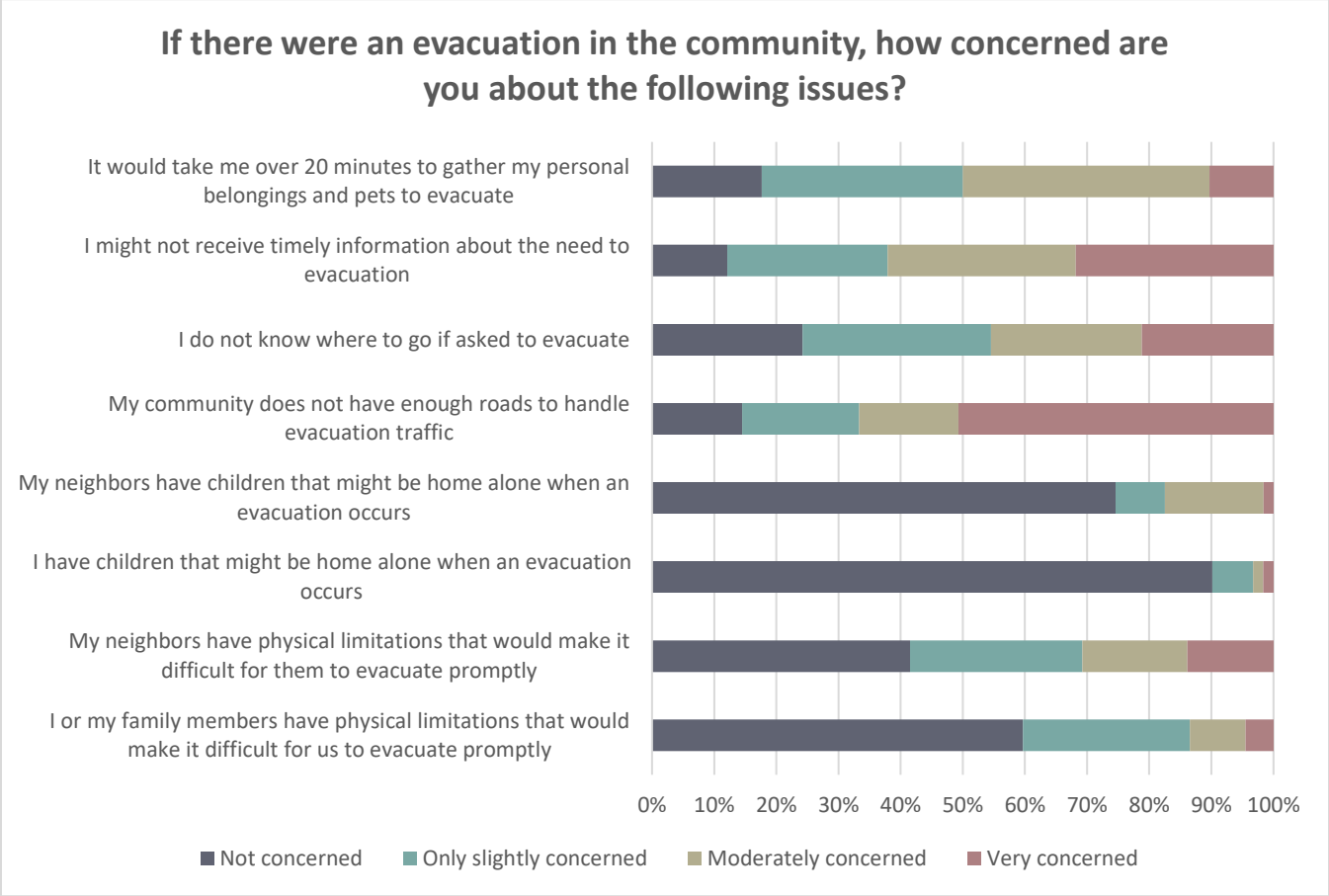


Figure 21. *Public levels of concern regarding possible evacuation. Source: Chelan Public Survey 2024 conducted by Perteet.*

11.e. Accessibility

Fire chiefs throughout the County have identified home accessibility issues as a primary concern in some parts of Chelan County. Many existing housing developments and private driveways have been constructed without regard to access requirements of large emergency vehicles. Additionally, many of these roads are several miles long and have a dead end with no warning or plans for future connections to other access roads. The lack of road connectivity and general accessibility in some areas restricts engagement by fire suppression resources. Continued enforcement of Chelan County's current standards regarding road and driveway construction regulations for fire apparatus would prevent accessibility issues in new developments. Wildfire

risk can be lessened, and firefighter safety can be improved by keeping vegetation including tall grass, brush, and trees a safe distance from the road right-of-way. This will not only improve accessibility but will also allow the road to serve as a control point for suppression activities.

Additionally, the fire districts have identified several unimproved and unmaintained county roads that could serve as strategic access points for fire suppression activities if they were maintained periodically for this purpose. In some cases, these roads are partially maintained but are limited by inadequate or nonexistent bridge crossings.

The planning committee involved in the development of this CWPP found accessibility to be one of the primary difficulties with safe emergency ingress and egress. It is a clear goal of this planning process to continue the enforcement and maintenance of the current road standards countywide. As part of this process, the committee has recommended an action item for improvement of existing substandard roads, driveways, and bridges, where necessary, to improve firefighter safety and suppression effectiveness.

11.f. Protection of Natural Resources and Wildfire Resilience in the Shrub-Steppe

Protection of native plant communities, especially those containing perennial native grasses and forbs essential to ecosystem integrity and diversity, is important to provide ecosystem services that sustain wildlife, such as native pollinators. One of the primary challenges to restoring the health of rangeland ecosystems is achieving effective long-term restoration and post-fire recovery. Arid rangelands and forests face many environmental and site conditions stresses exacerbated by drought, climate change, and spread of invasive species, leading to more frequent and catastrophic fires. While restoration can be successful at the small scale, achieving a landscape approach to effective and sustainable restoration of the sagebrush-steppe can be difficult. There is a need for natural resource advisors and fire managers, at all levels, to improve communication and continue to coordinate and work collaboratively to identify priority habitats before and throughout the wildfire season to improve fire response and protection of priority habitats. These natural values rely on a fire-dependent/fire adapted ecosystem that, when fire occurs, sustains these resources. Fire can and is often good and needed where priority habitat exists, along with pre-position of firefighting assets to improve preparedness and suppression capability in the initial stages of a wildfire. These efforts increase the chances of keeping fires small and limits loss of habitat.

11.g. Fire-Resistant Construction Materials

Due to the multitude of highly publicized wildland-urban interface fires occurring in the western states, there has been an increased level of research, development, and marketing of more fire-resistant construction materials. Information on high-risk materials as well as fire-resistant alternatives can be readily found online or through local fire departments.

The planning committee has recommended that additional education regarding wildfire awareness issues and fire-resistant construction materials be provided to those engaged in new construction projects.

11.h. Volunteer Firefighter Recruitment

The rural fire departments in Chelan County are predominantly dependent on volunteer firefighters. The trend for several years, in many volunteer fire departments, is that membership has continued to decrease. This can be attributed to several reasons including the need for two wage earners in a household to support their family, and the tremendous amount of time spent training to satisfy the ever-increasing regulations from state and federal agencies. Whether it be job and family commitments combined with hobbies or competition with other volunteer organizations, it comes down to the fact there is very little time left for being a volunteer firefighter. This is exacerbated by the added stress of emergencies and inherent dangers of the job, not to mention that our society is generally less appreciative of the commitment and sacrifices made by volunteer firefighters.

Today's fire departments, career and volunteer, find themselves in a position where there is an increased demand for their services, but are confronted with increasing operational costs. In the rural setting where revenue is limited and volunteers are limited, this can add up to a fire service that is stretched very thin. Many departments have difficulty maintaining volunteers available during regular workday hours (8am to 5pm).

Each district spends a considerable amount of time and resources training and equipping each volunteer, with the hope that they will continue to volunteer their services to the department for at least several years. One problem that all volunteer-based departments encounter is the diminishing number of new recruits. As populations continue to rise and more and more people build homes in high fire risk areas, the number of capable volunteers has gone down.

11.i. Communication

There are several communication issues being addressed in Chelan County. Many of the emergency responders have identified areas of poor reception for both radios and cell phones. The lack of communication between responders as well as with central dispatch significantly impairs responders' ability to effectively and efficiently do their job as well as lessen their safety.

On a smaller scale, many subdivisions or unincorporated population centers have identified the need to improve emergency communication between residents. In an emergency, there is no existing way of notifying each resident in an area of potential danger, the need for evacuation, etc. Many groups of homeowners have begun to establish phone trees and contact lists to communicate information on the individual scale; however, this is not being done in all the high-wildfire risk areas within the County. The County has installed EverBridge alert systems and the Federal Government's Integrated Public Alert & Warning System (IPAWS) to increase communications across the county. (IPAWS allows for geographic specific alerts can be sent to cell phones in English, Spanish and image messages. A cell phone user does not have to sign up for the

service, it is automatic and will send an alert to the phone, so long as the phone is charged, turned on and is in a service area).

11.j. Invasive Species

Cheatgrass (*Bromus tectorum*) contributes to the size and frequency of fires and directly threatens the habitat of the greater sage-grouse and other sagebrush-steppe dependent wildlife. Fire behavior and fire regimes have been altered due to the proliferation of cheatgrass and other invasive species. Cheatgrass invades disturbed open sites and can dominate an area. Cheatgrass ripens and cures much earlier in the season when compared with native species, thus extending the fire season (Pellant, M., 1996). According to some statistical analysis, cheatgrass dominated ranges are about 500 times more likely to burn than a native species dominated range(Platt, K., Jackman,E.R., 1946). Fire return intervals in steppe and shrub-steppe fuel types, pre-European settlement was typically between 32 and 70 years (Wright et al., 1979). In certain Great Basin rangelands, the fire return interval is shorter in rangelands dominated by cheatgrass, with cheatgrass-dominated areas four times more likely to burn than native vegetation types (Weltz et al., 2014). Cheatgrass has come to dominate many of the hillsides around Chelan Counties' most populated areas including the Wenatchee Foothills, Chelan Butte, and the foothills along the Columbia.

Vegetation management at this scale is complex and requires aggressive and targeted application of both proven techniques and implementation of new practices to control cheatgrass and mitigate habitat impacts from unwanted rangeland fire. Land managers need tools to reduce cheatgrass while simultaneously restoring resilient sagebrush-steppe ecosystems that can withstand fire and resist re-invasion of cheatgrass or other invasive species. Effective strategies developed for early detection and rapid response and implemented in collaboration with a wide range of stakeholders, can help check the rapid expansion of invasive non-native species.

11.k. Hazardous Materials

A concern within Chelan County is the hazardous materials stored countywide. Pesticides and fertilizers used in the agriculture industry can cause significant hazards should a location storing such materials burn.

11.l. Building and Zoning

County zoning restrictions, in some instances, allow structures to be built within five feet of a property line. Therefore, it may be difficult for a homeowner to adhere to the defensible space requirements that are typically advised by organizations such as Firewise. Some cities, like the City of Leavenworth have adopted the WUI code almost in its entirety.

11.m. Public Wildfire Awareness

As the potential fire risk in the wildland-urban interface continues to increase, fire service organizations cannot be solely responsible for protection of lives, structures, infrastructure, ecosystems, and all the intrinsic values that go along with living in rural areas.

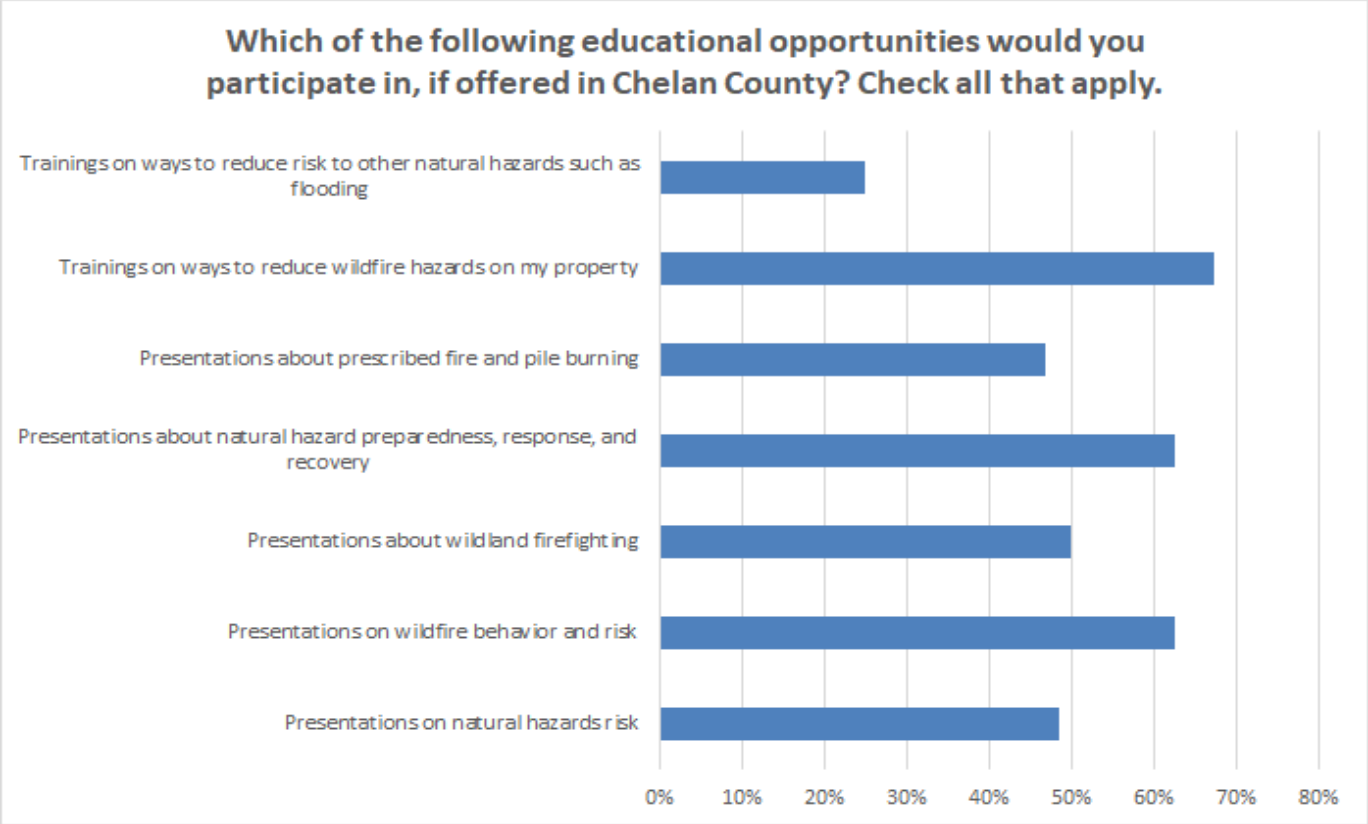


Figure 22. *Educational opportunities of interest to Chelan Public.* ***Source: Chelan Public Survey 2024.***

Public awareness of the wildland fire risks as well as homeowner accountability for the risk on their own property is paramount to protection of all the resources in the wildland-urban interface. Public awareness goes beyond just landowners in Chelan County, but includes all residents, business owners, renters, students and visitors. Everyone has a role, and wildfire education should be strategically and equitably directed toward a broad spectrum of people in Chelan County.

The continued development of mechanisms and partnerships to increase public awareness regarding wildfire risks before, during and after the fire and promoting "do it yourself" mitigation actions is a primary goal of the CWPP planning committee as well as many of the individual organizations participating on the committee. Increasing awareness and education to a broad spectrum of residents, landowners, students, visitors, and business owners is essential.

The following are programs available for the Chelan population:

Cascadia Conservation District provides a wide range of resources for residents to help them prepare and recover from wildfire. FREE chipping of your hazardous fuels, home ignition assessments, financial assistance for large fuel reduction projects, forest management plans, workshops for landowners and contractors, prescribed fire training, assistance developing Firewise Communities and more.

Firewise USA The national Firewise USA® recognition program provides a collaborative framework to help neighbors in a geographic area get organized, find direction, and take action to increase the ignition resistance of their homes and community and to reduce wildfire risks at the local level. Any community that meets a set of voluntary criteria on an annual basis and retains an "In Good Standing Status" may identify itself as being a Firewise® Site.

Fire Adapted Communities incorporates people, buildings, business, infrastructure, cultural resources and natural areas into the effort to prepare for the effects of wildland fire.

Wildfire Community Preparedness Day is an excellent opportunity for neighborhoods and fire agencies to work together to make communities a safer place to live. Efforts raise wildfire awareness and help protect homes, neighborhoods, and communities, while increasing safety of wildland firefighters or could lessen current post-fire impacts.

The national **Ready Set Go! Program**, managed by the International Association of Fire Chiefs (IAFC), works to develop and improve dialogue about wildland fire awareness and action between local fire departments and the residents they serve. It is complimentary and collaborative with Firewise and other wildland fire public education efforts.

NFPA Fire Prevention Week offers information and tools to help public educators teach all audiences about important fire and life safety issues.

12. Zone Risk Assessments

A primary objective of this plan is to enhance landscape-scale wildfire management by integrating science and technology to prioritize areas for prevention, suppression, and post-fire restoration using a risk-based approach. A landscape-scale strategy emphasizes ecosystem sustainability, stakeholder collaboration, and the ability to address current and future land conditions across various ownerships.

By applying the All Hands, All Lands management approach, increased collaboration among federal, state, tribal, and private landowners—as well as local officials, natural resource managers, and the fire community—can improve the overall effectiveness and efficiency of wildfire management. With wildfires becoming more frequent and intense, the risk of stand-replacing fires threatens wildlife, communities, and those who depend on these landscapes for their livelihoods and quality of life.

Not every acre can be treated to prevent wildfire, nor can every burned area be fully restored. Chelan County is adapting to wildfire as a regular occurrence, and a key goal of this CWPP is to build resilience in both the landscape and communities.

Prioritizing prevention, suppression, and restoration efforts is essential for increasing operational efficiency and treatment effectiveness. Risk-based, landscape-scale assessments help identify high-priority areas for fuel treatments while also guiding the strategic allocation and pre-positioning of suppression resources.

To provide a clearer understanding of wildfire risks, the following landscape-level wildfire risk assessments divide Chelan County into nine Zones (Figure 22). These Zones were designed to reflect distinct terrain, wildland fuels, and development features and were created using:

- Fire District boundaries
- Watershed (HUC 12) boundaries
- Key ingress/egress routes
- Community water sources
- Potential fire spread patterns

These Zones are not intended to assign responsibility for mitigation projects but instead serve as a framework for discussing and addressing wildfire risk within Chelan County at a more localized scale.

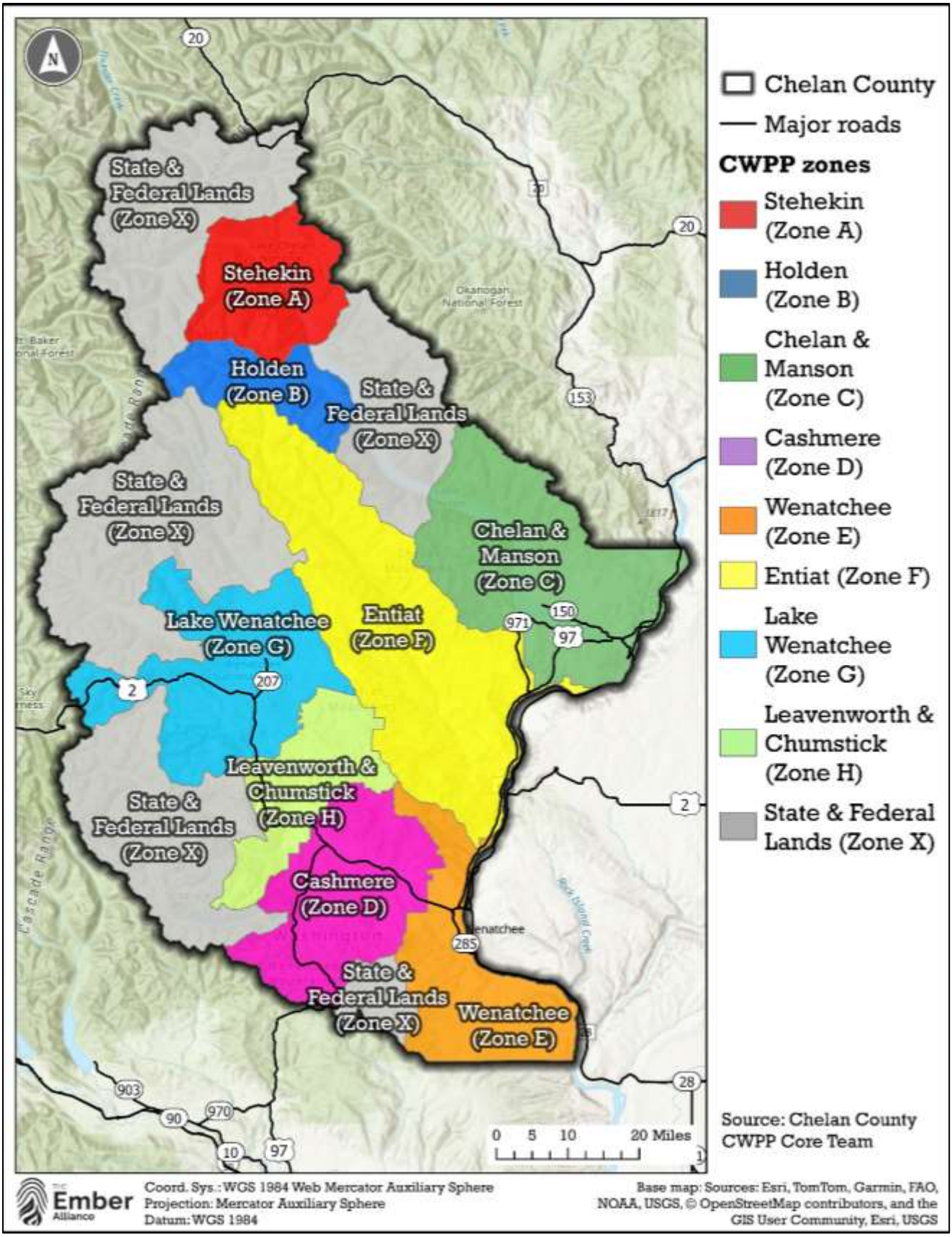


Figure 23. *Zones for the Chelan County CWPP. Source: Chelan County CWPP Core Team.*

12.a. Zone A – Stehekin

Zone A sits at the north end of Lake Chelan. It is approximately 98,160 acres and includes the lower Stehekin Valley and surrounding area. The Zone is surrounded by the Glacier Peak Wilderness, the North Cascades National Park Lake Chelan Recreation Area, and by the Lake Chelan Sawtooth Wilderness.

Zone A Parcel Summary.

#of Structures	# of Parcels	# of Parcels in Fire District	# Parcels Not in Fire District
122	361	336	25

Zone A Wilderness Summary.

Non-Wilderness	Glacier Peak Wilderness	Lake Chelan-Sawtooth Wilderness
58%	40%	2%

Zone A Ownership Summary.

Owner	Percent
National Park Service	55%
US Forest Service	42%
Private	3%

Most of the home sites do not include adequate defensible space although some work has been initiated by individuals. Some private lots and other areas within the valley are stocked with heavy fuels.

Private property comprises 2.64% of the Zone. In the Stehekin Valley proper, private property only makes up approximately 350 acres. The National Park Service and the United States Forest Service manage approximately 95%. Lake Chelan makes up approximately 3% of the Zone.

Fuel types are primarily overstocked, mixed conifer types with some openings along the arid south slopes. Heavy riparian vegetation exists along streams. A couple small “safe zones” exist within the valley. Citizens are instructed to congregate in the “safe zones” in the event of a fast-moving wildfire.

Wildfire Potential

The Douglas-fir cover type that occurs throughout the Stehekin Valley is the most xeric type in the North Cascades Complex. It is best characterized by a fire regime of mixed severity where stand replacing events occur infrequently (approximately every 100 years) and low severity fires occur more frequently. See Figure 24 for a map of fire behavior class within Zone A.

Lodgepole pine (*Pinus contorta*)-dominated sites in the Stehekin Valley are perpetuated by high severity fire events; lodgepole pine is the most likely pioneer following stand replacing events, and its continued dominance is reliant upon these high severity fires reducing competition from more shade tolerant species.

Mountain pine beetle (*Dendroctonus ponderosae*) has caused significant mortality in the lodgepole pines of Zone A. This mortality reduces the density of live tree canopies and can increase coarse woody debris on the forest floor. Fire behavior is more extreme, and ember production is greater than usual in forests affected by mountain pine beetles while dry, dead needles are still on dead trees. As trees begin to fall to the ground, the quantity of logs, bark, and other dry fuels increases and can fuel more intense wildfires (Parsons et al., 2014). One study in Oregon found that approximately 10% of the trees killed in a mountain pine beetle attack fell after 6 years and roughly 80% fell within 12 years post attack (Keen, 1955). However, in some situations, the likelihood of active crown fires is reduced in lodgepole pine stands impacted by mountain pine beetle after needles fall off dead trees (Klutsch et al., 2011). Fire behavior after mortality caused by mountain pine

beetles are affected by the time since tree mortality, density of living trees, surface fuel accumulation, fire weather conditions, and slope.

Grass and sedge dominated meadows allow for fire spread that is carried by the fine herbaceous fuels that have cured. Shrub-dominated meadows allow for fire to be carried by litter cast and other fine fuels. These sites likely burn infrequently due to their mesic nature and would burn with low intensity because of the lack of heavy (100 hour) fuels.

Wildfire Hazard Assessment

- **50%** of the Zone could experience high to extreme fire behavior (fire transitioning from the surface into treetops, spreading from treetop to tree, and/or emitting prolific embers).
- This Zone has a **high** to the **highest** likelihood of wildfire (relative burn probability) relative to the rest of Washington State.
- **20% of homes** in the Zone could be exposed to radiant heat from burning vegetation.
- **100% of homes** in the Zone could be exposed to embers from burning vegetation.
- This Zone has a **moderate** potential for structure-to-structure fire spread due to the moderate number of closely spaced structures.
- **47% of roads** in the Zone have potentially non-survivable conditions.

Infrastructure

There are a few bridges in Zone A of Chelan County, and most can accommodate firefighting apparatus. Bridge load rating signs are not in place for the existing bridges and could pose a limitation to access for firefighting equipment. Roads and bridges in this Zone are also subject to being washed out every spring if rapid snowmelt occurs.

Power is provided by overhead power lines with only a few overhead connections to structures. Water resources are obtained from private wells, Lake Chelan, and the Stehekin River.

Ingress-Egress

Stehekin is a remote community different from any other in the lower 48 states. It is accessible to outside resources only by air, boat, or foot travel. The shortest trail into the community is approximately 18 miles long. The remoteness of the Stehekin Valley creates issues for timely access of enough firefighting resources and efficiency of Jet A fuel availability. Stehekin abuts the north end of Lake Chelan and is surrounded by contiguous forest in the lower elevations. The area has had several significant wildfires and a history of fire suppression activities which have led to increased fuel loading and arboreal insect and disease issues.

There are only two roads in the Zone, the Stehekin Valley Road and Company Creek Road, providing access within the planning area. All the remaining roads a*re* primarily private along with some park service roads and county roads with varying standards. Most of the roadways can accommodate structural fire vehicles. Most of the terrain in the area is extremely rugged with numerous vertical cliffs and class 5 slopes, or greater than 70%.

Fire Protection

The Washington State Department of Natural Resources has protection responsibility for undeveloped private lands in the valley. Through agreement, the NPS is responsible for protecting lands via state DNR taxes to protect within the Stehekin drainage. The NPS has protection responsibility for land within Lake Chelan Recreation Area and North Cascades national Park, while the USFS has responsibility for land within the Glacier Peak Wilderness Area and the Chelan-Sawtooth Wilderness Area. No Fire Station exists yet.

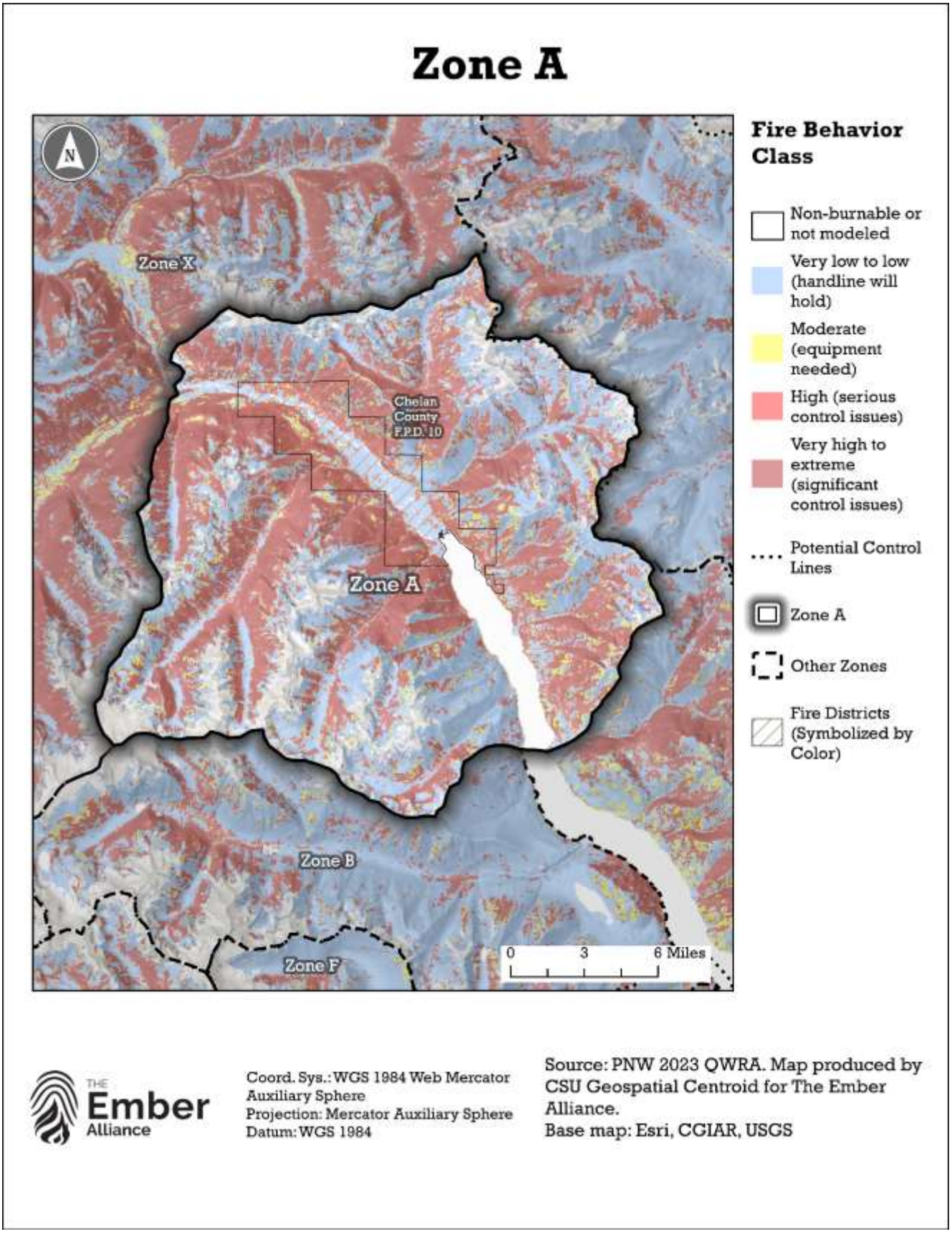


***Figure 24**. Fire behavior class seen within Zone A of Chelan County. Source: PNW 2023 QWRA.*

12.b. Zone B – Holden

Zone B sits at the north end of Lake Chelan. It is approximately 61,504 acres and includes the lower Railroad Creek drainage and surrounding area. The Zone is surrounded by the Glacier Peak Wilderness and by Lake Chelan. The Holden Village Fire Brigade provides fire protection for the non-profit organization facilities, staff and guests.

Lucerne is located at the east end of this Zone and includes campground facilities, barge and ferry docking capabilities. Holden Village is located approximately 10 miles up Railroad Creek where several structures exist. Holden Village is very limited on fire mitigation options because of USFS stipulations.

Zone B Parcel Summary.

#of Structures	# of Parcels	# of Parcels in Fire District	# Parcels Not in Fire District
45	7	0	7

Zone B Wilderness Summary.

Non-Wilderness	Glacier Peak Wilderness
36%	64%

Zone B Ownership Summary.

Owner	Percent
US Forest Service	>99%
Private	<1%

Private property comprises less than 1% of the Zone. The United States Forest Service manages approximately 99%.

Fuel types are primarily overstocked, mixed conifer types with some openings along the arid south slopes. Heavy riparian vegetation exists along streams. Multiple fires have burned through this Zone in the recent past leaving behind numerous snags and opening the canopy allowing for dense undergrowth to occur.

Wildfire Potential

The eastside Douglas fir cover type that occurs throughout the Railroad Creek drainage is the most xeric type on the North Cascades Complex and is comparable to the dry Douglas fir mixed conifer of the Rocky Mountains. It is best characterized by a fire regime I of mixed severity where stand replacing events occur infrequently (approximately every 100 years) and low severity fires occur more frequently. See **Figure 25** for a map of fire behavior class within Zone B.

Lodgepole pine (*Pinus contorta*)-dominated sites in Zone B are perpetuated by high severity fire events; lodgepole pine is the most likely pioneer following stand replacing events, and its continued dominance is reliant upon these high severity fires reducing competition from more shade tolerant species.

Mountain pine beetle (*Dendroctonus ponderosae*) has caused significant mortality in the lodgepole pines of Zone B. This mortality reduces the density of live tree canopies and can increase coarse woody debris on the forest floor. Fire behavior is more extreme, and ember production is greater than usual in forests affected by mountain pine beetles while dry, dead needles are still on dead trees. As trees begin to fall to the ground, the quantity of logs, bark, and other dry fuels increases and can fuel more intense wildfires (Parsons et al., 2014). One study in Oregon found that approximately 10% of the trees killed in a mountain pine beetle attack fell after 6 years and roughly 80% fell within 12 years post attack (Keen, 1955). However, in some situations, the likelihood of active crown fires is reduced in lodgepole pine stands impacted by mountain pine beetle after needles fall off dead trees (Klutsch et al., 2011). Fire behavior after mortality caused by mountain pine

beetles are affected by the time since tree mortality, density of living trees, surface fuel accumulation, fire weather conditions, and slope.

Grass and sedge dominated meadows allow for fire spread to be carried by the fine herbaceous fuels that have cured. Shrub-dominated meadows also abound where fire is carried by litter cast and other fine fuels associated with this type. These sites likely burn infrequently due to their mesic nature and would burn with low intensity because of the lack of heavy (100 hour) fuels.

Wildfire Hazard Assessment

- **22%** of the Zone could experience very high to extreme fire behavior (fire transitioning from the surface into treetops, spreading from treetop to tree, and/or emitting prolific embers).
- This Zone has a **moderate** to **high** likelihood of wildfire (relative burn probability) compared to the rest of Washington State.
- **13% of homes** in the Zone could be exposed to radiant heat from burning vegetation.
- **100% of homes** in the Zone could be exposed to embers from burning vegetation.
- This Zone has a **high** potential for structure-to-structure fire spread due to the high number of closely spaced structures.
- **22% of roads** in the Zone have potentially non-survivable conditions.

Ingress-Egress

Holden Village is a remote community only accessible by boat, emergency helicopter, or foot. The only road access from Lake Chelan is ten miles up the gravel USFS Road 8301 from the Port of Lucerne. There's also a secondary bypass road that loops around the remediated mine tailings and a few maintenance roads around the legacy Copper Mine Site. Maintaining adjacent forest fuels so they don't become a dense timber stand is a high priority for the community.

USFS Road 8301 continues up valley past Holden Village approximately 1.25 miles to a legacy ballpark, and private land owned by Holden. The community has a need to access their property and desires fuels adjacent be maintained so fire suppression crews can use it for access and safe escape route.

Infrastructure

There are a few bridges in Zone B of Chelan County, and most can accommodate firefighting apparatus. Bridge load rating signs are not in place for the existing bridges but mine remediation operations used many of the bridges in this Zone with equipment that far exceeds the weight of the typical fire apparatus.

Power is provided by underground power lines from a hydroelectric system operated by Holden Village. Water resources are obtained from private wells, Lake Chelan, and three vicinity creeks.

Fire Protection

The Holden Village Fire Brigade was established under WAC statute 296-811 to provide an organized group of employees and long-term staff who are knowledgeable, trained and skilled in basic firefighting to

safeguard the guests, staff and the privately-owned buildings of the Holden Village Community (a non-profit organization) from the threat of fire.

The Fire Brigade is the only emergency response resource the community can utilize because of its isolation by natural barriers from any rural fire protection district, the land is administered by USFS and Holden operates under a Special Use Permit. The USFS is responsible for all Wildland suppression and is beyond the Fire Brigades capabilities.

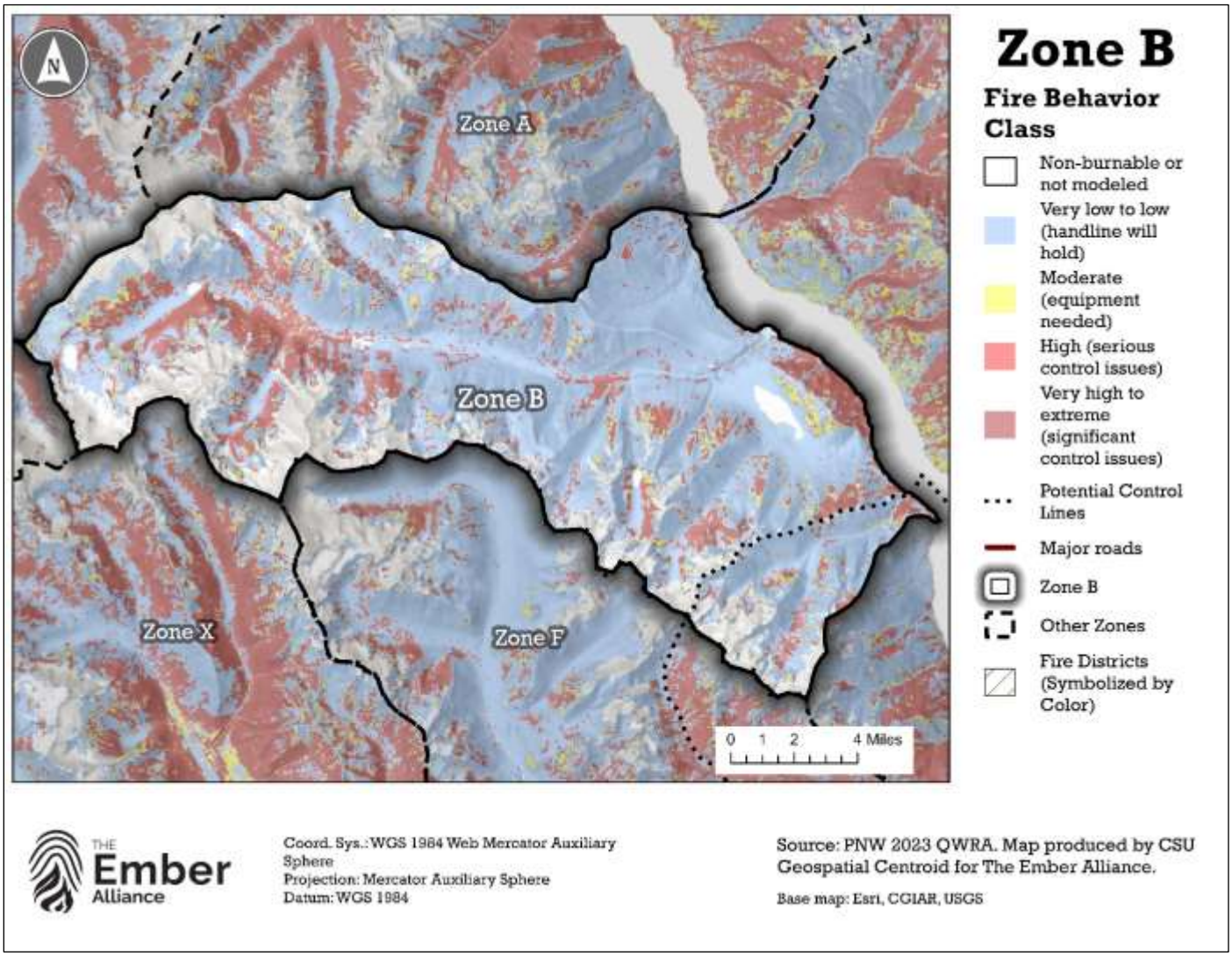


Figure 25. *Fire behavior class seen within Zone B of Chelan County. Source: PNW 2023 QWRA.*

12.c. Zone C – Chelan & Manson

Zone C sits at the southern end of Lake Chelan. It is approximately 213,251 acres and includes the Chelan, Manson, Union Valley, Lake Chelan, and surrounding area. This Zone includes Fire Districts #5 and #7 and encompasses the South Shore Lake Chelan, Union Valley Area and Manson Community Wildfire Protection Plans.

Zone C Parcel Summary.

#of Structures	# of Parcels	# of Parcels in Fire District	# Parcels Not in Fire District
8,341	11,731	11,642	89

Zone C Wilderness Summary.

Non-Wilderness	Wilderness
100%	0%

Zone C Ownership Summary.

Owner	Percent
US Forest Service	50%
Chelan County	38%
Bureau of Land Management	5%
WA Dept. of Fish & Wildlife	4%
WA Dept. of Natural Resources	2%
Private	1%
WA State Parks & Rec	<1%
Public school district	<1%

The Lake Chelan basin is a glacial U-shaped valley with steep sidewalls. Dominant vegetation includes grass-shrub species, mixed conifer, and open pine forests. In many places, bitter brush is the primary plant species dominating the landscape. Recent fires on Chelan Butte have reduced the density of shrubs in favor of grasses.

Residential development is largely rural in nature and density varies with topography and proximity to the lake. Numerous homes are seasonally or intermittently occupied. The area is a popular recreation destination, particularly during the summer months. Two state parks, Lake Chelan and Twenty-Five Mile, are located within the planning area.

The Manson area is located on the north shore of Lake Chelan. Residential development on private lands within the Manson area is concentrated in areas along Lake Chelan. The city of Manson contains the highest density of residential development in this portion of Zone C. Most homes outside of Manson are separated by large areas of open grass, sagebrush and scattered trees, patches of dense forest, or a mix of grass or brush and orchard.

The majority of the CWPP area land in First and Twenty-Five Mile Creeks is undeveloped National Forest with a great variety of vegetation types and structural stages. Fires occurring in 1970, 1994, 1998, and 2004 with a variety of burn intensities, have created a patchwork of structural stages, habitats, and vegetation and fuel conditions. The existing vegetation conditions surrounding the Manson area and Fire District #5 are the result of a long history of fires on the north shore of Lake Chelan, including in 2024 with the Pioneer Fire. Given this history, much of this portion of Zone C is currently recovering from these fires.

Across the landscape of Fire District #5 and the adjacent Forest Service lands areas of grass, brush, densely stocked trees, and dead fuels contribute to a landscape vegetation pattern that is conducive to large fire growth.

Wildfire Potential

Dense, overstocked stands of trees are increasing the fire hazard throughout the Lower North Shore, including the valleys leading out of the basin and the Union Valley CWPP area. Many stands of ponderosa pine are dominated by trees less than 18 inches in diameter. Pockets of trees are being killed by low level

(~0.3 to 4.5 trees/acre) infestation by mountain pine beetle and/or fir engraver. Trees often have co-mingled crowns, mistletoe and ladder fuels, and continuously tall underbrush which also dominates on the landscape. All these variables can create conditions for an intense and fast-moving fire. See Figure 26 for a map of fire behavior class within Zone C.

Grass and sedge dominated meadows, where fire spread is carried by the fine herbaceous fuels that have cured sit alongside shrub-dominated meadows, where fire is carried by litter cast and other fine fuels associated with this type. These sites likely burn infrequently due to their mesic nature and would burn with low intensity because of the lack of heavy (100 hour) fuels.

The timber litter and timber understory fuel models will have low to moderate fire activity under average summer weather conditions. These fuel models would include the lodgepole pine/mixed conifer stands at the lower elevations and the mountain hemlock (*Tsuga mertensiana)*, subalpine-fir (*Abies lasiocarpa)*, Whitebark pine (*Pinus albicaulis)* and Western larch (*Larix occidentalis*) found at the higher elevations.

Wildfire Hazard Assessment

- **25%** of the Zone could experience very high to extreme fire behavior (fire transitioning from the surface into treetops, spreading from treetop to tree, and/or emitting prolific embers).
- This Zone has a **high** to the **highest** likelihood of wildfire (relative burn probability) relative to the rest of Washington State.
- **5% of homes** in the Zone could be exposed to radiant heat from burning vegetation.
- **68% of homes** in the Zone could be exposed to embers from burning vegetation.
- This Zone has an **extreme** potential for structure-to-structure fire spread due to the extremely high number of closely spaced structures.
- **11% of roads** in the Zone have potentially non-survivable conditions.

Ingress-Egress

There are several main roads that serve as designated emergency evacuation routes for the South Shore of Lake Chelan, including Highway 97A, South Lake Shore Road, Navarre Coulee Road. However, several of the roads that access canyons or valleys are dead end roads. Not all roads in the planning area are paved or in suitable condition for fire equipment. Therefore, road access has been identified as a concern. Union Valley Road is the only designated emergency evacuation route in the Union Valley area, and it is oriented in a north-south direction. Due to the topography of the area, all other main roads are orientated primarily in a north and south direction. Not all roads in the CWPP area are paved or in suitable condition for fire equipment.

State Route 150 is the main emergency evacuation route into and out of the Manson area. This road is oriented in a northwest-southeast direction with outlets in both directions. Secondary roads that provide access include Ivan Morse Road, Grade Creek/Johnson Creek, Emerson Acres, Upper & Lower Joe Creek, Helios Hills/Green's Landing, and Wapato Lake Road. These roads are generally paved with two-lane loops

(with the exception of Emerson Acres). Primitive one-way dead ends that are unsuitable for fire equipment are scattered throughout the area.

The main secondary roads provide additional access through the Manson area and would be used by homeowners in the event of an evacuation to get people out. Road access to Emerson Acres has been identified as a potential concern in the event of wildfire. Roads are limited due to the influence of drainage topography (steep slopes).

Infrastructure

There are a few bridges in Zone C of Chelan County, and most can accommodate firefighting apparatuses. Bridge load rating signs are in place for the existing bridges and would not pose a limitation to access for firefighting equipment.

Power is provided by overhead power lines with numerous overhead connections to structures. Water resources are obtained from private wells and city water sources.

Fire Protection

Fire District #7 is a small combination department covering approximately 125 square miles. Chelan County Fire District #7 is responsible for protection of private property in the area surrounding the community of Chelan and Union Valley. District boundaries extend from Chelan Falls to 25 Mile Creek State Park. The City of Chelan is part of the fire district.

Chelan County Fire District #5 provides fire protection for about 18 square miles of private lands in the Manson area. They are also responsible for providing initial attack response to state and federal lands in the area per an interagency agreement.

The WDNR is the primary agency responsible for fire protection on forested private and state lands while the USFS is the primary agency responsible for management of fires on federal land. Areas outside the boundaries of the Fire Protection Districts #5 and #7 are not guaranteed fire response from the district. DNR will respond to forest fires however they generally do not have responsibility for structures. The WDNR does collect a “fire tax” from landowners north of Wapato Lake Road and is primarily responsible for responding to structure fires in this area. The district maintains mutual aid agreements with WDNR and all fire districts within Chelan and Douglas Counties.

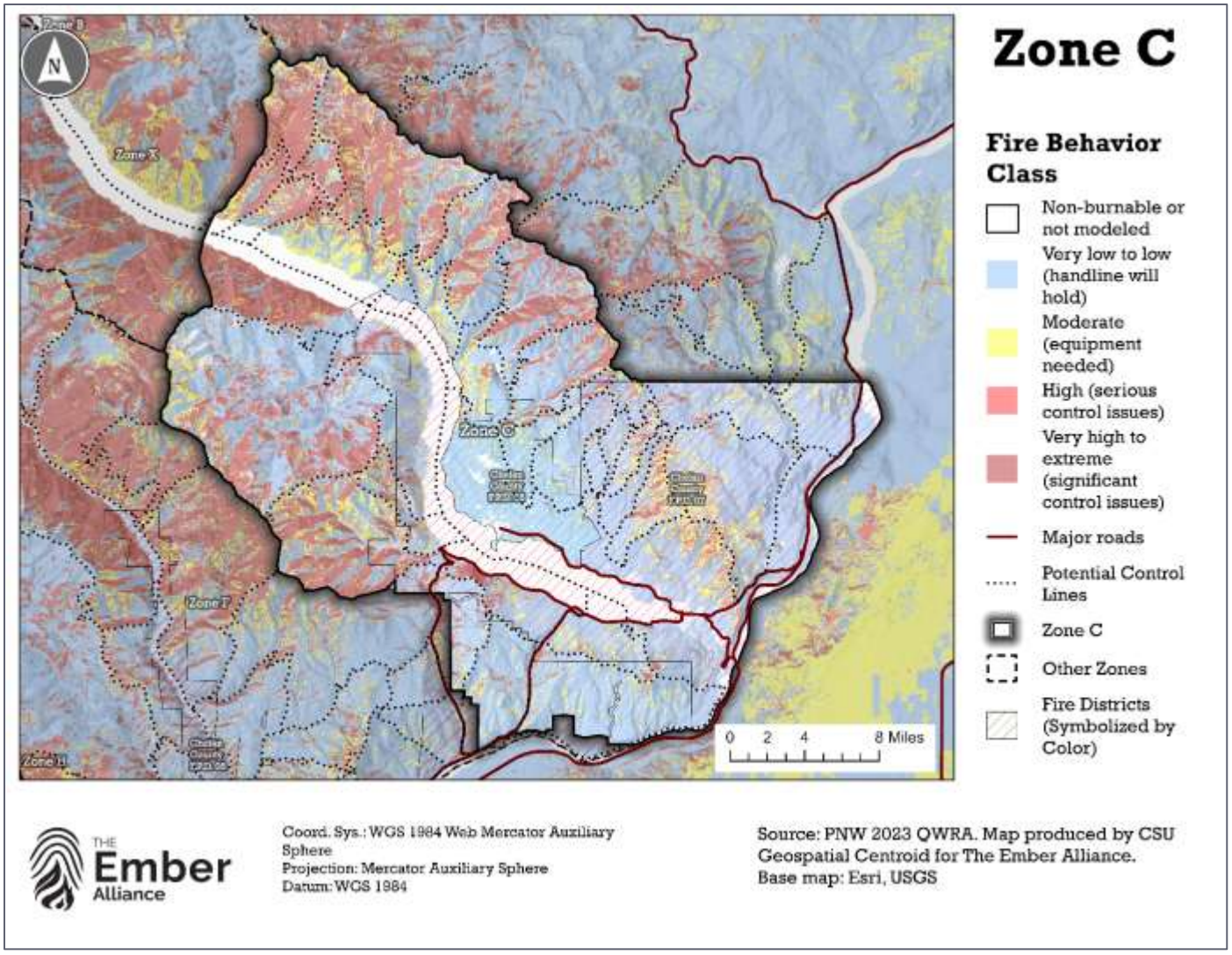


***Figure 26**. Fire behavior class seen within Zone C of Chelan County. Source: PNW 2023 QWRA.*

12.d. Zone D – Cashmere

Zone D is located at the southern portion of the County and encompasses approximately 150, 347 acres. Zone D includes the communities of Cashmere, Dryden, Monitor, Peshastin and surrounding area. Chelan County Fire District #6 provides the primary fire protection for residents in this Zone.

Zone D Parcel Summary.

#of Structures	# of Parcels	# of Parcels in Fire District	# Parcels Not in Fire District
6,214	5,822	5,757	65

Zone D Wilderness Summary.

Non-Wilderness	Alpine Lakes Wilderness
99%	<1%

Zone D Ownership Summary.

Owner	Percent
Private	50%
US Forest Service	47%
Bureau of Land Management	2%
WA Dept. of Natural Resources	1%
WA Dept. of Fish & Wildlife	1%
WA State Parks & Rec	<1%
Chelan County	<1%
City / Municipality	<1%
Public school district	<1%

Drainages in the Monitor, Cashmere, Dryden and Peshastin area are primarily glacial U-shaped valleys with steep sidewalls. Dominant vegetation includes mixed conifer and open pine forests. Residential development is largely rural in nature and density varies with topography and proximity to the lake and other scenic areas. The homes in this Zone are valued at several hundred million. Many residences are located up the numerous narrow canyons that feed into the Wenatchee River valley. In some cases, the homes are very large (>2,000 sq. ft.) and interface with both agricultural areas as well grass and forest environments. The area is a popular recreation destination, particularly during the summer and winter months.

The planning area varies in elevation from points above 4100' (Blag Mountain, Tibbetts Mountain, Eagle Rock and Burch Mountain) to 800' along the Wenatchee River. The annual precipitation ranges from approximately seven inches per year at the east end, south of Burch Mountain to nearly twenty inches per year (most in the form of snow) as you travel westward to Peshastin. This range of precipitation combined with elevation and aspect provides a vegetation gradient from hot, dry grass and shrub-steppe types to warm, dry forests of predominately ponderosa pine with inclusions of Douglas-fir. Shrub-steppe vegetation, primarily grasses, sagebrush and other shrub species cover the lower slopes of the Zone, mostly on south and west aspects. Private and agricultural lands comprise the remaining portions of the Zone that occur primarily on the flatter, lower elevations along the creek/river corridors.

Wildfire Potential

A substantial portion of the planning area is at a high risk of fire danger. Past activities such as logging, grazing, and fire suppression have altered the normal fire regime, stand species composition, and affected forest health. Dense, overstocked stands of trees, particularly in the Brender and Mission Creek areas, are increasing the fire hazard. Many stands of ponderosa pine are dominated by trees less than 18 inches in diameter. Numerous dense pockets of standing and dead fallen trees have been/or are being affected by low level (~0.3 to 4.5 trees/acre) infestation by mountain pine beetle and/or fir engraver and root rot (disease). Stands often have contiguous crowns and ladder fuels in the form of young conifers and tall brush species. These variables provide a continuous fuel profile which can create conditions for an intense and fast-moving fire.

Grass and sedge dominated meadows allow for fire spread to be carried by the fine herbaceous fuels that have cured. Shrub-dominated meadows also abound where fire is carried by litter cast and other fine fuels associated with this type. These sites likely burn infrequently due to their mesic nature and would burn with low intensity because of the lack of 100-hour fuels. See **Figure 27** for fire class behavior within Zone D.

Wildfire Hazard Assessment

- **41%** of the Zone could experience very high to extreme fire behavior (fire transitioning from the surface into treetops, spreading from treetop to tree, and/or emitting prolific embers).
- This Zone has the **highest** likelihood of wildfire (relative burn probability) relative to the rest of Washington State.
- **4% of homes** in the Zone could be exposed to radiant heat from burning vegetation.
- **96% of homes** in the Zone could be exposed to embers from burning vegetation.
- This Zone has an **extreme** potential for structure-to-structure fire spread due to the extremely high number of closely spaced structures.
- **10% of roads** in the Zone have potentially non-survivable conditions.

Ingress-Egress

There are several main roads that serve as designated emergency evacuation routes. The primary access through the planning area is Highway 2/97 (east/west). Other main roads exist and provide access up the canyons, such as Mission, Brender, Yaksum, Fairview, Hay, Nahahum, Camas Meadows, Mundan, Derby, Olalla, and Williams. Most of the roads that provide access up the canyons are dead end roads. However, several of the roads that access canyons provide access out of the upper ends, such as Nahahum, Mission. Not all roads in the planning area are paved or in suitable condition for fire equipment.

Infrastructure

There are numerous bridges in Zone D of Chelan County, and most can accommodate firefighting apparatus. Bridge load rating signs are in place for the existing bridges and would not pose a limitation to access for firefighting equipment. Power is provided by overhead power lines with numerous overhead connections to structures. Water resources are obtained from private wells and city water sources.

Fire Protection

Chelan County Fire District #6 is single departments consisting of five separate stations that are in the communities of Monitor, Cashmere, Dryden, Peshastin and Blewett Pass and are responsible for private property in the area surrounding those communities as well as the communities themselves. The WDNR is the primary agency responsible for fire protection on forested private and state lands while the USFS is the primary agency responsible for management of fires on federal land. Areas outside the boundaries of the Fire Protection District #6 are not guaranteed fire response from the district. DNR will respond to forest fires; however, they do not have responsibility for structures. The district maintains mutual aid agreements with WDNR and fire districts within Chelan and Douglas Counties.

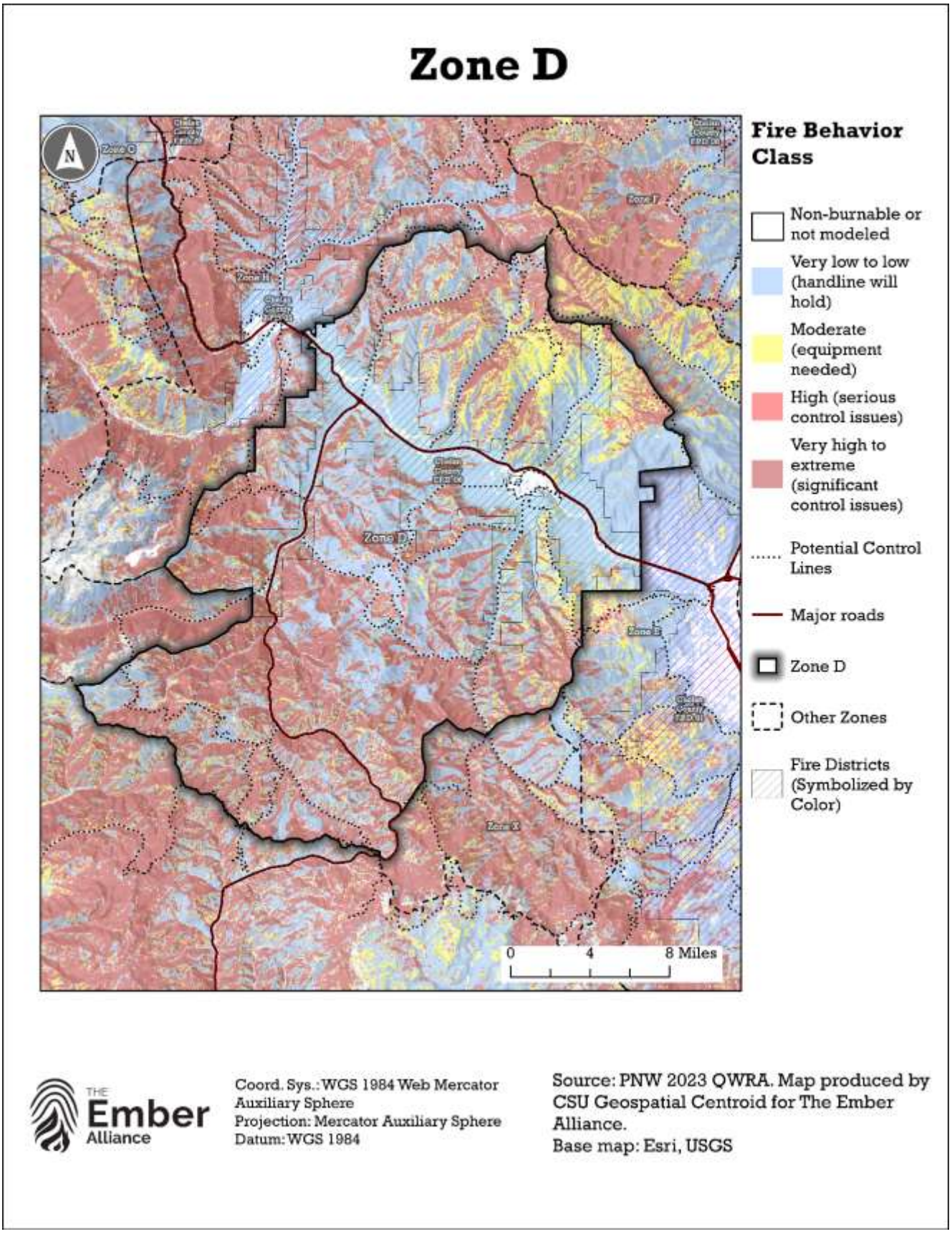


***Figure 27**. Fire behavior class in Zone D of Chelan County. Source: PNW 2023 QWRA.*

12.e. Zone E – Wenatchee

Zone E is located at the southeastern portion of the County and encompasses approximately 135,040 acres. Zone E includes the City of Wenatchee and the communities of Sunnyslope, Malaga, Wenatchee Heights and surrounding area. This Zone has the highest percentage of private ownership of all the Zones in the County.

Zone E Parcel Summary.

#of Structures		# of Parcels	# of Parcels in Fire District	# Parcels Not in Fire District
17,281		18,582	18,513	69

Zone E Wilderness Summary.

Non-Wilderness	Wilderness
100%	0%

Zone E Ownership Summary.

Owner	Percent
Private	47%
WA Dept. of Natural Resources	23%
US Forest Service	13%
WA Dept. of Fish and Wildlife	12%
Bureau of Land Management	3%
Chelan County	1%
U.S. Fish and Wildlife	<1%
WA State Parks & Rec	<1%
Chelan County	<1%
Public school district	<1%

Zone E primarily encompasses the lower elevations. Dominant vegetation includes grass-shrub species, mixed conifer, and open pine forests. Most structures in the planning area occur within the City limits. However, much of the land area within the city has been developed, thus forcing new construction to occur on small percentages of steep parcels, or areas unprotected by the City of Wenatchee's existing Wildland Urban Interface (WUI) building code.

Most of Zone E consists of dry forest stands of predominately ponderosa pine with some small amounts of Douglas-fir. Shrub-steppe vegetation, primarily grasses, sagebrush and other shrub species cover the lower slopes of the Zone, mostly in south and west aspects. Private and agricultural lands comprise the remaining portions of the Zone that occur primarily on the flatter, lower elevations along the creek/river corridors.

A fair amount of difference in the vegetation exists between the lower part of the Squilchuck Valley (Pitcher Canyon, etc.) which is dominated by sagebrush and grass, to areas dominated by orchard trees (Wenatchee Heights) with pockets of trees and sagebrush, to the upper parts of the Valley which are dominated by thick forest. Ponderosa pine is a shade intolerant species naturally adapted to survive in areas that experience fire on a regular basis (i.e. frequent fire regime, fire interval every 2-20 years for lower Wenatchee valley). The forest types on the upper slopes and ridges are composed of more shade tolerant species (e.g. true firs) and have fire regimes that experience fire on longer fire return intervals (35-100 years).

Wildfire Potential

Many portions of this zone are at a high risk of fire danger. Past activities such as logging, grazing, and fire suppression have altered the normal fire regime, stand species composition, and affected forest health. Dense, overstocked stands of trees, particularly in the Squilchuck Valley area, is increasing the fire hazard in this Zone. Many stands of ponderosa pine are dominated by trees less than 18 inches in diameter. Numerous dense pockets of standing and dead fallen trees have been/or are being affected by low level (~0.3 to 4.5 trees/acre) infestation by mountain pine beetle and/or fir engraver (WDNR GIS; see previous Vegetation map) and root rot (disease). Stands often have contiguous crowns and ladder fuels in the form of young

conifers and tall brush species. These variables provide a continuous fuel profile which can create conditions for an intense and fast-moving fire. **Figure 28** shows expected fire behavior class in Zone E of Chelan County.

Grass and sedge dominated meadows allow for fire spread to be carried by the fine herbaceous fuels that have cured. Shrub-dominated meadows also abound where fire is carried by litter cast and other fine fuels associated with this type. These sites likely burn infrequently due to their mesic nature and would burn with low intensity because of the lack of heavy (100 hour) fuels.

Wildfire Hazard Assessment

- **20%** of the Zone could experience very high to extreme fire behavior (fire transitioning from the surface into treetops, spreading from treetop to tree, and/or emitting prolific embers).
- This Zone has a **high** to the **highest** likelihood of wildfire (relative burn probability) relative to the rest of Washington State.
- **1% of homes** in the Zone could be exposed to radiant heat from burning vegetation.
- **39% of homes** in the Zone could be exposed to embers from burning vegetation.
- This Zone has an **extreme** potential for structure-to-structure fire spread due to the extremely high number of closely spaced structures.
- **4% of roads** in the Zone have potentially non-survivable conditions.

