Community Wildfire Protection Plan

Okanogan County, Washington

Published in 2024

Okanogan County
Community Wildfire Protection Plan
2024 Update

Prepared for OKANOGAN COUNTY, WA

Washington State Conservation Commission

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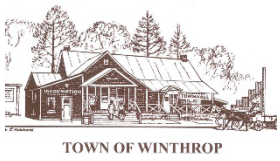

Mt. Tolman Fire Center, Municipal Fire Departments, and Fire Districts 1-16.
Fire Adapted Methow, Methow Valley Citizens Council, Methow Watershed Council.

This document follows a template produced by the Ember Alliance, Fort Collins, CO.

DISCLAIMER

This Community Wildfire Protection Plan (CWPP) is intended to be informational and supplemental to the planning of wildfire mitigation efforts and related efforts thereof in Okanogan County. This document attempts to overview and highlight the drastic changes to the landscape since the previous CWPP update in 2013 and aims to reflect the current wildfire landscape and demographics of Okanogan County. Over 1,000 individual Okanogan County residents and local, state, tribal, and federal partners have provided input to this plan. The collective group has identified areas for consideration, highlighted recommended actions and resources, and determined project priorities specific to Okanogan County and its unique communities and natural environment. Per the Healthy Forest Restoration Act of 2003, this plan is not legally binding.

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For questions about the development of this CWPP, and to request hard or digital copies, maps, or other resources please contact the Okanogan Conservation District.

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Acronyms

BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BR	Bureau of Reclamation
CAFÉ	Community for the Advancement of Family Education
CAM	Clean Air Methow
CTCR	Confederated Tribes of the Colville Reservation
CWI	Central Washington Initiative
DAHP	Washington State Department of Archaeology and Historic Preservation
DOH	Washington State Department of Health
EMD	Emergency Management Department/Division
EPA	Environmental Protection Agency
FAC	Fire Adapted Community
FAM	Fire Adapted Methow
FSA	Farm Service Agency
HFRA	Healthy Forest Restoration Act
HOA	Homeowners Association
NCWFHC	North Central Washington Forest Health Collaborative
NRCS	Natural Resource Conservation Service
NCPBA	North Cascades Prescribed Burn Association
Okanogan CD	Okanogan Conservation District
OCFD	Okanogan County Fire District
OCDPW	Okanogan County Dept. of Public Works
OCEM	Okanogan County Emergency Management
OCLTRG	Okanogan County Long Term Recovery Group
OCNWCB	Okanogan County Noxious Weed Control Board
OKPUD	Okanogan County Public Utility District
OPH	Okanogan Public Health
ORAP	Okanogan River Airshed Partnership
PCL	Potential Control Line

POD	Potential Operation Declination
USDA	United States Department of Agriculture
USFS	United States Forest Service
USDI	United States Department of the Interior
VSP	Voluntary Stewardship Program
WA DOA	Washington Department of Agriculture
WA DNR	Washington Department of Natural Resources
WA DOE	Washington Department of Ecology
WSDOT	Washington State Department of Transportation
WDFW	Washington Department of Fish and Wildlife
WiRe Center	Wildfire Research Center
WLA	Wildlife Area
WSCC	Washington State Conservation Commission
WSP	Washington State Patrol
WUI	Wildland Urban Interface

Complex interactions among wildland fuels, weather, and topography determine how wildfires behave and spread. Many aspects of wildfires are predictable based on known scientific research on the physical processes driving fire. Much of the work in this CWPP is based on scientific research and computer models of wildfire behavior. A basic understanding of fire behavior aids in interpreting the findings and recommendations reported herein. See Appendix A. Introduction to Wildfire Behavior and Terminology and the **Glossary on page 257 for the definition of key terms.**

1. Introduction

1.a. Purpose and Need for a CWPP

What is a CWPP?

A CWPP helps communities assess local hazards and identify strategic investments to mitigate wildfire risk and promote preparedness. A CWPP is also a process that allows local stakeholders to come together to clarify and refine priorities for the protection of life, property, and critical infrastructure in the wildland-urban interface (WUI) on both public and private lands. Throughout this process, community members come together for valuable discussions regarding mitigation options and implications for the surrounding land base. Assessments and discussions during the planning process can help residents prioritize mitigation actions and assist local fire districts and other local, state, and federal agencies with fire operations during an emergency event. Local fire service organizations help define issues that may place the county, communities, and/or individual homes at risk.

Figure 1.a.1. Elements of a holistic and actionable CWPP.

This process prioritizes public input and community involvement and provides an educational opportunity for an interested public to interact with local wildfire specialists. To lead the CWPP process, a planning committee is established to discuss potential solutions, project actions, and regulatory concerns, as well as identify funding opportunities. This process is documented and results in the development of recommendations for the plan. A CWPP can also assist with funding gaps for fuel mitigation projects since many grants require an approved CWPP.

The idea for community-based wildfire 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 legislation includes meaningful statutory incentives for the United States Forest Service (USFS) and the Bureau of Land Management (BLM) to consider local communities' priorities as they develop and implement forest management and hazardous fuel reduction projects. To take full advantage of these opportunities, a community must first prepare a CWPP.

HFRA requires that a CWPP contain the following elements:

1. Collaboration: A CWPP must be collaboratively developed by local and state government representatives in consultation with federal agencies and with input from the public.

2. Prioritized Fuel Reduction: A CWPP must identify and prioritize areas for hazardous fuel reduction treatments and recommend the types and methods of treatment to protect at-risk communities and essential infrastructure on private and public lands.

3. Structural Ignitability Treatments: A CWPP must recommend measures that homeowners and communities can take to reduce the ignitability of structures throughout the area addressed by the plan.

State and Federal CWPP Guidelines

This CWPP will include compatibility with FEMA requirements for a Hazard Mitigation Plan while also adhering to the guidelines proposed in the National Fire Plan and HFRA (2003). This CWPP has been prepared in compliance with the following:

- The National Fire Plan: A Collaborative Approach for Reducing Wildland Fire Risks to Communities and the Environment 10-Year Comprehensive Strategy Implementation Plan– December 2006.
- Healthy Forests Restoration Act (HFRA) (2003).
- The Federal Emergency Management Agency's (FEMA) Region 10 guidelines for a Local Hazard Mitigation Plan as defined in 44 CFR parts 201 and 206, and as related to a fire mitigation plan chapter of a Multi-Hazard Mitigation Plan.
- National Association of State Foresters – guidance on identification and prioritizing of treatments between communities (2003).

The objective of combining these complementary guidelines is to facilitate an integrated wildland fire risk assessment, identify pre-hazard mitigation activities, and prioritize activities and efforts to achieve the protection of people, structures, the environment, and significant infrastructure in Okanogan County while facilitating new opportunities for pre-disaster mitigation funding and cooperation. Additional information detailing the state and federal guidelines used in the development of the Okanogan County CWPP is included in Appendix B.

Why is the CWPP relevant to me?

Becoming a community that can safely coexist with wildland fire takes a concerted, ongoing effort by everyone who lives, owns property, protects, or manages land in and around this community. Conditions in Okanogan County share risk factors common to catastrophic wildfires across the country.

This CWPP overviews fire mitigation actions that government agencies, NGOs, and communities, may plan to work toward over the next decade and provides recommendations and resources for individuals like you to help determine the best mitigation actions that you can take to protect and prepare your family for wildfire. This includes the preparation of your home ignition zones to give your home a chance at surviving a fire event, guidance for evacuation planning, and other actions that you can take to enhance the efforts of firefighters engaged in protecting your community.

The work that you do to reduce fire risk on your property can encourage and amplify the work that your neighbors do on theirs, resulting in greater protection for everyone. This CWPP is a call to action to do your part. Land management partners in Okanogan County have resources available to support your individual efforts, and they are committed to taking action to reduce wildfire risk and increase emergency preparedness for the safety and benefit to the community and preservation of Okanogan County's landscape and natural resources.

The History and Scope of Okanogan County's CWPP

Located in North Central Washington, Okanogan County is the largest county in Washington State, covering 5,281 square miles. It encompasses incredibly diverse ecosystems and equally diverse human communities, all of which have their own unique challenges when interacting with wildfire on the landscape.

This CWPP is a holistic document, its scope encompassing the entire county, with special emphasis on areas within the WUI. The original Okanogan County CWPP was drafted in 2009 and updated in 2013 by the Okanogan County CWPP committee, the Okanogan Conservation District (Okanogan CD), and the Washington Department of Natural Resources (WA DNR) with project facilitation and support provided by Northwest Management, Inc. of Moscow, Idaho.

This 2024 update supersedes the previous two additions to this plan. The Okanogan CD led this update with funding from the Washington State Conservation Commission's Forest Health Grant, funded through the state's Climate Commitment Act. It was developed in compliance with FEMA requirements for a wildfire mitigation plan by following the guidance of the Ember Alliance of Denver, Colorado. This plan includes graphics, resources, and other references from the Ember Alliance.

A countywide CWPP planning committee was formed to determine the direction and actions taken for this 2024 CWPP update. Generally, project recommendations are made based on the issue causing the wildfire risk rather than focusing on individual landowners or organizations. Thus, projects are mapped and evaluated without regard for property boundaries, ownership, or current management. Upon approval of this document by the Okanogan County Board of Commissioners, the CWPP planning committee will begin further refining proposed project boundaries, feasibility, and public outreach, as well as seeking funding opportunities, as identified in this 2024 CWPP.

This CWPP for Okanogan County, Washington, is the result of professional collaboration and assessments of wildfire risks and other factors focused on reducing wildfire threats to people, structures, infrastructure, and unique ecosystems in Okanogan County in accordance with the Healthy Forests Restoration Act.

1.b. Accomplishments and Challenges on a Changing Landscape

Wildfire in Okanogan County
2,200,162 acres of Okanogan County have been directly impacted by fire on the landscape between 1985 and 2023 (WA DNR, 2023).

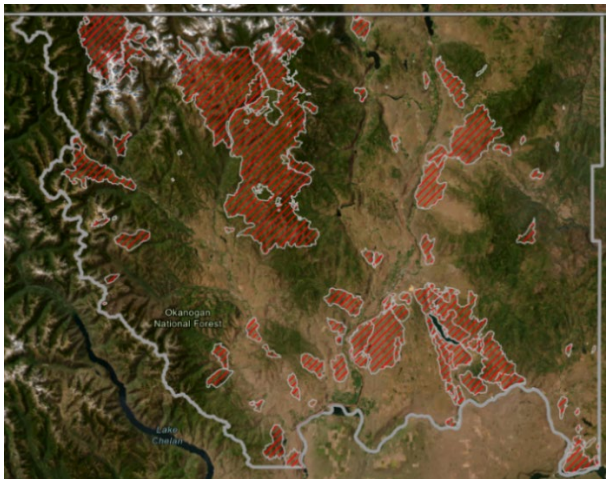


Figure 1.b.1. WA DNR sourced data of previously burned areas from 1985-2013.

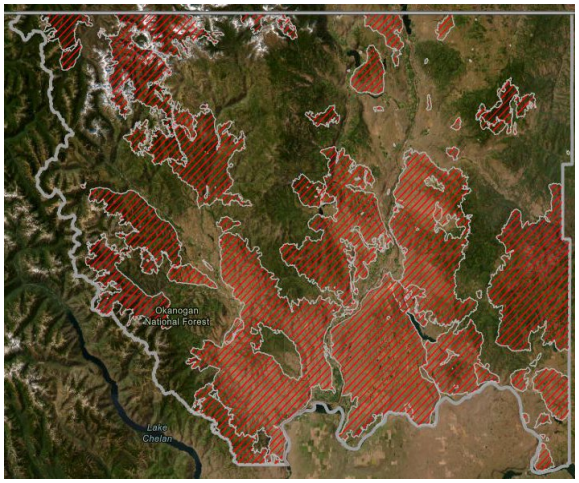


Figure 1.b.2. WA DNR sourced data of previously burned areas from 2013-2023.

A Decade of Fire: Wildfire Impacts Between 2013-2023

Since the 2013 update of Okanogan's CWPP, Okanogan County has experienced multiple major wildfires, including the three largest wildfires in Washington's recorded history:

- 2020 Cold Springs/Pearl Hill Fires | 410,000 acres total, 190,033 acres in Okanogan County
- 2015 Okanogan Complex Fire | 304,782 acres
- 2014 Carlton Complex Fire | 256,108 acres

In addition, among those fires are ten federally declared disasters related to wildfire, including:

- Eagle Bluff Fire, 2023 | 16,428 acres
- Chuweah Creek Fire, 2021 | 36,752 acres
- Muckamuck Fire, 2021 | 13,414 acres
- Cedar Creek Fire, 2021 | 55,235 acres
- Anglin Fire, 2020 | 1,922 acres
- Cold Springs/Pearl Hill Fire, 2020 | 190,033 acres in Okanogan County
- Palmer Fire, 2020 | 18,013 acres
- Twisp River Fire, 2015 | 11,222 acres
- North Star Fire Complex, 2015 | 218,138 acres
- Okanogan County Fire Complex, 2015 | 304,782 acres
- Carlton Complex Fire, 2014 | 256,108 acres

Combined with other smaller incidents, these fires have burned 1,516,127 acres of the county since 2013 (including 52,024 acres that burned at least twice).

Accomplishments from the 2013 CWPP

The uptick in fire activity over the past decade has created a wide array of different challenges at individual, community, and county-wide scales. Despite this, the 2013 CWPP did have a substantive impact on the overall wildfire resilience of Okanogan County, supported and, at times, magnified by responses to the major incidents that have occurred.

The 2013 CWPP identified a variety of project areas having multiple factors contributing to potential wildfire risk to residents, homes, infrastructure, and ecosystems. These areas were identified within the WUI, irrespective of ownership, and included a variety of treatment options, such as the creation of defensible space, the full gamut of fuel reduction techniques, access corridor improvements, and homeowner education.

The project focus areas identified in 2013 (figure 1.b.3) were incorporated into planning by the USFS (detailed on pages 14-15). However, wildfires across the county in the succeeding years also burned through many of these focus areas (figure 1.b.4).

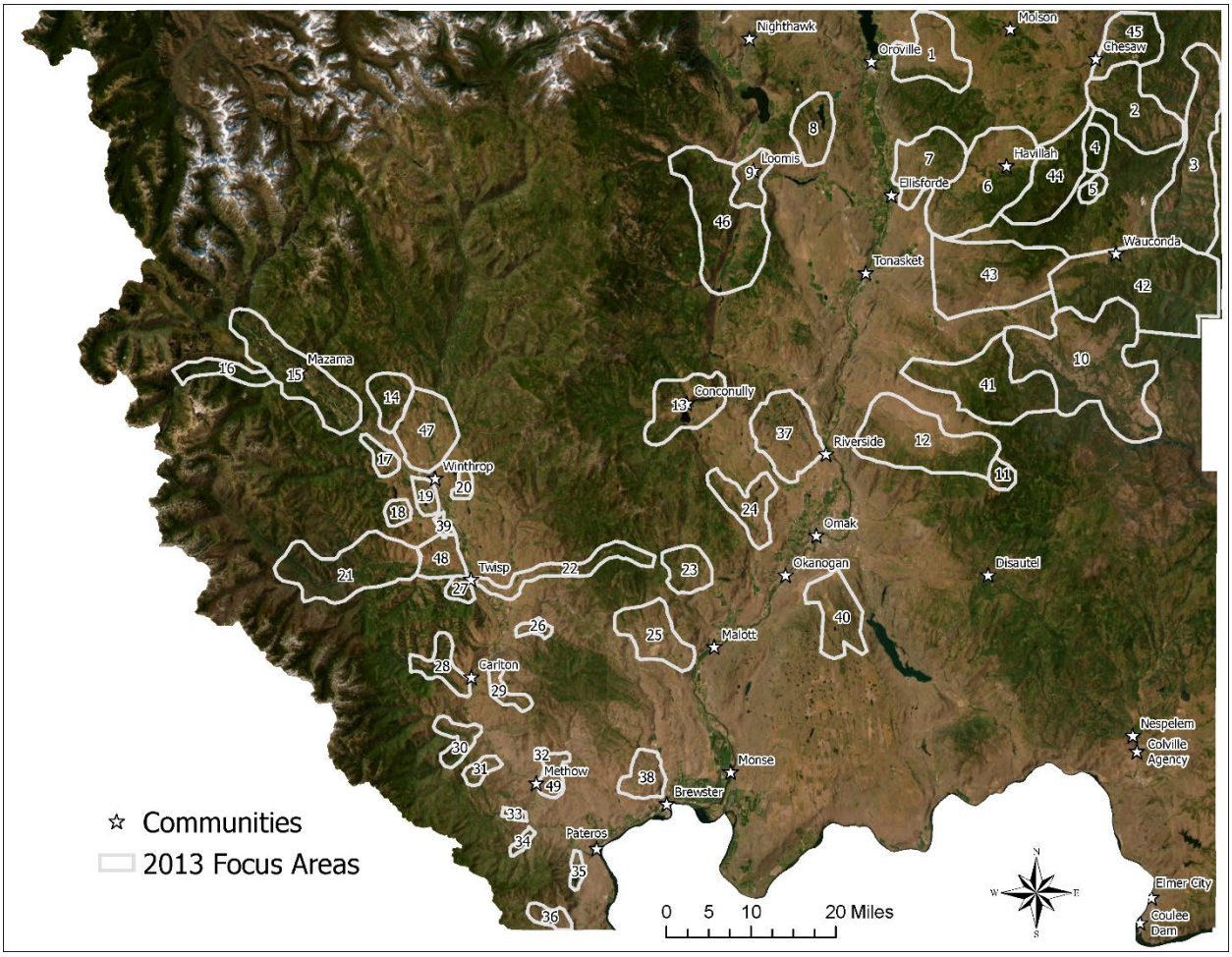


Figure 1.b.3. 2013 project focus areas for Okanogan County. (Source: Okanogan CD, 2023)

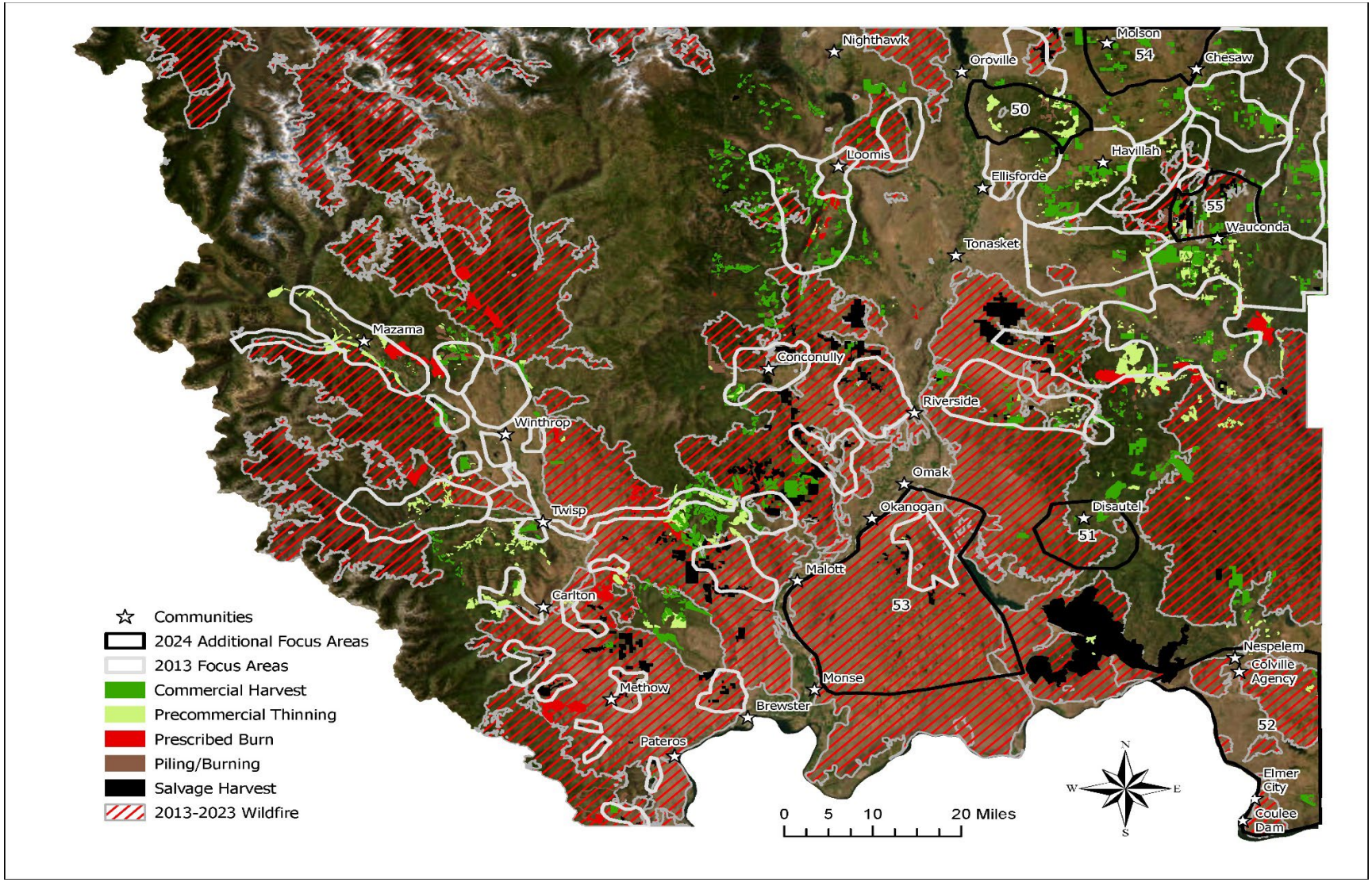


Figure 1.b.4. Many of the 2013 treatment areas were impacted by wildfires from 2013-2023. However, treatments were also implemented in many of those areas and elsewhere in the county. This included successful commercial harvests, precommercial thinnings, prescribed burns, and salvage harvests. (Source: USFS, WA DNR, CTCR, 2024)

Project Focus Areas in Detail

The accomplishments within and adjacent to these previously identified project areas are captured below. These mitigation projects consist wholly of various fuel reduction efforts on USFS lands.

USFS Colville NF - Tonasket Ranger District

- In the North Fork Bonaparte project area identified in the 2013 CWPP, approximately 1,350 acres of USFS land have been treated since 2013 with a combination of commercial and non-commercial thinning, machine piling, and pile burning as part of the Tonasket Ranger District North Flank project.

- In the Cayuse Project area identified in the 2013 CWPP, approximately 800 acres of USFS land have been treated since 2013 with a combination of commercial and non-commercial thinning, piling, and pile burning as part of the Tonasket Ranger Districts Light Stewardship project. Much of the fuels work on USFS land in this project area burned prior to or mid-completion in the 2021 Walker-Spur wildfire, which is currently serving as a form of natural fuels treatment.

- In the Wauconda and Aeneas Valley Project areas identified in the 2013 CWPP, approximately 5,000 acres of USFS land have been treated since 2013 with a combination of commercial and non-commercial thinning, piling, pile burning, and underburning as part of the Tonasket Ranger District's Annie Restoration and Frosty projects.

- In the Bannon Project area identified in the 2013 CWPP, approximately 5,100 acres of USFS land have been treated since 2013 with a combination of commercial and non-commercial thinning, piling, pile burning, and underburning as part of the Tonasket Ranger District's Bannon Ladder fuel reduction, Upper Aeneas, Sneed, and Crawfish Restoration projects. Additionally, a portion of this project area burned in the 2015 Tunk Block wildfire which is serving as a form of fuels treatment.

- The Crawfish Lake project area identified in the 2013 CWPP lies predominantly on the Colville Reservation; however, approximately 300 acres of USFS land adjacent to Crawfish Lake itself have been treated since 2013 with a combination of commercial and non-commercial thinning, piling, pile burning, and underburning as part of the Tonasket Ranger District's crawfish restoration project.

- In the Conconully project area identified in the 2013 CWPP, approximately 1,500 acres of USFS land have been treated. The Tonasket Ranger District's Schalow Mtn. underburn makes up 1,338 of those acres, and the rest of the treatment consists of machine piling and pile burning as part of the Salmon Creek salvage project that occurred after the 2020 Muckamuck fire burned adjacent to the Town of Conconully. Additionally, the Muckamuck fire scar is currently serving as a form of fuels treatment in this area.

- In the Bonaparte Project area identified in the 2013 CWPP, approximately 350 acres of USFS land have been treated since 2013 with a combination of commercial and non-commercial thinning, piling, and pile burning as part of the Tonasket Ranger District's Light stewardship and Toroda Creek Salvage projects. Additionally, a large portion of this project area burned in the 2021 Walker/Spur wildfire, which is currently serving as a form of fuels treatment.

- In the Mount Hull project area identified in the 2013 CWPP, approximately 1,100 acres of USFS land have been treated since 2013. Treatments include a combination of commercial and non-commercial thinning, thinning, piling, pile burning, and underburning as part of the

Tonasket Ranger Districts, Hull South Rx, Summit timber sale, Hull Ladder Fuel Reduction, and Wilcox GNA projects.

- In the Havillah Project area identified within the 2013 CWPP, approximately 700 acres of USFS land have been treated with a combination of commercial and non-commercial thinning, piling, and pile burning as part of the Tonasket Ranger Districts North Flank project.

USFS Okanogan-Wenatchee NF - Methow Valley Ranger District

- In the Libby Creek project area identified in the 2013 CWPP, a total of 1,130 acres of USFS land were treated with a combination of commercial and non-commercial thinning, piling, and pile burning, along with 120 acres of underburning. Underburning in this area has just begun in the last year and is ongoing.
- In the Benson Creek project area identified in the 2013 CWPP, 136 acres of thinning and piling were completed. Fires in 2014 burned the remainder of the planned projects in the area.
- In the Highway 20 Corridor project area identified in the 2013 CWPP, 694 acres were treated with a combination of commercial and non-commercial thinning, piling, and pile burning.
- In the Rendezvous project area identified in the 2013 CWPP, 1,227 acres of USFS land were treated with a combination of commercial and non-commercial thinning, piling, and pile burning, along with 92 acres of underburning.
- In the Mazama project area identified in the 2013 CWPP, a total of 2,087 acres of USFS land were treated with a combination of non-commercial thinning, piling, and pile burning, along with 1,301 acres of underburning.

Expansion of Communications and Emergency Alerts

Another accomplishment involves communications with the Okanogan County emergency alert notifications system which has greatly improved since 2013. Traditionally, the way of informing the public of evacuation notices included door-to-door notifications, which posed challenges such as delayed notices due to the time it would take first responders to arrive at incident locations.

In early 2015, Okanogan County purchased a mass notification system called Everbridge, which now allows Emergency notifications and advisories to be pushed out quickly and well before first responders arrive on site.

The Everbridge mass notification system has several different ways of allowing citizens to receive alerts/emergency notifications. The most accurate way is for individuals to create an account for their specific location (up to 5 locations within the boundaries of Okanogan County can be added). Another option is for a user to sign up for non-emergency county-wide advisories.

Everbridge also allows emergency notifications to be sent by Wireless Emergency Alerts (WEA), which targets all cellphones that are connected to a cell tower, i.e., vacationers. It also allows notifications to be sent out through the Emergency Alert System (EAS), which is broadcasted over a network of radio and TV stations. These notifications are always followed up by door-to-door notifications. As the system works well, there still needs to be a level of self-responsibility for all citizens to be aware of their surroundings, have a plan in place, and take action if needed.

As of the publication of this edition of the CWPP, there are 10,633 individuals who have created an account and signed up to receive Okanogan County emergency alerts.

"There is no future without fire on the ground and smoke in the sky…"
Paul F. Hessburg, Senior Research Ecologist, USFS PNW Research Station

Figure 1.b.5. Regeneration one year after the 2014 Carlton Complex Fire. (Source: Okanogan CD, 2015)

Challenges

The aforementioned accomplishments highlight a few of the efforts made in mitigating, recovering, and preparing for major wildfires in Okanogan County and helping partners identify many strengths and assets. Nevertheless, a multitude of challenges still exist when working to address the complex issues faced in Okanogan County. These challenges include, but are not limited to:

Public Emergency Awareness:

Cell phone service, internet access, and many of the other essential elements of the digital age are not universally available across Okanogan County. Factors such as topography, socio-economic challenges, lack of infrastructure, and, for some, personal choice diversify communication needs and restrict immediate access to the notification of wildfire incidents for many individuals.

Since 2013, infrastructure expansion improvements have been implemented and planned, and the Okanogan County emergency alerts system has been essential in increasing awareness and the ability to reach more residents in real-time. Despite this, challenges continue to persist, inhibiting Okanogan County residents from being readily alerted to wildfires and other emergencies.

Public Wildfire Awareness:

Fire services agencies cannot be solely responsible for preserving and protecting the diverse array of values that Okanogan County's residents have. As the risk of wildfire in the WUI expands and rural areas outside of the WUI become increasingly important for the recreational, economic, and ecological values they provide, public awareness of wildfire risk and accountability for homeowners for the risks on their properties is essential for protecting all resources in the WUI and throughout Okanogan County.

Rural Fire Protection and Volunteer Personnel:

Structural firefighting in rural areas is a challenge that is compounded by wildfires, which place tremendous pressure on fire district personnel, who are largely volunteers. Newer residents in Okanogan County arriving from more urban areas may have expectations concerning response times and other factors that are incongruent with the realities of responding to wildfires or structural fires in a large geographic area like Okanogan County. The fire protection of individual properties is heavily dependent on the landowner's initiative to take action to protect life and property.

Figure 1.b.6. Firefighting efforts by rural Fire District #8 during the 2021 Cold Springs Fire. (Source: Edd Townsend, T3 Ranch/OCFD 8, 2021)

Furthermore, as shown by multiple fires in the last decade, most recently, the 2023 Eagle Bluff Fire and the 2024 Sandflats Fire, ignitions are happening more frequently in, or immediately adjacent to, the county's more heavily populated and developed areas. Raising concerns among more urban residents and requiring municipal fire departments to prepare for the possibility of a wildland fire to transition into an urban or suburban conflagration.