Ingress-Egress

The Squilchuck Road is a main artery to the areas of Wenatchee Heights, Pitcher Canyon, Halverson Canyon, Forest Ridge subdivision, National Forest lands, and the Mission Ridge ski area. Squilchuck Road extends from Mission Street approximately (8) eight miles southwest of Wenatchee to Mission Ridge Road, and then another four miles to the Mission Ridge ski area. Squilchuck Road is the primary egress from the upper reaches of the valley. Secondary, limited, egress from the upper reaches of the valley is possible via the paved Stemilt Loop road on the southeast side of the valley. Areas in Zone E are locally referred to as Number 1 Canyon and Number 2 Canyon are highly developed yet have single ingress/egress routes. Limited egress means that residents, particularly in subdivisions, may be difficult to evacuate in the event of a fast-moving wildfire.

Infrastructure

There are numerous bridges in Zone E of Chelan County, and most can accommodate firefighting apparatus. Bridge load rating signs are in place for the existing bridges and would not pose a limitation to access for firefighting equipment. Not all bridges have signs posted however, particularly private bridges accessing single residences.

Chelan County PUD transmission and distribution lines depart two hydroelectric power facilities located in Zone E. There is a mixture of overhead and underground power services throughout this Zone. Public domestic water systems serve a majority of Zone E with the remainder being private wells.

Fire Protection

Wenatchee Valley Fire Department (WVFD) serves the city of Wenatchee, and unincorporated areas of Chelan County. The WADNR is the primary agency responsible for fire protection on forested private and state lands while the USFS is the primary agency responsible for management of fires on federal land. Areas outside the boundaries of WVFD are not guaranteed fire response from the district. DNR will respond to forest fires; however, they do not have responsibility for structures. The district maintains mutual aid agreements with WADNR and neighboring County Fire Districts within Chelan, Grant, Kittitas and Douglas Counties.

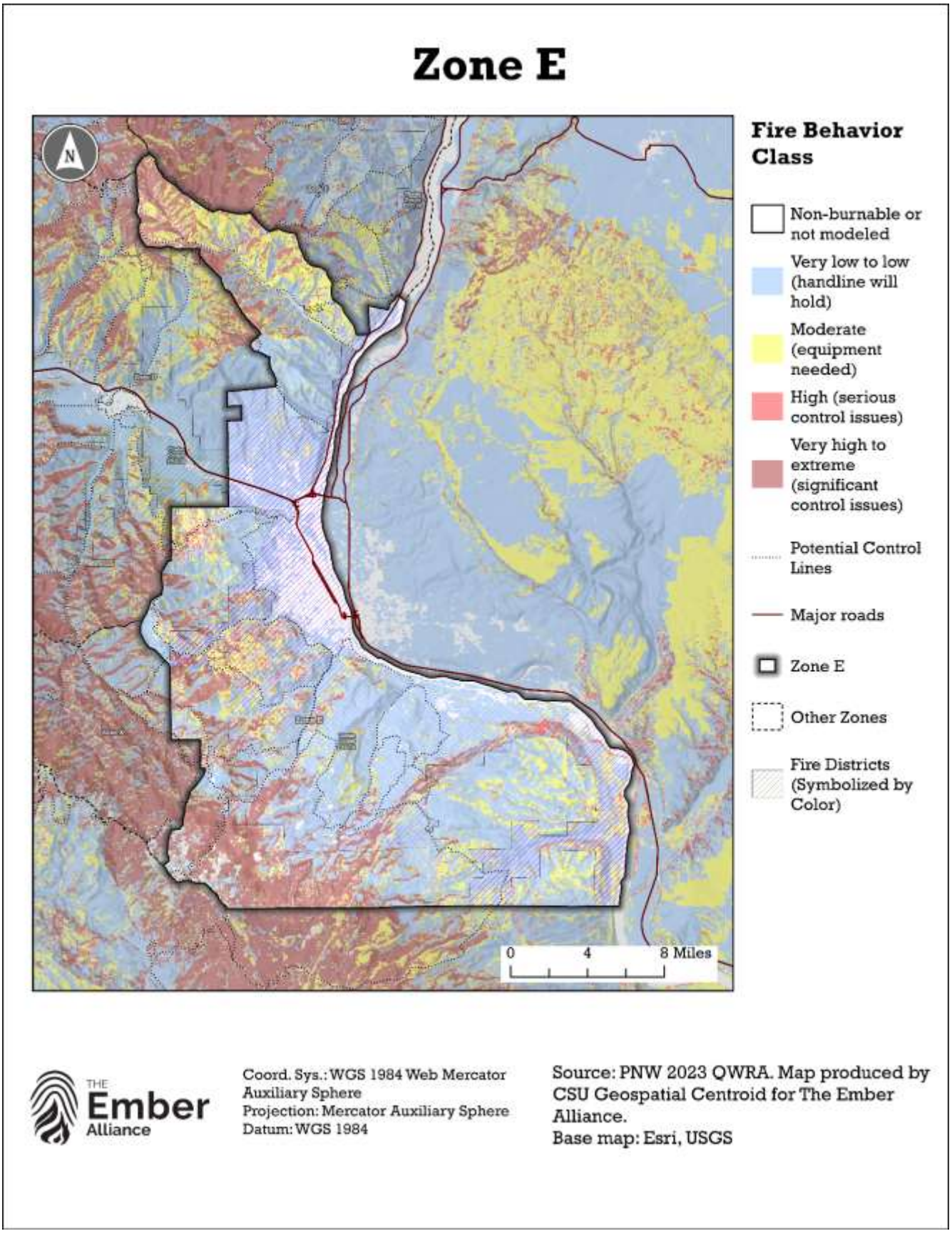


***Figure 28**. Fire behavior class within Zone E of Chelan County. Source: PNW 2023 QWRA.*

12.f. Zone F – Entiat

Zone F is located along the eastern slopes of the Cascade Mountains in north-central Washington State, Chelan County. The planning area is approximately 301,056 acres and is bordered on the northeast by the Chelan Mountains, to the southeast by the Entiat Mountains and to east by the Columbia River. Residential areas, outside the City of Entiat, are intermixed with orchard, open grass, sagebrush, bitterbrush, scattered ponderosa pine and Douglas fir forested areas.

Zone F Parcel Summary.

#of Structures	# of Parcels	# of Parcels in Fire District	# Parcels Not in Fire District
1,665	2,725	2,571	154

Zone F Wilderness Summary.

Non-Wilderness	Glacier Peak Wilderness
92%	8%

Zone F Ownership Summary.

Owner	Percent
US Forest Service	83%
Private	10%
WA Dept. of Natural Resources	4%
WA Dept. of Fish and Wildlife	2%
Bureau of Land Management	2%
U.S. Fish and Wildlife	<1%
Public school district	<1%

The City of Entiat lies north and west of the confluence of the Entiat and Columbia Rivers. The City is bisected by Washington State Route 97 Alternate and is located roughly midway between Wenatchee and Chelan. The city covers approximately 2 square miles that are situated in a long narrow alignment, running parallel to the Columbia River for nearly 3 miles. The city has experienced rapid growth over recent years, with numerous new housing areas under development.

Vegetation within the city limits consist mostly of grasses and shrubs. The more level sites have been developed into irrigated crop land (orchards).

Fuel types are primarily overstocked, mixed conifer types with some openings along the arid south slopes. Heavy riparian vegetation exists along streams. Multiple fires have burned through this Zone in the recent past leaving behind numerous snags and opening the canopy allowing for dense undergrowth to occur.

The primary stream flowing through the area is the Entiat River. It flows 43 miles in a southeasterly direction from near the head of the Entiat Valley to its confluence with the Columbia River near the City of Entiat. The highest elevation in the planning area is the 9,249-foot summit of Mt. Fernow. The lowest elevation occurs at the Entiat River's mouth, at approximately 713 feet. Precipitation varies from 90 inches in the Alpine ecosystems to 10 inches in the shrub-steppe.

Wildfire Potential

The steep grass and brush slopes along the breaks to the Columbia River are conducive to fast wind driven fires that can be an immediate threat to homes and improvements in the area. The mid to lower Entiat Valley once had most of the properties protected by a buffer of agricultural land. This buffer, which was primarily orchards, has quickly diminished in recent years with many homes built up against the steep hillsides. The mid to upper reaches of the Entiat Valley and the area of Navarre Coulee have a direct impact from timber adjacent to many home sites and improvements. Insect infestations, in the upper Entiat Valley areas, are causing large expanses of dead and dying trees that are adding to the fuel load. All these variables provide a continuous fuel profile that can result in large intense wildfire. Weather, topography and fuels interact to

create a recent history of large fires that move rapidly and with great intensity across the landscape. These recent fires are likely to be outside the range of normal intensity in the "typical disturbance regimes". However, large fast-moving fires, with lower intensity, have always occurred in the Entiat Valley. **Figure 29** shows the fire behavior class found within Zone F of Chelan County.

Across the landscape, areas of grass, brush, densely stocked trees, and dead fuels contribute to the landscape vegetation pattern, when mixed with steep slopes that is conducive to rapid rates of spread and large stand replacing wildfires when weather conditions are extreme.

Grass and sedge dominated meadows would allow fire spread to be carried by the fine herbaceous fuels that have cured. Shrub-dominated meadows would allow fire to be carried by litter cast and other fine fuels associated with this type. These sites likely burn infrequently due to their mesic nature and would burn with low intensity because of the lack of heavy (100 hour) fuels.

The timber litter and timber understory fuel models will have low to moderate fire activity under average summer weather conditions. These fuel models would include the lodgepole pine/mixed conifer stands at the lower elevations and the Mountain hemlock (*Tsuga mertensiana)*, Subalpine-fir (*Abies lasiocarpa)*, Whitebark pine (*Pinus albicaulis)* and Western larch (*Larix occidentalis*) found at the higher elevations.

Wildfire Hazard Assessment

- **35%** of the Zone could experience very high to extreme fire behavior (fire transitioning from the surface into treetops, spreading from treetop to tree, and/or emitting prolific embers).
- This Zone has a **high** to the **highest** likelihood of wildfire (relative burn probability) relative to the rest of Washington State.
- **7% of homes** in the Zone could be exposed to radiant heat from burning vegetation.
- **82% of homes** in the Zone could be exposed to embers from burning vegetation.
- This Zone has a **high** potential for structure-to-structure fire spread due to the high number of closely spaced structures.
- **20% of roads** in the Zone have potentially non-survivable conditions.

Ingress-Egress

Washington State Highway 97A is the primary artery providing access through the eastern section of the planning area. This highway is a major north/south travel route and a high-speed two-lane highway that travels along the edge of the Columbia River. Many neighborhoods are served by a single access route providing residents with only one way in and one way out. Evacuation and defense of such areas have been and will be in the future difficult in the event of fast-moving wildfire.

Infrastructure

The City of Entiat is served by a domestic water and sewage system. Most of the other residents in the Zone are served by private wells and septic systems. Power service is distributed via a mix of overhead and underground lines, provided by the Chelan County Public Utility District.

There are a few bridges in Zone F of Chelan County, and most can accommodate firefighting apparatus. Some bridge load rating signs are not in place for the existing bridges and could pose a limitation to access for firefighting equipment.

Fire Protection

Chelan County Fire District 8 provides fire protection for private lands inside their district boundaries and the City of Entiat. They are responsible for providing initial attack response on state and federal lands within their district boundary and aid through reciprocal agreement to adjacent state and federal lands. The Washington State Department of Natural Resources and United States Forest Service (Entiat Ranger District) are the primary agencies responsible for management of wildland fires on public lands in the Entiat Valley CWPP area. The Washington State Department of Natural Resources has overlapping jurisdictional responsibility for fire protection on timber-lands in the fire district. Cooperative agreements are maintained with the Department of Natural Resources and the U.S. Forest Service whereby resources are utilized and shared between the different jurisdictions. Washington State Department of Fish and Wildlife and Chelan County P.U.D. provide no fire protection on their lands. An agreement is in place with Chelan County Fire District 8 for protection of P.U.D. developed property.

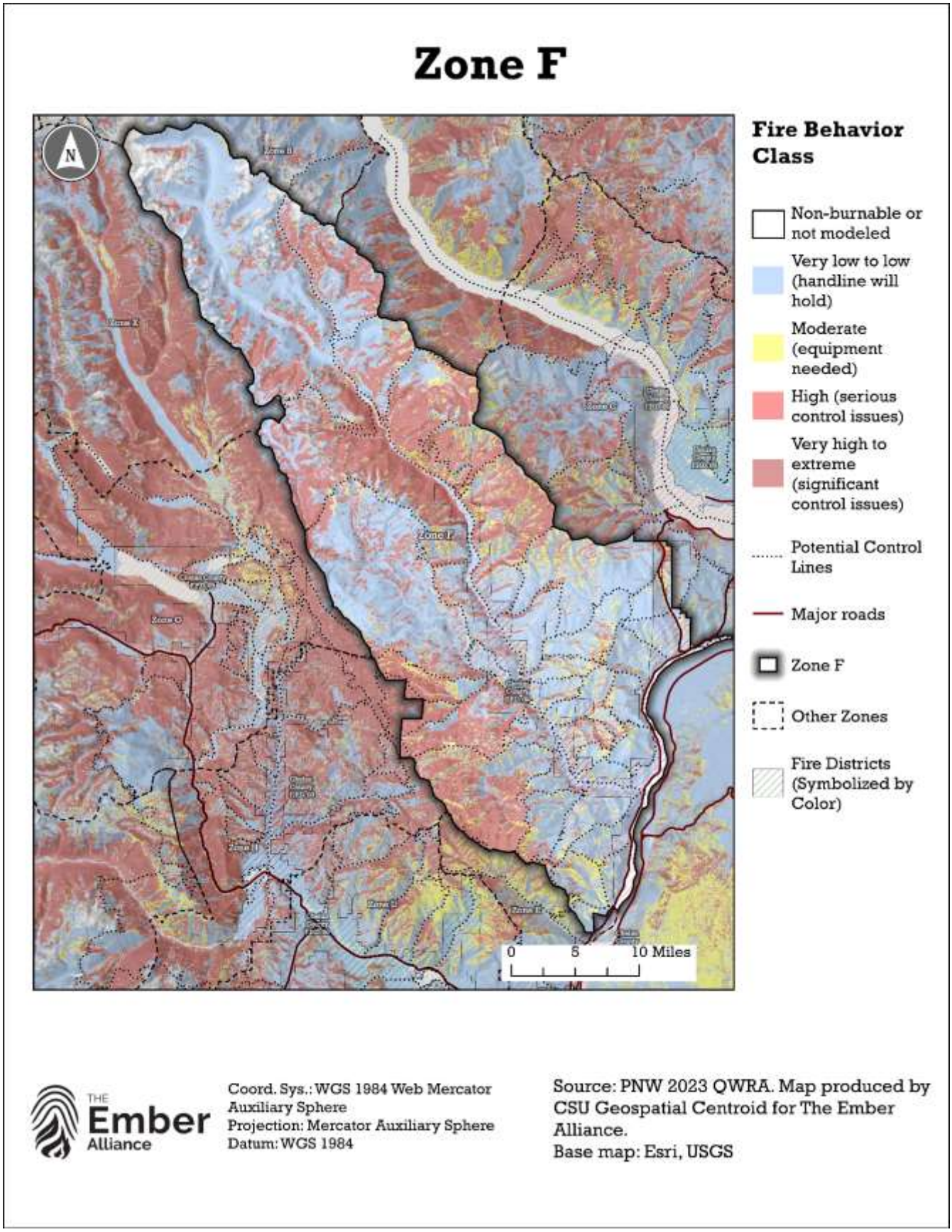


***Figure 29**. Fire behavior class within Zone F of Chelan County. Source: PNW 2023 QWRA.*

12.g. Zone G – Lake Wenatchee

Zone G is located at the west central portion of the County and encompasses approximately 177,761 acres. Zone G includes areas within Chelan County Lake Wenatchee Fire & Rescue (LWFR), as well as several unincorporated communities, adjacent private, state and federal forestlands. Lake Wenatchee Fire and Rescue provides the primary fire protection for residents in this Zone.

Zone G primarily encompasses very steep slopes and mid elevations. However, the western portion of this Zone does experience higher elevations. Dominant vegetation includes mixed conifer and open pine forests. Primary land use in Zone G consists of forest land, limited agriculture, recreational areas (golf course, campgrounds and State Park), and rural residential. There are over 3,600 structures in the Zone, many of which occur intermixed with wildland fuels.

Zone G Parcel Summary.

#of Structures	# of Parcels	# of Parcels in Fire District	# Parcels Not in Fire District
2,507	4,908	4,771	137

Zone G Wilderness Summary.

Non-Wilderness	Alpine Lakes, Glacier Peak and Henry M. Jackson Wilderness
84%	16%

Zone G Ownership Summary.

Owner	Percent
US Forest Service	83%
Private	15%
WA Dept. of Natural Resources	1%
WA State Parks and Rec.	<1%
WA Dept. of Fish and Wildlife	<1%

Residential development is largely rural in nature and density varies with topography and proximity to the lake and other scenic areas. Several properties remain undeveloped. Many residences are second homes that are seasonally or intermittently occupied. In some cases, the homes are very large, but neighbor much smaller recreational cabins. The area is a popular recreation destination, particularly during the summer and winter months. Lake Wenatchee State Park is also located within the Zone.

Zone G varies in elevation from 4056' in the upper reaches of the Nason Creek watershed near Stevens Pass to 1680' at the upper end of Tumwater Canyon. The annual precipitation at the lower end of Lake Wenatchee is approximately 28-30 inches/year and increases to 60 inches/year near the Cascade Crest to the north and west (most in the form of snow). This range of precipitation combined with elevation provides a broad spectrum of forest and vegetation communities.

Currently, the primary vegetation type for the Lake Wenatchee/Plain Area is overstocked ponderosa pine forest with large amounts of Douglas-fir regeneration and intrusions of grand fir. Ponderosa pine is a shade intolerant species naturally adapted to survive in areas that experience fire on a regular basis. This frequent fire regime with a fire interval every 2-20 years was standard for the entire lower Wenatchee River valley. North aspect slopes may act as fire refugia and not experience fire on the same interval.

Wildfire Potential

Dense, overstocked stands of trees are increasing the fire hazard in the Lake Wenatchee/Plain Area CWPP. Many stands of ponderosa pine are dominated by trees less than 18 inches in diameter. Numerous dense pockets of standing and dead fallen trees have been/or are being affected by low level (~0.3 to 4.5 trees/acre) infestation by mountain pine beetle and/or fir engraver (WDNR GIS; see previous Vegetation map) and root

rot (disease). Stands often have contiguous crowns and ladder fuels in the form of young conifers and tall brush species. These variables provide a continuous fuel profile which can create conditions for an intense and fast-moving fire. See **Figure 30** for fire behavior class of Zone G within Chelan County.

Since 1970, over 557 fires have occurred within the Lake Wenatchee/Plain CWPP area. Fires are started naturally by lightning in the planning area nearly annually and are typically concentrated along ridge tops though random strikes may occur anywhere. In addition, human-caused fire starts are also occurring (and increasing with increased development and recreational use) because of other activities, such as dispersed and motorized recreation and debris burning. The Wenatchee River drainage, particularly in the Natapoc area, has seen a very high number of ignitions along the Burlington Northern-Santa Fe Railroad tracks in the past, but that concentration has diminished somewhat with new maintenance practices employed by the railroad. Conditions are still conducive for a large, high severity fire, particularly in the Chiwawa drainage where spruce budworm (a conifer defoliator) activity has expanded from a few acres in 2001 to nearly 70,000 acres.

Weather, topography, and fuels affect wildfire behavior. The Lake Wenatchee/Plain Area, like other areas of Chelan County, is prone to severe weather conditions (hot, dry, and windy) in late summer that can support extreme fire behavior. The terrain is an extremely important aspect of expected fire behavior in this area.

Remote access weather stations (RAWS) in the area show measurable wind gusts 75% of all days in the year. Historical fire activity has reflected typical wind driven fire behavior. When winds align with slope, extreme fire activity can occur. Insect infestations of western pine beetle and/or fir engraver beetle are becoming more prevalent as are root rot pathogens which kill patches of all ages of trees providing jackpots of fuel.

Areas in the mid to lower portions of the Nason, White, and Little Wenatchee River drainages may not experience fire as often, but the density and stratification of fuels is such that an initially small fire could grow quickly to a large high intensity fire with potential for spotting well ahead of the main fire front. Focused treatments around homes and other improvements to maximize defensible space, incorporating fire resistant building materials, thinning, and easily negotiable emergency access are critical to the protection of these homes and minimize the potential for fatalities of residents and firefighters.

Wildfire Hazard Assessment

- **61%** of the Zone could experience very high to extreme fire behavior (fire transitioning from the surface into treetops, spreading from treetop to tree, and/or emitting prolific embers).
- This Zone has the **highest** likelihood of wildfire (relative burn probability) relative to the rest of Washington State.
- **27% of homes** in the Zone could be exposed to radiant heat from burning vegetation.
- **100% of homes** in the Zone could be exposed to embers from burning vegetation.
- This Zone has a **high** potential for structure-to-structure fire spread due to the high number of closely spaced structures.
- **37% of roads** in the Zone have potentially non-survivable conditions.

Ingress-Egress

Highway 2, Lake Wenatchee Highway (highway 207), and the Beaver Valley Road provide the main access roads in and through the planning area. The Chiwawa and White River roads are one way in and one way out roads. Most of these roads are too narrow for fire protection vehicles to easily access and maneuver in.

There is only one access road in and out of the Ponderosa area that is designated as an emergency evacuation route. This is the County Camp 12 Road – a narrow double lane, paved road from Plain through the Ponderosa subdivision, then a one-lane, private, primitive road through the Standing Rock development, which then becomes virtually impassible beyond. This road passes through dense timber with forest canopy overhanging the road. It would not be considered a fire or fuel break. A one-way loop road provides access to a portion of the Ponderosa subdivision, but the remaining roads are narrow with approximately 12 dead-end streets with minimal room for a fire apparatus.

Infrastructure

There are several main roads that serve as designated emergency evacuation routes including Beaver Valley Road (old Highway 209), State Route 207, Lake Wenatchee Hwy, Highway 2, River Road, etc. However, several of the roads that access canyons or valleys are dead end roads. Not all roads in the planning area are paved or in suitable condition for fire equipment. Therefore, road access has been identified as a concern. There are numerous bridges in Zone G of Chelan County, and most can accommodate firefighting apparatus. Bridge load rating signs are not in place for the existing bridges and could pose a limitation to access for firefighting equipment.

There is a mixture of overhead and underground power service and multiple private water purveyors serving Zone G. Chelan County PUD operates a water treatment facility serving the Lake Wenatchee community. In addition, the PUD has 3 substations and multiple transmission lines throughout the area. Major transmission lines serving the Seattle area run across Zone G.

Burlington Northern Santa Fe Railroad operates approximately 40 miles of intercontinental rails through Zone G including the longest tunnel in the United States at the Cascade Crest. Approximately 30 trains pass through Zone G daily.

Fire Protection

Lake Wenatchee Fire & Rescue is responsible for protection of private property in the area surrounding the communities in the Lake Wenatchee and Plain area. The WDNR is the primary agency responsible for fire protection on forested private and state lands while the USFS is the primary agency responsible for management of fires on federal land. Lake Wenatchee Fire and Rescue often provides the Initial Attack on Public Lands due to the distance from, and availability of, DNR and USFS firefighting forces. Areas outside the boundaries of LWFR are not guaranteed fire response from the district. DNR will respond to forest fires; however, they do not have responsibility for structures. The district maintains mutual aid agreements with WDNR and fire districts within Chelan and Douglas Counties.

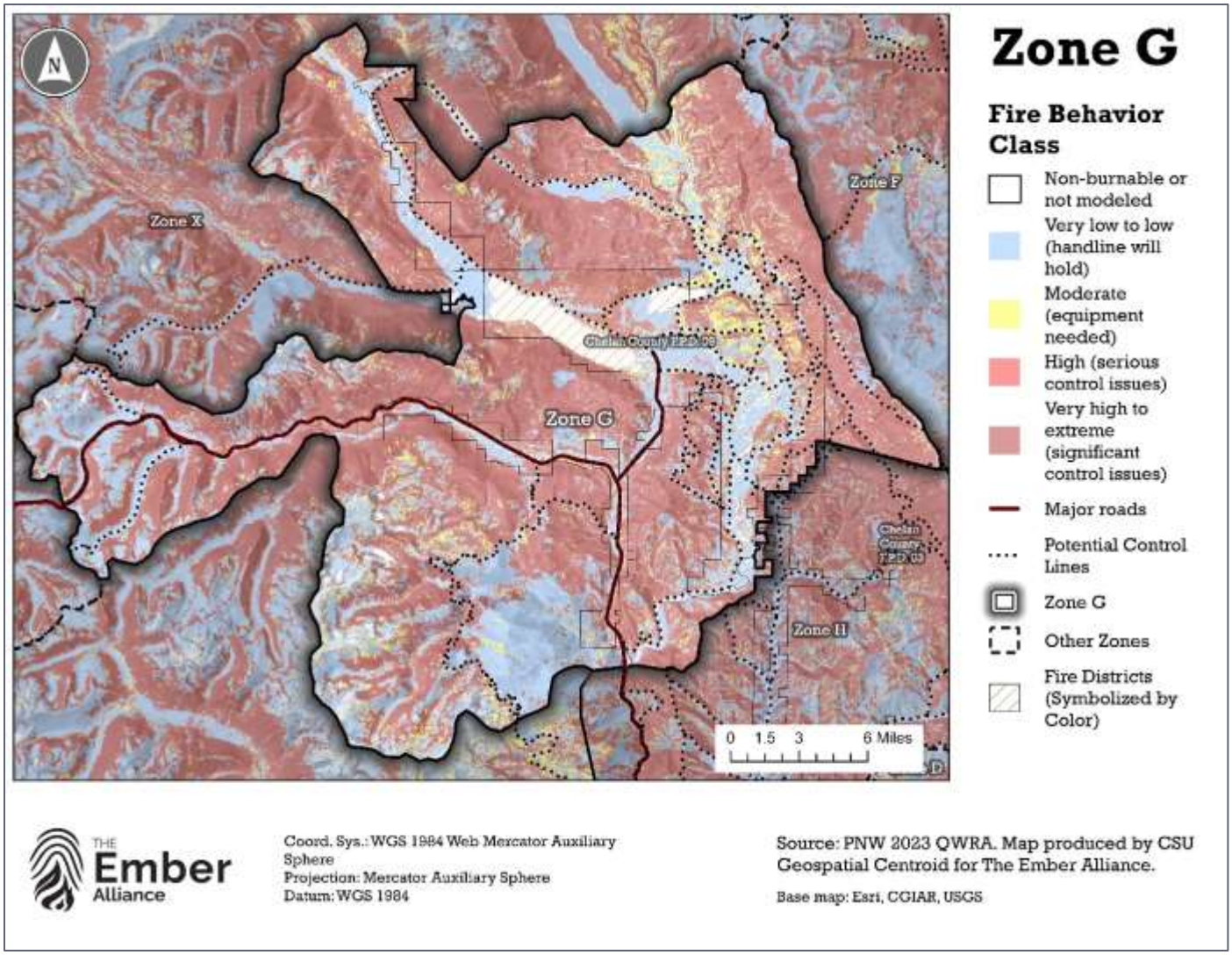


***Figure 30**. Fire behavior class within Zone G of Chelan County. Source: PNW 2023 QWRA.*

12.h. Zone H – Leavenworth & Chumstick

Zone H is located at the southern portion of the County and encompasses approximately 92,953 acres. Zone H includes the City of Leavenworth, Chumstick watershed and surrounding area. Also located in the Zone are the Leavenworth National Fish Hatchery and the Icicle and Cascade Orchards irrigation diversion head works and canals. Chelan County Fire District #3 provides the primary fire protection for residents in this Zone.

Dominant vegetation includes mixed conifer and open pine forests. Residential development is largely rural in nature and density varies with topography and proximity to the lake and other scenic areas. The homes in this Zone are valued at several hundred million. Many residents live in tightly spaced older homes. In some cases, the homes are very large (>2,000 sq. ft.) and interface with both agricultural areas as well grass and forest environments. The area is a very popular recreation destination, particularly during the summer and winter months.

Zone H Parcel Summary.

#of Structures	# of Parcels	# of Parcels in Fire District	# Parcels Not in Fire District
3,664	4,404	4,345	59

Zone H Wilderness Summary.

Non-Wilderness	Alpine Lakes Wilderness
89%	11%

Zone H Ownership Summary.

Owner	Percent
US Forest Service	64%
Private	32%
WA Dept. of Natural Resources	3%
U.S. Fish and Wildlife	1%
WA Dept. of Fish and Wildlife	<1%
Chelan County	<1%
Public school district	<1%

Currently, the primary vegetation type for the area covered by Zone H is overstocked Ponderosa pine forest with large amounts of Douglas-fir regeneration and intrusions of Grand fir. Ponderosa pine is a shade intolerant species naturally adapted to survive in areas that experience fire on a regular basis. This frequent fire regime with a fire return interval of 2-20 years was standard for the entire lower Wenatchee River valley, however north aspects may act as fire refugia and not experience fire on the same interval.

Wildfire Potential

Many stands of ponderosa pine are dominated by trees less than 18 inches in diameter. Pockets of trees are being affected by low level (~0.3 to 4.5 trees/acre) infestation by mountain pine beetle and/or fir engraver (WDNR GIS; see previous Vegetation map) and root rot (disease) is also a problem. Stands often have contiguous crowns and ladder fuels in the form of young conifers and tall brush species. All these variables provide a continuous fuel profile which can create conditions for an intense and fast-moving fire. See **Figure 31** for fire behavior class of Zone H of Chelan County.

Since 1970, over two hundred fires have occurred within the Leavenworth area. In addition, human caused fire starts are also occurring (and increasing) because of other activities, such as recreation (campfires) and debris burning. The Chumstick Valley has seen a very high number of ignitions along the Burlington Northern-Santa Fe Railroad tracks in the past but that concentration has diminished somewhat with new maintenance practices employed by the railroad.

Weather, topography, and fuels affect wildfire behavior. Zone H, like other areas of Chelan County, is prone to severe weather conditions in late summer that can support extreme fire behavior. The terrain is an extremely important aspect of expected fire behavior in this area. Chumstick Creek runs generally north and south but has varied topographic conditions and side drainages that funnel the winds across the Chumstick Creek watershed where the velocity increases as air is forced into the confined area.

The landscape has many valleys with steep slopes and dense stands dominated by ponderosa pine and thickets of Douglas-fir, with the largest trees primarily less than 18 inches in diameter. Stands in the area are dense and continuous, a perfect setting for large, lethal wildfire. Many stands have closed canopies and abundant ladder fuels. Continuous, tall underbrush also predominates. Insect infestations of western pine beetle and/or fir engraver beetle are becoming more prevalent.

Fire may move rapidly through these common areas with the potential for spotting highest in the adjacent forested areas and could be difficult to manage if wind is a factor. These brush and dense forest fuel types could produce fast moving fires especially in areas of steep slopes or with sustained winds. The threat would soon be in all areas of the communities with fire potential to involve all adjacent structures.

Wildfire Hazard Assessment

- **58%** of the Zone could experience very high to extreme fire behavior (fire transitioning from the surface into treetops, spreading from treetop to tree, and/or emitting prolific embers).
- This Zone has the **highest** likelihood of wildfire (relative burn probability) relative to the rest of Washington State.
- **9% of homes** in the Zone could be exposed to radiant heat from burning vegetation.
- **100% of homes** in the Zone could be exposed to embers from burning vegetation.
- This Zone has an **extreme** potential for structure-to-structure fire spread due to the extremely high number of closely spaced structures.
- **12% of roads** in the Zone have potentially non-survivable conditions.

Ingress-Egress

There are several main roads that serve as designated emergency evacuation routes including Chumstick Highway, North Road, Highway 2, Ski Hill Drive, Mountain Home Road and Icicle Road. However, several of the roads that access canyons or valleys are dead end roads. Not all roads in the planning area are paved or in suitable condition for fire equipment. Therefore, road access has been identified as a concern.

Chumstick Highway is the main artery to the areas of the Chumstick Valley (including all canyons off the main Chumstick). Icicle Road provides the main access for the Icicle Valley, and North Road and Mountain Home Road provide the main access for those areas.

Infrastructure

Infrastructure consists of overhead and underground power service, irrigation systems and a public domestic water system that serves part of the Icicle Valley. “The City of Leavenworth’s water system consists of two

pressure zones, one booster station, three wells adjacent to the Wenatchee River, one surface water treatment plant drawing from Icicle Creek, two reservoirs, and a 23 mile network of distribution mains(*Water – City of Leavenworth*, n.d.)."

The Burlington Northern-Santa Fe Railroad runs through the majority of the Chumstick valley. This has been a source of frequent small fires. Recent means of mitigating for these small fires is in the form of bulldozing a "fire line" parallel to the tracks to bare earth.

Fire Protection

Chelan County Fire District #3 is responsible for protection of private property in the area surrounding the community of Leavenworth. The City of Leavenworth was annexed into Fire District #3 by public vote in 2012. The WDNR is the primary agency responsible for fire protection on forested private and state lands while the USFS is the primary agency responsible for management of fires on federal land. Areas outside the boundaries of the Fire Protection District #3 are not guaranteed fire response from the district. DNR will respond to forest fires however they do not have responsibility for structures. The district maintains mutual aid agreements with WDNR and all fire districts within Chelan and Douglas Counties.

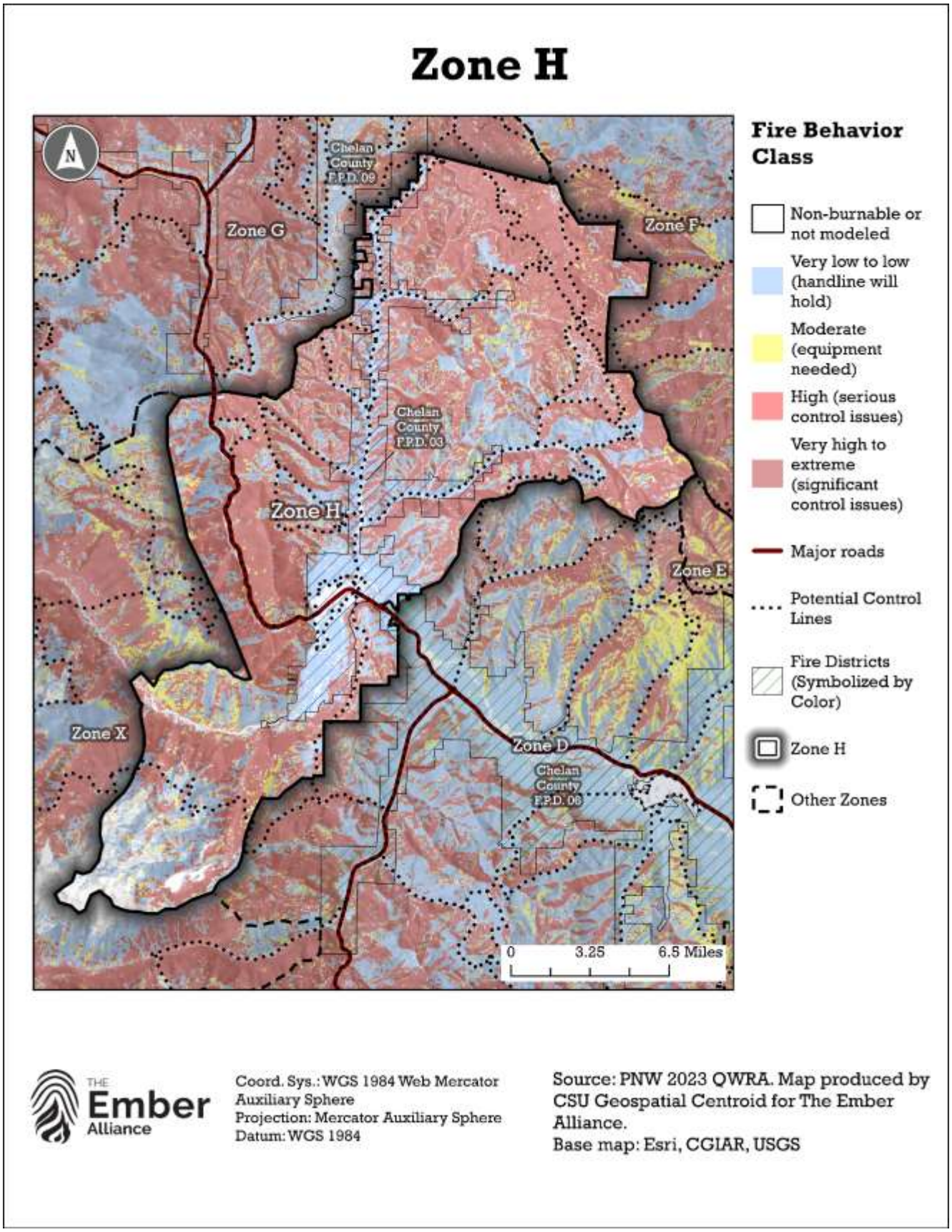


***Figure 31**. Fire behavior class with Zone H of Chelan County. Source: PNW 2023 QWRA.*

12.i. Zone X – State & Federal Lands

Zone X is largely located along the most remote western portions of the County. It is approximately 691,706 acres and includes much of the publicly owned land in the County. The Zone is bounded by the Snohomish and King Counties to the west, Okanogan County to the north, and Kittitas County to the south.

Most of the structures located in this Zone are likely facilities associated with campgrounds and other recreation sites. However, if residences do occur, it would be expected that private lots and other areas within this Zone are stocked with, or within proximity to, heavy fuels.

Fuel types are primarily high elevation, mixed conifer types with some openings along the arid south slopes. Heavy riparian vegetation exists along streams.

Zone X Parcel Summary.

#of Structures	# of Parcels	# of Parcels in Fire District	# Parcels Not in Fire District
61	584	99	485

Zone X Wilderness Summary.

Wilderness Area	Percent
Non-Wilderness	42%
Alpine Lakes Wilderness	20%
Glacier Peaks Wilderness	27%
Lake Chelan-Sawtooth Wilderness	8%
Henry M. Jackson Wilderness	<4%

Zone X Ownership Summary.

Owner	Percent
US Forest Service	88%
National Park Service	12%
Private	<1%
WA Dept. of Natural Resources	<1%
WA Dept. of Fish and Wildlife	<1%

Wildfire Potential

The eastside Douglas fir cover type that occurs throughout the Zone is the most xeric type on the North Cascades Complex and is comparable to the dry Douglas fir mixed conifer of the Rocky Mountains. It is best characterized where stand replacing events occur infrequently (approximately every 100 years) and low severity fires occur more frequently. Figure 32 shows the fire behavior class within Zone X of Chelan County.

Grass and sedge dominated meadows would allow fire spread to be carried by the fine herbaceous fuels that have cured. Shrub-dominated meadows would allow for fire to be carried by litter cast and other fine fuels associated with this type. These sites likely burn infrequently due to their mesic nature and would burn with low intensity because of the lack of heavy (100 hour) fuels.

Wildfire Hazard Assessment

- **51%** of the Zone could experience very high to extreme fire behavior (fire transitioning from the surface into treetops, spreading from treetop to tree, and/or emitting prolific embers).
- This Zone has a **moderate** to the **highest** likelihood of wildfire (relative burn probability) relative to the rest of Washington State.
- **75% of homes** in the Zone could be exposed to radiant heat from burning vegetation.
- **100% of homes** in the Zone could be exposed to embers from burning vegetation.
- This Zone has a **low** potential for structure-to-structure fire spread due to the low number of closely spaced structures.
- **48% of roads** in the Zone have potentially non-survivable conditions.

Ingress-Egress

There are numerous roads (Forest, County, private and state) that access this, Zone. Some provide primary or secondary evacuation routes for residents and visitors during a wildland fire. There is also a vast network of foot trails that can be used to reroute the many hikers that visit Chelan County every summer.

Infrastructure

There are numerous bridges in Zone X of Chelan County, and some can accommodate firefighting apparatus. Many bridges do not have posted load rating signs which could pose a limitation to access for firefighting equipment. Roads and bridges in this Zone are also subject to being washed out every spring if rapid snowmelt occurs.

Power is provided by overhead power lines with only a few overhead connections to structures. Water resources are obtained from private wells, spring fed or other local water sources.

Fire Protection

The NPS has protection responsibility for land within Lake Chelan Recreation Area and North Cascades national Park, while the USFS has responsibility for land under their ownership. The WDNR is the primary agency responsible for fire protection on forested private and state lands while the USFS is the primary agency responsible for management of fires on federal land. DNR will respond to forest fires; however, they do not have responsibility for structures.

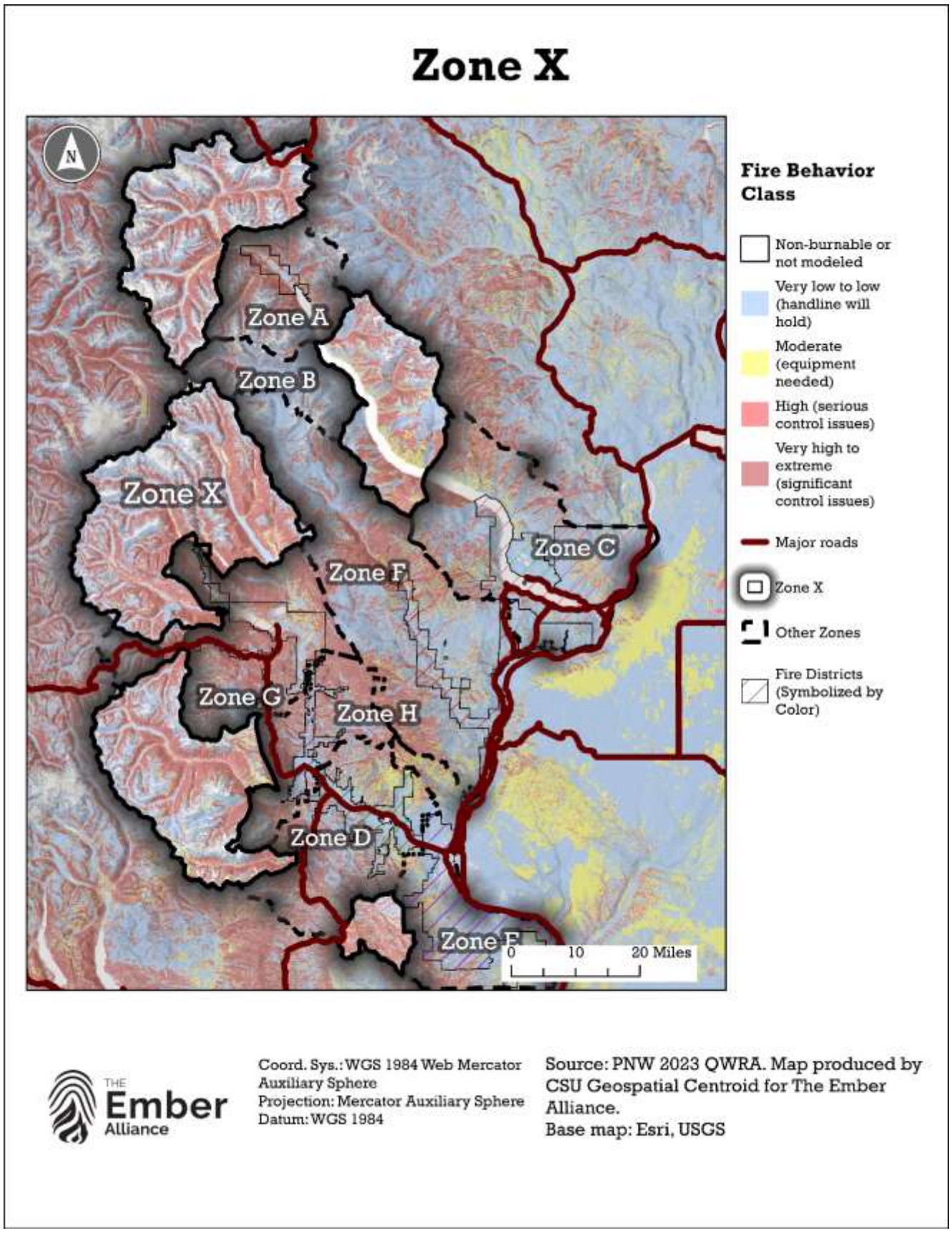


***Figure 32**. Fire behavior class of Zone X within Chelan County. Source: PNW 2023 QWRA.*

13. Mitigation Recommendations

13.a. Background

Critical to implementation of this Community Wildfire Protection Plan are the identification and implementation of an integrated schedule of action items targeted at achieving a reduction in the number of human-caused fires and the impact of wildland fires in Chelan County. This section of the plan identifies and prioritizes potential mitigation actions, including treatments that can be implemented in the county to pursue that goal. As there are many land management agencies and thousands of private landowners in Chelan County, it is reasonable to expect that differing schedules of adoption will be made, and varying degrees of compliance will be observed across various ownerships. A public survey for Chelan County in 2024 showed that the largest barrier to people reducing wildfire risk on their own property was needing help doing the mitigation (Figure 33).

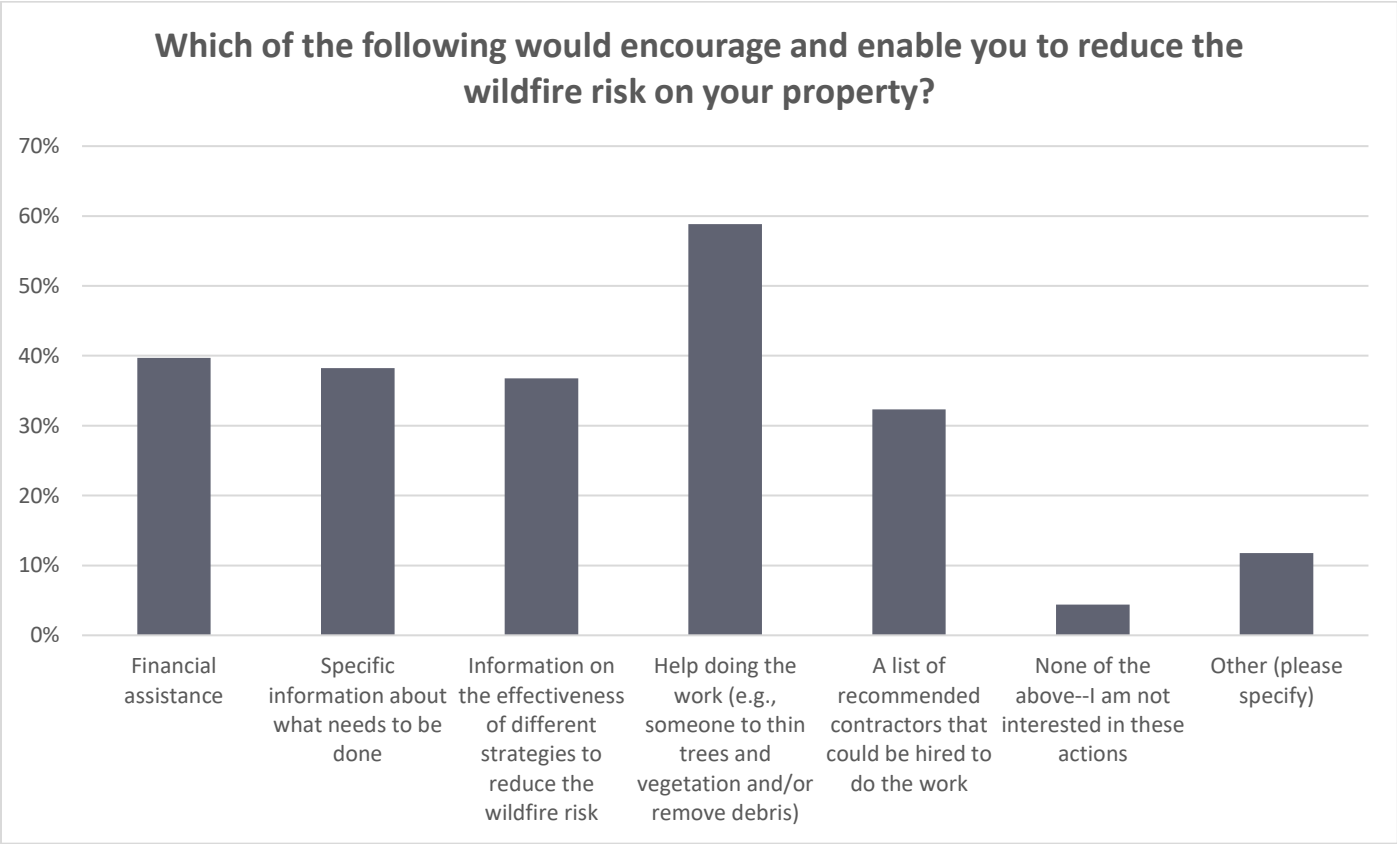


***Figure 33**. Public needs for wildfire risk reduction. Source: Chelan Public Survey by Perteet in 2024 (n=74).*

The land management agencies in Chelan County, including the Washington Department of Natural Resources and BLM, are participants in the planning process and have contributed to this plan's development. Where available, their schedule of land treatments has been considered in the planning process to improve the correlation between their identified planning efforts and the efforts of planning partners and private residents in Chelan County.

Chelan County encourages the building of disaster-resilience structures in normal day-to-day operations. By implementing a plan to build with existing programs and resources, the cost of mitigation is often a small portion of the overall cost of a project's implementation.

Some risk assessments were based on 2023 Pacific Northwest Quantitative Wildfire Risk Assessment (PNW QWRA) data as well as 2022 data collected by WiRé and community participation. Therefore, the recommendations in this section have been made with those assessments in mind. However, the components of risk and the preparedness of the county's resources are not static. It will be necessary to fine-tune this plan's recommendations regularly to adjust for changes in the components of risk, population density changes, infrastructure modifications, and other factors.

13.b. Recommendations for Residents

A commitment to monitoring changes in resources will improve learning and, through adaptive management, increase the success of wildfire mitigation activities. Lessons learned from self-evaluation can be shared with larger companies and inform changes to correct for ineffective management prescriptions, respond to changes in resource conditions, guide new science and research needs. Without careful monitoring and evaluation of management efforts we cannot be certain we are achieving desired outcomes.

PRIORITATIZATION OF MITIGATION ACTIVITIES

During catastrophic wildfires, property loss happens mostly due to conditions in the home ignition zone (HIZ) and a lack of defensible space around structures. The HIZ includes your home and other structures (e.g., sheds and garages), and the area within 100 feet of each structure extending out to 200 feet on steep slopes (Figure 34). Firefighter intervention, adequate defensible space, and home hardening measures are common factors for homes that stand strong during major wildfires (IIBHS, 2019; Maranghides et al., 2022).

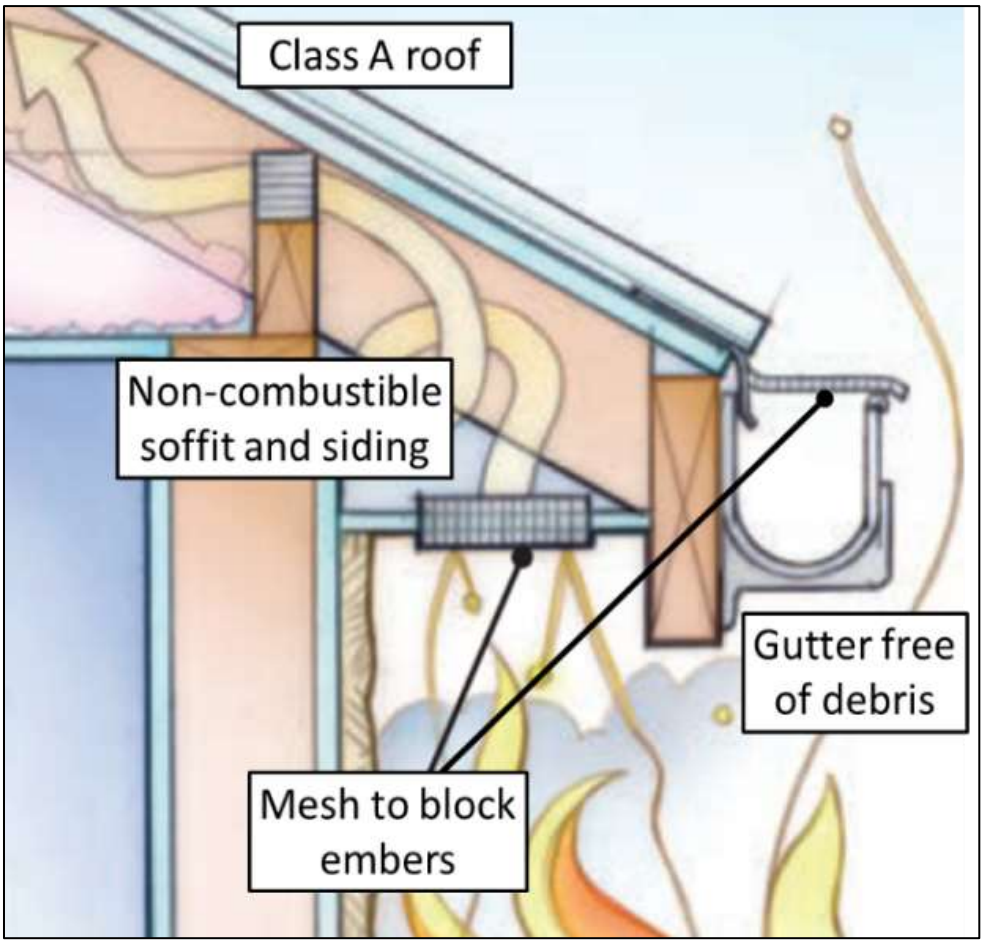
If you are a home- or property- owner with long- or short-term renters, the responsibility to mitigate the HIZ is yours and recommendations in this section apply to you.

BE EMBER AWARE

Over 90% of structures lost during wildfire are lost due to an ember falling somewhere on or near the structure. Embers can regularly travel over a mile, and during the Sleepy Hollow Fire of 2015 embers were igniting structures over 5 miles away from the wildfire. Understanding the role of embers play in igniting homes during wildfire is critical to consider when implementing defensible space and home hardening mitigation strategies. Free home ignition zone assessments are available through your local fire district or Cascadia Conservation District.

Roofs, siding, decks, vents, and gutters are particularly vulnerable to embers from wildfire, and actions that prevent embers from penetrating your home can offer additional benefits such as reduced maintenance costs, greater durability, and increased energy efficiency:

- **Roofs** should be rated Class A and made of noncombustible materials such as some composites, metal, cement, or tile, which tend to be more durable against wind, snow, and hail as well as wildfire.
- **Siding and decking** should be made of ignition-resistant or noncombustible materials, which is particularly effective when homes also have a 5-foot noncombustible border of dirt, stone, or gravel around them. Non-wood siding and decking, such as stucco, brick, metal, and some composites, are often more durable and require less routine maintenance than traditional wood.
- **Enclosed eaves and vent screens** reduce the penetration of wind-born embers into structures and can deter pests and critters from nesting in your home's vents and eves. Enclosing your eaves and screening your vents are relatively low-cost action that can help protect your home.



Residents can increase their homes' chance of survival by making it harder for embers to enter and ignite their homes (image from Healthy Building Science).

DEFENSIBLE SPACE

Defensible space is the area around a building where vegetation, debris, and other types of combustible fuels have been treated, cleared, or removed to slow the spread of fire and reduce the structure's exposure to embers, radiant heat and direct flame. Homeowners who create and maintain adequate defensible space give their homes a better chance to survive during a wildfire event even when firefighting resources are limited.

> *Do not count on firefighters staying to defend your home —your home should be able to stand strong on its own during a wildfire. There are never enough firefighters to stay and defend every single home during large incidents. Properties that are not defensible will often not receive firefighter resources due to unsafe conditions and have a higher likelihood of home loss regardless of firefighter intervention.*

HOME HARDENING

Home hardening is the practice of making a home less likely to ignite from embers, radiant heat, and/or direct contact with flames. It is important to remember that even when the flaming front of a wildfire is far away, the embers (not the flames) are what ignite 50 to 90% of the homes lost in wildfires (Gropp, 2019; Holstrom et al., 2023; Johnston, 2018). Home hardening involves reducing this risk by changing building materials, installation techniques, structural characteristics, and routine maintenance of a home. Home hardening measures are particularly important for anywhere that could be exposed to embers.

It is important for residents to work together as a community to mitigate shared wildfire risk in the HIZ. Structure-to-structure ignition is a major concern in high-density WUI neighborhoods and can cause substantial property loss. Neighbors can work together to increase their homes' chances of survival during wildfire by reducing hazards in their overlapping defensible space. Fortunately, many residents in Chelan County have already started taking actions to mitigate their home ignition zone.

Defensible space is divided into three zones around a home or other structure, and recommended practices vary among zones. WA DNR Wildfire Ready Neighbors and NFPA Firewise USA® define the immediate zone as 0 to 5 feet from the home, the intermediate zone as 5 to 30 feet from the home, and the extended zone as 30 to 100 feet from the home (Figure 34). **It is important to acknowledge these distances are specific for flat ground. Aggressive topography can double the distance of each zone.**

Property owners should establish defensible space around each building on their property, including campers/RVs, detached garages, storage buildings, barns, and other structures. RVs are highly flammable and can emit embers that might ignite nearby homes and vegetation. Removing all vegetation under and around campers in the Immediate zone is crucial. Campers/RVs, boats, detached garages, storage buildings, barns,

and other large structures should be placed at least 50 feet away from primary structures to prevent structure-to-structure fire spread (Maranghides et al., 2022).

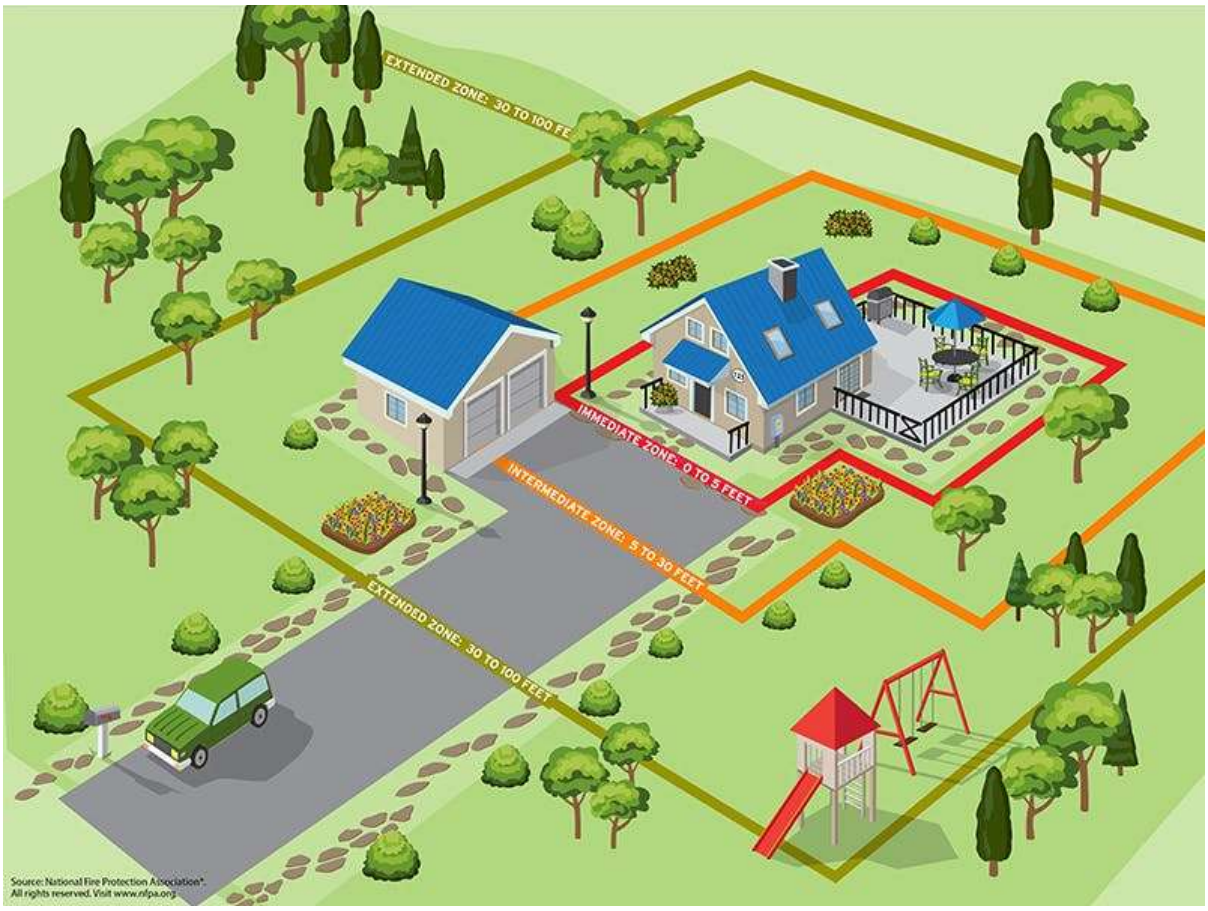


Figure 34: *Home ignition zone (HIZ) and immediate, intermediate, and extended zone recommendations. Using ignition-resistant building materials and removing burnable fuel around primary structures, outbuildings, and campers/RVs is crucial for increasing your home's chance of standing strong during a wildfire and creating safe conditions for wildland firefighters. Source: National Fire Prevention Association (NFPA).*

13.c. General Mitigation Strategies

Homeowners living in the WUI typically underestimated the level of risk their home has due to wildfire and tended to overestimate the amount of work they have done to protect their property *(Simpkins, 2021*). According a 2022 WiRé study conducted in Chelan County, "Three quarters of survey respondents (75%) reported having evacuation plans for the people in their household. Of the survey respondents with pets, 78% had a plan for their pets (*2022 WiRé Data*, n.d.)." Refer to the NFPA Firewise USA® program and the WA DNR Wildfire Ready Neighbors program for more specific recommendations.

There are many actions that will help improve safety in a particular area; there are also many mitigation activities that can apply to all residents and all fuel types. The Central Washington Initiative (CWI) has developed a 10-year plan (Figure 20) that proposes fuel reductions throughout much of the County to help reduce ignitions and spread of wildfire. Respondents in the 2022 WiRé survey reported "high levels of mitigation actions they have performed on their properties and around their communities. The three most reported activities were regularly mowing and raking around the residence (97%), reducing vegetation (92%), and regularly clearing roof and gutters (81%). However, fewer respondents (62%) reported hardening their homes, and 25% had met with a wildfire professional to evaluate their home's risk (*2022 WiRé Data*, n.d.)."

General mitigation activities that apply to all of Chelan County are discussed below with County Wide recommendations following area-specific mitigation activities are discussed within the Zone Recommendations.

Prevention. The safest, easiest, and most economical way to mitigate unwanted fires is to stop them before they start. Generally, prevention actions attempt to prevent human-caused fires. Campaigns designed to reduce the number and sources of ignitions can be quite effective and can take many forms.

Limiting Use. The issues associated with debris burning during certain times of the year are difficult to negotiate and enforce. However, there are significant risks associated with the use of fire adjacent to expanses of flammable vegetation under certain scenarios. Fire departments typically observe the State of Washington closed fire season between June 1st to September 30th. This is a statewide regulation and Fire Chiefs and DNR coordinate burn ban timing.

Defensible Space. Residents of Chelan County must be made aware that home defensibility starts with the homeowner. Once a fire has started and is moving toward a structure, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the building. The Firewise Communities USA program is an excellent tool for educating homeowners on the steps to take in order to create an effective defensible space. Residents of Chelan County should be encouraged to work with local fire departments and fire management agencies within the county to complete individual home site evaluations. Home defensibility steps should be enacted based on the results of these evaluations.

Evacuation. Development of community evacuation plans is necessary and critical to ensure an orderly evacuation in the event of a threatening wildland fire. Designation and posting of escape routes would reduce chaos and escape times for fleeing residents. Community safety zones should also be established in the event safe evacuation is impossible and 'sheltering in place' becomes the better option.

Access. Also of vital importance is the accessibility of homes to emergency apparatus. The fate of a home will often be determined by homeowner actions prior to the event. A few simple guidelines such as widening or pruning along driveways and creating a turnaround area for large vehicles, can greatly enhance home survivability.

Facility Maintenance. Recreational facilities near communities or in the surrounding forests such as parks or natural areas should be kept clean and maintained. To mitigate the risk of an escaped campfire, escape-resistant fire rings and barbeque pits should be installed and maintained. In some cases, restricting campfires during dry periods may be necessary. Surface fuel accumulations in nearby forests can also be kept to a minimum by periodically conducting pre-commercial thinning, pruning and limbing, and possibly controlled burns.

Development Standards. County, city, and even fire district policies can be updated or revised to provide for more fire conscious techniques such as using fire resistant construction materials, improving roads, and establishing permanent water resources.

Other Mitigation. Other actions to reduce fire hazards are thinning and pruning timbered areas, creating a fire-resistant buffer along roads and power line corridors, and strictly enforcing fire-use regulations. Ensuring that areas beneath power lines have been cleared of potential high-risk fuels and making sure that the buffer between the surrounding lands is wide enough to adequately protect the poles as well as the lines is imperative.

13.d. Long Term Recovery

Long term recovery from a fire is a continuous effort and many resources are available to the people of Washington. Residents in areas with an elevated risk of post-fire debris-flow should be aware of proactive measures they can take to prepare for post-fire effects, including (1) working with insurance agents to determine their need for flood insurance to the homeowner's policy, (2) elevating and anchoring electrical panels, propane tanks, wiring, appliance, and heating systems, (3) securing important documents in waterproof deposit boxes, (4) ensuring sump pumps are working and have battery-operated backup power sources, (5) installing terraces or slope drains that could protect homes but without altering drainage patterns that could worsen conditions for neighbors, and (6) consulting a forester to discuss pre-fire fuel mitigation options to reduce fire severity and reduce the potential for damaging post-fire sediment delivery and debris flows.

Post-Fire Emergency Response in Chelan County has historically been an informal but effective partnership between USFS, Chelan County Public Works, Cascadia CD, Natural Resources Conservation Service, WA DNR Geologic Survey, Chelan County Emergency Management and the National Weather Service. After large fires the USFS initiates a Burned Area Emergency Response Team (BAER) and notifies the local partners. Post-fire partners engage in the BAER effort as needed and assess the post fire and flooding debris flow risks beyond USFS bounders onto private land. While this effort has been effective for over a decade, resulting in many projects which have reduced risk to life and property, it is not a formalized partnership and would benefit from developing a Memorandum of Agreement between the agencies involved.

The Post Fire Recovery Program of Washington state was created in 2021 with the help of "the Forest Resilience Division at DNR, with an overarching goal of helping communities and watersheds recover from wildfires increasing in size, severity, and long-term impacts felt across Washington.(*Post-Fire Recovery Program | WA - DNR*, n.d.)" The program is a large part of the Washington 10-Year Wildland Fire Strategic Plan, 20-Year Forest Health Strategic Plan, and Forest Action Plan. Funding is intended to support post-fire recovery activities that stabilize and prevent unacceptable degradation to natural and cultural resources and minimize threats to life and property resulting from the effects of a wildfire, as well as long-term efforts to increase the resilience of the landscape and communities against future disturbance. Cascadia Conservation District is a local resource and provides stie visits, technical, and financial assistance to landowners to help them recover their land from wildfire events.

Post-Fire Recovery at a Property Scale

"Post-fire recovery can be extremely challenging for individual property owners and residents. Any scale of loss from wildfire can be emotionally and financially burdensome, be it the loss of a particular feature of a property, a home, or simply the sense of security many expect to experience in their daily lives. Many of the biophysical impacts of fire noted previously in this section may ultimately resolve themselves with time.

"Wait and see" is the common refrain of most land managers in the period immediately after a fire. However, the form of that resolution at times needs to be guided by property owners and land managers to ensure a beneficial result. The Okanogan CD, WA DNR, WDFW, USFS, CTCR, OCLTRG, and other entities can provide post-fire assistance in identifying hazards. Organizations like OCLTRG can assist with recovering the loss of homes and other property, while Okanogan CD, WA DNR, and other agencies are able, when funding is available, to assist in recovering agricultural infrastructure, managing fire-impacted forests and other land management concerns. OCLTRG can assist individuals and businesses with holistic post-fire recovery planning.(*Okanogan County CWPP*, n.d.)"

Other resources include:

- Ongoing collaboration with the Okanogan County Long Term Recovery Group (OCLTRG) to prepare emergency managers to rapidly undertake post-fire emergency response and mitigation measures. Pre-planning can help emergency managers identify points of contact with organizations that need to be involved in post-fire recovery efforts. Pre-planning can also help managers understand tradeoffs of different mitigation approaches (e.g., applying straw mulch, applying seed mixes, and building water barriers) to determine which might be more appropriate in different areas given burn severity, soil texture, topography, values at risk, and available resources. See Robichaud and Ashmun (2013) for a scientific review of the relative effectiveness of different post-fire mitigation measure.
- Work with WSDOT and Chelan County Road Department to improve and maintain culverts, drainage features, and roadways in areas with elevated risk of post-fire sedimentation and debris flows. Proactive measures to improve infrastructure can reduce the potential for severe road damage in the future. After the Fire Washington is also a useful resource for information on how to prepare for and mitigate post-fire impacts.
- United Policyholders (UP) is a non-profit organization that has thirty-plus years of expertise in wildfire recovery and insurance claims. They specialize, state by state, in giving reliable strategies, information and support, experienced guidance and links to reliable professional and government resources (*Insurance Claim and Recovery Help*, n.d.).

13.e. County Wide Recommendations

The action items recommended in this chapter were prioritized through group discussion and community feedback. The action items below are ranked as "High", "Medium", or "Low" priorities for Chelan County as a whole. The CWPP team does not want to restrict funding to only those projects that are high priority because what may be a high priority for a specific community may not be a high priority at the county level. Regardless, the project may be just what the community needs to mitigate disaster. The flexibility to fund a variety of diverse projects based on varying criteria is a necessity for a functional mitigation program at the county and community level.

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Cohesive Strategy Goal: Fire Adapted Communities						
Establish a CWPP Steering Committee	Conduct annual CWPP meeting, commit to annual review of CWPP accomplishments		Annual meetings held and document updated with accomplishments and new ideas	CCD	Locale FDs, DNR, Chelan County, USFS	High
Improve access to wildfire preparedness information and programs to Spanish speaking community	Translate materials and websites, conduct outreach campaigns, participate in education events			CAFE	Chelan PUD	High
Countywide website for preparedness resources	Obtain funding, coordinate partners, hire consultants to develop and maintain the website	Submitted FEMA grant to fund website development	Completed, functional Website	CCD	CWPP Planning Partners	High
Engage in policy making and legislative actions to improve insurance access for residents						High
Improve smoke preparedness and resources for residents	HEPA filter loan program, smoke preparedness education campaign, outreach to farm workers and outdoor laborers			Chelan Douglas Public Health District (CDPHD)	Red Cross, Fire Districts, Schools, NCW Libraries, café, CCD	High
Develop HEPA filter loan or distribution program	Secure funding, develop strategy for identifying high-risk residents and distributing HEPA filters		Filters distributed	CDPHD	American Lung Association, DOE, CAFE, CCD	High
Educate youth on wildfire ecology, defensible space, and smoke preparedness	Utilize existing programs such as "Kids in the Forest" and "Kids in the Snow" to establish additional opportunities to teach students about wildfire ecology in an outdoor setting		Number of students participating	CCD	WVFD, DNR, WSU Master Gardeners, CDPHD, Columbia Breaks	High
Develop programs to incentivize voluntary home hardening retrofits for structures		Chelan PUD's window replacement rebate program	Number of structures improved	CCD	Local FDs, PUD, Chelan County Fire Marshall, CAFE	High
Develop strategy and programs to reduce risk in socially vulnerable communities	Conduct needs assessment, prioritize pilot locations, develop tools and strategies to assist and educate residents		Households served	CAFE	CCD, Local FDs, DEM, CDPHD	High
Increase FPD capacity with seasonal crews	Have FPDs hire seasonal crews that can do mitigation	Several local fire districts have hired seasonal crews to provide wildfire education, home assessments, and implement community fuel reduction projects		Local FPD's	CCD, Chelan County	High

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Local building regulators and fire departments should review the 2021 State WUI code and make recommendations for adoption. Driveways and water supply should be prioritized				County Fire Marshall	Local FPD's	High
Encourage those with special needs to complete the Chelan County Special Needs Registry (a voluntary registration to provide extra assistance during the event of an evacuation)	Incorporate registry information into any available mailing	Functional and being utilized. Could use more advertisement	Number of registrants.	Chelan Co DEM	CWSC, CCFD3 USFS, WA DNR, Cascadia CD	High
Work with the County planning department to get Firewise building materials information provided to developers and home builders during the permitting process	Contact County; produce information sheet; acquire additional building materials information sheets; distribute	Occurring naturally through market demand after implementation of WUI Codes	Agreement with County	Chelan County Fire Marshall	City and County Planners, CWSC, Forest Ridge, CCFD3, Fire Chiefs, Firewise Communities	High
Business Continuity Planning		Several workshops have been held to provide business owners with tools for planning in case of a disaster	Host workshops and events			High
Continuing home hardening by residents		Several fire districts have developed programs using post-fire FEMA funding to provide cost-share assistance to landowners interested in replacing flammable roofs, and other practices to reduce the threat of ember ignitions in the WUI.				High
Maintain and develop new Firewise USA sites	Continue and expand Firewise communities	Over 20 Firewise Communities are currently active in Chelan County, many of which have implemented projects to reduce the risk to their community		CWSC, DNR, CCD		High

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Participate in Washington Fire Adapted Communities Learning Network		Several organizations in Chelan County are involved in this network.	Partners are connected to a network of fire practitioners that provides shared learning, knowledge exchange, and partnership development.	CCD, LWFR, WVFR, DNR		High
Launch countywide annual media campaign for Wildfire Ready Neighbors and cost-share programs	Establish countywide wildfire outreach committee and funding source for outreach			WDNR		Medium
Provide free Home Ignition Zone Assessments to residents	Better coordinate efforts across agencies and build a central database that informs pre-attack planning and planning efforts.		Central Data Base		FDs, Cascadia CD, DNR, and other partners	Medium
Identify areas for refuse						Low
Develop a plan for neighborhoods outside the Fire District	Develop and distribute clear, well-defined procedures for neighborhoods outside the Fire District to apply for inclusion	On-going (information included on FD3 website)	Plan completed	CCFD3	CCFD3, CWSC, WA DNR, Cascadia Conservation District	Low
Participate in some sort of assessment and rating system to give feedback to insurance companies to help keep coverage in area	Engage in policy discussions and develop tools and programs for landowners to help them maintain insurance			Chiefs Association		Low
Develop programs to incentivize voluntary home hardening retrofits for structures	Develop incentive programs, rebates, and grant programs to assist in home hardening retrofits			CCD	CWSC, PUD, Local FDs, Chelan Fire Marshall	Low
Consolidated Chelan County Map of Evacuation Routes and Pre-Identified Places of Refuge and Shelters for People and Animals	Chelan County map that identifies these evacuation routes (primary, secondary, etc.) as well as pre-identified places of shelter for people and animals (primary, secondary, etc.)			CCD		High
Information in Spanish for communities from 2025 CWPP Update	Develop Summaries/Documents of CWPP in Spanish for local communities	Multiple Requests for Spanish CWPP		CCD		High
Cohesive Strategy Goal: Safe and Effective Fire Response						
Utilize triage assessment data from Incident Management Teams to prioritize fuels treatments on high-risk properties and conduct direct outreach	Centralize all IMT triage data, WRN assessments, and Fire District assessments; Develop outreach campaign and funding source to offer incentives for improving defensible space		New homes with adequate defensible space	CCFD7&5	DNR, CCD, USFS	High
Educate residents on safe debris burning and provide alternatives to burning	Conduct pile burn workshops and notifications for "great burn days"; utilize chipper programs, biochar kilns, and air curtain burners when possible			CCD	CCFD 3, DNR	High
Increase roadside vegetation management	Conduct roadside mastication and fuels reduction on all public right of ways	PUD expanded program in 2024 and adopted more aggressive vegetation management program standards for roadway powerlines.	Miles treated or maintained	Chelan County	Local FDs, CCD, DNR	High

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Create database of residents interested in prescribed fire and shelf stock of burn plans ready for implementation	Targeted outreach campaign; coordinate with existing cost-share programs to include prescribed fire planning as part of technical assistance available to participants			CCD		High
Conduct hazardous fuels reduction treatments along critical evacuation routes	Plan forest thinning and hazardous fuels treatments along critical evacuation routes, obtain funding and implement projects	NRCS EQIP: A portion of landowner's costs can be covered to improve forest health, reduce wildfire threat, and improve fish and wildlife habitat.		CCD, Local FPD's	USFS, WDNR, Chelan County	High
Host a TREX		Prescribed Fire Training: Chumstick Wildfire Stewardship Coalition and the Wenatchee River Ranger District hosted the first TREX in WA State. Washington Prescribed Fire Council has been actively participating in various coalitions and collaboratives in the county.		Cascadia PBA	CCD, DNR, USFS	High
Continued participation in Fueling Adaptation research		Participated in a research project funded by the US Forest Service				High
Identify residents that may need additional help during smoke and evacuation events and help	Work with Chelan Public Health District and Emergency Management; develop plans to assist residents			CDPHD	Red Cross, Fire Districts, Schools, NCW Libraries, CAFE	High
Identify and pre-arrange clean air shelters	Develop clean air shed criteria, locations, and protocol for working with administrators to establish and maintain sites		Number of sites available during smoke event	CDPHD	Red Cross, Fire Districts, Schools, NCW Libraries, CAFE	High
Develop pre-fire plans	Improve data access in fire rigs			local FDs		High
Improve access to information on anticipated duration and concentration of smoke	Develop notification tools and outreach strategies informing public		Number of views of notification platform	CDPHD	DOE, DNR, CCD	Medium
Encourage residents in the CWPP area to dispose of brush generated through fuels reduction efforts via chipping	Contact County Solid Waste, identify funds, schedule chipper, work with DNR landowner assistance, recruit participants, distribute hourly tracking sheets	CCFD 3 and CCD have chipping programs; need to solve the problem of county pit	Acres treated/participants in chipping program	CWSC	CWSC, WA DNR, NRCS, Cascadia, CCFD3	Medium
Support implementation of water storage tanks for response operations in remote locations	Find water tanks to bury		Buried and filled water tanks			Low
Develop and expand programs to offer free defensible space to residents not able to complete	Focus on low-income, disabled, elderly residents who need defensible space but cannot afford to or physically			CCD, Local FPD's	Local FPD's	Low

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
the work themselves.	complete the work.					
Develop educational workshops for landscapers, building industry, and real-estate agents on best practices for defensible space and home hardening.	Develop curriculum and secure funding to host workshops	Applied for FEMA grant	Number of workshops	CCD	WSU Ext, café, Cities	Low
Outreach and communications: annual smoke readiness communications fund	Create an annual communications campaign that includes coordinated billboard, radio and print campaign plus portable HEPA air cleaner and box fan filter and AQ outreach displays. Consider highly visible locations for display of real-time air quality. Fund the development of smoke-readiness outreach displays (previously developed by CAM) including materials generation and design, and additional 50 air cleaners to use for public displays to familiarize the public to the concept of cleaning indoor air and the construction of a DIY box fan air cleaner.					Low
Cohesive Strategy Goal: Resilient Landscapes						
Post Fire Recovery work	Local fire departments and many local state and federal partners work together to respond to post-fire recovery in the shrub-steppe; these agencies work together to identify effective treatments on the landscape to help the recovery of native fire adapted plant species become established and create a more resilient landscape	Two Pilot Project areas in the Wenatchee Foothills: Methow Street burn scar (2022) and Balsamroot burn scar (2024)	Acres Treated		Local FDs, CCD, Cafe, DNR, BLM, USFS, WDFW, USFS	High
Establish coordination & collaboration across partners to create treatment connectivity	Hold monthly coordination meetings, identify and connect partners, conduct community outreach		Areas treated	DNR or SNW	CCD, SNW, USFS, Fire districts, DNR, etc.	Medium
Maintain and support forest health collaboratives	Regular meetings with a wide spectrum of stakeholders interested in forest resiliency in Chelan County	Several Forest Health Collaboratives exist in Chelan County which include diverse participation from agencies, conservation groups, NGOs, industry etc. These groups have varying scopes but are all working toward strategically planning landscape level forest restoration projects, some of which have a strong WUI protection component.		UCSRB		Medium
Expand access to Cascadia CD landowner assistance program	Cascadia CD cost-shares up between 50-100% of the cost to do fuels reduction projects that benefit groups of landowner and communities		Acres treated, number of landowner participants			Medium

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Provide free woody debris dump days	Provide free dump days for the disposal of hazardous fuels in areas where there are limited options for burning and disposal		Schedule Days	CCD, Chelan County		Medium
Provide access to a roving chipper program	Landowners reduce fuels around their structures, build chipping piles, and hire a chipping crew or local fire district to chip the material		Days scheduled/Participants in program	CCD, Local FPD's		Medium
Leverage WA DNR Cost-Share Program	Up to 50% of financial assistance to landowner's costs to help reduce fuels can be covered through this program administered through the DNR's Small Forest Landowners Assistance Office Program					Medium
Implement post-fire flooding projects	The Chelan County Flood Zone Control District, and many partners including Cascadia, Chelan County Public Works, NWS, NRCS, USFS, and DNR work together to respond to watershed threats post-fire; these agencies have worked together to model and identify threats to life and property, communicate these threats to the public, and implement projects to reduce threats					Medium
Participate in social science research project to inform collaborative management on different landscapes	Through Wildfire Crisis Strategy, aiming at landscape scale treatments specifically for fire risk reduction and forest health restoration					Medium
Encourage use of fire-resistant plants in landscaping	Use lists of plants that are acceptable for landscaping in defensible space zones and tools for enforcement of such at tags on plants/codes	Fire Resistant Plants for Eastern Washington	FireWise Plant Materials - 6.305 - Extension			Low
Assess opportunities for cross-boundary burning in the WUI and develop projects with USFS to maintain cross-boundary fuels treatments.	Identify WUI and critical evacuation route locations where checkerboard landscape will make maintenance of fuels treatments challenging, and develop Wyden agreements with private landowners to support cross boundary burning.			CCD, DNR	USFS, Local FPD's	Low
Implement strategic fuel breaks	Utilize POD/PCLs, critical evacuation routes, landscape evaluations, and WA DNR Dual Benefit Analysis to prioritize fuel break locations			CCD	Chelan County, USFS, DNR, Local FPD's	Low
Expand access to prescribed fire implementation and training for private landowners	Develop and support prescribed fire associations, workshops, trainings, burn plans		Participants, acres burned	Cascadia PBA	CCD, DNR, Local FPD's, USFS	Low
Expand capacity for prescribed fire implementation across boundaries.	Develop a local fuels module or similar model which would be trained and available to assist on private and public burns.			CCD		Low

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Develop local capacity to utilize logs and woody biomass for commercial products.	Develop a wood utilization campus, utilize Winton MFC composting facility, establish a small diameter mill.			Chelan County	CCD	Low
Increase biochar production as a tool for treating slash from hazardous fuels reduction projects.	Biochar workshops for landowners, biochar kiln loaner programs, cost share for bio-char production.			CCD	NRCS, USFS, WDNR, Chelan County	Low
Reconnect floodplains, restore wet meadows, and encourage beaver activity to increase wildfire and drought resilience in riparian areas.	Partner with salmon recovery organizations to utilize low-tech process-based restoration techniques to restore floodplains and beaver habitat.			BOR. Coordinated Resource Management Group	CD, Cascade Fisheries, Trout Unlimited	Low
Implement strategic fuel reduction treatments adjacent to critical infrastructure such as Chelan PUD overhead line.	Coordinate landowner assistance programs with Chelan PUD, Cities, and County Public Works to prioritize treatments that would have a risk reduction benefit to critical infrastructure.			CCD, Chelan PUD	NRCS, WDNR, Chelan County	Low

See ***Figure 35*** for the location of priority fuel treatments across Chelan County. Zoomed in maps of projects in each zone are provided in the sections below.

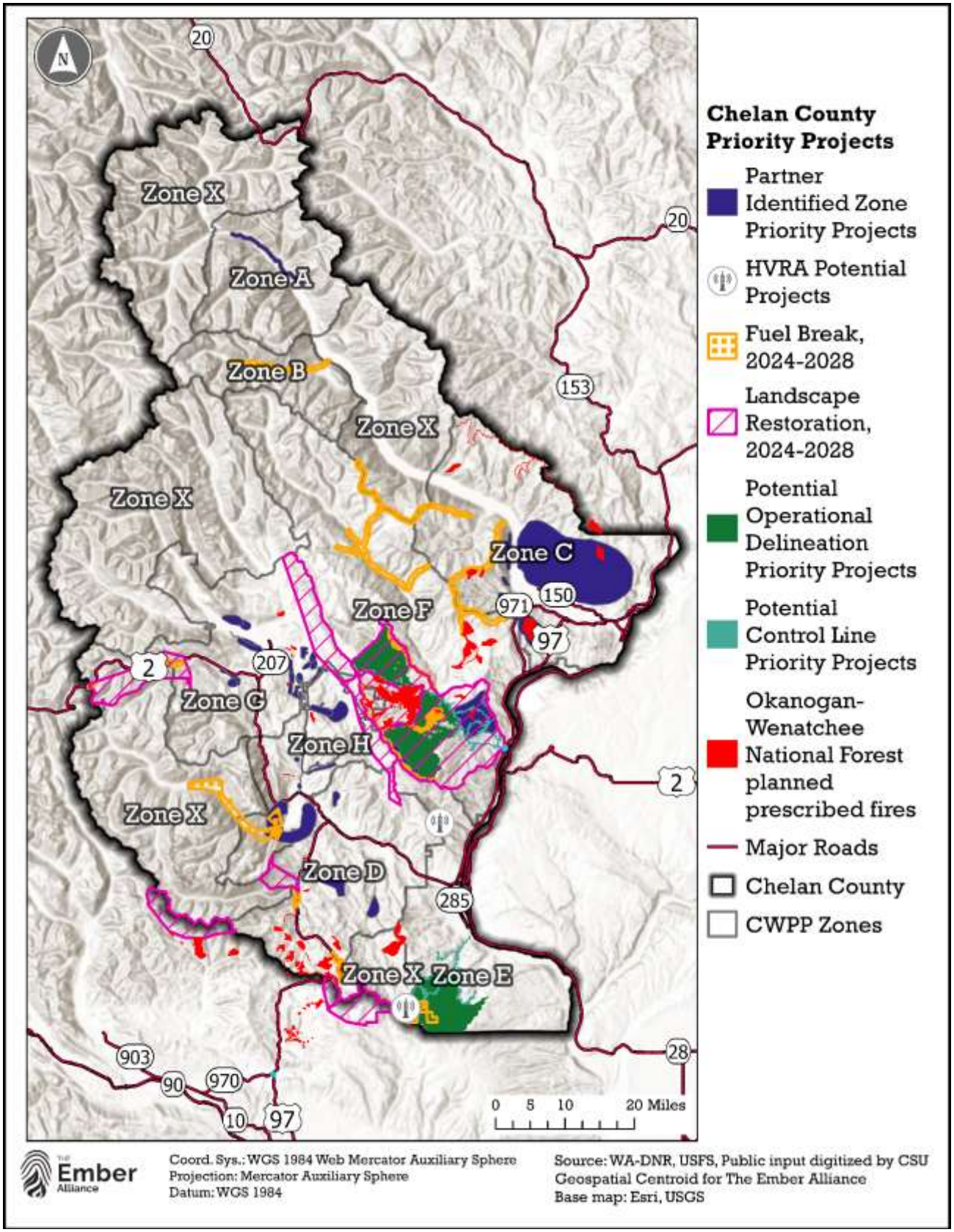


***Figure 35**. Proposed projects in Chelan County for 2025 CWPP Update. Source: WA-DNR, USFS, TEA.*

Overall Prevention & Mitigation Activities

There are many specific actions that will help improve safety in an area; however, there are also many potential mitigation activities that apply to all residents and all fuel types. General mitigation activities that apply to all of Chelan County are discussed below while area-specific mitigation activities are discussed within the individual landscape assessments.

The safest, easiest, and most economical way to mitigate unwanted fires is to stop them before they start. Generally, prevention actions attempt to prevent human-caused fires. Campaigns designed to reduce the number and sources of ignitions can take many forms. Traditional "Smokey Bear" type campaigns that spread the message passively through signage can be quite effective. Signs that remind people of the dangers of careless use of fireworks, burning when windy and leaving unattended campfires have been effective. Fire danger warning signs posted along access routes remind residents and visitors of the current conditions.

Burn Permits: Washington State Department of Natural Resources is the primary agency issuing burn permits in forested areas of Chelan County. The Washington DNR burn permits regulate silvicultural burning. Washington Department of Ecology (DOE) is the primary agency issuing burn permits for improved property and agricultural lands. All DOE burn permits are subject to fire restrictions in place with WA DNR & local Fire Protection Districts. Washington DNR has a general burning period referred to as "Rule Burn" wherein a written burn permit is not required in low to some moderate fire dangers.

The timeframes for the Rule Burn are from October 16th to June 30th. Washington DNR allows for Rule Burns to be ten-foot (10') piles of forest, yard, and garden debris. From July 1st to October 15th if Rule Burns are allowed, they are limited to four-foot (4') piles.

Defensible Space: Effective mitigation strategies begin with public awareness campaigns designed to educate homeowners of the risks associated with living in a flammable environment. Residents of Chelan County must be made aware that home defensibility starts with the homeowner. Once a fire has started and is moving toward a structure or other valued resources, the probability of that structure surviving is largely dependent on the structural and landscaping characteristics of the home. "Living with Fire, A Guide for the Homeowner" is an excellent tool for educating homeowners as to the steps to take in order to create an effective defensible space. Residents of Chelan County should be encouraged to work with local fire departments and fire management agencies within the county to complete individual home site evaluations. Home defensibility steps should be enacted based on the results of these evaluations. Beyond the homes, forest management efforts must be considered to slow the approach of a fire that threatens a community.

Evacuation Plans: Development of community evacuation plans are necessary to ensure an orderly evacuation in the event of a threatening wildland fire. Designation and posting of escape routes would reduce chaos and escape times for fleeing residents. Community safety zones should also be established in the event of compromised evacuations. Efforts should be made to educate homeowners through existing homeowners associations or the creation of such organizations to act as conduits for this information.

Accessibility: Also, of vital importance is the accessibility of homes to an emergency apparatus. If a home cannot be protected safely, firefighting resources will not jeopardize lives to protect a structure. Thus, the fate of the home will largely be determined by homeowner actions prior to the event. In many cases, homes' survivability can be greatly enhanced by following a few simple guidelines to increase accessibility such as widening or pruning driveways and creating a turnaround area for large vehicles.

Fuels Reduction & Restoration: Reducing fuels, particularly in areas where excessive fuels have built up due to decades of fire suppression or insect or disease, is a critical part of the strategy for reducing future wildland fires and protecting important habitat. It is important that vegetation management and habitat restoration (not simply building fuelbreaks or applying prescribed fire) be an integral part of the solution. Treating minimal scattered acreage generally will not have a large enough impact on reducing the wildfire threat in the County. Land managers need to work with landowners, other agencies and fire districts to work cooperatively in identifying and implementing landscape level projects to address the build-up of fuels throughout the County.

Better management of shrub-steppe vegetation and reversing the spread of invasive, non-native grasses, such as cheatgrass, is critical to breaking the invasive species-fire cycle that has contributed to the increased frequency and intensity of shrub-steppe fires. By planning projects at the landscape scale to reduce and control invasive species and rapidly restore lands impacted by fire to native vegetation, progress in protecting and restoring Chelan County's unique ecosystems for the benefit of all. Vegetation inventories, treatments, and preventative measures can be used to reduce the risk of shrub-steppe fire such as the appropriate use of herbicides, biological controls, biocides; prescribed fire, green stripping, and fuel breaks; and the prioritization of efforts to restore fire-impacted landscapes.

Emergency Response: Once a fire has started, how much and how large it burns is often dependent on the availability of suppression resources. In most cases, rural fire departments are the first to respond and have the best opportunity to halt the spread of wildland fire. For many districts, the ability to reach these suppression objectives is largely dependent on the availability of functional resources and trained individuals. Increasing the capacity of departments through funding and equipment acquisition can improve response times and subsequently reduce the potential for resource loss.

Other Activities: Other specific mitigation activities are likely to include improvement of emergency water supplies, access routes, and management of vegetation along roads and power line rights-of-way. Zoning ordinances that address minimum setbacks of structures should be revised to increase space between structures and property lines to allow enough space for homeowners to complete enough defensible space around their home without having to rely on neighboring property owners to conduct fuel reduction work on their property. Furthermore, building codes should be revised to provide for more fire-conscious construction techniques such as using fire resistant siding, roofing, and decking in high-risk areas.

Recommend All structures are within a fire district.

13.f. Zone A - Stehekin

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Cohesive Strategy Goal: Fire Adapted Communities						
Complete treatment in Upper Stehekin	Defensible space, hazardous fuel reduction	None known	94 Structures addressed with defensible space; 2,900 acres of land treated			High
Conduct risk assessment surveys	Data collection and map integration of private resident risk and fire protection resources (pumps, sprinklers, generators, etc.)	None known	Digital maps of the structures and infrastructure are created and shareable with partners	CCFD 10	NPS, CCFD 10, Private residences	Medium
Cohesive Strategy Goal: Safe and Effective Fire Response						
Identify and improve contingency lines	Map existing contingency lines on both sides of the valley in GIS to identify property ownerships and develop Scope of Work and maintenance schedule.	None known	Map of contingency lines created and sharable with partners.	NPS	Chelan Co Fire Dist 10, Stehekin private residences or contractors.	High
Planning and improvement of safety zones.	Identify and map safety zones, assess improvements needed and update FMP for any further compliance needed; this includes mowing and burning the Buckner Orchard and developing a plan for use of the Stehekin Airstrip as a safety zone	None known	Safety zone map and maintenance plan created	NPS	Chelan Co Fire Dist 10, Stehekin private residences or contractors	High
Update evacuation plan	Evaluate current plans for needed updates including mapping, descriptions, and content	None known	Meet with Chelan County Staff, updated evacuation plan	NPS, CCFD 10	NPS, CCFD 10, Chelan Co Sherriff	Medium
Cohesive Strategy Goal: Resilient Landscapes						
Complete road fuels reduction in Stehekin Valley	Remove mistletoe brooms from trees within 100 feet of roads; maintain and improve shaded fuel breaks along roads to include tree removal and brush clearing	None known	Main roads within the area are treated to this standard	NPA	CCFD 10, Stehekin private residences	Medium

See **Figure 36** for priority fuel treatments in and around Zone A.

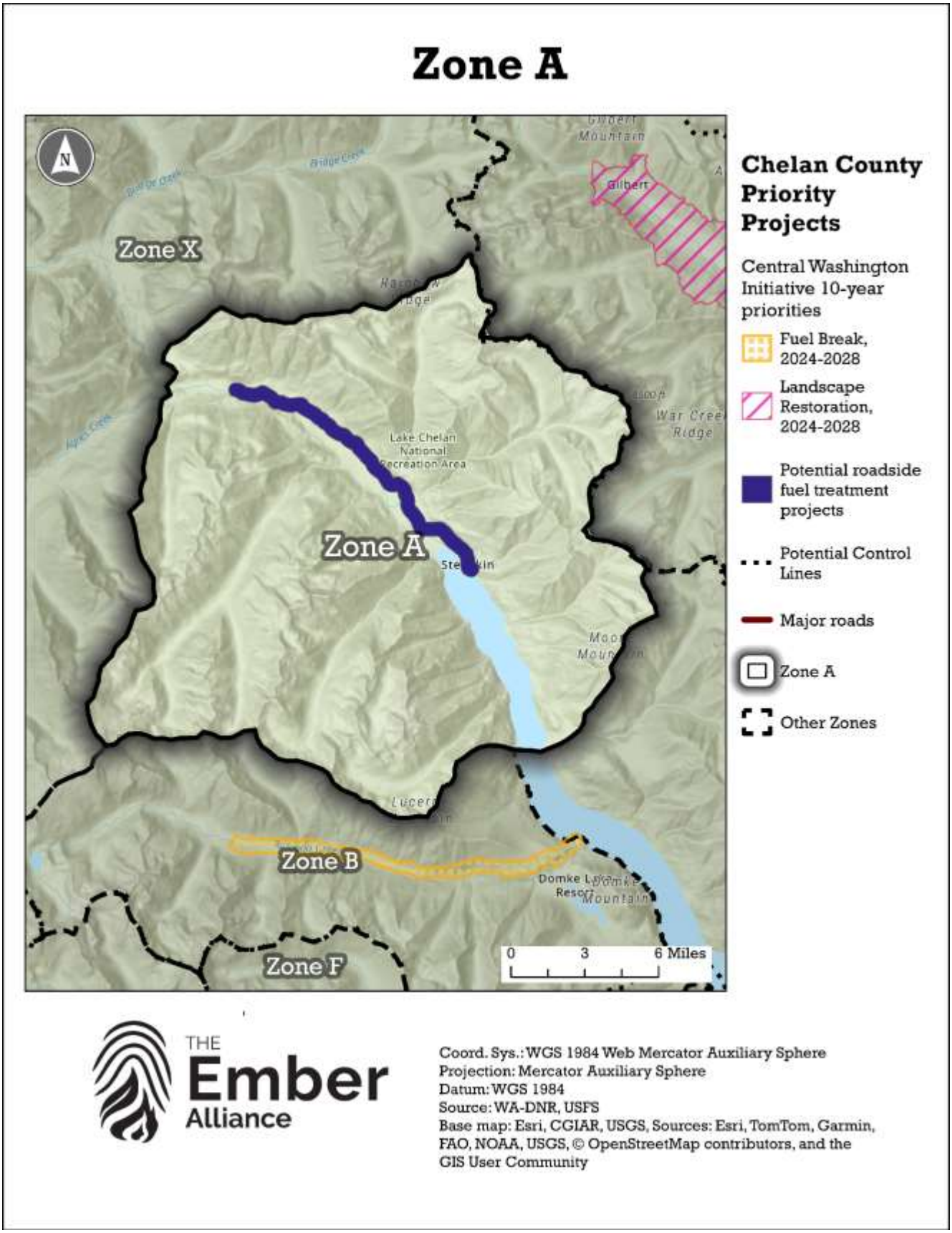


Figure 36. *Priority fuel reduction projects in and near Zone A of Chelan County. Source: WA-DNR. USFS, TEA.*

13.g. Zone B - Holden

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Cohesive Strategy Goal: Fire Adapted Communities						
Designate Holden Village as a HEPA Filter Distribution Site	Develop a relationship with CDHD; work together to provide filters to at risk community members	None known		Holden Medic		High
Pursue Firewise USA status	Network with Cascadia and USFS; apply for Firewise Status	None - need to form a Firewise Committee first	Firewise status by 2027	Holden Village Fire Brigade (HVFB)	USFS, Cascadia Conservation District	High
Cohesive Strategy Goal: Safe and Effective Fire Response						
Conduct a feasibility study for forming a rural fire protection district	Meet with recently formed RFPD and attorney		Formation ready documents	HVFB		High
Develop backup water supply for wildland defense sprinklers	Purchase trailered; diesel powered pump	None - funding needed	2,000 gpm drafting capability	Holden Village Fire Brigade (HVFB)	USFS	High
Hazardous fuels reduction to maintain ingress/egress road accessibility for wildfire responders and evacuation	Remove small trees, brush, and down logs adjacent to existing road systems and Port of Lucerne	None - funding and labor needed	Develop plan and implement strategy for 350 acres	USFS	Holden Community, HVFB, USFS	High
Increase weather monitoring equipment to improve fire behavior predictions	Add wind & relative humidity instruments to build historical database of typical valley weather	None - funding is needed	Daily reporting to USFS and/or NOAA	Holden Operations	USFS, NOAA and Holden Operations	High
Improve radio communications	Install a repeater system near Lucerne	Planned Research - FCC permitting is needed	Eliminate dead areas in lower and upper RR Creek Basin	HVFB	USFS	High
Procure Type 6 fire engine available for IA	Purchase Pickup truck with fire suppression package	None - funding is needed	Engine is in service	HVFB		High
Increase capacity to two firefighters during wildfire season	Secure funding for two positions	None - funding is needed	3-years of funding secured	HVFB	Wenatchee College, USFS, DNR	High
Cohesive Strategy Goal: Resilient Landscapes						
Develop partner contact list and opportunities for Holden to engage with policy and planning opportunities	Identify opportunities for input; Forest Plan revision, DNR 20-Year Strategic Plan	None - need to get in contact with partners to participate in meetings and events		Holden Village Fire Brigade (HVFB)		High
Maintain & improve shaded fuel breaks across valley on both sides of the community	Remove small trees, ladder fuel, and accumulation of down material	None - need USFS engagement and agreement	40 acres treated	USFS	Holden Community, HVFB, USFS	High

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Continue to reduce accumulations of coarse woody debris on forest floor	Create strategic fuel breaks that will enhance local fire suppression efforts and utilize natural/existing fuel breaks where feasible	Some reductions are made under Holden's permit to harvest firewood & lumber; Holden has limited resources to achieve significant fuel reduction	Lower fire intensity along only escapes route & in community	USFS, HVFB	USFS, IMCO/Rio Tinto	High
Restore low-intensity fire regime to landscape	Support landscape scale fuels reduction activities, including use of prescribed fire, by the USFS that create safe areas and wildfire containment opportunities	None known	Patchwork of low-density fuel areas		USFS	Medium
Work with USFS to modify creek riparian restrictions to allow establishment of defensible spaces around structures and along ingress/egress routes by trimming of shrubs, pruning ladder fuels, opening tree canopy and generally reducing the fuels loads	Consider using WDNR Forest Practice Standards for fuels reduction projects in riparian designated areas	None known	Standards in place	TBD		Low

See **Figure 37** for priority fuel treatments in and around Zone B.

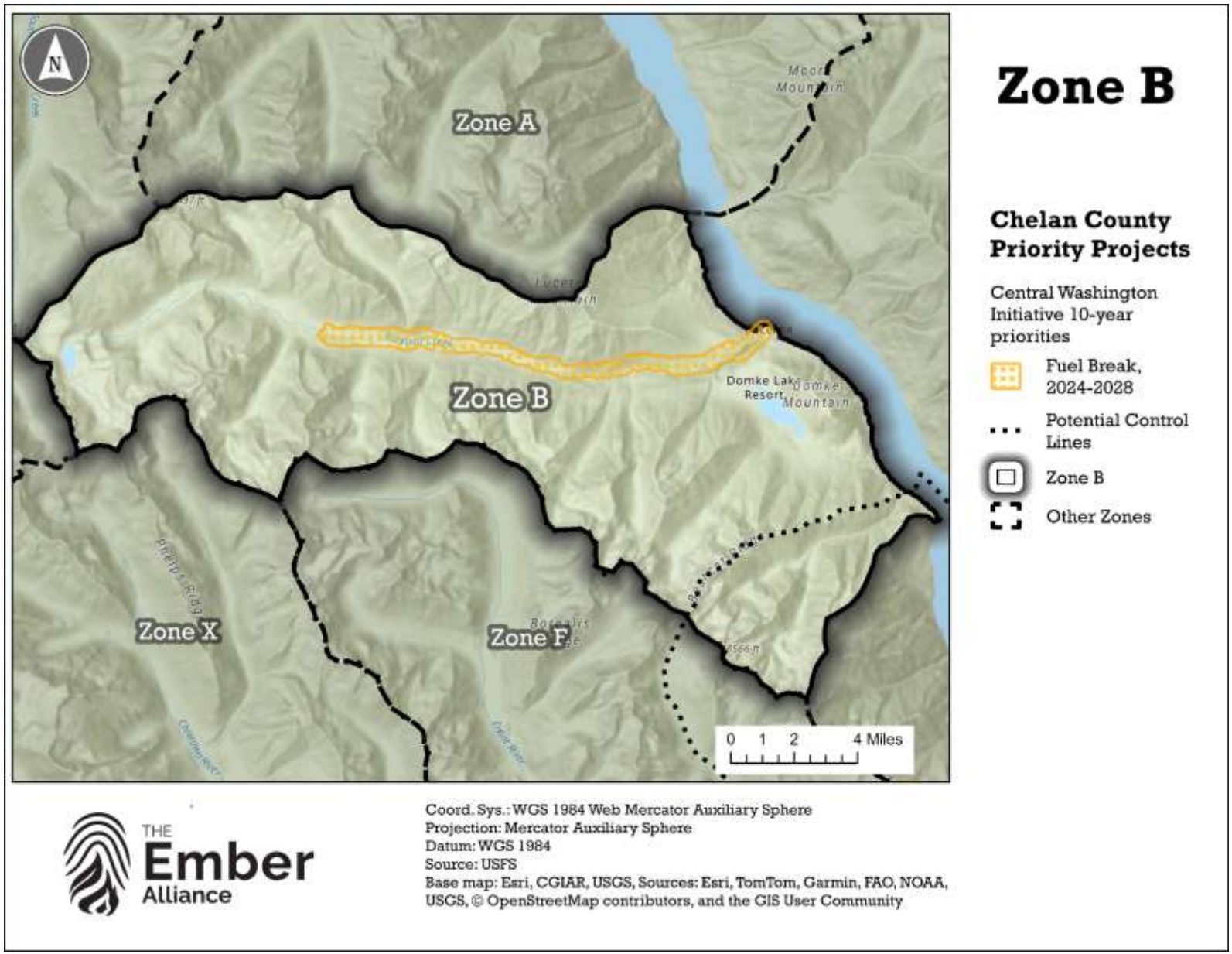


Figure 37. Priority fuel reduction projects in and near Zone B of Chelan County. Source: WA-DNR. USFS, TEA.

13.h. Zone C – Chelan & Manson

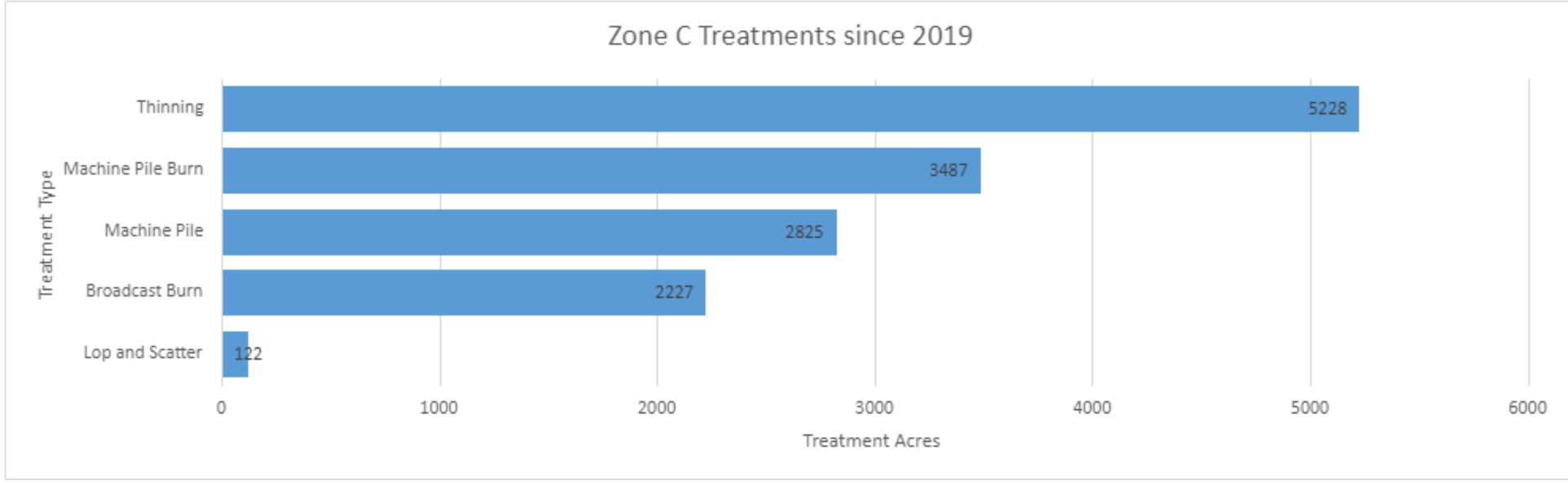


***Figure 38**. USFS landscape fuel treatments since 2019; 5228 acres of thinning and 2825 acres of piles built; 3487 acres of pile burning and 2227 acres of broadcast burning. Source: USFS.*

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Cohesive Strategy Goal: Fire Adapted Communities						
Provide Community Wildfire Resilience Community Education events	Example: Screening of Era of Megafires or Paradise documentary at Ruby Theater with panel discussion		Number of events	CCD	Local FPD's, USFS	High
Conduct risk assessments of individual structures and essential infrastructure	Identify recommendations for implementation and provide information to landowners	FDs and DNR worked on wildfire ready neighbors, but WRN has tapered off; agency coordination and connecting with homeowners was a challenge, but well-coordinated	WA DNR CR Program Created, Wildfire Ready Neighbors	DNR CR	CCFD7 & CCFD5	High

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
		outreach led to higher participation				
Direct outreach to high-risk private landowners utilizing previous triage data from IMTs						Medium
Increase cost-share rates for private landowners in strategic locations including potential containment lines and priority neighborhoods						Medium
Encourage adjacent landowners and agencies to perform complimentary treatments on their land	Inform landowners how to be more involved in the public planning process and invite neighboring private landowners to participate in Firewise USA and Fare Adapted Communities workshops	Success: Bear Mountain, Union Valley, First Creek; DNR completed Navarre coulee state land; USFS-Copper Valley fuel break adjacent to Union Valley; North Shore Lake Chelan Planning area	WA DNR CR Program Created		All	Medium
Implement landowner education programs	Educate homeowners to the hazards of highly flammable landscape plant types and encourage landowners to remove such high-risk plants	WRN; CCD chipping days	Firewise USA, Wildfire Ready Neighbors, Ready Set Go!, WA FAC, FAC NET, WA DNR CR Program Created		All	Medium
Compile essential Firewise USA information and distribute it to landowners	The information presented should cover landowner responsibilities and residential security options (i.e., creating defensible spaces and fire breaks, "FireWise" construction materials, etc.), and individual preparedness (i.e., how to create a Personal Emergency Action Plan, what to do and what not to do in the case of a wildfire, etc)	WA DNR Firewise USA Micro Grant received; well-coordinated outreach yielded higher participations	Firewise USA Program, WA DNR CR Program Created	DNR CR	DNR CR & local Firewise USA regional coordinators	Medium
Implement Fire Adapted Community recommendations within 200 feet of all private homes, egress roads, and essential infrastructure	Cost share on private lands and Chelan Douglas Land Trust Lands; DNR/CCD Interagency Agreement for chipping program	DNR cost share projects on private lands	51 projects for 530.9 acres	DNR SE Service Forestry	CCFD7, CCD, CDLT	Medium

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Develop central database for home assessment and triage data accessible to IMTs, local fire districts, DNR, and partners	Work with USFS to collate past triage data and develop a central location for digital storage					Medium
Develop fire resistant screening vegetation alternatives and provide incentives for use by residents and developers	Develop a list of appropriate alternatives and work with local suppliers to stock		Number of homes converting arborvitae to alternatives	CCFD7&5	CCD, WSU Mater Gardeners, DNR	Medium
Improve fire prevention safety messages using LED signage	Fire safety messages	Installed at Chelan Headquarters Station; Was well received by the community		DNR	CCFD7	Medium
Continue engaging with WA DNR Community Resilience Program	Education, Outreach, Coordination			DNR		Medium
Cohesive Strategy Goal: Safe and Effective Fire Response						
Develop and maintain additional safe areas, shelters, and staging locations as identified	Include new Chelan Community Center			CCFD7	Chelan City	High
Improve water availability in remote locations with HRVAs	Install fracking tanks throughout districts to provide water in hard to get to places; legislative funding for this was approved			Chelan County	CCFD7 & CCFD5	Medium
Hazardous fuels reduction and vegetation management along critical evacuations routes						Medium
Convert transmission structures to steel	Hardening of power grid			Chelan PUD		Medium
Increase staffing available for wildfire response	Sustain funding for seasonal wildland firefighters; secure funding to hire a full-time volunteer (firefighter) coordinator	Actively backfill stations with off duty career staff and volunteers. The availability of personnel is a limiting factor.	Recruitment and retention rate; staffing	CCFD7	All	Medium
Apparatus procurement and replacement	Replace fire apparatus nearing end of service life; acquire new apparatus to accommodate additional staffing, and suppression needs	Created an Apparatus Advisory Group to standardize apparatus and evaluate procurement needs	New equipment acquired; equipment in service	CCFD7	All	Medium
Training	Pursue wildfire training and skill development compliant with NFPA and NWCG standards	Ongoing training and annual wildland refresher training,	Training hours	CCFD7	All	Medium

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
		hoping to include prescribed fire training in the future				
Emergency Egress	Identify emergency evacuation routes for WUI communities in planning area; post evacuation route signs; develop evacuation plans for WUI areas; distribute evacuation plans to residents		Signs posted; plans developed	CCFD7	Rivercom911, CCFD7, Chelan County, City of Wenatchee	Medium
Cohesive Strategy Goal: Resilient Landscapes						
Develop cross-boundary fuels reduction and prescribed burning project	Continue cross boundary prescribed burning coordination on Baer Mountain; develop new private/public burning opportunities on lower North Shore including Union Valley					High
Increase opportunities for private landowners to utilize prescribed fire to maintain fuels reduction treatments	Promote DNR Certified Burner Program, establish a prescribed burn association, develop Wyden agreements with private landowners		Number of private burns, acres treated	CCD, DNR	CCFD7 & CCFD5	High
Increase vegetation management budget annually	Maintenance			Chelan PUD		High
Increase fire resiliency in riparian areas utilizing instream restoration	Build beaver dam analogs in strategic locations; identify wet meadow restoration opportunities			CCD	CCFEG, TU	Medium
Create 200-foot-wide shaded canopy fuel breaks on private land adjacent to publicly managed lands	Union Valley SFB Contract on Private Lands	Union Valley SFB Contract on Private Lands. Active project planning ongoing in Purtteman Gulch and Grade Ck Rd.	72.3 acres	DNR SE Service Forestry	CCFD7, CCFD5	Medium

See ***Figure 39*** for priority fuel treatments in and around Zone C.

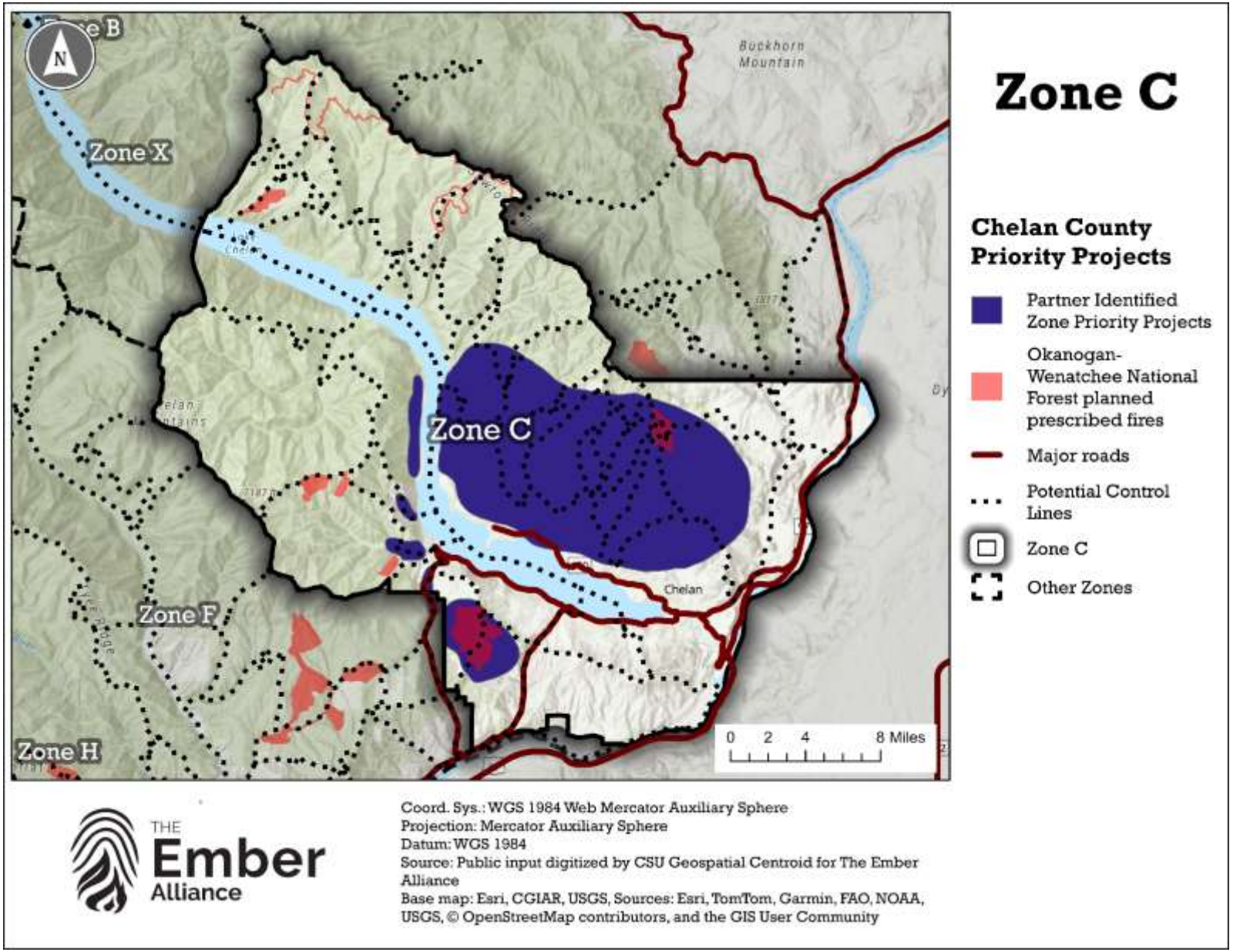


Figure 39. *Priority fuel reduction projects in and near Zone C of Chelan County. Source: WA-DNR. USFS, TEA.*

13.i. Zone D – Cashmere

Figure 40. *USFS landscape fuel treatments since 2019; 9572 acres of thinning, 3080 acres of lop and scatter and 2232 acres of piles built; 1570 acres of pile burning, 216 acres of broadcast burning, and 150 acres of jackpot burning.* ***Source: USFS.***

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Cohesive Strategy Goal: Fire Adapted Communities						
Develop policies and inspection criteria that help residents maintain homeowners' insurance			Number of reports of dropped coverage	Chiefs Association, WRCD, DNR	CCD	High
Adopt county wide WUI codes	Work with county and state building officials to adopt WUI codes where appropriate			Chelan County Fire Marshall		High
Establish new Firewise USA sites	Outreach to Valley-Hi, Camas Meadows, Olalla, Derby, Mundan, etc.		Number of new Firewise USA sites	CCD	CCFD 6, DNR	Medium
Provide alternatives to burning for slash treatment including chipping and bio-char kiln programs			Number of program participants, tons of slash treated	CCD	CCFD 6	Medium

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Circulate fuels reduction and fire precaution pamphlet yearly that includes essential Firewise USA information	Content Development: landowner responsibilities and residential security options, individual preparedness, home hardening; Distribution: annually to landowners in and adjacent to the Monitor, Cashmere, Dryden and Peshastin CWPP area	None known	Timeline for completing updates; number of pamphlets distributed	CCFD 6		Medium
Provide up-to-date fire-related information on existing and new billboards	Identify Locations: existing billboards on main roads, new billboards on other roads; Content Development: fire danger level, burn-ban regulations, actions to take if smoke or fire detected, penalties	None known	Number of main roads with signage; number of other roads with signage; total number of signs	CCFD 6		Medium
Provide FireWise building materials information to developers and home builders during the permitting process	Work with the County planning department to develop contact list and for timely permit information	None known	Number of developers/builders provided information	CCFD 6	CC Comm. Dvlp., CC Fire Marshal	Medium
Home risk assessments	Develop strategy for generating home assessment requests; conduct detailed individual home assessments; conduct rapid (sidewalk) home assessments; develop a central database for storing, accessing, and sharing home assessment information; establish a timeframe for re-visiting homes	2 years into 4-year goal of assessing all homes in CCFD 6	Number of assessments conducted; development of database	CCFD 6	Cascadia, DNR	Medium
Identify critical infrastructure within planning area boundary	Identify infrastructure, conduct assessments and document; create plan for mitigating risk and response	None known	All critical infrastructure documented and with a plan	CCFD 6	CPUD	Medium
Implement defensible space recommendations within 200 feet of private homes and essential infrastructure	Establish defensible space; provide adequate turnaround space for emergency equipment; post clear and consistent address signs	None known	Number of homes with 200 feet of treatment, turnaround space, signage	CCFD 6	landowners	Medium
Reduce risk of fire starts from homeowner burning	Encourage chipping of fuels instead of burning; support efforts to coordinate shared small mobile chipper for use in the CWPP area	None known		CCFD 6	CCFD 1	Medium
Re-establish addresses in a logical fashion for all roads/homes	Determine resource needs; support implementation	Effort underway	Percent of homes with corrected addresses	CCFD 6	CC Public Works	Medium
Cohesive Strategy Goal: Safe and Effective Fire Response						
Maintain updated emergency evacuation plans and routes	Work with Chelan County Emergency Management (CCEM) to obtain current plans; make information readily available to the public; update plan or provide input as appropriate	None known		CCFD 6	CCEM	Medium
Develop Emergency Communication Strategy and safe escape routes	Mark exit routes on maps; make directional emergency exit signs; coordination with KOMO and KPQ for emergency info	None known	Number of routes posted	CCFD 6	Chelan County, WSDOT, CCEM	Medium
Improve site access for fire fighting	Identify priority sites and roads; treat vegetation along roads and driveways; implement shaded canopy defensible space on both sides of the roads	Private lands matching funds is an ongoing barrier.	Number of sites and roads with treatment	CCFD 6	CC Public Works, WSDOT, DNR, USFS	Medium

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Cohesive Strategy Goal: Resilient Landscapes						
Work with private and public landowner to implement shaded fuel breaks along HWY 97 and one-way roads in canyons	Coordinate landowners conduct fuels treatments on Old Blewett Rd, Mundun Canyon, Cambell Rd, Ingalls and Camas Creek		Number of participants, miles of fuel break	CCD, CCFD 6	DNR, NRCS, USFS	High
Work with landowners and public landowners in Camas Meadow and Camas Bible Camp to conduct coordinated fuels treatments.	Conduct community meeting and targeted outreach to sign-up residents for cost-share programs		Number of participants, acres treated			High
Project: Mission Creek/Nahahum Canyon	Defensible space; hazardous Fuels Reduction	None known	5661 structures to address or prioritize, and 48372 acres to treat.			High
Encourage coordination across State, Federal, and private land ownership	Identify opportunities for joint projects; incorporate landscape fuels reduction strategies into state owned area management objectives and fuels reduction projects	None known	Number of cross boundary projects.	CCFD 6	DNR, USFS	Medium
Reduce the potential of wildfire moving from public to private lands and vice versa across the landscape	Implement fuels reduction on strategically located areas that will have the greatest benefit for the entire project area; prioritize USFS, industrial forest lands, and private property in Derby and Anderson Canyons; identify other priority areas	SE DNR Service Forestry 16 project for a total of 44.2 acres on private lands; potential project areas identified in Ollala Canyon, Camas, and Pendleton Canyons; in 2022, SE DNR secured 300K in WSFM grant funding for the Camas area	Number of priority areas with implemented fuels reduction projects .	CCFD 6	USFS, DNR, landowners	Medium
Restore low-intensity fire regime to landscape	Support landscape scale fuels reduction activities by the USFS; create strategic fuel breaks that will enhance local fire suppression efforts and utilize natural/existing fuel breaks where feasible; encourage similar activities on other National Forest lands adjacent to private ownership within the CWPP	DNR NAP implemented 10-acre prescribed fire on Camas Meadows for Checkermallow restoration	Number of acres treated within CWPP and within county.	CCFD 6	USFS, DNR	Medium
Complete fuel reduction and maintenance along county roadways to improve equipment access and evacuation	Prioritize Nahahum and Brender Creek roads for implementation; prioritize additional roadways for fuel reduction actions and maintenance needs in order to keep certain critical roads passable; encourage neighbors to organize their own clearing projects; Work with Chelan County and private landowners on roadway projects	None known	Number of priority roads with completed maintenance; landowner support.	CCFD 6	Chelan County	Medium
Complete fuel reduction along primitive roadways	Identify rural roads classified as primitive; identify subset with conditions which limit responder access; identify potential resources for addressing needs	None known		CCFD 6	Chelan County	Medium
Construct a new Regional Fire Station	Proceed with planning efforts, fundraising, design and construction of a new regional fire station on land owned by the fire district in Dryden.	Funding search and early planning underway.	Adequately sized facility that meets state and federal standards.	CCFD 6		High
Update Fire District 6 Apparatus and Equipment	Replace broken, aged and outdated wildland firefighting apparatus and equipment.	Inventory of broken and damaged apparatus and equipment conducted.	Reliable apparatus and equipment on every incident scene.	CCFD 6		High

See Figure 41 for priority fuel treatments in and around Zone D.

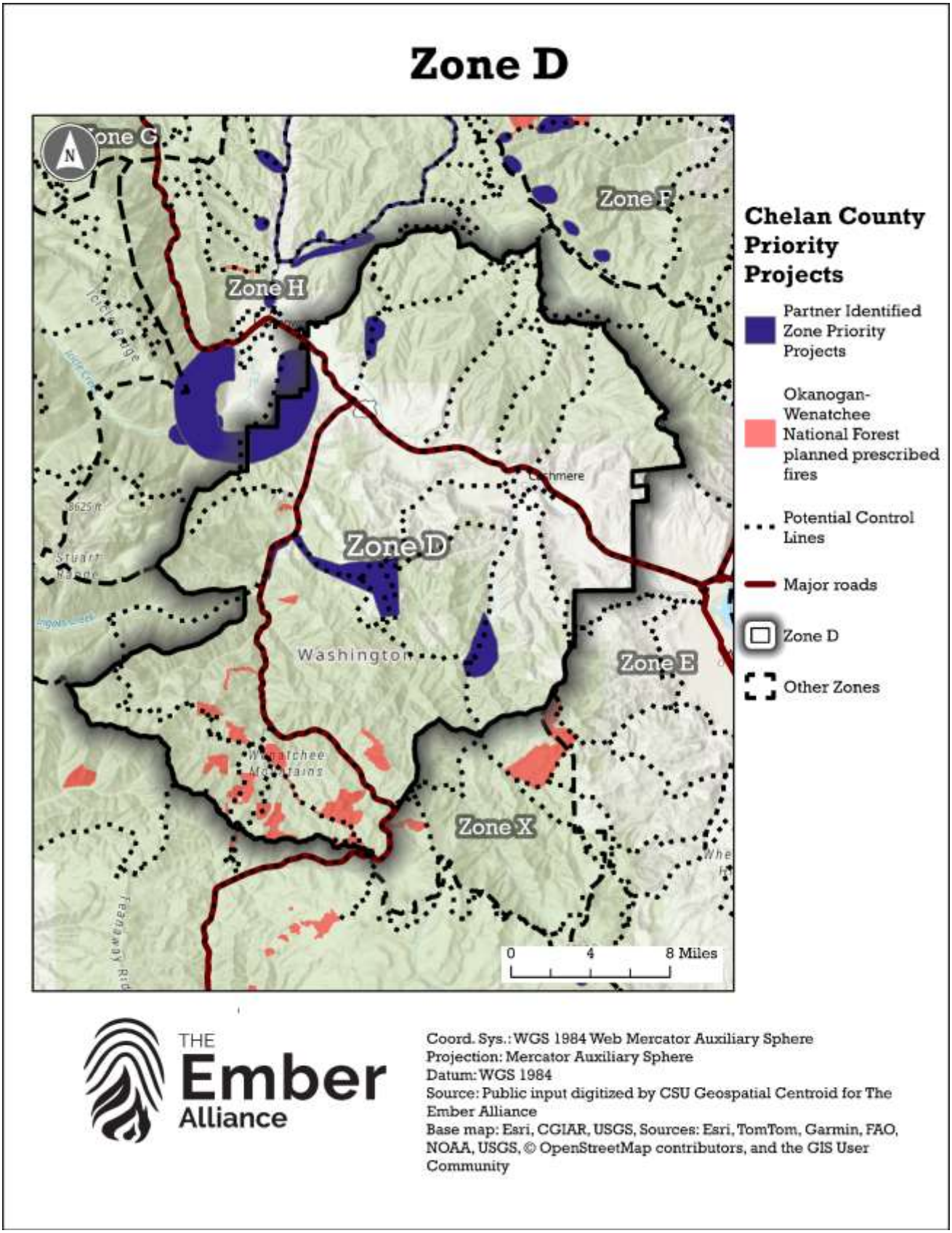


Figure 41. Priority fuel reduction projects in and near Zone D of Chelan County. Source: WA-DNR. USFS, TEA.