Figure 1.b.7. An area burned in the July 4th, 2024 Sandflat Fire across the road from homes, just outside of Omak's city limits. (Source: Emmy Engle, Okanogan CD, 2024)

Local volunteer-driven fire departments and districts struggle to recruit and retain firefighters in many areas of the county. Economic realities, lack of interest, and the time commitments to satisfy training regulations, among other factors, play a role in the diminished capacity experienced in recent years. While state and federal agencies have, in many cases, been able to expand their workforces, as was the case of the WA DNR in the aftermath of the passage of HB 1168 in 2021, local fire districts and departments are very often the first to respond to a wildland incident. The mismatch of lower capacity mixed with increased demand for services precipitates a service challenge that does not have an immediate solution.

Figure 1.b.8. Fire District #11 annual meeting in Molson with fire chiefs, firefighters, local agencies, and residents. (Source: Maurice Goodall, OCEM, 2024)

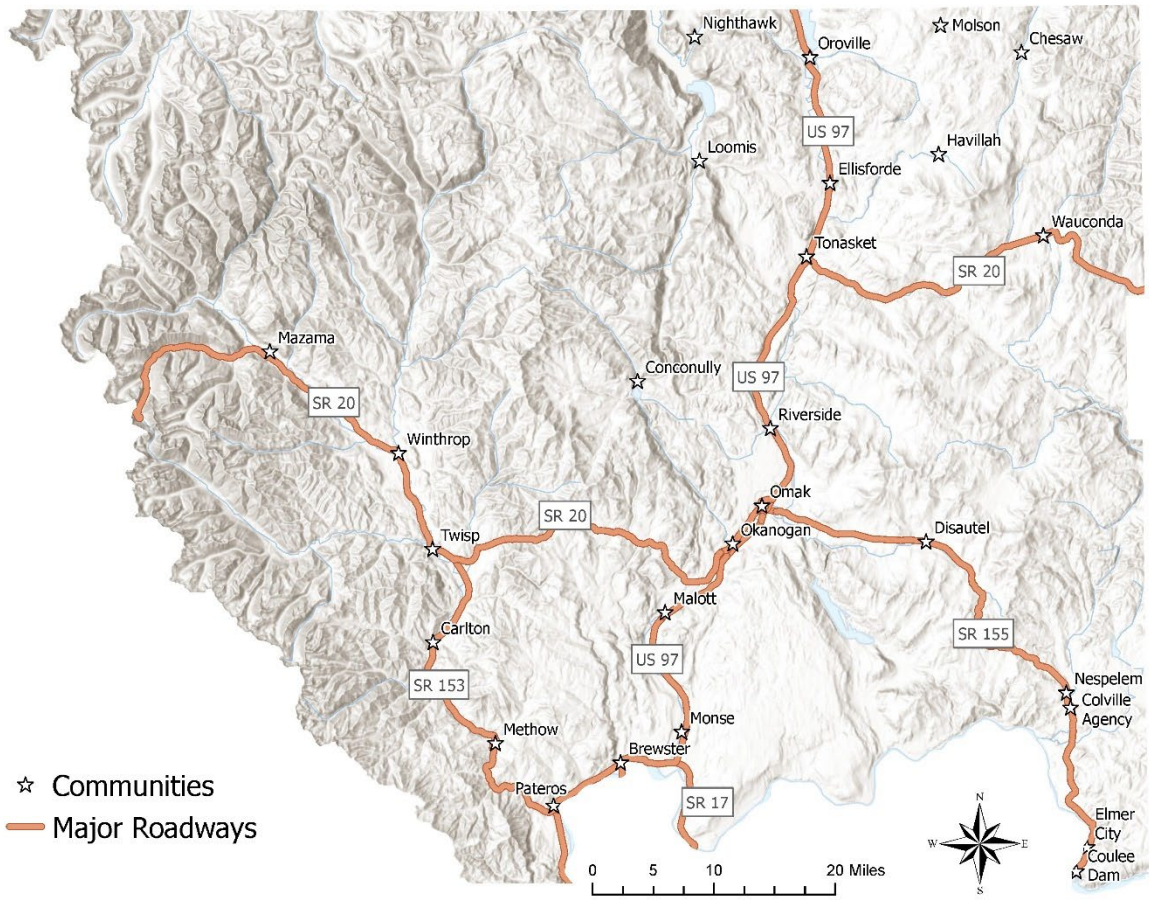


Figure 1.b.9. Major roadways of Okanogan County. (Source: WSDOT, 2024)

Transportation Corridors:

Roadways are frequently the locus of origin for wildfires due to the abundance of potential sources for human-caused ignitions. Various automotive issues, such as damaged parts, dragged trailer chains, parking or driving on dried vegetation, and irresponsible disposal of cigarettes and other burning materials, all contribute to fire starts along roadways. Threats to major transportation routes in the county are both physically and economically hazardous to residents and visitors, blocking evacuation routes and, in the case of long-term closures, depressing commerce. Post-fire impacts, including flooding and debris flows, also create threats to roadways that have deleterious impacts that can take years to resolve.

Urban/Suburban Growth/Rural Growth:

By virtue of size and geographic position, Okanogan County is one of the least densely populated counties in WA, with around eight people per square mile. However, the population is mostly concentrated along valley floors and major transportation routes when factoring in the vast swaths of land under federal and state ownership. Thirty-eight percent (38%) of county residents live in incorporated towns and cities located along highways and rivers, and many others live in small unincorporated communities (such as Loomis or Carlton) or large lot residential subdivisions outside of any of the existing communities (exurban development). These concentrated populations

represent "urban" and "suburban" patterns of land use, which pose unique challenges and complexities in defending and protecting against wildfire spread.

Urban and suburban development patterns in and around Okanogan County cities and towns result in higher concentration of buildings and infrastructure, often called "density." In towns, the value of land, infrastructure needs, and typical patterns of development result in higher density with buildings that are located on small lots and sometimes are joined at lot lines, such as in downtowns and townhomes or multifamily developments. That development pattern tends to spread out at the perimeter of the cities or towns, with commercial, industrial, or residential development on larger lots. This pattern moves into agricultural lands and WUI.

Human activities increase the incidence of fire ignition. The denser development pattern means that fire ignition and spread affect more property, infrastructure, and people, which can stretch the existing fire protection systems beyond their capacity. Property owners in urban and suburban environments may be unaware of the problems and threats they face and may lack information or resources to manage or offset fire hazards or risks on their property. Municipalities often do not have sufficient expertise or resources to adequately address these risks on their own.

This urban/suburban landscape poses challenges in preventing fire spread and safely evacuating large numbers of people; however, because these population centers will continue to grow, it is crucial to address those challenges comprehensively. Emphasis on connected transportation networks, resilient water infrastructure, solid communications strategies, fire-resistant building standards, and vegetation management will help ensure we can protect our communities.

Land Use Conversion:

Land use conversion involves the transition of land from one use type to another. Agriculture, natural resource extraction and management, and outdoor recreation are cornerstones of Okanogan County's cultural heritage, history, and modern economy. More and more of Okanogan County's agricultural and timber lands are being converted for land development, typically for housing. These developments are often essential for the region's long-term economic viability. Nevertheless, these land conversions require additional fire protection resources. However, they, in turn, are also an opportunity to encourage the adoption of modern fire mitigation and wildfire resiliency strategies.

Diminished Timber Processing Capacity:

The availability of milling resources for timber in North Central Washington is limited. The closure of the Omak lumber mill has greatly increased the distance to the nearest mills, which are now located in Darrington and Colville. The expanded distances negatively impact the ability of small forest landowners seeking to receive a positive economic return on any pre-commercial thinnings or timber harvest on private lands to make such activities economically viable. The lack of milling resources also creates a gap in available employment in natural resources that negatively impacts the local economy.

Fireworks:

Viewing and using fireworks are a popular seasonal celebratory activity in Okanogan County. Even with the existing fireworks bans during periods of high wildland fire risk, the use of fireworks, particularly in recreational areas, is high. Both the CWPP planning committee and local residents have noted fireworks as a high-risk factor for wildfire ignitions. So far, they have not resulted in large fires; however, several documented ignitions are due to fireworks within Okanogan County.

Accessibility:

Fire chiefs, law enforcement, and residents throughout the county identified home accessibility issues as a primary concern in some parts of Okanogan County. Many existing housing developments and private driveways have been constructed without regard to the access requirements of large emergency vehicles. Additionally, many of these roads are several miles long and 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 Okanogan 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 would not only improve accessibility but would also allow the road to serve as a control point for suppression activities.

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

Figure 1.b.10. Debris flows, floods and other post-fire hazards can require significant effort to mitigate and possibly obstruct future firefighting efforts. This crossing was constructed by the Tonasket Ranger District in the aftermath of repeated blowouts of Lightning Creek in the Okanogan Highlands after the 2021 Walker Creek Fire. (Source: Mike Baden, WSCC, 2024)

Wildfire Suppression and Mobility:

An important factor in fire suppression is mobility. The ability to transport personnel and equipment to and from the incident is essential for firefighting safety and efficiency. Portions of the topography of Okanogan County limit access. Some areas are difficult to reach, and wildfires will develop before suppression resources arrive. Occasionally, suppression efforts employing defensible roads and topographic breaks as an in-direct strategy are necessary. Making the most of existing road systems is a prudent planning strategy, and the effectiveness of those road systems can be maximized if fuel reduction thinning occurs where necessary.

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.

Road Signage and Rural Addressing:

Quickly locating a physical address is critical in providing services in any type of emergency response. Accurate road signage and rural addressing are fundamental to assure the safety and security of Okanogan County residents. Currently, numerous areas throughout the county lack road signs, rural addresses, or both. Signing and addressing throughout the county must be brought up to the NFPA code to ensure visibility and quick identification.

Figure 1.b.11. Address and road signage across the county is not cohesive and varies vastly in quality and utility. In this example the road signage is sufficient, but the non-reflective "DEAD END" sign would not be easily visible to first responders and firefighters during an emergency wildfire event. (Source: Eli Loftis, Okanogan CD, 2024)

Water Resources:

Nearly every fire district involved in this planning process indicated the need to develop additional water resources in several rural areas. Developing water supply resources such as cisterns, dry hydrants, drafting sites, and/or dipping locations ahead of an incident is considered a force multiplier and can be critical for the successful suppression of fires. Pre-developed water resources can be strategically located to cut refilling turnaround times in half or more, saving valuable time for structural and wildland fire suppression efforts.

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 Okanogan 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. 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. All of these plans should be available to the local fire departments as well as dispatch personnel.

Insurance Coverage:

As wildfire and other climate change-driven natural disasters have become increasingly frequent and destructive to property in the United States in recent years, many of Okanogan County's full and part-time residents have experienced being dropped by insurance companies due to increased wildfire risk. The issue is not unique to Okanogan County; property owners throughout the western US have begun to experience the issue. However, in Okanogan County and Washington as a whole, their ability to address or mitigate insurance companies' concerns is limited due to limited resources and a lack of legal means of providing insurance incentives for creating defensible space and applying home harden principles to structures. Property owners can shop around for other coverage if policies are not renewed or cancelled. However, the number of insurance companies becoming reluctant to insure properties in areas perceived to be at an increased risk of wildfire diminishes the number of feasible options. This issue has the potential to precipitate a three-pronged crisis in which property owners are either forced to take on financially burdensome insurance policies, accept policies that under insure their assets, or forgo holding policies at all.

Figure 1.b.12. Okanogan CD's Wildfire Planner, Dylan Streeter, performs a Home Ignition Zone (HIZ) assessment with a homeowner. Insurance companies will sometimes encourage policyholders to get a HIZ assessment from Okanogan CD, WA DNR, or OCLTRG. While assessments are excellent education opportunities, they cannot certify a home or structure as being fire-resistant. (Source: Rosalie Powell, Okanogan CD, 2024)

Noxious Weeds, Invasive Weeds, and Non-Native Plants:

Noxious weeds, namely those listed by the state and county noxious weed control boards, and many non-native plants that are utilized in modern landscaping are extremely abundant and can create severe fire hazards. Also, in some circumstances, the quality of grazing for livestock, and reduce valuable wildlife habitat. Measures to reduce noxious weeds on the landscape,

encouraging the utilization of wildfire-resistant landscaping plants - preferably native to the region, and encouraging hardscaping or xeriscaping can assist in alleviating those issues.

Burn Permits and Burn Ban Observance:

A persistent issue in Okanogan County is the lack of public understanding of burn permitting regulations and burn bans. It is not uncommon for long-time residents and newcomers alike to improperly burn material when permits are indeed required or for residents to mistake a brief period of rain during an active burn ban as a green light to begin burning once again. This is an issue largely fueled by a mix of lack of public knowledge and uncoordinated communication between agencies regarding permitting needs and the issuance of burn bans at various jurisdictional levels.

Burn permitting procedures differ for lands on and off the Colville Reservation. The details of state and tribal permits are below; individual municipalities have their own regulations.

WA DNR and WA DOE Silvicultural Permits:

The Washington State Department of Natural Resources (WA DNR) is the primary agency issuing burn permits for all parcels that pay a Forest Fire Protection Assessment in Okanogan County. WA DNR burn permits regulate silvicultural burning, whereas the Washington Department of Ecology (WA DOE) is the primary agency that issues burn permits for agricultural lands. All WA DOE permits are subject to fire restrictions in place with WA DNR and local Fire Districts. WA DNR allows small pile burning, referred to as "Rule Burns," wherein a written burn permit is not required. WA DNR can suspend "Rule Burns" at any time when conditions become unsafe for unpermitted burning. WA DNR allows for Rule Burns to be ten-foot x ten-foot (10') piles of forest debris from October 16th to June 30th. If Rule Burns are allowed from July 1st to October 15th, they are limited to 4x4 piles.

Colville Tribe Burn Permit System:

The Colville Confederated Tribes (CTCR) has a burn permit system, and the general population on the Colville Reservation is well informed of this. Mount Tolman Fire Center makes it known by placing signage on the main entrance highway into the Colville Reservation. There is no need to obtain a burn permit during the open burning period from December 1st through March 1st. From March 1st to November 30th, everyone must have a burn permit on hand in order to burn. There are four types of burning that MTFC allows:

- Burn Barrel
- Recreational
- Debris Pile
- Traditional

No burn permit is required for campfires at designated campgrounds maintained by the CTCR Parks and Recreation Department. The Parks and Recreation Department will have established fire pits in place. Cancellation or restriction of all types of permits issued by Mount Tolman Fire Center will be considered as the fire danger level rises and changes. There is no cost to obtain a burn permit because MTFC does not charge a fee. The permittee does not need to be a Colville tribal member but must live within the jurisdictional boundaries of the Colville Reservation.

1.c. Planning Process and Partner Involvement

Figure 1.c.1. The first partner kickoff meeting was held on January 31, 2024. More than 100 local partners were invited to the hybrid meeting to discuss the process and timeline for updating the countywide CWPP. (Source: OCEM, 2024)

CWPP Planning Philosophy and Goals

This 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 significant impact wildfires can have on the regional economy, ecology, and public health and safety.

Mission Statement

The Okanogan County CWPP identifies wildfire response capability, educates and engages with homeowners, renters, and visitors to reduce the ignitability of structures, evaluates critical infrastructure throughout the county, identifies prioritized areas for hazardous fuel reduction treatments on federal, tribal, state, and private lands, and builds on existing efforts to restore healthy forest and sagebrush steppe conditions within the County. This plan will clarify our priorities for the protection of life, property, and critical infrastructure, as well as identify WUI areas.

Vision Statement

Promote a countywide wildfire hazard mitigation concept through leadership, professionalism, and excellence, guiding the way to a safe, sustainable Okanogan County, ensuring that people, structures, infrastructure, wildlife, livestock, unique ecosystems, natural resources, and cultural heritage are protected and resilient to wildfire.

Commitment to Environmental Justice

Okanogan County is a diverse landscape, with equally diverse human communities that all face communal challenges for living with fire on the landscape. However, many communities face different challenges in working towards wildfire resiliency and recovery, and not all communities face those challenges with equal access to resources and assistance. This plan acknowledges that

some communities bear a disproportionate burden of environmental challenges and hazards relating to wildfire because of differences in socioeconomic, race, or other factors. Through the practice of environmental justice, the partners involved in Okanogan County's CWPP commit to providing fair treatment and opportunities for meaningful involvement to all, acknowledging social and institutional inequities that create barriers for individuals and communities to achieve greater fire resiliency and taking proactive, deliberate, and targeted actions to remove those inequities and barriers. This will not only elevate communities to a position of equity that befits them but also magnify the fire resilience of everyone who lives and recreates in Okanogan County and achieve environmental equity for all.

The Okanogan County CWPP is committed to principles of environmental justice (EJ) and shall incorporate EJ principles into actions, recommendations, and plans presented in this document for wildfire resiliency, response, and recovery.

CWPP Objectives and Goals:

1. To reduce the area of WUI land burned and losses experienced because of wildfires
2. Prioritize the protection of people, structures, infrastructure, and unique ecosystems contributing to our way of life and the sustainability of the local and regional economy
3. Educate communities about the unique challenges of wildfire in the WUI
4. Establish mitigation priorities and develop mitigation strategies in Okanogan County
5. Strategically locate and plan fuel reduction projects
6. Provide recommendations for alternative treatment methods, such as modifying forest stand density, herbicide treatments, fuel reduction techniques, and disposal or removal of treated slash
7. Meet or exceed the requirements of the National Fire Plan and FEMA for a County-level Wildfire Protection Plan

Integrations with Other Plans

During the development of this CWPP, several planning and management documents were reviewed to understand and avoid conflicting goals and objectives. Existing programs and policies were reviewed to identify those that may weaken or enhance the mitigation objectives outlined in this document. A few of the existing Okanogan County planning documents, as well as those from the State of Washington and the federal government, were considered during the development of this plan and are identified in Appendix D.

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 was involved in the process, and how all the agencies involved participated.

The Okanogan County CWPP was developed through a collaborative process involving various organizations and agencies, as detailed below (page 26). The planning process included four distinct categories of activity that occurred concurrently to contribute to the overall development of the document. Initial work for this plan began in November 2023 and was concluded in November 2024. A description of the planning process can be found in Appendix B.

Figure 1.c.2. Residents from southeastern Okanogan County discuss wildfire values and priorities at the CWPP public meeting held in Nespelem on March 20th, 2024. (Source: Dylan Streeter, Okanogan CD, 2024)

The 4 Planning Stages of the CWPP Process:

- **Community Public Engagement** included two main components: first, the identification and formation of CWPP partners that would be a part of the planning committee and involved in frequent communications as well as planning efforts—and also, overall community engagement and public involvement throughout the development of the plan. Engagement efforts included press releases, newspaper articles, social media and website updates, email communications, a community input survey, public and community meetings, planning meeting notes, public and partner review of draft documents, and acknowledgment of the final plan by the signatory representatives.

- **Wildfire Risk Data** included the collection and mapping of new and existing data regarding wildfire risk in Okanogan County from up-to-date sources, research, and local knowledge and expertise. Data included, but was not limited to, the location of critical infrastructure or structures, community values at risk, priority risk areas, access or ingress/egress concerns, and previous and potential treatment areas. Wildfire risk data considered the extent and periodicity of the wildfire hazard in and around Okanogan County.

- **Prioritization** included the data, resources, and project action recommendations for this document in consideration of district and partner capacity, existing and needed resources, mitigation and treatments, infrastructure, risk assessments, resource values, and other related data.

- **Analysis and Drafting of the Final Report** included the integration of information, maps, photos, and other details resulting from the planning process with ample input, feedback, and review by the CWPP planning committee, partners, and public, as well as signatures of the final document.

Community Partner Involvement

4 CFR §201.6(a)(3) calls for multi-jurisdictional planning in the development of Hazard Mitigation Plans that impact multiple jurisdictions. These jurisdictions include Okanogan County, lands managed by the federal, state, and tribal governments within Okanogan County, the 13 incorporated cities and towns, municipal fire departments, fire districts 1-16, and several other governmental entities (listed below).

Community engagement, partner commitment, and follow-through make a CWPP successful. A wide variety of partners and representatives from Okanogan County were engaged to develop the recommendations set forth in this CWPP.

These jurisdictions and several non-governmental organizations were represented on the CWPP planning committee and in public meetings either directly or through communications with members of the core planning group within the planning committee. They participated in the development of hazard profiles, risk assessments, and mitigation measures. The planning committee meetings were the primary venue for authenticating the planning record. However, additional input was gathered from each jurisdiction in the following ways:

- Planning committee leadership visits to local group meetings (e.g., county departmental meetings, city council meetings, fire district commission meetings) where planning updates were provided and information was exchanged.
- One-on-one visits between the planning committee leadership and representatives of the participating jurisdictions (e.g., meetings with county commissioners, city councilors and/or mayors, fire district commissioners, or community leaders).
- Written correspondence between the planning committee leadership and each jurisdiction updating the participating representatives on the planning process, making requests for information, and facilitating feedback.

Like other areas of Washington and the United States, Okanogan County's human resources have many demands placed on them in terms of time and availability. A few of the elected officials (county commissioners and city mayors) do not serve in a full-time capacity; some of them have other employment and serve the community through a convention of community service. Recognizing this and other time constraints, many jurisdictions decided to identify a representative to cooperate on the planning committee and then report back to the remainder of their organization on the process and serve as a conduit between the planning committee and the jurisdiction.

The following partners are highlighted for their time and effort in developing, providing data, providing feedback, and planning implementation projects for this CWPP:

- Okanogan Conservation District, Okanogan County Emergency Management, Okanogan County Commissioners, Okanogan County Sheriff's Office, Washington State Department of Natural Resources, USFS-Tonasket Ranger District (Colville NF), USFS Methow Valley Ranger District (Okanogan-Wenatchee NF), Confederated Tribes of the Colville Reservation, City of Omak, City of Okanogan, Town of Conconully, Town of Coulee Dam, Town of Pateros, Town of Twisp, Town of Winthrop, City of Oroville, Okanogan County Public Works-Landfill & Road Depts., Okanogan County Noxious Weed Board, Okanogan County Public Health, Washington Department of Fish and Wildlife, Bureau of Land Management, Conservation Northwest, Okanogan County Long Term Recovery Group, Methow Valley Citizens Council, Clean Air Methow, Methow Watershed Council, Okanogan Public Utility District, Okanogan County Electric Co-Op, North Cascades Prescribed Burn Association, Okanogan Economic Alliance, Mt. Tolman Fire Center, Municipal Fire Departments, and Fire Districts 1-16.

2. Okanogan County Background

2.a. General Description

Okanogan County Characteristics

Okanogan County is the largest county in the State of Washington, covering 5,281 square miles. Larger than three states and several countries, the total area of the county is approximately 3,399,050 acres. Approximately 58% of Okanogan County is owned by Federal, State, or Local agencies (USFS, USBLM, WDFW, WADNR, and other local governments (<1%)); 16% is owned by The Confederated Tribes of the Colville Reservation; and 26% is owned privately (Okanogan County Assessor, 2017).

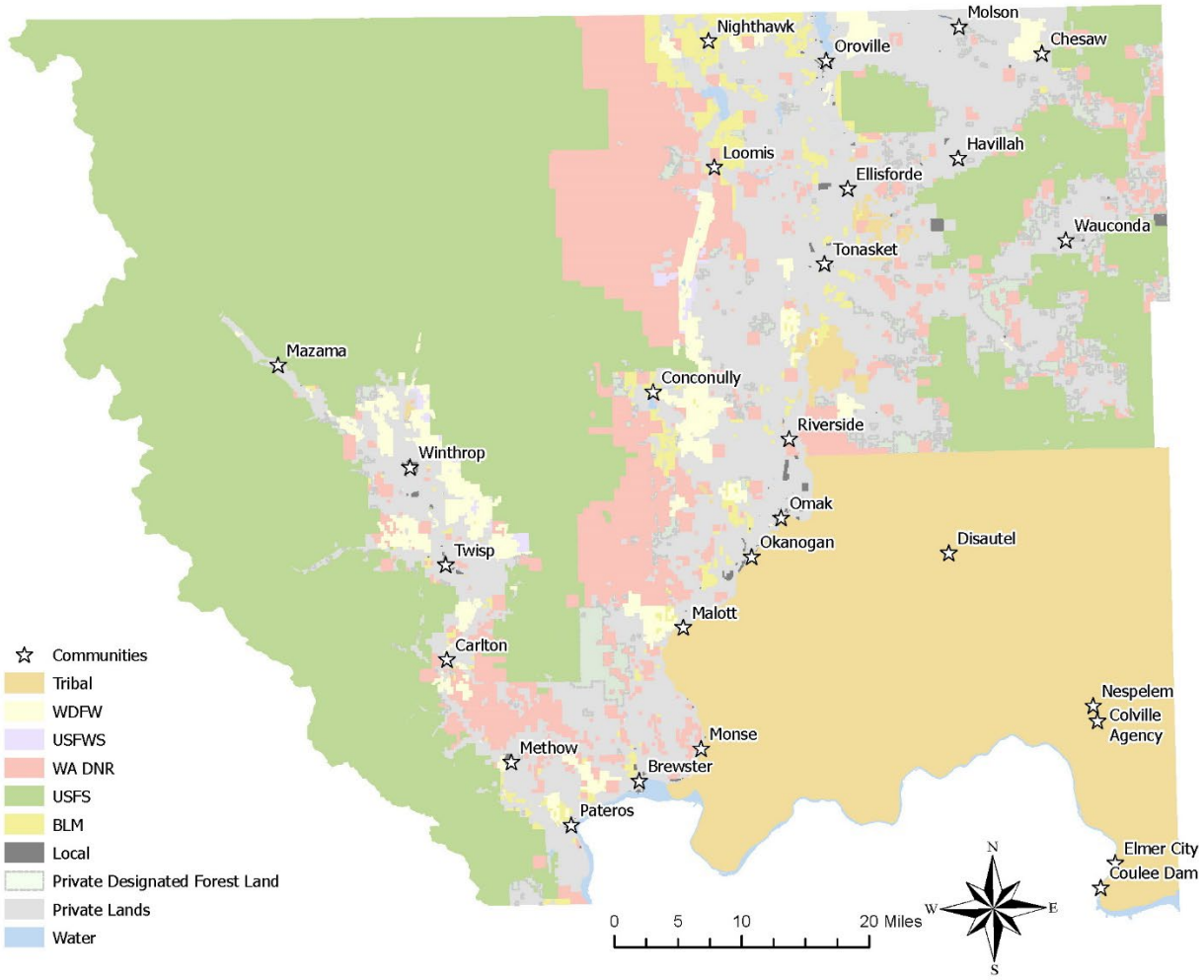


Figure 2.a.1. Landownership across Okanogan County. (Source: Okanogan County, 2024)

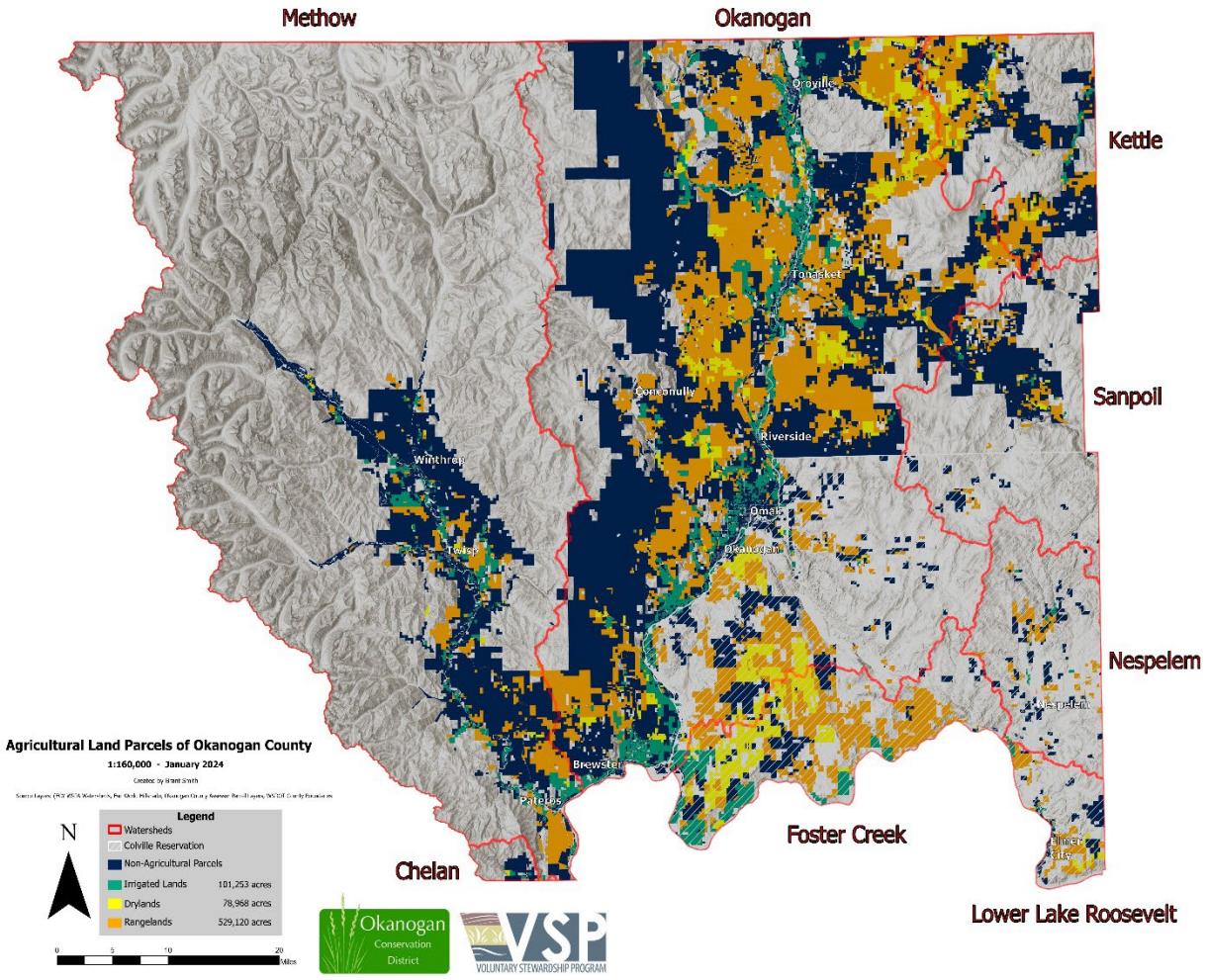


Figure 2.a.2. A breakdown of agricultural land parcel types. (Source: Okanogan CD VSP, 2024)

Population and Demographics

As of the 2020 census, Okanogan County's total recorded population is composed of 42,104 people, roughly 8 individuals per square mile. This represents roughly a 5.2% increase since the 2010 census (Census Bureau nd). As estimated by the Census Bureau, the 2023 population of the county was 43,127, 89% White, 1% Black, 12.3% Native American, 1.2% Asian, 0.3% Pacific Islander, 22.5% Hispanic or Latino (Census Bureau nd).