13.j. Zone E – Wenatchee

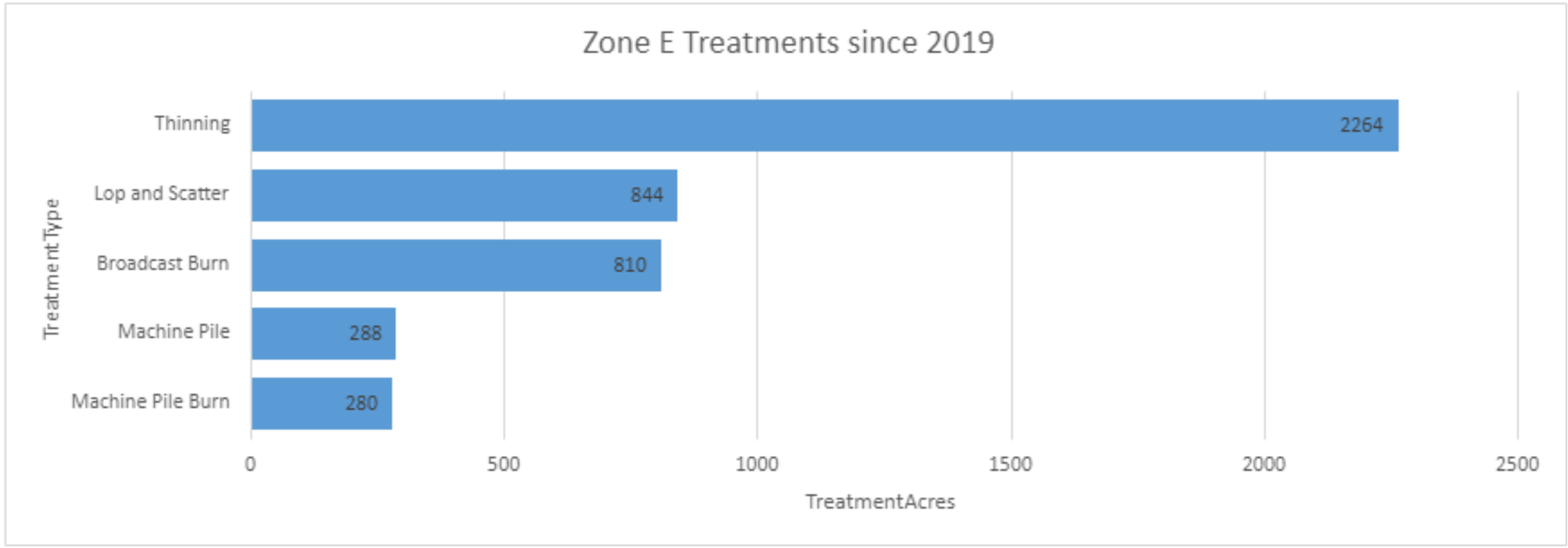


Figure 42. *USFS landscape fuel treatments since 2019; 2264 acres of thinning, 844 acres of lop and scatter and 288 acres of piles built. 280 acres of pile burning and 810 acres of broadcast burning.* ***Source: USFS.***

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Cohesive Strategy Goal: Fire Adapted Communities						
Establish a CWPP Steering Committee and commit to an annual review of CWPP accomplishments	Conduct annual CWPP meetings each year until the next update		Meetings held	CCD	Locale FDs, DNR, Chelan County, USFS	High
Improve smoke preparedness and resources for residents to stay safe during smoke events	HEPA filter loan program, smoke preparedness education campaign, outreach to farm workers and outdoor laborers			CDPHD	Red Cross, Fire Districts, Schools, NCW Libraries, CAFE	High

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Identify residents with special medical needs and help develop plans to assist those residents during smoke and evacuation events	Work with Chelan Public Health District, EM and disaster-based event volunteers			CDPHD	Red Cross, Fire Districts, Schools, NCW Libraries, CAFE	High
Identify and pre-arrange clean air shelters	Develop clean air shed criteria, locations, and protocol for working with administrators to establish and maintain sites		Number of sites available during smoke event	CDPHD,	Red Cross, Fire Districts, Schools, NCW Libraries, CAFE	High
Improve access to wildfire preparedness information and programs to Spanish speaking community	Translation of all materials and websites, outreach campaigns, education events			CAFE	WVFD, DNR, WSU Master Gardeners, CCD, USFS	High
Educate all youth in Chelan County on wildfire ecology, defensible space, and smoke preparedness	Utilize existing programs such as Kids in the Forest, and establish additional opportunities to teach students about wildfire ecology in an outdoor setting		Number of students participating	CCD	WVFD, DNR, WSU Master Gardeners,	High
Improve access to information on anticipated duration and concentration of smoke	Develop notification tools and outreach strategies informing public		Number of views of notification platform	CDPHD,	DOE, DNR, PUD, CCD	High
Develop HEPA filter loan or distribution program	Secure funding, develop a strategy for identifying high-risk residents and distributing HEPA filters.		Filters distributed	CDPHD,	American Lung Association, DOE, CAFE, CCD	High
Develop pre-fire plans	Improve data access in fire rigs			local FDs, DEM		High
Develop programs to incentivize voluntary home hardening retrofits for structures	develop incentive programs, rebates, and grant programs to assist in home hardening retrofits		Number of structures improved	CCD	Local FDs, PUD, Chelan County Fire Marshall, CAFE	High
Develop strategy and programs to reduce risk in socially vulnerable communities	Conduct needs assessment, prioritize pilot locations, develop tools and strategies to assist and educate residents		Households served	CAFE	CCD, Local FDs, DEM	High
Increase roadside vegetation management	conduct roadside mastication and fuels reduction on all public right of ways		Miles treated or maintained	Chelan County, PUD	Local FDs, CCD, DNR	High

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Encourage and support participation in the Firewise USA Program	Distribute landscaping and construction information; Attend community meetings; Hold workshops on relevant Firewise subjects; Support local Firewise USA community initiatives; Maintain relationships with existing Firewise USA Communities and connect Firewise USA board members with other local board members from Firewise communities in WVFD district; Follow up with community event participants; Use local media outlets to market and highlight activities; Explore the process of creating a Community Ambassador Program	In Progress	Number of meetings attended; Number of workshops hosted	DNR, WVFD, Cascadia	WSU Extension, NFPA, USFS, BLM, Chelan County, City of Wenatchee, Local media	High
Produce/ acquire education and outreach materials to address local needs	Produce local materials to meet education and awareness needs of various populations. Plant guides, evacuation materials, translation, smoke impacts, public safety during wildfires, human ignition prevention and others as needed	Ongoing - coordinating with local, state and federal partners	Amount of materials produced; Information published; Materials distributed	ALL	ALL	High
Community outreach	Assess needs of ESL populations; develop outreach strategies targeting ESL communities; develop a strategy for engaging vacation property owners, and visiting populations; Produce wildfire safety resources for visitors; provide public health information to smoke sensitive populations; encourage participation in the County Sheriff's special needs registry; encourage registration in the AlertSense Notification System	CCD increased staff capacity with a bi-lingual outreach specialist to increase engagement with Spanish-speaking community. CCD partnering with CAFE to create wildfire and smoke outreach materials and educational presentations for Spanish-speaking community.	Number of outreach events; information published; announcements posted	All	All	High
Youth wildfire education	Partner with local school districts; develop a field site to serve as outdoor classrooms; incorporate wildfire education into the local education curriculum; attend events aimed at engaging youth; Engage local youth organizations in experiential learning and volunteer opportunities	In Progress-Kids in the Forest, Cafe, Red Cross etc	Number of events; adoption of wildfire curriculum	Local Schools	All	High

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Home risk assessments	Develop strategy for generating home assessment requests; conduct individual, detailed home assessments; conduct rapid (sidewalk) home assessments; develop a central database for storing, accessing and sharing home assessment information; host home assessment training for practitioners	WiRe study area in the Squilchuck drainage and Stemilt. Development of DNR Wildfire Ready Neighbors program includes standardized home risk assessment form and database accessible to all partners.	Number of assessments conducted; Development of a database; standardization of Assessment questions asked by all agencies conducting them; development of a data server or a shared website.	WVFD, Cascadia, DNR	All	High
Support and participate in FAC efforts of other planning areas in CWPP area, and across the state	Participate in Washington Fire Adapted Communities Learning Network (WAFAC) and the national FAC network; Share successes, information, and assist other areas with similar interests to help accelerate FAC work locally and statewide; Attend workshops, seminars, and events to develop practitioner skills and resources	Ongoing - participation by all partners in WAFAC workshops.	Maintain affiliate member status	WVFD	ALL	High
Local CWPPs	Incorporate existing CWPPs into planning processes	Ongoing- Will be finished with this CWPP update	CWPPs developed	Planning area Community	Cascadia, WVFD, City of Wenatchee, Squilchuck,	High
Coordinate with communities to update and distribute community emergency phone trees and use neighborhood communication apps for residents	Establish means of obtaining information and assign task	Several Firewise Communities have created phone trees and Everbridge Emergency is the new alert system in Chelan and Douglas County. Success of this work is dependent of functioning cell networks.	Annually update people contact information	Planning area community	CCFD1, Rivercom911, CCDEM, Chelan County, City of Wenatchee, Red Cross, Cascadia, HOA's and Firewise USA communities	High
Encourage adoption and/or updates of future and/or existing Wildland-Urban Interface (WUI) codes	Conduct outreach to partners, communities, local leadership, and all other associated parties; Obtain lessons learned from areas that have adopted WUI code; Adopt/ amend/ update WUI codes		Code adoption and/or update	Chelan County	Cascadia, DNR WVFD, builders, residents	High

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Encourage and assist planning area residents to implement defensible space/ fuels reduction	Utilize existing community assistance programs; develop new assistance programs as needs and capacity develop; coordinate volunteer opportunities; conduct site visits	Wildfire Ready Neighbors Home Assessments. Agencies added capacity, Interagency agreements. WVFD Wildland Fire Liaison position created (2017), integrating new partners like Wenatchee CAFE. DNR SF and others added capacity. Success is limited by requiring landowner match, or landowners assuming up-front costs.	Number of structures treated; number of volunteer hours tracked	WVFD, DNR, Cascadia	City of Wenatchee, Chelan County NRD, USFS,	High
Colockum Creek	Defensible Space for 25 structures across 5957 acres		Defensible Space completed for a majority of the 25 structures			High
Number 1/Number 2 Canyons	Defensible Space for 36 structures across 4245 acres	USFS Rx burning Number 2 Canyon	Defensible Space completed for a majority of the 36 structures.			High
Wenatchee Heights/Squilchuck	Defensible Space for 614 structures and fuel breaks placed across 19705 acres	Chelan NRD, USFS, DNR, & CCD extensive fuel break project work is currently being implemented. Currently using 20-Year Plan and Dual Benefit analysis to drive grant applications and implementation	Defensible Space completed for many of the 614 structures and fuel breaks placed in strategic areas			High
Upper Canyon	Defensible Space for 1429 structures, Access Improvement in the neighborhood		Defensible Space completed for many of the 1429 structures, and firefighter access is not a concern for local firefighters.			High

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Stemilt	Defensible Space for 156 structures, Access Improvement in the area	WiRe study area in Stemilt. Chelan NRD, DNR, & CCD extensive fuel break project work is currently being implemented. Currently using 20-Year Plan and Dual Benefit analysis to drive grant applications and implementation	Defensible Space completed for many of the 156 structures, and firefighter access is not a concern for local firefighters.			High
Address several communities that are 1-way-in/1-way-out						Medium
Identify how to include communities not served by a FPD.	Communicate with Colockum community and southern Douglas County (South of Rock Island)					Medium
Post signs to raise fire hazard awareness.	Identify and post signs along roadways and at intersections. Identify and post signs at areas used by recreationalists (trailheads, ORV areas, campgrounds, etc.)	Fire hazard signs have been placed at 5 locations in Wenatchee by WVFD. Supported by DNR funding.	Number of sings posted.	WVFD	USFS, DNR, WFVD, CDLT, City of Wenatchee, Chelan County NRD	Medium
Decrease human ignitions of wildfires	Conduct analysis of human ignitions; Identify activities that lead to ignition; Develop management strategies to reduce human ignitions for each activity	In Progress; This objective will mainly be met through education and outreach regarding ways to reduce potential ignitions caused by humans	Human Ignitions decreased	All	All	Medium
Provide opportunities for residents, communities and agencies to provide input on wildfire mitigation programs, and forest health projects	Schedule public meetings; provide alternative means for gathering feedback (mail, online, etc.)	In Progress	Number of meetings held, mailers circulated and online activity.	All	ALL	Medium
Emphasize responsibilities of residents, recreational users, agriculture, and the industry of lands within the CWPP regarding wildfire concerns.	Identify key responsibilities of these groups; raise awareness through outreach to each group	In Progress	Chelan County NRD, Cascadia	ALL	All	Medium

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Smoke management	Conduct public outreach on prescribed burning plans, and likelihood of smoke; conduct public outreach during wildfire season/ smoke events to educate and inform general public of wildfire status, smoke conditions, air quality and associated human health issues; provide face to face opportunities for public to ask questions, and have conversations with local fire managers and authorities; use best management practices to prevent/ limit smoke impacts from ag burning	Chelan County NRD held Fire-Wise and Smoke Readiness Workshop for in-person public engagement. CCD hosted pile burning workshops.	Number of outreach events; information published; announcements posted	Agency responsible for/ managing wildfire, prescribed fire or permitting authority	USFS, DNR, BLM, WDFW, Dept. of Ecology, WVFD, Incident Management team, Cascadia, Chelan County NRD, City of Wenatchee, Cafe, etc.	Medium
Coordinate prevention and outreach efforts among agencies	Improve sharing information and resources across agencies; partner with different jurisdictions to create consistent messaging	Ongoing & in progress.	TBD	ALL	All	Medium
Mitigate potential losses of critical infrastructure to wildfire	Identify and map vulnerable infrastructure; develop mitigation strategies	Vulnerability mapping was completed in 2019 and updated in 2021. CCPUD Developed wildfire mitigation plan. CCPUD Veg Mgt Program, doubled budget for veg mgt, wrapping power poles with mesh. Replaced wood structures with steel along Horse Lk Rd. Wildfire mitigation settings (increased sensitivity along powerlines) in high-fire danger areas (including Colockum). Success was spurred by budget and increased inspection cycle. External factors leading to increased investment. Barriers to included reduced reliability due to increased outages.	Planning area map and strategy	CCPUD	All	Medium
Promote native and fire-resistant plants	Provide resources and consultation for landowners; develop a mitigation strategy for invasive annual grass species in the Wenatchee Foothills; develop demonstration areas, and gardens to educate residents; Develop post-fire landscape restoration planting program; Develop nursery partnerships	CCD secured funding from WA Conservation Commission for outreach materials and technical assistance. Development of Heritage Gardens program. Non-native plants brochure created. Demonstration garden installed at Saddle Rock TH. 30 acres reseeding native grass reseeding project in Methow St burn scar. Barriers included the timing of restoration projects, availability of non-native plants, and lack of education around fire-resistant native vegetation		WSU Extension, CDLT, Cascadia, Weed Board	All	Medium

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Review and support improvements to the cell phone towers serving the CWPP area.	Identify towers needing improvement and cost estimates		Towers improved	Chelan County		Medium
Recreation emergency location sites	Posts signs with maps, and emergency location information in local recreation areas “you are here” signs		Signs posted	CDLT, USFS, DNR, City of Wenatchee, State Park	All	Medium
Cohesive Strategy Goal: Safe and Effective Fire Response						
Increase staffing available for wildfire response	Sustain funding for seasonal wildland firefighters; secure funding to hire a full-time volunteer (firefighter) coordinator	Actively backfill stations with off duty career staff and volunteers. The availability of personnel is a limiting factor.	Recruitment and retention rate; staffing	WVFD	All	High
Apparatus procurement and replacement	Replace fire apparatus nearing end of service life; acquire new apparatus to accommodate additional staffing, and suppression needs	Created an Apparatus Advisory Group to standardize apparatus and evaluate procurement needs	New equipment acquired; equipment in service	WVFD	All	High
Training	Pursue wildfire training and skill development compliant with NFPA and NWCG standards	Ongoing training and annual wildland refresher training, hoping to include prescribed fire training in the future	Training hours	WVFD,	All	High
Emergency Egress	Identify emergency evacuation routes for WUI communities in planning area; post evacuation route signs; develop evacuation plans for WUI areas; distribute evacuation plans to residents		Signs posted; plans developed	CCDEM	Rivercom911, WVFD, Chelan County, City of Wenatchee	High
Emergency response mapping	Identify safety zone, water supply, staging area, potential containment line and other critical emergency response locations; triage structures in WUI areas; make information available in electronic map format		Emergency response data	WVFD	Rivercom911, Chelan County, City of Wenatchee, CCDEM, DNR, USFS	High
Pre-fire strategic groundwork	Construct pre-fire containment lines around WUI areas using bull dozers, disc plow, handline, green strips, and other methods appropriate for topography and land management objectives.		Pre-fire containment line constructed	ALL	ALL	High
Address multiple roads in WUI that can ONLY be accessed by Brush truck or Response vehicle.						Medium
Water Supply outside UGAs	Work outside UGAs to identify/ map areas unprotected by hydrants; develop strategies for improving water supply to identified areas		Plan to improve water supply	Chelan County	WVFD	Medium

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Access	Locate, inventory and post weight limits on all unmarked bridges in planning area; post signs on all unmarked roadways (street name, road number, etc.); promote blue address signs in WUI areas	Communicate gate code information to Rivercom911, still working on weight limit information on bridges. Promote road signage and encourage landowners to install blue address signs	Number of new postings	Chelan County, City of Wenatchee	WVFD, Rivercom911,	Medium
Develop secondary fire apparatus road in the Wenatchee foothills	Identify secondary access route; establish timeline for construction; construct fire apparatus roads in identified areas		Roadway constructed	City of Wenatchee, CDLT, CCPUD	Chelan County, WVFD	Medium
Support implementation of water storage tanks for response operations in remote locations						Medium
Cohesive Strategy Goal: Resilient Landscapes						
Coordinate resilient landscape work among agencies, across jurisdictions and ownership	Develop agreements/ understanding/ policy so that private property owners, and community groups may conduct defensible space work on adjacent public land; Coordinate with adjacent property owners to increase project effectiveness and scope where appropriate; Promote RX Fire use in planning area, and collaboratively among jurisdictions	Stemilt Partnership assembled including agencies and private landowners. Produced 2019 Landscape Evaluation. Multiple projects across ownerships and cost sharing projects. Multiple grants have been acquired. Several Interlocal cross boundary Rx agreements. The timing of funding and fiscal cycles made progress difficult, as does burning with grant funding and related smoke management. However, the success that this project has seen is due to partners matching funding for project and building momentum between landowners and partners.	Landowners/Partners Engaged; Grants awarded	ALL	All	High
Reduce burn frequency in Wenatchee Foothills	Develop restoration strategy and implementation plan for Wenatchee Foothills and Sunnyslope which emphasize restoring shrub steppe species which are more fire resilient.		Number of fires over 50 ac annually	CCD	WISRE, WDNR, WCFD, CDLT, City of Wenatchee, CPUD	High
Continue cross-boundary fuels reduction treatments in Stemilt-Squilchuck Basin to work toward Landscape Evaluation goal of ~25% of forested landscape treated	Fuels reduction	Potential funding through CWDG, DNR, FEMA, WDFW, RMEF	Acres treated	CCNRD	WDFW, DNR, Cascadia, WVF, State Parks, Mission Ridge, private landowners	High

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Improve fuel condition and emergency ingress/egress along ROW and road easements in high-risk areas.	Identify high risk areas and associated ROW and road easement; establish timeline for addressing concerns; reduce fuels along ROW and road easements	Forest Ridge and surround area work, continuation of FW Community. Treatments along Stemilt Loop Road, Mission Ridge Road, and Beehive Res. USFS RX in Number 2 Canyon. Barriers: slope steepness and operational feasibility	Areas treated (acres, feet, miles etc.)	Chelan County, City of Wenatchee	DNR, USFS, WVFD	High
Forest (type) fuels reduction	Identify and map existing fuel breaks; develop fuel breaks in forested areas using appropriate methods (mechanical thinning, RX fire, grazing, etc) to slow the spread of wildfire; maintain existing fuel reduction projects in planning area	DNR SF treated 440.3 acres across 28 projects in the Stemilt/Squilchuck since 2019. Additional funding including CWDG, FEMA, and capital investments have enabled over 1,000 acres of acres of additional treatments across ownerships.	Acres treated; fuel breaks mapped; fuel breaks identified; areas maintained	USFS, DNR, Chelan County NRD, Landowner, State Park	All	High
Rangeland (type) fuels reduction	Accommodate diverse management objectives; promote native plant populations; develop appropriate fuels reduction strategies for the Wenatchee Foothills including the use of bulldozers, disk plow, handline, RX fire, herbicide application, mechanical treatment, grazing, and native plantings to slow the spread of fire and control invasive species; conduct outreach of best practices for shrub-steppe fuels management	Non-native plants brochure created. Demonstration garden installed at Saddle Rock TH. 30 acres reseeding native grass reseeding project in Methow St burn scar. Barriers included lack of funding and/or timeliness of funding to effectively re-seed or treat noxious weeds post-fire.	Acres treated	WVFD, CDLT, WSU Extension, City of Wenatchee, landowners, Chelan County, NRD, CCPUD	BLM, DNR, USFS, WVFD, Cascadia	High
Implement fuels reduction work in the Stemilt Basin on County and WDFW ownership, including treatments on 600+ acres and broadcast burning on 100+ acres	Plan and implement through contract work and agency partnerships	Multiple projects currently being implemented in Stemilt-Squilchuck.	Acres treated	Chelan County NRD	WDFW, DNR, USFS, Landowners, Cascadia, WVFD	High
Plan and implement priority treatment areas under the DNR 20-year Forest Health Plan in the Stemilt-Squilchuck watershed	Use landscape-scale evaluation to prioritize treatment areas; coordinate with stakeholders to implement treatment	Multiple projects currently being implemented in Stemilt-Squilchuck utilizing 20-year Plan. Development of 2019 Stemilt-Squichuck Landscape Eval.	Acres treated	Chelan County NRD	DNR, WDFW, USFS, WA State Parks, Mission Ridge, Private Landowners, Conservation Science Institute	High
Replace undersized culverts in fire-affected areas	Identify, design, and contract for culvert replacement with fish-passable crossings that can handle possible debris or flow issues caused by fire		Number of culverts replaced	Chelan County NRD, CCFEG, Cascadia	Landowners, agencies, project funders	High

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Biomass disposal and harvest	Explore and employ methods to recycle or dispose of biomass from fuel reduction project waste, construction waste and other wood products (drop site, burn day, free dump day, etc.); continue dialogue about slash disposal planning and timing; support efforts for small diameter thinning, and saw mill opportunity in Central Washington; work with elected officials and regulatory authorities to develop burning opportunities for vegetative fuels in the urban growth boundary of Wenatchee.	Ongoing - free dump days coordinated through CCD, DOE, Waste Loop & WM. Chelan NRD hosted Chelan County Forest Products Campus Summit to engage partners in opportunity for Central WA sawmill.		City of Wenatchee, Chelan County, Dept. of Ecology	Private Business, Landowners	High
List neighborhoods where there are **NOT** adequate hydrants or draft sites.						Medium
Develop an integrated invasive species management plan for Wenatchee Foothills which includes utilizing prescribed fire and post-fire restoration as tools to restore native species	Develop partner workgroup, strategy and funding sources		Acres treated, species diversity	CCD	WISRE, WDNR, WCFD, CDLT, City of Wenatchee, CPUD, Chelan County Noxious Weed Board	Medium
Identify significant evacuation routes which current fuel conditions would make them a priority for grant work	Develop a list of priority roadways based on this 2025 CWPP and seek grant funding		Miles of road improved	WVFD	CCD, Chelan County, PUD	Medium
Create firewood cutting permit areas	Identify new firewood cutting areas to reduce forest fuels; Provide permits, and information to firewood harvesters	Areas established	Firewood harvested	USFS		Medium
Community noxious weed plan	Develop priorities; address boundary issues; address funding issues; develop improved communication strategy			Chelan County Noxious Weed Board	CDLT, WSU Extension, Cascadia	Medium
Encourage and assist adjacent private and agency landowners to map and assess fire behavior and risk across the landscape and consequently perform fuel reduction strategically across the landscape to minimize the movement and intensity of fire across the landscape to residential and agricultural areas.	Identify existing risk and fire behavior information and data gaps; establish plans and timeline for filling data gaps and for strategic approach to fuel reduction	Development of 20-Year Plan and Dual Benefit analysis to coordinate strategic fuel break implementation across ownership.	Fire risk lowered and projected fire behavior less volatile	Cascadia; USFS; NRCS; DNR	All	Medium

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Seek out funding sources from different entities to help support fuel reduction efforts and fuel reduction waste disposal.	Maintain list of funding sources; partner coordination, and list of priority actions		Increased funding to support fuel reduction and fuel reduction waste disposal	All	All	Medium

See ***Figure 43*** for priority fuel treatments in and around Zone E.

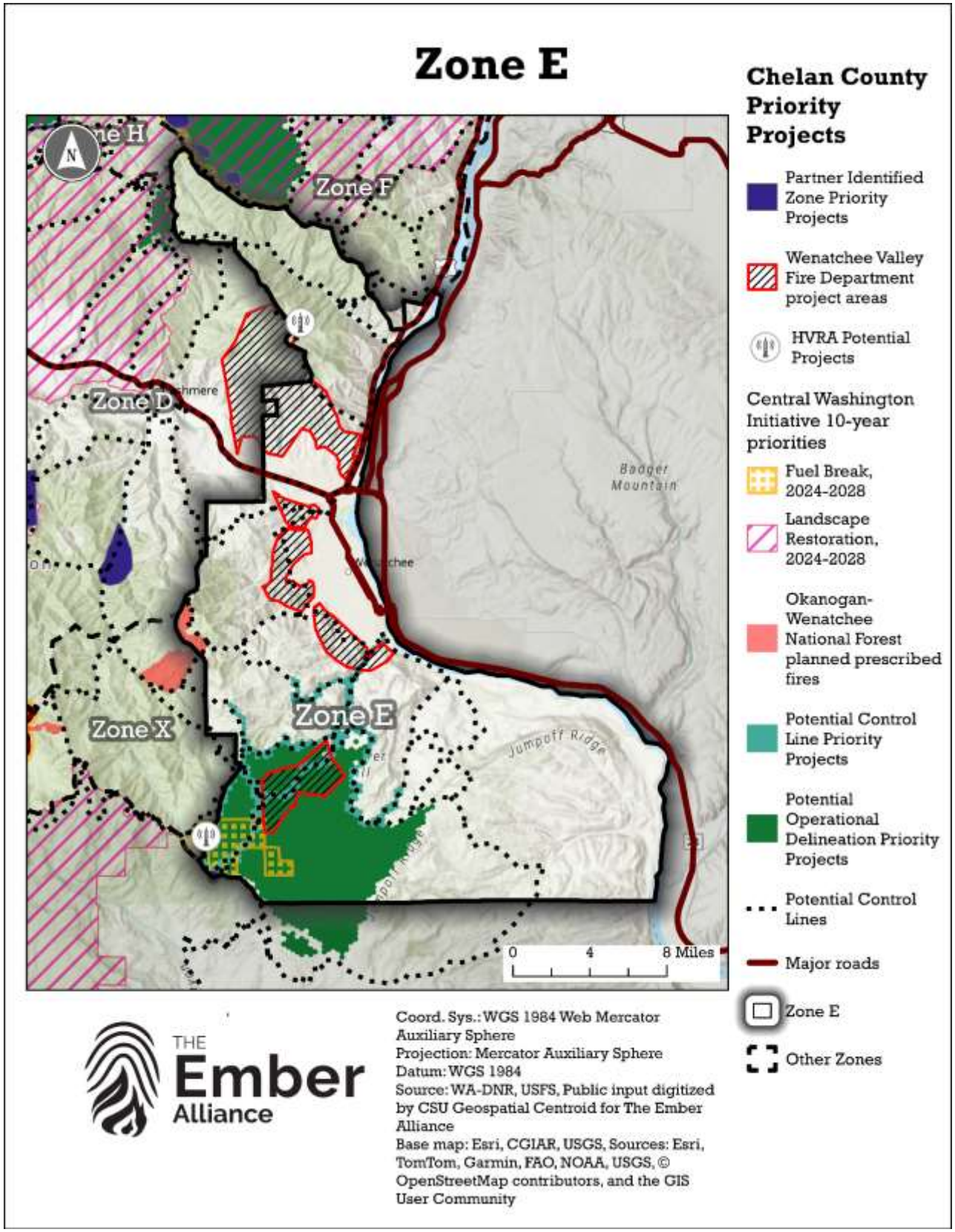


Figure 43. *Priority fuel reduction projects in and near Zone E of Chelan County. Source: WA-DNR. USFS, TEA.*

13.k. Zone F – Entiat

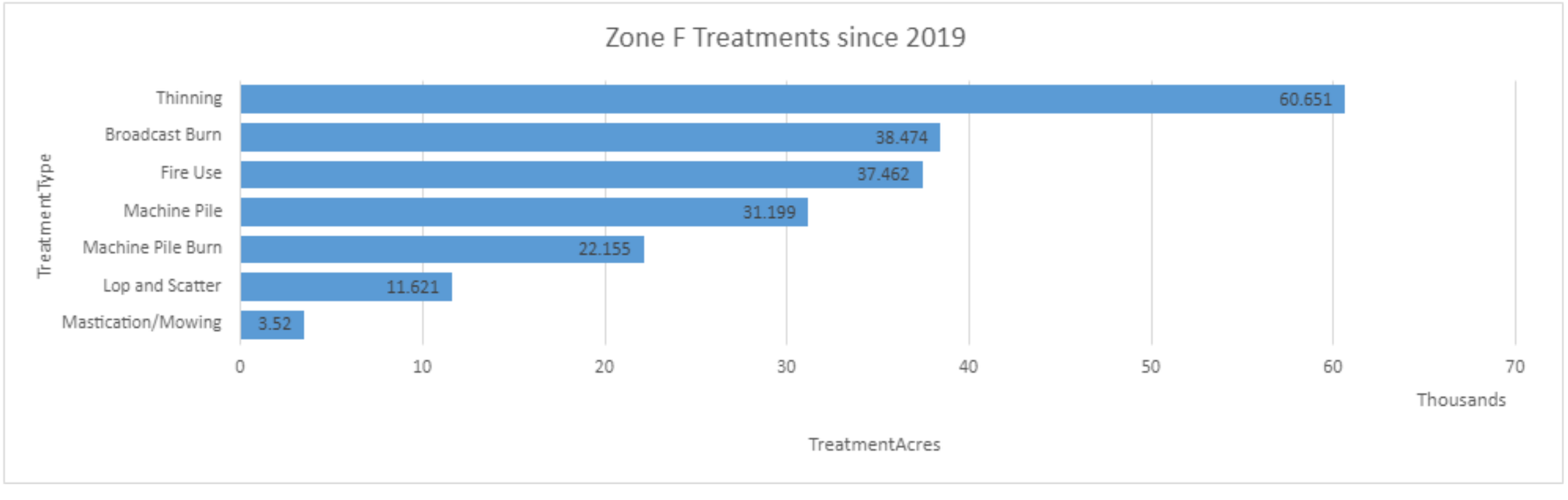


Figure 44. *USFS landscape fuel treatments since 2019; 60,000 acres of thinning, 11,000 acres of lop and scatter and 31,000 acres of piles built. 22,000 acres of piles burned, 38,000 acres of broadcast burning, and 3,500 acres of mastication and/or mowing. Source: USFS.*

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Cohesive Strategy Goal: Fire Adapted Communities						
Annual meeting to review CWPP accomplishments	Rotating schedule to have different agency lead each year			CCD	CWPP Steering Committee	High
Improve Riverwood Neighborhood Defensible Space	Work with USFS to conduct fuels treatments around the Riverwood community		Acres treated	CCD	DNR, USFS, CCFD 6	High
Coordination with private landowners in checkboard ownership on the Entiat Ridge and Moe Canyon fuel breaks	Target outreach to landowners and increased cost-share incentives for participating based on strategic location			CCD	DNR, NRCS	High
Entiat Defensible space and hazardous fuel reduction	Defensible Space for 755 structures, Hazardous Fuel Reduction in the 5517 acres		Many of the homes have defensible space; multiple fuel reduction projects have taken place in the area			High

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Crum Canyon defensible space, access improvement, fuel breaks, and cross-boundary fuels reduction and burning in the Crum Canyon to Sunshine area	Defensible Space for 63 structures, Access Improvement, Fuel Breaks, and fuels reduction within the 3900 acres. Conduct private and public lands fuels treatments, develop agreements for cross-boundary burning and interagency burn plans		Many of the homes have defensible space; multiple fuel reduction projects have taken place in the area, access throughout the area is not a concern	DNR	CCD, BLM, USFS, Private residents	High
Mud Creek/Potato Creek defensible space, access improvement, and fuel breaks	Defensible Space for 202 structures, Access Improvement and Fuel Breaks within the 8369 acres		Many of the homes have defensible space; multiple fuel reduction projects have taken place in the area, access throughout the area is not a concern			High
Home risk assessments	Develop strategy for generating home assessment requests; develop a central database for storing, accessing and sharing home assessment information; host home assessment training for practitioners	WRN in 2021, but there were not enough staff for more.	Number of assessments conducted; development of a data server	CCFD8, Cascadia, DNR	All	High
Encourage and support participation in the Firewise USA Program	Distribute landscaping and construction information; hold workshops on relevant Firewise subjects; support local Firewise USA community initiatives	Other than WRN, it never started. Not enough staff.	Number of Firewise Communities	DNR, CCFD8, Cascadia	NFPA, USFS, BLM, Chelan County, City of Entiat, WSU Extension, local media	High
Produce/ acquire education and outreach materials to address local needs	Annual newsletter to community members informing them of upcoming wildland fire season issues and ongoing cooperative agency/landowner projects.			ALL	ALL	Medium
Youth wildfire education	Partner with local school; work with Columbia Breaks Fire interpretive Center; incorporate wildfire education into the local education curriculum; attend events aimed at engaging youth	Year events hosted at Wildfire Interp. Center with interagency participation	Number of events; adoption of wildfire curriculum	Local School	All	Medium
Local CWPP	Develop local CWPPs within planning area for specific geographical and protection needs.	Never Started	CWPPs developed	Planning area Community	Cascadia, CCFD8, City of Entiat, Entiat River Valley	Medium
Annually update and distribute community emergency phone trees for residents	Establish means of obtaining information and assign task	Never started	Annually updated phone tree	Planning area community	CCFD8, Rivercom911, CCDEM, Chelan County, City of Entiat, Red Cross	Medium
Annually update and distribute community emergency phone trees for residents	Establish means of obtaining information and assign task	Never started	Annually updated phone tree	Planning area community	CCFD8, Rivercom911, CCDEM, Chelan County, City of Entiat, Red Cross	Medium
Increased Mapping Capability	GIS Data Layer needs to be developed in a cooperative effort with USFS and Chelan County Assessor's Office to utilize data from NFPA 1144 forms	In progress. The Mobile Mapping tool never really took off in CCFD8. The tablet was used for Wildfire Ready Neighbors HIZ Assessments	Mapping; database; forms	CCFD8, USFS, Chelan County Assessor	All	Medium

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Develop Mobile Mapping Capability	Seek funding for computer and/or hard copy mapping capability for use in the field on wildland fires.		Equipment; app	Fire District 8 Commissioners and Officers		Medium
Identify and Maintain Address Signs	Seeking funding for and maintain address signage to identify residences.		Number of new address signs	Fire District 8 Commissioners and Officers in collaboration with private landowners.		Medium
Cohesive Strategy Goal: Safe and Effective Fire Response						
Expand awareness with community members for prevention and early detection of wildland fires	Annual agency meeting to discuss upcoming wildland fire season; Develop radio public service announcements specifically tailored to wildland fires that occur in the Entiat Valley	Wildfire Ready Neighbors campaign in 2021. Not enough staff for other work	Annual Meeting; number of announcements	Columbia River Division Fire Operations Specialist and Information Assistant	USFS, CCFD8, DNR	High
Decrease human ignitions of wildfires	Conduct analysis of human ignitions; identify activities that lead to ignition; develop management strategies to reduce human ignitions for each activity	Never started	Human Ignitions decreased	All	All	High
Encourage and support individual evacuation preparedness through the Ready, Set, Go! program	Distribute Ready, Set, Go! information and materials at public events and meetings; edit materials to incorporate relevant Local information	Have ~500 Kits at CCFD8	Number of events reported in AMS	CCFD8, Cascadia, CCDEM	USFS, DNR, City of Entiat	High
Identify adequate Staging and Safety Zone Locations in the Entiat Valley	Identify possible locations for emergency response resources to stage during large wildland fire incidents and pre-identify possible safety zones.	Identified, need to place on map		Fire District 8 Chief and Officers		High
Develop Emergency Water Storage	Identify possible locations for emergency water storage every five miles in the Entiat Valley	CCFD8 and PUD have MOU signed, PUD to put above ground tank at Winesap.		CCFD8	All	High
Recruitment of Volunteer Firefighters	Do community outreach by planning, advertising and staging a public meeting with the express purpose of increasing fire district membership.	Ongoing community outreach and planning. Lack of interest from the community has hindered this work.	Public Meeting	District 8 Commissioners, Chief and Asst. Chief		High
Interagency Fire Training	Pursue wildfire training and skill development compliant with NFPA and NWCG standards; develop joint initial and extended attack exercise, with emphasis placed on unified	Yearly pre-season North Chelan Cooperators Meeting every year since 2019	Training hours	CCFD8	Fire District 8 Chief and Asst Chief. USFS Columbia River Division Chief, WDNR Local Area Manager	High

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
	command that utilizes resources from all three firefighting agencies					
Management of Evacuation Routes	Reduce fuels to less than 4 tons per acre within 100 feet of evacuation routes and manage standing vegetation to not support crown fire Post signs on all unmarked roadways (street name, road number, etc); all critical evacuation routes should remain open and maintained for safe travel by emergency response vehicles and by passenger cars evacuation the area	DNR Service Forestry Fuels Reduction, USFS and BLM fuels reduction	Number of new postings	Chelan County, City of Entiat	CCFD8, Rivercom911, USFS, BLM, DNR, Longview Fibre	High
Post signs to raise fire hazard awareness	Annually review and update prevention signing program, including the use of highway electronic reader boards (appropriate message)		Number of sings posted.	Columbia River Division Fire Operations Specialist and Information Assistant	USFS, DNR, CCFD8, City of Entiat	Medium
Cohesive Strategy Goal: Resilient Landscapes						
Mitigate potential losses of critical infrastructure to wildfire	Identify and map vulnerable infrastructure; develop mitigation strategies	It has been identified but needs to be mapped.	Planning area map and strategy	CCPUD	All	High
Increase fire resiliency in riparian areas utilizing instream restoration	Build beaver dam analogs in strategic locations, identify wet meadow restoration opportunities					High
Support Hazardous Fuel Treatment Projects Within the Wildland Urban Interface	Provide landowners with training pertaining to fuels management methods and techniques, forestry skills and utilization of wood products. Focus on defensible space program; secure matching grants to provide financial assistance to those private landowners in need for reducing fire risk on their properties; secure grant funding to purchase community chipper. Develop hourly use rates to cover replacement cost and yearly maintenance cost	DNR SF secured two grants for ~500K since 2019. Actively Engaged with project implementation in Crum Canyon (133 acres). Beginning project implementation in Mud Creek and Mills Canyon. Barriers include the cost to landowners and regulatory issues around burn permitting	Acres	Collaborative effort between Fire District 8, WDNR, USFS, Forest Land stakeholders, and private landowners	Cascadia, builders, residents	High
Coordinate resilient landscape work among agencies, across jurisdictions and ownership	Concentrate on the USFS, WDNR, WDFW and BLM vegetation management work in areas adjacent to private landowners. Work cooperatively starting in greatest hazard areas Coordinate with adjacent property owners to increase project effectiveness and scope where appropriate; promote RX Fire use in planning area, and collaboratively among jurisdictions	Mad Roaring Mill and Tillicum LE's conducted by WADNR. PCL's identified by interagency fire partners		ALL	All	High

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Encourage and assist planning area residents to implement defensible space/ fuels reduction	Utilize existing community assistance programs	DNR SF treated 7.7 acres across 5 individual cost share projects since 2019	Number of structures treated,	CCFD8, DNR, Cascadia	City of Entiat, USFS,	High
Coordinate hazardous fuel treatment projects between private landowners, state and federal land managers	Coordinate, at a minimum, annual discussion regarding hazardous fuel treatment programs with Forest Service, WDNR, and Fire District 8, landowners where appropriate on cross boundary projects; create a wildland urban interface fuels reduction zone from Potato Creek to the United States Forest Service Boundary at mile marker 26. Treat fuels along Chelan County Road 51 and all residences creating a 150-foot fuels reduction zone. Chelan County Fire District 8, United States Forest Service, Washington State Department of Natural Resources and private landowners should work cooperatively to maximize available resources; engage volunteer firefighters and WUI Assessment Zone leaders in identifying desirable cross-boundary projects	DNR SF, USFS and BLM coordinating Cross Boundary treatments in Crum Canyon, and Mills Ck. Also working with DFW and DNR State Lands		Fire District Commissioners, Chelan Douglas Land Trust	USFS, DNR, WDFW, CCFD8, Cascadia,	High
Public involvement in proposed vegetation treatment	Develop a list of hazardous fuel treatment contractors and forestry consultants; coordinate volunteer opportunities; enhance agency outreach efforts		Number of volunteer hours tracked			Medium

See ***Figure 45*** for priority fuel treatments in and around Zone F.

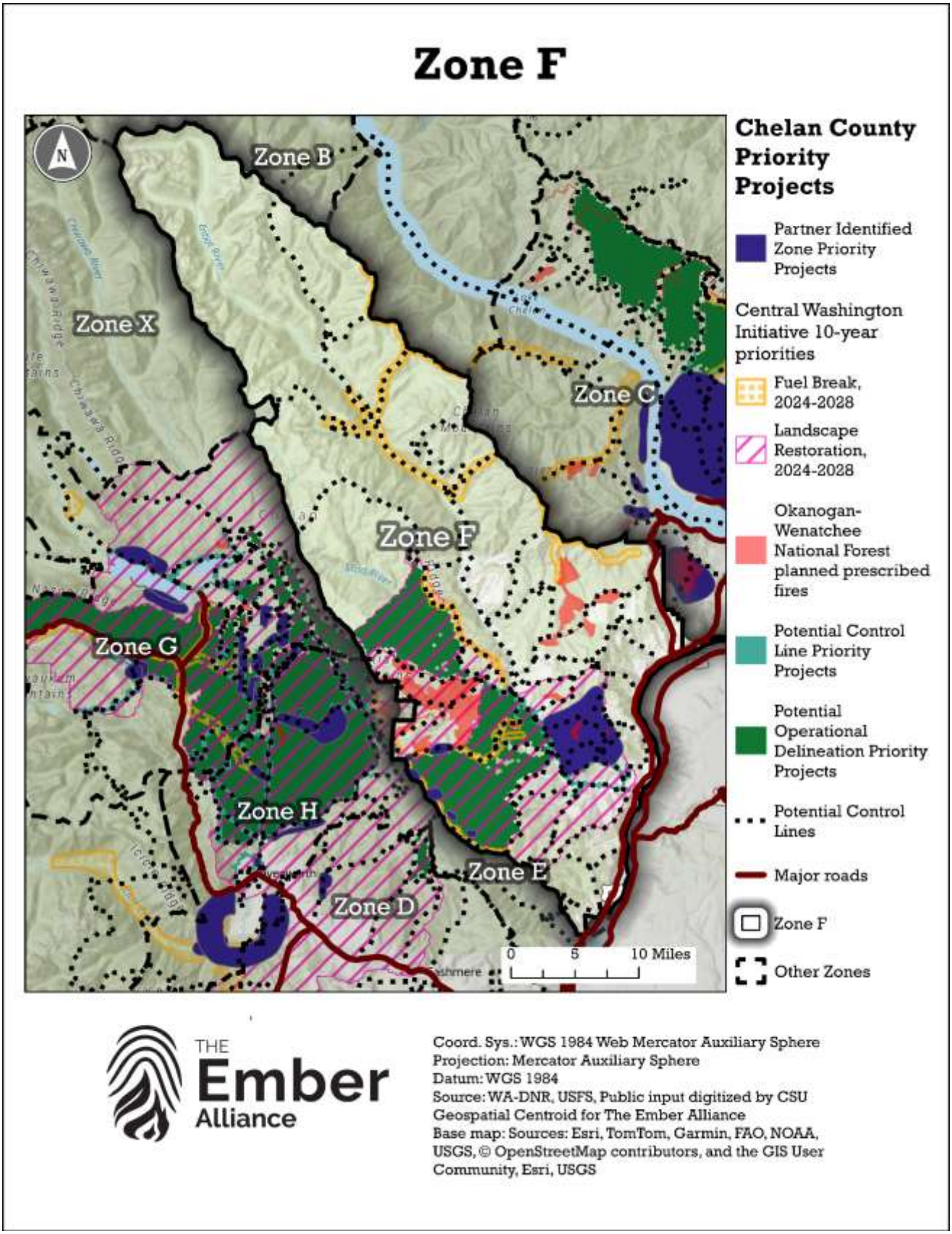


Figure 45. *Priority fuel reduction projects in and near Zone F of Chelan County. Source: WA-DNR. USFS, TEA.*

13.l. Zone G - Lake Wenatchee

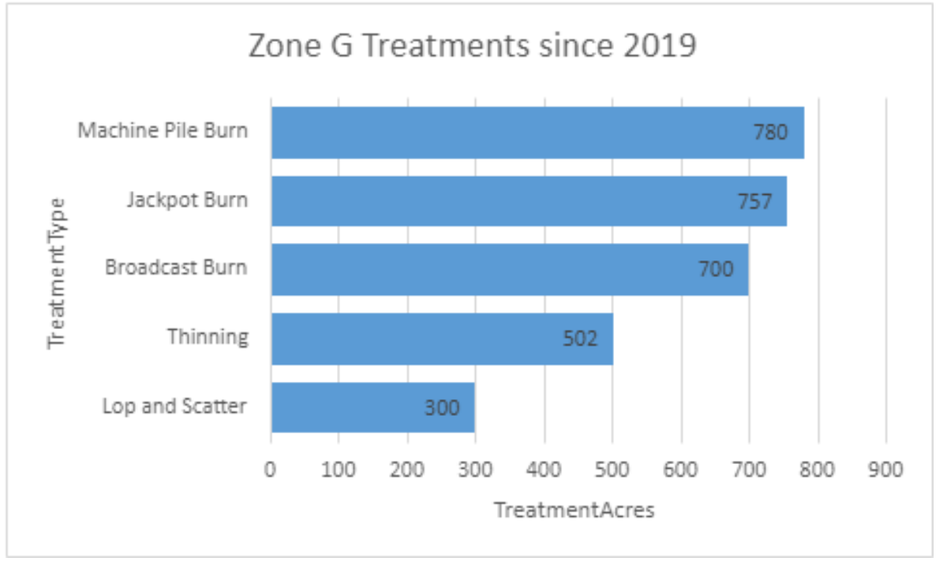


***Figure 46**. USFS landscape fuel treatments since 2019; 502 acres of thinning and 300 acres of lop and scatter. 780 acres of pile burning 700 acres of broadcast burning, and 757 acres of jackpot burning. Source: USFS.*

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Cohesive Strategy Goal: Fire Adapted Communities						
During non-emergent conditions, provide personnel that can assist in home assessments, fuel reduction, response planning and community outreach	Secure funding for seasonal emergency response personnel during periods of increased response demands caused by wildfires	Accomplishments: LWFR Seasonals and Wildfire Risk Reduction Coordinator, Chipping Program, Community Outreach program (LWFR), Cascadia/Team Rubicon Partnership, WiRe, Cost Share, PUD Vegetation management, USFS: treatments, ASIP training organized by DNR. Barriers: Covid, smoke, NEPA compliance, Staffing/capacity (housing), weather windows, wildfire activity, local and contractor availability for vegetation management Bons to success: grants, more federal and state funding, increased collaboration, Winton as vegetation disposal option, DNR-Cascadia-LWFR partnership supporting Firewise communities	# Seasons implemented	LWFR	WA DNR, Cascadia, LWFR Auxiliary, Chelan CO	High

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Improve key evacuation routes (*could specify like this: that have been closed/decommissioned: River Rd., Camp 12)	Improve and make available during emergencies a secondary egress route on Camp 12 Road that would serve over 400 residents. Assess and improve other evacuation routes as needed.	More Camp 12 talk, increased discussions. Barriers: lack of project prioritization, multi-jurisdictional ownership, capacity to outreach Potential Boon: Team Rubicon?	# of new egress routes opened	DNR, LWFR	Chelan Co, LWFAC, CWSC	High
Host a Lake Wenatchee Fire Adapted Communities meeting once every 2 months	Organize, and lead this group of engaged residents around the concepts of Fire Adapted Communities		Attendance at meetings and how many meetings hosted	LWFR	Firewise leaders, residents, LWFR Auxiliary	High
Database for landowners who are interested in prescribed fires on their property and connect to partners.	Integrate prescribed fire planning and outreach into existing cost-share programs and outreach efforts		Number of individuals in database	CCD	Cascadia PBA, LWFR, DNR	High
HEPA Filer and Box Fan loaners programs for citizens to manage smoke	Develop loan and distribution program					High
County Shoreline Management Plan regulation assistance	Provide economical and practical pathways for residents to meet defensible space recommendations within shorelines of the state					High
Improve County Rd. Standards	Improve Road Infrastructure and Maintenance to reduce risk					Medium
Create understanding and better tell the story of what projects have been accomplished on a parcel level	Database or progress report that is publicly accessible with maps for homeowners to use for insurance purposes.			LWFR	LWFAC, CCD	Medium
Direct outreach to residents and formalize an annual outreach plan	Annual outreach workplan and calendar of typical activities. Annual letter to the community updating on wildfire prevention accomplishments over the last year.					Medium
Improve smoke preparedness among vulnerable citizens	Education, resources, outreach for assistance programs.					Medium
Better prepare tourists	Educational Resources in rental and hotel units.					Medium
Economic mitigation for fire	include economic mitigation in both post-fire recovery and during the fire, like lost business during closed highways					Medium
Address homes not included in FPD	Yodelin community					Medium
Harden Critical Infrastructure from wildfire	Harden Fire Stations, Power Substations, Water Facilities, Communications towers		Acres treated; Buildings Hardened	LWFR, LWFAC	LWFR, WA DNR, Chelan County	Medium
Cohesive Strategy Goal: Safe and Effective Fire Response						
Improve early warning systems and notification platforms to advise both responders and the public to impending hazards or current situational updates.	Increase use of AlertSense, identify warning systems for emergencies including post-fire flooding	5 Sirens coming to LWFR summer 2024, 2 Wildfire Early Detection Cameras installed 2023, County changed from Alertsense to Everbridge for emergency alerts. This project was successful partially due to grant funding.	# of citizens signed up for AlertSense	Chelan Co EM	LWFR, Chelan Co Public Works, NWS, NRCS, Cascadia	High
Improve centrally located emergency operations center with apparatus and administrative facilities. This complex will also serve as a refuge for those citizens impacted by disasters.	Seek funding and acquire land to expand our Plain Area Station	Land is purchased, and needs capital funding for structure	% complete	LWFR	LWFR Auxiliary, Chelan County EM	High

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Develop, collect, store, and share GIS Layered Map identifying water sources, evacuation routes, response zones and response plans with pre-identified areas of responsibilities.	Develop central database and data management system. Complete surveys and maintain data.	None (RE-WRITE objective or get clarity); Fire Defense Plan: LWFR makes strategic plan for defending community from wildfire, and identifying locations for stopping/slowing fire, establishing community protection lines and defensive structures --based on local community priorities. Barriers include Siloed shapefiles (even within agencies), no GIS specialist, could this be public facing? -- dedicated funding/staff time	Complete/ Not complete	LWFR	Cascadia, Chelan CO, other Fire Districts, USFS, DNR, RiverComm , Chelan County EM	High
Improve safe travel conditions imperative during evacuations and emergency response. (improving conditions laterally from main roads, Cedar Brae, 207 Beaver Valley, Lake Wenatchee Highway, Chiwawa Loop, Shugart Flats: need work on both sides to make them safe during evacs/provide shaded fuel break)	Reduce fuels within 100' of evacuation routes (dead standing, down vegetation, and thinning	Some project work has been done by PUD, Need USFS support	# of road miles thinned	LWFR	Chelan CO Public Works, DOT, Cascadia, CWSC, Chelan County EM	High
Increase capacity during emergencies (Reword key activities)	Institute a CERT-like training program to involve local teams and citizens in assisting their local communities and neighborhoods during emergencies. Reword (no CERT, already have a volunteer program), this would be a separate activity but call out need for seasonal staff for specific needs like fuel treatment projects.	No action taken; funding needed	# of trained volunteers	LWFR	LWFR Auxiliary, LWFAC	High
Improve reliability of power sources during emergencies (need generators for water systems: water supply districts)	Provide alternate power sources to critical infrastructure during emergencies (fire stations, water distribution points, and water treatment facilities. Add radio communications, need more water supply, get more specific on the need for back-up power	4 of 5 stations have backup generators. funding and availability of generators is an issue (2 years out if you order today)	% critical infrastructure with back-up power source	LWFR	Chelan Co EM, WA State EM, FEMA	High
Emergency Power	Providing resources for vulnerable people/communities					High
Design & Install Dry Hydrants/Cisterns in areas without Municipal water.	Installation	No actions taken	Number of Hydrants Installed	LWFR	WA DNR, US Fish & Wildlife, USDA	High
Cohesive Strategy Goal: Resilient Landscapes						
Sustain and improve Rivercom Infrastructure	Continue the buildout of the RiverCom infrastructure to ensure communications with emergency responders.	Round Mtn repeater improved		River Com, Chiefs Association	LWFR, Fire Districts, Fire Marshal	High
Implement fuels reduction on the priority Coulter Creek Road PCL	Reduce fuels along the Coulter Creek Road PCL with hand thinning and machine mastication to create a fuel break from valley bottom to ridge top	Funding from DNR, CWDG	Acres of thinning, piling, mastication	CCNRD	DNR, Chinook Forest Partners	High
Implement fuels reduction on private lands adjacent to UWPP FRB treatments on federal lands	Hazardous fuels reduction, forest health thinning	Funding from CWDG	Acres of thinning, piling, mastication	CCNRD	DNR, Cascadia, LWFR	High
Implement fuels reduction on federal lands within the UWPP FRB footprint	Hazardous fuels reduction, forest health thinning	Funding from DNR, USFS, Chelan County, PUD, grants	Acres treated	CCNRD	USFS, DNR, Blue Forest	High

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Encourage a collaborative effort by both public and private entities to reduce fuels in the drainages above the Lake Wenatchee/Plain area	Develop and coordinate a partnership group or extension of existing FAC or NCWFHC groups focused on All Lands, All Hands projects in the planning area	UWPP, Cost Share, USFS, Firewise, Referrals to partner agencies; DNR Service Forestry treated 66 landowner projects for a total of 485 acres since 2019. received 2 WSFM and NFP grant awards for 400K for landowner cost share; Bureaucracy, engaged community lead, workforce, turnover, weather window for Rx BOONS: Blue Forest funding, Firewise support, focused outreach for Cost Share, increased collaboration; Barriers for implementation include cost to landowners; Small parcel sizes such as Chiwawa Pines and Ponderosa are difficult/expensive to treat individually; Resource challenges include treating in NSO habitats or Shoreline of the State buffers	Acres Treated, Acres planned, funding secured	LWFR/Cascadia	NCWFHC, DNR, USFS, LWFAC, Firewise Communities, HOAs, Irrigation District, etc.	High
Fuels Treatment to increase road survivability						High
Encourage the USFS to complete fuels reduction activities at the landscape scale with an emphasis of creating strategic fuel breaks that will enhance local fire suppression efforts and utilize “natural” fuel breaks where feasible (such as orchards, ridge tops, highways, rocky outcrops and irrigated pastures)	Work with USFS to identify project areas. Facilitate collaboration during the planning process. Facilitate landowner involvement., On a broader scale, work with USFS to incorporate socio-economic concerns into the Forest Restoration Strategy EMDS runs	Planning has started on Chumstick to Lower Peshtin	Acres treated	LWFR	USFS, Chelan County DNR, Residents, LWFAC, Cascadia CD	High
Complete fuel reduction along County roadways	Prioritize roadways for fuel reduction activities (for better ingress/egress)., Recruit landowners to participate in neighborhood ingress/egress projects (e.g. Icicle Island Club)., Collaborate with County and landowners to implement., Work to maintain residential sense of place, aesthetics, privacy needs while allowing appropriate ingress/egress.	Large population 65+ years old	Miles of roadway treated.	LWFR/Cascadia CD	WA DNR, Chelan County Public Works, Landowners, Chelan Co. PUD	High
Lake Wenatchee/Chumstick	Defensible Space among 5553 structures.	Chumstick to LP project is underway	Many of the most at risk 5553 structures have defensible space completed			High
Increase fire resiliency in riparian areas utilizing instream restoration	Build beaver dam analogs in strategic locations, identify wet meadow restoration opportunities			CCD	CFEG, TU	High
Implement fuels reduction on Nason Ridge Community Forest and neighboring lands	Hazardous fuels reduction, forest health thinning	Funding from DNR, CWDG, NRCS	Acres treated	CCNRD	CDLT, State Parks, DNR	High
Establish better coordination and collaboration between partners implementing fuels reduction and forest restoration projects	Establish an implementation committee which meets regularly and develops a coordinated implementation plan		Successful multi-agency project implemented	SNW	CCD, DNR, LWFR, Chelan County, USFS	Medium
Prioritize treatments on Shugart Flatts	Work with forest service and private landowners to implement coordinated fuels treatments.			Chelan County	CCD, DNR, USFS, LWFR	Medium
Blue Forrest FRB (Forest Resilience Bond)	Projects in Lake Wenatchee & Plain	2024 Work currently being done			Blue Forrest	Medium
Encourage management of slash piles on the Nason Community Forest.			Piles burned	LWFR		Medium
Conduct/Implement Prescribed Burning programs on Private Land	Hire & Train Workforce, Build Prescribed burn program, Community Outreach	Local Cascadia PBA Formed	Acres Treated; Program Implemented	LWFR, LWFAC	LWFR, Cascadia PBA, WA DNR, USFS	Medium

See ***Figure 47*** for priority fuel treatments in and around Zone G.

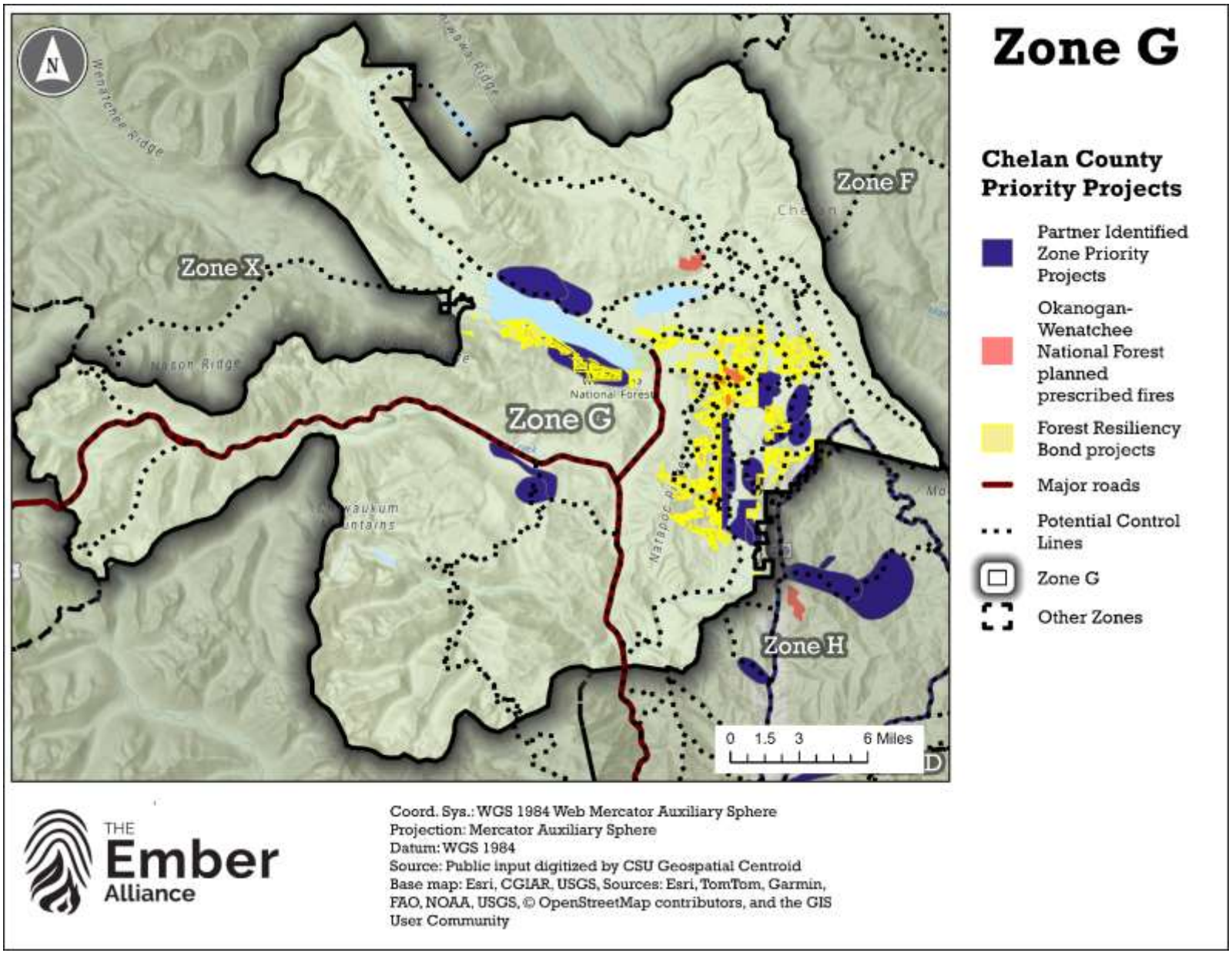


Figure 47. *Priority fuel reduction projects in and near Zone G of Chelan County. Source: WA-DNR. USFS, TEA*.

13.m. Zone H- Leavenworth & Chumstick

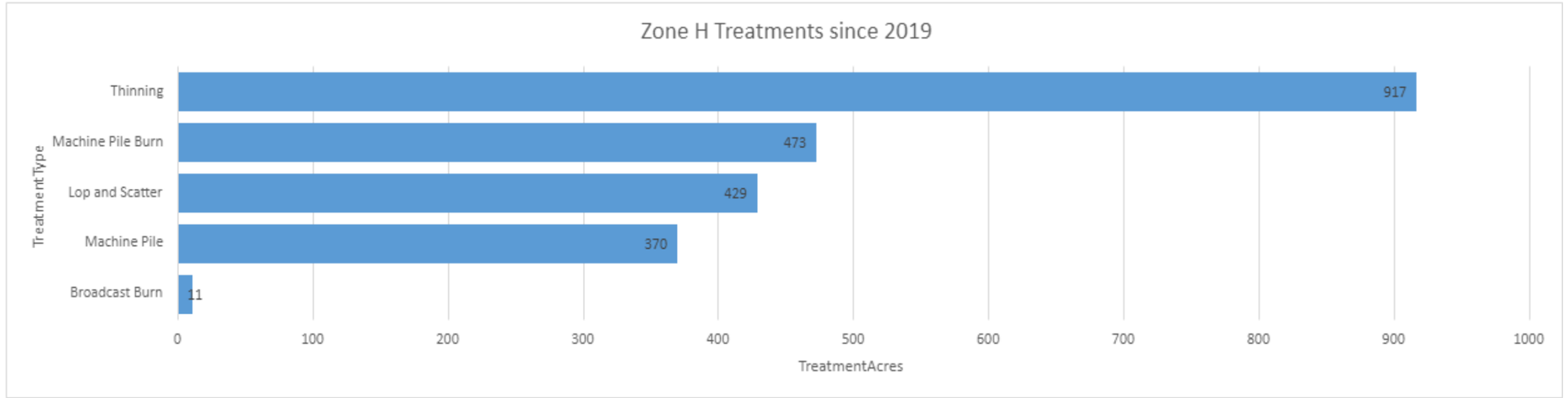


***Figure 48**. USFS landscape fuel treatments since 2019; 917 acres of thinning, 429 acres of lop and scatter; 370 acres of piles built, and 473 acres of piles burned, and 11 acres of broadcast burning. Source: USFS.*

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Cohesive Strategy Goal: Fire Adapted Communities						
Compile essential Firewise information and distribute it to landowners and businesses in and adjacent to the Leavenworth CWPP area	Target: residents, second homes, vacation rentals, real estate agents, new homeowners; compile information for: Firewise USA, defensible space, Ready, Set, Go! ember awareness, emergency planning, what to do in case of fire; develop targeted messaging; identify funding; secure mailing list; mail	Partnerships between agencies. Pros and Cons to state led Wildfire Ready Neighbor effort. Ongoing work. utilized RSG, Wildfire Ready Neighbors, WiRE and Firewise and reached over 1000 landowners. Also conducted outreach events such as Earth Day, Community Town Hall, Leavenworth Engagement nights	Number of landowners reached	CWSC	CWSC, CCFD3, insurance companies, real estate, BVBA, Chamber, USFS, WA DNR, Cascadia CD	High
Continue / renew annual emergency planning workshop for businesses	Utilize FEMA curriculum; Recruit businesses; hold workshop	Could bring business resiliency workshops back, and especially on the heels of fire seasons	Number of attendees	CWSC	Chamber, BVBA, CWSC, Chelan Co. DEM, Insurance Companies, WA EMD, Business Owners, NCW EDD, NGO's, WA Dept. of Commerce	High

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Provide wildfire information to homeowners' association meetings	Identify HOAs; determine contacts; determine schedule; provide information	This could be improved by developing a comprehensive list of HOAs and getting on the schedule. Limited number of HOAS, need to use road associations as well.	Number of HOAs reached	CWSC, Cascadia CD	CCFD3, CWSC, NRCS, WA DMR	High
Hold an annual Firewise workshop for all interested residents	Network with Cascadia, WSU Extension, DNR; identify funding; recruit participants; plan workshop; present workshop	Complete through the annual town hall. Successful event and planning to continue.	Number of participants	CWSC	CWSC, Cascadia CD, NRCS, WA DNR, WSU Extension, CCFD3	High
Maintain Firewise Community status in the Chumstick	Hold Firewise USA day; track in-kind contributions; report annually	Complete	Annual renewal	CWSC	Cascadia CD, WA DNR	High
Pursue Firewise Community status in other neighborhoods within the CWPP and add new ones	Network with Cascadia; recruit neighborhood sparkplugs; consider workshop introducing process	Achieved recognition on Ski Hill, started at Dempsey. Will develop a strategic plan for smaller FW communities.	Number of Firewise Communities recognized in Leavenworth CWPP area.	Landowner sparkplugs	Cascadia CD, CWSC, WA DNR	High
Utilize Ready, Set, Go! Program materials in the CWPP area	Report Ready, Set, Go! Participation in AMS system; consider applying for grant; produce one publication for Chelan County as described in outreach meeting; acquire additional materials for distribution; encourage use program within the county	Maxed out the grants: Bi-lingual pamphlet developed and distributed through public outreach; incorporated into evacuation response form. Produced an original outreach document	Number Ready, Set, Go! Guides distributed	CCFD3	CWSC, CCFD3, WA DNR, Chelan County EMD	High
Continue and renew annual emergency planning workshop for businesses	Utilize FEMA curriculum; Recruit businesses; hold workshop; hold workshop	Did business resiliency workshops for a few years: bring it back.	Number of attendees.	CWSC	Chamber, BVBA, CWSC, Chelan Co. DEM, Insurance Companies, WA EMD, Business Owners, NCW EDD, NGO's, WA Dept. of Commerce	High
Develop new Firewise communities in each canyon of Chumstick				CWSC		High
Develop community and neighborhood long-term recovery strategies/plans	Develop key partnerships with those who will serve on a long-term recovery group; develop a long-term community recovery plan; work with neighborhoods and Firewise communities to map assets and resources within their neighborhoods; determine key leaders from neighborhoods who will be able to work with long-term recovery needs to serve as a conduit of information between leaders and community members and share community needs with long-term recovery groups	CWSC/WRCD completed for Leavenworth but has not been adopted by City: Need to check back with Hilary and Annie to see the status	Long-term Recovery Plan is created; long-term Recovery Group is formed; community organizations	TBD	City of Leavenworth, Chelan County (Public Works and Planning), Firewise Communities, Churches, VOADs, Community Foundation of NCW, Cascade School District, Health related organizations, WA Dept. Commerce, NCW EDD, City and County Managers, Elected Officials	High
Address vulnerable communities	CCFD #3 has a significant Hispanic population where language is often a barrier; seasonal occupants in FS campgrounds					High

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Implement Firewise USA recommendations within 200 feet of all private homes and essential infrastructure	Secure cost-share funding for landowners; recruit landowner participation; Implement	CCFD 3 surveyed all Chumstick Watershed structures. Many landowners have completed. CWSC 123 project with 25 landowners and 130... DNR Service Forestry has completed 682 acres of fuels reduction treatments and has received 2 WSFM grants for ~417K for landowner cost share: Need to improve follow-up to see who has implemented recommendations	Acres treated	Landowner	CWSC, Cascadia, NRCS, WA DNR, CCFD3	High
Provide wildfire information to business owners for distribution to visitors during wildfire season and wildfire incidents	Create wildfire information card; place IIO in business core during wildfire incidents; encourage networking with Chamber and BVBA during prescribed burning	Complete and ongoing	Number of businesses contacted.	IMT	CWSC, Chamber, USFS, BVBA	High
Provide post-fire recovery information to residents, landowners and businesses	Complete After the Fire toolkit; develop Community After the Fire resource guide; distribute as necessary	Resource guide developed and distributed at fire meetings and post-fire meetings; BAER Team works with WAEMD, NRCS, NOAA, DNR	Toolkit completed	CWSC	CWSC, NRCS, Cascadia, WAFAC, WA EMD, Chelan County DEM, NGO's, Firewise Communities, Neighborhood sparkplugs, Cascade Medical Center, CCFD3	High
Zone H Steering Committee will be meeting at an agreed upon frequency	Establish Leavenworth community Firewise groups (i.e. citizen core) to foster collaboration and coordination					High
Inform the public on planning efforts for large scale evacuation scenarios in downtown Leavenworth	Include summary of simulations and planning efforts in annual letter to residents			CCFD 3	DEM	High
Increase awareness for wildfire prevention and response efforts for both new and old residents	Annual mailing, especially in high-risk areas, providing an overview of prevention and response efforts occurring in the area, and information on evacuation		Letters sent	CCFD 3	RC3, CWSC, CCD	Medium
Develop an emergency preparedness guide for distribution to all residents	Utilize LWFAC Emergency Preparedness Guide as a template and adopt for Leavenworth, print and distribute to all residents			CCFD 3	CCD, DNR, RCD	Medium
Create local working groups that can be engaged more regularly than the five-year updates. Help keep processes fresh and spearhead funding applications	Foster collaboration and communication across various levels of government and organizations in Leavenworth through the formation of standing working groups to manage ongoing mitigation activities					Medium
Establish zone-specific post-fire recovery plans	Utilize existing templates and work with Okanogan Long Term Recovery to help develop plan based on their expertise		Plans complete	Local FDs	Okanogan Long Term Recovery	Medium
Inform the residents on the level of service they should expect	Identify landowners in "no man's land"; notify landowners of location and expected service	Ongoing	Landowners contacted.	CCFD3	CCFD3, CWSC, Cascadia Conservation District, USFS, DNR	Medium

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Utilize a post-fire recovery strategy to encourage return of tourism	Develop radio spots, Woody Goomsba ad and press releases pre-fire; develop "menu" of post-fire options (e.g. "fire sale" on lodging or materials, community party for firefighters, etc.). Identify post-fire advertising sources	Chamber was not interested in 2019; new director should be approached		Chamber	CWSC, Chamber, BVBA	Medium
Develop and review business continuity and community infrastructure plans.	Develop key partnerships with community leaders, infrastructure mangers, key business owners; develop and review continuity plans and resources	Not started for business continuity; ongoing for community infrastructure through CCFD 3	Businesses have created continuity plans; community leaders are familiar with and reviewed plans; community leaders understand their role in post-fire recovery`	TBD	Elected officials Government entities, Infrastructure managers, CWSC, NGO's, Businesses, WA EMD, Chelan County DEM, Housing Authority, NCW EDD, WA Dept. of Commerce, Business Owners, Cascade School District, Health related organizations	Medium
Participating in Forest Service and State Management policy issues during amendment processes to provide input to insure local land/homeowner interest are considered	Identify opportunities for input: Forest Plan revision, DNR 20-Year Strategic Plan	Complete and ongoing; participation in State 20-year Plan and 10-year Wildfire Strategies; help open house for Chumstick to LP and participate in NCWFHC		NCW Forest Health Collaborative, CWSC	Cascadia CD, WA DNR, USFS	Low
Work with local businesses to promote the availability of Firewise purchases (1/8" screening, Class A roofing, Firewise landscaping, etc.)	Contact businesses; publicize	Occurring naturally through market demand after implementation of WUI Codes	Number of incentives offered	CWSC	Chamber, BVBA, CWSC	Low
Cohesive Strategy Goal: Safe and Effective Fire Response						
Develop evacuation plan for the downtown core	Develop plan; distribute plan; practice plan	DEM has a plan for Leavenworth Christmas Lighting, need to see if it is also applicable for Wildfires: Need to check with DEM	Evacuation plan in place for downtown core	TBD	City Chamber, BVBA, Chelan Co. DEM, CCFD3, Business owners	High
Develop area "pre-attack plan"	Work with USFS/CCFD3/DNR to gather existing data; acquire GIS funding; produce and vet plan	Complete and ongoing	Complete	CCFD3	CWSC, USFS, WA DNR, Chelan County DEM	High
Address coordination needs to occur in a logical, sequential way (e.g. Eagle, Chumstick Creek, Mountain Home properties)	Standardize location of address signs; contact person at Chelan County responsible for assigning addresses to assist and verify correct information; standardize appearance of signs	Completed. The County started a program which is successful	Miles of roadway renumbered	Chelan Co.	Chelan Co, CCFD3, Chelan DEM	High
Develop evacuation warning systems and safe escape routes: Evaluate the need for, and potentially complete, a comprehensive evacuation plan addressing the unique challenges in Leavenworth, including a road risk analysis, traffic control measures, re-routing options, and risk mitigation strategies.	Procure and install warning signs; contact radio station for possible help with emergency information; make signs saying in case of emergency, tune your radio to KOHO. Research, develop and potentially install enhanced community warning systems in Leavenworth with support from mitigation grants.	Ongoing	Evacuation routes marked/Contingency communication plan in place	Chelan Co DEM	CWSC, Chelan DEM, CCFD3, Chelan Co. Sherriff	High
Encourage homeowners to display addressing on visible signage	Mail address order forms to all landowners within the Leavenworth Area CWPP.	Completed for all Chumstick watersheds; available on CCFD 3 website and they can make them in house	Address signs ordered	CCFD3	CCFD3, CWSC	High

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Conduct risk assessments of individual structures and essential infrastructure for the entire planning area and implement identified recommendations	Secure funding, identify assessors, Train assessors if needed; assess and compile; implement	Completed for all Chumstick through WiRE study; additional assessments completed by CCFD 3 and Wildfire Ready Neighbors	# structures assessed	TBD	CCFD3, CWSC, Cascadia, WA DNR	High
Identify, develop and maintain safe areas, shelters, and staging locations	Identify funding; prioritize locations; determine maintenance responsibilities and schedules	Complete, need to identify next steps for sharing with public	Number of areas in place	TBD	USFS, WA DNR, CCFD3, CWSC	High
Produce emergency evacuation route maps and provide that information to landowners	Identify funding; develop emergency evacuation route maps; include emergency contact information; Consider evacuation drill; mail	Completed an evacuation guide for the public in Lake Wenatchee that could be replicated: Plan developed and approved by fire district; have not developed maps due to concerns over changing conditions.; has not been distributed to public. Includes safe areas; Fire District will work on outreach after MOUs with private landowners prior to homeowner outreach	Routes identified.	Chelan County DEM, CCFD3	Chelan Co. Sheriff, Chelan Co. DEM, CCFD3	Medium
Develop water sources for firefighting efforts.	Use USFS Fire Atlas to identify water sources in the CWPP planning area; locate sites to install 5,000-to-10,000-gallon water storage tanks to provide additional water; improve additional drafting sites; pursue funding for sites previously identified: Eagle Creek (2 sites), Merry Canyon (2 sites) and Chumstick (3 sites); locate additional site(s) on Mountain Home Road	Ongoing, CWSC is working on water tanks. The county got earmarked funding for new water tanks	Gallon's capacity added	CCFD3	CCFD3, WA DNR, USFS, CWSC, Landowners	Medium
Improve outreach and education around evacuation planning and procedures	Hire consultant to develop messaging and outreach plan in coordination with fire districts and local agencies		Media touches, mailer sent, etc.	RC3	CWSC, Local FDs, DEM	Medium
Increase access to HEPA filters and Box Fan Filters for smoke events	Establish a HEPA Filter loan or distribution program. PSAs on box fan filters and free box fan distribution at fire station			CDPHD	CAFE, CCD, Local FDs, DEM	Medium
Develop uniformity of all road signs and install signs (evacuation route, road names/numbers, Fire danger, etc.) at strategic location. Sign design will meet County and State (if appropriate) requirements.	Work with County and USFS to identify needs; prioritize signs for replacement/installation	On-going (evac routes viability not determined yet)	Road signs installed.	TBD	Chelan Co, CCFD3, CWSC	Low
Identify draft points during an incident and communicate those locations to the City of Leavenworth to ensure consistent water monitoring	Identify points; determine point of contact	Ongoing	Locations identified	IMT/City	City, CCFD3, IMT, USFS, WA DNR	Low
Cohesive Strategy Goal: Resilient Landscapes						
Provide prescribed and wildfire information at recreation stores and to the Chamber/BVBA in Leavenworth for seasonal visitors	Develop distribution network, outreach strategy and messages; partner with outdoor retailers (including those west of the Cascades) and recreation sites (Stevens Pass, Lake Wenatchee State Park) to share prescribed fire information	Generated brochures for STRs; Did some Rx Fire outreach through stores and chamber during HB 2928 Forest Resiliency Burning Pilot	Number of stores participating.	CWSC	Chamber, BVBA, CWSC, USFS, Cascadia CD, Recreational Clubs, CCFD3	High

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Provide alternatives to burning slash to reduce smoke impacts on community	Acquire a large mobile bio-char processor or air curtain burner, continue to utilize chipper programs and bio-char kilns when feasible			CCD	DNR, USFS	High
Increase fire resiliency in riparian areas utilizing instream restoration	Build beaver dam analogs in strategic locations, identify wet meadow restoration opportunities			CCE	CFEG, TU	High
Increase opportunities for safe and beneficial use of prescribed fire on private lands	Improve access to training and equipment for residents, improve interagency coordination, educate community on benefits of prescribed fire, coordinate cross-boundary burns and increase capacity for burning			Cascadia PBA	DNR, CCD, USFS	High
Utilize media as a tool to promote forest restoration and community preparedness work	Develop outreach strategy and messages; share and promote the work of partners and homeowners; partner with media outlets	Ongoing. Had a communication plan including social posts and local newspaper articles for a few years.	Press releases, PSA's, social media posts, TV	CWSC	CCFD3, DNR, USFS, NCW Forest Health Collaborative, Cascadia CD, Washington Prescribed Fire Council, City of Leavenworth	High
Provide prescribed fire information to business owners for distribution to visitors	Develop distribution network, outreach strategy and messages; create prescribed fire information card; place information cards in business core during prescribed burns; encourage networking with Chamber and BVBA during prescribed burning; partner with outdoor retailers (including those west of the Cascades) and recreation sites (Stevens Pass, Lake Wenatchee State Park) to share prescribed fire information	Completed for 2 years by CWSC. Fizzled out due to lack of capacity: Consider going back to the chamber. Utilize trail head ambassador program	Number of businesses contacted	IMT	CWSC, Chamber, USFS, BVBA, Cascadia CD, Civic Clubs, Recreational Clubs, Chelan-Douglas Health District, Cascade Medical Center, Firewise Communities, CCFD3	High
Create 200-foot-wide fuel breaks on strategically located areas (such as the CWPP high priority areas) that will have the greatest benefit for the entire project area.	Identify priority areas as determined through CWPP update; secure funding; recruit landowner participation; Implement	Fuel breaks have been identified through the POD/PCL. Being utilized by DNR and Cascadia to prioritize treatment areas.	Acres treated	USFS	USFS, CWSC, CCFD3	High
Identify extreme hazard sites and work with landowners to reduce fuel loads of these sites to improve safety for an entire area (mouth of Spromberg Canyon)	Identify sites; prioritize sites; mitigate hazards	Add code enforcement and county fire marshal	Number of sites mitigated	CWSC	USFS, WA DNR, CWSC, NRCS, Landowner, CCFD3	High
Encourage the USFS to complete fuels reduction activities at the landscape scale with an emphasis of creating strategic fuel breaks that will enhance local fire suppression efforts and utilize "natural" fuel breaks where feasible (such as orchards, ridge tops, highways, rocky outcrops and irrigated pastures)	Work with USFS to identify project areas; facilitate collaboration during the planning process; facilitate landowner involvement; work with USFS to incorporate socio-economic concerns into the Forest Restoration Strategy EMDS runs	Planning has started on Chumstick to Lower Peshtin	Acres treated	CWSC		High

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Encourage the USFS to link future treatment areas (such as the lower Chiwawa area) to the area treated through the Chumstick Hazardous Fuel Reduction Environmental Assessment	Work with USFS to identify project areas; facilitate collaboration during the planning process; facilitate collaboration during the planning process; facilitate landowner involvement	Complete. Planning area was expanded to include whole Chumstick to link treatments	Acres treated	CWSC	Plain community, CWSC, WA DNR, USFS, CCFD3, CCFD6/CCFD9	High
Collaborate with USFS, NCWFHC, and scientists to determine a plan for post fire harvest	Identify researchers and partners who will be working on a post fire landscape and their roles. Understand the policy and framework in which all entities can work in a post fire environment; identify key issues and barriers to post fire harvest; identify areas where post fire harvest could be feasible; have agreements in place	NCWFHC worked with sustainable NW, Conservation NW, TNC, DNR and others to develop a post-fire harvest white paper. DNR has developed the Work of Wildfire Report	Where feasible, harvest occurs following a fire	TBD	TNC, USFS, WA DNR, NCWFHC, CWSC, Contractors	High
Work with private landowners to determine a plan for their lands in a post fire environment	Identify strategies to help stabilize and recover the landscape; incorporate strategies into individual forest and landscape management plans; identify and share technical and financial assistance resources	Completed as needed by CCD		TBD	Cascadia CD, WA DNR, NRCS, CWSC	High
Complete fuel reduction along County roadways	Prioritize roadways for fuel reduction activities (for better ingress/egress); recruit landowners to participate in neighborhood ingress/egress projects (e.g. Icicle Island Club); collaborate with County and landowners to implement; work to maintain residential sense of place, aesthetics, privacy needs while allowing appropriate ingress/egress	Ongoing; DNR, CCFD 3 and CCD are partnering with Chelan PUD and County Public Works to complete fuel reduction efforts in coordinated and strategic locations	Miles of roadway treated	TBD – Cascadia Conservation District?	CWSC, WA DNR, Chelan County Public Works, Landowners, CCFD3, Chelan Co. PUD	High
Complete fuel reduction along primitive roadways	Identify and prioritize primitive roadways for fuel reduction; acquire funding; work with landowners and County to complete fuel reduction	Ongoing; DNR, CCFD 3 and CCD are partnering with Chelan PUD and County Public Works to complete fuel reduction efforts in coordinated and strategic locations	Miles fuel reduction completed		Cascadia Conservation District, Chelan County Public Works, CWSC, Landowners, CCFD3, Chelan Co. PUD, USFS, WA DNR	High
Wildfire mitigation settings along powerlines in areas of high fire danger (Lake Wenatchee/Plain) during fire season, started in 2021. Installed remote SCADA devices to move in and out of that state based on weather forecasts, started in 2024	increased inspections, extra precautions to reduce risk of ignition along powerlines			CPUD		High
Increase Ignition resistance/ Continue fuel reduction around structures	Home assessment, home hardening, Hazard Fuel Zones			Chumstick, DNR, FD 3		High
Contact BNSF Railroad about Chumstick Rd reducing fuels around their infrastructure				CCFD 3	Chelan County, PUD, CCD	High
Improved Coordination on large landscape restoration projects between partners and private landowners	Establish a implementation committee which meets regularly and develops an implementation strategy for coordinated hazardous fuels reduction and forest restoration treatments			SNW	CCD, Chelan County, USFS, DNR, Local FDs, CWSC	Medium

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Conduct cross boundary prescribed fires to maintain fuels treatments on rattlesnake hill, Ski Hill, and Tumwater Mountain	Develop Wydne Agreements, Complete NEPA and necessary surveys, write burn plans, conduct multi-agency burns		Acres treated	USFS	CCFD 3, Cascadia PBA, DNR, CCD	Medium
Convene discussion of burn bans, campfire closures, burning decision makers to explore options for consistency and ease of use	Meet with USFS, DNR, Chelan County Fire protection districts; determine feasibility of incorporated/unified closures	Completed. now coordinated by zones and coordinated through regional chiefs' association		Fire Chiefs	USFS, DNR, CCFDs, WA Dept. Ecology	Medium
Encourage the USFS to continue permitting sheep grazing allotments in the Chumstick Creek watershed and align grazing routes with strategic fuel breaks (such as ridge tops).	Contact USFS; identify current grazing permits	Ongoing	Acres of strategic importance grazed.	CWSC		Medium
Develop burning regulation decision-tree for landowners to demystify current burning regulations	Convene CCFD3, DNR, Ecology; develop outreach materials; distribute	Complete. ON CCFD 3 website	Completed decision tree	CWSC	USFS, WA DNR, Ecology, Cascadia CD, NRCS, CCFD3	Medium
Utilize existing billboard on highway and/or AM radio station to provide fire-related information such as fire danger level, burn ban regulations, prescribed fire notifications, informational messages or reminders (i.e. "No campfires"), and/or what to do if smoke or a fire is detected (i.e. "report signs of smoke or fire immediately Call 911")	Contact WSDOT; determine costs/protocols; schedule billboard and/or Contact DOT re: possibility of AM station	Implemented for prescribed fire, trailer chain safety messages, etc. CCFD 3 has a direct phone line and can have them change the sign messages.	Days in place	TBD	WA DOT, CWSC, USFS, WA DNR, Ecology, CCFD3	Low
Investigate biomass conversion technology for opportunities to implement biomass utilization technology in the CWPP area and County wide as part of fuel reduction projects		Significant work took place with Chelan County received a wood innovation grant; C6 Carbon private company had the opportunity to start a biochar plant at Winton but funding has not been approved; wood campus has support from county commissioners and is continuing to move forward		Biomass Collaborative	Biomass Collaborative	Low
Request a waiver or special standard be established for fuel management in riparian setbacks	Contact County and DNR; identify areas for field review; work to determine viable solution	Complete in the last shoreline management plan	Process in place for landowners	TBD		Low
Work with Chelan County to modify Shoreline/Riparian restrictions to allow establishing defensible spaces around structures and along ingress/egress routes by trimming of shrubs, pruning ladder fuels and generally reducing the fuels loads	Consider requesting that the County adopt WDNR Forest Practice Standards for fuels reduction projects in Shoreline/Riparian designated areas	Completed in 2020 Shoreline Management Plan	Standards in place	TBD		Low
Work to accommodate the many special circumstances found on primitive roads in the Leavenworth area including seasonal contracts.	Contact landowners on primitive roadways; identify options for fire service (e.g. seasonal contracts, safe zones, turnarounds)	On-going (Demsy Rd and others)	Landowners contacted.	CCFD3	CCFD3, Landowners	Low

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Lake Wenatchee/Chumstick	Creating Defensible Space	Currently using 20-Year Plan and Dual Benefit analysis to drive grant applications and implementation	5553 Structures and 59,540 acres treated		USFS	Low
Icicle Road	Creating Defensible Space		439 Structure and 3,859 acres treated		USFS	Low

See Figure 49 for priority fuel treatments in and around Zone H.

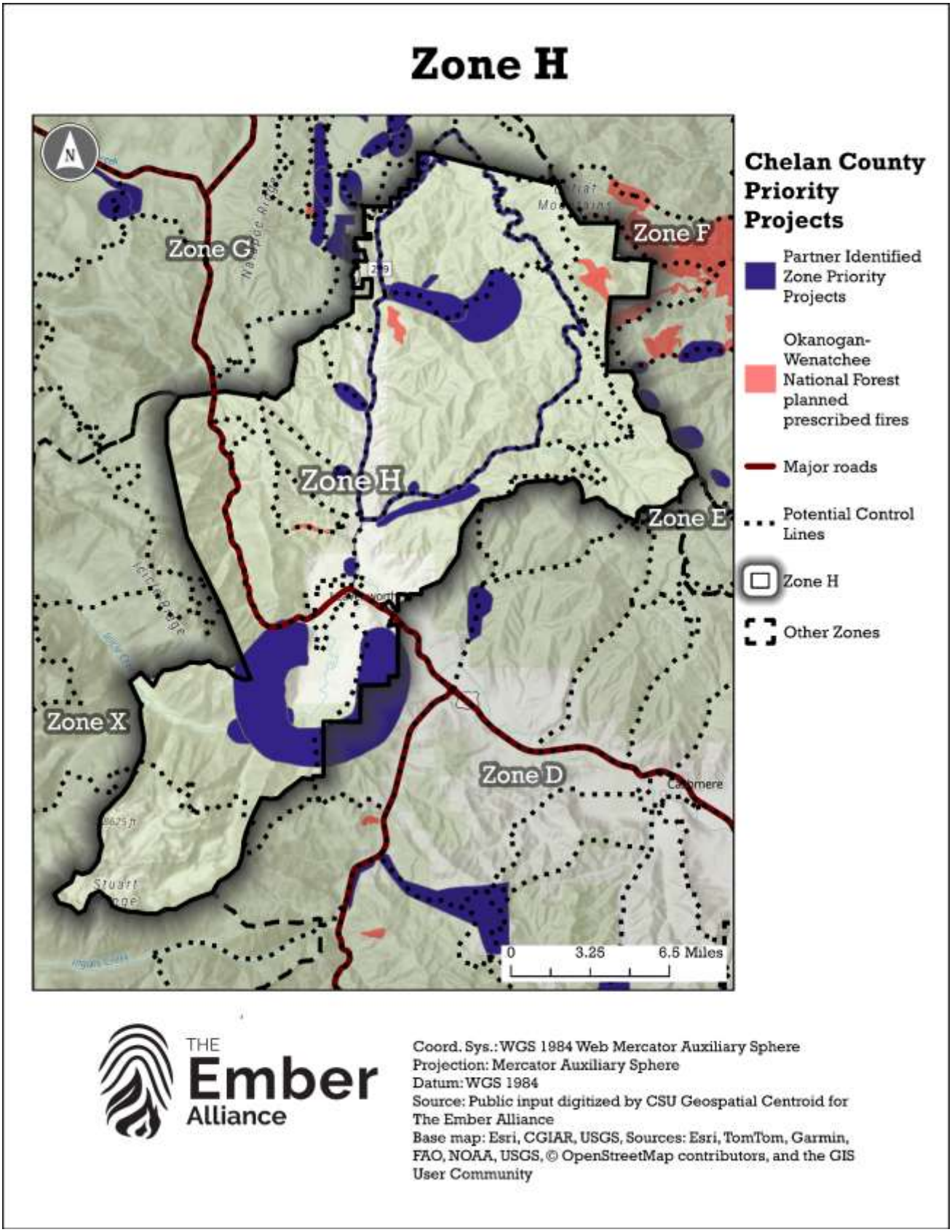


Figure 49. Priority fuel reduction projects in and near Zone H of Chelan County. Source: WA-DNR. USFS, TEA.

13.n. Zone X - State & Federal Lands

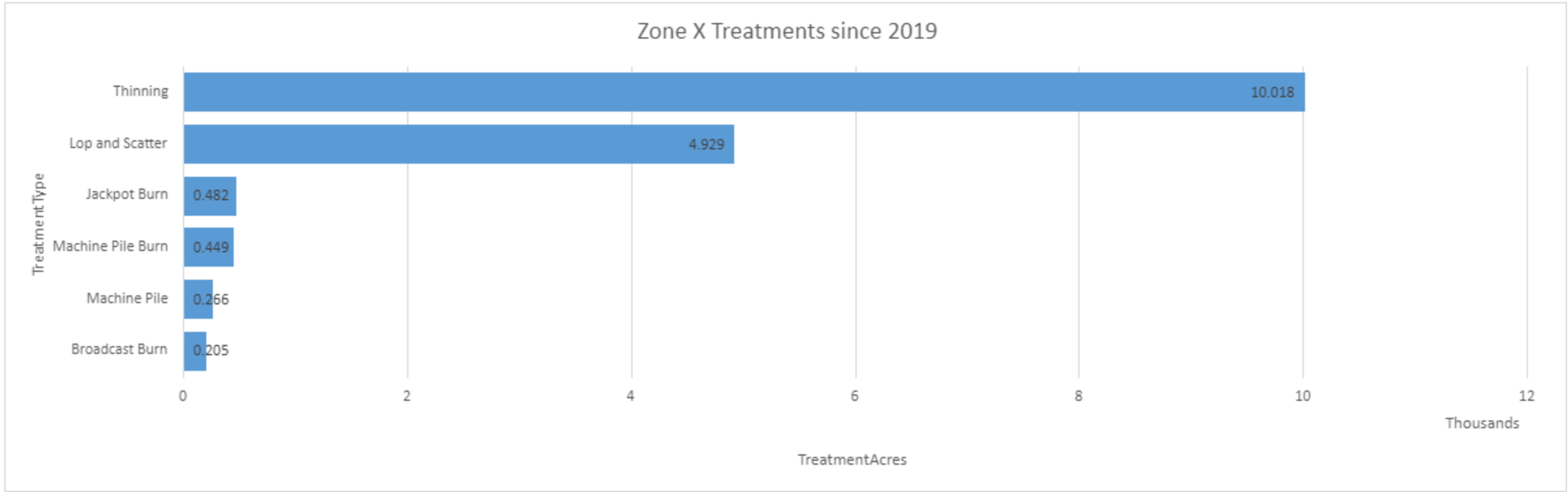


Figure 50. *USFS landscape fuel treatments since 2019; 10,000 acres of thinning, 5,000 acres of lop and scatter. 226 acres of piles built and 449 acres of piles burned. 205 acres of broadcast burning and 482 acres of jackpot burning. Source: USFS.*

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Cohesive Strategy Goal: Fire Adapted Communities						
Continue to encourage homeowners to reduce fuels and implement Firewise recommendations 200 feet around homes and structures	Educate homeowners living on leased USFS land with Firewise info. Identify opportunities to plan projects to help reduce fuels next to any structures on USFS land.	DNR Service Forestry completed 3 projects for 95.6 acres, in private inholdings near Lake Wenatchee and Icicle Creek				High
Encourage property owners outside of a Fire Protection District to explore being annexed into existing FPD						High
Opportunities to incorporate cooperative agreements should be pursued						Medium

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Secure and make available structure fire protection materials to homeowners. Including, but not limited to foam and/or house wrap						Medium
Cohesive Strategy Goal: Safe and Effective Fire Response						
Evaluate opportunities of re-establishing access into historic and surveyed roads for safety and firefighting purposes	Encourage internal departments within the USFS to keep roads open for fuels and fire suppression purposes.					High
Reopen and maintain critical roads for access during fuels reduction, initial attack and suppression, and/or emergency evacuation	When decommissioned roads are opened for fire suppression work encourage internal departments within the USFS to keep roads open for fuels and fire suppression purposes after the incident.					High
Work cooperatively with the federal agencies and Chelan County Sheriff's Department to establish an evacuation and structure protection plan and make it available to landowners and visitors	Meet with Sheriff's Dept. to assess current evacuation routes for wildfire emergencies. Coordinate between the 3 Ranger Districts to identify routes that could be used for escape if primary and secondary evacuation routes are blocked. Finalize routes, distribute and post on Forest Website.					High
Coordinate with local contractors for the transportation of personnel and equipment during major fire events. Inventory location of local private and public resources and document compatibility for use during fire events	All Federal Firefighters will come with transportation provided by the Agency. There are some limited circumstances to do an emergency equipment rental agreement on scene. Usually, contractors have a VIPR Preseason Agreement done and there are rules for them to get dispatched in a certain order. Each Federal Fire resource is self-sufficient for 72 hours and they all have Incident Commanders that can order additional needs through CWICC. Identifying and documenting local resources such as water sources is very valuable.				USFS	Medium
Cohesive Strategy Goal: Resilient Landscapes						
Reduce fuel loads and hazard trees at a minimum of 100' from the center line of all roads and driveways so that they can serve as emergency evacuation routes	USFS coordinate internally to work towards getting roadside fuels reduction work completed in identified evacuation routes.					High
Encourage the federal agencies to continue current fuels reduction activities at the landscape scale with an emphasis of restoration of a low intensity fire regime and the creation and maintenance of strategic fuel breaks that will enhance local fire suppression efforts and utilize "natural" fuel breaks where feasible (such as ridge tops, rock outcrops and roads)	The USFS has a 5 Year plan for Hazardous Fuels reduction work across the Forest. There are many variables that lead into conducting a prescribed fire and the 3 Ranger Districts in the County are proactive in maximizing the amount of burn days within the prescription parameters as laid out in the burn plans. This will continue.					High
Remove old unoccupied, unused federal shacks/buildings in the Zone	Identify specific shacks/buildings and bring that information to your local Ranger Station with an explanation of what you are requesting and a justification. This is not a guarantee that any action will be taken.					High

Recommendations for 2025-2030						
Objective	**Key Activities**	**Actions Taken**	**Measure**	**Coordinator**	**Partners**	**Priority**
Participate with federal agencies fuels reduction efforts. Community members will work with the agencies to pursue fuels treatments on lands federally managed that complement fuels reduction efforts on adjacent private lands. Public lands nearest to private property should have the highest priority for fuels reduction efforts	If there is a possibility for a fuels reduction project adjacent to houses on USFS land, then contact your local Ranger Station. USFS internally identify areas where future fuels projects can be planned adjacent to houses.					High

See Figure 51 for priority fuel treatments in and around Zone X.

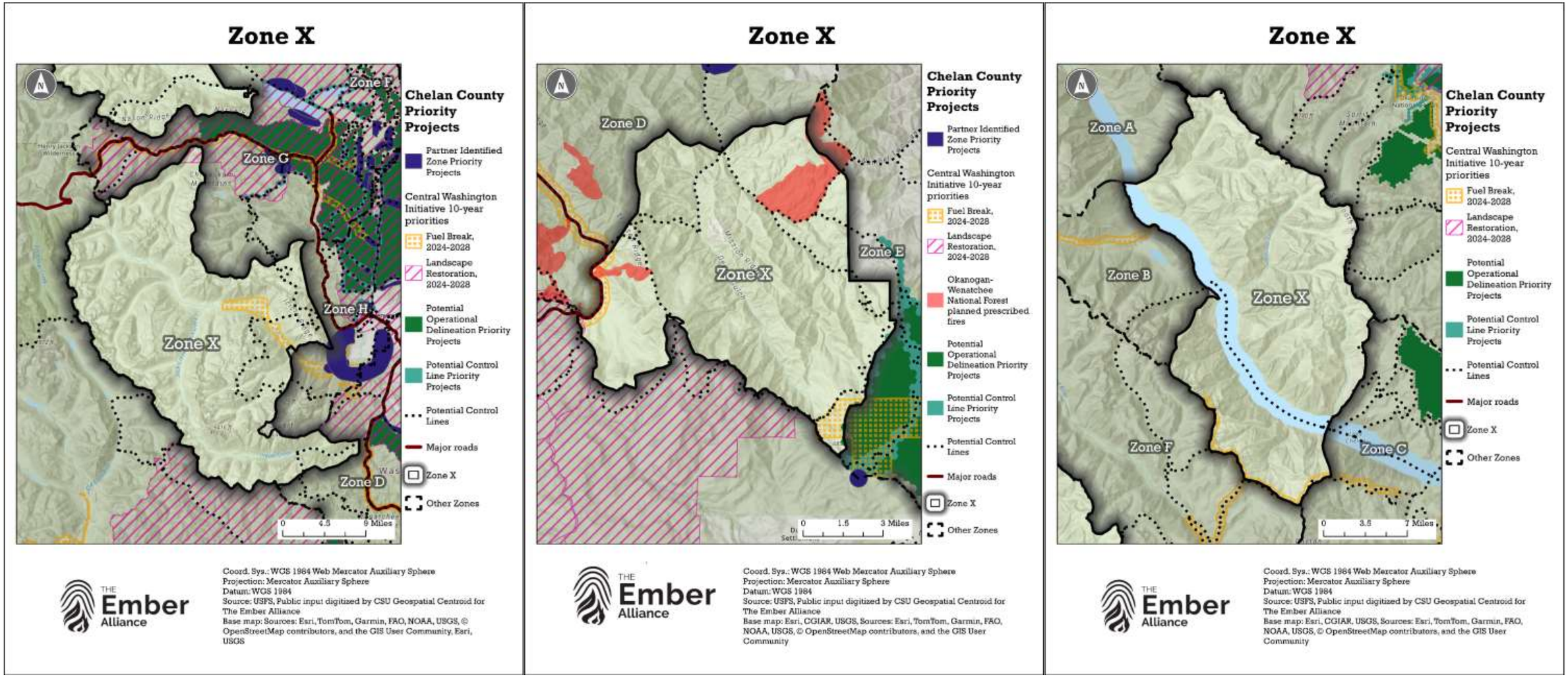


Figure 51. *Priority fuel reduction projects in and near Zone X of Chelan County. Source: WA-DNR. USFS, TEA.*

Regional Land Management Recommendations

Wildfires will continue to ignite and burn depending on the weather conditions and other factors enumerated earlier. However, active land management that modifies fuels, promotes healthy shrubland and grassland conditions, and promotes the use of natural resources (consumptive and non-consumptive) will ensure that these lands have value to society and the local region. The Washington DNR, Washington Department of Fish and Wildlife Service, BLM, USFS, private forest landowners, and all other landowners in the region should be encouraged to actively manage their wildland-urban interface lands in a manner consistent with reducing fuels and wildfire risks.

Control Invasive Weeds

Non-native or invasive plants have been spreading across the western United States since Euro-Americans began settling the region. With the aid of grazing livestock and human disturbance, some non-native species have spread over vast areas and can out-compete many native species. This change in vegetation regime often comes with secondary impacts such as an increase in fire frequency or fire intensity, as well as many other impacts.

There are many methods that can be utilized to control non-native species from spreading. The size of the outbreak and the species involved will determine the most effective method to control the outbreak. Small outbreaks of non-native plants can often be pulled by hand and disposed of before the plant goes to seed. Mowing, spraying, and even biological (insect) methods can be employed to control larger outbreaks. Regardless of the method, timing is often very important, and a quality plan will ensure the treatment is successful.

Control Insects and Disease

Insects and diseases have been a common occurrence within forests and shrublands throughout the western U.S. for millennia. In the past, these impacts generally occurred in specific locations and would eventually run their course, often benefiting the ecosystem by creating natural openings in the forest. Currently, our forests are unhealthy due to a variety of reasons and are subject to outbreaks of insect and/or disease over much larger areas than historically normal. These large outbreaks lead to severe impacts because they leave the forest susceptible to stand replacing wildland fires.

Having a healthy forest or shrubland is the first, and most effective, step in combating the effect of insect or disease outbreaks. Insecticide can be sprayed over affected areas to eradicate harmful insects. Pheromones can be used, on a smaller scale, to deter certain species of insects from attacking an individual tree.

Thin Shrublands

Many of the shrublands throughout the western U.S. have become overstocked and stagnant. There are numerous reasons to explain why this is, but regardless of the reason, it is widely accepted that some management is required. Overstocking leads to numerous other health issues including susceptibility to insects, disease, and drought.

A suitable spacing for shrubs is selected to reduce the ability of fire to spread between shrubs. The shrubs are cut by hand or with a machine and mulched or piled for burning. The result is a stand of shrubs that is less dense which allows the remaining shrubs to have access to more resources (water, sunlight, and nutrients) than there was pre-thinning, creating a healthier ecosystem that is more resistant to insect and disease outbreaks.

Reintroducing Fire to the Ecosystem: Managed Fire

Fire has been removed from the system for several decades because it was once seen as destroyer of our nation's natural resources (Pyne, 1982). This exclusion has resulted in an unnatural build-up of fuel that, when fire does occur, has higher potential to be a stand replacing event (Odion et al., 2014). The lack of wildland fires has also changed the species composition that historically occurred in many areas by allowing fire intolerant species to dominate or co-dominate the canopy.

Reintroducing wildland fire under the right place, time, conditions and with agency-specific policy, can be accomplished in multiple ways. The first and most obvious is to simply conduct prescribed burns. Another way is to manually collect downed woody debris and either removing it from the site or to pile it for burning. Chipping or mulching is yet another method that mimics the effects of fire by reducing large amounts of fuel into small chips that decompose more rapidly than a large diameter log would. These are just a few suggestions of how to reintroduce fire or mimic the effects of fire.

Targeted Livestock Grazing

Livestock grazing, particularly cattle, has been a long-standing tradition in the rangelands of central Washington. Historically, ranchers were able to make agreements with state and federal land managers to expand their grazing operations on public ground for mutual benefit.

> *"Today, livestock grazing is being rediscovered and honed as a viable and effective tool to address contemporary vegetation management challenges, like controlling invasive exotic weeds, reducing fire risk in the wildland-urban interface, and finding chemical-free ways to control weeds in organic agriculture."* [43]

Most rangeland ecologists agree that in ***site-specific*** situations, livestock can be used as a tool to lower fire risk by reducing the amount, height, and distribution of fuel. Livestock can also be used to manage invasive weeds in some cases and even to improve wildlife habitat.

By definition, "Targeted grazing is the application of a specific kind of livestock at a determined season, duration, and intensity to accomplish defined vegetation or landscape goals. (*Targeted_Grazing.Pdf*, n.d.)"

There are many factors to consider regarding the use of livestock for reducing the amount, height, and continuity of herbaceous cover (especially cheat grass) in site-specific situations:

- During the spring, cheatgrass is palatable and high in nutritional value before the seed hardens. Repeated intensive grazing (two or three times) at select locations during early growth can reduce the seed crop that year. In areas where desirable perennial species are also present, the intensive grazing of cheatgrass must be balanced with the growth needs of desired plants that managers and producers want to increase.
- USFS has one sheep grazing permit. Goat grazing trials have resulted in excessive erosion and non-natives post-grazing.
- The Bureau of Land Management (BLM) in some locations has an active "green strip" program designed to reduce fire size and spread in key areas. Livestock can be used to maintain such green strips to reduce the fine fuels (grasses) and control the spread of fire.
- The concept of "brown-strips" refers to areas where one or more treatments (prescribed fire, mechanical thinning, herbicide, and/or grazing) are used to reduce shrub cover, releasing the native perennial grasses. This method leaves "brown-strips" when the stubble dries out in mid-summer, serving as fuel breaks to control the spread of wildfire. Where appropriate, protein-supplemented cows, goats, or sheep could be used to intensively graze and create brown-strips (e.g. along fences) to reduce the spread of fires during or after years of excess fuel build-up.
- Strategic locations could be grazed annually to reduce fuel loads and continuity at specific locations. Rotation of locations across years prevents overgrazing of any one area but confers the benefits of fuel load reductions to much larger landscapes. Even moderate grazing and trampling can reduce fuels and slow fire spread(*Publications & Other Scholastic Works | Extension | University of Nevada, Reno*, n.d.).

Dormant season grazing of perennial grasses has also been reported to aid in seedling recruitment. Some seeds require scarification before they germinate. That can be accomplished by passage through the digestive tract or by hoof action on the seed.

Targeted grazing can reduce wildfire risk in specific areas. The targeted grazing strategies discussed above all require a very flexible adaptive management approach by both land management agencies and targeted grazing providers.

Livestock grazing is a more desirable tool for managing wildland fire risk on both private and public lands because it poses less risk than prescribed burning, is less expensive than chemical applications, can be managed effectively for the long-term, and it benefits a large sector of the local economy.

> *The role of grazing as a tool for fuel management is generally supported, but it should be cautiously evaluated on a case-by-case basis because fire potential is influenced by interactions among several ecosystem variables.* (*Publications & Other Scholastic Works | Extension | University of Nevada, Reno*).

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Glossary of Terms

Active crown fire: Fire in which a solid flame develops in the crowns of trees and advances from tree crown to tree crown independently of surface fire spread (NWCG, 2018).

Broadcast prescribed burning (aka, prescribed burn, controlled burn): A wildland fire originating from a planned ignition in accordance with applicable laws, policies, and regulations to meet specific objectives (NWCG, 2018).

Canopy fuels: The stratum of fuels containing the crowns of the tallest vegetation (living or dead), usually above 20 feet (NWCG, 2018).

Canopy: The more or less continuous cover of branches and foliage formed collectively by adjacent tree crowns (USFS, 2021).

Chain: Chains are commonly used in forestry and fire management as a measure of distance. 1 chain is equivalent to 66 feet. Chains were used for measurements in the initial public land survey of the U.S. in the mid-1800s.

Community Wildfire Protection Plan (CWPP): A plan developed in the collaborative framework established by the Wildland Fire Leadership Council and agreed to by state, Tribal, and local governments, local fire departments, other partners, and federal land management agencies in the vicinity of the planning area. CWPPs identify and prioritize areas for hazardous fuel reduction treatments, recommend the types and methods of treatment on Federal and non-Federal land that will protect one or more at-risk communities and essential infrastructure, and recommend measures to reduce structural ignitability throughout the at-risk community. A CWPP may address issues such as wildfire response, hazard mitigation, community preparedness, and structure protection (NWCG, 2018).

Convection: A type of heat transfer that occurs when a fluid, such as air or a liquid, is heated and travels away from the source, carrying heat along with it. Air around and above a wildfire expands as it is heated, causing it to become less dense and rise into a hot convection column. Cooler air flows in to replace the rising gases, and in some cases, this inflow of air creates local winds that further fan the flames. Hot convective gases move up slope and dry out fuels ahead of the flaming front, lowering their ignition temperature and increasing their susceptibility to ignition and fire spread. Homes located at the top of a slope can become preheated by convective heat transfer. Convection columns from wildfires carry sparks and embers aloft.

Crown (aka, tree crown): Upper part of a tree, including the branches and foliage (USFS, 2021).

Debris flow: A fast-moving landslide made up of a mixture of water-saturated rock, soil, and debris with a consistency similar to wet cement.

Defensible space: The area around a building where vegetation, debris, and other types of combustible fuels have been treated, cleared, or reduced to slow the spread of fire and reduce exposure to radiant heat and direct flame. It is encouraged that residents develop defensible space so that during a wildfire their home can stand alone without relying upon limited firefighter resources due to the great reduction in hazards they

have undertaken. WA DNR Wildfire Ready Neighbors and NFPA Firewise USA® define three zones around a structure: the immediate zone as 0 to 5 feet from the home, the intermediate zone as 5 to 30 feet from the home, and the extended zone as 30 to 100 feet from the home. **It is important to acknowledge these distances are specific for flat ground. Aggressive topography can double the distance of each zone.**

Direct attack: Any treatment applied directly to burning fuel such as wetting, smothering, or chemically quenching the fire or by physically separating the burning from unburned fuel (NWCG, 2018).

Ecological restoration: The process of assisting the recovery of an ecosystem that has been damaged, degraded, or destroyed (SER, 2004). In ponderosa pine and dry mixed-conifer forests, ecological restoration involves transforming dense forests into a mosaic of single trees, clumps of trees, and meadows similar to historic forests that were maintained by wildfires and very resilient to them (Addington et al., 2018).

Ember: Small, hot, and carbonaceous particles. The term "firebrand" is also used to connote a small, hot, and carbonaceous particle that is airborne and carried for some distance in an airstream (Johnston, 2018).

Ember cast: The process of embers/firebrands/flaming sparks being transported downwind beyond the main fire and starting new spot fires and/or igniting structures. Short-range ember cast is when embers are carried by surface winds and long-range ember cast is when embers are carried high into the convection column and fall out downwind beyond the main fire. The number of embers reaching an area decreases exponentially with distance traveled, and the likelihood of structure ignition increases with the number of embers landing on receptive fuels (Caton et al., 2016).

Fire adapted community (FAC): A human community consisting of informed and prepared citizens collaboratively planning and taking action to safely coexist with wildland fire (NWCG, 2018). There is not a checklist or one silver bullet to become a FAC; there are many strategic actions and tools that should be used together to reduce shared risk. Risk mitigation is the responsibility of everyone who lives and works in the community—residents, community groups, fire protection districts, agency partners, non-governmental organizations, etc. Fire adaptation is an ongoing process of collaborative action to identify risk, mitigate it, and maintain the work overtime.

Fire behavior: The way a fire reacts to the influences of fuel, weather, and topography. Characteristics of fire behavior include rate of spread, fire intensity, fire severity, and fire behavior category (NWCG, 2018).

Fire history: A general term referring to the historic fire occurrence in a specific geographic area (NWCG, 2018).

Fire intensity (aka, fireline intensity): (1) The product of the available heat of combustion per unit of ground and the rate of spread of the fire, interpreted as the heat released per unit of time for each unit length of fire edge, or (2) the rate of heat release per unit time per unit length of fire front (NWCG, 2018).

Fire regime: Description of the patterns of fire occurrences, frequency, size, and severity in a specific geographic area or ecosystem. A fire regime is a generalization based on fire histories at individual sites. Fire regimes can often be described as cycles because some parts of the histories usually get repeated, and the repetitions can be counted and measured, such as fire return interval (NWCG, 2018).

Fire severity. Degree to which a site has been altered or disrupted by fire; loosely, a product of fire intensity and residence time (NWCG, 2018). Fire severity is determined by visually inspecting or measuring the effects that wildfire has on soil, plants, fuel, and watersheds. Fire severity is often classified as low-severity (less than 20% of overstory trees killed) and high severity (more than 70% of overstory trees kills). Moderate-severity or intermediate fire severity falls between these two extremes (Agee, 1996). Specific cutoffs for fire severity classifications differ among researchers. For example, Sheriff et al. (2014) define high-severity fires as those killing more than 80% of overstory trees.

Fire weather conditions: Weather conditions that influence fire ignition, behavior, and suppression, for example, wind speed, wind direction, temperature, relative humidity, and fuel moisture (NWCG, 2018).

Firebreak: A natural or constructed barrier where all vegetation and organic matter have been removed down to bare mineral soil. Firebreaks are used to stop or slow wildfires or to provide a control line from which to work (Bennett et al., 2010; NWCG, 2018).

Fireline: (1) The part of a containment or control line that is scraped or dug to mineral soil, or (2) the area within or adjacent to the perimeter of an uncontrolled wildfire of any size in which action is being taken to control fire (NWCG, 2018).

Flame length: The distance between the flame tip and the midpoint of the flame depth at the base of the flame (generally the ground surface). Flame length is measured on an angle when the flames are tilted due to effects of wind and slope. Flame length is an indicator of fire intensity (NWCG, 2018).

Fuel model: A stylized set of fuel bed characteristics used as input for a variety of wildfire modeling applications to predict fire behavior (Scott & Burgan, 2005).

Fuel reduction: Manipulation, combustion, or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage from wildfires and resistance to control (NWCG, 2018).

Fuelbreak: A natural or manufactured change in fuel characteristics that affects fire behavior so that fires burning into them can be more readily controlled. Fuelbreaks differ from firebreaks due to the continued presence of vegetation and organic soil. Trees in shaded fuelbreaks are thinned and pruned to reduce the fire potential but enough trees are retained to make a less favorable microclimate for surface fires (NWCG, 2018).

Fuels mitigation/management: The act or practice of controlling flammability and reducing resistance to control of wildland fuels through mechanical, chemical, biological, or manual means, or by fire, in support of land management objectives (NWCG, 2018).

Fuels: Any combustible material, most notably vegetation in the context of wildfires, but also including petroleum-based products, homes, and other manufactured materials that might combust during a wildfire in the wildland-urban interface. Wildland fuels are described as 1-, 10-, 100-, and 1000-hour fuels. One-hour fuels are dead vegetation less than 0.25 inch in diameter (e.g., dead grass), ten-hour fuels are dead vegetation 0.25 inch to 1 inch in diameter (e.g., leaf litter and pine needles), one hundred-hour fuels are dead vegetation 1 inch to 3 inches in diameter (e.g., fine branches), and one thousand-hour fuels are dead vegetation 3 inches

to 8 inches in diameter (e.g., large branches). Fuels with larger diameters have a smaller surface area to volume ratio and take more time to dry out or become wetter as relative humidity in the air changes (NWCG, 2018).

Hand crews: A number of individuals that have been organized and trained and are supervised principally for operational assignments on an incident (NWCG, 2018).

Handline: Fireline constructed with hand tools (NWCG, 2018).

Hazards: Any real or potential condition that can cause injury, illness, or death of personnel, or damage to, or loss of equipment or property (NWCG, 2018).

Highly valued resources and assets (also known as values at risk): Aspects of a community or natural area considered valuable by an individual or community that could be negatively impacted by wildfire or wildfire operations. These values can vary by community and include diverse characteristics such as homes, specific structures, water supply, power grids, natural and cultural resources, community infrastructure, and other economic, environmental, and social values (NWCG, 2018).

Home hardening: Steps taken to improve the chance of a home and other structures withstanding ignition by radiant and convective heat and direct contact with flames or embers. Home hardening involves reducing structure ignitability by changing building materials, installation techniques, and structural characteristics of a home (California Fire Safe Council, 2020). A home can never be made fireproof, but home hardening practices in conjunction with creating defensible space increases the chance that a home will stand strong during a wildfire.

Home ignition zone (HIZ): The characteristics of a home and its immediate surroundings within 100 feet of structures. Conditions in the HIZ principally determine home ignition potential from radiant heat, convective heat, and ember cast (NWCG, 2018). WA DNR Wildfire Ready Neighbors and NFPA Firewise USA® define three zones around a structure: the immediate zone as 0 to 5 feet from the home, the intermediate zone as 5 to 30 feet from the home, and the extended zone as 30 to 100 feet from the home. **It is important to acknowledge these distances are specific for flat ground. Aggressive topography can double the distance of each zone**

Ignition-resistant building materials: Materials that resist ignition or sustained flaming combustion. Materials designated ignition-resistant have passed a standard test that evaluates flame spread on the material (Quarles, 2019; Quarles & Pohl, 2018).

Indirect attack A method of suppression in which the control line is located some considerable distance away from the fire's active edge. Generally done in the case of a fast-spreading or high-intensity fire and to utilize natural or constructed firebreaks or fuelbreaks and favorable breaks in the topography. The intervening fuel is usually backfired; but occasionally the main fire is allowed to burn to the line, depending on conditions (NWCG, 2018).

Ladder fuels: Fuels that provide vertical continuity between strata, thereby allowing fire to carry from surface fuels into the crowns of trees with relative ease. Ladder fuels help initiate torching and crowning and assure

the continuation of crowning. Ladder fuels can include small trees, brush, and lower limbs of large trees (NWCG, 2018).

Lop-and-scatter: Cutting (lopping) branches, tops, and unwanted boles into shorter lengths and spreading that debris evenly over the ground such that resultant logging debris will lie close to the ground (NWCG, 2018).

Mastication: A slash management technique that involves using a machine to grind, chop, or shred vegetation into small pieces that then become surface fuel (Jain et al., 2018).

Mitigation actions: Actions that are implemented to reduce or eliminate (mitigate) risks to people, property, or natural resources. These actions can be undertaken before and during a wildfire. Actions before a fire include fuel treatments, vegetation modification in the home ignition zone, and structural changes to increase the chance a structure will stand strong during a wildfire (aka, home hardening). Mitigation actions during a wildfire include mechanical and physical tasks, specific fire applications, and limited suppression actions, such as constructing firelines and creating "black lines" through the use of controlled burnouts to limit fire spread and behavior (NWCG, 2018).

Mosaic landscape: A heterogeneous area composed of different communities or a cluster of different ecosystems that are similar in function and origin in the landscape. It consists of 'patches' arranged in a 'matrix', where the patches are the different ecosystems and the matrix is how they are arranged over the land (Hansson et al., 1995).

National Wildfire Coordinating Group (NWCG): An operational group established in 1976 through a Memorandum of Understanding between the U.S. Department of Agriculture and Department of the Interior to coordinate programs of the participating agencies to avoid wasteful duplication and to provide a means of constructively working together. NWCG provides a formalized system and agreed upon standards of training, equipment, aircraft, suppression priorities, and other operational areas. More information about NWCG is available online at: https://www.nwcg.gov/.

Noncombustible building materials: Material of which no part will ignite or burn when subjected to fire or heat, even after exposure to moisture or the effects of age. Materials designated noncombustible have passed a standard test (Quarles, 2019; Quarles & Pohl, 2018).

Non-survivable road: Portions of roads adjacent to areas with predicted flame lengths greater than 8 feet under severe fire weather conditions. Potentially non-survivable flame lengths start at 8 feet according to the Haul Chart, which is a standard tool used by firefighters to relate flame lengths to tactical decisions (NWCG, 2019). Drivers stopped or trapped on these roadways would have a lower chance of surviving radiant heat from fires of this intensity. Non-survivable conditions are more common along roads that are lined with thick forests, particularly with trees that have limbs all the way to the ground and/or abundant saplings and seedlings.

Overstory: Layer of foliage in a forest canopy, particularly tall mature trees that rise above the shorter immature understory trees (USFS, 2021).

Passive crown fire: Fire that arises when surface fire ignites the crowns of trees or groups of trees (aka, torching). Torching trees reinforce the rate of spread, but passive crown fires travel along with surface fires (NWCG, 2018).

Pile burning: Piling slash resulting from logging or fuel management activities into manageable piles that are subsequently burned during safe and approved burning conditions (NWCG, 2018).

Potential operational delineations (PODs): PODs are topographic areas bounded by features suitable for fire control (e.g., ridgetops and roads) that can be used for proactive wildfire decision making and tactical operations during wildfire events. PODs can serve as management units for proactive ecological restoration and wildfire risk mitigation, as well as for cross-boundary and collaborative land and fire management planning (Thompson et al., 2022).

Quantitative wildfire risk assessment (QWRA): Analyses that utilize fire behavior modeling, expert opinion, and community values to characterize the predicted benefits and threats from fire on several, often overlapping, values across your landscape. This information can be used to plan fuel treatments, pre-plan suppression response, design fire effects monitoring programs, and other related management activities on a landscape while accounting for the predicted benefits and threats from fire and the relative importance of different landscape values (Interagency Fuel Treatment Decision Support System).

Radiation: A method of heat transfer by short-wavelength energy through air (aka, infrared radiation). Surfaces that absorb radiant heat warm up and radiate additional short-wavelength energy themselves. Radiant heat is what you feel when sitting in front of a fireplace. Radiant heat preheats and dries fuels adjacent to the fire, which initiates combustion by lowering the fuel's ignition temperature. The amount of radiant heat received by fuels increases as the fire front approaches. Radiant heat is a major concern for the safety of wildland firefighters and can ignite homes without direct flame contact.

Rate of spread: The relative activity of a fire in extending its horizontal dimensions. It is expressed as rate of increase of the total perimeter of the fire, as rate of forward spread of the fire front, or as rate of increase in area, depending on the intended use of the information. Rate of spread is usually expressed in chains or acres per hour for a specific period in the fire's history (NWCG, 2018).

Risk: (1) The chance of fires starting as determined by the presence and activity of causative agents (e.g., lightning), (2) a chance of suffering harm or loss, or (3) a causative agent (NWCG, 2018).

Roadside fuel treatment: A natural or manmade change in fuel characteristics along a roadway that affects fire behavior so that fires burning into them can be more readily controlled, survivable conditions with shorter flame lengths are more likely during a wildfire, and firefighter access is enhanced (NWCG, 2018).

Safety zones: An area cleared of flammable materials used by firefighters for escape in the event the line is outflanked or spot fires outside the control line render the line unsafe. In firing operations, crews progress to maintain a safety zone close at hand, allowing the fuels inside the control line to be consumed before going ahead. Safety zones may also be constructed as integral parts of fuelbreaks; they are greatly enlarged areas that can be used with relative safety by firefighters without the use of a fire shelter (NWCG, 2018).

Shaded fuelbreak: Fuel treatments in timbered areas where the trees on the break are thinned and pruned to reduce fire potential yet enough trees are retained to make a less favorable microclimate for surface fires (NWCG, 2018).

Slash: Debris resulting from natural events such as wind, fire, or snow breakage or from human activities such as road construction, logging, pruning, thinning, or brush cutting. Slash includes logs, bark, branches, stumps, treetops, and broken understory trees or brush (NWCG, 2018).

Smoldering combustion: The combined processes of dehydration, pyrolysis, solid oxidation, and scattered flaming combustion and glowing combustion, which occur after the flaming combustion phase of a fire; often characterized by large amounts of smoke consisting mainly of tars (NWCG, 2018).

Spot fire: Fire ignited outside the perimeter of the main fire by an ember (NWCG, 2018). Spot fires are particularly concerning because they can form a new flaming front, move in unanticipated directions, trap firefighters between two fires, and require additional firefighting resources to control.

Spotting: Behavior of a fire producing sparks or embers that are carried by the wind and start new fires beyond the zone of direct ignition by the main fire (NWCG, 2018).

Stand: An area of forest that possesses sufficient uniformity in species composition, age, size, structural configuration, and spatial arrangement to be distinguishable from adjacent areas (USFS, 2021).

Structure protection: The protection of homes or other structures from an active wildland fire (NWCG, 2018).

Structure triage: The process of inspecting and classifying structures according to their defensibility or non-defensibility, based on fire behavior, location, construction, and adjacent fuels. Structure triage involves a rapid assessment of a dwelling and its immediate surroundings to determine its potential to escape damage by an approaching wildland fire. Triage factors include the fuels and vegetation in the yard and adjacent to the structure, roof environment, decking and siding materials, prevailing winds, topography, etc. (NWCG, 2018). There are four categories used during structure triage: (1) defensible – prep and hold, (2) defensible – stand alone, (3) non-defensible – prep and leave, and (4) non-defensible – rescue drive-by. The most important feature differentiating defensible and non-defensible structures is the presence of an adequate safety zone for firefighters (NWCG 2018a). Firefighters conduct structure triage and identify defensible homes during wildfire incidents. Categorization of homes is not pre-determined; triage decisions depend on fire behavior and wind speed due to their influence on the size of safety zones needed to keep firefighters safer.

Suppression: The work and activity used to extinguish or limit wildland fire spread (NWCG, 2018).

Surface fire: Fire that burns fuels on the ground, which include dead branches, leaves, and low vegetation (NWCG, 2018).

Surface fuels: Fuels lying on or near the ground, consisting of leaf and needle litter, dead branch material, downed logs, bark, tree cones, and low stature living plants (NWCG, 2018).

Torching: The burning of the foliage of a single tree or a small group of trees from the bottom up. Torching is the type of fire behavior that occurs during passive crown fires and can initiate active crown fires if tree canopies are close to each other (NWCG, 2018).

Watershed (aka, drainage basin or catchment): An area of land where all precipitation falling in that area drains to the same location in a creek, stream, or river. Smaller watersheds come together to create basins that drain into bays and oceans (NOAA, 2021).

Wildfire-resistant building materials: A general term used to describe a material and design feature that can reduce the vulnerability of a building to ignition from wind-blown embers or other wildfire exposures (Quarles, 2019; Quarles & Pohl, 2018).

Wildland-urban interface (WUI): Any area where the built environment meets wildfire-prone areas—places where wildland fire can move between natural vegetation and the built environment and result in negative impacts on the community (Mowry & Johnston, 2018). For this CWPP, the WUI boundary includes almost all of the developed areas of Chelan County (the zones) and the surrounding landscape that could transmit wildland fire into the developed areas and important evacuation. Strategic wildfire mitigation across the WUI can increase the safety of residents and wildland firefighters and reduce the chances of home loss.