The median household income in 2020 was $58,218 in Okanogan County, and the median household income statewide in Washington was $91,306. 17,005 households were identified within 21,720 housing units (Census Bureau nd). The countywide employment rate stands at 52.5%. 18.9% of the population lived below the poverty line. The largest industry for civilian employment overall was educational services, health care, and social assistance (Census Bureau nd). 20.7% of the population was employed in agriculture, natural resource extraction, or management. 63% of agricultural producers in Okanogan County are 65 years old or older (Census Bureau, 2020). Agriculture has been seeing a national trend of a decline in younger primary agricultural producers and an increase in the average age of primary agricultural producers (Manly 2019). Okanogan County also follows this

national trend (average primary operator age - 57.1 in 2007, 58.8 in 2012). The median age in Okanogan County was 42.9, and 22.4% of the population was 65 years old or older (Census Bureau nd).

Geography and Climate

Forested highlands, shrub-covered hills, and valleys with fertile farmlands comprise Okanogan County. Bordering the County on the west are Whatcom, Skagit, and Chelan counties. To the east is Ferry County, and to the south are Douglas, Lincoln, and Grant counties. The Canadian province of British Columbia bounds the county to the north. The county's western half is comprised of dense, rugged, mountainous terrain, much of which is within the Okanogan-Wenatchee and Colville national forests. Similar topography can also be found in the county's northeast corner within the Okanogan Highlands. Elevation ranges from 208-8,956ft, with North Mount Gardner, located within the Okanogan-Wenatchee National Forest, standing as the highest mountain in Okanogan County and the 23rd highest mountain in Washington state overall.

The region has a complex geological history shaped by tectonic plates, volcanic eruptions, and ice age sculpting. Precambrian rock underlies the eastern part of the county, eventually creating a region rich with mining resources and ancient fossils. The majority of the county was glaciated during the last ice, the retreat of the Cordilleran Ice Sheet at the end of the Pleistocene, and the beginning of the Holocene craving many of the valleys familiar today (Mack et al. 1979). Geologically, the county could be categorized into three distinct geological regions: the Okanogan Highlands (characterized by rounded mountains with elevations up to 8,000 feet above sea level and deep, narrow valleys), the Kootenay Arc (A northeast trending structure formed from the repeatedly folded Paleozoic rocks in the region), and the Columbia Plateau (A wide flood basalt plateau) (Northwest Planning Council 2001; Koch nd; Sam 2008; Okanogan Conservation District 2009; Okanogan Conservation District 2024).

The landscape of Okanogan County is exceptionally diverse by virtue of its position: the semi-arid Methow and Okanogan Valleys are nestled among the steep North Cascades and the Okanogan Highlands, an extension of the Northern Rocky Mountains. Okanogan County features predominantly dry conditions within the rain shadow of the Cascades, consisting of marine-modified continental subhumid and humid climates (Zamora 2017).

From the Canadian border southward, the Okanogan River runs through the lowest elevations in the county. Four to five months out of the year, extreme highs of 100°F or more are frequently experienced, and winter temperatures can fall as low as - 20°F to 20°F (Okanogan MHMP 2021). Precipitation in low-lying areas of the county averages 10-14 inches per year, received mostly in winter. Many of the lower elevation areas in proximity to water sources have been converted to agricultural land. Higher elevation areas experience summer highs closer to 90°F winter lows of -10°F to -20°F, with an average of 25-30 inches of precipitation (Okanogan MHMP 2021). As a consequence of climatic change, temperatures are projected to warm on average in the twenty-first century, impacting the frequency, extent, and severity of wildfires in Okanogan County and throughout western North America (Halofsky et al. 2020).

Hydrology

The Water Resource Inventory Area (WRIA) delineation system developed by the WA Department of Ecology designates seven distinct watersheds that are fully or partially within Okanogan County (Okanogan Conservation District, 2024). This includes the Methow, Okanogan, Foster, Kettle, Lower Lake Roosevelt, Nespelem, and Sanpoil watersheds. These watersheds support multiple major rivers: the Methow, Chewuch, Twisp, Similkameen, Okanogan, and, most notably, the Columbia. Currently,

the Okanogan watershed encompasses around 2,600 square miles in Washington State and extends 6,000 square miles into Canada, flowing out from Lake Okanagan. The Methow watershed, encompassing around 1,805 square miles, borders the eastern crest of the Cascades and travels nearly 80 miles to the Columbia River at Pateros, WA. The whole of Okanogan County is within the 258,000 square-mile watershed of the Columbia River.

Okanogan County has more than 230 lakes, including the transboundary Lake Osoyoos. Many of the lakes in the region are alkaline. Omak Lake is the largest saline lake in Washington, sitting within an endorheic, closed, basin. With 3,820 acres in surface water area and 7.5 miles in length, it is the largest lake in Okanogan County (Okanogan Conservation District 2024).

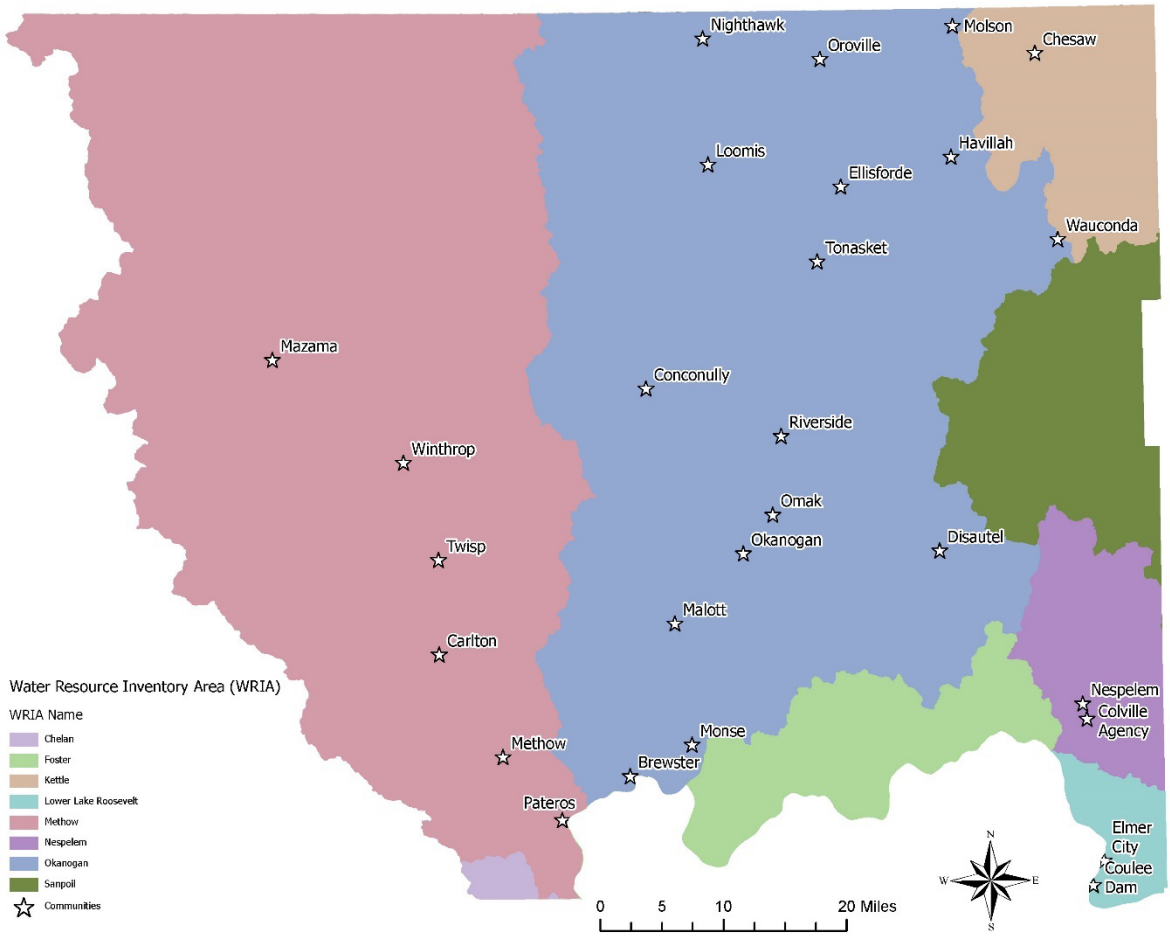


Figure 2.a.3. Water Resource Inventory Areas (WRIA) across Okanogan County.
(Source: Washington Geospatial Open Data Portal, 2023)

The state may assign or designate beneficial uses for 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, and 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.

Landcover and Vegetation Cover

Vegetation in Okanogan County consists of forestland and agricultural ecosystems. Satellite imagery of the region provides some insight into the composition of the vegetation in defining land cover classes. Across the almost 3.4 million acres of Okanogan County, 1,068,836 acres are classified as herbaceous, 1,022,610 acres of shrub/scrub, and 1,000,421 acres of evergreen forest, with 307,183 acres of other cover classes.

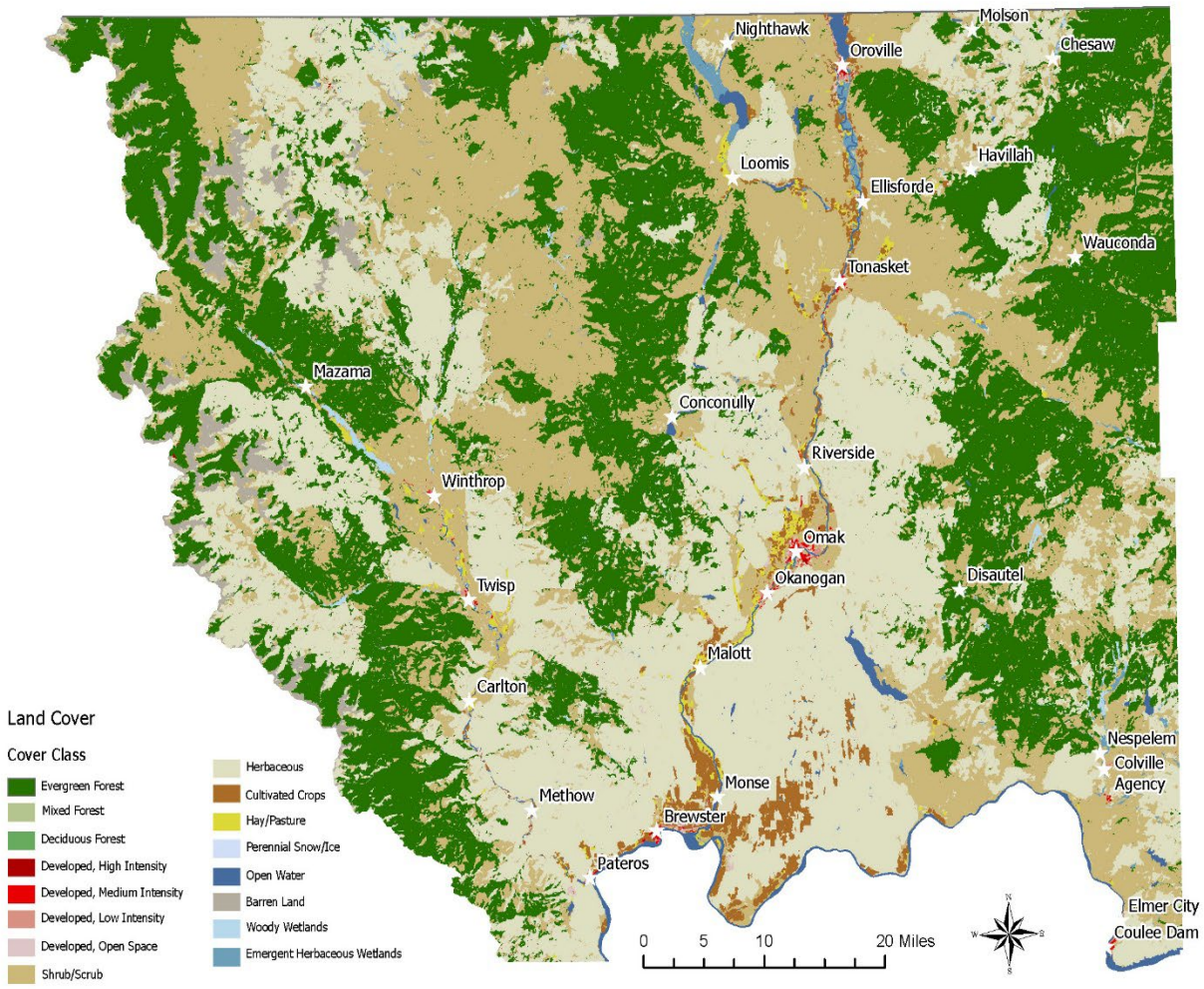


Figure 2.a.4. Land Cover types of Okanogan County, WA. (Source: USGS, 2024)

Ecoregions and Ecosystems

Okanogan County is composed of multiple ecoregions and ecosystems with complex arrays of vegetation, wildlife, and fisheries that have developed with and adapted to fire as a natural disturbance process. Nearly a century of wildland fire suppression coupled with past land-use practices (primarily timber harvesting and agriculture) has altered plant community succession. It has resulted in dramatic shifts in the fire regimes and species composition. As a result, forests and rangelands in Okanogan County have become more susceptible to large-scale, higher-intensity fires posing a threat to life, property, and natural resources, including wildlife and plant populations, timber, grazing, and recreational opportunities. High-intensity fires have the potential to seriously damage soils and native vegetation. In addition, an increase in the number of large, high-intensity fires throughout the nation's forest and rangelands has resulted in significant safety risks to firefighters and higher costs for fire suppression.

Figure 2.a.5. A Dusky Grouse (Dendragapus obscurus) amongst arrowleaf balsamroots (Balsamorhiza sagittata).
(Source: Alyssa Carlson, Okanogan CD, 2018)

Broadly, Okanogan County and the greater Okanogan Ecoregion is a transitional zone between multiple Level 1,2, and 3 ecoregions. Ecoregions are areas in which ecosystems are generally similar. Utilizing the classification of ecoregions developed by the Environmental Protection Agency (EPA), Okanogan County is divided between two Level 1 ecoregions that reflect the conditions of the high-elevation and low-elevation areas of the county, Northwestern Forested Mountains and North American Deserts, which also corresponds to the Level 2 ecoregions of the Western Cordillera and Cold Deserts. The county is divided into four Level 3 ecoregions: The Columbia Mountains/Northern Rockies, North Cascades, Columbia Plateau, and Thompson-Okanogan Plateau. The county is further divided into 11 Level 4 ecoregions reflecting more localized aspects of our area's ecosystems' topographical, climatic, and biological diversity.

Okanogan County and the greater Okanogan Ecoregion that extends into British Columbia and NE Washington has an unusually high species richness and hosts the greatest diversity of breeding bird species in both Washington and British Columbia (Pryce et al. 2006). The typical natural vegetation of the low-lying areas of the Okanogan and Methow valleys is dominated by shrubsteppe species of the Columbia Plateau, characterized by xeric habitats made up of a mix of shrubs and herbaceous plants, including antelope bitterbrush (*Purshia tridentata*) and big sagebrush (*Artemisia tridentata*) with intermixed ponderosa pine (*Pinus ponderosa*) woodlands and savannas (West 1999; Heinlen & Vitt 2003; Pryce et al. 2006; Pilkington 2019). The arrival of invasive grasses has broadly disrupted historic natural vegetation communities in these areas, most notably cheatgrass (*Bromus*

Figure 2.a.6. A pronghorn (Antilocapra americana) buck, a sagebrush obligate species on Cameron Loop Rd.
(Source: Eli Loftis, Okanogan CD, 2024)

tectorum), which, in conjunction with other invasives and disturbance agents, can increase the prevalence and intensity of wildfires in those habitats (West 1999; Hemstrom et al. 2002; Pilkington 2019). These areas are heavily utilized for agricultural production, particularly as rangelands, and are intermixed within the WUI with residential areas. Wildlife includes mule deer (*Odocoileus hemionus*), whitetail deer (*Odocoileus virginianus*), various songbirds, birds of prey, and reptiles including the north Pacific rattlesnake (*Crotalus oreganus*). Okanogan County's shrubsteppe provides habitat for multiple species of conservation concern, including state-listed threatened species such as the Columbian sharp-tailed grouse (*Tympanuchus phasianellus columbianus*) and, historically, the now locally diminished greater sage-grouse (*Centrocercus urophasianus*), which still occurs and breeds across the Columbia River in Douglas County.

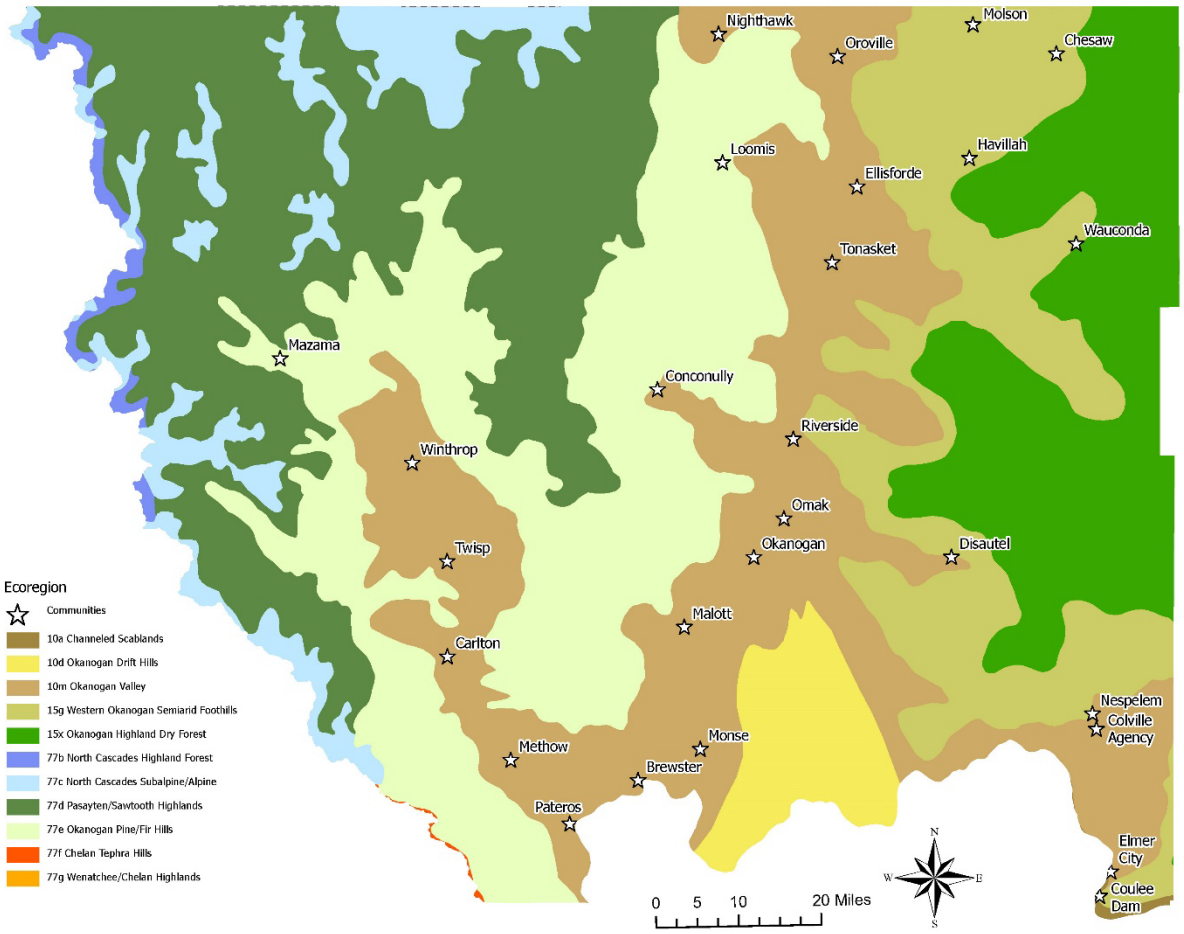


Figure 2.a.7. Level IV Ecoregions across Okanogan County. (Source: EPA, 2024)

Within the mountainous portions of the county, plant communities tend towards forest and woodland compositions except in the highest of elevations along the Cascade Crest past the tree line, including large areas of alpine and subalpine tundra in the Pasayten Wilderness, typically occurring above 6,500 ft (Fahnestock 1976). Ponderosa pine, Douglas-fir (*Pseudotsuga menziesii*), western larch (*Larix occidentalis*), and lodgepole pine (*Pinus contorta*) dominate lower and mid-slope forests and woodlands, with the higher elevation forests of the North Cascades hosting large tracks of subalpine fir (*Abies lasiocarpa*) and other cold tolerant conifers, with some pockets of high elevation forests also being found in the Okanogan Highlands that make up the northeastern corner of the

county (Fahnestock 1976; Mack et al. 1979; Heinlen and Vitt 2003; Pryce et al. 2006; Zamora 2017). The federally threatened whitebark pine (*Pinus albicauils*) is found in patches within the North Cascades and in an isolated population on Mount Bonaparte in the Okanogan Highlands (Heinlen and Vitt 2003). The North Cascades also host populations of federally and state-protected populations of Canada lynx (*Lynx canadensis*), the largest in the Lower 48, wolverine (*Gulo gulo*), and other high-elevation cold-tolerant animal species such as American pika (*Ochotona princeps*) (WDFW 2024). The Okanogan Highlands hosts a variety of uncommon wetland habitats, such as fens, that are home to several rare plant species (Mack et al. 1979; Okanogan Highland Alliance nd).

Air Quality

The primary means of protecting and enhancing air quality in the United States is through the implementation of National Ambient Air Quality Standards (NAAQS), administered by the Environmental Protection Agency (EPA). These standards address six pollutants known to harm human health, including ozone, carbon monoxide, particulate matter, sulfur dioxide, lead, and nitrogen oxides (EPA 2024).

The Clean Air Act, passed in 1963, is the primary legal authority governing air resource management. The Clean Air Act provides the principal framework for national, state, and local efforts to protect air quality. Under the Clean Air Act, the EPA's OAQPS (Office for Air Quality Planning and Standards) is responsible for setting standards, NAAQS, for pollutants that are considered harmful to people and the environment. OAQPS is also 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).

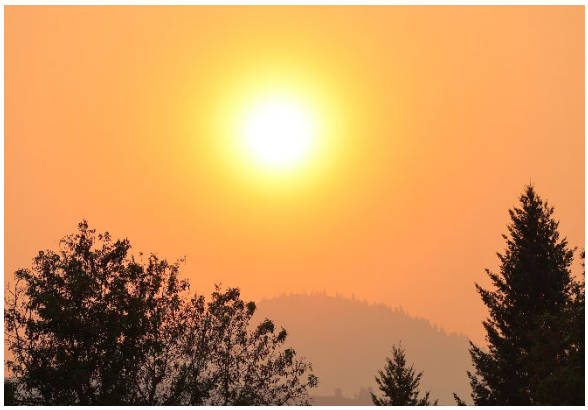


Figure 2.a.8. Smoke emissions from fires in northern Okanogan County and Canada can be seen from central Okanogan to the southeast in August 2023. (Source: Emmy Engle, Okanogan CD, 2023)

Smoke emissions from fires can significantly impact an area and the airsheds that surround it. Smoke from large wildfires can also travel hundreds of miles to impact communities far away from its source. Smoke is a complex mixture of gases and fine particles, including PM2.5, water vapor, carbon dioxide and monoxide, ozone, PAHs, nitrogen oxides, and other chemicals. PM2.5 is typically the component of greatest concern for health impacts as it is small enough to bypass many of the body's natural defenses to air pollutants in the respiratory system, lodge deep in the lungs, and initiate a cascade of inflammatory reactions. Short- and long-term exposures to PM 2.5 can harm human health, contributing to and exacerbating cardiovascular and respiratory disease, causing low birth weight, premature births, and other issues (EPA 2024).

Figure 2.a.9. Extreme smoke emissions from the Carlton Complex fire viewed from Buzzard Lake Rd. along HWY 20. (Source: Okanogan CD, 2014)

As mentioned previously, Okanogan County must cope with extreme levels of seasonal wildfire smoke and PM 2.5 from other sources during almost every season of the year.

Large-scale influences on smoke travel include latitude, altitude, prevailing hemispheric wind patterns, and mountain barriers. Topography and vegetation cover also affect air movement patterns on a smaller scale. Major river drainages are subject to temperature inversions, which trap smoke and affect dispersion, causing local air quality problems. This occurs most often during the summer and fall months and can potentially affect many communities in Okanogan County. Wintertime inversions are less frequent but can trap smoke from home heating, winter silvicultural burning, and pollution from other sources.

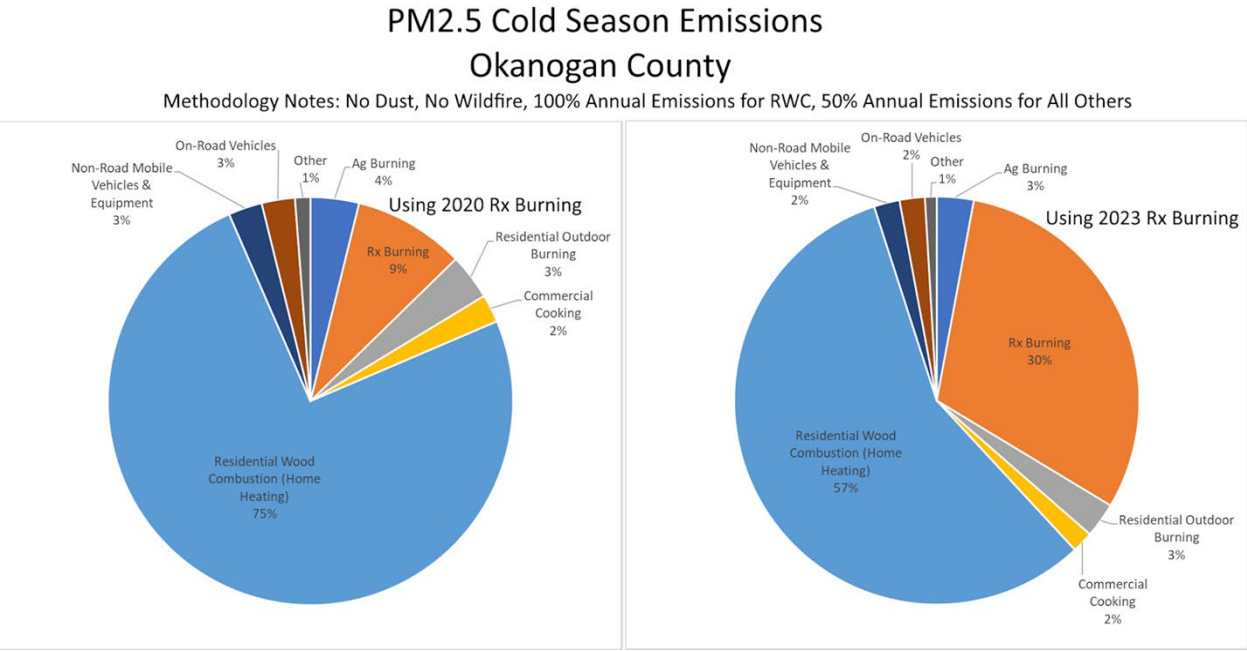


Figure 2.a.10. Okanogan County Emissions Inventory identifying sources of PM 2.5 emissions in the cold season between the months of Oct-June 2020. (WA DOE, 2024)

2.b. Wildland Fire Characteristics

Wildland Fire Description

Wildfire is a dynamic landscape-level force that requires a wide range of considerations when managing it on every scale, from a single source of fuel to the county and region as a whole. An informed discussion of fire mitigation is incomplete until basic concepts governing fire behavior are understood. In the broadest sense, wildland fire behavior describes how fires burn, how fuel ignites, how flames develop, and how fire spreads across the landscape.

The three major physical components that determine fire behavior are the fuels supporting the fire, the topography in which the fire is burning, and the weather and atmospheric conditions during a fire event. At the landscape level, both topography and weather are beyond our control. We cannot control winds, temperature, relative humidity, atmospheric instability, slope, aspect, elevation, and landforms. It is beyond our control to alter these conditions, and thus impossible to alter fire behavior through their manipulation. When we attempt to alter how fires burn, we are left with manipulating the third component of the fire environment: fuels that support the fire. By altering fuel loading, type, configuration, condition, and continuity across the landscape, we have the best opportunity to control or affect how fires burn.

A brief description of each fire environment element follows to illustrate their effect on fire behavior.

Weather

Weather conditions contribute significantly to 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, wind speed, and direction can significantly affect fire behavior.

Figure 2.b.1. The 2021 Muckamuck Fire driven by high winds. (Source: Justin Stanley, 2021)

Direct sunlight and hot temperatures impact how ready fuels are to ignite. Warm air preheats fuels and brings them closer to their ignition point. When relative humidity is low, the dry air can absorb moisture from fuels, especially flashy fuels, making them more susceptible to ignition. Long periods of dry weather can dehydrate heavier fuels, including downed logs, increasing the risk of wildfires in areas with heavy fuel loads.

Winds fan fires with oxygen, increasing the rate at which fire spreads across the landscape. Wind influences fire behavior by drying out fuels (think how quickly your lips dry out in windy weather), increasing the amount of oxygen feeding the fuel, preheating vegetation through convective heat, and carrying embers more than a mile ahead of an active fire. Complex topography, such as chutes, saddles, and draws, can funnel winds in unpredictable directions, increasing wind speeds and resulting in erratic fire behavior.

Weather is the most unpredictable component governing fire behavior, constantly changing in time and across the landscape.

Topography

Fires burning in similar fuel conditions burn very differently under varying topographic conditions. Topography (slope and aspect) influences fire intensity, speed, and spread. It also alters heat transfer and localized weather conditions, influencing vegetative growth and resulting fuels. Changes in slope and aspect can have significant influences on how fires burn. Generally speaking, north slopes tend to be cooler, wetter, and more productive sites. This can lead to heavy fuel accumulations, with high fuel moistures, later fuel curing, and lower spread rates.

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" for a greater portion of the year.

Figure 2.b.2. Slope, relative position, and other topographic factors influence vegetation communities and fire behavior. (Source: Eli Loftis, Okanogan CD, 2024)

Slope also plays a significant role in spreading fire by allowing the preheating of fuels to upslope from the burning fire. As the slope increases, the rate of spread and flame lengths tend to increase. Therefore, we can expect the fastest rates of spread on steep, warm south and west slopes with fuels that are exposed to the wind.

Narrow canyons can experience increased combustion because radiant heat from fire burning on one side of the canyon can heat fuel on the other side of the canyon. Embers can easily travel from one side of a canyon to the other. Topography also influences wind behavior and can make fire spread unpredictable. Wildfires burning through steep and rugged topography are harder to control due to reduced access for firefighters and more unpredictable and extreme fire behavior. Post-fire, these areas have a higher potential for debris flows, flooding, and erosion.

Figure 2.b.3. Post-fire impacts from the Eagle Bluff Fire in northern Okanogan County. (Source: Emmy Engle, Okanogan CD, 2023)

Fuels

Fuel is any material that can ignite and burn. Fuels describe any organic material, dead or alive, found in the fire environment. Grasses, brush, branches, logs, logging slash, forest floor litter, conifer needles, and buildings are all examples. The physical properties and characteristics of fuels govern how fires burn. Fuel loading, size, shape, moisture content, continuity, and arrangement affect fire behavior. Generally speaking, the smaller and finer the fuels are, the faster the potential rate of fire spreads. Small fuels such as grass, needle litter, and other fuels that are less than a quarter inch in diameter are most responsible for fire spread. In fact, "fine" fuels, with high surface-to-volume ratios, are considered the primary carriers of surface fire. This is apparent to anyone who has ever witnessed the speed at which grassfires burn. As fuel size increases, the rate of spread tends to decrease due to a decrease in the surface-to-volume ratio. Fires in large fuels generally burn slower but release much more energy and burn with much greater intensity. This increased energy release, or intensity, makes these fires more difficult to control. Thus, it is much easier to control a fire burning in grass than to control a fire burning in timber.

When burning under a forest canopy, the increased intensity can lead to torching (single trees becoming completely involved) and the potential development of crown fires. That is, they release much more energy. Fuels are found in combinations of types, amounts, sizes, shapes, and arrangements. The unique combination of these factors and the topography and weather determines how fires will burn.

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

Figure 2.b.4. The intersection of different fuel types, including where natural vegetation meets lawns and other landscaping, greatly impacts fire behavior. (Source: Okanogan CD, 2020)

Fuel Types

Figure 2.b.5. While the home to the right has built-in features that can reduce the risk of structural ignition (pictured to the right is metal siding), the density of intermixed fuel types, including tall grasses, shrubs, and ladder fuels dramatically reduce the utility of these resiliency features by creating a pathway for fire to travel from the ground to the roof of the building. Fuel management is essential for creating defensible space and managing fire risk within the WUI. (Source: Eli Loftis, Okanogan CD, 2022)

Grasses:

Grasses easily catch fire, spreading fire rapidly. Grasses burn out quickly, producing lower heat intensities than those produced by larger fuel sources like woody vegetation. Nevertheless, while they do not burn as intensely, grassfires move quickly and can create embers that can ignite structures and spread fire into other fuel sources. Abundant invasive grasses, like cheatgrass, can accelerate the spread of grass fires when compared to native grass species.

Needles/Leaves:

Shed needles and leaves naturally accumulate at the base of trees and shrubs. Depending on the kind of material, successive layers may develop from shed broadleaf trees and longer-needled conifers like ponderosa pine, which typically do not shed material that compacts readily but can still leave thick heaps of loose material. These uncompacted layers may burn more readily during wind-driven fires. With shorter needles, trees such as lodgepole pine, Douglas-fir, and arborvitaes, the needles frequently compact, forming thick mats that retain moisture and are more resistant to fire, taking

longer to burn and may smolder for weeks or months afterward. Arborvitaes and similar conifers, however, tend to deposit needles close to the base of the plant, causing build-ups that create continuous fuel loads from the ground to the crown.

Needles and leaves accumulated near structures are a major source of embers, flames, and radiant heat that could ignite a building.

Downed Woody Debris:

Naturally occurring dead woody materials such as logs and fallen branches, as well as human-placed or created materials like slash and wood chips (mulch), can provide fuel sources for fire. Forest and woodland habitats need woody debris to decompose in order to support proper nutrient cycling, but excessive accumulation may create areas of heavy fuels that generate large amounts of heat. However, most nutrient cycling occurs through burning in dry conifer forests where moisture is deficient. Slash piles and woodchips near structures may have a similar effect, creating embers and radiant heat that can spread the fire to buildings or into surrounding vegetation that the fire has preheated.

Figure 2.b.6. Ladder fuels can easily develop as a cohort of younger trees can take root below the crown of a more mature cohort. (Source: Eli Loftis, Okanogan CD, 2024)

Ladder Fuels:

Young trees, shrubs, standing dead trees touching the crowns of live trees nearby, lower branches on live trees, and climbing plants like vines or brambles create a path for fire to move from the ground in the canopy of the forest like a ladder, thus the name ladder fuels. Ladder fuels have the potential to be extremely hazardous as they create conditions that could allow fire to move through an area as a crown fire rapidly. However, ladder fuels are one of the easier challenges to mitigate through pruning and limbing.

Brush/Shrubs:

Like many of our tree species, many of Okanogan County's shrub species are adapted for fire on the landscape. These adaptions include, in many cases, the ability to resprout from surviving roots and root crowns or having high concentrations of natural oils that readily burn. Just like with forests, decades of fire suppression and grazing have led to high densities of sagebrush, antelope bitterbrush, and other shrubs in some areas, which, compounded by the expansion of development in shrubsteppe areas, creates prime conditions for wildfire that will impact development.

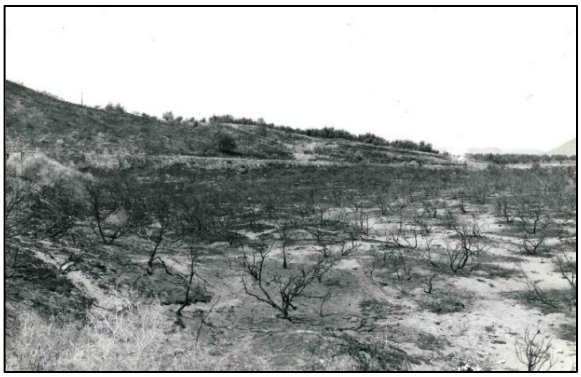


Figure 2.b.7. The July 1970 Omak Gun Club Fire, showing an area of shrubsteppe fuels burned in the background, and several fire damaged apple trees in the foreground. (Source: A.B. Blomdahl, USDA-Soil Conservation Service, 1970)

Shrubs typically burn longer and more intensely than the grasses around them. They may also act as ladder fuels when they are intermixed with trees, such at the edge of the forest or in a ponderosa pine savanna. Sagebrush and bitterbrush are important components of the shrubsteppe habitat, which is declining across Washington State and beyond.

Selective removal of shrubs, breaking up continuous layers of fuel that foster more natural breaks and clumps of vegetation, can reduce fire risk while maintaining cover and forage for wildlife that rely on shrubsteppe plants like pronghorn and Columbian sharp-tailed grouse (*Tympanuchus phasianellus columbianus*). See Appendix E for more information on the shrubsteppe in Okanogan County.

Crown Fuels:

Fires that reach the crowns of trees can move rapidly, burning large areas and producing copious amounts of embers that can be carried ahead of the flame front and potentially ignite other fuel sources, creating spot fires that tax the resources of firefighters and potentially place them at additional risk, and damage or burn structures that are not immediately near the flame front. Thinning trees, removing ground fuels below them, and removing ladder fuels can reduce the risk of crown fires. The crowns of isolated trees may "torch out," but if the density and spacing of trees in the area are sufficient, the fire may not be able to spread beyond the crown of a single tree to the next.

Agricultural Fuels:

The wide valley bottoms and availability of irrigation water throughout much of Okanogan County allow for extensive agricultural operations, particularly fruit orchards. Irrigated agricultural fields and orchards infrequently serve to fuel a fire. Most of the orchards within the valleys are irrigated until late in the fire season, drastically reducing the ignition's likeliness. In some cases, radiant heat from nearby wildfires has been observed to damage irrigated crops; for example, the sap of trees can boil without the tree burning and cause isolated spot fires within an irrigated area.

Other agricultural products, such as hay, tend to burn in much the same manner as low-growing grasses. Stacked hay can burn if exposed to direct flame contact, embers, or radiant heat and, in some cases, can combust on its own (though this is typically due to excessive moisture). Loss of stacked hay was a major wildfire impact observed in the 2015 Okanogan Complex and 2020 Cold Springs/Pearl Hill fires. Stacked hay in isolation can burn if embers land on or near the stacks and can produce embers and radiant heat that can spread fire to agricultural buildings and equipment.

Fires in grass and rangeland fuel types tend to burn at relatively low intensities, with moderate flame lengths and only short-range spotting. Suppression resources are generally quite effective in such fuels. Homes and other improvements can be easily protected from direct flame contact and radiant heat through the adoption of precautionary measures around the structure. Although fires in these fuels may not present the same control problems as those associated with large, high-intensity fires in timber fuel types, they can cause significant damage if precautionary measures have not taken place prior to a fire event. Wind-driven fires in short grass fuel types spread rapidly and can be difficult to control. During extreme drought and pushed by high winds, fires in grassland fuel types can exhibit extreme rates of spread.

Figure 2.b.8. This propane tank, utilized to fuel a grill, was exposed to high amounts of radiant heat and eventually direct flame contact as the home it was adjacent to burned, causing the gas to ignite and spread the fire further.
(Source: Eli Loftis, Okanogan CD, 2023)

Urban Non-vegetative Fuels

In urban areas, including towns and cities, there is a denser pattern of development, often consisting largely of structures built from wood. Within this built environment, which includes human-made or modified landscapes, structures, and infrastructure systems, building codes have historically functioned to try to prevent the spread of fire (USGCRP, 2023). Smaller and more spread-out communities correlate with higher rates of property damage than large cities (Potter 2021). Factors such as sprinkler systems in buildings and newer fire-resistant construction materials serve to limit fire spread. Nevertheless, the urban environment is filled with numerous non-vegetative fuels that have the potential to carry fire from the wildland deep into the urban interface or vice versa. Many of these urban-nonvegetative fuels create hazards for fire suppression, including toxic smoke emissions (sourced from burning car batteries, plastics, etc.) that may require personal protective equipment not typically carried by wildland firefighters. Fuel tanks, ammunition, and other combustives can create dramatic risks for responders and the public if ignited during a fire event.

Figure 2.b.9. Common fuel sources and points of ignition around a home. (Source: University of Arizona Extension, nd)

1) Non-class A roofs 2) roof openings 3) roof debris 4) skylights 5) spark arrester 6) windows 7) vents 8) gutters 9) combustible siding 10) firewood piles 11) patio furniture 12) decking 13) deck debris 14) wooden door frame 15) materials or debris under the deck 16) flower boxes 17) eaves 18) planting beds with wood or rubber mulch 19) vehicles 20) garage doors 21) garbage or other waste storage 22) wood or vinyl fencing.

Fuels In Highlighted Forest and Woodland Types

Fuels within forested and wooded ecosystems are diverse in their structure and vary depending on multiple factors. Broadly speaking, the following descriptions can apply to various forest types in Okanogan County. Issues impacting timber fuels intersect with a wide array of other factors on the landscape that impact forest health, including pests, pathogens, and climate change.

Figure 2.b.10. This photo was taken from HWY 20; this area was burned multiple times in the past two decades and has experienced differing amounts of regeneration as a result of variable burn intensities. As a result of the series of large fires that have impacted Okanogan County, much of the area now experiences a greater heterogeneity of age classes and relative levels of forest health. (Source: Emmy Engle, Okanogan CD, 2024)

Ponderosa pine:

Stands in the ponderosa pine forest are often choked with understory regeneration as the result of an extended period of fire exclusion. The extensive stocking has encouraged the proliferation of a number of bark beetle species. Whereas fire formerly thinned the stands from below, the bark beetles are now thinning them from above, killing the most valuable trees first. This is occurring despite repeated entries that have removed high-risk trees and reduced the amount of old growth to low levels. Mistletoe (*Arceuthobium*), which was formerly a localized problem, is now widespread, with understory trees being rapidly infected by residual overstory. The large stumps created by several cycles of previous logging are increasingly the focus of annosum (*Heterobasidion annosum*) root rot centers. Plentiful ladder fuels, mistletoe brooms, and dead and down material make the threat of catastrophic fire a greatly increased possibility in the area identified in the ponderosa pine forest. Under existing conditions, tree mortality appears to be increasing, and site productivity is declining in these stands.

Figure 2.b.11. An aerial view of a ponderosa pine forest intermixedwith agricultural infrastructure. The area was mechanically thinned and was then partly burned in the 2015 Okanogan Complex Fire. Ponderosa pine forests and woodlands are the forest types most intermixed with development and agriculture in Okanogan County. (Source: Aaron Nepean, Cutboard Studio, 2022)

Douglas-fir:

Tree species occurring on lands in the Douglas-fir zone include Douglas-fir, ponderosa pine, western larch, lodgepole pine, and quaking aspen (*Populus tremuloides*). The lower elevation area in these stands provides a winter range for deer and Rocky Mountain elk (*Cervus canadensis canadensis*). Fire history indicates slightly less frequent fires of mixed severity than in the drier ponderosa pine stands and has created a large mosaic of patches burned by surface fires or crowning fires. Fire-resistant and seral species were favored, with regeneration occurring in the fire-created openings and fire-induced thinning occurring elsewhere. Individual stands within the complex mosaic were largely even-aged. All the common forest pests, while present, were usually at endemic levels.

With fire suppression/exclusion starting in the early 1900s, the natural thinning and stand replacement function in these forests no longer occurred to any level of significance. The introduction of selection logging along with fire control no longer opened up stands sufficiently to favor the establishment of shade-intolerant seral species. Additionally, the fire functions of duff reduction for site preparation and continual culling of the more fire-sensitive climax species were eliminated. The result has been a massive conversion to a condition of overstocked Douglas-fir understories. The seral species' overstories diminished as successive stand entries continue.

Armillaria and laminated root disease (*Phellinus weirii*), which formerly were endemic, have exploded in the presence of their preferred host, Douglas-fir. Bark beetles in epidemic proportions are serious pests related to overstocked conditions, while mistletoe has spread under multi-canopy conditions.

Figure 2.b.12. This clearing, located in the Okanogan Highlands, provides a typical example of the Douglas fir zone. The clearing itself is the result of natural processes reopening the canopy in the aftermath of a root rot infestation. (Source: Eli Loftis, Okanogan CD, 2023)

Grand Fir:

The grand fir (*Abies grandis*) zone has the greatest diversity of tree and understory plant species. Tree species include grand fir, Douglas-fir, western larch, ponderosa pine, lodgepole pine, Engelmann spruce *(Picea engelmannii*), western redcedar (*Thuja plicata*), Sitka alder (*Alnus alnobetula*), and quaking aspen. Lands in this condition provide deer and elk summer range, hiding, and thermal cover. These stands are located on soils moister than those occupied by Douglas-fir, sometimes occupying favorable aspects or sheltered positions in a complex matrix within the Douglas-fir zone. The natural fire frequency within lands classified in the grand fir varies from somewhat longer than the Douglas-fir sites to nearly rotation length in the wettest locations. In most cases, recurring fires precluded the development of thin-barked, shallow-rooted climax grand fir while favoring fire-resistant western larch. Douglas-fir in older age classes also has thick bark and might be classified as moderately fire-resistant. In many cases the natural stands prior to wildfire suppression were nearly indistinguishable from the Douglas-fir zone stands except for a lusher understory vegetation and an increased component of Douglas-fir allowed by the longer fire frequency. Grand fir itself is uncommon in Okanogan, found in the upper Methow Valley along the Cascade Crest and in a disjointed population that occurs along the Okanogan/Ferry county line.

Here, as in the Douglas-fir zone, fire exclusion and selection logging have allowed the development of understories of the most shade-tolerant species (grand fir and Douglas-fir), resulting in chronic overstocking, multi-level stands and large numbers of host trees for a variety of forest pests and diseases. Annosum root rot in grand fir is a serious problem along with various heart rot fungi. *Armillaria* and laminated root rots attack both grand fir and Douglas-fir. Dwarf mistletoe in Douglas-fir and western larch reacts dramatically when closed stands are opened up, and the understories are soon infected in multi-story stands. The spruce budworm (*Choristoneura sp*.) and tussock moth(Lymantriinae sp.) are expected to soon become epidemic, and the combination of all of the above plus the chronic overstocking can be expected to create future bark beetle problems. Fuel buildup and large quantities of ladder fuels, combined with the fire-sensitive grand firs, ensure that any fire in the future will cause serious damage or stand replacement.

Figure 2.b.13. Wildfires in high-elevation forests may burn at a very high intensity as a result of high fuel loading and extended fire return intervals. (Source: Craig Nelson, Okanogan CD, 2003)

Subalpine Fir:

Tree species located on lands within the subalpine fir zones include subalpine fir, Douglas-fir, western larch, subalpine larch (*Larix lyalli*), lodgepole pine, Engelmann spruce, Sitka alder, and quaking aspen. The area provides cover for deer and elk during the summer season, along with forage in disturbed areas. Being at the highest elevations or in the coldest areas, lands in these areas have the lowest fire frequency; the longer period between fires, plus generally favorable climatic conditions, allow for higher fuel accumulations than in most forest areas of the county. When they occurred, fires were more likely to be catastrophic in nature and resulted in stand replacement with seral, fire-related lodgepole pine or lodgepole pine-western larch mixtures. In some areas, even-aged fire-resistant old-growth western larch stands developed.

Fire suppression and selection logging have allowed many old-growth western larch stands to develop understories of shade-tolerant subalpine fir, Engelmann spruce, or Douglas-fir, with each successive selection harvest decreasing the amount of western larch remaining in the overstory. *Armillaria*, laminated, and annosum root rots are damaging the shade-tolerant species. Douglas-fir and western larch mistletoe infections have become serious in the partially harvested overstories, and understories are becoming infected. Spruce budworm and tussock moth are now present in the host species (Douglas-fir and subalpine fir) and are expected to cause significant future losses.

Lodgepole stands have not, for the most part, been selectively logged but, for many years, were bypassed because of low product values. This has resulted in a large inventory of lodgepole at or near rotation age, most of which are in an overstocked condition. Mountain pine beetle activity is increasing and will continue for many years into the future. Lodgepole mistletoe, while present, is usually not serious due to the extensive even-aged structures and younger age of the stands.

Figure 2.b.14. High-elevation forests contain a high diversity of conifer species and support many of the climate change-sensitive species of plants and animals found in Okanogan County.
(Source: Eli Loftis, Okanogan CD, 2023)

Categories of Fire Behavior

Weather, topography, and fuels influence fire behavior, and fire behavior, in turn, influences the tactical options available for wildland firefighters and the risks posed to lives and property. There are three general categories of fire behavior described throughout this CWPP: surface fire, passive crown fire, and active crown fire.

- **Surface fire –** Fire that burns fuels on the ground, which include dead branches, leaves, and low vegetation. Surface fires can be addressed with a direct attack using hand crews when flame lengths are less than four feet and with equipment when flame lengths are less than eight feet. Surface fires can emit significant radiant heat, which can ignite nearby vegetation and homes.
- **Passive crown fire –** Fire that arises when a surface fire ignites the crowns of trees or groups of trees (aka, torching). Torching trees reinforces the rate of spread, but passive crown fires travel along with surface fires. Firefighters can sometimes address passive crown fires with indirect attack, such as dropping water or retardant out of aircraft or digging fireline at a safe distance from the flaming front. The likelihood of passive crown fire increases when trees have low limbs and when smaller trees and shrubs grow below tall trees and act as ladder fuels. Radiant heat and ember production from passive crown fires can threaten homes during wildfires.
- **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. Crown fires are very difficult to contain, even with the use of aircraft-dropping fire retardant, due to long flame lengths and tremendous release of radiant energy. The likelihood of active crown fires increases when trees have interlocking canopies. Radiant heat and ember production from active crown fires can threaten homes during wildfires.

Passive and active crown fires can result in short- and long-range ember production that can create spot fires and ignite homes. 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. Crown fires are generally undesirable in the WUI because of the risk to lives and property; however, passive and active crown fires are part of the natural fire regime for some forest types and result in habitat for plant and animal species that require recently disturbed conditions (Keane et al. 2008; Pausas and Parr 2018). Historically, passive and active crown fires occurred in some lodgepole pine forests and higher-elevation ponderosa pine and mixed-conifer forests on north-facing slopes (Addington et al. 2018; Romme 1982).

Figure 2.b.15. Crown fires can leave behind large areas of standing dead timber that can be a safety hazard, but also provide habitat for early successional species in the years after a fire. (Source: Natalie Osowski, Grays Harbor CD, 2018)

3. Risk & Preparedness

3.a. Wildland Urban Interface

Wildland Urban Interface (WUI)

The WUI is an area where the built environment meets wildfire-prone areas – where wildland fire can move between natural vegetation and the built environment and negatively impact the community (Forge 2018; Paveglio et al. 2015). People who live and work in the WUI must be aware of the effect that ecosystem processes and disturbances, such as wildland fire, have on their lives.

The WUI exists along a continuum of wildland to urban densities (figure 2.c.1). Wildland-urban intermix refers to areas where housing and wildland vegetation intermingle, while WUI refers to areas where housing is in the vicinity of a large area of dense wildland vegetation (Martinuzzi et al. 2015). The WUI encompasses not only the interface (areas immediately adjacent to urban development) but also the surrounding vegetation and topography. The WUI is not necessarily geographically continuous and hosts diverse sets of human communities interwoven together on the landscape (Paveglio et al. 2016). The WUI is not simply a delineation of human population densities relative to fuel source abundance but also reflects numerous social, political, and economic characteristics of a landscape, fostering unique local conceptions, capacities, and other challenges that need to be considered when working toward greater wildfire resiliency (Carroll et al. 2004; Paveglio et al. 2009).

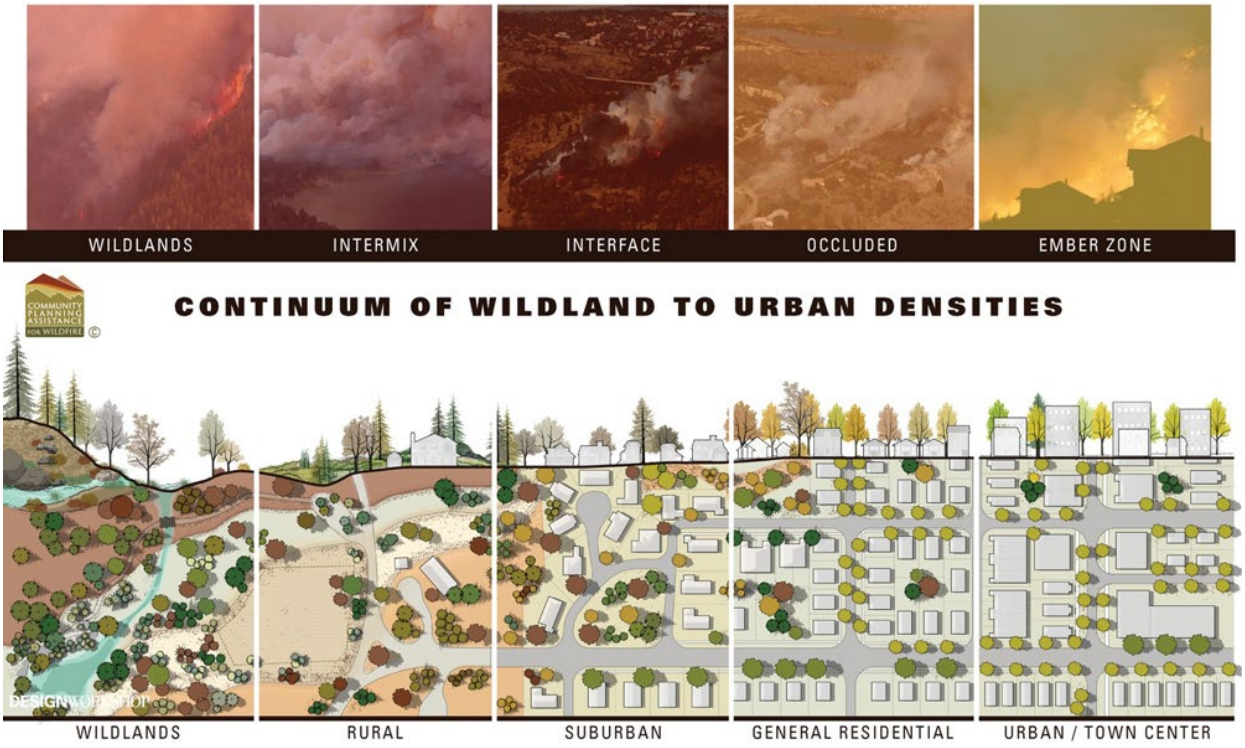


Figure 3.a.1. The WUI exists along a continuum of wildland to urban densities.
(Source: Community Planning Assistance for Wildfire, nd)

According to the 2020 Wildfire Risk to Communities analysis produced by the USFS, Okanogan County is at a higher risk of negative wildfire impacts than 98.6% of other counties in Washington

(USFS 2021). Okanogan is among the most rural counties in Washington, with homes, businesses, and infrastructure intermixed with wildland vegetation and agricultural lands that are at high risk of ignition under particular conditions.

A key component in meeting the underlying need for the protection of people and structures is protecting and treating hazards in the WUI. Reducing the hazard in the WUI requires the efforts of federal, state, and local agencies and private individuals (Norton 2002). "The role of [most] federal agencies in the WUI includes wildland firefighting, hazard fuels reduction, cooperative prevention and education, and technical experience. Structural fire protection [during a wildfire] in the WUI is [largely] the responsibility of Tribal, state, and local governments" (Glickman and Babbit 1995).

Figure 3.a.2. Fires in agricultural areas have high potential for spreading fire into more developed areas. (Source: Elsa Bowen, Lincoln County CD, 2017)

The role of the federal agencies in Okanogan County is and will be much more limited. Property owners share a responsibility to protect their residences and businesses and minimize the danger by creating defensible areas around them and taking other measures to minimize the risks to their structures (Glickman and Babbit 1995).

Treatments within the WUI can assist in creating defensible spaces and facilitate easier access and maneuverability for firefighters. In addition, a WUI that is properly treated will be less likely to sustain a crown fire that enters or originates within it (Norton 2002).

HFRA clearly states that the location of the WUI is determined by the county or reservation when a formal and adopted CWPP is in place. It further states that federal agencies are obligated to use this WUI designation for all purposes of HFRA.

The WUI Boundary for Okanogan County:

Strategic wildfire mitigation efforts across the WUI can increase the safety of residents and wildland firefighters and can reduce the chances of home loss. While a formal WUI map currently exists and is used by federal agencies, the CWPP planning committee created an additional WUI map for CWPP planning purposes. After evaluating a variety of different approaches to determine the WUI boundary for Okanogan County, the selected approach was adopted, and it is hoped that this WUI map will serve as a future planning tool for the county, local fire districts, and other entities.

For the purpose of this CWPP, the WUI boundary includes lands within approximately 3 miles of any addressed structure or other critical infrastructure. This boundary is considered the Extended WUI (figure 3.a.3 on page 52). Portions of the boundary in the Extended WUI were slightly altered to follow Potential Operational Delineations (PODs) in applicable locations. Also included in this CWPP is a Core WUI (figure 3.a.4. on page 52), which encompasses additional lands within 1 mile of a structure.