Appendices

Appendix 1 - Fire Services

***Table 7**. List of fire protection organizations within Chelan County and their contact information.*

Wenatchee Valley Fire Department (WVFD):	Chief: Brian Brett Telephone: 509-662-4734 Address: PO Box 2106 Wenatchee 98807
Lake Wenatchee Fire and Rescue (LWFR) :	Chief: David Walker Telephone: 509-763-3034 Address: 21696 Lake Wenatchee Hwy Leavenworth, WA 98826
Chelan County Fire District 3 (CCFD3):	Chief: Kelly O'Brian Telephone: 509-548-7711 Address: 228 Chumstick Rd Leavenworth, WA 98826
Chelan County Fire District 5 (CCFD5):	Chief: Arnold Baker Telephone: 509-687-3222 Address: PO Box D250 W Manson Blvd Manson, WA 98831
Chelan County Fire District 6 (CCFD6) :	Chief: Andy Lee Telephone: 509-663-1678 Address: PO Box 296 Monitor, WA 98836
Chelan County Fire District 7, (Chelan Fire and Rescue) :	Chief: Brandon Asher Telephone: 509-682-4476 Address: PO Box 1317 Chelan, WA 98816
Chelan County Fire District 8:	Chief: Adam Jones Telephone: 509-784-1366 Address: 2200 Entiat Way Entiat, WA 98822
Holden Village Fire:	Fire Marshall: Jeff Pierce Telephone: 509-678-5933 Address: HC 0 Box 2 Chelan, WA 98816
Okanogan-Wenatchee National Forest:	Telephone: 509-664-9333 Address: 215 Melody Lane Wenatchee, WA 98801
Bureau of Land Management:	Spokane District Office Telephone: 509-536-1237 Address: 1103 North Fancher Road

	Spokane, Washington 99212-1275
National Park Service:	North Cascades National Park Telephone: 360-854-7200 Address: 810 State Route 20 Sedro-Woolley, Washington 98284
Washington State Department of Natural Resources:	Wildland Fire Management Division Telephone: 360-902-1300 Address: MS 47037 Olympia, WA 98504-7037

Appendix 2 - Risk Analysis Models

A2.1. Fire Behavior Analysis

Interpretations and Limitations

Fire behavior models have been rigorously developed and tested based on over 40 years of experimental and observational research (Sullivan, 2009). Fire behavior models allow us to identify areas that could experience high-severity wildfires and pose a risk to lives, property, and other values at risk.

Fire behavior analyses are useful for assessing relative risk across the entire County and are not intended to assess specific fire behavior in the vicinity of individual homes. It is not feasible to predict every combination of fire weather conditions, ignition locations, and suppression activities that might occur during a wildfire. Uncertainty regarding where a wildfire might ignite and how it will behave is inevitable until one is actually occurring. Even then, fire behavior can be erratic and unpredictable.

Important Considerations about Fire Behavior Predictions

Fire behavior models can provide reasonable estimates of relative wildfire behavior across a landscape. However, wildfire behavior is complex, and models are a simplification of reality. Models also struggle to capture impacts of structures on wildfire spread and home-to-home ignitions. It is recommended to use the fire behavior analyses within this document to understand relative risk at a landscape scale, and not as an indication of a single property's risk.

Exceptionally hot, dry, and windy conditions are increasingly common due to climate change and could result in even more extreme fire behavior across Chelan County than predicted by this analysis.

The 2025 CWPP for Chelan County utilizes the 2023 Pacific Northwest Quantitative Wildfire Risk Assessment (2023 PNW QWRA) analyses facilitated and managed by Oregon State University in close partnership with Pyrologix, Washington Department of Natural Resources, U.S. Forest Service, and Bureau of Land Management (McEvoy et al., 2023). The 2023 PNW QWRA is an objective, science-based risk assessment used to support risk management and proactive wildfire planning and management, including CWPPs, across Oregon and Washington. The assessment uses state-of-the art fire behavior modeling conducted by Pyrologix LLC with the large-fire simulator (FSim) (Finney et al., 2011) and WildEST (Scott, 2020), which deploys a command-line version of FlamMap (Finney, 2006).

Fire behavior models like FSim and WildEST do not include structures as a fuel type. Structures like homes, sheds, fences, and other buildings are absolutely a source of fuel during wildland fires and can produce massive amounts of embers that contribute to home-to-home ignitions (Maranghides et al., 2022). FSim and WildEST cannot account for fine-scale variation in surface fuel loads, defensible space created by individual homeowners, and the ignitability of building materials, nor are these data available at the scale of individual homes across an entire fire protection district. In the absence of this information and a deeper quantitative understanding of interactions between structures and wildland vegetation during a wildfire, fire behavior cannot be modeled for areas dominated by homes in the same fashion as areas dominated by grassland, shrubland, or forest vegetation. For this reason, The Ember Alliance conducted a separate analysis to predict potential exposure of homes to radiant heat and ember cast (see section below). Maps of fire behavior predictions include areas indicated as "unburnable / not modeled". Parking lots, roadways, bodies of water, and barren areas are considered unburnable; areas dominated by homes and buildings were classified as "not modeled" because fire behavior models do not include structures as a fuel type (Scott & Burgan, 2005).

Modeling Specifications

Fire behavior models require information on topography and fuel loads across the area of interest and fire weather conditions. For the 2023 PNW QWRA, Pyrologix, LLC mapped fuel conditions across Oregon and Washington representative of the 2022 fire season. They organized a workshop with dozens of wildland fire professionals to review and improve fuel data available from LANDFIRE. They modified fuel characteristics in areas that had experienced recent wildfires and fuel treatments to approximate post-disturbance conditions. Pyrologix, LLC developed custom fuel models to allow fire to propagate through agricultural and developed areas where experts thought fire spread was possible in these land use types. Fuel models are a stylized set of fuel bed characteristics used as input for a variety of wildfire modeling applications to predict fire behavior (Scott & Burgan, 2005). See additional details on development of fuel data for the 2023 PNW QWRA in McEvoy et al. (2023).

Fuel types are highly variable across Chelan County, with grasses, shrubs, and agricultural fuel models dominating in the eastern, lower-elevation portion of the county, shrublands in some of the areas burned by wildfires in the past 10 years, and timber understory and timber litter in mid- to high-elevations across the central and western portions of the county (**Figure 52**). The 2023 PNW QWRA was completed prior to the 2024 Pioneer Fire, which burned 38,730 acres in Chelan County, so post-fire conditions were not reflected in the analysis.

Pyrologix, LLC modeled fire behavior in WildEST and FSim under 10,000 simulated fire seasons for 23 fire occurrence areas across Washington and Oregon. Fire occurrence areas (FOA) were delineated based on historic fire occurrence and observed fire weather characteristics. Chelan County is primary in FAO 407, but a small portion of the southeastern part of the County is in FAO 420 and a small portion of the southern part of the County is in FAO 408. Different weather conditions were used to model fire behavior in each of these

three FAOs. For each day of the 10,000 simulated fire seasons, FSim selects plausible weather scenarios based on historic data. A wildfire ignition is simulated if the energy release component (ERC) exceeds the 80th percentile of historic ERC values. Therefore, output from FSim represents potential fire behavior under high to extreme fire weather conditions. See additional details on fire weather conditions for the 2023 PNW QWRA in McEvoy et al. (2023).

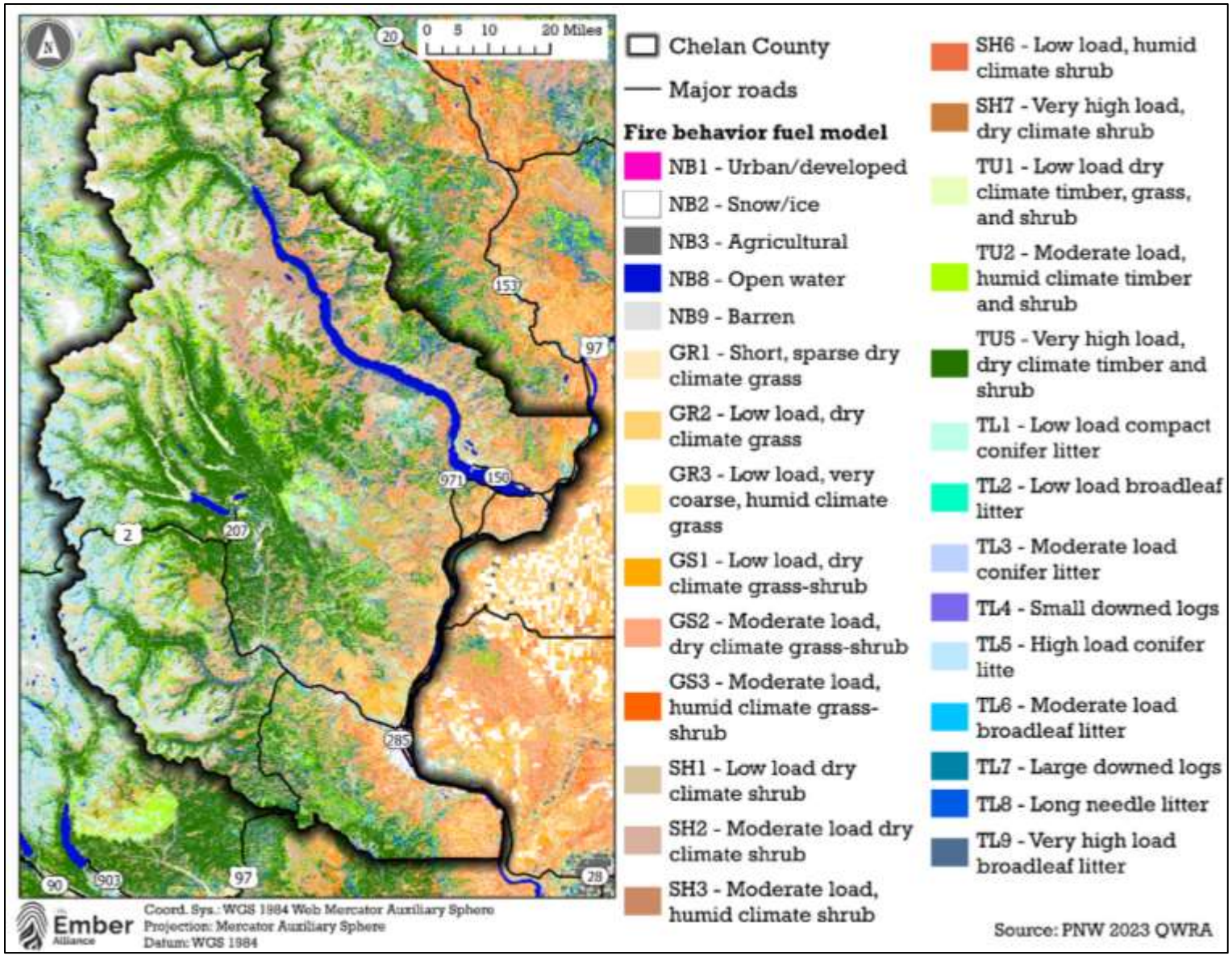

***Figure 52**. Fire behavior fuel models in Chelan County. Source: PNW 2023 QWRA.*

Predicted Fire Behavior

Conditional Flame Length

Flame length is the distance measured from the average flame tip to the middle of the flaming zone at the base of the fire. Flame length is measured at an angle when the flames are tilted due to effects of wind and slope (see image at right). Flame length is an indicator of fire intensity—the amount of energy released by a fire.

Conditional flame length from the 2023 PNW QWRA is the average flame length experienced at a location across all simulated wildfires that reached that location. Conditional flame length is calculated by multiplying the conditional probability of flame lengths falling in each of six fire intensity levels (0-2 feet, 2-4 feet, 4-6 feet, 6-8 feet, 8-12 feet, and >12 feet) by the midpoint flame length for each class. For the flame length class of >12 feet, a flame length midpoint of 100 feet was used to represent torching trees. Figure 53 shows conditional flame lengths across Chelan County.

Conditional Probability of Flame Lengths Exceeding 8 Feet

Conditional probability of flame lengths exceeding 8 feet is the probability that flame lengths exceed the threshold beyond which firefighters can safely engage with a wildfire at the flaming front (Table 8). Conditional probability of flame lengths exceeding 8 feet in Chelan County was determined by adding together the conditional probability for the 8-12 feet and >12 feet fire intensity levels from the 2023 PNW QWRA (Figure 54).

Most Likely Fire Type

Each location on the landscape is described by the most likely type of fire behavior it could experience based on all simulated wildfires that reached that location. Fire types for the 2023 PNW QWRA are surface fire (no forest canopy present), underburn (surface fire where forest canopy is present), low-grade passive crown fire (0-25% crown fraction burned), mid-grade passive crown fire (>25-60% crown fraction burned), high-grade passive crown fire (>60-90% crown fraction burned), and active crown fire (>90%). WildEST produces a probability of each type of fire occurring at a given location, and The Ember Alliance determined the type of fire with the greatest probability of occurring at each location in Chelan County using output from the 2023 PNW QWRA (Figure 55).

Fire Behavior Class

Wildland firefighters pay attention to current and expected fire behavior when making tactical decisions. Fire behavior classes are based on flame length, rate of spread, and crown fire activity and are utilized by firefighters to guide tactical decisions following the Haul Chart (Table 8). The Ember Alliance combined

estimates of flame length and fire type from the 2023 PNW QWRA to produce a map of fire behavior class across Chelan County (Figure 56).

Under hot, dry, and windy weather, 40% percent of Chelan County could experience very high to extreme fire behavior, including ember production that ignites additional fires away from the main fire and the movement of high-intensity fire from treetop to treetop. Such fires are extremely challenging if not impossible to control until winds die down and fuel moisture increases. High-intensity wildfires and active crown fires are most likely in the forested parts of Chelan County on steep slopes.

Under hot, dry, and windy weather, 40% percent of Asotin County could experience very high to extreme fire behavior. Very high to extreme fire behavior includes ember production that ignites additional fires away from the main fire and the movement of high-intensity fire from treetop to treetop. Such fires are extremely challenging if not impossible to control until winds die down and fuel moisture increases. High-intensity wildfires and active crown fires are most likely on steep, forested slopes across Chelan County, including along Icicle River, all around Lake Wenatchee and Leavenworth, east of Chumstick, near Blewett Pass, the center of the Entiat valley, north and south of the middle of Lake Chelan, and up valley from Stehekin.

Table 8. *The Haul Chart and tactical interpretations. The Haul Chart is a tool used by firefighters for relating fire behavior to tactical decision-making (NWCG, 2019).*

Fire behavior class	Flame length (ft)	Tactical interpretation
Very low, smoldering	<1	Fire is not spreading and has limited flames. Fire can be attacked at the head or flanks by persons using handtools. Handline will hold the fire.
Low, creeping, spreading	1-4	Fire can be attacked at the head or flanks by persons using handtools. Handline should hold the fire.
Moderate, running	4-8	Fires are too intense for direct attack at the head of the fire using handtools. Handline cannot be relied on to hold the fire. Equipment such as dozers, engines, and retardant aircraft may be effective.
High, torching and spotting	8-11	Fires present serious control problems with torching, crowning, and spotting. Control efforts at the head of the fire are probably ineffective.
Very high, active crown fire	11-25	Crowning, spotting, and major fire runs are expected. Control efforts at the head of the fire are ineffective.
Extreme and erratic	>25	Extreme intensity, turbulent fire, and chaotic spread. Escaping to safety should be considered.

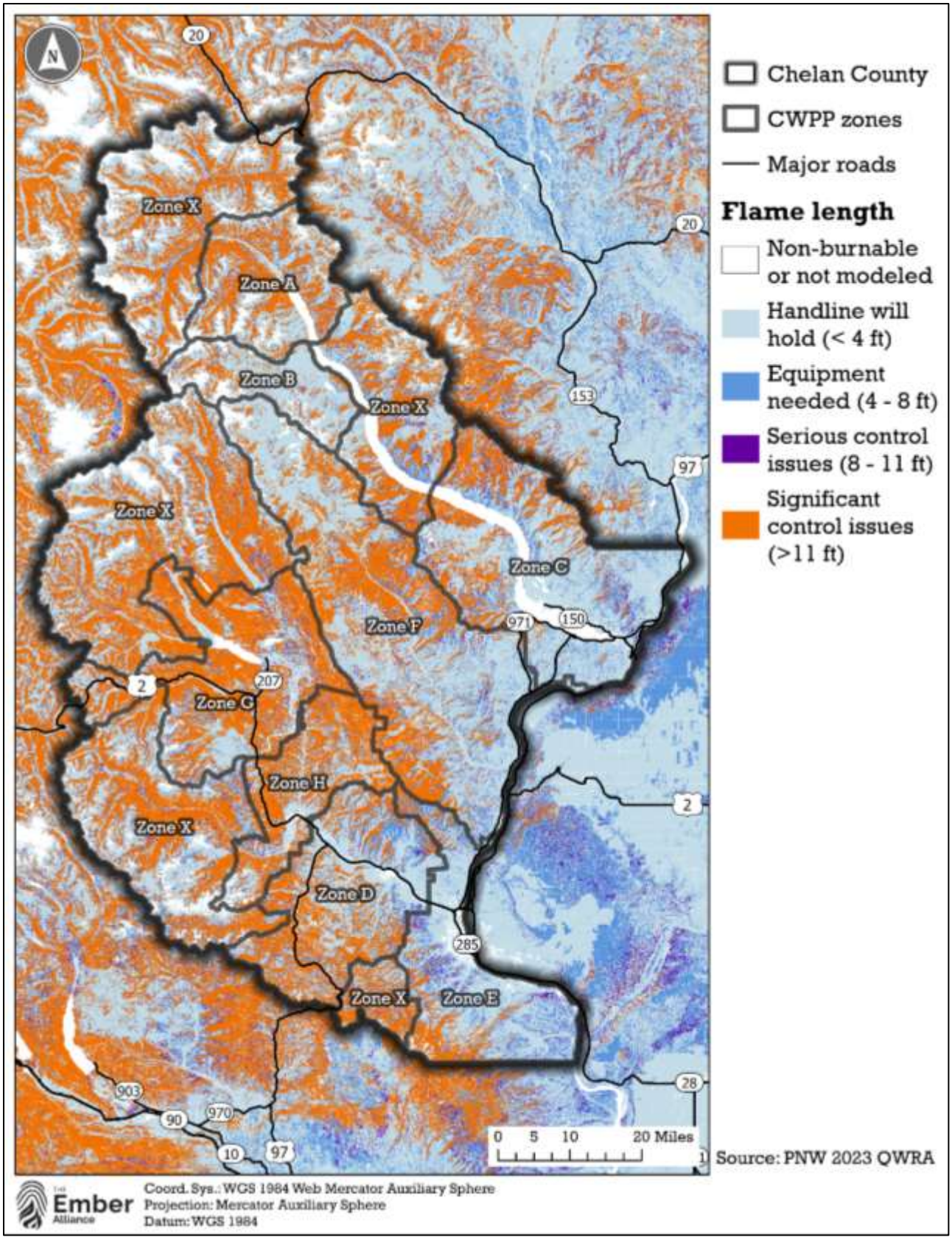

***Figure 53**. Conditional flame lengths in Chelan County under high to extreme fire weather conditions, categorized by the Haul Chart (Table 8). Source: PNW 2023 QWRA.*

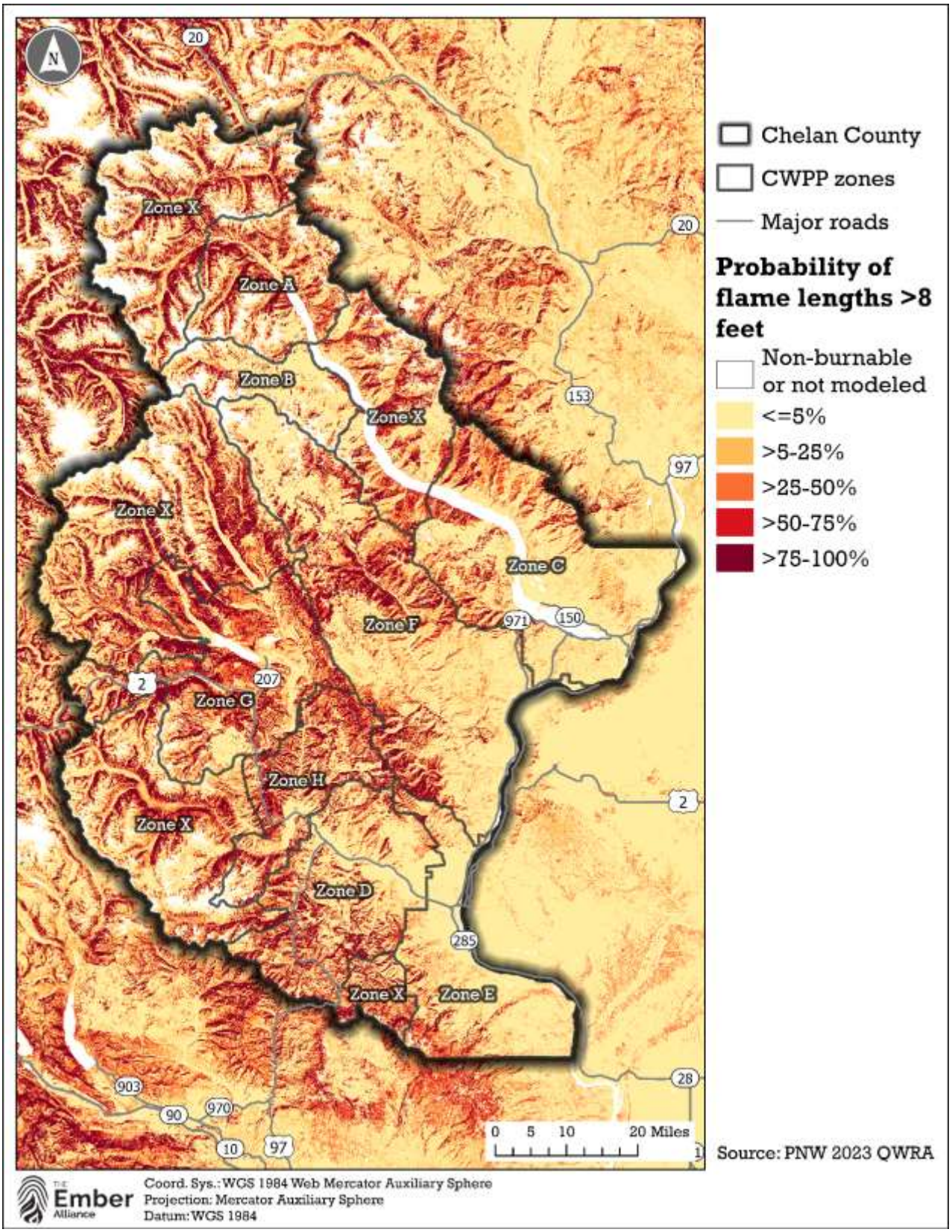

***Figure 54**. Conditional probability of flame lengths exceeding 8 feet in Chelan County under high to extreme fire weather conditions. Source: PNW 2023 QWRA.*

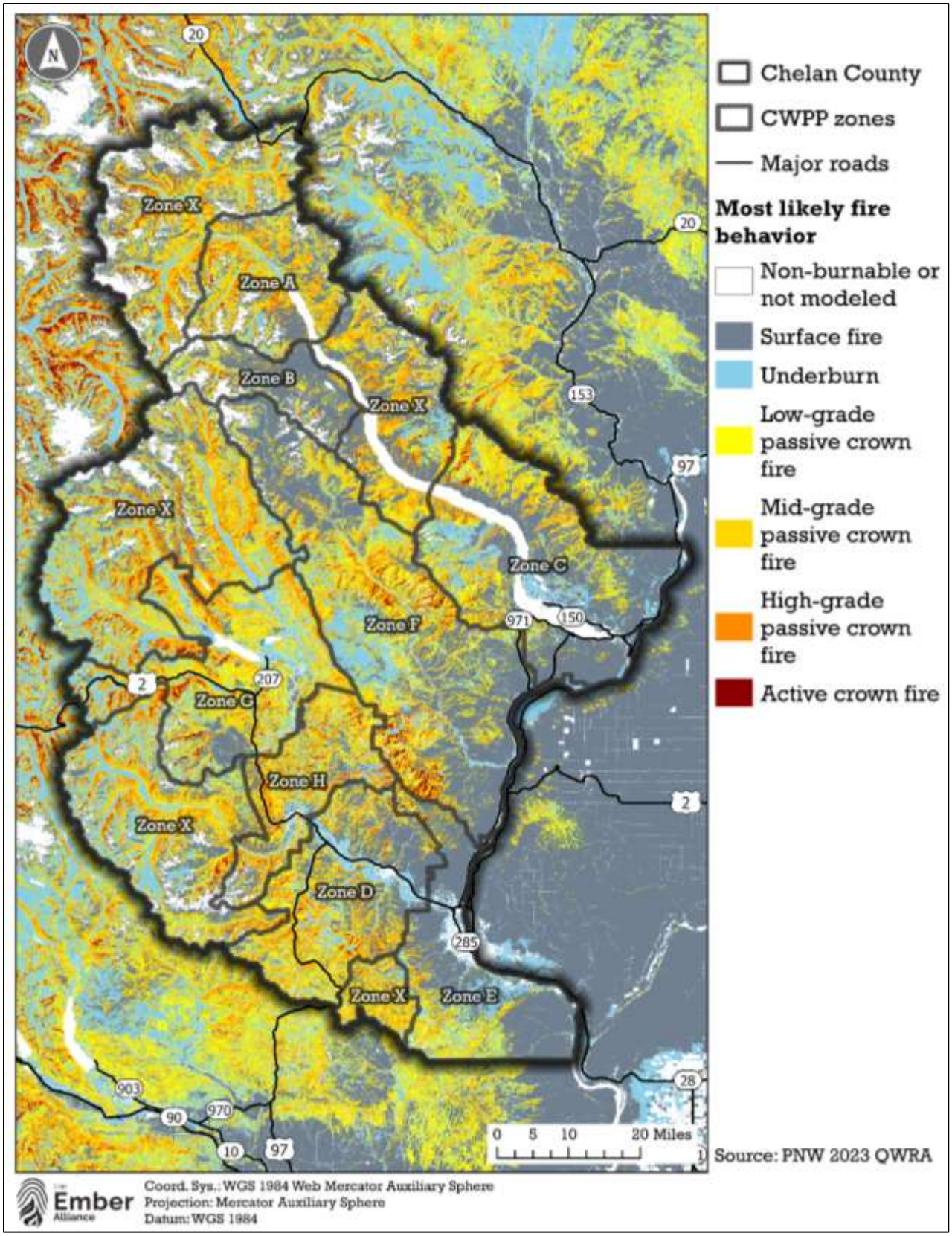

***Figure 55**. Most likely fire type across Chelan County under high to extreme fire weather conditions. Source: PNW 2023 QWRA.*

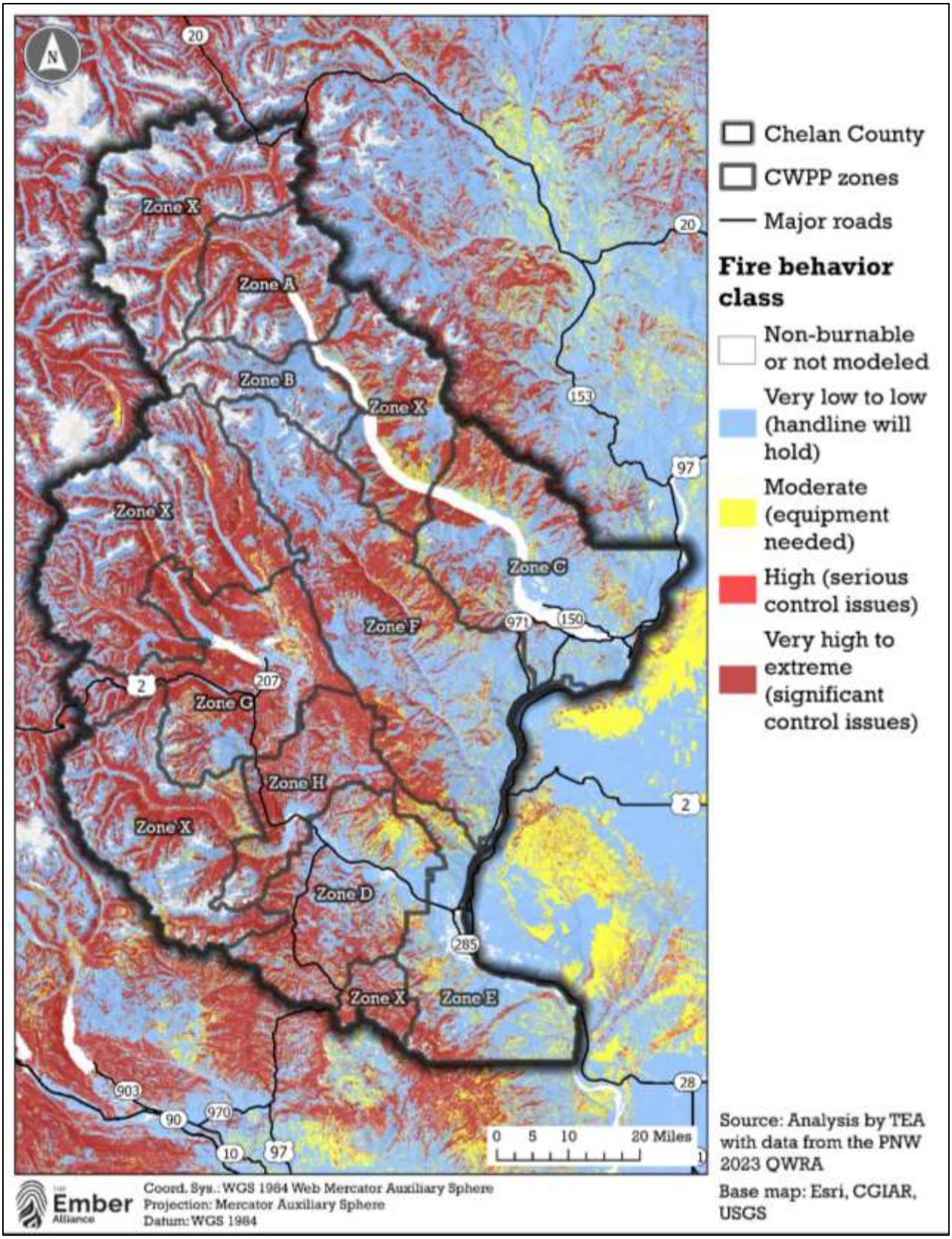

***Figure 56**. Fire behavior class across Chelan County under high to extreme fire weather conditions. Source: PNW 2023 QWRA.*

Burn Probability

Burn probability is the annual likelihood of wildfire at a given location. Fuels, topography, and wind affect burn probability by dictating how fire spreads across the landscape. Modelers for the 2023 PNW QWRA divided the number of fire perimeters that burned each location by the total number of simulated fires from FSim to determine the burn probability.

Most of Chelan County has high to very high probability relative to the state of Washington according to the 2023 PNW QWRA (Figure 57). High burn probabilities occur in much of Chelan County due to high fuel loads across steep, complex terrain. Areas with lower relative burn probability are high-elevation alpine areas with low amounts of fuel in the western part of Chelan County and areas that burned in the past 10 years, such as the 2015 Wolverine Fire, 2018 Cougar Creek Fire, and 2021 Twenty-five Mile Fire.

Expected Net Value Change

Expected net value change (eNVC) is a quantitative assessment of wildfire risk to highly valued resources and assets (HVRAs) at each location of a landscape based on potential fire intensity, likelihood of wildfire, and the exposure, relative importance, and sensitivity of values at risk to different types of fire behavior. Expected net value change is positive where the overall impact of wildfire is expected to benefit HVRAs present at a location, and eNVC is negative where the overall impact is expected to degrade HVRAs. Expected net value change is calculated by multiplying flame length probability for each flame length class by the potential impact of each flame length class on each HVRA (positive or negative impact) by the relative importance of each HVRA by the burn probability at each location.

Various subject matter experts from different universities, state agencies, and federal agencies collaboratively identified which HVRAs to include in the 2023 PNW QWRA, selected the relative importance of HVRAs, and defined the sensitivity of each HVRA to different types of fire behavior (also known as response functions). Categories of HVRAs were people and property (35% relative importance), drinking water (18%), infrastructure (16%), timber (12%), ecological integrity (11%), wildlife habitat (7%), agriculture (1%), and recreation infrastructure (<1%). Maps of and response functions for HVRAs are provided throughout McEvoy et al. (2023), and appendix A of McEvoy et al. (2023) lists sub-HVRAs.

According to the 2023 PNW QWRA, wildfire and/or broadcast prescribe burning could benefit portions of Chelan County by restoring ecological conditions and reducing fuel loads. Beneficial fire is more likely in areas without homes and where expected fire behavior is moderate (Figure 58).

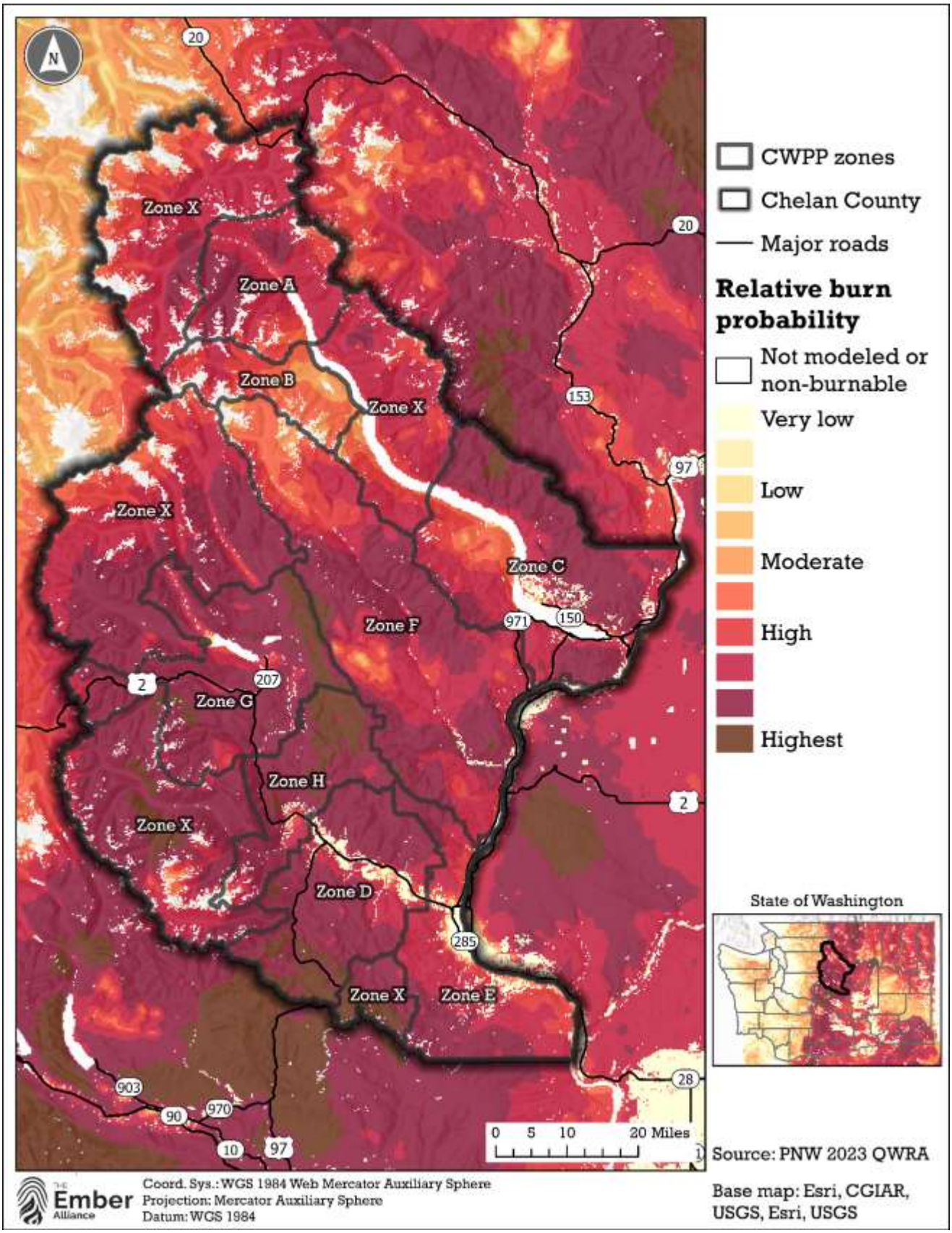

***Figure 57**. Likelihood of wildfire across Chelan County. Source: PNW 2023 QWRA.*

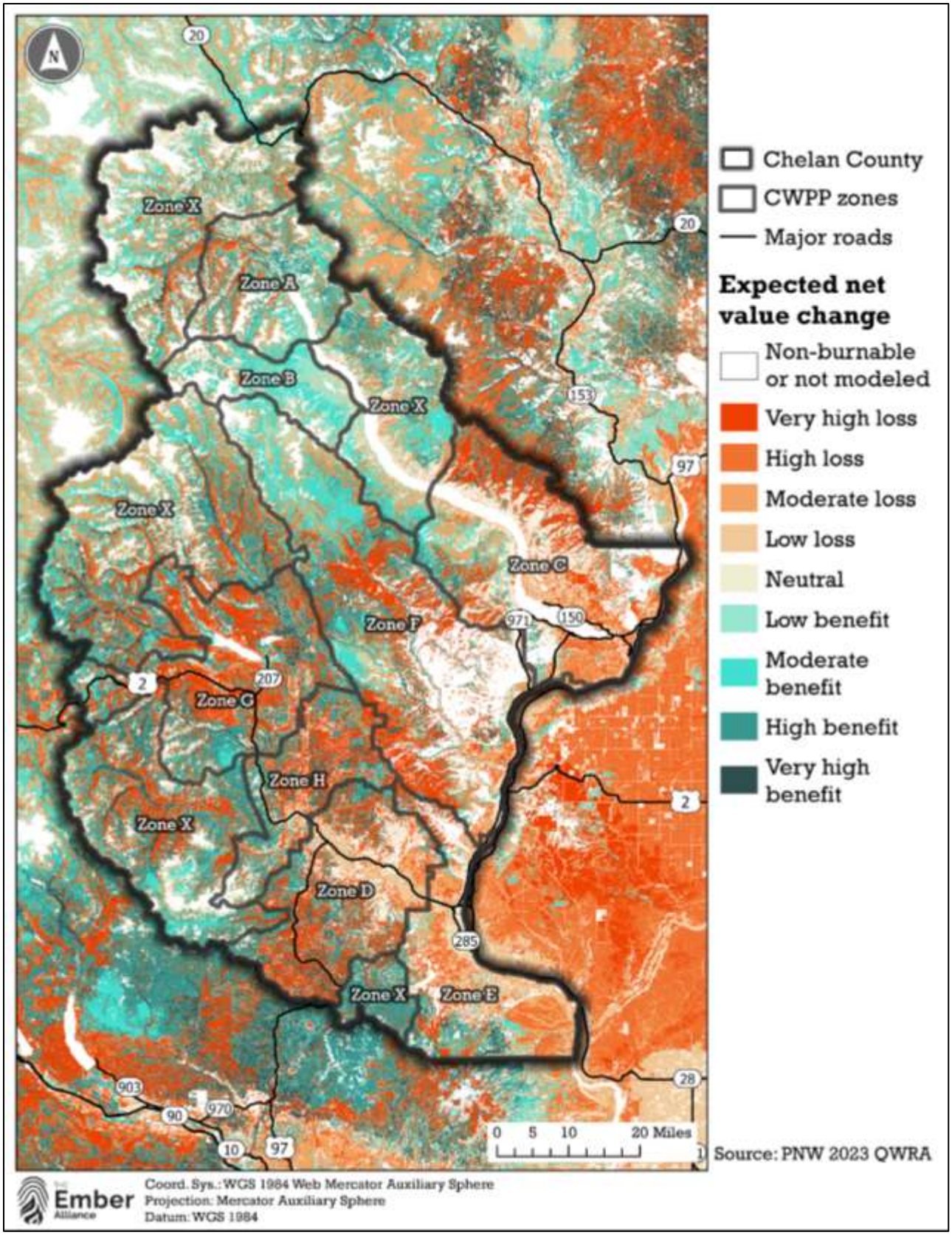

Figure 58. *Expected net value change following wildfire in Chelan County. Source: PNW 2023 QWRA.*

Predicted Radiant Heat and Ember Cast Exposure

Embers can ignite homes even when the flaming front of a wildfire is far away. See Section 13.b. Recommendations for Residents for tangible and relatively simple steps you can take to harden your home against embers. Mitigation practices, such as removing pine needles from gutters and installing covers over vents, can make ignition less likely and make it easier for firefighters to defend your property.

The Ember Alliance assessed the risk that radiant heat and long-range ember cast pose to structures2. Radiant heat from burning vegetation can ignite nearby homes, and embers emitted from burning vegetation or other homes can travel long distances and ignite vegetation and homes away from the main fire. This analysis is useful for comparing relative exposure across the entire county and not for evaluating absolute risk to individual homes. Fire behavior outputs from the 2023 PNW QWRA cannot account for defensible space, the fire resistance of materials used in home construction, and other fine-scale variation in fuel loads that contribute to the ignition potential of individual homes.

Ember production and transport and their ability to ignite recipient fuels are guided by complex processes structure (Caton et al., 2016), so The Ember Alliance utilized research by Beverly et al., (2010) and Caggiano et al., (2020) for simplified predictions of exposure to flame impingement, radiant heating, and long-range ember cast. Exposure is based on distance from long flame lengths and torching trees assuming:

- Radiant heat can ignite homes when extreme fire behavior (flame lengths > 8 feet) occurs within 33 yards (30 meters) of structures. Areas with conditional flame lengths of >8 feet (Figure 53) and areas with conditional probability of >5% of flame lengths exceeding 8 feet (Figure 54) were included in these predictions. Research summarized by (Abo El Ezz et al., 2022) suggest that 75% of structures are destroyed when exposed to >8-foot flame lengths during actual wildfires.
- Long-range embers can reach homes within 930 yards (850 meters) of mid-grade passive crown fire, high-grade passive crown fire, or active crown fires (Figure 55). (Caggiano et al., 2020) found that a vast majority (95%) of home losses during WUI fires occurred within 100 meters of wildland vegetation, but homes were lost as far as 850 meters from the flaming front.

Based on the analysis for this CWPP, 6% of addresses in Chelan County could be exposed to radiant heat and 66% of addresses could be exposed to embers from burning vegetation (Figure 59). The percentage of homes potentially exposed to radiant heat is as high as 75% in Zone X, and over 95% of homes could be exposed to in Zones A, B, G, H, X, and D.

The Ember Alliance identified community lifelines that could experience damaging radiant heat and/or long-range ember cast to inform project prioritization for the CWPP (Figure 60). Data on the location of community

lifelines came from Perteet. The analysis was shared with the Chelan County CWPP Core Team and partner agencies to help guide mitigation actions around critical infrastructure.

Keep in mind that fire behavior analyses from the 2023 PNW QWRA at the scale of 0.2 acres (30 x 30 meters), and input fuel data is developed via extrapolation of aerial imagery and satellite data. **Site-level assessments are vital to verify exposure of lifelines and develop specific plans for mitigation.**

When homes are closely spaced and have overlapping home ignition zones (HIZs; 0-100 feet from structures), there is a greater potential for home-to-home ignitions, especially if homes are not mitigated or hardened (Syphard et al., 2012). Almost 80% of structures in Chelan County have overlapping HIZs with at least one neighboring structure, 30% have overlapping HIZs with three or more neighboring structures, and 2% have overlapping HIZs with 11 or more neighboring structures (Figure 61). The cities of Chelan, Manson, Entiat, Cashmere, and Wenatchee have the greatest potential for structure-to-structure spread due to higher structure densities.

Fuel treatments within the Chelan County WUI planning and prevention area and mitigation around the HIZs for all structures can reduce the exposure of homes to radiant heat and short-range ember cast. Secondary structures also need to be hardened to reduce the likelihood of ignition and fire spread to primary structures (Maranghides et al., 2022). All structures should be built and upgraded with ignition-resistant materials to reduce the ability of embers to penetrate the building.

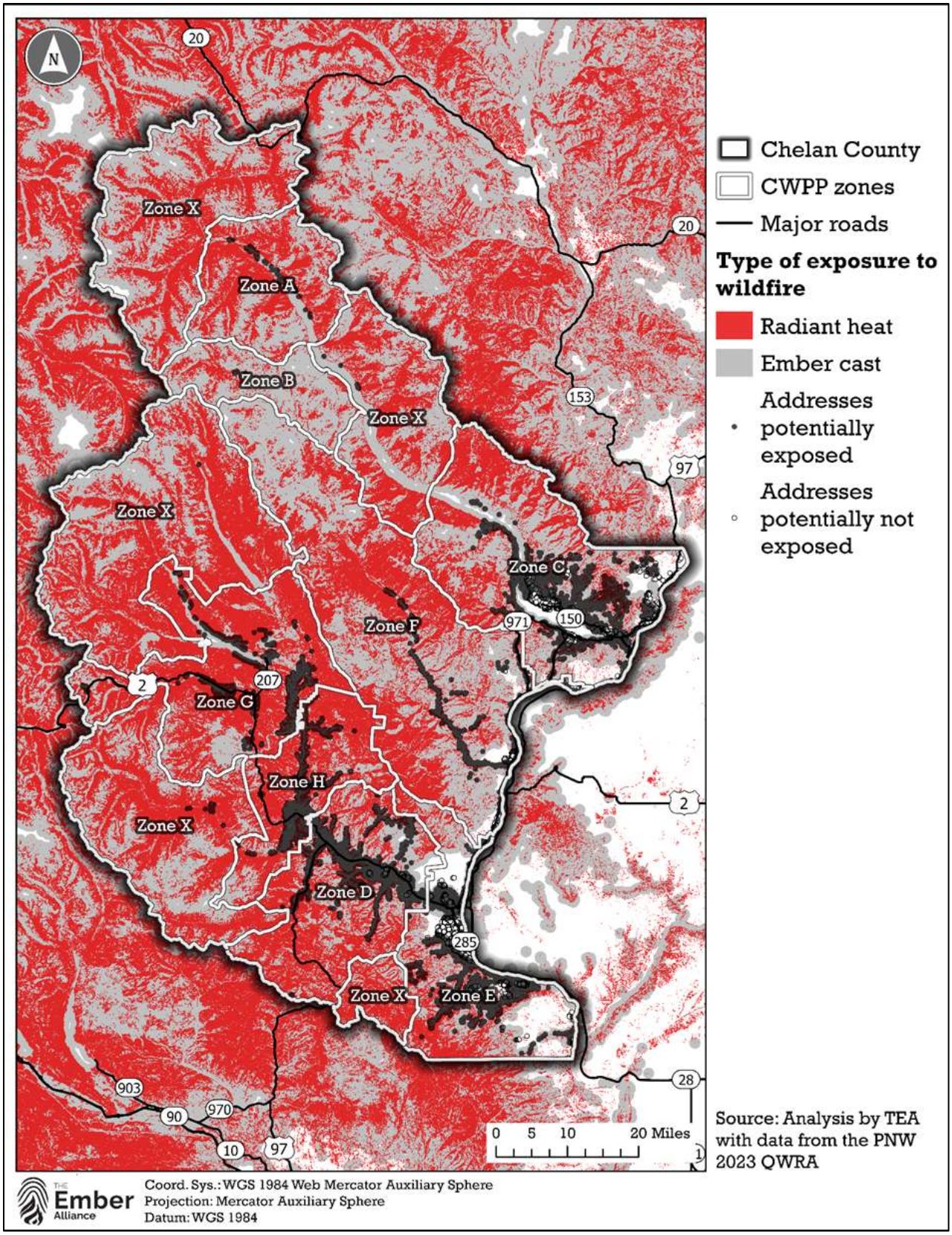

***Figure 59**. Potential exposure of addresses to radiant heat and embers from wildfires in Chelan County. Source: Analysis by TEA with data from the PNW 2023 QWRA.*

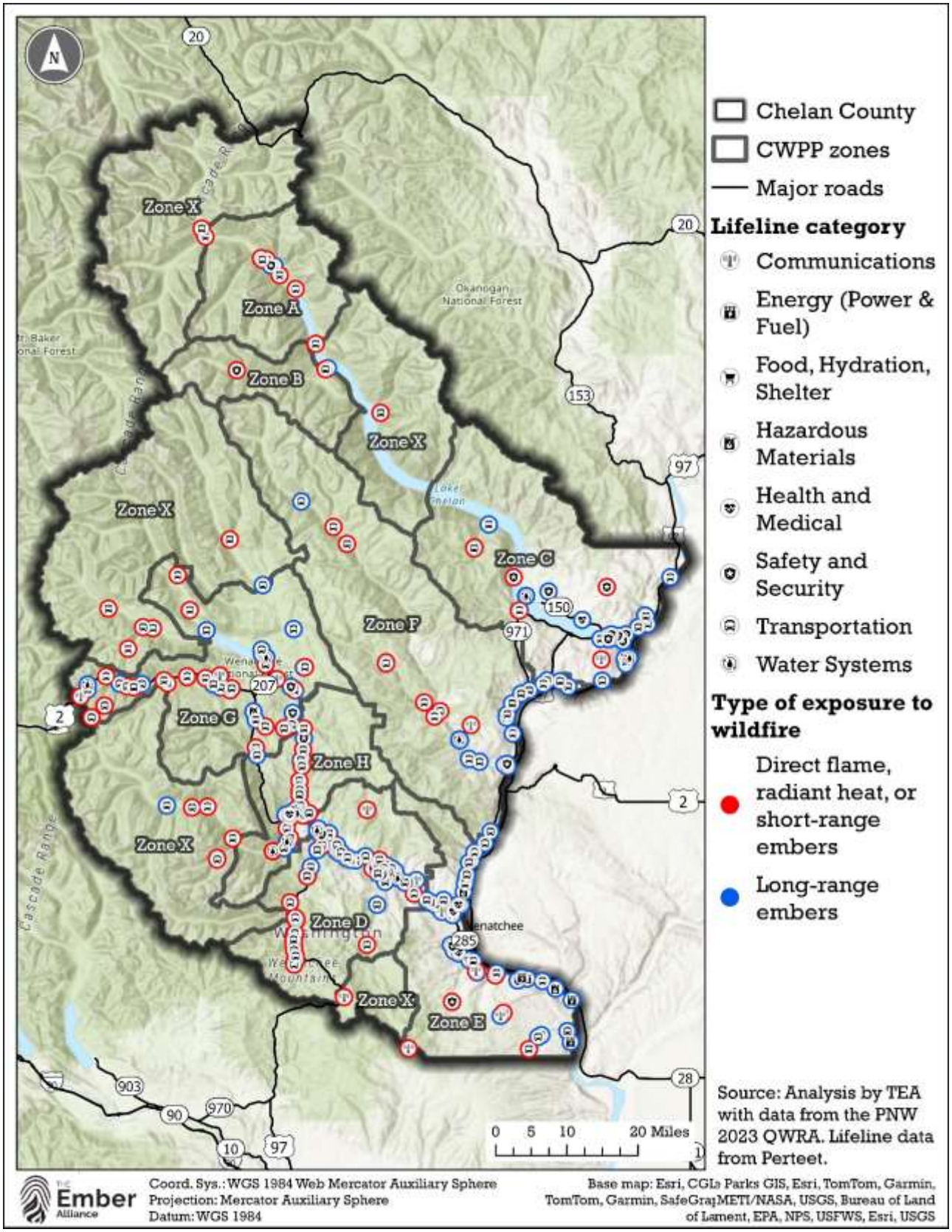

***Figure 60**. Lifelines with Potential Exposure to Wildfires. Source: Perteet and Analysis by The Ember Alliance using the PNW 2023 QWRA.*

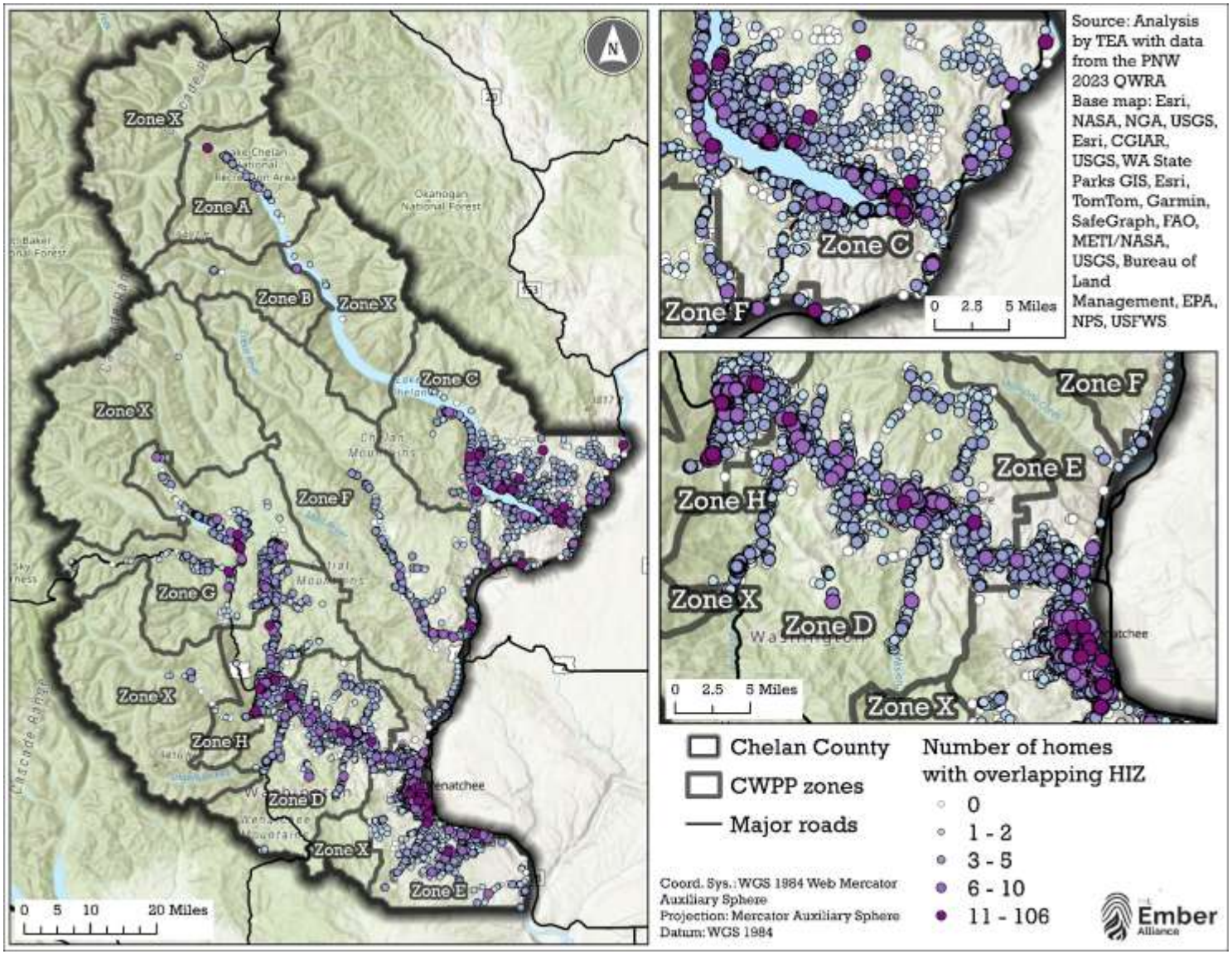

Figure 61. *Overlapping home ignition zones (HIZs) for structures in Chelan County. Source: Analysis by The Ember Alliance using structure locations from Perteet.*

Roadway Survivability

Based on an analysis by TEA, 14% of road segments in Chelan County could experience non-survivable conditions during a wildfire (Figure 62). "Non-survivable roadways" were defined as portions of roads adjacent to areas with conditional flame lengths greater than 8 feet (Figure 53) or areas with conditional probability of >5% of flame lengths exceeding 8 feet (Figure 54). Maximum conditional flame length was identified in 60 m x 60 m areas along all roads.

Mitigation actions along sections of road with high risk for non-survivable conditions during a wildfire can increase the chances of survival for residents stranded in their vehicles during a wildfire and decrease the chance that roadways become impassable due to flames. Evacuation preparedness is paramount for all residents of Chelan County.

Drivers who are stopped or trapped on potentially non-survivable roadways could have a lower chance of survival due to radiant heat emitted from fires of this intensity. This assumption is based on the Haul Chart, which is a standard tool used by firefighters to relate flame lengths to tactical decisions (Table 8). Direct attack of a flaming front is no longer feasible once flame lengths exceed about 8 feet due to the intensity of heat output (NWCG, 2019). Flames greater than 8 feet could also make roads impassable and cut residents off from egress routes. Non-survivable conditions are more common along roads lined by thick forests with abundant ladder fuels, such as trees with low limbs and saplings and tall shrubs beneath overstory trees.

Roads with long segments of hazardous conditions in Chelan County include Stehekin Valley Road, Entiat River Road, S. Lakeshore Road, 1st Creek Road, Union Valley Road, Lower Chiwawa River Road, White River Road, Lake Wenatchee Highway, Merritt Winton Road, Number 2 Canyon Road, Mountain Home Road, Olalla Canyon Road, Squilchuck Road, and Colockum Road. Over a third of roads could experience non-survivable conditions in Zones A, G, and X. Evacuation preparedness is of the utmost importance for residents in neighborhoods with hazardous conditions along roadways, as are strategic fuel treatments along evacuation routes and other major roads.

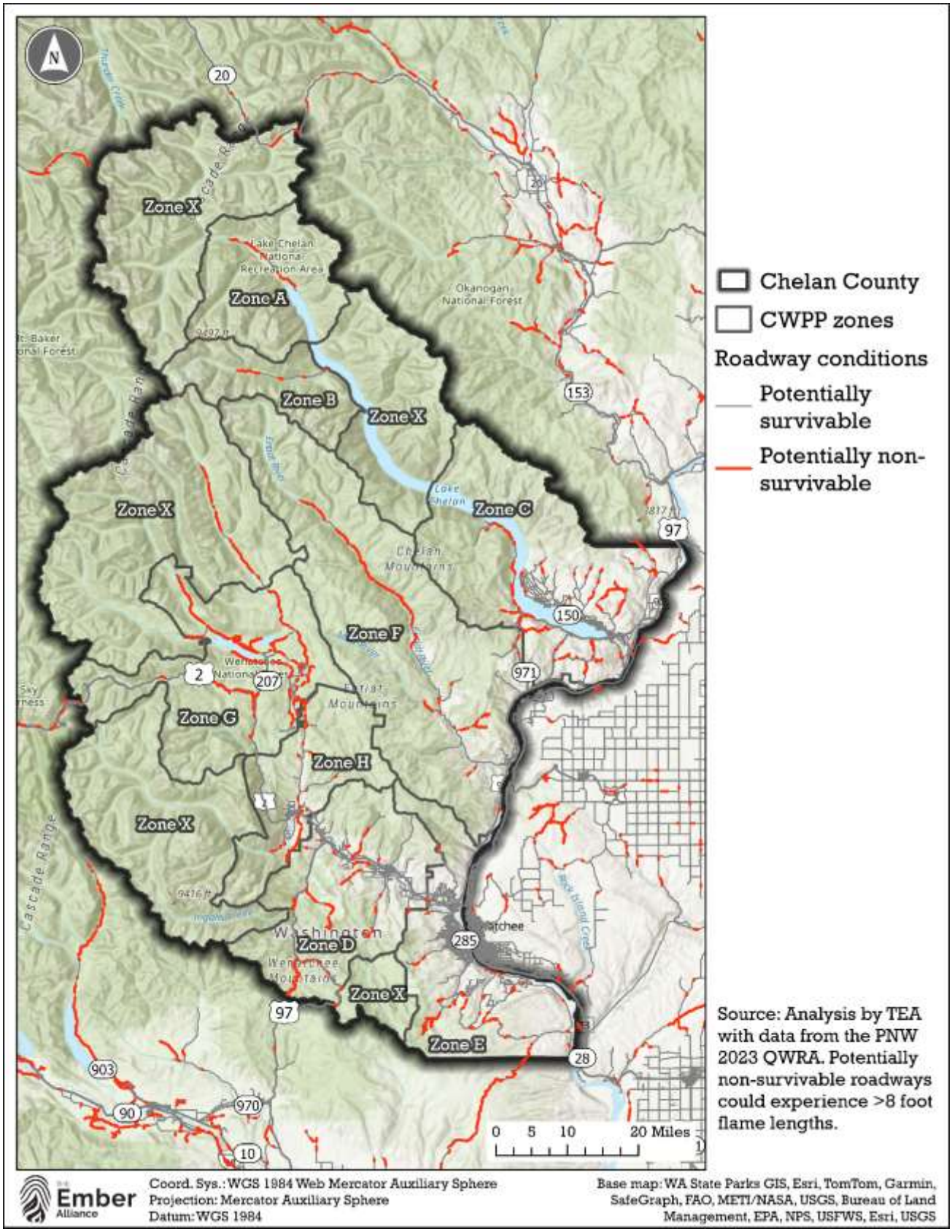

***Figure 62**. Roadways that could experience hazardous, potentially non-survivable conditions during a wildfire in Chelan County. Source: Analysis by TEA with data from the PNW 2023 QWRA.*

A2.2. Mapping the WUI Planning and Prevention Area

Delineating the wildland-urban interface (WUI) is a critical component of CWPPs in compliance with the Healthy Forest Restoration Act (HFRA) of 2003. Communities can extend the WUI boundary into adjacent areas that pose a wildfire threat to their community, that can serve as a strategic location for wildland firefighting, and that are adjacent to evacuation routes for the community (HFRA 4 U.S.C. §101.16). WA DNR guidance for CWPPs permits CWPP groups to collaboratively develop a WUI planning and prevention map that differs from the WA DNR WUI map. The purpose of a WUI planning and prevention map to guide fuel reduction projects and fire prevention planning and is NOT tied to state building codes.

The Chelan County CWPP Core Team developed the WUI planning and prevention map in collaboration with partners and members of the community. The map combines several existing analyses of wildfire hazards and prioritization for strategic action to mitigate wildfire risk (Table 9; Figure 63).

Table 9. *Criteria used to combine existing analyses of wildfire hazards and prioritization to produce the 2025 WUI planning and prevention map for Chelan County. See listed source of data for additional information on methodology.*

Input	Inclusion criteria for the WUI Planning & Prevention Area	Source of data
WUI from the 2019 Chelan County CWPP	WUI intermix, WUI interface, and WUI infrastructure areas. Inhabited, non-WUI areas (downtown Wenatchee and downtown Manson) due to potential smoke exposure. All potential operational delineations with >33% WUI intermix and WUI interface.	2019 Chelan County CWPP and (Mowrey M., Johnston K., Yellin B., 2018)
WA DNR dual hazard analysis	First-priority potential control lines and potential operational delineations.	(WA DNR, 2024)
Potential Operational Delineation relative risk for Wildfire Crisis Strategy National Priority Landscapes	Potential operational delineations with very high relative risk.	(USFS WO Fire and Aviation Management Strategic Analytics Branch, 2024)

Input	Inclusion criteria for the WUI Planning & Prevention Area	Source of data
Potential control lines	All areas within 1000 feet of potential control lines that serve as boundaries for potential operational delineations. Section 16 USC 6592b of the 2021 Infrastructure Investment and Jobs Act permits the U.S. Forest Service to use a categorical exclusion to establish linear fuel breaks up to 1,000 feet in width in the WUI (Infrastructure Investment and Jobs Act, 2021).	(USFS WO Fire and Aviation Management Strategic Analytics Branch, 2024)
WA DNR 20-year Forest Health Plan for Eastern Washington	High-priority HUC-6 watersheds	(WA DNR, 2017)
Wilderness areas	Wilderness areas were excluded from the WUI planning and prevention area except for POD boundaries and areas around structures.	USGS, PAD 3.0

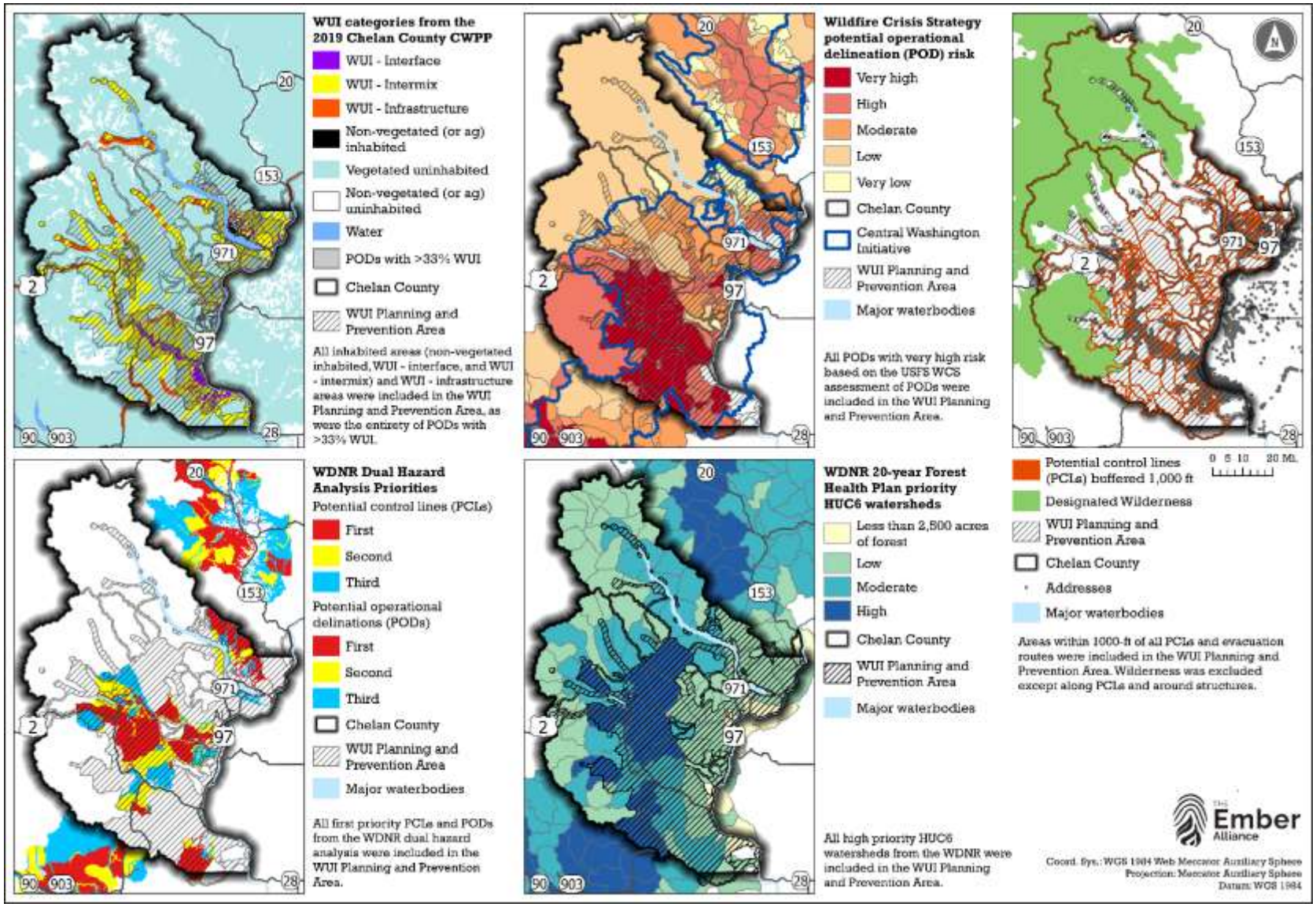

***Figure 63**. Inputs to the wildland urban interface planning and prevention area for the 2025 Chelan County CWPP. Sources: 2019 Chelan County CWPP, WA DNR, and U.S. Forest Service.*

A2.3. Smoke Dispersion and Emission

We utilized **BlueSky Playground v3.5** to model smoke dispersion, emissions, and subsequent levels of particulate matter of 2.5 microns or less in diameter (PM2.5) for cities near fire ignition sites under two different fire scenarios: a **prescribed burn** and a **wildfire**. The BlueSky Playground is a comprehensive tool produced by the U.S. Forest Service to simulate air quality impacts, particularly smoke dispersion and particulate matter concentration for a given area due to fire. This tool creates modeling pathways by connecting various models including fuel loading and consumption, weather conditions, fire behavior, fire emissions, and others to generate specific desired outputs. Below is a detailed outline of the methodology used in this analysis.