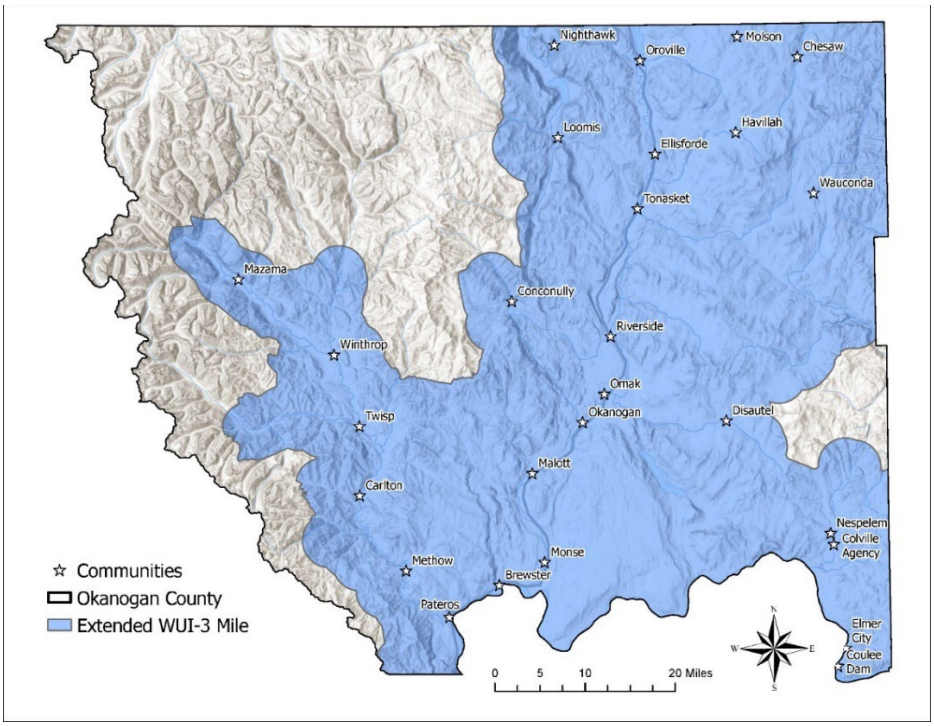


Figure 3.a.3. Extended Wildland Urban Interface (WUI) as defined by this CWPP. This boundary was determined by placing a 3-mile buffer around any addressed structure. (Source: Okanogan CD, 2024)

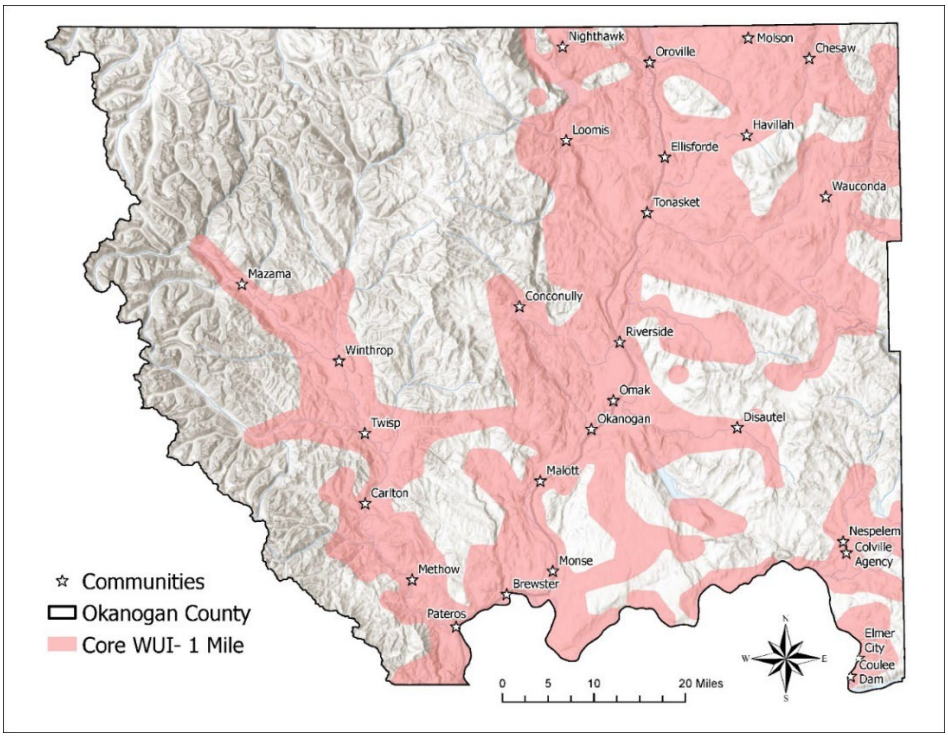


Figure 3.a.4. Core Wildland Urban Interface (WUI) as defined by this CWPP. This boundary was determined by placing a 1-mile buffer around any addressed structure. (Source: Okanogan CD, 2024)

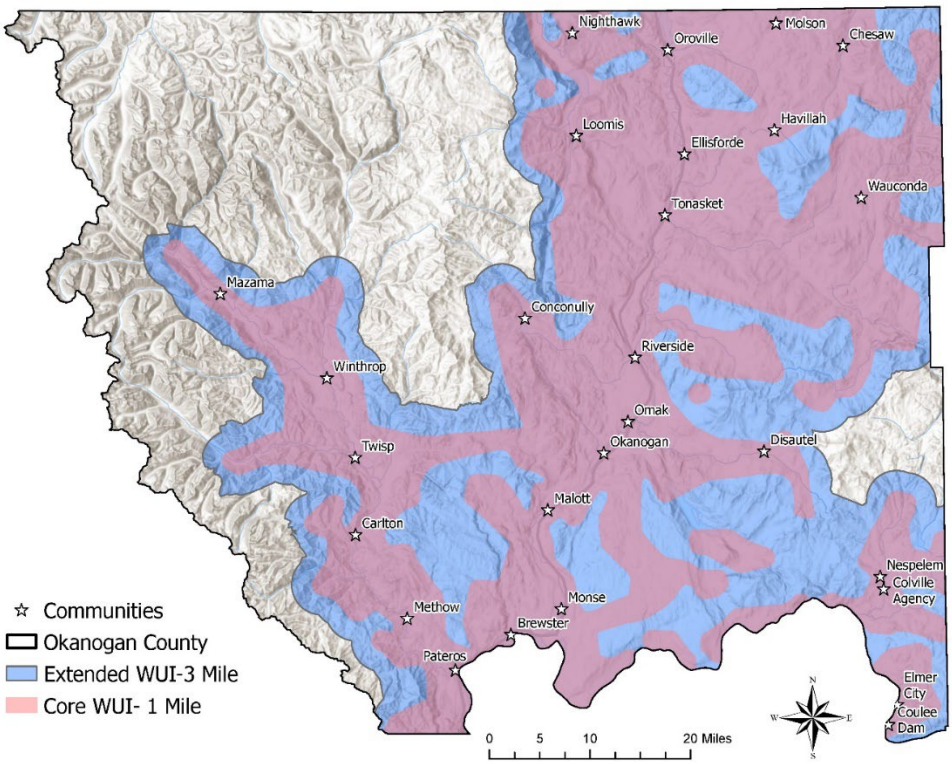


Figure 3.a.5. This map combines the two figures above to show the Core and Extended Wildland Urban Interface (WUI) as defined by this CWPP. (Source: Okanogan CD, 2024)

It should not be assumed that just because an area is identified as being within the WUI, it will, therefore, receive treatments because of this identification alone. Nor should it be implicit that all WUI treatments will be the application of the same prescription. Instead, each location targeted for treatments must be evaluated on its own merits: factors of structural ignitability, access, resistance to control, population density, resources and capabilities of firefighting personnel, and other site-specific factors.

It should also not be assumed that WUI designation on national or state lands automatically equates to a treatment area. The federal and state agencies are still obligated to manage lands under their control according to the standards and guides listed in their respective land management plans and in compliance with relevant state and federal laws, including the National Environmental Policy Act. Their adopted management plans have legal precedence over the WUI designation until these plans are revised to reflect updated priorities.

Most treatments on private lands may begin with a home risk evaluation, also known as a home ignition zone (HIZ) assessment, provided by Okanogan CD, WA DNR, OCLTRG, another entity, and addressing implicit factors of structural ignitability such as roofing, siding, deck materials, and vegetation within the treatment area of the structure. However, treatments in the low population areas of rural lands may look closely at access (two ways in and out) and communications through means other than land-based telephones. On the other hand, a subdivision with densely packed homes surrounded by forests and dense underbrush may receive more time and effort implementing fuels treatments beyond the immediate home site to reduce the probability of a crown fire entering the subdivision.

Wildfires in Suburban/Urban Areas

Increasingly, wildfire originates from and/or spreads through towns and cities where development is much more concentrated, as was seen in the Carlton Complex and other recent fires in Washington, such as those impacting Malden and Pine City in Whitman County in 2020. Thirty-eight percent (38%) of Okanogan County residents live in incorporated towns and cities. Development in municipalities can range from relatively large single-family or commercial/industrial properties towards the outer perimeter to much more concentrated residential and commercial uses towards the core. Once fire ignites in this setting, it can spread quickly in a way that affects a greater number of people and amplifies the intensity of response needed to address public safety and loss of property. Nine Okanogan County communities are ranked within the top 35 communities in Washington State for community wildfire exposure, and four (Riverside, Winthrop, Twisp, and Malott) rank in the top 10 communities in the state for burn probability, per the WA DNR (Scott et al. 2018; Torgerson et al. 2019).

Community Exposure Ranking	Community	Number of Housing Units Exposed to Wildfire	Burn Probability Ranking
8	Tonasket	2343	28
10	Omak	4065	65
11	Twisp	1364	7
14	Okanogan	1947	32
17	Winthrop	1095	6
19	Brewster	1973	41
24	Malott	830	8
29	Riverside	638	2
35	Oroville	2317	84

Table 3.a.1. Nine Okanogan County communities are ranked within the top 35 communities in Washington State for community wildfire exposure, and four (Riverside, Winthrop, Twisp, and Malott) rank in the top 10 communities in the state for burn probability, per the WA DNR. (Source: Scott et al. 2018; Torgerson et al. 2019)

As with the WUI, the built environment can contribute to the level of risk a community faces during a wildfire event. Compared with the WUI, the density of structures is much higher, and the vegetation is likely to vary considerably from pockets of natural, relatively undisturbed vegetation to deliberate landscaping with a range of species, some of which are highly flammable. Municipalities will have water, sewer, and electric utilities that may be disrupted during a wildfire, resulting in a cascading public emergency.

Although cities and towns are more likely to have infrastructure in place to aid in fighting fire and evacuating residents, existing development regulations may not adequately address the growing wildfire risks to the community. Municipal entities will need to address this area as soon as possible.

3.b. Wildfire Risk, Treatment History, and Mitigation Activities

Wildfire Hazards

Wildfires have been a natural force on landscapes across western North America for thousands of years (Pyne 2015; Loftis et al. 2024; Crist et al. 2024). A dominant agent of disturbance and successional change, with the frequency, intensity, and physical scale of fire impacting the compositions of plant and animal communities, frequent fire return intervals reduced the overall impact that individual fires had on the landscape (Agee 1993; Monsanto and Agee 2008; Merschel et al. 2021; Loftis et al. 2024). The routine return of fire on the landscape in these areas led to the development of plant communities that were adapted to regular exposure to flames and high temperatures, leading to the prevalence of species, communities, and ecosystems that were resilient to wildfire (Agee 1993; Hessburg and Agee 2003). In areas with naturally infrequent fire return internals, such as high-elevation forests or localized stands or pockets of forest at lower elevations with wetter conditions, plant species frequently lack the natural resilience to wildfire observed in species found in areas where fire was a common occurrence (Agee 1993; Hessburg & Agee 2003; Crist et al. 2024).

Historically, fires originating from lightning strikes in the summer were the primary source of ignition before European-American settlement, which began in the 19th century (Pyne 2015; Loftis et al. 2024). Additionally, many of the region's Indigenous peoples utilized fire as a management tool, using periodic applications of fire since time immemorial to maintain favorable conditions for game, culturally significant plants, and other resources (Boyd 1999; Storm and Shebitz 2006). Whatever the origin of ignition, fire played an essential role in the majority of the ecosystems of Okanogan County until the early 20th century, when the complete elimination of fire on the landscape through fire suppression became the primary management strategy utilized by state and federal authorities (Loftis et al. 2024). This shift led to the disruption of fire's natural role on the landscape. When fires did ignite, more frequently due to unintentional human action, the intensity and scale of the burns began to precipitously increase in the 1980s across the western United States, a trend that persists to the present (Pyne 2015; Westerling 2016; Haugo et al. 2009). As the decades passed, the absence of fire, compounded by other factors, including invasive plants, led to a higher accumulation of fuels and an overall decline in forest health (Hessburg and Agee 2003; Monsanto and Agee 2008; Smith 2023). With average temperature increase of 0.8°C (1.4°F) across Washington and western North America and reduced snowpack, the impacts of anthropogenic climate change further exacerbate the challenges of managing wildfire on a drying landscape (Haugo et al. 2009; Ryan et al. 2013; Marlier et al. 2017; Halofsky et al. 2018).

The severity of a fire season can usually be determined in the spring by how much precipitation is received, which, in turn, determines how much fine fuel growth there is and how long it takes this growth to cure. Combined with annual wind events in late summer, these factors drastically increase the chance that a fire start will grow and resist suppression activities. Furthermore, harvest is also occurring at this time. Occasionally, harvesting equipment causes an ignition that can spread into populated areas and timberlands.

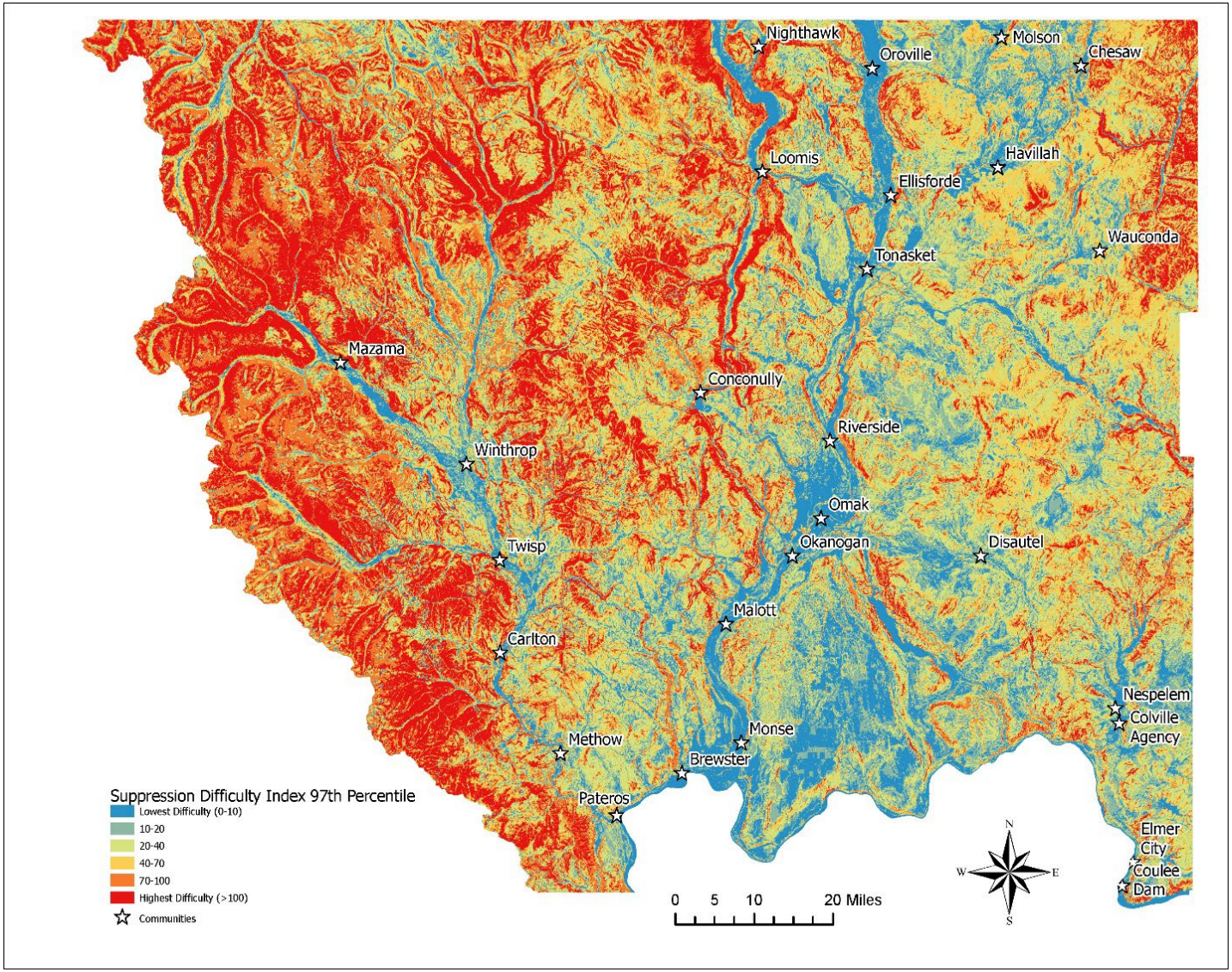


Figure 3.b.1. This map shows the suppression difficulty of a wildfire during extreme weather conditions. These conditions are modeled to be in the 97th percentile of conditions. Okanogan County has seen a significant expansion of housing units and other structures in or adjacent to high-difficulty areas. (Source: Risk Management Assistance Dashboard, 2023)

Wildfire Ignition and Extent Profile

The WA DNR maintains detailed records of wildfire ignitions, with data for major incidents available from 1973 onward (the earliest dated data point from Okanogan County is from 1985) and data for all ignitions the agency has responded to in Okanogan County available going back to 2008. Using data about these past fire events, general trends in wildfire occurrence in Okanogan County have been evaluated.

According to the WA DNR's major incidents data set, Okanogan County experienced 183 major fires between 1985 and 2023. These incidents range in size from less than an acre to the largest wildfires in Washington State's history. Included are fires for which the cause is unknown or currently under investigation. Data shows that the most frequent ignition source for major wildfires in Okanogan County is lightning strikes followed by humans (excluding arson, debris burning, etc.).

Cause	Number of Ignitions	Percent	Acres Burned	Percent
Debris Burning	1	0.55%	1,744.03	0.07%
Structure	1	0.55%	1,350.33	0.05%
Electric Fence	1	0.55%	1,097.64	0.04%
Equipment Use	2	1.09%	12,832.72	0.52%
Under Investigation	2	1.09%	208,046.72	8.44%
Arson	6	3.28%	60,395.00	2.45%
Natural (Non-Lightning)	12	6.56%	187,313.10	7.60%
Misc.	13	7.10%	23,457.30	0.95%
Human	28	15.30%	345,077.20	14.00%
Lightning	37	20.22%	716,701.80	29.08%
Undetermined/Unknown	80	43.72%	906,286.80	36.78%
Total	183	100.00%	2,464,302.64	100.00%

Table 3.b.1. Lightning is the most frequent cause of major fires in Okanogan County. (Source: WA DNR, 2024)

According to records from WA DNR's wildfire response statistics, between 2008 and May 2024, the agency responded to 3,202 separate incidents in Okanogan County. Roughly 50% of those fires were naturally occurring, which is the designation utilized for lightning and other naturally occurring ignition sources. 685,590 acres were burned by naturally occurring fires in the 16-year period covered by the data. 28% of the ignitions do not have a listed cause. In most cases, this is likely the result of WA DNR personnel responding to incidents that were outside of their direct jurisdiction, and as such, the agency was not the responsible party for conducting the investigation or, at the time of this report, an investigation was still underway for a particular incident (table 3.b.3.).

Cause	Number of Ignitions	Percent	Acres Burned	Percent
Railroad	1	0.03%	0.10	<0.01%
Children	5	0.16%	30.62	<0.01%
Firearms	8	0.25%	293.81	0.02%
Smoking	10	0.31%	19.36	<0.01%
Arson	13	0.41%	140,357.85	10.32%
Fireworks	13	0.41%	14.67	<0.01%
Power Generation	61	1.91%	12,451.68	0.92%
Unrecorded	68	2.12%	680.69	0.05%
Vehicle/Equipment	108	3.37%	91,858.47	6.75%
Campfires	118	3.69%	175.80	0.01%
Misc.	219	6.84%	38,026.71	2.80%
Debris Burning	325	10.15%	3,724.27	0.27%
Natural	792	24.73%	685,590.67	50.39%
Undetermined	1461	45.63%	387,241.08	28.46%
Total	**3202**	**100.00%**	**1,360,465.78**	**100.00%**

Table 3.b.2. Nearly 25% of the wildfires in Okanogan County are naturally occurring. (Source: WA DNR, 2024)

Nationally, the extent of wildfire acres burned, and the expenditure allocated for suppression efforts by federal and state authorities have increased. The National Interagency Fire Center (NIFC) maintains records of fire costs, extent, and related data for the entire nation. According to the data, total fires and the number of acres burned are trending upward. These trends are likely to continue into the future unless targeted fire mitigation efforts are implemented and maintained.

Year	Fires	10 Year Average ending with indicated year (Fires)	Acres	10 Year Average ending with indicated year (Acres)
2023	56,580	60,941	2,693,910	6,775,211
2022	68,988	61,958	7,577,183	7,378,150
2021	58,985	62,425	7,125,643	7,481,257
2020	58,950	63,606	10,122,336	7,144,628
2019	50,477	65,410	4,664,364	6,762,760
2018	58,083	68,001	8,767,492	6,819,860
2017	71,499	70,512	10,026,086	6,870,820
2016	67,743	72,774	5,509,995	6,856,971
2015	68,151	72,684	10,125,149	7,146,006
2014	63,312	72,440	3,595,613	6,961,709
2013	47,579	72,469	4,319,546	6,994,912
2012	67,774		9,326,238	
2011	74,126		8,711,367	
2010	71,971		3,422,724	
2009	78,792		5,921,786	
2008	78,979		5,292,468	
2007	85,705		9,328,045	
2006	96,385		9,873,745	
2005	66,753		8,689,389	
2004	65,461		8,097,880	
2003	63,629		3,960,842	

Table 3.b.3. National averages of wildfire burned acreage. (Source: NIFC, 2024)

At the state level, WA DNR's suppression budget has dramatically increased between 2012 and the present day. While variable depending on the fire season's intensity, the agency has experienced a significant increase in the number of incidents it responds to in a given, and the intensity of those incidents has required a robust expansion of suppression resources (Loftis et al. 2024).

Fiscal Year	Total Funds
FY 2012	$13,232,000
FY 2013	$47,123,000
FY 2014	$30,904,000
FY 2015	$89,063,000
FY 2016	$146,486,000
FY 2017	$52,038,000
FY 2018	$94,597,000
FY 2019	$113,532,000
FY 2020	$56,719,000
FY 2021	$97,325,000
FY 2022	$174,482,000

Table 3.b.4. WA DNR fire operation budgets between FY 2012 and FY 2022. (Source: WA DNR, 2024)

Fire Return Intervals and Historic Fire Regimes

Figure 3.b.2. "Severely burned ponderosa pine about 40 years old in small draw. A few quaking aspen and serviceberry bushes present." (Source: R. Medrod, USDA-Soil Conservation Service, 1970)

Prior to European-American contact and settlement, fire was, at least in some areas, a near-constant force on the landscape in Okanogan County since the end of the last ice age (Agee 1993; Raymond and McKenzie 2012; Walsh et al. 2018). Variability in fire regimes is an indicator of the sustainability of an ecosystem, which necessitates understanding the nature of historic fires on the landscape in order to plan and recover for future fires. The frequency and severity of fires has been, and continues to be, a powerful force dictating the character of the ecological and human communities of Okanogan County. Land managers need to understand historical fire regimes, the fire return interval (frequency), and fire severity prior to settlement by Euro-Americans to be able 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. Historic fire return intervals ranged wildly depending on multiple factors, particularly elevation, with low-lying areas seeing return intervals of as brief as 6-9 years and high elevations intervals of several decades or centuries (Schellhaas et al. 2001; Walsh et al. 2018).

Regime Group	Fire Return Interval	Fire Severity	Acres of County
Group I	0-35 Years	Low/Mixed Severity	1,238,679
Group II	0-35 Years	Stand Replacement Severity	97,835
Group III	35-100+ Years	Mixed Severity	873,232
Group IV	35-100+ Years	Stand Replacement Severity	761,385
Group V	200+ Years	Stand Replacement Severity	332,304

Table 3.b.5. This table shows the historic fire regime and return interval for Okanogan County and the respective acreage for each group. (Source: Landfire, 2014)

Many ecological assessments are enhanced by the characterization of the historical range of variability, which helps managers understand:

(1) how the driving ecosystem processes vary from site to site

(2) how these processes affected ecosystems in the past

(3) how these processes might affect the ecosystems of today and the future

Historical fire regimes are a critical component for characterizing the historical range of variability in fire-adapted ecosystems. Furthermore, understanding ecosystem departures provides the necessary context for managing sustainable ecosystems. Land managers need to understand how ecosystem processes and functions have changed prior to developing strategies to maintain or restore sustainable systems. In addition, the concept of departure is a key factor for assessing risks to ecosystem components. For example, the departure from historical fire regimes may serve as a useful proxy for the potential of severe fire effects from an ecological perspective.

Figure 3.b.3. The Frazer Crossing Fire in August 2024 reburned an area burned in the 2014 Carlton Complex Fire, similar to historic fire return intervals. (Source: Eli Loftis, Okanogan CD, 2024)

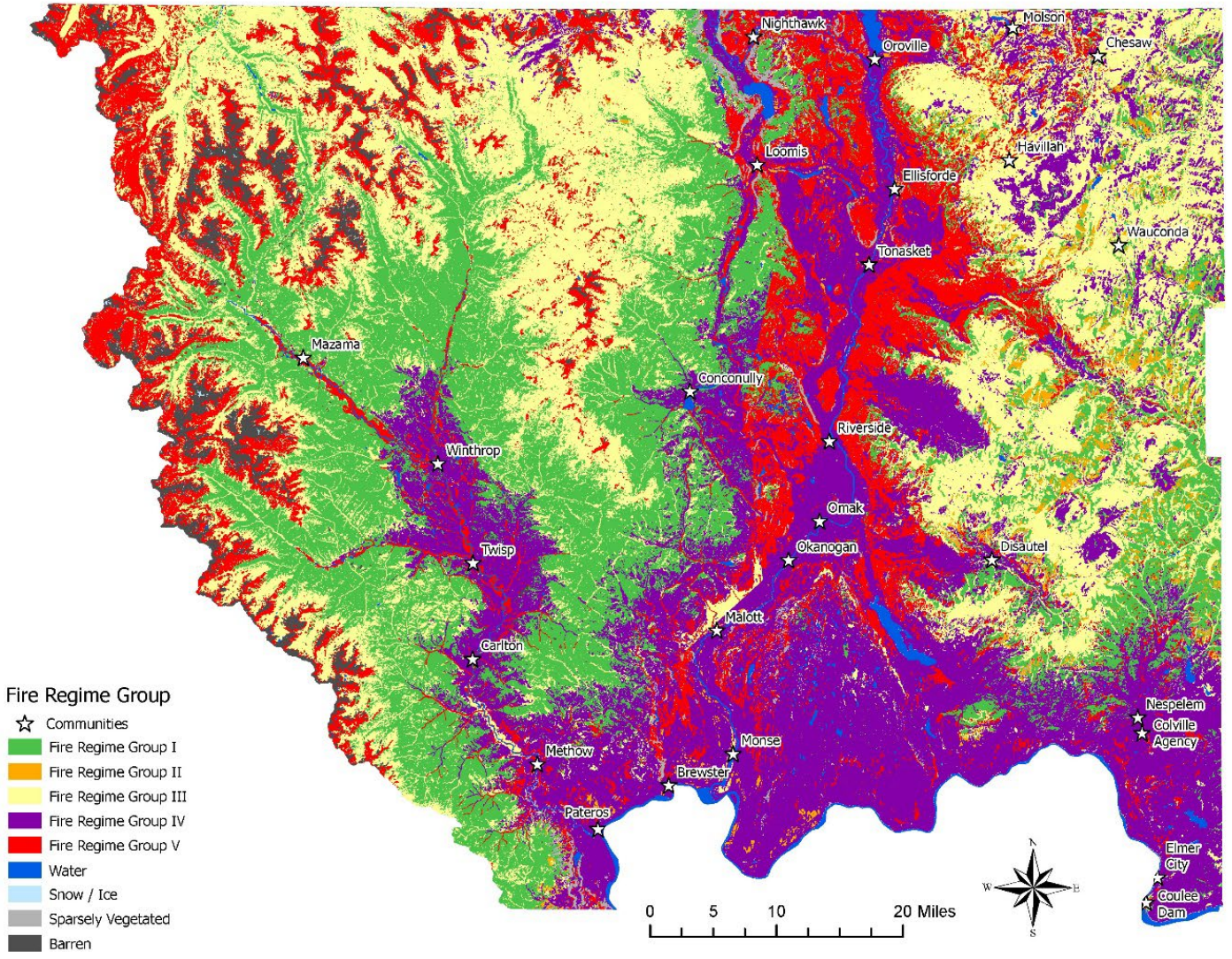


Figure 3.b.4. Fire Regime Groups across Okanogan County.
(Source: Landfire, 2014)

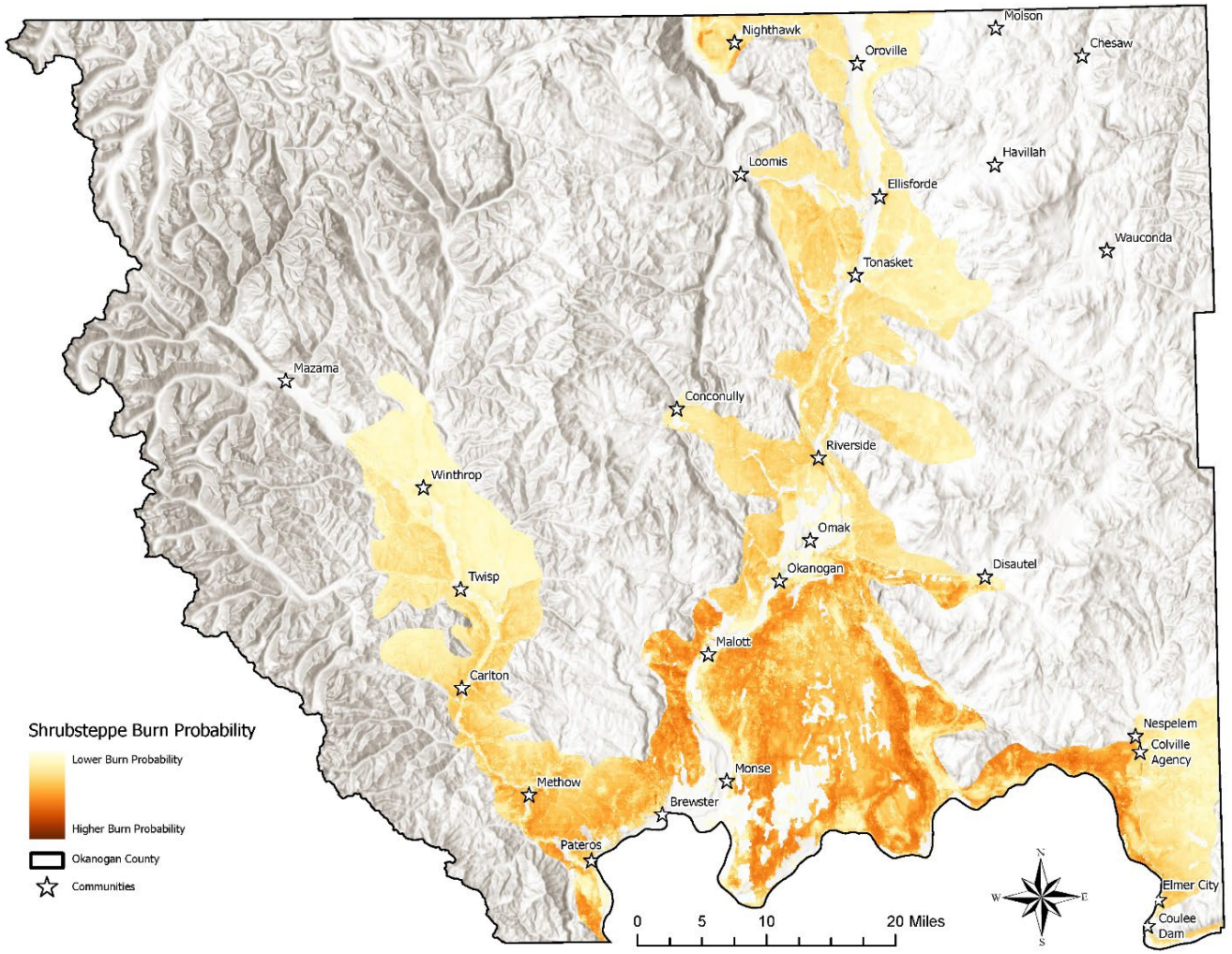


Figure 3.b.5. Burn probability of the shrubsteppe across Okanogan County. (Source: WDFW, 2024)

Timbered Fuel Types: Impacts on Suppression and Treatment

Timbered fuel types in Okanogan County can generally be characterized as falling into one of three categories:

The first category found at lower elevations just above the shrubsteppe or agriculture-dominated valley bottoms and at moderate elevations on south-facing slopes can best be described as open stands predominantly dominated by ponderosa pine with some Douglas-fir mixed in. These stands range in condition from being within the historical range of variability to being highly departed, dependent on whether the stand has seen recent wildfire or fuel treatment such as thinning combined with prescribed fire. The more highly departed stands falling into this category often burn with a moderate to high rate of spread and can be difficult to suppress due to the general openness of the stand allowing exposure to wind, the general dryness of these sites as compared to stands supporting more mixed conifers, the understory often being composed of grass and shrubs, the development of ladder fuels as the stands become more departed, and the highly flammable nature of the surface fuels composed of fluffy ponderosa pine litter and down woody material. In stands that are less departed, the open nature of the stand combined with low fuel loading and a relative lack of ladder fuels due to a relatively frequent fire return interval leads to low to moderate-intensity wildfire. This can provide good fire suppression opportunities for personnel and equipment.

The second category is generally found on north-facing slopes, in riparian drainages, and at higher elevations and is composed of various mixtures of coniferous tree species, usually including ponderosa pine, Douglas-fir, western larch, Engelman spruce, and lodgepole pine. These stands also range in condition from recently treated with thinning and or prescribed fire or having seen a recent wildfire to highly departed thick, decadent stands full of ladder fuels and deadfall and suffering forest health-related issues due to insect and disease outbreaks. Wildfire generally moves with a low to moderate rate of spread in these fuel types due to a combination of being cooler and more humid at higher elevations/on north slopes, increased shade and decreased wind from a more closed canopy, and the more compact nature of the surface fuels and duff composed of short needle conifer litter. However, wildfires in this fuel type can burn with high intensity and prove difficult to suppress, especially under unusually dry conditions. Abundant ladder fuels and a more closed canopy can lead to torching and abundant spot fires or crown fire under severe conditions. A dense stand and an abundance of large down logs and snags can make access for firefighters and equipment difficult. Heavy loading of dead and down material and frequent spotting significantly increases the amount of effort it takes to put out fire in the more departed stands of this type.

The third category can be considered logging slash and is found in recently treated logging units that may have not yet been treated either by piling and pile burning or broadcast burning, in historical logging units where the slash may not have been treated appropriately or in areas naturally high in blowdown and deadfall. Wildfire generally moves with a low to moderate rate of spread in these areas but can burn with extreme intensity under dry conditions. The suppression difficulty of slash fires is often very high and may require significant heavy equipment, manpower, and water to effectively suppress.

Thinning

Thinning is a popular method of forest management on federal, state, and private lands as a means for fuels reduction and improving overall forest health. Thinning is the selective cutting of trees to meet a certain management goal. These management goals can include fuels reduction/wildfire resiliency, promote tree growth and vigor, promote species diversity, and improve overall stand health.

Small tree thinning includes thinning that is not implemented for commercial purposes. Precommercial thinning is the practice of removing dead/dying, undesirable, or smaller, non-merchantable trees from a stand that may one day be harvested. Commercial thinning/harvest is the practice of cutting trees that are considered merchantable. All of these forms of thinning can have positive impacts on wildfire resiliency.

Thinning can either be completed by hand or through mechanized equipment. Hand thinning is typically done at a smaller scale and involves smaller-size material. Mechanical thinning is typically done on larger scales and can handle larger trees. Mechanical thinning entails more ground disturbance than thinning done by hand.

Thinning is often times done alongside other land management activities such as prescribed fire and pile burning, mastication and chipping, pruning, and ground fuel reduction.

Mastication is a type of fuel treatment that utilizes machinery to grind or shred fuels. Mastication does not reduce the amount of fuel on a landscape; instead, it alters the size and arrangement to allow for quicker decomposition. Mastication is typically used on non-commercial vegetation and dead ground fuels.

Figure 3.b.6. Thinning by the residents of the Pine Forest POA in the Methow Valley has significantly improved forest health and reduced fire risk in the community. This piling operation assists in slash disposal. Pine Forest is primary example of the value of community led fuels reductions and forest health improvements in Okanogan County. (Source: Eli Loftis, Okanogan CD, 2023)

Pile burning is simply the piling of slash resulting from logging, thinning, or other fuel management activities into manageable piles that are subsequently burned during safe and approved burning conditions. Piling is done by hand or with appropriate equipment (NWCG, 2018b).

Prescribed Fire

As a land management tool, prescribed burning is the planned application of fire to predetermined areas under prescribed conditions where fire intensity and spread are controlled to meet specific objectives.

Objectives may include:

1) fuels reduction,
2) ecosystem maintenance or restoration,
3) fire regime and condition restoration,
4) releasing nutrients tied up in dead vegetation,
5) maintaining grasslands,
6) increasing infiltration of precipitation,
7) reduce numbers of certain sized or species of trees,
8) reinvigorate certain trees and shrubs,
9) improve wildlife habitat,
10) reduce plant use of water and increase surface and groundwater

The History of Fire as a Management Tool

Fire used as a land management tool has existed for millennia. Indigenous peoples used fire to maintain food plants, medicinal plants, plants used for tools and basketry, conditions attractive to game animals for easier hunting, keeping the landscape more open, reducing ticks and other parasites, and reducing fuels to maintain an environment less prone to catastrophic wildfires. In addition to historic Indigenous burning, early European-American settlers utilized burning to clear areas for crops and livestock grazing. Many land managers, in particular cattlemen, saw the benefits of periodic fires on rangelands to increase grass vigor and maintain grasslands by reducing brush abundance and encroaching trees.

Figure 3.b.7. Early manged use of fire by land management agencies in 1964 on Cook Mt. (Source: USDA-NRCS, 1964)

The logging industry has used fire to reduce accumulated slash and "prep" sites for planting trees and naturally stimulate tree regeneration. Historically, in general, fire was portrayed and echoed by the public as an evil, and wildfires that occurred on the landscape destroyed everything; thus, great expense and considerable effort were used to exclude fire from the landscape.

Since the early 1900s, efforts to exclude fire from the landscape have been a primary policy of many private entities and county, State, and Federal governments. Whilst this aggressive regime of fire suppression did accomplish the desired goal of the time, to remove fire as a force on the landscape, ensuring adequate timber resources, the unintended biophysical and structural consequences of removing fire from the landscape have become self-evident in the more than a century since fire exclusion began.

Fuel accumulations, the expansion of homes and infrastructure into the WUI, and climate change have fostered dramatically unhealthy and hazardous conditions across North America's landscapes, including Okanogan County. The necessity of wildfire as a natural force on the landscape and fire as a management tool, something long recognized by Native Americans and, to a certain degree, by European-American settlers, has led to the slow adoption of prescribed burning, intentional use of fire to manage fuels and forest health, in the last several decades in response to a more sophisticated understanding of wildfire and forest science and the realities of management on the ground.

Even though many individuals recognized the benefits of fire and advocated for its use before the fire exclusion policy was fully implemented in the early 20th century, the policy dominated. However, the general population began to recognize the values and benefits of fire, at least prescribed fire, in the late 2000s and early 2010s. As of today, the need for fire use and prescribed fire as a land management tool is becoming more accepted by a majority of the public.

The State of Prescribed Fire in Washington

In Washington State, Federal Agencies, i.e., the USDA Forest Service (USFS), USDI (Department of the Interior) BLM, and USDI National Park Service (NPS), have consistently had prescribed fire programs for many years but were hampered by general public acceptance and various regulations regarding prescribed burning and smoke. Unlike elsewhere in the United States, the USDA Natural Resource Conservation Service (NRCS) in Washington State has not had involvement in prescribed fire since the early 1990s; however, they are beginning to move closer to re-engaging in prescribed fire support.

Two state agencies have engaged in prescribed fires with prescribed fire programs. The WA DNR historically used prescribed fire for "site prep" before replanting, but not much for forest health until recently, i.e., in 2019, when a prescribed fire program was created within a Forest Resilience Division. WDFW began prescribed burning in 2011, and by 2016, a prescribed fire program was established and adopted as part of the Lands Division. The Washington State Parks system has engaged in prescribed fire in the form of pile burning, but as of this CWPP update, there is no formal prescribed fire program.

USFS - Tonasket RD (Colville NF) & Methow Valley RD (Okanogan-Wenatchee NF) Utilization

The Tonasket Ranger District (RD) and Methow Valley Ranger District (RD) are dedicated to the planning and implementation of prescribed fire on Forest Service-managed lands here in Okanogan County and across the Nation. Prescribed fire is critical to improving forest health and resiliency and to implementing the Forest Service's Wildfire Crisis Strategy which aims to reduce the amount of catastrophic wildfire on the landscape. The Forest Service continues to prioritize prescribed fire on larger geographic scales across its managed lands, emphasizing those determined to be "priority" landscapes, a category that the Colville and Okanogan-Wenatchee National Forest Fall into.

Tonasket RD is committed to assisting our local land management partners with the planning and implementation of prescribed burns through the sharing of resources and technical expertise. Tonasket's program aspires to demonstrate the values of safety and service by protecting communities from wildfire and restoring the health and resilience of the Nation's forests. The Tonasket District historically burns hundreds to thousands of acres across the district annually. Prescribed fire is used for fuel reduction of harvest or thinning slash, site preparation for planting or natural regeneration of trees, for reduction of hazardous fuel accumulations near the WUI, to

reinforce fuel breaks along features that would be utilized to stop a large wildfire, and for ecological benefit.

It takes a sustained effort to plan, organize, train, and equip personnel to execute prescribed fires efficiently and effectively; however, this work and other fuels management practices will continue to reduce wildfire risk to people's lives and communities and create healthy, resilient forests for the benefit of current and future generations.

Figure 3.b.8. Combined thinning and prescribed fire treatments can potentially modify wildfire behavior. (Source: Dale Swedberg & Justin Haug, WDFW, 2015)

Prescribed Burn Associations: The Future of Public-Private Partnership for Prescribed Fire

The Washington Prescribed Fire Council, launched in 2012, an offshoot of the North Central Washington Prescribed Fire Council established in 2006, is a nonprofit 501(c) 3 organization established to advocate for prescribed fire and policies that will hopefully increase the pace and scale of prescribed fire use. Among its various advocacy efforts, the development of Prescribed Burn Associations (PBAs) expands the use of prescribed fire in Okanogan County, creating an avenue for coordination and collaboration between public land managers and private property owners. PBAs, which have existed in the SE and mid-west US for decades, are now beginning to form in Washington State, Oregon, and California. PBAs are organizations that are comprised of landowners and

interested individuals sharing their resources, knowledge, skills, and abilities to apply prescribed fire to private lands. Federal and State fire organizations must adhere to National Wildfire Coordinating Group (NWCG) standards that are rigorous in qualifications and training required so that these fire resources can be dispatched to large incidents with assurance that all resources are qualified to a single standard. PBAs do not have to meet NWCG standards. However, it does not mean that they will tolerate irresponsible actions before, during, or after prescribed burning. PBAs not requiring NWCG standards for participants create opportunities for individuals to participate that do not have funds and/or time to attend NWCG training. In a structured PBA with close monitoring and cooperation of individuals, and in particular experienced individuals, involved with PBAs, knowledge, skills, and abilities will be developed over time.

Development of PBAs enables private property owners to collaboratively reduce fuel loads by implementing prescribed fire on their lands, in coordination with federal, state, and tribal authorities. PBAs are a means to implement prescribed fires on private lands and to enhance the value of prescribed fires utilized on public lands by easing the process of implementing cross-boundary burns. Partners will work to facilitate and help develop opportunities that invite the public and relevant resources to increase their knowledge and skillsets of prescribed burning and managed wildfires.

Figure 3.b.9 Members of the North Cascades Prescribed Burn Association demonstrate the construction of handlines as part of a Learn and Burn event held in the central Methow Valley in October 2024. (Source: Kara Karboski, Washington Resource Conservation and Development Council, 2024)

Overall Mitigation Activities

There are many specific actions that will help improve safety in a particular 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 Okanogan 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. It is impossible to say just how effective such efforts actually are; however, the low costs associated with posting a few signs are inconsequential compared to the potential cost of fighting a fire.

Figure 3.b.10. The aftermath of the 2015 Okanogan Complex Fire along HWY 20. (Source: Okanogan CD, 2015)

Mitigation Considerations for Land Managers, Fire Districts, Community Members and Businesses

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 Okanogan 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. Residents of Okanogan 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. **See Chapter 5.b for more details on defensible space.**

Evacuation Plans: The development of personal and community evacuation plans is 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, namely the Firewise USA® program offered by the National Fire Protection Association (NFPA), which is implemented in Okanogan County by WA DNR and Okanogan CD. **See Chapter 5.c for more details on evacuation.**

Accessibility: Also of vital importance is the accessibility of the homes to 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's 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. **See Chapter 5.c for more details.**

Fuels Reduction & Rearrangement: Recreational facilities such as campgrounds and boat launches along the Columbia River should be kept clean and maintained. In order to mitigate the risk of an escaped campfire, escape-proof fire rings and barbeque pits should be installed and maintained. Surface fuel accumulations in forests and shrublands can be kept to a minimum by periodically conducting pre-commercial thinning, clearing, pruning, limbing, and prescribed burns. Other actions that would reduce the fire hazard would be creating a fire-resistant buffer along roads and power line corridors and strictly enforcing fire-use regulations.

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 a 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 departments' capacity through funding and equipment acquisition can improve response times and reduce the potential for resource loss.

Other Activities: Other specific mitigation activities are likely to include the improvement of emergency water supplies, access routes, and management of vegetation along roads and power line right-of-ways. 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.

3.c. Okanogan County Risk Assessments

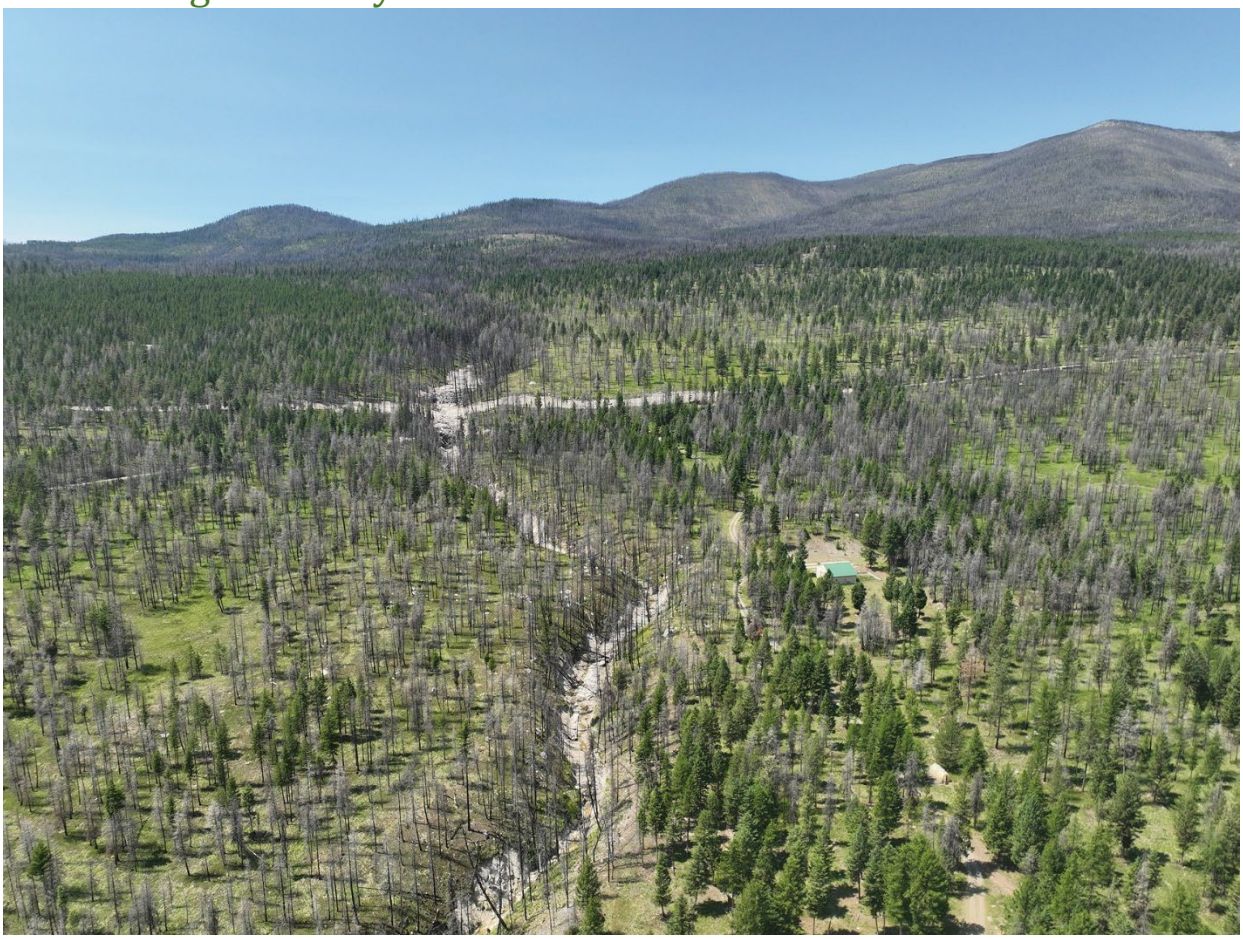


Figure 3.c.1. The 2021 Walker Creek Fire heavily impacted the Bonaparte Creek Watershed in NE Okanogan County. The influence of fuels management and composition on both private and public lands led to a dynamic burn mosaic. Higher fire intensity in upper elevations of the watershed led to repeated and severe post-fire debris flows in the area in the years after the fire. (Source: Mike Baden, WSCC, 2024)

Okanogan Highlands Risk Assessment

Wildfire Potential

The Okanogan Highlands, for the purposes of this plan, are defined as those areas in the county east of the rim of the Okanogan Valley east of HWY 97 to the Okanogan/Ferry county lines and from the northern edge of the Colville Reservation to the Canadian border, are a patchwork of dry Douglas-fir and ponderosa pine forests that, in many areas, have become overstocked, resulting in multistoried conditions with abundant ladder fuels. During pre-settlement times, much of this area was characterized by low-intensity fires due to the relatively light fuel loading, which mostly consisted of small-diameter fuels. Frequent, low-intensity fires generally kept stands open and free of fire-intolerant species, and they maintained seral species such as ponderosa pine and larger diameter fire-resistant Douglas-fir. In some areas, low-intensity fires stimulated shrubs and grasses, maintaining vigorous browse and forage. The shrub layer could either inhibit or contribute to potential fire behavior, depending on weather and live fuel moisture conditions at the time of the burn.

In general, large fires that start in the Okanogan Highlands start high in elevation and move downhill. As fires move down in elevation, they encounter drier and flashier fuels in the lower elevations. Rolling embers and spot fires are common methods of downhill fire spread. Spot fires ignited on slopes trigger uphill runs that throw more spot fires, expanding the downward fire progression. Modifying fuels to reduce the likelihood of torching and crowning trees will, in turn, reduce the likelihood of spot fires.

The potential for wildland fire starts has always existed in the Okanogan Highlands during wildfire season and has only increased with the increase in population and expansion of the WUI, providing greater chances for human-caused ignitions along with the typical lightning-caused fires. That being said, a large percentage of the Okanogan Highlands has experienced either fuel treatments or wildfires over the last ten years. This has increased the chances of a successful initial attack and reduced potential fire severity in many areas, especially in the more recent fire scars and treatments. Notable fire scars include the Walker/Spur and Bulldog Fires of 2021 and the Tunk Block, NorthStar, Graves Mountain, Renner, and Stickpin fire scars from 2015. The fire scars from 2015 are reaching a stage of regrowth where they will burn again and dependent on snag hazard, amount of regrowth, and fuel accumulation from now decaying snags that were created during the fires are beneficial in some places and detrimental to fire suppression in others.

Figure 3.c.2. The hilly and rocky topography of much of the Okanogan Highlands can hamper fire response and detection. (Source: Rosalie Powell, Okanogan CD, 2024)

Ingress-Egress

The main routes of travel through the Okanogan Highlands are HWY 20, which bisects the area east-west between Tonasket and Republic; the Chesaw Rd, which runs east-west from Oroville to Chesaw before turning southeasterly; the Havillah Rd, which runs from Tonasket to northeast to Havillah before merging with the Havillah Rd, the Toroda Creek Rd that runs between Wauconda and Toroda, connecting with the Chesaw Rd, and the Aeneas Valley Rd, that runs through the floor of the Aeneas Valley.

There are numerous one-way-in-one-out roads and driveways, typically unpaved and very narrow, that lead to residences, ranches, and other infrastructure throughout the area. The sections of the Colville National Forest host interconnected forest road networks that interface with the adjoining county roads. In spite of this, the Okanogan Highlands is one of the most isolated areas of the county, and many residents are lacking more than one means of ingress-egress. Much of the road system off the main county and Forest Services roads are unsuitable for firefighting apparatuses or other vehicles first responders utilize and are furthermore not appropriate evacuation routes at a large scale. The distance from response resources further compounds this issue. Furthermore, post-fire debris flows, and other hazards have the potential to obstruct ingress and egress in areas adjacent to recent burn scars, a prime example being repeated blowouts on Bonaparte Lake Rd in the aftermath of the 2021 Walker Creek Fire.

Infrastructure

Property owners in the Okanogan Highlands typically rely on single or multi-home well systems. Connectivity to power infrastructure varies, with residents connecting into the broader power grid or utilizing solar energy or generators.

Fire Protection

Fire District #11 provides both structural and wildland fire protection to a large portion of the North Central Okanogan Highlands. The communities of Chesaw and Molson fall into the district's service area. The district follows the U.S.-Canada border on the North. Fire District #12 encompasses much of the inhabited area of Mount Hull and provides both structural and wildland fire protection. There are no incorporated towns within the district. Okanogan-Ferry Fire District #13 lies on the far eastern edge of the county. Most of the service area falls within Ferry County, with only a small portion extending into Okanogan County. It generally follows the Highway 20 corridor. Okanogan-Ferry Fire District #14 is in the Northeastern corner of Okanogan County and extends east into Ferry County. In Okanogan County, the district encompasses portions of the Toroda Creek Rd. Fire District #16 encompasses much of the Aeneas Valley and provides both structural and wildland fire protection to residents. It has the highest population of any of the Okanogan Highlands fire districts.

Mutual aid agreements between fire districts supplement the wildland fire protection response when needed. Additional fire protection is provided by the Washington DNR, which provides wildfire protection and suppression on privately-owned forestland and state-owned forestland in Okanogan County. The DNR does not provide structural fire suppression, but it does provide wildfire protection on non-forested land that threatens DNR-protected lands. Federal lands are the sole responsibility of the Federal management agency (reciprocal agreement may apply).

Potential Mitigation Activities

On private parcels in the Okanogan Highlands, the creation of defensible space and improved road/driveway infrastructure that can accommodate firefighting apparatus are essential mitigation activities. The vast majority of homes and other structures in the area are isolated in one way or

another, extending response times during incidents. Additionally, many homes are not continuously inhabited throughout the year, being recreational cabins or secondary homes. Property owners focusing on creating defensible space the first 100 ft around a structure, supplemented by home-hardening actions, have the ability to increase the likelihood of survival of their structures, regardless of whether anyone is present to defend them.

Improved driveways and private road maintenance, as well as the expanded use of reflective address signing, will further assist during incident response. Roads and driveways accessing rural residents may or may not have adequate road widths and turnouts for firefighting equipment, depending on when the residences were constructed. Performing road inventories in high-risk areas to document and map their access limitations will improve firefighting response time and identify areas in need of enhancement. Primitive or abandoned roads that provide key access to remote areas should also be maintained in such a way that enables access to emergency equipment so that response times can be minimized.

Roads can be made more fire-resistant by frequently mowing along the edges or spraying weeds to reduce the fuels. Aggressive initial attack on fires occurring along travel routes will help ensure that these ignitions do not spread to nearby home sites. Designing a plan to help firefighters control fires in croplands that lie adjacent to agricultural crops would significantly lessen a fire's potential of escaping to the higher value resource. Mitigation associated with this situation might include installing fuel breaks or plowing a fire-resistant buffer zone around fields and along predesigned areas to tie into existing natural or manmade barriers or implementing a prescribed burning program during less risky times of the year.

Maintaining developed drafting sites (for fire engines), increasing access to water from irrigation facilities, and developing other water resources throughout the agricultural landscape will increase the effectiveness and efficiency of emergency response during a wildfire.

Due to the isolation that characterizes much of the Okanogan Highlands, property owners are strongly encouraged to identify the most likely routes of evacuation and to be on high alert for evacuation alerts. The development of community or neighborhood-level groups, informal or formal, to coordinate the dissemination of evacuation orders and advisories to be issued by OCEM is essential to mitigate challenges related to cell service and internet access. The establishment of Firewise USA® sites, in coordination with the Okanogan CD and WA DNR, can further augment community resources and help residents interface with local fire agencies.

For those areas in the shrubsteppe, adopting the principles presented in the Washington Shrubsteppe Restoration and Resiliency Initiative is highly recommended. **See Appendix D**.

Figure 3.c.3. The Okanogan Valley features a wide array of different land uses and habitats that all have their own weaknesses and strengths when addressing wildfire resiliency. (Source: Okanogan CD, 2021)

Okanogan Valley Risk Assessment

Wildfire Potential

This assessment area includes the Okanogan River Valley from the Okanogan River's confluence with the Columbia north to Oroville, as well as the Sinlahekin and Similkameen valleys. The Communities of Loomis, Nighthawk, Oroville, Ellisforde, Tonasket, Conconully, Riverside, Omak, Okanogan, Malott, Monse, and Brewster are among Washington state's most vulnerable to wildfire impacts. Many of these communities are interconnected with outlying neighborhoods and other commercial, residential, and agricultural lands. Many benches, draws, and constituent valleys host private homes, farms, and ranches. Orchards, livestock pasture, hay, or other crops are grown on nearly every available acre that has access to irrigation water. During the summer and fall, this creates a mosaic of lush green vegetation where there is irrigation and cured sagebrush and grass in areas where there is not.

The Okanogan Valley has a relatively high potential for wildfire when compared to other fire danger rating areas in the county. Its relatively low elevation leads to warmer and drier conditions that start earlier and end later in the season, extending its period of availability to burn. Outside of irrigated agricultural areas, its low elevation and warmer and drier conditions tend to favor a fuel type composed primarily of grasses and shrubs such as cheat grass and sagebrush with some ponderosa

pine and Douglas-fir mixed in where growing conditions for trees are more favorable. This, coupled with a north-to-south alignment, which is also the typical alignment of our wind pattern, allows for rapid rates of spread, especially during windy conditions. The valley, which is the most highly populated portion of the county, adds to wildfire potential with the increased risk of human-caused fires and associated complications of suppressing wildfire in the WUI.

The Oroville area, which was directly impacted by the 2023 Eagle Bluff Fire to the west of the town, is exposed to increased fire risk due to the local topography and vegetation. The foothills rising out of the valley are typically covered by sagebrush and bunchgrasses that form a continuous fuel bed. The steepness of the topography is variable; however, the foothills near the valley have low to moderate steepness, but the degree of slope tends to increase on the mid and upper slopes. The slope rising from the east side of the valley between Oroville and Swanson Mill Road is much steeper and sparsely forested by ponderosa pine. This slope is characterized by sheer rock faces and outcroppings; however, the lack of vegetation does not generally help to slow the upslope spread of wildfire. The Oroville area and other areas of the county adjoining the international border are at risk of fire spreading from British Columbia; the Eagle Bluff fire, which burned over 32,000 acres along the border, also starkly illustrated the risks of fires spreading from Okanogan County into the much more densely populated areas of Southern BC around Osoyoos. The Crater Creek Fire, which began near Keremeos, BC, burned roughly 5,000 acres (burning an additional 114,913 acres in BC) at the eastern edges of the Pasayten Wilderness in Okanogan County west of Oroville in August 2023. Cross-border collaboration during incidents is sufficient, but future fire resiliency and recovery coordination across the international boundary is necessary.

Moving southward through the valley, the Ellisforde, Tonasket, and Crumbacher communities sit in a mixed landscape of agricultural lands, residential developments, and naturally occurring shrubsteppe vegetation with pockets and islands of ponderosa pine savanna and woodlands. These communities are at high exposure to wildfire risk resulting from rapidly spreading grass fires or ember showers from fires occurring in the adjoining Okanogan Highlands.

Wildland fuels within the community of Riverside are fairly limited to ditches, empty lots, and the riverbanks due to extensive urban and agricultural development. Orchards and other crops grow within the valley and on many low benches where irrigation water is available. The surrounding foothills are vegetated primarily by sagebrush and various lower-growing grasses. Sparse ponderosa pine can be found in a few of the nearby draws.

Figure 3.c.4. The Okanogan Valley contains the largest areas of shrubsteppe habitat in Okanogan County. Pictured in June 2022, this area south of Okanogan was heavily impacted by the 2020 Cold Springs Fire. (Source: Eli Loftis, Okanogan CD, 2022)

South of Riverside, the Okanogan Valley widens, opening out to a landscape of mixed shrubsteppe, wetlands along the Okanogan River, islands of pine forests and woodlands, cultivated fields, range land, and the most urbanized areas of the WUI in Okanogan County in and around Okanogan and Omak. These areas, as seen through the course of several fire seasons, experience extremely high wildfire potential. This is

attributed to the abundance of shrubs and grasses, which fuel the rapid spread of fire (especially when driven by the wind) and sloping terrain. Large expanses of open rangeland or pasture provide a continuous fuel bed that could, if ignited, threaten structures and infrastructure under extreme weather conditions. Cattle grazing will often reduce fine, flashy fuels, reducing a fire's rate of spread; however, high winds increase the rate of fire spread and intensity of rangeland fires. A wind-driven fire in dry, native fuel complexes on variable terrain produces a rapidly advancing, very intense fire with large flame lengths, which enables spotting ahead of the fire front.