Smoke emissions from a **wildfire** were modeled assuming a fire spread across **1200 acres** under dry fuel conditions. Emissions from a prescribed fire were modeled assuming a controlled burn across **140 acres** under moderate fuel conditions. Smoke emissions and dispersal were simulated for 48 hours for the prescribed burn scenario and 60 hours for the wildfire scenario. Prescribed burns are usually conducted in a shorter timeframe than a large wildfire. We modeled smoke emissions from wildfire and prescribed fire in three locations—near the cities of Chelan, Entiat, and Wenatchee (Figure 64, Figure 65, Figure 66). Table 10 provides simulation parameters used for the wildfire and prescribed fire scenarios.

It is important to remember that the output presented here represents simulations under realistic conditions. However, the simulations are not for actual wildfires or prescribed burns. The amount of smoke emitted by a prescribed burn, the distribution of the smoke, and impacts on communities are impacted by the size of the burn, location of the burn, techniques used to ignite the prescribed burn, fuel moisture, fuel loads, wind speed and direction, atmospheric stability, topography, and interactions among these factors. Fire and fuel managers take these factors into account when planning and implementing prescribed burns to reduce potential impacts to the community (NWCG, 2020).

Simulated Prescribed Burn Size and Weather Conditions

Data on prescribed burns were downloaded from the USFS and clipped to the surrounding area of Wenatchee and Chelan, resulting in a total of 6,618 data points. The data were filtered to include: “Planned Treatment Burned in Wildfire”, “Underburn-Low Intensity (majority of unit)”, and “Broadcast Burning”. The average burn size using these criteria was 140 acres. Several fuel treatments were conducted by the USFS in the area between November 12-15, 2024, so we chose November 14, 2024, as the date with representative weather conditions for the prescribed burn scenario.

Simulated Wildfire Size and Weather Conditions

To determine the size of a wildfire for this model, data on past fires were downloaded from the National Interagency Fire Center (NIFC) and clipped to the surrounding area of Wenatchee and Chelan. The data were filtered to include only wildfires from 2010-present and average wildfire size was determined (1,200 acres).

To isolate the impact of fuel moisture and fire size on modeled smoke emissions, we modeled a wildfire ignition on the same day as the prescribed burn scenario—November 14, 2024.

Simulated Ignition Locations

We chose the point of ignition for each of the three locations (Chelan, Entiat, and Wenatchee) by examining geospatial data to find a location that was not surrounded by buildings or roads yet proximal to the town of interest. We identified areas with a large enough area of continuous fuel bed where a prescribed burn or wildfire could feasibly occur. Ignition locations were also chosen based on historic fire activity in the vicinity and the strategic potential of that location for landscape-scale prescribed burning.

Table 10. *Simulation parameters used for modeling PM2.5 emissions and dispersal with the model BlueSky Playground v3 for a simulated wildfire and prescribed burn in three locations in Chelan County.*

Simulation parameters	**Chelan**		**Entiat**	**Wenatchee**			
	Wildfire		***Prescribed burn***	***Wildfire***	***Prescribed burn***	***Wildfire***	***Prescribed burn***
Ignition location	Latitude: 47.939˚N Longitude: 120.252˚W		Latitude: 47.701˚N Longitude: 120.272˚W	Latitude: 47.445˚N Longitude: 120.425˚W			
Fuelbed	Douglas-fir-Pacific ponderosa pine/ocean-spray forest		Douglas-fir-Pacific ponderosa pine/ocean-spray forest	Douglas-fir-Pacific ponderosa pine/ocean-spray forest			
Consumption	Default setting		Default setting	Default setting			
Plume rise	Default settings (using modeled plume)			Default settings (using modeled plume)		Default settings (using modeled plume)	
Dispersion	Default setting			Default setting		Default setting	
Meteorology	Pacific Northwest 4-km			Pacific Northwest 4-km		Pacific Northwest 4-km	
Date of simulation	11/14/2024			11/14/2024		11/14/2024	
Length of simulation	60 hours	48 hours		60 hours	48 hours	60 hours	48 hours
Size of incident	1,200 acres	140 acres		1,200 acres	140 acres	1,200 acres	140 acres
Fuel moisture	Dry	Moderate		Dry	Moderate	Dry	Moderate

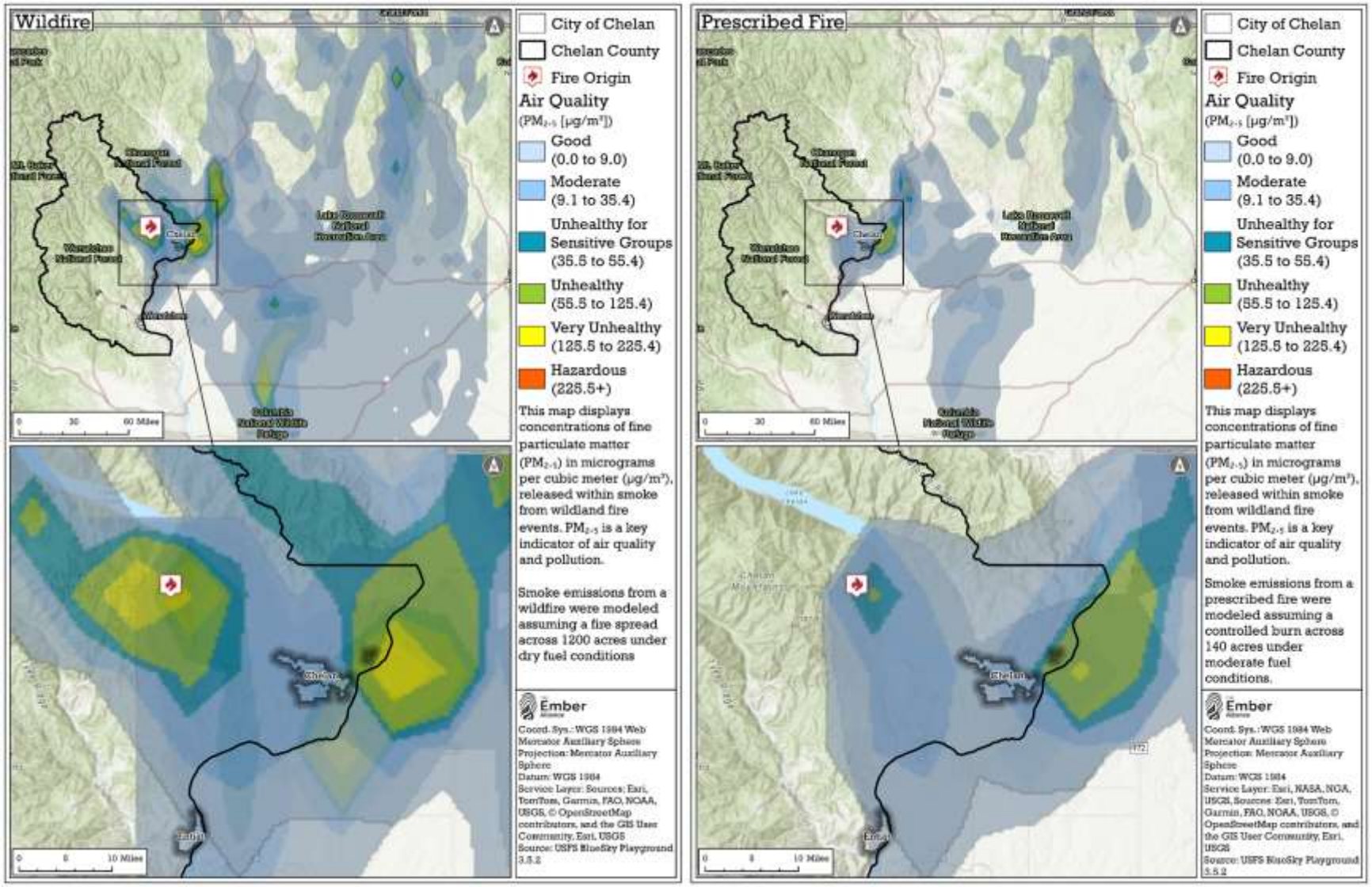

Figure 64. *Modeled emissions and dispersal of PM2.5 under wildfire and prescribed burning conditions for a simulated ignition outside the city of Chelan. Source: Analysis by The Ember Alliance.*

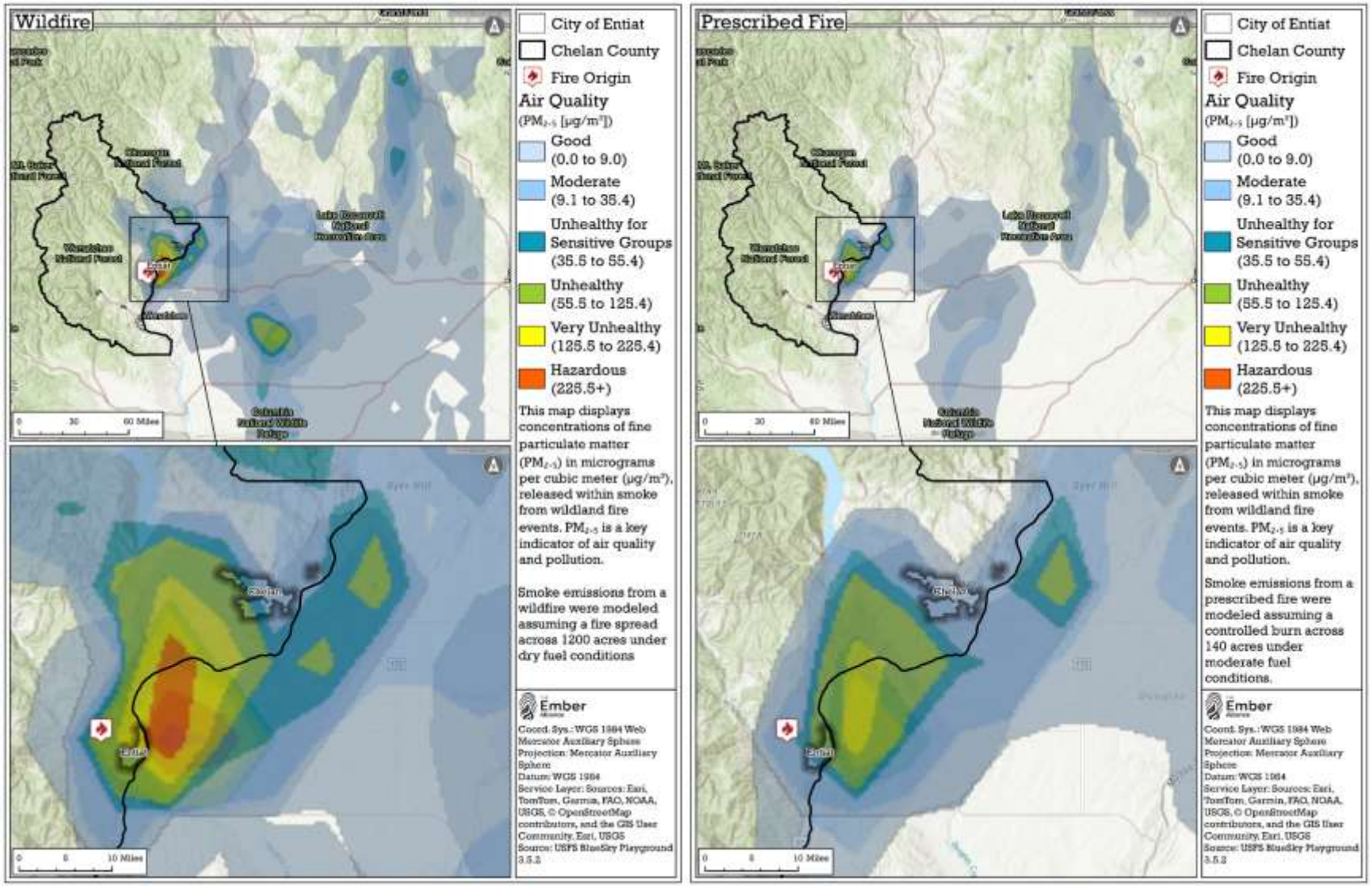

***Figure 65**. Modeled emissions and dispersal of PM2.5 under wildfire and prescribed burning conditions for a simulated ignition outside the city of Entiat. Source: Analysis by The Ember Alliance.*

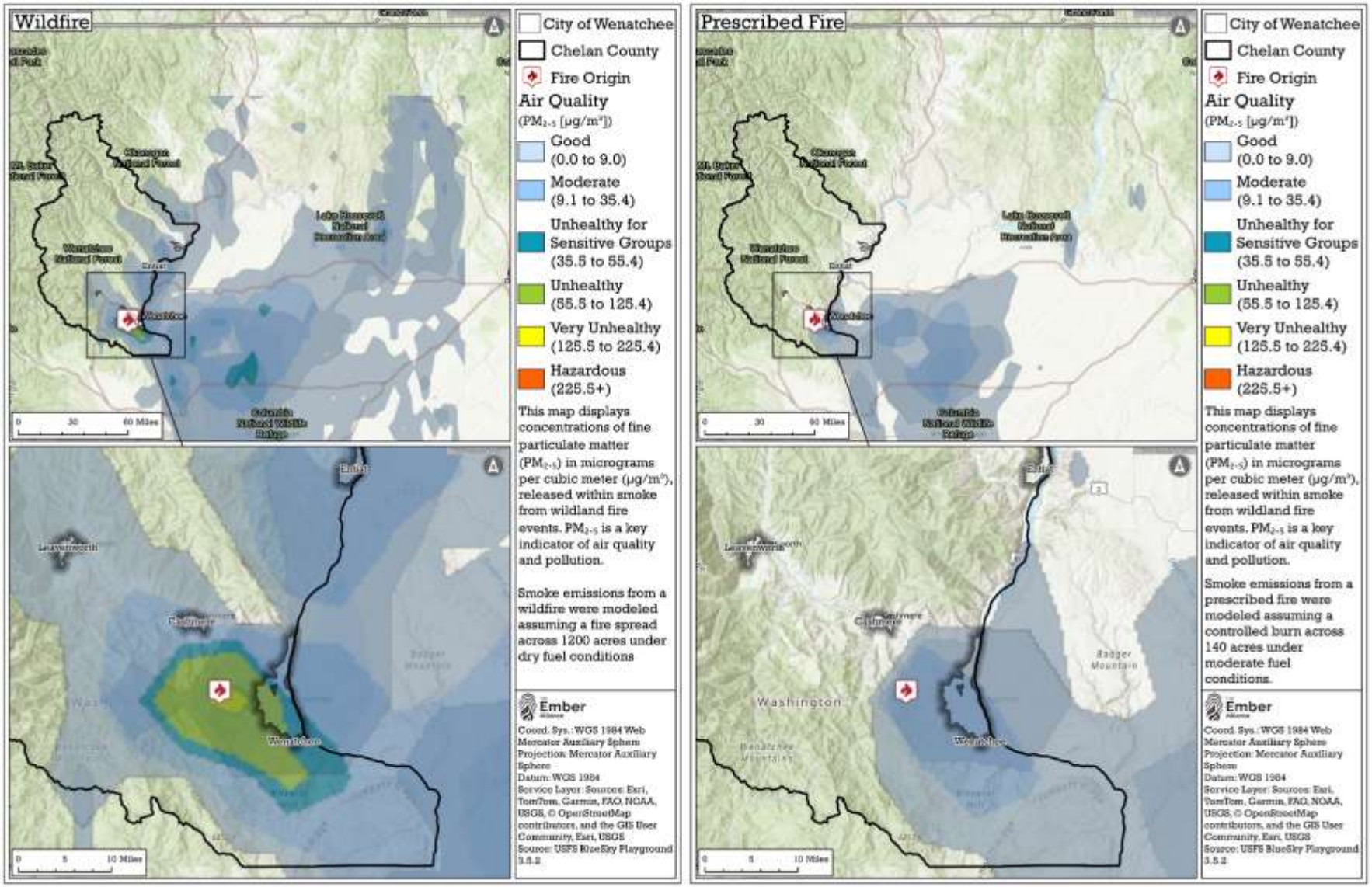

Figure 66. *Modeled emissions and dispersal of PM2.5 under wildfire and prescribed burning conditions for a simulated ignition outside the city of Wenatchee. Source: Analysis by The Ember Alliance.*

Appendix 3 – Additional Zone Maps

A3.1. Zone A - Stehekin

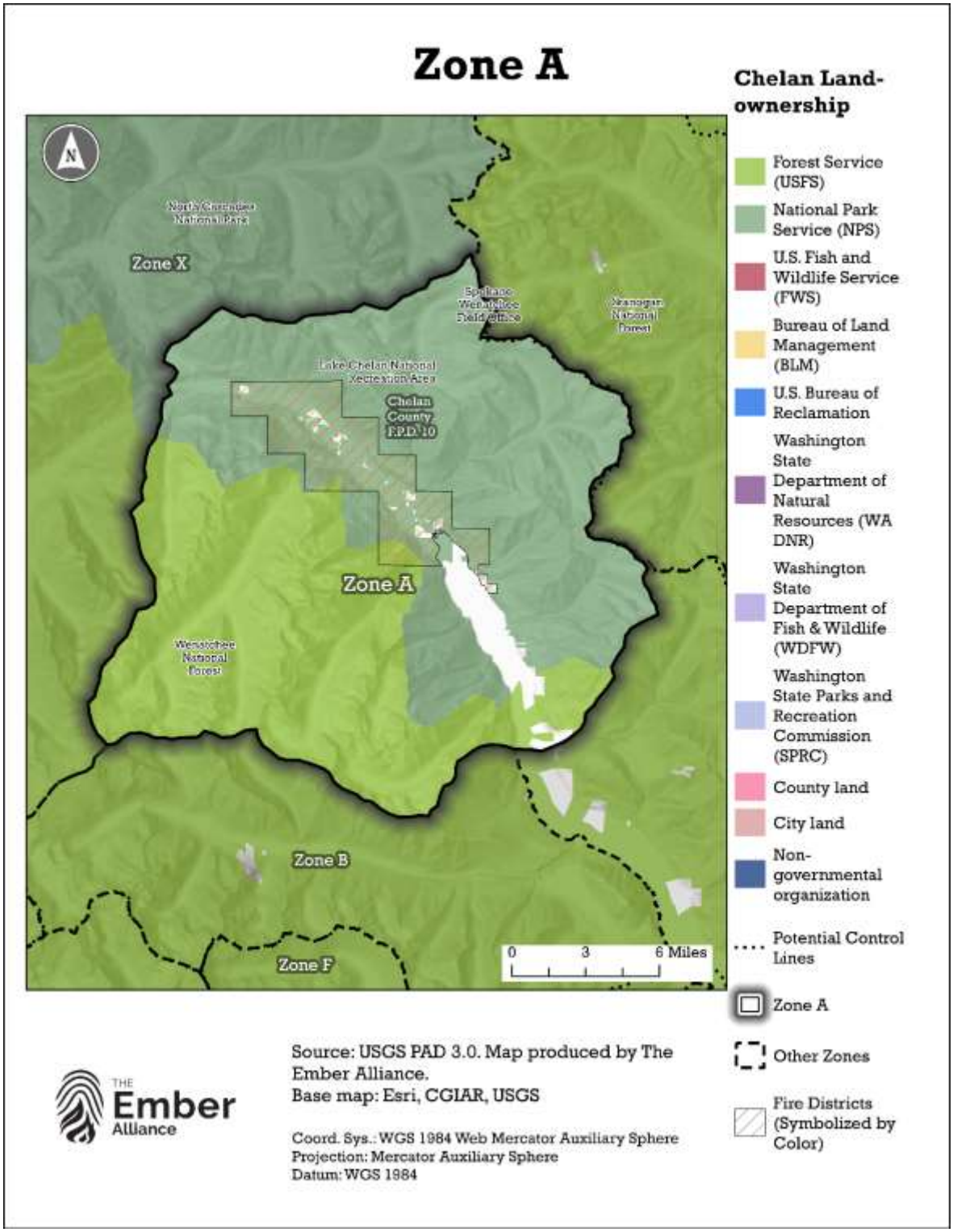

Figure 67. *Land Ownership for Zone A in Chelan County. Source: USGS PAD 3.0.*

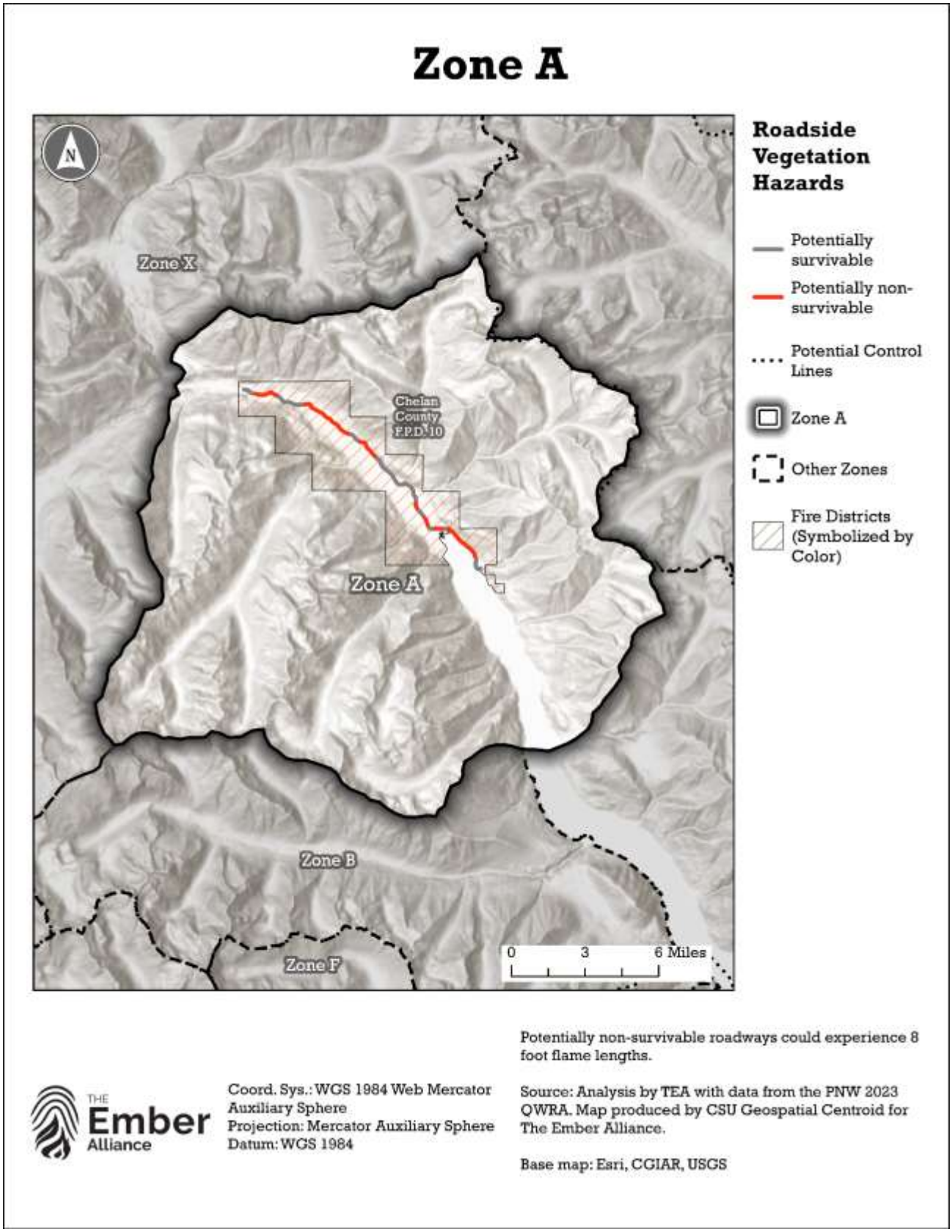

Figure 68. *Roadside vegetation hazards with Zone A of Chelan County. Source: Analysis by TEA with data from the PNW 2023 QWRA.*

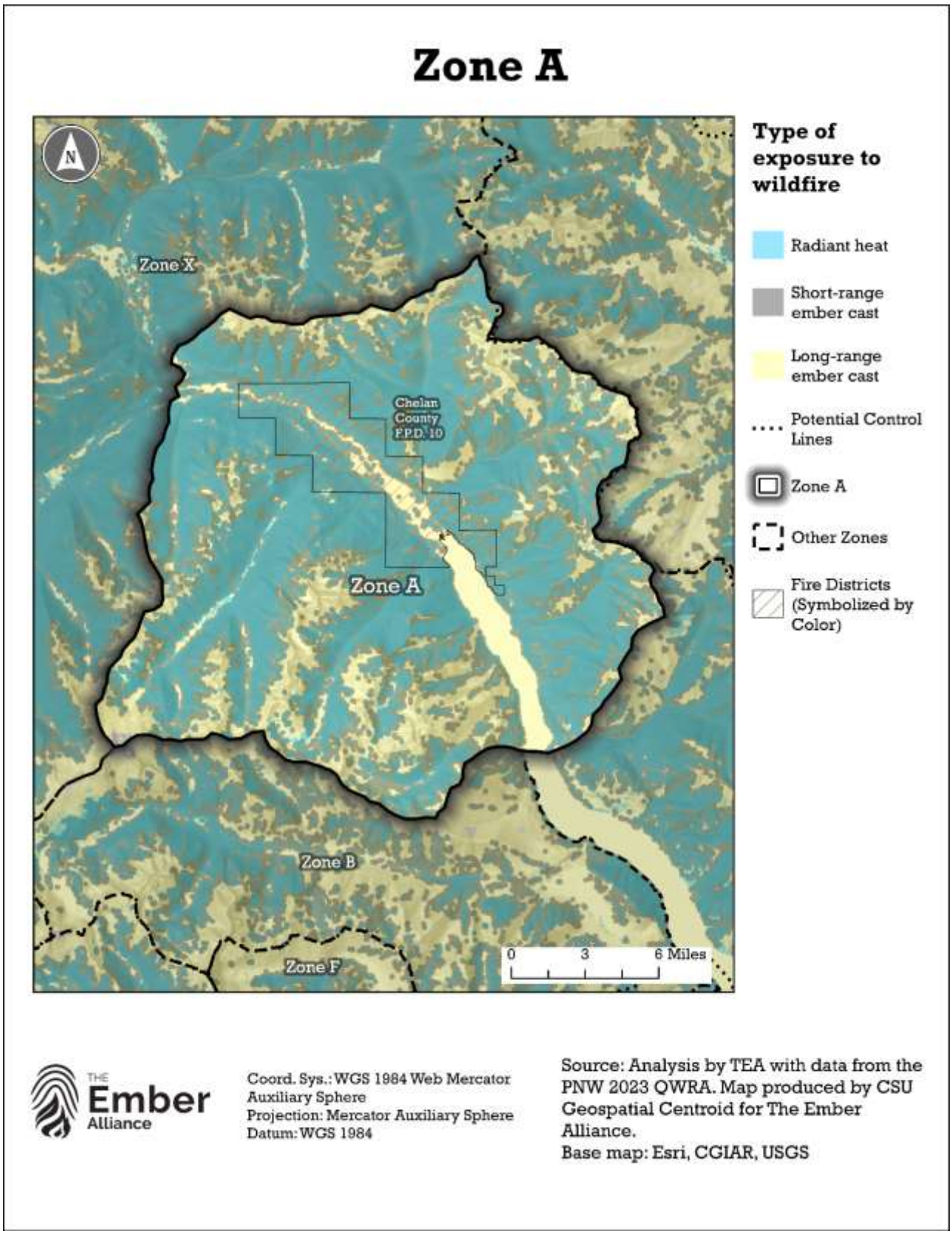

***Figure 69**. Type of exposure to wildfire in Zone A of Chelan County. Source: Analysis by TEA with data from the PNW 2023 QWRA.*

A3.2. Zone B - Holden

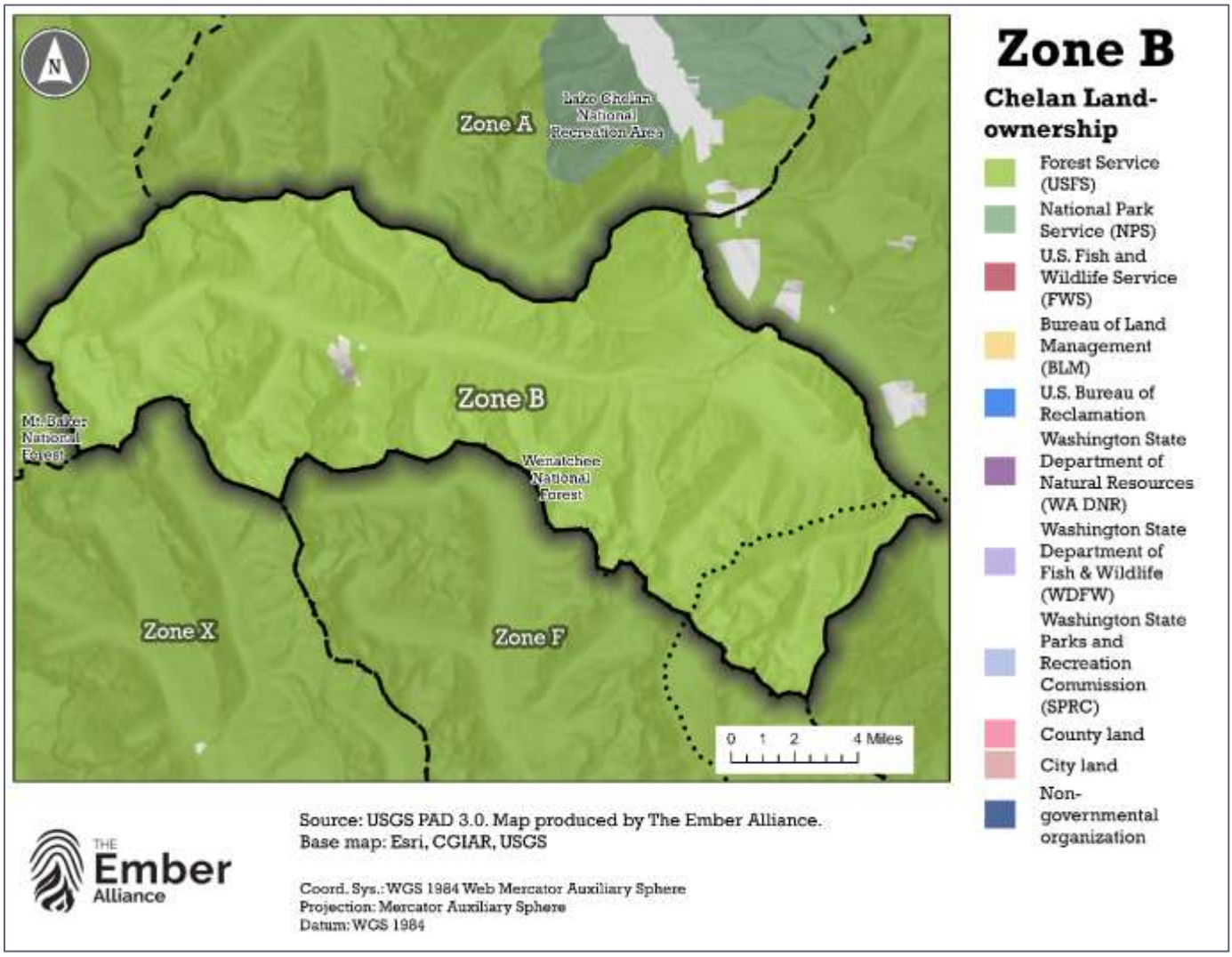

Figure 70. *Land Ownership for Zone B in Chelan County. Source: USGS PAD 3.0.*

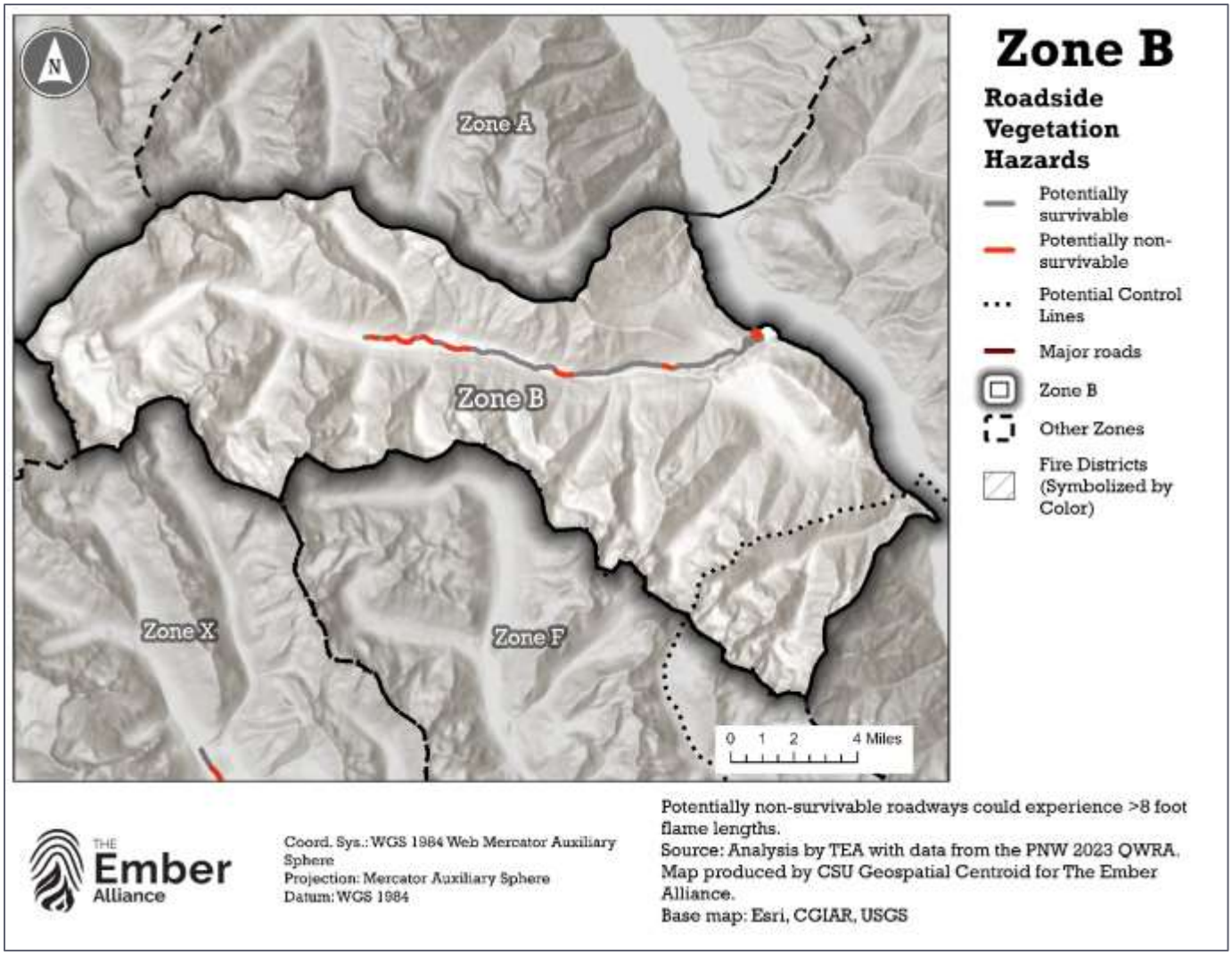

***Figure 71**. Roadside vegetation hazards with Zone B of Chelan County. Source: Analysis by TEA with data from the PNW 2023 QWRA.*

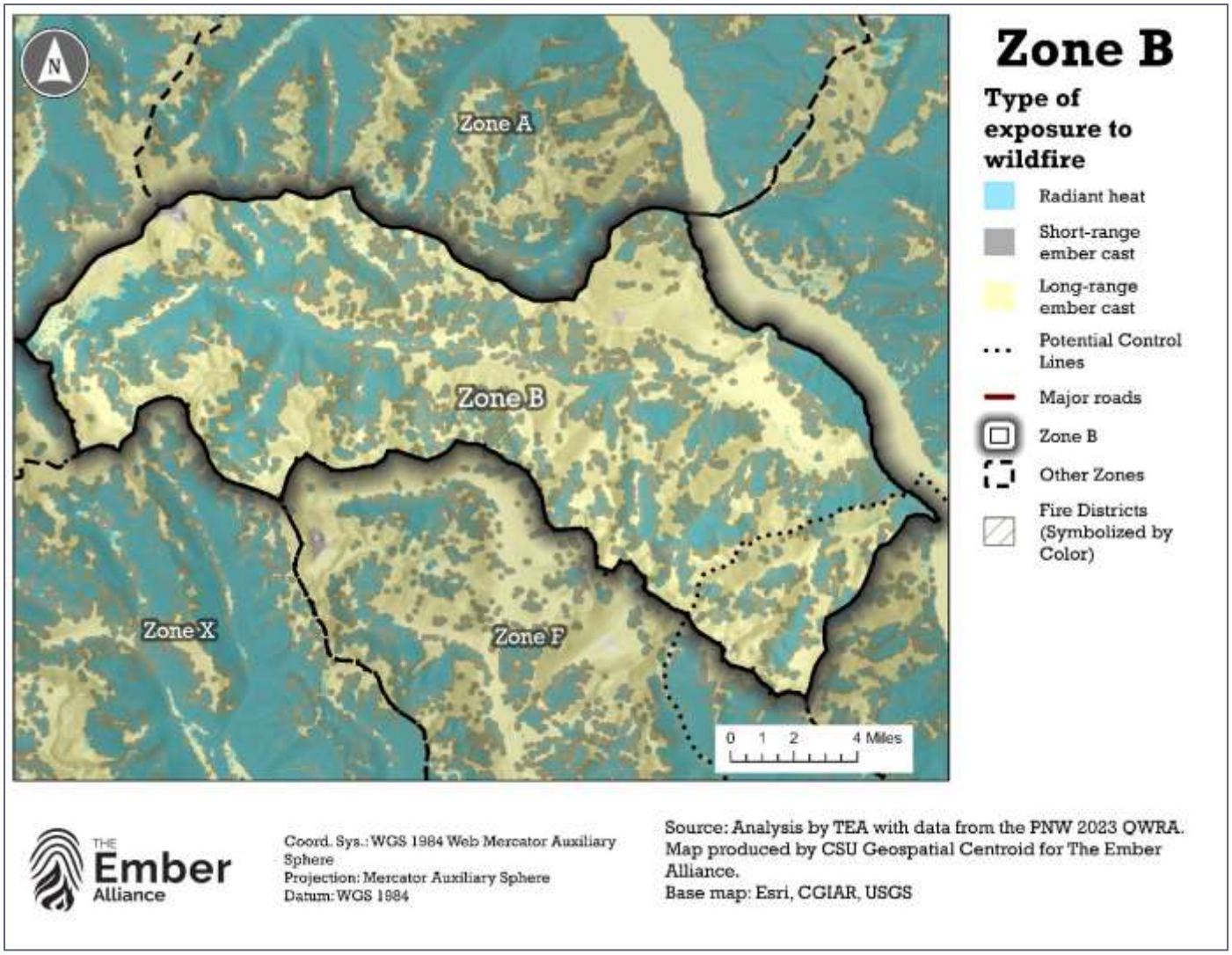

***Figure 72**. Type of exposure to wildfire in Zone B of Chelan County. Source: Analysis by TEA with data from the PNW 2023 QWRA.*

A3.3. Zone C – Chelan and Manson

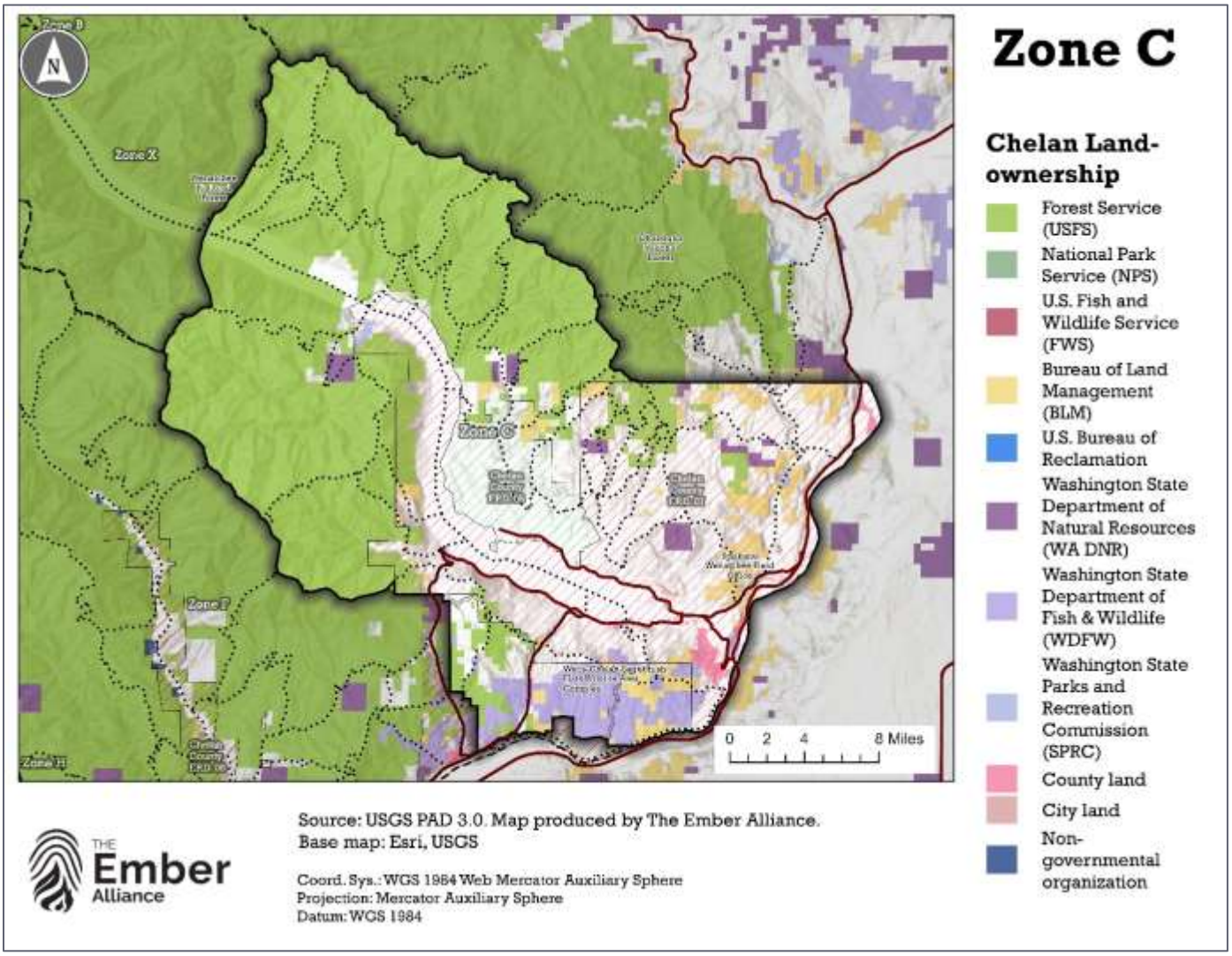

***Figure 73**. Land Ownership for Zone C in Chelan County. Source: USGS PAD 3.0.*

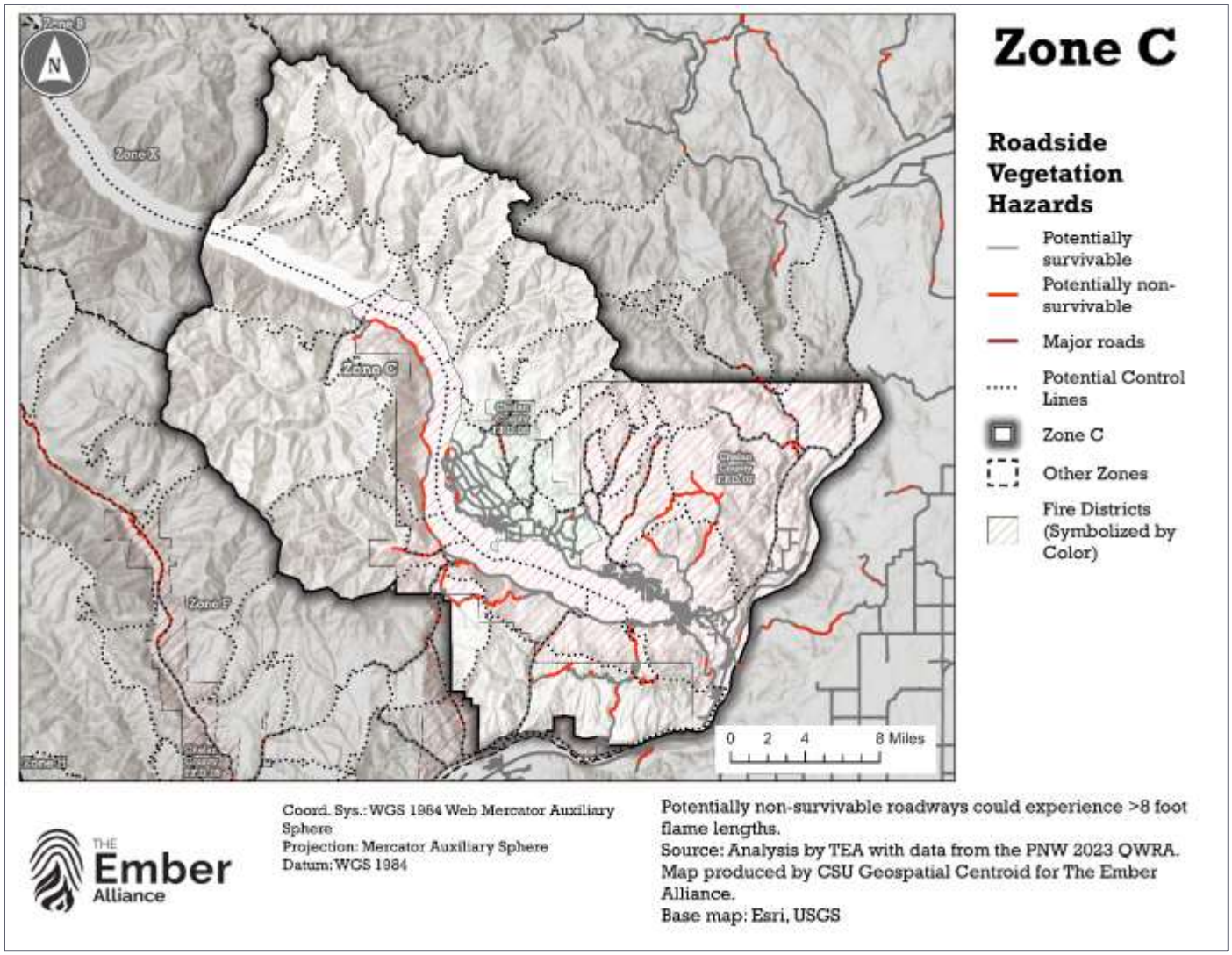

***Figure 74**. Roadside vegetation hazards with Zone C of Chelan County. Source: Analysis by TEA with data from the PNW 2023 QWRA.*

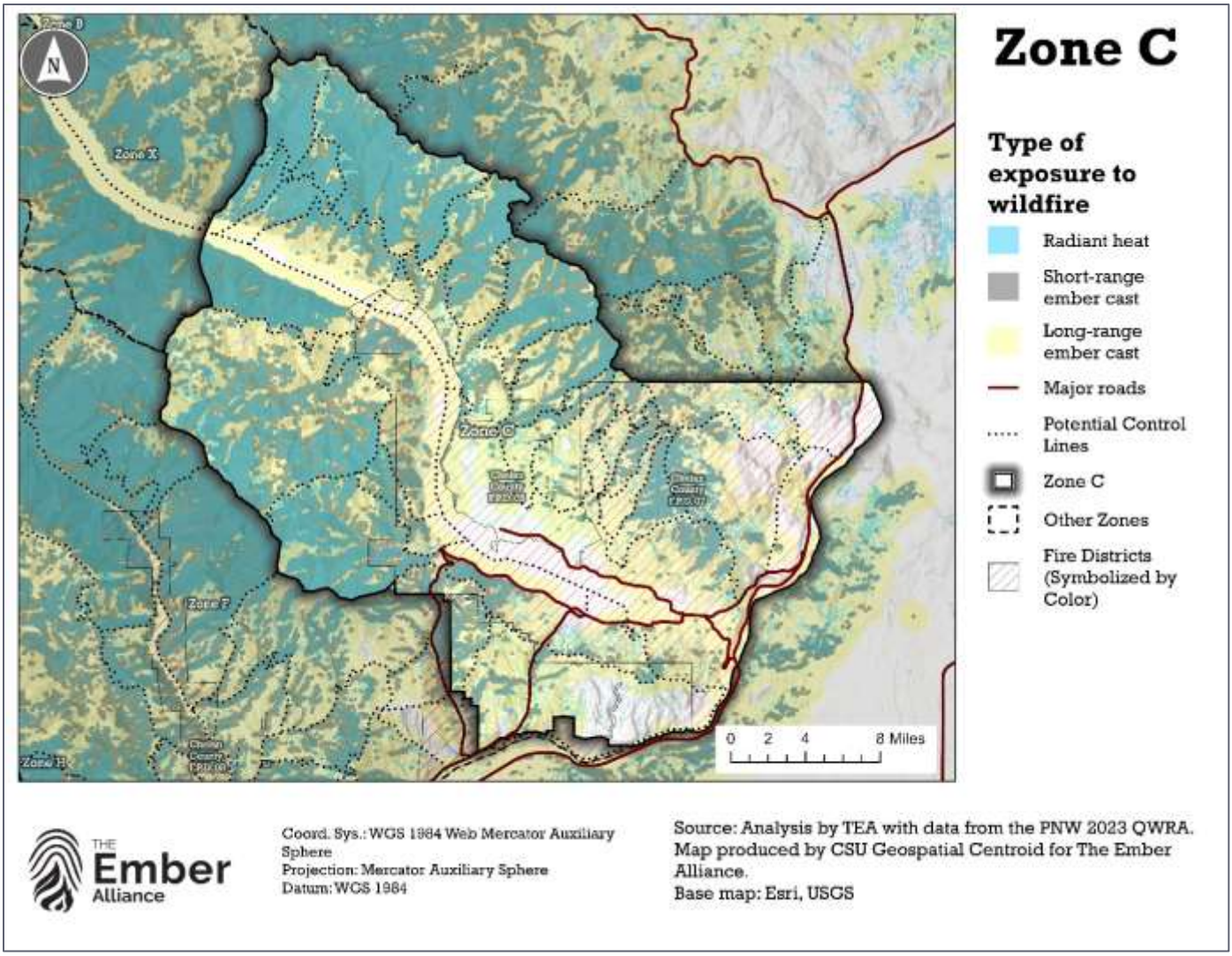

Figure 75. *Type of exposure to wildfire in Zone C of Chelan County. Source: Analysis by TEA with data from the PNW 2023 QWRA.*

A3.4. Zone D - Cashmere

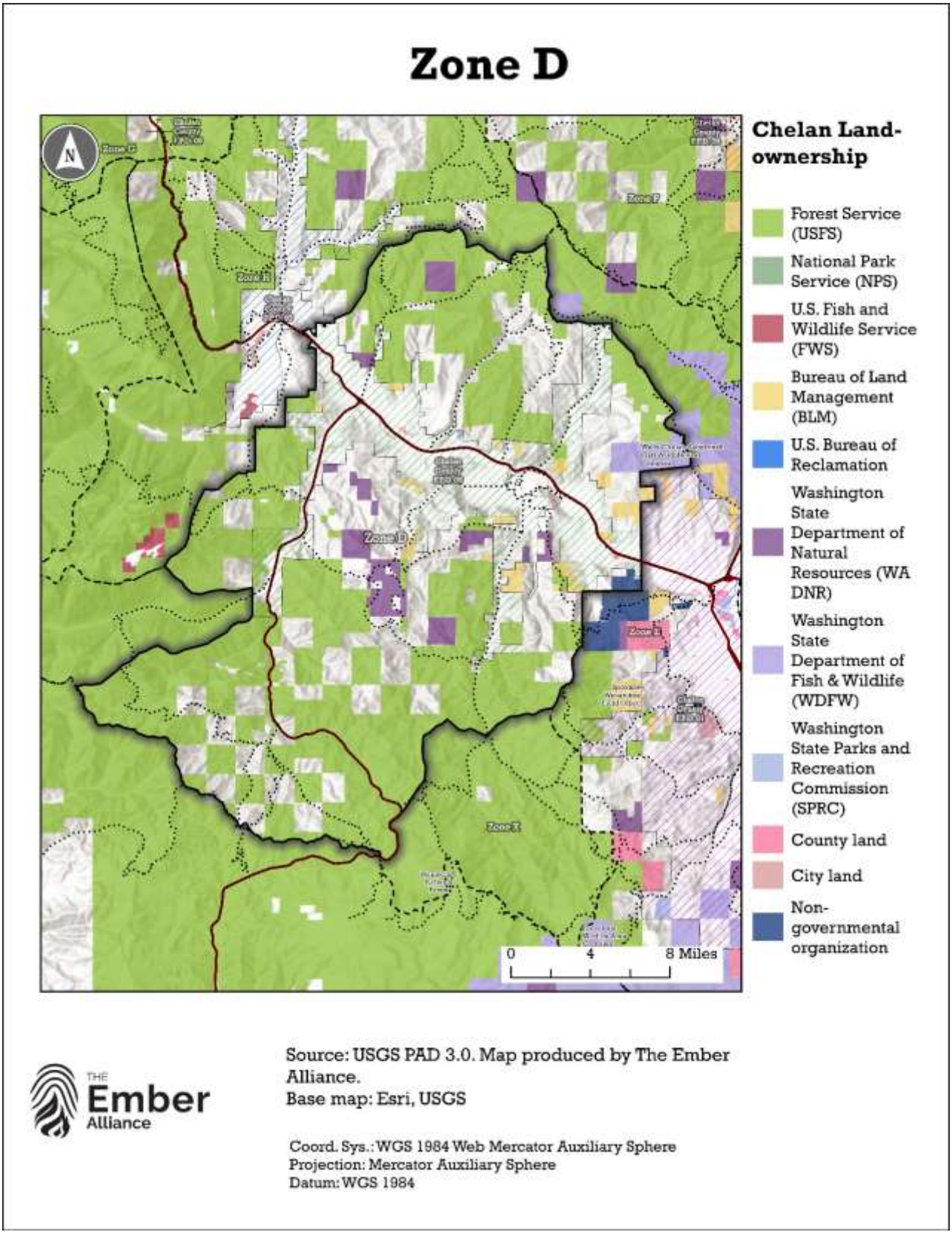

Figure 76. *Land Ownership for Zone D in Chelan County. Source: USGS PAD 3.0.*

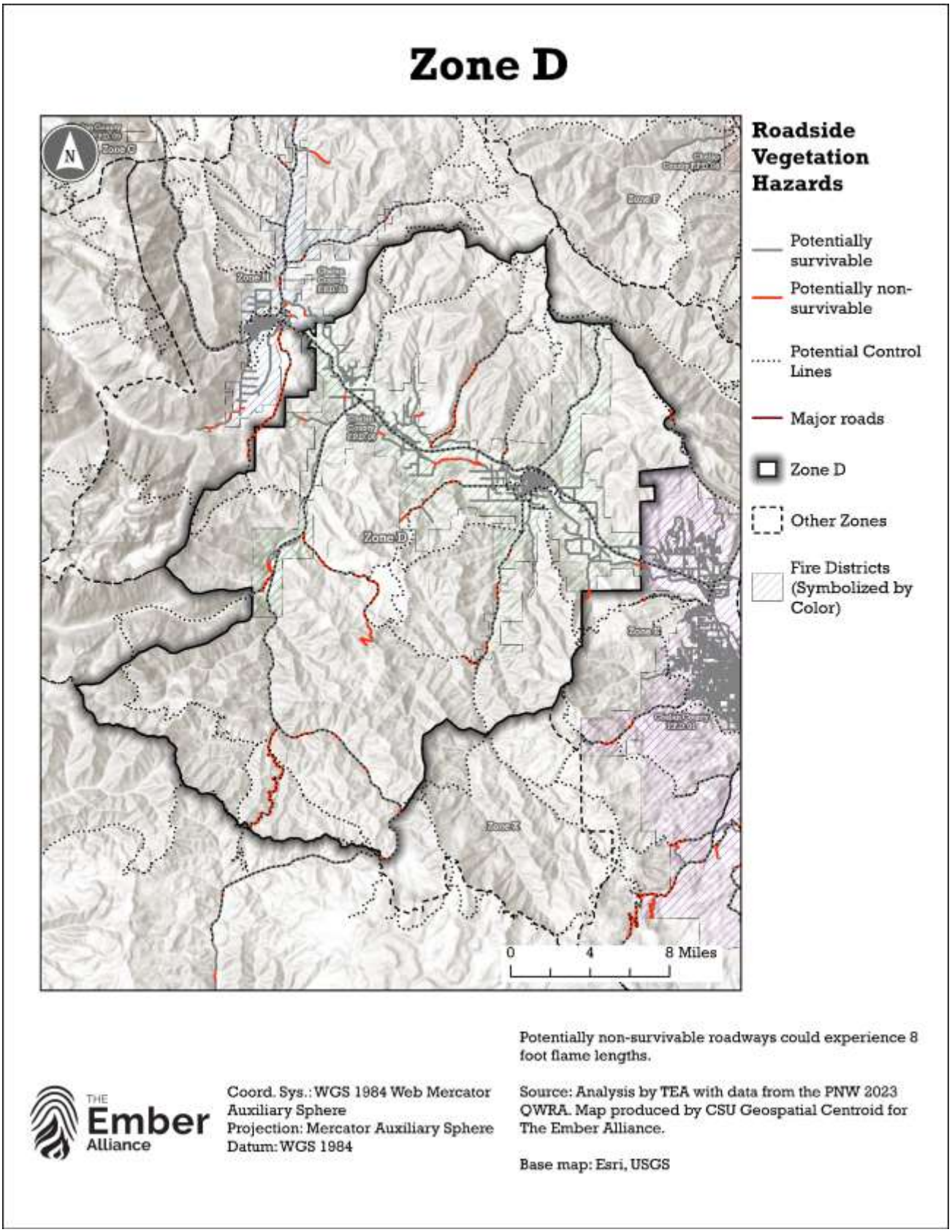

Figure 77. *Roadside vegetation hazards with Zone D of Chelan County. Source: Analysis by TEA with data from the PNW 2023 QWRA.*

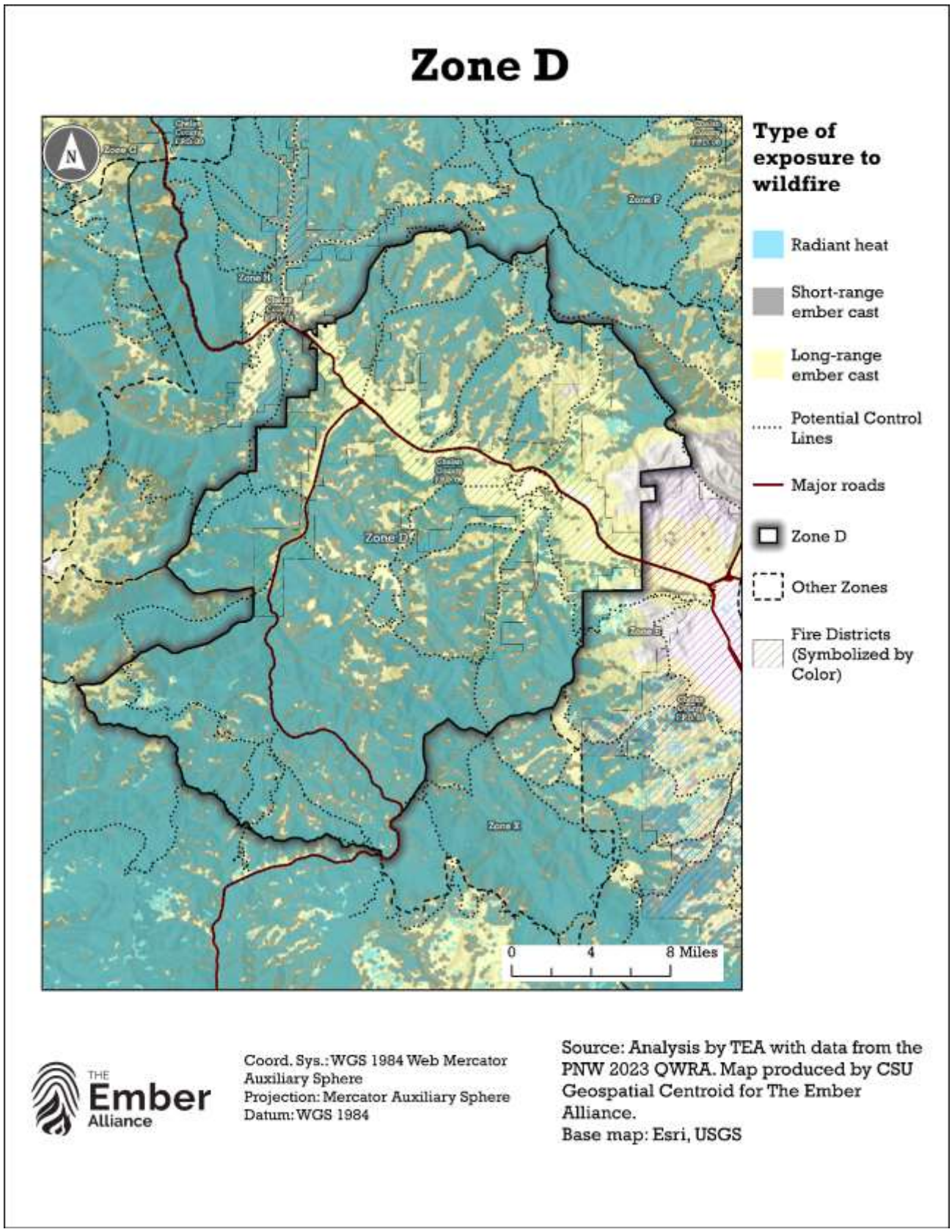

Figure 78. *Type of exposure to wildfire in Zone D of Chelan County. Source: Analysis by TEA with data from the PNW 2023 QWRA.*