Wildfire risk in the Okanogan Valley and throughout the county is at its highest during summer and fall when daily temperatures are high and relative humidity is low. Fires burning in some types of unharvested fields are expected to burn more intensely and have larger flame lengths due to the greater availability of fuels. Fields enrolled in conservation programs or managed for wildlife habitat can burn intensely due to increased fuel build-up from previous years' growth. Fires in this fuel type are harder to extinguish completely due to the dense duff layer, which often leads to hold-over fires that may reemerge at a later date, causing additional fire starts.

Figure 3.c.5. Much of the Okanogan Valley is a prime area for dryland agriculture and grazing.
(Source: Mike Baden, WSCC, 2024)

Residents in the Conconully have a very high risk of experiencing wildfire, as was seen during the 2006 Tripod Fire and 2021 Muckamuck Fire. Not only are the fuels and topography in this area very conducive to fire, but there is also a high likelihood of ignition due to heavy recreational use. Campfires and ATVs are just a few of the potential human-caused ignition sources. Further increasing the risk is the popularity of wood siding, decking, and roofing on homes throughout the area. Many homes and other structures are crammed onto small lots between the lake shores and the access routes with forest fuels on the slope above and among the structures. In the event of a fire, these homes would form a continuous fuel bed that could facilitate the spread of the fire from home to home. Conconully is also at high risk of post-fire debris flow impacts, with debris flows having impacted the town in the aftermath of fires in 1894 and 2022.

The fuels in and around Conconully are somewhat variable. Sparse to moderate density ponderosa pine and Douglas-fir stands dominate around the shores of Salmon Lake and Conconully Dam Reservoir and extend west towards the Colville National Forest boundary. The understory vegetation is a mixture of open grass and shrub, transitioning to mostly shrub and conifer regeneration as the elevation increases. Where homes occur, some of the larger trees and understory vegetation in the immediate area have been thinned to allow for development. The south and west aspect slopes near the community are mostly covered with grasses, sparse shrubs, and occasional ponderosa pine. Due to the variable topography and vegetation, fire behavior will also tend to be variable. Fires will typically burn more intensely where forest fuels are denser, such as in the Salmon Creek drainages. On grass slopes and in open, well-spaced forest stands, fires will typically move quickly through the flashy surface fuels but burn with less intensity. Many of the structures within the greater Conconully community were built using wood materials for siding, decking, and roofing, which adds to the potential fuel load because of its ignitability.

Figure 3.c.6. The impacts of post-fire debris flow near Conconully in July 2022.
(Source: Eli Loftis, Okanogan CD, 2022)

In the Sinlahekin Valley, including the Loomis community, sagebrush, and grasses dominate the lower and mid slopes. This type of fuel tends to dry out early in the summer and supports very rapidly spreading surface fires. The topography consists of moderate to steep slopes rising out of the drainages, which tends to encourage the quick spread of fires upslope. The landscape to the west of the Sinlahekin Valley towards the national forest boundary is very rugged and covered by forestland fuels.

Sparse stands of ponderosa pine and Douglas-fir can typically be found in some draws and along the upper slopes in these areas. This type of dry forestland fuel can also be found along the shores of Wannacut Lake and the surrounding hillsides.

The steep slopes around Palmer Lake are also partially forested with sparse ponderosa pine and Douglas-fir. Fires in this type of fuel would be expected to move very quickly along the surface with occasional torching and crowning of the canopy. Fuel loading in stands that have not been burned or otherwise been managed for many years may burn more intensely and have a higher rate of tree mortality.

Loomis has a high potential fire risk due to the abundance of recreational activity and increased residential development. The Gold Hill and Cecile Creek areas west of the Loomis townsite have experienced a significant increase in the number of both seasonal and permanent homes. Many of these new home builders in the Loomis area are unaware that their investments may be outside of local Fire District boundaries. The fire risk in these areas is particularly high due to the steep topography, limited access, and forest fuels. The fuels bordering the Loomis-Oroville Road corridor and surrounding Palmer, Spectacle, and Whitestone lakes are very conducive to ignition as well as rapid fire spread. While this area was heavily impacted by the 2020 Palmer Mountain fire, considerable areas of fuels still remain, and vegetative regeneration in burn scars includes many pyrophilic weeds that can readily facilitate grass fires in the succeeding years after the burn.

Despite the increases in wildfire potential, the valleys also offer opportunities for successful fire suppression. Irrigated agricultural fields and orchards rarely serve as fuel for a fire and offer barriers to fire spread. Access in the form of roads is more numerous than in more mountainous parts of the county and, oftentimes, enables a more timely response to new fire starts. Roads also act as barriers to fire spread, giving fire suppression resources the opportunity to stop the rapidly spreading fires. The flatter terrain and more open timber or grass and sage fuel type also allow for effective fire suppression with heavy equipment, aircraft, and fire engines. Fires in this fuel type spread more quickly but also go out quickly and require less mop-up than timber fires.

Ingress-Egress

The main arterial through the Okanogan River Valley is U.S. Highway 97 from the Chelan/Okanogan County line all the way to the Canadian border. The Okanogan Valley is home to the bulk of the county's population; therefore, there are a multitude of County and city roads. State Routes 20, 215, 17, 153, 173, and 155 all cross through the Okanogan Valley.

Within the core of the Okanogan Valley, county roads, as well as rural ranch access roads, are well distributed throughout most of the area, often following section lines or traversing the multitude of draws and drainage ways. In remote rural areas, county roads often change from paved or maintained gravel surfaces to unimproved primitive roads, making access possible only during certain times of the year. Limited access within remote areas and a lack of maintenance on existing travel routes increase fire suppression response time and have a direct effect on fire spread, leading to increased fire size and destructive potential. This is an issue most easily apparent in areas such as the Chiliwist, which was heavily impacted in the 2014 Carlton Complex Fire. While additional resources have been provided to Chiliwist and areas experiencing similar ingress-egress issues, the dual challenge of recovering from previous fires while preparing for future fires is financially and logistically challenging for property owners, infrastructure managers, and fire response personnel.

Many private homes and subdivisions are accessed via unimproved, single-lane roads accessible only by small emergency vehicles. Often, access roads and driveways are steep and/or lined with wildland fuels that can limit or prohibit access during a wildfire. Many of these roads have one way in and one way out and lack adequate turnout and turn-around areas for emergency vehicles. The inability of emergency resources to safely access structures reduces or may even eliminate suppression response. Roads in newer subdivisions have been designed to accommodate emergency vehicles with either loop roads or cul-de-sacs with wide turning radii and easily negotiable grades, which are better suited to all types of emergency response equipment.

The primary ingress/egress route for the communities of Loomis and Nighthawk is the Loomis-Oroville Road, which travels in a big loop from Oroville through Nighthawk and Loomis and reconnects with Highway 97 near Ellisforde. This is a paved, two-lane highway throughout its extent. The Similkameen, Loomis, and Wannacut areas all have a reasonable amount of alternative escape routes other than the Loomis-Oroville Road in the event of a fire-involved evacuation. Due to the steep topography, however, residents in the Palmer Lake area are limited to the main Loomis-Oroville Road as their sole escape route. Nevertheless, this route is likely to be the safest escape route from Palmer Lake, either to the north or the south.

The Conconully Road provides primary access into the community of Conconully. This paved, two-lane route between Omak and Conconully, the Sinlahekin Road, and the West Fork Road also provide graveled access to the town site from the north and south. There are a minimal number of secondary roads in this neighborhood, but those that exist are typically gravel or dirt routes traveling through the forested areas to the north and west of the community.

Infrastructure

Residents living in the populated centers of Oroville, Tonasket, Riverside, Omak, Okanogan, Loomis, Conconully, and Brewster have access to municipal water supply systems with public fire hydrants. Creeks, ponds, and developed drafting areas provide water sources for emergency fire suppression in rural areas to a limited extent. Water tanks have been set up at several ranches throughout the area as a supplemental water supply during fire season. Irrigation systems are capable of providing additional water supplies for suppression equipment on a limited basis. Additional water resources

distributed and documented throughout the agricultural landscape are needed to provide adequate water for fire suppression.

The bench west and north of Omak and Okanogan is served by the Okanogan Irrigation District. This pressurized system has two reservoirs: Lower Conconully Lake and Upper Conconully Lake. The water is released through a dam on the lower lake into Salmon Creek and then diverted from Salmon Creek about 3 miles upstream from its mouth at the Okanogan River. This water enters a concrete-lined canal that takes it north and east across the Okanogan and Omak Flat, where there are pumping stations. During periods of drought, they can supplement this system by pumping water from the Okanogan River. They also receive some water from Johnson Creek, which is diverted by pipe to Duck Lake on the North Omak Flat. There is also a small private water right (Swayze) that exists on Salmon Creek that covers several residences and small farms just west of the Okanogan city limits. This system also diverts water from Salmon Creek.

The Alta Vista Irrigation District is a small irrigation district within the boundaries of the City of Okanogan. This system draws its water from the Okanogan River and is dispersed into the neighborhood by buried pipe covering five blocks north of Pines Street to Irene Street west of the Okanogan River. Irrigation water is provided to the Loomis, Spectacle Lake, and Whitestone Lake areas by the Whitestone Irrigation District. Outside these areas, development relies on individual, co-op, or multiple-home well systems.

There are two electrical substations in close proximity to the City of Okanogan. They are both located on Van Duyn Street, where they distribute the power to various parts of the county. A transmission line to the upper Methow follows the same general route as State Route 20. This line terminates at a substation in the Town of Twisp. There is also a transmission line that goes south to the Brewster area following State Route 97 for 13 miles and then crosses the Okanogan River and ends in Brewster Flat.

Public utility lines travel both above and below ground along roads and cross-country to remote facilities. Many irrigation systems and wells rely on above-ground power lines for electricity. These power poles pass through areas of dense wildland fuels that could be destroyed or compromised in the event of a wildfire. Cell phone service is well established in most parts of the county, with only limited dead zones.

Residents near the Loomis and Conconully have access to a municipal water system, but all other residents in the Similkameen, Palmer, Pine Creek, Happy Hill, Cook Mountain, and Wannacut communities rely on personal or multiple home well systems. Irrigation water is provided to the Loomis, Spectacle Lake, and Whitestone Lake areas by the Whitestone Irrigation District.

The main transmission line extends from Tonasket to Oroville, distributing power to the Similkameen, Loomis, Palmer, and Wannacut communities through public distribution lines.

The neighborhoods of Pine Creek, Happy Hill, and Cook Mountain are provided electrical power via public distribution lines stemming from the main transmission lines in the Okanogan River valley. A branch of one of the main transmission lines travels from the valley up Conconully Road to the Town of Conconully.

Figure 3.c.7. Okanogan is the county seat and the central hub for most governmental services in the county. Along with Omak, it forms the largest concentration of homes, businesses, and vital infrastructure in the county. (Source: Mike Baden, WSCC, 2024)

Fire Protection

OCFD #1 provides both structural and wildfire protection for nearly all of the Oroville Area. OCFD #4 covers much of the communities of Ellisforde, Tonasket, Crumbacher, and a narrow corridor east along State Route 20 to the Aeneas Valley Road. OCFD #7 provides protection for an area extending from Riverside and including a small part of Omak suburbs. OCFD #7 protection area encompasses part of the Crumbacher area.

Fire District #3 covers a large part of the Okanogan River Valley, including the majority of the Omak – Okanogan and Malott communities. Okanogan-Douglas County Fire District #15 provides structural and wildland fire protection for the communities of Pateros, Brewster, and Bridgeport Bar. Finally, OCFD #8 provides structural and wildland fire protection for the Tribal land east of the Okanogan River, which includes the communities of Timentwa and Lafleur.

Much of the rural area around Conconully has structural and wildland fire protection provided by OCFD #9, excluding the north end of the Limebelt area and Pine Creek area. Additionally, the Town of Conconully maintains its own Volunteer Fire Department, which is responsible for fire protection within the community. OCFD #3 extends part way up State Route 20 and the Chiliwist Road to provide structural and wildland fire protection to residents in those areas.

OCFD #10 provides structural and wildland fire protection to a small service area surrounding the community of Loomis and a narrow strip along the Loomis-Oroville Road to encompass most of the area immediately surrounding Spectacle Lake. Nearly all other structures in the Similkameen, Loomis, Palmer, and Wannacut Neighborhoods are not currently covered by a rural fire district (there are a few structures in the Loomis Neighborhood that are within OCFD #4).

Mutual aid agreements between fire districts supplement the wildland fire protection response when needed. Additional fire protection is provided by the Washington DNR, which provides wildfire protection and suppression on privately-owned forestland and state-owned forestland west of Highway 97 in Okanogan County. The DNR does not provide structural fire suppression, but it does provide wildfire protection on non-forested land that threatens DNR-protected lands. BLM provides wildfire protection on their lands within Okanogan County and has mutual aid agreements with the DNR for the protection of forested land. BLM also does not provide structural fire suppression.

Potential Mitigation Activities

Mitigation measures needed in the Okanogan Valley include maintaining a defensible space around structures and access routes that lie adjacent to annual crops and other wildland fuels. Around structures, this includes maintaining a green or plowed space, mowing weeds, and other fuels away from outbuildings, pruning and/or thinning larger trees, using fire-resistant construction materials, and locating propane tanks, fuel tanks, and firewood away from structures.

While density and spacing of structures do play a significant role in the potential spread of wildfire transitioning from the wildland in an urban or suburban setting, these issues can broadly be mitigated by retrofitting, home hardening, existing structures, and ensuring wildfire-resistant building practices, landscaping, and other structural features that are documented to reduce the risk of structure ignition are utilized in future construction. Many of these practices have additional benefits for water resource management and climate change adaptation.

Roads and driveways accessing rural residents may or may not have adequate road widths and turnouts for firefighting equipment, depending on when the residences were constructed. Performing road inventories in high-risk areas to document and map their access limitations will improve firefighting response time and identify areas in need of enhancement. Primitive or abandoned roads that provide key access to remote areas should also be maintained in such a way that enables access to emergency equipment so that response times can be minimized.

Roads can be made more fire-resistant by frequently mowing along the edges or spraying weeds to reduce the fuels. Aggressive initial attack on fires occurring along travel routes will help ensure that these ignitions do not spread to nearby home sites. Designing a plan to help firefighters control fires in croplands that lie adjacent to agricultural crops would significantly lessen a fire's potential of escaping to the higher value resource. Mitigation associated with this situation might include installing fuel breaks or plowing a fire-resistant buffer zone around fields and along predesigned areas to tie into existing natural or manmade barriers or implementing a prescribed burning program during less risky times of the year.

Maintaining developed drafting sites (for fire engines), increasing access to water from irrigation facilities, and developing other water resources throughout the agricultural landscape will increase the effectiveness and efficiency of emergency response during a wildfire.

For those areas in the shrubsteppe, adopting the principles presented in the Washington Shrubsteppe Restoration and Resiliency Initiative is highly recommended. **See Appendix D.**

Figure 3.c.8. Overlooking Elmer City, Coulee Dam, with the Grand Coulee Dam in the background. The area is vital for the power infrastructure of the county and much of the region. (Source: Eli Loftis, Okanogan CD, 2024)

Colville Reservation Risk Assessment

Wildfire Potential

Typical vegetation found throughout the western portion of this area is grass, mixed shrubs, and sagebrush, along with areas of wetlands, marsh, ponderosa pine islands, and cultivated crops. Private land ownership includes cattle ranches and holdings of cultivated farmland. New development occurs primarily near existing communities and along major roads, including HWY 155, HWY 97, HWY 17, the Columbia River Rd, and Cameron Lake Rd. Most of the pressure for multi-housing subdivisions occurs near the towns. Rural development is widely dispersed, consisting primarily of isolated ranching headquarters, home sites, irrigation systems, and developed springs or wells. In nearly all developed areas, structures are near vegetation, which becomes a significant fire risk at certain times of the year.

The Vegetation of the southern portion of the Reservation along the Columbia River reflects the strong influence of the arid and semi-arid climates and steppe region (shrub and grass-dominated vegetation) of the north-central Columbia Basin. Fires are frequent (1-25 years); the effect on vegetation varies by species composition and community structure. For example, longer fire-free intervals lead to the dominance of bitter/sagebrush communities, which, when burned, are replaced for a time by herb-dominated communities. The area between Omak Lake and Brewster is considered ecologically and geologically distinct, forming the Okanogan Drift Hills. This area hosts a high concentration of dryland crops and cattle grazing intermixed with the shrubsteppe. This area was severely impacted by the 2020 Cold Springs/Pearl Hill Fires, burning 190,033 acres north of the Columbia River in Okanogan County and a further 219,967 acres in Douglas County. Vegetative conditions in this area facilitate rapid movement of fire across the landscape as a result of xeric conditions (despite receiving slightly more precipitation on average compared to the Okanogan Valley) and a tendency towards experiencing high wind events and electrical storms that produce

lightning. The Omak Lake area is one of the most frequently burned areas of Okanogan County, with the entire area in the immediate vicinity of the lake having burned at least once between 2001 and 2021.

The character of the vegetation in northeastern portions of the Colville Reservation in Okanogan County transitions from predominantly rangeland and shrubsteppe, with intermixed residential and agricultural development, into progressively more forested and wooded conditions. As part of the Okanogan Highlands ecoregion, the northeast corner of the Colville Reservation in Okanogan County is wetter and cooler than those areas closer to the Columbia and Okanogan Rivers, being more aligned with forests and other habitats observed in Ferry County and the Kettle Range. The southeastern portions of the reservation, in the vicinity of Nespelem, The Colville Agency, Elmer City, and Coulee Dam, are very similar to those areas along the Okanogan River, being composed mainly of shrubsteppe. The lands immediately around Elmer City and Coulee Dam are the only portions of Okanogan County that are ecologically and geologically part of the Channeled Scablands, though many land features associated with that area, namely the abundance of coulees and benches, are frequent on the landscape across much of the reservation. These areas are at risk of wind-driven fires moving rapidly uphill as a result of radiant heat pre-heating fuels ahead of the fire or burning material rolling downhill in new fuels.

The forested area of the Reservation in Okanogan County, classified as the ponderosa pine zone, is dominated by ponderosa pine with only minor amounts of Douglas-fir. Quaking aspen may occur on wetter soils. These stands include a large part of the deer and elk winter range. Ponderosa pine forests present at the turn of the century were the result of frequent low-intensity fires caused by both lightning and aboriginal ignitions. The result was a forest mosaic of small to moderate-sized even-aged patches. Stocking levels were low, creating very open stands. As with other parts of Okanogan County and western North America, fire suppression has led to increased density in many of these stands, leading to a loss of the open conditions historically associated with forests of the area and an increased risk of high-intensity fires moving into the canopy.

Figure 3.c.9. Sites previously impacted by fires in certain areas of the Reservation have experienced severe post-fire erosion issues and changes to local hydrology. Such as this section of Omak Creek. (Source: Okanogan CD, 2018)

Ingress-Egress

Whilst communities like Nespelem, The Colville Agency, Elmer City, and Coulee Dam have sufficient road infrastructure to facilitate easier ingress-egress, the many isolated farms, ranches, and homes in the area frequently lack more than one means ingress-egress. For example, areas located north

and east of Omak Lake have many one-way roads and driveways to homes, creating concerns for access and suppression efforts. There are roads that are not maintained to remove vegetative fuels near the roadways and are choked with vegetation that risks vehicle access. Additionally, there are bridges that may not be engineered to sufficient standards to enable fire apparatus to cross access areas impacted by active incidents. Address markers that are reflective or otherwise highly visible are not commonly used in many areas, increasing the difficulty for first responders to navigate to incidents when dealing with smokey conditions or long driveways.

Infrastructure

The western edge of the reservation is bounded by the Okanogan River and HWY 97. HWY 155 runs through the reservation and is the main route of travel between communities in southeastern Okanogan County and the central Okanogan Valley. HWY 17 connects the areas around the confluences of the Okanogan with the Columbia to northern Douglas County and Bridgeport. Many of the roads in the area are unpaved and subject to seasonal weather impacts and damage.

The Chief Joseph Dam, operated by the Army Corps of Engineers, and the Grand Coulee Dam, operated by the Bureau of Reclamation (BR), play essential roles in regional hydroelectric power production, irrigation water availability, and flow management on the Columbia River. The Grand Coulee Dam is the largest power station in the United States and is a keystone of the power system in the Pacific Northwest, with a tremendous amount of historical and cultural value as well.

Various communication structures, including cell towers and radio repeaters, are present and have been highlighted as a major point of concern by residents. Preservation of those structures during a major incident is essential for timely suppression and communication.

Figure 3.c.10. Emergency managers and residents have expressed a high level of concern for the protection of telecommunication resources such as this cell tower that overlooks Elmer City and Coulee Dam. (Source: Eli Loftis, Okangoan CD, 2024)

Fire Protection

OCFD #8 and Okanogan-Douglas Fire District #15 serve the southwestern portions of the reservation. District 8 operates exclusively to suppress wildland fire. The City of Omak Fire Department serves portions of East Omak up to Jackson Street, after which OCFD #3 covers the area immediately adjacent to East Omak up to the Pascal Sherman Indian School. Okanogan County Fires District 2 serves the area around Elmer City and Coulee Dam, with the municipal fire department of Coulee Dam covered by the local fire department. The Omak/Nespelem District of the Mount Tolman Fire Center covers the area and responds to incidents that occur on tribal land. Some areas of the reservation are not formally within the jurisdiction of any of the noted agencies. However, adjoining jurisdictions will respond to incidents in those uncovered areas depending on the situation.

Potential Mitigation Activities

Mitigation measures needed include maintaining a defensible space around structures and access routes adjacent to wildland fuels. Around structures, this includes maintaining a green or plowed

space, mowing weeds, and other fuels away from outbuildings, pruning and/or thinning larger trees, using fire-resistant construction materials, and locating propane tanks and firewood away from structures. Roads and driveways accessing rural development need to be kept clear of encroaching fuels to allow escape and access by emergency equipment. Performing road inventories in high-risk areas and documenting and mapping their access limitations will improve firefighting response time and identify areas in need of improvement. Primitive or abandoned roads that provide key access to remote areas should be maintained to allow access to emergency equipment so that emergency response times are minimized. Designing a plan to help firefighters control fires in conservation lands and wildlife habitat areas will significantly lessen a fire's potential of escaping to other areas. Mitigation associated with this situation might include managed grazing in designated fuel reduction areas, creating fuel breaks, and implementing a prescribed burning program during less risky times of the year.

Additional mitigation activities include installing more water storage sites, improving water access from irrigation facilities, and developing other water resources throughout the landscape. This will increase the effectiveness and efficiency of emergency response during a wildfire.

Given the abundance of power infrastructure present in the area, continuing work to remove hazardous trees near power lines and create defensive space around power station substations, as well as telecommunications hubs, is vital.

For those areas in the shrubsteppe, adopting the principles presented in the Washington Shrubsteppe Restoration and Resiliency Initiative is highly recommended**. See Appendix D**.

Figure 3.c.11. The western portions of the Colville Reservation are a vibrant working landscape with a mix of rangeland, agricultural fields, and shrubsteppe that host essential economic enterprises and ecosystems that support migratory birds like sandhill cranes (Grus candensis), and game species like mule deer. (Source: Eli Loftis, Okanogan CD, 2024)

Figure 3.c.12. The narrowness of the Methow Valley leads to tight concentrations of structures within the WUI. (Source: Aaron Nepean, Cutboard Studio, 2022)

Methow Valley Risk Assessment

Wildfire Potential

At its furthest, the Methow Valley extends about 68 miles north to south and approximately 40 miles east to west, encompassing the incorporated communities of Winthrop, Twisp, and Pateros and multiple unincorporated hamlets, including Carlton, Methow, and Mazama. The area also features a high density of neighborhoods in the WUI, many of which are within Homeowner's Associations (HOAs). The Methow contains portions of or is bounded by large areas of public lands on all sides, including the Loomis State Forest, Okanogan-Wenatchee National Forest, the Sawtooth and Pasayten wildernesses, Lake Chelan National Recreation Area, and the southern unit of the North Cascades National Park.

The Methow Valley's climate is influenced by maritime weather patterns, elevation, topography, and its location on the leeward side of the Cascade Mountains. Pacific storms driven by prevailing westerly winds are routinely interrupted by the Cascade Mountains, dropping heavy precipitation throughout the upper elevations. Precipitation falls off significantly as elevation decreases and as the distance from the Cascade Crest increases. The floor of the valley is characterized by shrubsteppe vegetation common to the Columbia Plateau, with the valley walls featuring intermixed Douglas-fir and ponderosa pine forests and woodlands. Northern portions of the valley are more densely forested than the southerly sections.

Figure 3.c.13. Agency staff meet with the public at the Mazama Store during the 2021 fire season. (Source: Okanogan CD, 2021)

The upper portions of the Methow River and its tributaries host riparian forests that are typically more resistant to ignition but, when exposed to sustained drought and high winds, would provide the settings for intense, rapidly moving fires that would severely negatively impact bank stability and both terrestrial and aquatic wildlife habitat.

The community of Mazama and the various subdivisions in the vicinity, including Edelweiss, the Lost River Airport Association, and others, are among the highest-risk unincorporated communities for negative wildlife impacts in Okanogan County. The area's relative isolation from response resources, proximity to federal wilderness areas, dense fuel loads, and expanding development greatly increases the risk of ignition. The 2021 Cedar Creek fire, which burned along the valley's southern rim in the area, illustrated the high risk of wildfire moving down the valley. Homes in this area are often scattered along both sides of the Methow River. In some cases, well-constructed bridges access groups of homes on the other side; however, several unrated bridges may not support large fire suppression apparatus. Wildfires burning in this area may funnel smoke and hot gasses up the canyon, which may cause health problems and make safe fire suppression very difficult and dangerous.

Homes on the mid and upper slopes, such as those in the Skyline Ranch Subdivision, have an increased fire risk due to the limited accessibility and the likelihood of up-canyon and upslope fire spread. Homes along the Lost River Road and in the Lost River Airport Association are typically completely surrounded by thick stands of timber and underbrush. While many individual residents, HOAs, and Firewise USA® sites in this area have taken great care to create defensible space around homes and other structures, the increase of development in the WUI, particularly since 2020 onward, expands the human footprint in the area and intermixes structures more and more with potentially hazardous fuel loads. Canopy closure throughout this area is highly likely to carry a running crown fire, which is very difficult to suppress. The vegetation of the upper Methow Valley is noticeably less fire tolerant in some areas, given the localized weather patterns and topography that provides additional moisture compared with the rest of the valley. The highest abundances in the county of culturally and ecologically significant western redcedar, which is extremely fire intolerant, and plant species more commonly associated with Western Washington, such as Pacific yew (*Taxus brevifolia*) and bigleaf maple (*Acer macrophyllum*), are found in this area.

Figure 3.c.14. Winthrop is the main choke point for the upper Methow Valley for transportation, services, and recreation. A fire moving from the wildland into the urban core of the town, with its heavy utilization of wood construction inspired by the late 19th century western aesthetic, could easily travel through the area under the right conditions. (Source: Rocklynn Culp, Town of Winthrop, nd)

The Town of Winthrop is ranked by the WA DNR as the 17th most at-risk community in Washington in terms of the likelihood of being exposed to wildland fire (Scott et al. 2018; Torgerson et al. 2019). The population of the town stands at 580 residents as of 2024. In the last decade, Winthrop has experienced a development boom that has led to infill within the town and the expansion of new neighborhoods within the town and immediately adjacent to it. The town has bands of vegetation along slopes and waterways within its jurisdiction. There are a few forested areas of predominantly ponderosa pine mixed with shrubsteppe in undeveloped areas of the town. Winthrop is surrounded by lower-density housing and agricultural and natural lands in the WUI setting.

There is a high potential for ignition from various sources due to the density of recreation, development, or other human activities. Recreational activities along the Methow and Chewuch Rivers and at Pearrygin Lake State Park are likely to ignite from campfires, BBQs, ATVs, etc. Careful maintenance of the fuels within and surrounding the park reduces this potential risk and helps protect the park from fires spreading into the area from the surrounding area. In the event of a threatening fire, the Town of Winthrop may be at high risk due to the use of wood building materials on many of the buildings in the town's core. The plank board siding and wooden walkways would be very receptive to ignition from firebrands. Housing and structure density within the city limits and in the areas immediately around Winthrop creates the possibility of a wildland fire transitioning into an urban conflagration similar to those that have occurred in Malden, Washington, Paradise, California, Lahaina, Hawai'i, and Jasper, Alberta. However, this issue can be mitigated by retrofitting existing structures with fire-resistant materials, reassessing and modifying landscaping designs, and minimizing anthropogenic fuel sources. Any new construction built in Winthrop, and indeed anywhere in Okanogan County, can be constructed at the same density found in Winthrop and other population centers if wildfire safety standards are adopted as an essential element of their planning.

The WA DNR ranks Twisp as the 11th most at-risk community in Washington in terms of the likelihood of being exposed to wildland fire (Scott et al. 2018; Torgerson et al. 2019). The town covers roughly 1.18 square miles at the confluence of the Twisp River into the Methow River within the Methow Valley. Twisp's current population is roughly 1,000 residents, and the Twisp business districts provide critical services to Methow Valley residents from Mazama to Carlton. The properties within Twisp were recently annexed into the OCFD #6 service area. Twisp is currently experiencing rapid residential growth and has many new subdivision proposals.

Rural lands adjacent to Twisp include overstocked dry forests, fire-prone shrubsteppe vegetation communities, and valley landforms that can promote dangerous wildfire behavior. Twisp has experienced many wildfire-induced Level 3 evacuations and has lost structures in town due to fire incidents resulting from internal human causes. As the fire season around Twisp has become extended and more intense, it has many needs to increase local wildfire planning and fire prevention resources around and within the town to increase community resilience and prevent catastrophic loss of property and life.