A3.5. Zone E - Wenatchee

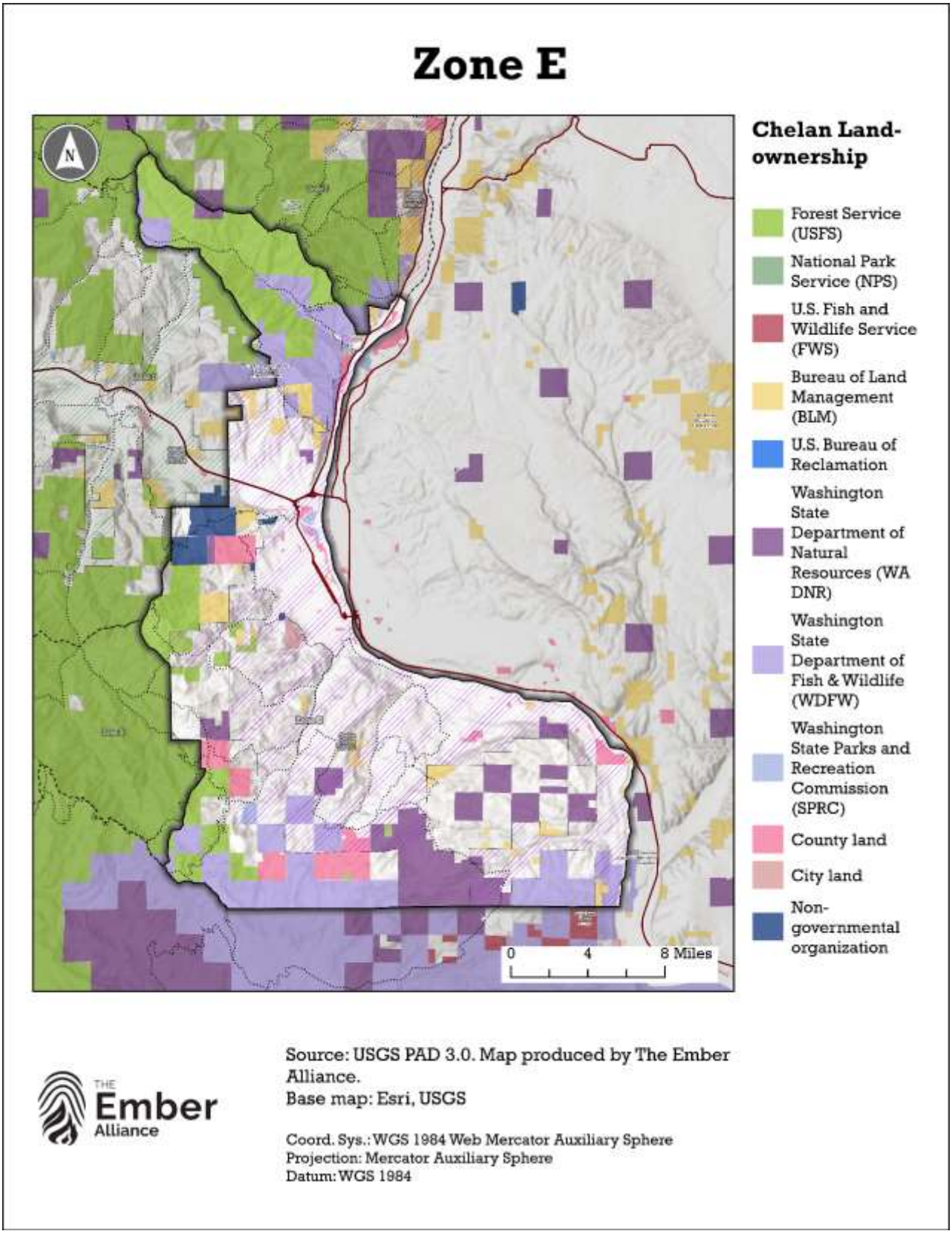

***Figure 79**. Land Ownership for Zone E in Chelan County. Source: USGS PAD 3.0.*

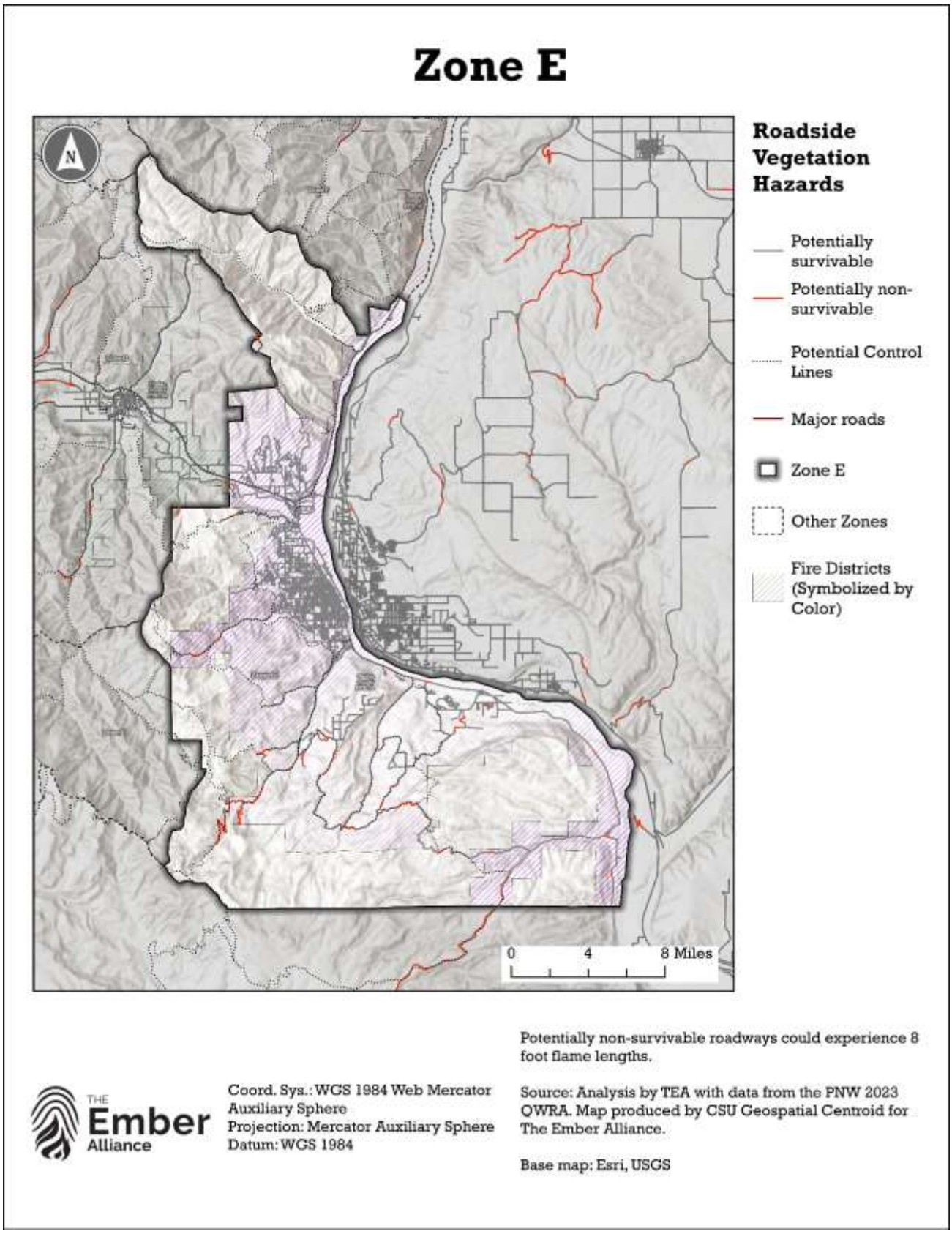

***Figure 80**. Roadside vegetation hazards with Zone E of Chelan County. Source: Analysis by TEA with data from the PNW 2023 QWRA.*

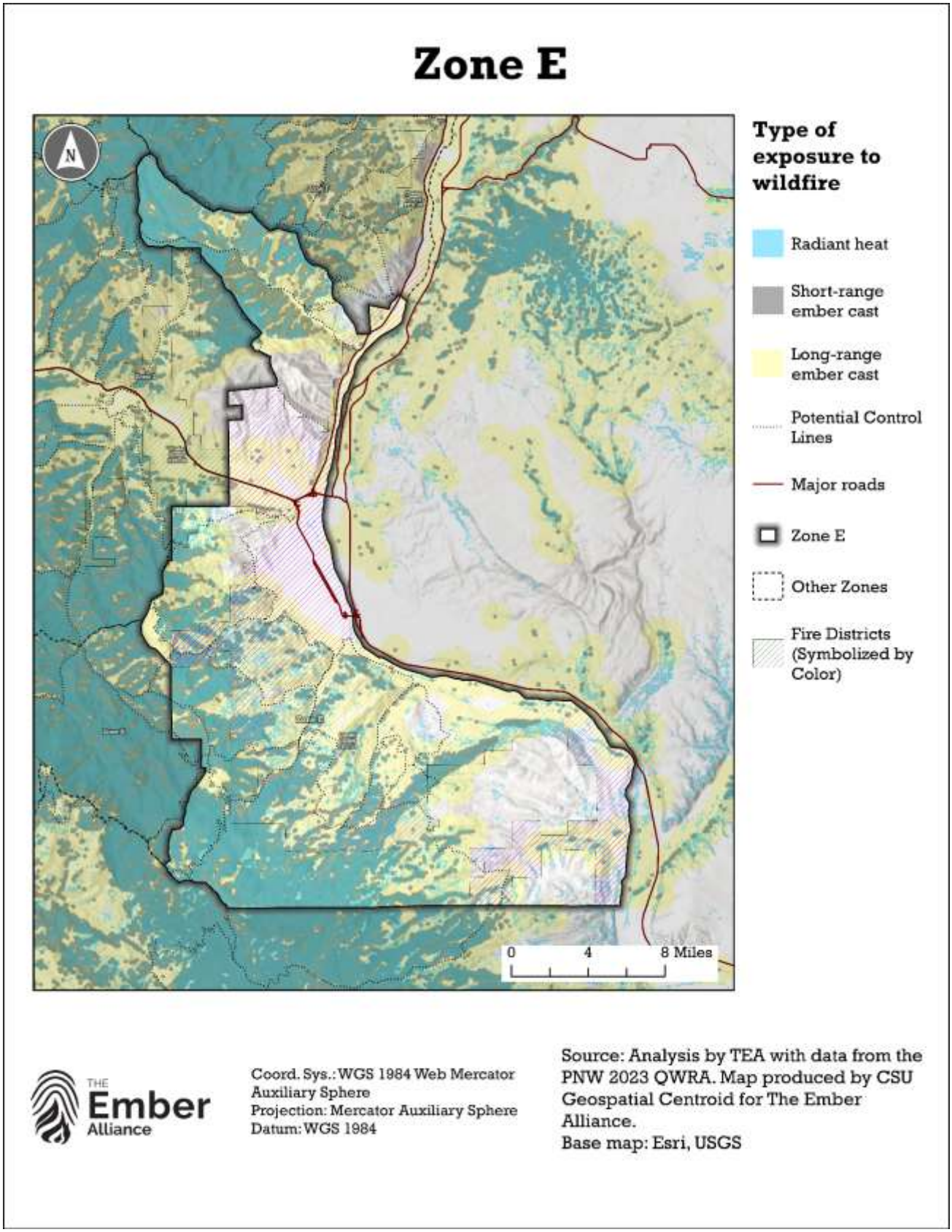

***Figure 81**. Type of exposure to wildfire in Zone E of Chelan County. Source: Analysis by TEA with data from the PNW 2023 QWRA.*

A3.6. Zone F - Entiat

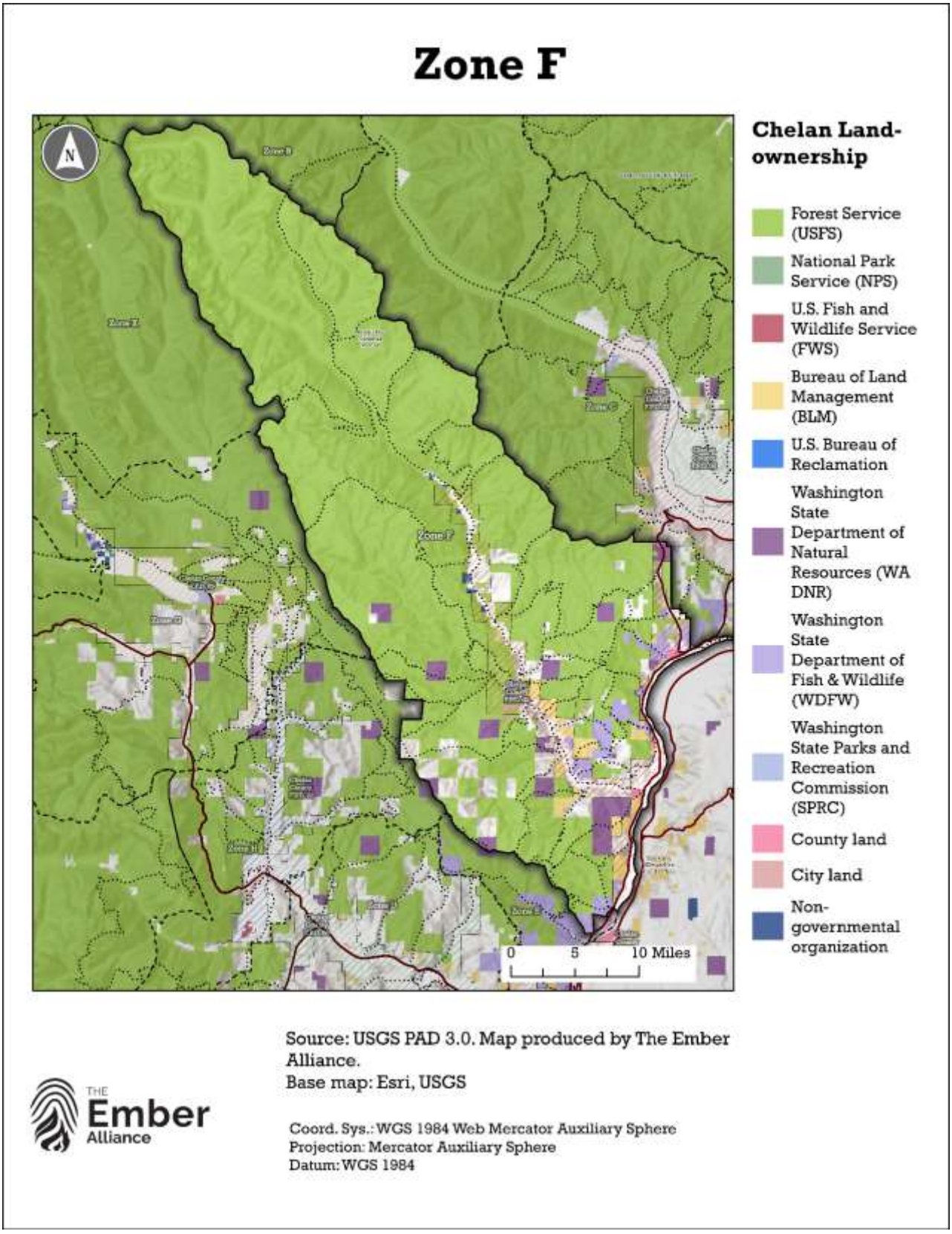

***Figure 82**. Land Ownership for Zone F in Chelan County. Source: USGS PAD 3.0.*

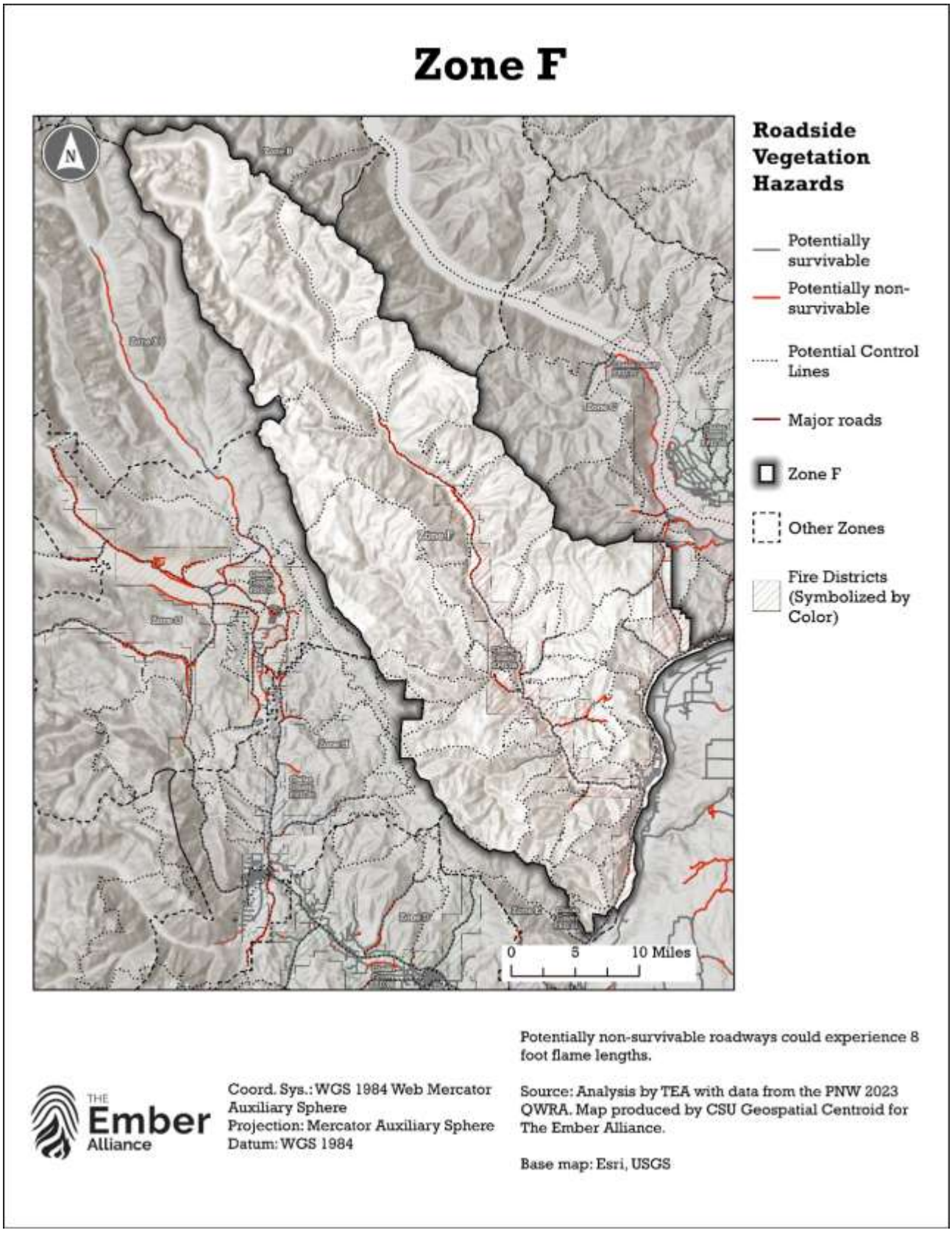

***Figure 83**. Roadside vegetation hazards with Zone F of Chelan County. Source: Analysis by TEA with data from the PNW 2023 QWRA.*

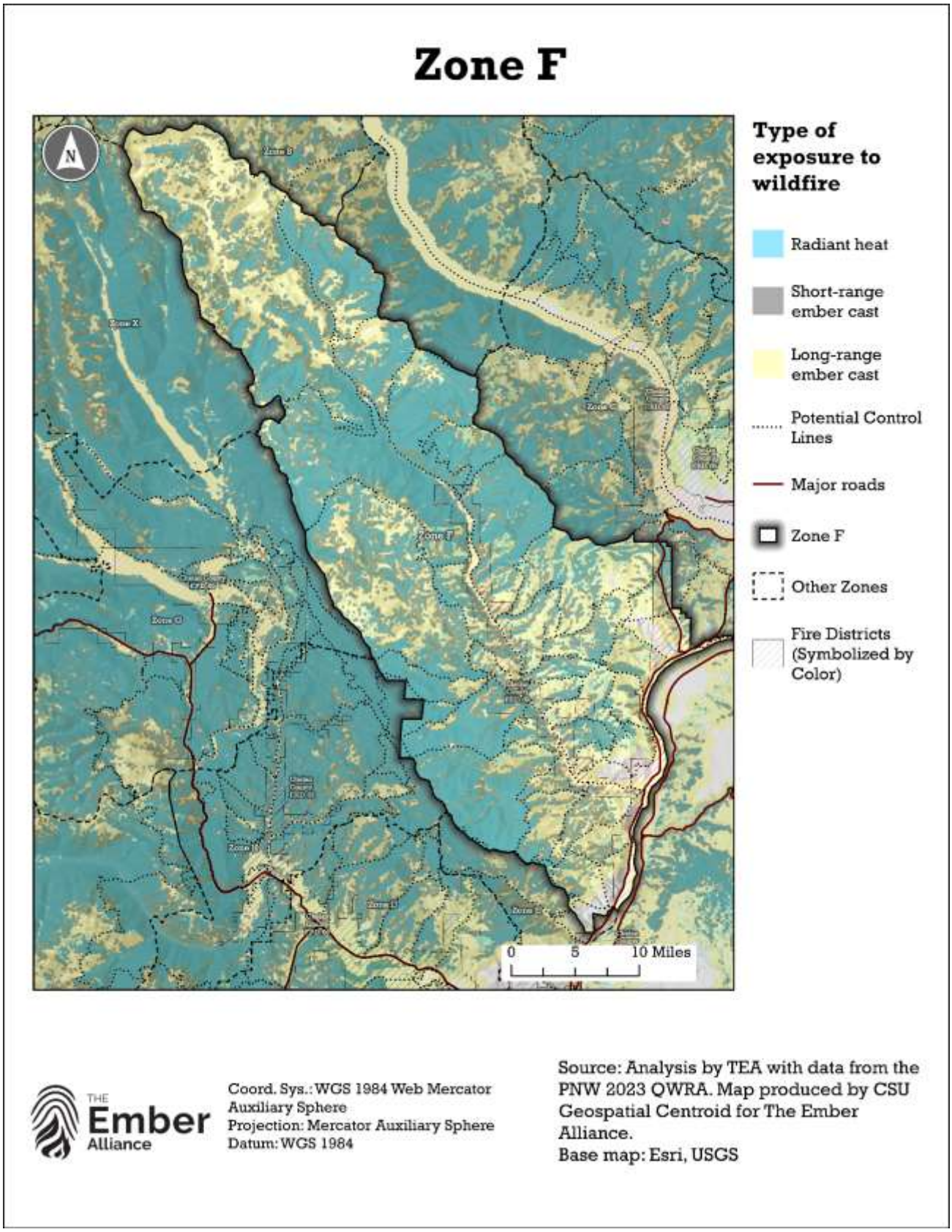

***Figure 84**. Type of exposure to wildfire in Zone F of Chelan County. Source: Analysis by TEA with data from the PNW 2023 QWRA.*

A3.7. Zone G – Lake Wenatchee

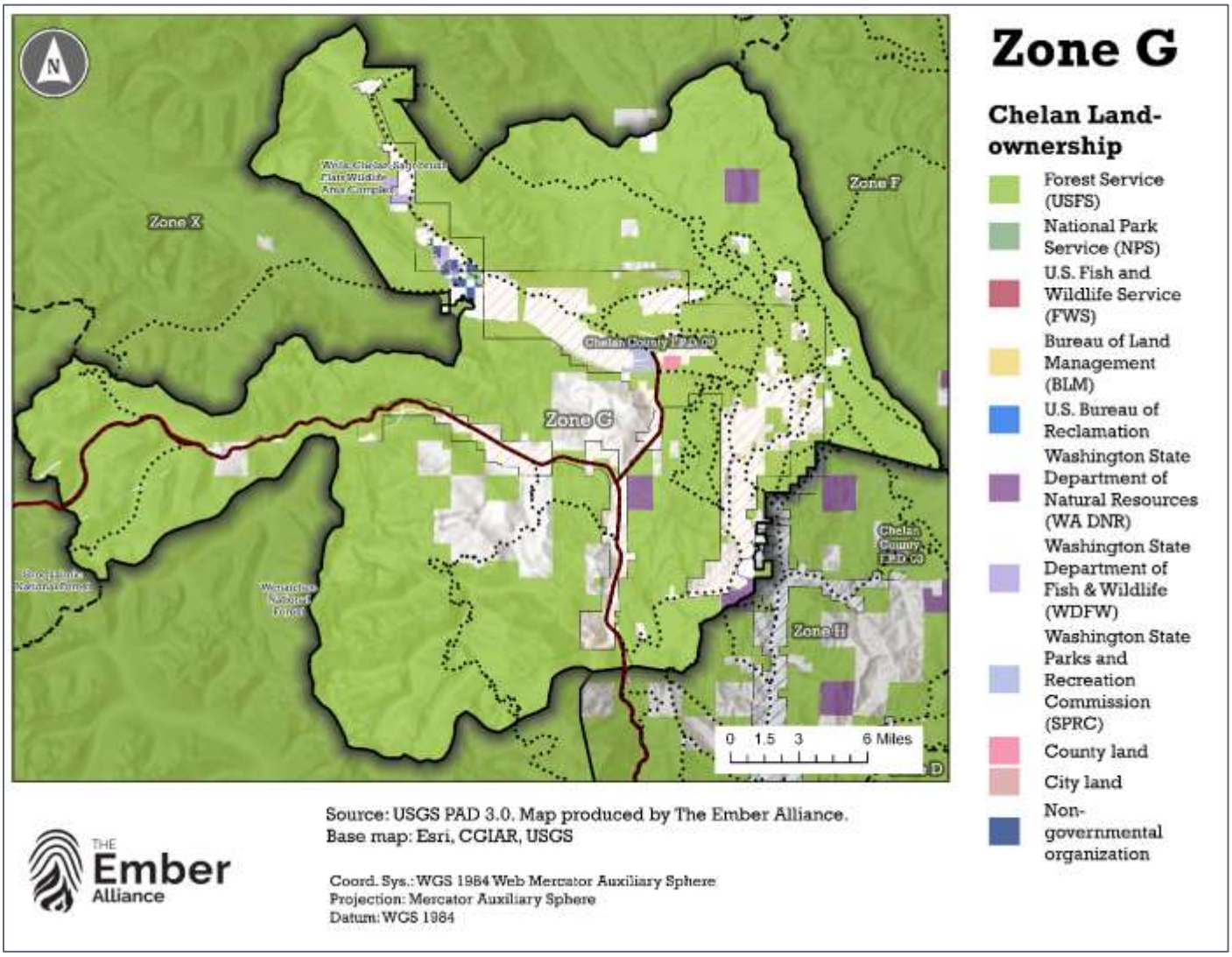

Figure 85. *Land Ownership for Zone G in Chelan County. Source: USGS PAD 3.0.*

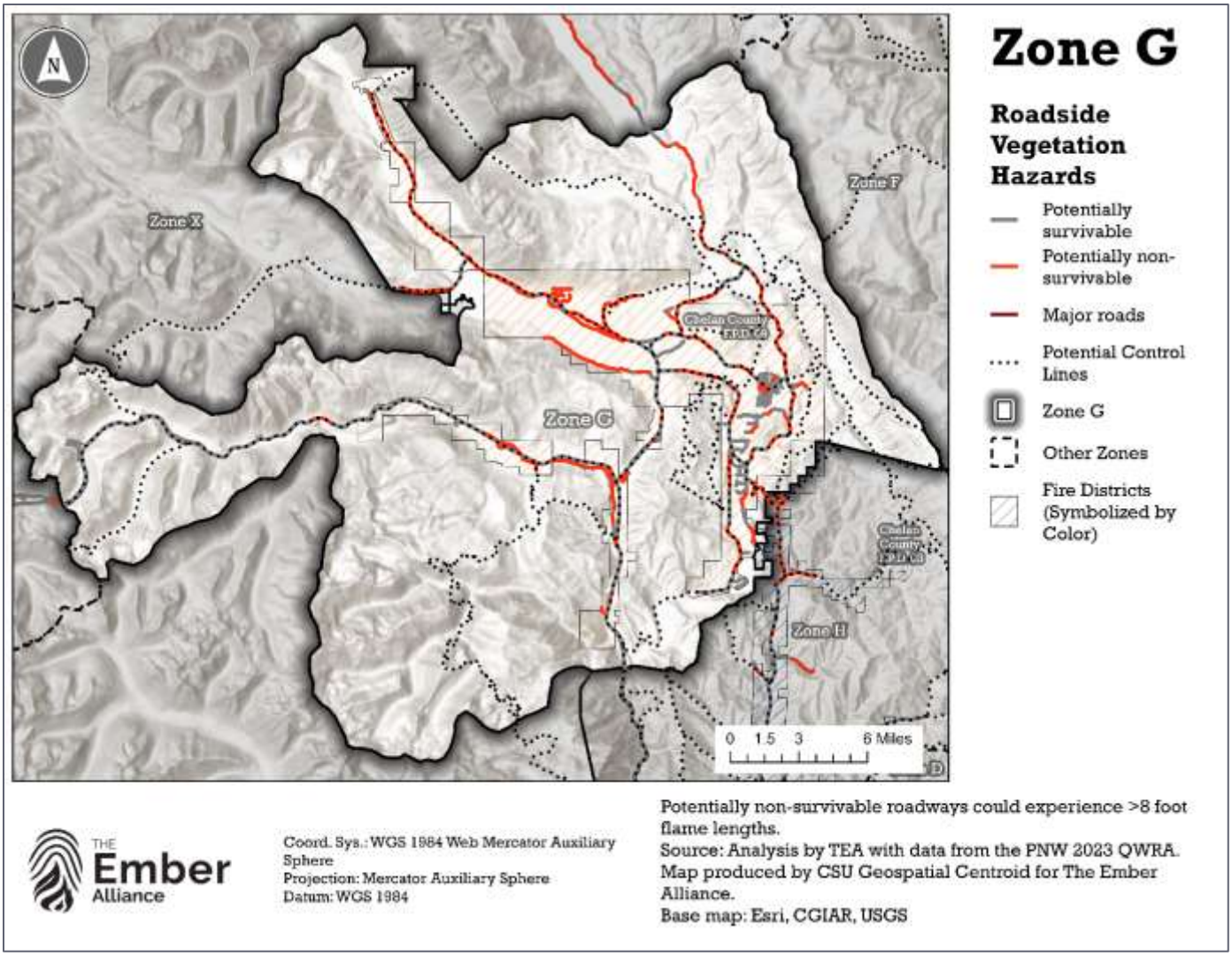

***Figure 86**. Roadside vegetation hazards with Zone G of Chelan County. Source: Analysis by TEA with data from the PNW 2023 QWRA.*

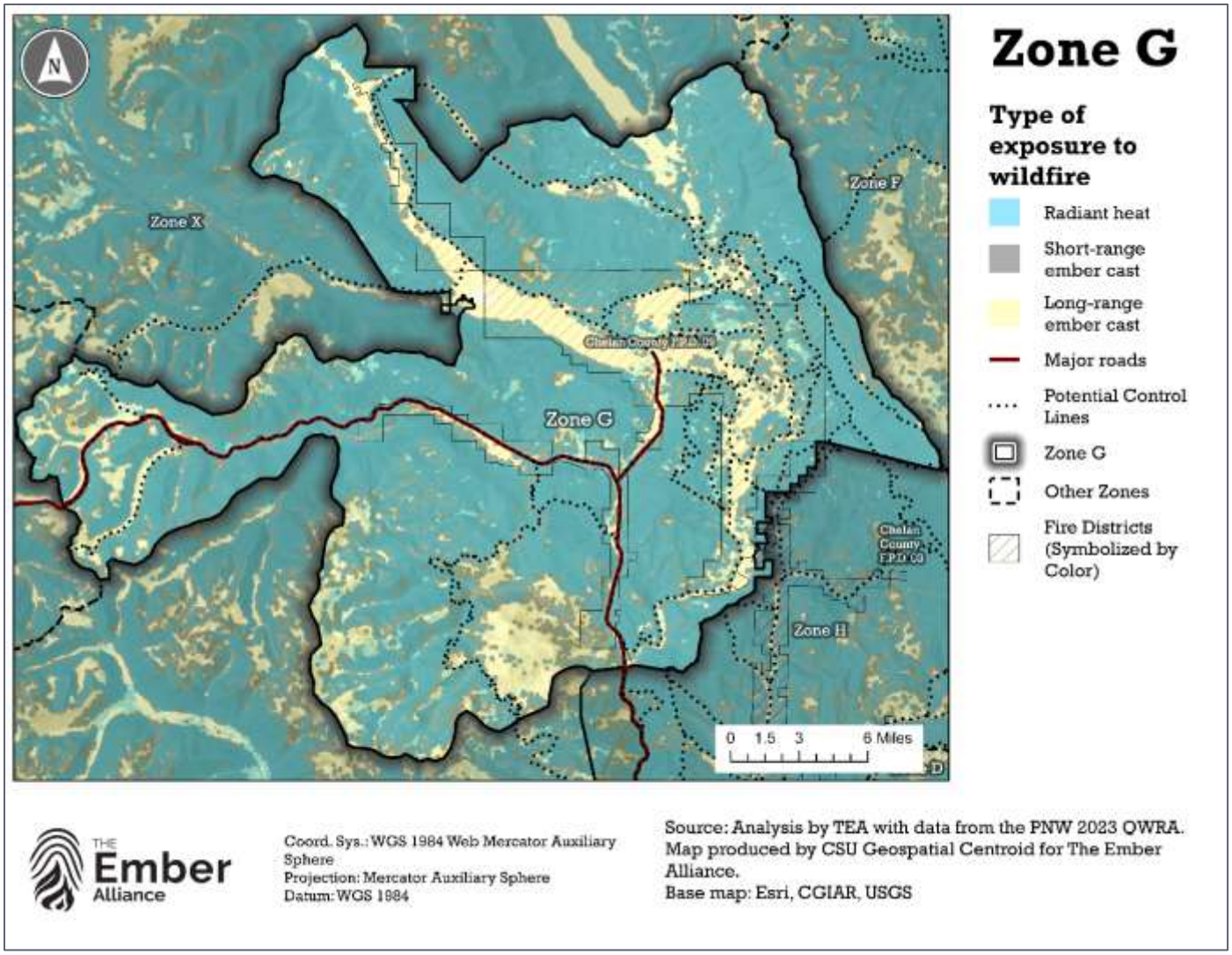

***Figure 87**. Type of exposure to wildfire in Zone G of Chelan County. Source: Analysis by TEA with data from the PNW 2023 QWRA.*

A3.8. Zone H – Leavenworth and Chumstick

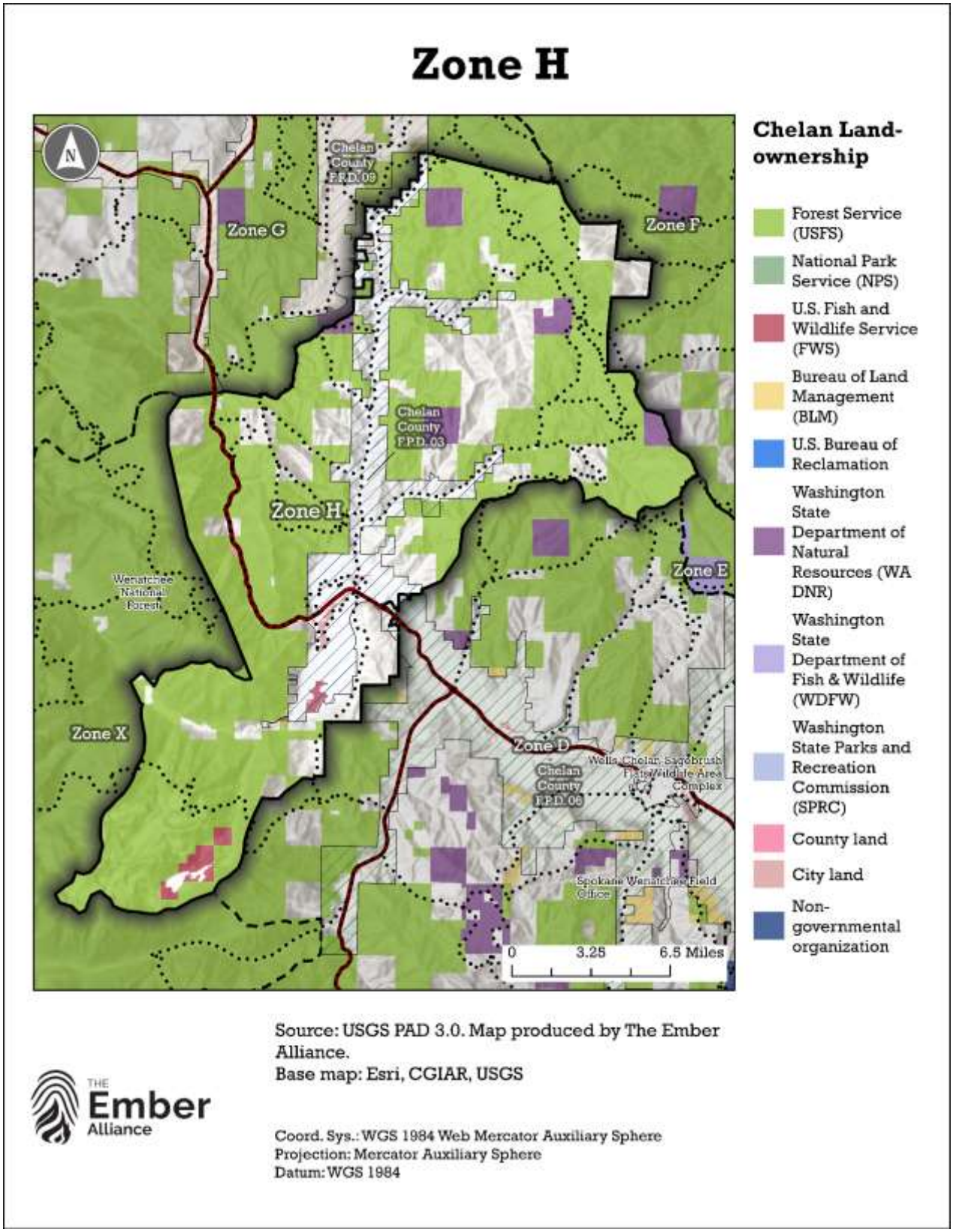

***Figure 88**. Land Ownership for Zone H in Chelan County. Source: USGS PAD 3.0.*

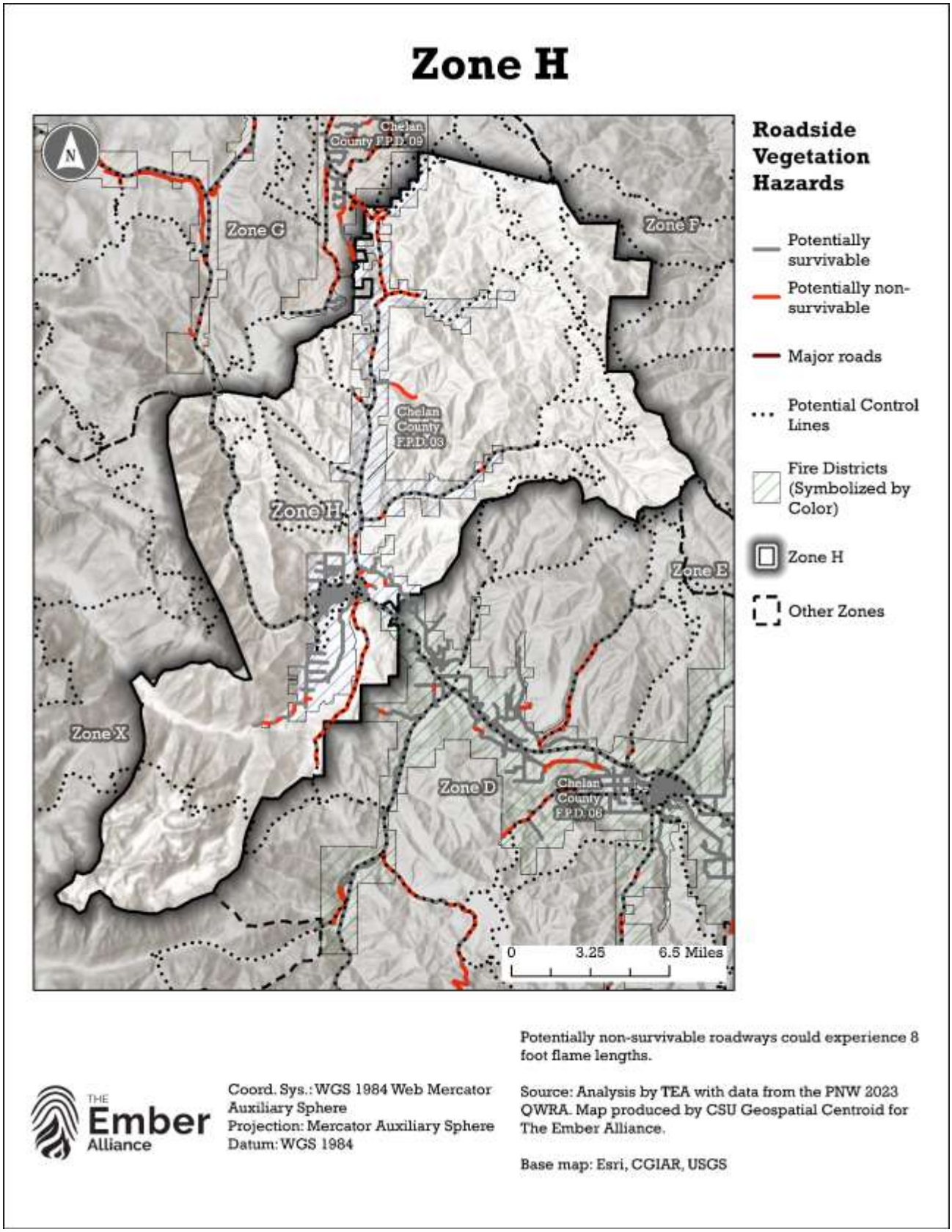

***Figure 89**. Roadside vegetation hazards with Zone H of Chelan County. Source: Analysis by TEA with data from the PNW 2023 QWRA.*

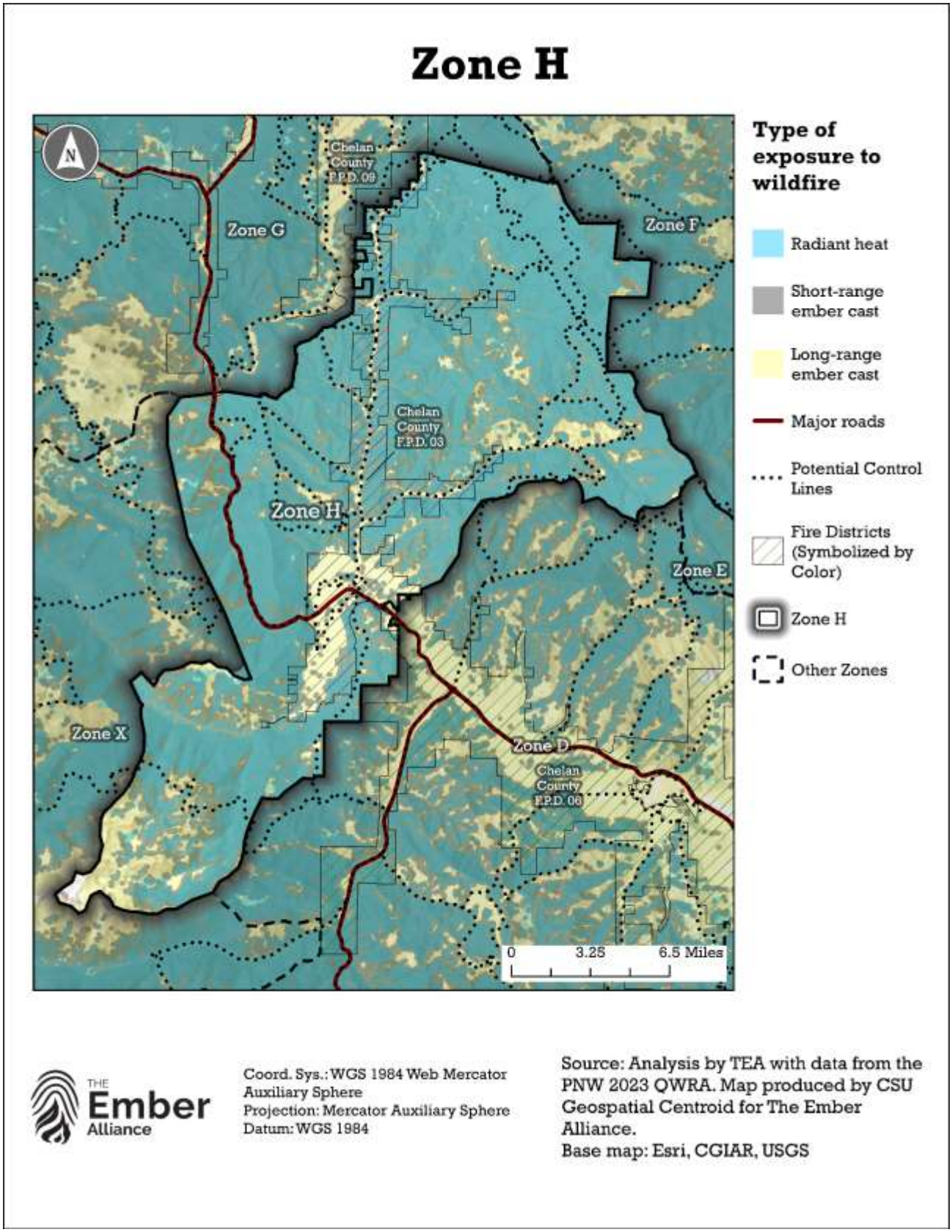

***Figure 90**. Type of exposure to wildfire in Zone H of Chelan County. Source: Analysis by TEA with data from the PNW 2023 QWRA.*

A3.9. Zone X – State and Federal Lands

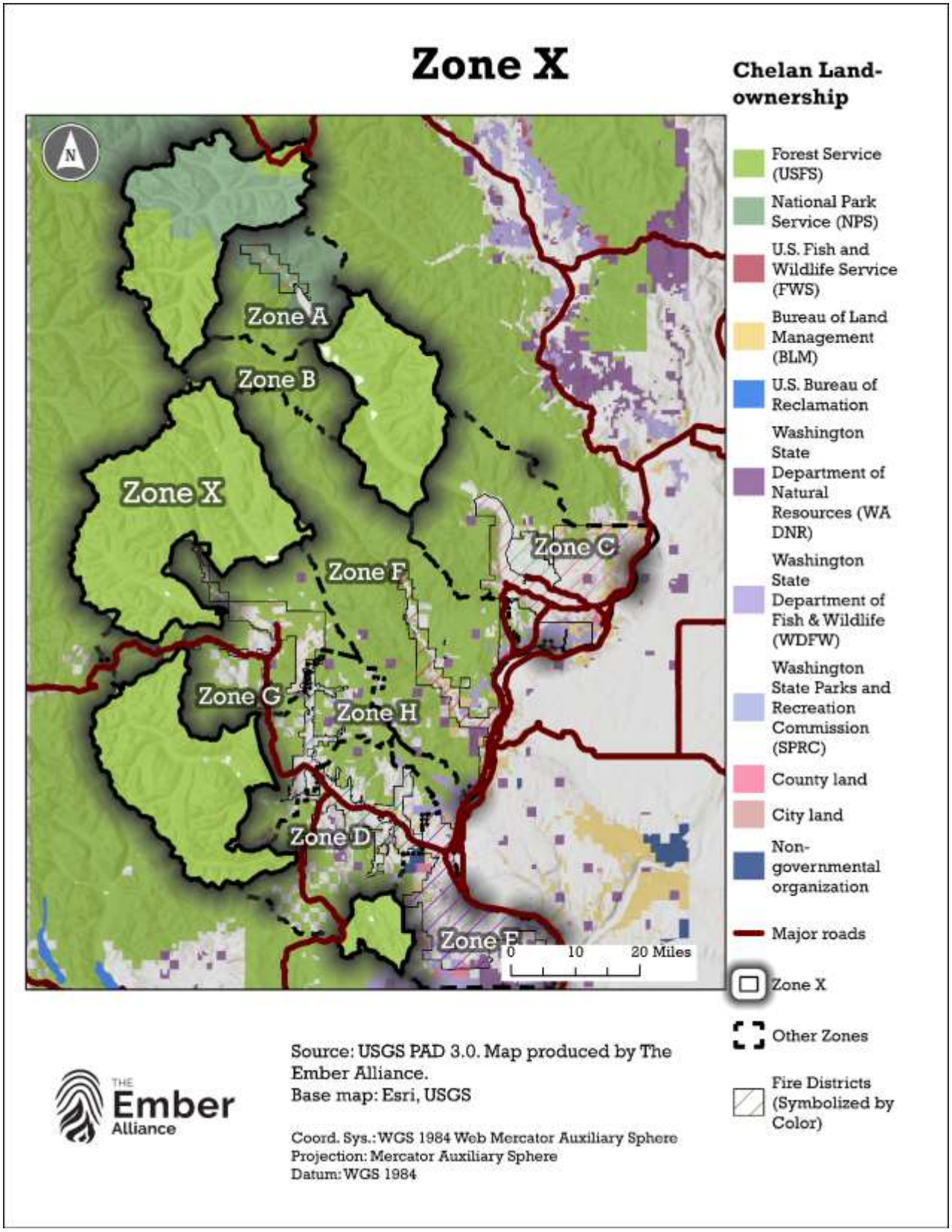

***Figure 91**. Land Ownership for Zone X in Chelan County. Source: USGS PAD 3.0.*

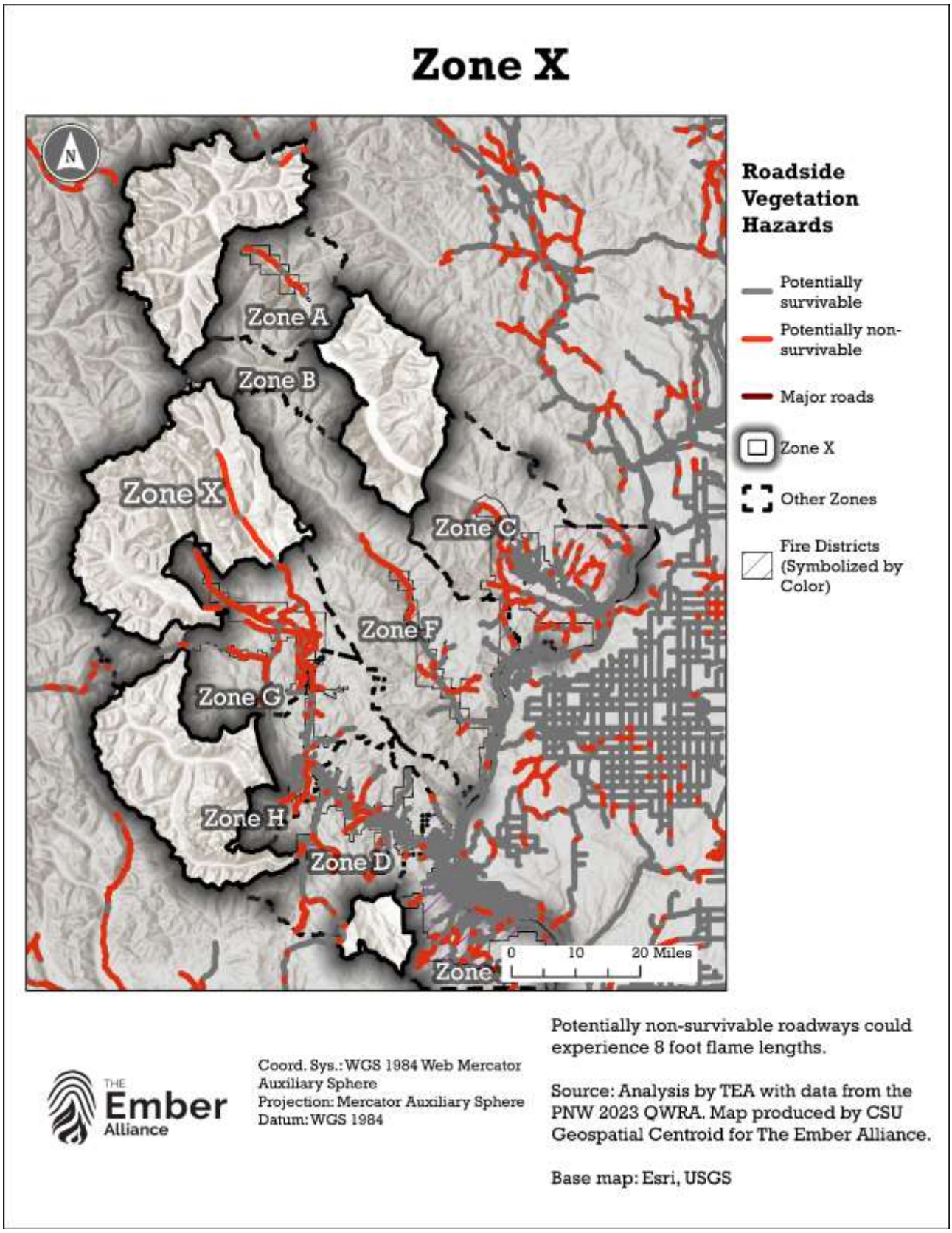

Figure 92. *Roadside vegetation hazards with Zone X of Chelan County. Source: Analysis by TEA with data from the PNW 2023 QWRA.*

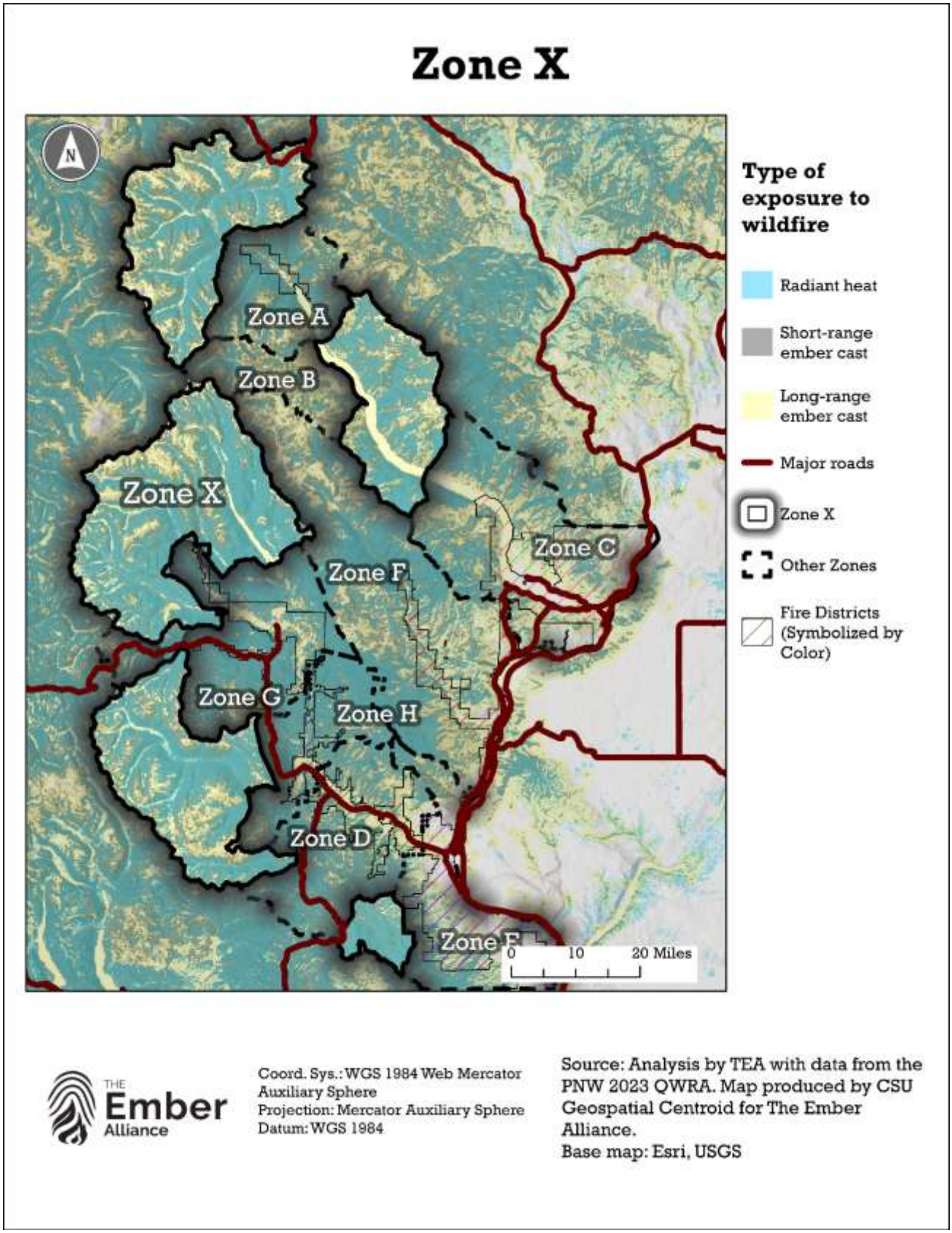

Figure 93. *Type of exposure to wildfire in Zone X of Chelan County. Source: Analysis by TEA with data from the PNW 2023 QWRA.*

Appendix 4 – Potential CWPP Project Funding Sources

Assistance to Firefighters Grant (AFG)

http://www.fema.gov/assistance-firefighters-grant

The primary goal of the Assistance to Firefighters Grant (AFG) is to meet the firefighting and emergency response needs of fire departments and nonaffiliated emergency medical service organizations. Since 2001, AFG has helped firefighters and other first responders to obtain critically needed equipment, protective gear, emergency vehicles, training and other resources needed to protect the public and emergency personnel from fire and related hazards.

Fire Service Grants and Funding (AFGP)

http://www.usfa.fema.gov/grants/

Under the Federal Emergency Management Agency's Assistance to Firefighters Grant Program (AFGP), career and volunteer fire departments and other eligible organizations can receive funding through three different grants to:

- *Enhance a fire department's/safety organization's ability to protect the health and safety of the public.*
- *Protect the health of first responders.*
- *Increase or maintain the number of trained, "front-line" firefighters available in communities.*

Staffing for Adequate Fire & Emergency Response Grant (SAFER)

http://www.fema.gov/staffing-adequate-fire-emergency-response-grants

The Staffing for Adequate Fire and Emergency Response Grants (SAFER) was created to provide funding directly to fire departments and volunteer firefighter interest organizations to help them increase or maintain the number of trained, "front line" firefighters available in their communities. The goal of SAFER is to enhance the local fire departments' abilities to comply with staffing, response and operational standards established by the NFPA (NFPA 1710 and/or NFPA 1720).

Fire Prevention & Safety Grants (FP & S)

http://www.fema.gov/fire-prevention-safety-grants

The Fire Prevention and Safety (FP&S) Grants are part of the Assistance to Firefighters Grants (AFG) and support projects that enhance the safety of the public and firefighters from fire and related hazards. The primary goal is to reduce injury and prevent death among high-risk populations. In 2005, Congress reauthorized funding for FP&S and expanded the eligible uses of funds to include Firefighter Safety Research and Development.

Buffer Zone Protection Program (BZPP)

http://www.fema.gov/pdf/government/grant/bzpp/fy06_bzpp_guidance.pdf

The FY 2006 BZPP provides funds to build capabilities at the state and local levels to prevent and protect against terrorist incidents primarily done through planning and equipment acquisition.

Emergency Management Performance Grant Program

https://www.fema.gov/fiscal-year-2015-emergency-management-performance-grant-program

The purpose of the EMPG Program is to provide Federal grants to states to assist state, local, territorial, and tribal governments in preparing for all hazards, as authorized by the Robert T. Stafford Disaster Relief and Emergency Assistance Act (the Stafford Act), as amended (42 U.S.C. §§ 5121 et seq.) and Section 662 of the Post Katrina Emergency Management Reform Act of 2006, as amended (6 U.S.C. § 762). Title VI of the Stafford Act authorizes FEMA to make grants for the purpose of providing a system of emergency preparedness for the protection of life and property in the United States from hazards and to vest responsibility for emergency preparedness jointly in the Federal government and the states and their political subdivisions. The Federal government, through the EMPG Program, provides necessary direction, coordination, and guidance, and provides necessary assistance, as authorized in this title, to support a comprehensive all hazards emergency preparedness system.

State Homeland Security Program

https://www.fema.gov/fiscal-year-2015-homeland-security-grant-program

The SHSP assists state, tribal and local preparedness activities that address high-priority preparedness gaps across all core capabilities and mission areas where a nexus to terrorism exists. SHSP supports the implementation of risk driven, capabilities-based approaches to address capability targets set in urban area, state, and regional Threat and Hazard Identification and Risk Assessments (THIRAs). The capability targets are established during the THIRA process, and assessed in the State Preparedness Report (SPR) and inform planning, organization, equipment, training, and exercise needs to prevent, protect against, mitigate, respond to, and recover from acts of terrorism and other catastrophic events

Urban Areas Security Initiative

https://www.fema.gov/fiscal-year-2015-homeland-security-grant-program

The UASI program funds addressed the unique risk driven and capabilities-based planning, organization, equipment, training, and exercise needs of high-threat, high-density Urban Areas based on the capability targets identified during the THIRA process and associated assessment efforts; and assists them in building an enhanced and sustainable capacity to prevent, protect against, mitigate, respond to, and recover from acts of terrorism.

Operation Stonegarden

https://www.fema.gov/fiscal-year-2015-homeland-security-grant-program

OPSG program supports enhanced cooperation and coordination among Customs and Border Protection (CBP), United States Border Patrol (USBP), and local, tribal, territorial, state, and Federal law enforcement agencies. The OPSG Program funds investments in joint efforts to secure the United States' borders along routes of ingress from international borders to include travel corridors in states bordering Mexico and Canada, as well as states and territories with international water borders.

Pre-Disaster Mitigation Grant Program

https://www.fema.gov/pre-disaster-mitigation-grant-program

The PDM Program, authorized by Section 203 of the Robert T. Stafford Disaster Relief and Emergency Assistance Act, is designed to assist States, territories, Federally-recognized tribes, and local communities in implementing a sustained pre-disaster natural hazard mitigation program. The goal is to reduce overall risk to the population and structures from future hazard events, while also reducing reliance on Federal funding in future disasters. This program awards planning and project grants and provides opportunities for raising public awareness about reducing future losses before disaster strikes. PDM grants are funded annually by Congressional appropriations and are awarded on a nationally competitive basis.

Community Assistance Grants

http://www.fs.fed.us/r6/fire/fireplan/apply/

The 2016 National Fire Plan grant process has been scaled down to accommodate a limited source of funding that is directly tied to state planning efforts. At a minimum, project proposals must reside within high priority areas identified in the statewide assessments and resource strategies (refer to links below) to be considered.

To focus limited resources and funding (potentially $875,000 within each state), the interagency Pacific Northwest Wildfire Coordinating Group, FMWT Fuels Management Working Team (PNWCG-FMWT) has asked the Washington Department of Natural Resources (DNR) and the Oregon Department of Forestry (ODF) to collaborate with communities that are within high priority areas.

Projects should address and reduce the threat of wildfire within Eligible Project Areas and be identified as high priority in a completed Community Wildfire Protection Plan (CWPP). DNR will work with local CWPP groups to identify and prioritize projects.

Western States Fire Managers Wildland Urban Interface Grant Program

https://www.westernforesters.org/wui-grants

The focus of much of this funding is mitigating risk in Wildland Urban Interface (WUI) areas. In the West, the State Fire Assistance (SFA) funding is available and awarded through a competitive process with emphasis on hazard fuel reduction, information and education, and community and homeowner action. This portion of the National Fire Plan was developed to assist interface communities manage the unique hazards they find around them. Long-term solutions to interface challenges require informing and educating people who live in these areas about what they and their local organizations can do to mitigate these hazards.

Appendix 5 - Citation of this work

Citation of this work:

This plan was updated in 2025 by The Ember Alliance in Ft. Collins, Colorado along with Washington state's Cascadia Conservation District & Chelan County Natural Resources Department.

The previous plan was updated in 2019 by Northwest Management, Inc. at 233 East Palouse River Drive, PO Box 9748, Moscow ID 838.