As with Winthrop, the density and style of construction within the town's small footprint create an increased risk of structure ignitions during a wildfire. The continuity of fuels along the Methow River is disrupted in some areas by alfalfa fields and other small agricultural operations. The value of this break in fuels is mild to moderate. Similar to the Mazama area, the communities up the Twisp River, which meets the Methow River at Twisp, are at considerable risk due to their isolation from response resources, fuel loading, and increased development in the WUI. The many drainages and sub-watersheds of the Methow Valley, including Cub Creek, Bensen Creek, Texas Creek, French Creek, Gold Creek, and Black Canyon, area all similarly imperiled.

The character of the Methow Valley's vegetation transitions south of Twisp, becoming noticeably drier. In the southern half of the valley, most of the fire risk occurs on the mid and upper slopes and in the developed drainages. Libby Creek is a prime example of a high-risk drainage, with very high fuel loads and an interface between shrubsteppe and forested plant communities, intermixed with homes and other structures of various styles and individual levels of wildfire exposure risk.

The Alta Lake area, including the State Park, has a high fire risk potential. Homes and recreational facilities were built very close together along the lake shore and lower slopes with forestland fuels intermingled and overhanging roofs. Wood siding, decking, and roofing are popular construction materials in this area, as many of the structures are recreational or seasonal homes. The Alta Lake Road around the lake is fairly narrow, with high-risk fuels immediately abutting the travel surface. In addition, this is a dead-end road with few areas large enough to turn fire suppression equipment around. The potential for ignition in this area is very high due to the intensity of the recreational use. In the event of a fire in this area, there would likely be severe damage to many of the structures.

Pateros, at the mouth of the valley where the Methow River meets the Columbia, is similarly densely housed when compared to other communities in the Methow and Brewster. It is positioned firmly in the shrubsteppe, where fires are apt to move rapidly through flashy fuels, compounded by its place on the slopes descending to the confluence of the two rivers, which increases the risk of fires rapidly advancing uphill or burning material rolling down slope and spreading flames.

The Methow River Valley is a prime recreational area and, as such, has experienced rapid subdivision development and scrutiny by developers. Many of the new homes are located in what used to be rural areas and are being built as vacation or seasonal-use homes. In many cases, homes are being built in high-risk areas, and no precautions have been taken to reduce the wildfire threat around the home. Log or wood-sided homes are very popular, and many homeowners are adamant about maintaining the trees and other "natural" landscaping on their property. This leads to several potential problems. Not only are these types of homes difficult and dangerous for firefighters to protect in a wildfire situation, but they also require additional suppression resources that could be used more effectively elsewhere to help stop the spread of the fire.

The growing number of residents living on their own power sources (off the grid) has allowed homes to extend further into the rural and backcountry areas of the County. Many of these homes are also not addressed, which makes them difficult to locate in emergency situations. Furthermore, concern over the protection of these homes is compounded by the lack of water availability, as many of these homeowners rely on deep wells with limited recharge.

Figure 3.c.15. Much of the southern Methow Valley burned at very high intensity in the 2014 Carlton and 2015 Okanogan Complex Fires. (Source: Okanogan, CD, 2014)

Ingress-Egress

The primary access route from Twisp south is State Route 153, which is a paved, two-lane highway. State Route 20 is also a paved, two-lane highway that travels over Loup Loup Summit from the Okanogan River Valley, turns north at Twisp, passes through Winthrop, and then heads west over the mountains via the North Cascades Highway. There is also a multitude of secondary roads accessing homes and other more rural parts of these neighborhoods. These roads are typically well-maintained gravel routes that travel up drainages. The access route into Alta Lake is a paved, two-lane route. The Gold Creek Road is also paved for a few miles up, but mostly as a single lane with pullouts. The Gold Creek Road does connect to the Libby Creek drainage to the north; however, this is a dirt road bordered by forest-type fuels, and neither of these roads should be considered evacuation routes. The East Chewuch Rd/NF Rd 37 runs northeasterly from Winthrop, meandering through the Okanogan-Wenatchee and Colville national forests before intersecting with the Conconully Rd. The length, overall condition of the road surface, and the isolation of the route preclude the East Chewuch Rd/NF Rd 37 as an evacuation route out of the Methow Valley. It should not be used for evacuations.

The Lost River Road needs fuel treatments to serve as a safe evacuation route, especially since this is the sole escape route between Mazama and the communities to its northeast and the easiest means of evacuation of hikers on the upper portions of the Pacific Crest Trail. Visible addressing is almost non-existent on many private driveways, though many HOAs and Firewise USA® sites have worked with state partners to increase their prevalence in some areas. It is highly probable that several homes in this area would be lost in the event of a wildfire.

Many private homes and subdivisions are accessed via unimproved, single-lane roads accessible only by small emergency vehicles. Often, access roads and driveways are steep and/or lined with wildland fuels that can limit or prohibit safe access during a wildfire. Many of these roads have only one way in and one way out and lack adequate turnout and turn-around areas for emergency vehicles. The inability of emergency resources to safely access structures reduces or may even eliminate suppression response. Most of the roads in newer subdivisions have been designed to accommodate emergency vehicles with either loop roads or cul-de-sacs with wide turning radii and easily negotiable grades, which are better suited to all types of emergency response equipment.

Figure 3.c.16. The Methow Valley hosts a large number of developed communities within the WUI that have limited means of ingress and egress. (Source: Eli Loftis, Okanogan CD, 2023)

Infrastructure

Residents of Winthrop, Twisp, and Pateros have access to municipal water systems. All other Methow Valley residents rely on personal or multiple home well systems. Irrigation ditches, headgates, and other irrigation infrastructure are often situated in high-risk areas and have been severely damaged in previous fires in some areas of the valley.

Okanogan Public Utility District (PUD) and Okanogan Electric Cooperative (OCEC) provide electrical service to the Methow Valley. Most of the Methow Valley's electricity needs are presently served by a single transmission line, which starts in Okanogan at a substation and follows the route of State Route 20 over Loup Loup Pass to the Twisp substation in the town of Twisp. Okanogan PUD is responsible for maintaining the transmission line under an agreement between the two utilities and the Bonneville Power Administration.

Fire Protection

OCFD #6 is responsible for structural and wildland fire protection within most of the populated areas of Winthrop, Twisp, Mazama, and Carlton. Okanogan-Douglas County Fire District #15 provides

protection for the populated areas bordering the Methow River through the Lower Methow communities, including Methow, Pateros, Brewster, and Monse areas.

All of the OCFDs have signed a "Memorandum of Understanding" to assist any of the other districts in the County with fire suppression to the utmost of their abilities. State lands are the sole responsibility of the WA DNR (suppression and reciprocal agreements may apply). Federal lands are the sole responsibility of the Federal management agency (reciprocal agreement may apply). Much of the private lands in Okanogan County are within joint jurisdiction between the County Fire Districts and the WA DNR.

Figure 3.c.17. The Winthrop area features some of the highest density of urban development in the Methow Valley and is located roughly on the boundary between the shrubsteppe and forested areas of the upper valley. (Source: Eli Loftis, Okanogan CD, 2024)

Potential Mitigation Activities

The best possible mitigation activity for all residents in the Winthrop, Twisp, Pateros, and the numerous unincorporated communities of the Methow Valley is to construct and maintain a defensible space. The expanding density of homes and other structures in the WUI in the Methow necessitates heavy treatment of vegetation and other fuel sources to reduce risk and increase resiliency. This may include mowing and clearing grass and weeds away from structures in grass and shrubsteppe-dominated areas. In forest areas, thinning undergrowth and pruning larger trees may also be necessary. Locating flammable items such as firewood, propane tanks, and other accumulations of human-made and natural materials away from structures will also help reduce their risk. Due to the proliferation of out-of-county homeowners, an in-depth educational outreach program may be necessary to convey wildfire prevention and mitigation information.

As the population expands in the Methow, the need for additional housing and other structures necessitates buildings with higher density than was historically typical. While density and spacing of structures do play a significant role in the potential spread of wildfire transitioning from the wildland in an urban or suburban setting, these issues can broadly be mitigated by retrofitting, home hardening, existing structures, and ensuring wildfire-resistant building practices, landscaping, and other structural features that are documented to reduce the risk of structure ignition are utilized in future construction. Many of these practices have additional benefits for water resource management and climate change adaptation.

Outside of large towns and small road-adjacent communities like Carlton and Methow, many of the smaller drainages throughout these neighborhoods are accessed by one-way in, one-way out roads. Ensuring that these roads will be safe for an evacuation is critical. Fuels should be thinned away from the road surface. This not only creates a safe access corridor, but it can also serve as a potential fuel break. Private driveways should also be addressed with visible signs and safely accessible fire suppression equipment. Longer driveways should have turnouts for vehicles to pass each other and an area large enough for a fire truck to turn around at the home site.

In general, due to the dispersed nature of the electrical infrastructure, all of the existing above-ground power lines are exposed to varying levels of fire risk. Vegetation clearing under rights-of-way, multi-agency coordination of thinning adjacent to power line easements, and public education can help prevent this system from failing due to wildfires, as well as prevent a potential ignition from these lines.

The Alta Lake State Park should be a high priority for fuels reduction and homeowner education. The slopes around the lake are in need of fuels reduction treatments to reduce the fire risk, and trees and other vegetation around homes should be pruned or even evaluated for removal in some cases. Homeowners should be made aware that wood construction materials drastically increase the probability of ignition. Furthermore, due to the close proximity of homes and other structures, there is a high possibility that one home burning could catch several others on fire. The Alta Lake Road should be either extended to form a loop around the lake or significantly widened to allow for a better and safer evacuation of residents and visitors in the area during any emergency. Reducing the fuel along this road would also help protect people and structures by allowing for safer access and serving as a fuel break.

Figure 3.c.18. Methow Valley residents have a high level of engagement with government entities and NGOs working to achieve greater wildfire resiliency. The Methow hosts all but one of Okanogan County's Firewise USA® sites, and residents can regularly articulate their values as illustrated by the mapping exercise conducted at the Winthrop CWPP Public Meeting held in March 2024. (Source: Craig Nelson, Okanogan CD, 2024)

Adopting the principles presented in the Washington Shrubsteppe Restoration and Resiliency Initiative is highly recommended for those areas in the shrubsteppe within the Methow, which occurs up to the areas immediately north of Winthrop. **See Appendix D.**

3.d. Post-Fire Recovery

Figure 3.d.1. Post-fire recovery and vegetation regeneration three weeks after the 2023 Eagle Bluff Fire. (Source: Eli Loftis, Okanogan CD, 2023)

The majority of this plan revolves around mitigating fire risk and developing or maintaining fire resiliency. Nevertheless, wildfire recovery is a major element of the relationships between humans and the landscapes of Okanogan County, and it can be said that recovery from the last fire creates resiliency for the next. Many of the immediate post-fire hazards that are familiar to Okanogan County residents, post-fire debris flows/mudslides, hazard trees, noxious weed invasions, and others, precipitate or compound other conservation issues that are addressed in the short and long term after a wildfire. It is important to recognize the resilience and determination of Okanogan County residents in the face of these challenges.

Many of the action items recommended in this CWPP have elements of both fire resiliency and fire recovery involved in their implementation. Fire recovery is a greater challenge due to the economic and emotional toll it can have on people and the immediate environmental changes, positive or negative, depending on the context, that occurs. Funding for fire recovery assistance is typically reactive and, depending on the funding source, is not always considerate of the extended timelines on which fire recovery may play out. Recovery in an ecological context can be a matter of years, decades, or centuries, inconsequential periods of time in nature. However, in most human senses, recovery varies from individual to individual and cannot be fully addressed in a document such as this.

Figure 3.d.2. Post-fire flooding damage. (Source: Okanogan CD, 2014)

Soil Erosion and Flooding

Wildfires can be a major driver of soil erosion, as they cause structural and chemical changes in the soil due to exposure to extreme heat. High-intensity fires burn for extended periods and frequently destroy the soil's root structures and other organic matter. Additionally, gases produced by the combustion of plant material penetrate and cool in or on the soil surface, creating a waxy coating that repels water. The creation of hydrophobic soils, combined with the loss of structural stability provided by plants' root systems and other structures, can lead to rapid erosion of soil post-fire. If soil particles are unable to retain water, they can easily be blown away when dry. During rain events or the spring melt-off, the abundance of moisture may exceed the soil's ability to absorb it, which, combined with the force of gravity, can lead to mudslides, debris flows, and flash floods.

The 2021 Cedar Creek, Muckamuck, and Walker Creek fires have all produced the conditions required to cause semi-regular post-fire debris flows. As of this writing, Lighting Creek, a tributary of Bonaparte Creek that runs off Mount Bonaparte impacted by the Walker Creek Fire, has suffered three debris flows since July 2022, severely damaging several homes, repeatedly destroying sections of the Bonaparte Lake Road and releasing loads of sediment that degrade downstream habitats. Many species of anadromous fish, including salmon and steelhead, are negatively impacted by increased post-fire sediment loads.

Wind erosion of topsoil in the aftermath of intense wildfires has also been observed in Okanogan County. This erosive loss of soil not only creates hazardous air quality conditions for sensitive individuals but also removes valuable substrate for crop production.

Figure 3.d.3. In the aftermath of the Okanogan Complex Fire, BAER team members examine the impacts of severe wildfire on soils. (Source: Andrew Phay, Whatcom CD, 2015)

Algae Blooms

The increase in sediment in waterbodies after wildfires can trigger large algae blooms that are detrimental to terrestrial and aquatic wildlife, livestock, and humans. Nutrients in sediment, runoff, and PM 2.5 particles that come to rest on waterbodies fuel the growth of algae that can choke out ponds and lakes, decreasing the availability of light. Excessive concentrations of dead and decaying algae cause a cascading effect within aquatic ecosystems, leading to the loss of dissolved oxygen and frequently killing aquatic wildlife. Certain species of algae and associated cyanobacteria are toxic and can severely sicken or kill wildlife, livestock, pets, and humans that ingest water from impacted areas.

Hazard Trees and Burnt Timber

Depending on local conditions, burned trees can remain standing for years, if not decades, after a fire. The destabilizing impacts of fire on soil, combined with wind, frequently topples trees, which in many cases creates beneficial structural diversity in a regenerating forest and woodland and assists in nutrient cycling. However, burned trees located near infrastructure, such as roads, fences, powerlines, homes, and other structures, create a threat to public safety.

Fire-killed trees are more easily toppled by winds and air currents observed during wildfire events, which has the potential to block ingress/egress routes during an incident. In addition, incidental tree falls block routes periodically throughout the year. Tree damage to fences leads to costly repairs and the escape of livestock. Trees striking powerlines is a frequent cause of ignitions.

Figure 3.d.4. Standing dead timber may persist for decades after a fire depending on a variety of conditons. High intensity burned areas, such as one pictured here in aftermath of the Okanogan Complex Fire, have a high potential for rapid windfall and severe eroison. Trees and other vegetation may struggle to regenerate if the seed bank and organic elements of soil have been destoryed. (Source: Andrew Phay, Whatcom CD, 2015)

One major barrier for many landowners after a fire to removing hazardous trees or any burnt timber they may wish to remove is the common inability of many to process that timber in a timely manner, either ecologically or economically. Post-fire salvage logging is rarely economically viable in Okanogan County; the distance to milling resources, the nearest being over the North Cascades Hwy or in Colville, and the already diminished value of burnt timber make a positive economic outcome unlikely. Timescales are often incongruent as well. If property owners wish to recoup some of the value of their timber after a fire, a salvage harvest must occur as soon as possible. Many property owners are unable to coordinate a salvage harvest before the decomposition of standing dead timber, windfall, and other sources of damage quickly reduce the value of burnt timber after a wildfire. While in some situations, salvage harvests may be viable up to three years after a fire, typically after less than a year, burnt timber loses all economic value. The ecological value of salvage logging is nebulous at best at large scales and is marginal when not also working to address other conservation concerns at small scales.

Noxious Weed Invasion

Okanogan County is subjected to a wide array of noxious weed infestations that are enhanced in intensity by wildfires. Weed species typically benefit from environmental disturbance, taking advantage of newly opened habitats to rapidly expand. Many non-native annual grasses found in the county, namely cheatgrass and smooth brome, are fire-adapted species that benefit from frequent burns that remove competition for native species. Not only does this remove habitat for native species of plants and animals, but it also increases the risk of more frequent fast-moving grass fires.

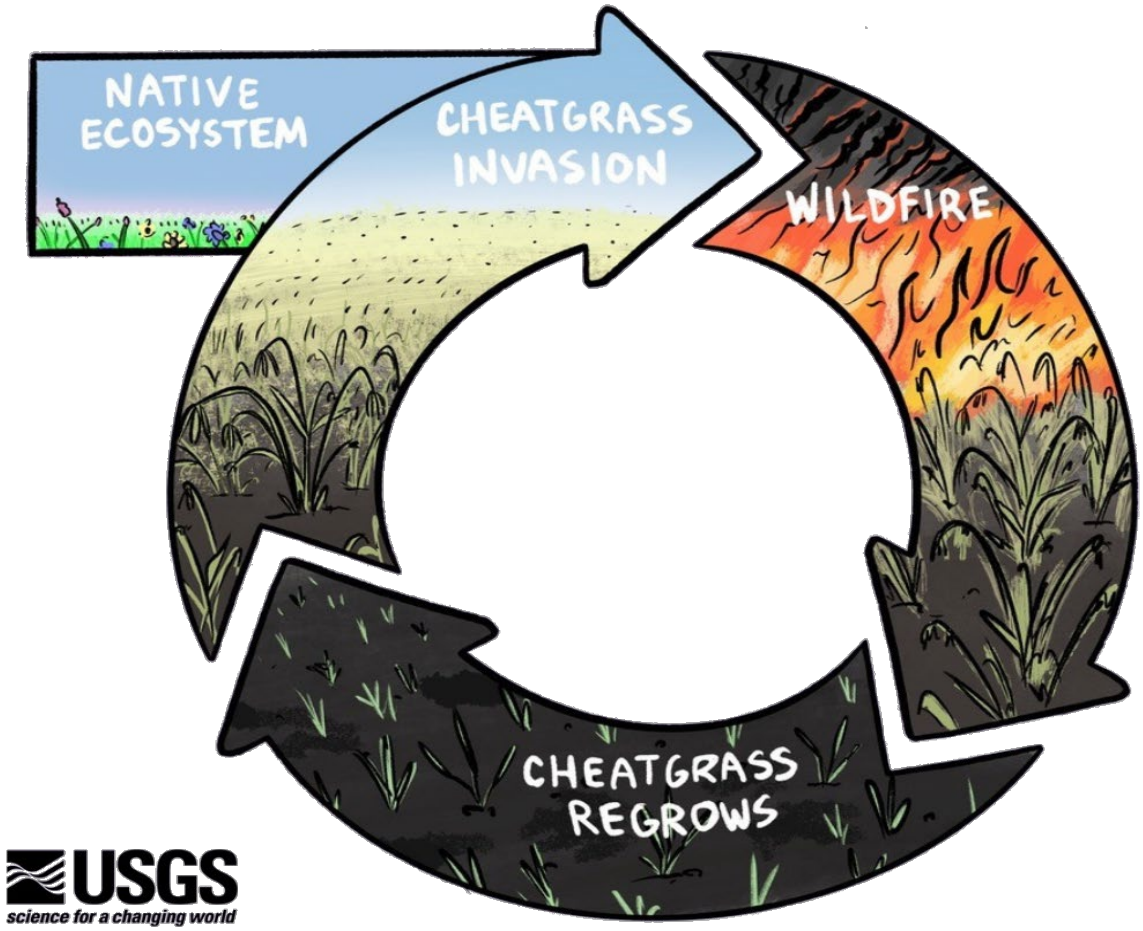


Figure 3.d.5. Fires clear the way for invasive plants like cheatgrass to dominate a once diverse ecosystem. (Source: USGS, 2024)

Post-fire management of noxious weeds can be physically and economically challenging. Large burn areas are prime habitats for weed species, making detection and management difficult. Management frequently requires the application of herbicides. However, in some cases, biocontrols can be utilized. Depending on the listing status of the weed species by the Washington State Noxious Weed Control Board and Okanogan County Noxious Weed Control Board, property owners may be required to eradicate all plants or prevent propagation completely. Noxious weed invasion can be one of the most persistent post-fire challenges property owners and land managers face.

Livestock Impacts

Figure 3.d.6. While livestock are often able to escape wildfires, some do perish.
(Source: Ben Carroll, Okanogan CD, 2020)

Wildfires can heavily impact livestock during and after an incident. The difficulty of evacuating livestock, which are often dispersed across grazing areas, either on private properties or on grazing allotments on public lands, often necessitates that animals face the flames alone. While sometimes livestock are killed during a fire event, many can successfully remove themselves from immediate danger. However, some are injured by collisions with fences or other obstacles while fleeing a fire. Those who are unable to flee the fire frequently suffer burn injuries to the hooves, legs, belly, and utters, often leading to an immediate dispatchment in the field or culling later. Smoke inhalation can severely damage respiratory systems, taking weeks, if not months, to heal.

One of the most pressing post-fire hazards experienced by ranchers and farmers in Okanogan County is the immediate loss of stored feed, frequently stacked hay, and forage for livestock. A lack of food further imperils surviving livestock that are already stressed and injured, leading to a loss of stock and a severe negative economic outlook for owners. The long-term impacts of wildfire on the landscape may render some grazing areas unusable for years afterward, forcing hard decisions about grazing management and stock numbers. Damaged fences, particularly on difficult terrain, are costly to replace both in terms of time and money, further reducing grazing availability. Stump holes and other depression in the ground after fires can lead to leg breaks and other injuries. Livestock can be a vector for the spread of noxious weeds into burned areas, disturb recovering areas, and negatively impact the ecological recovery of sensitive wetlands.

Wildlife Impacts

Figure 3.d.7. From moose to pygmy short-horned lizards, Lyall's mariposa lily (Calochortus lyalli) to western white pine, and sandhill cranes to Chinook salmon (Oncorhynchus tshawytscha), the wildlife and plants we share the landscape with play vital roles in ecosystems we all live in.
(Source: Ben Carroll & Eli Loftis, Okanogan CD, 2020-2023)

All of Okanogan County's forests, woodlands, grasslands, shrubsteppe, and aquatic ecosystems provide important wildlife habitat. Many fire resiliency, suppression, and recovery activities have direct impacts on wildlife. Wildfire-driven disturbances to wildlife habitats are not universally negative nor universally positive. The negative impacts of wildfire disturbances are often compounded by drought, climate change (e.g., shifting the seasonality of wildfire and vegetation), and altered native vegetation (e.g., invasive non-native plants, riparian area degradation, agricultural or residential land conversion, etc.). However, every native species of wildlife depends on wildfire to create and maintain a shifting mosaic of forage, cover, populations, and space. The discussions around wildfires are frequently oriented by the realities and necessities of managing fuels, protecting life and property, and post-fire restoration. The impacts on human and plant communities are often the most immediate impact observed after a fire, but wildfires' relationships with wildlife, terrestrial and aquatic, are a major area of concern that must be addressed in order to ensure a sustainable environment for Okanogan County's ecosystems as whole.

Fire has been a natural force of disturbance in all of Okanogan County's ecosystems for thousands of years. Wildfires have historically played a crucial role in maintaining specific habitat conditions. The

periodic return of fire-controlled plant populations prevented the growth of certain species in certain areas and created conditions that more easily propagated other species. This natural adaptation to fire is not limited to plant life but is also reflected in the natural history and behavior of wildlife. Wildlife in the Okanogan are physiologically adapted to frequent fire regimes, and the life histories of different species depend on structures created or maintained by fire, such as large trees, snags, deciduous species, and shrub and forb diversity.

Wildlife Response to Wildfire and Immediate Impacts

Like humans, animals are reactive to the presence of wildfire on the landscape. Many species utilize smoke as an indicator that cues fire avoidance behaviors (Lyon et al. 2000; Sanderfoot and Gardner 2021; Sanderfoot et al. 2022). Smaller animals may seek shelter underground or amongst rocks, while large creatures will begin to move away if threatened by nearby fires. Many wildlife species take advantage of environmental changes and may forage for insects that are attracted to or released from the heat of the fire. As with humans and livestock, acute and chronic exposure to wildfire smoke can lead to severe health issues for wildlife (Lyon et al. 2000; Sanderfoot et al. 2022).

Figure 3.d.8. Wildlife will utilize burned areas in the immediate aftermath of the fire. (Source: Okanogan CD, 2020)

While many animals display some form of fire avoidance behavior, the speed of a fire's spread and the severity of a burn may lead to mortality or injury during the fire. A prime example of this can be found locally with the story of Cinder, an American black bear (*Ursus americanus*) that was severely burned during the 2014 Carlton Complex Fire and was rescued by WDFW before being rehabilitated and released back into the wild in 2015. Fires may have severe localized impacts on small animals, particularly those that are otherwise imperiled, as was the case during the 2020 Labor Day fires that led to the loss of significant portions of Washington's greater sage grouse and pygmy rabbit populations (*Brachylagus idahoensis*) (WSSRI 2024). Research indicates that large mammal mortality rates are low as a direct result of fire, with smoke inhalation being the primary cause of death observed in the aftermath of major fires such as the Yellowstone fires of 1988 (Lyon et al. 2000).

The immediate aftermath of wildfires, depending on the fire's type, severity, extent, and length, in many cases see reduced availability of resources for many species, leading to surviving individuals to select adjoining unburned habitats or leave the area in search of sufficient resources (Lyon et al. 2000; Albery et al. 2021). Residual impacts of stress, injury, or loss of resources can lead to deleterious effects on wildlife populations in the weeks or months after a burn, and most fire-related mortality of wildfire occurs during that period (Lyon et al. 2000; Albery et al. 2021; Sanderfoot et al., 2022). High-severity fires divergent from historical fire regimes, seen in many low to mid-elevation ponderosa pine, Douglas-fir, western larch, and lodgepole pine forests and woodlands, and within the shrubsteppe, greatly increase the negative impacts of wildfire on wildlife when compared to low to moderate-intensity wildfires or human-managed fires (Lyon et al. 2000; Snow 2022). Stand-replacing wildfires are normal between long fire intervals in some environments, such as dense, cold, or moist forests (Lyon et al. 2000).

Post-Fire Succession and Wildlife

While the period shortly after a wildfire is frequently a period of hardship for wildlife, depending on the intensity of the burn, the ecological successional process that follows a major wildfire often fosters beneficial conditions for many species. Snags, standing dead trees, and dead wood on the ground left in the aftermath of fire are essential habitat features for many species, ranging from invertebrates to large mammals and birds (Lyon et al. 2000). Woodpeckers are among the most immediate beneficiaries of wildfires within wooded habitats, with the abundance of fire-killed or injured trees providing excellent foraging and nesting opportunities (Logan et al. 2016). In Okanogan County, black-backed woodpecker (*Picoides arcticus*), Lewis's woodpecker (*Melanerpes lewis*), American three-toed woodpecker (*Picoides dorsalis*), and white-headed woodpecker (*Dryobates albolarvatus*) represent species that are candidates for listing as endangered, threatened or sensitive in Washington, are strongly influenced by wildfire activity in their habitats in addition to more common woodpecker species (Logan et al. 2016; WDFW nd).

The stages of post-fire succession provide different habitats for different species depending on site conditions. Burn scars in most habitats create various habitat features that are beneficial to wildlife, including black bears and moose (*Alces alces*). An increased abundance of early successional plant species, including saskatoon serviceberry (*Amelanchier alnifolia),* chokecherry (*Prunus virginiana*), and willows *(Salix ssp.*), provide ready forage for large wildlife, pollen sources for numerous insects, and cover and nesting opportunities for many species. Early successional stages, when conditions are more open with abundant dead timber, favor animals that prefer open habitats and forests rich with snags, such as mule deer, northern hawk owls (*Surnia ulula*), and olive-sided flycatchers (*Contopus cooperi*). Over the decades or centuries, as vegetation densifies, animal species that find open habitats more favorable become less abundant as species that benefit from enclosed forests and woodlands, or dense shrubs, increase in number.

Wildfires in shrubsteppe typically reduce the abundance of woody shrubs like sagebrush and antelope bitterbrush, opening up available habitat for grasses and forbs (Lyon et al. 2000). In healthy fire regimes, this reduction of woody shrubs would not be heavily detrimental to wildlife in most cases. However, the impacts of fire suppression, irrigation, and overgrazing, compounded by the post-fire invasion of exotic grasses and forbs, namely cheatgrass, fosters post-fire conditions within the shrubsteppe that often see reduced forage and cover for shrubsteppe obligate species (Lyon et al., 2000; Molvar et al., 2024).

Figure 3.d.9. Bighorn were first reintroduced to Washington in the Sinlahekin Valley in the 1950s. (Source: Okanogan CD, 2011)

Wildlife inhabiting low-intensity, frequent fire environments, such as western gray squirrel (*Sciurus griseus*) and bighorn sheep (*Ovis canadensis*), are adapted to utilize resources from rich forb and shrub layers, cavities in trees or the ground, deciduous vegetation, isolated stands, and individuals of large vegetative structure, and small clumps of dense structure that are isolated from wildfire disturbance. Moderate-intensity wildfire creates and maintains the most variable and diverse vegetative structure.

The diversity of vegetative structure influences future pyrodiversity. Wildlife using moderate-intensity, moderately frequent fire environments, such as sagebrush sparrows (*Artemisiospiza nevadensis*) and American goshawks (*Accipiter gentilis*), depend on complex assemblages of vegetation composed of heterogeneous size classes, ages, species compositions, densities, and openings. High-intensity, low-frequency wildfires occur in productive moist and cold forests, resulting in a build-up of fuels over long intervals between wildfires. The high intensity of burns over long periods of time creates a shifting vegetation mosaic of islands and patches over time, providing early successional and late successional structures. The adjacency of regenerating vegetation and decadent structure provides the complex landscape needs for wildlife such as Canada lynx and wolverine (Vanbianchi et al. 2017).

Figure 3.d.10. Depending on burn conditions, vegetation is able to regenerate rapidly after a fire. Early successional species are vital for the survival of returning wildlife and for new arrivals that favor the open habitats created after the flames. (Source: Okanogan CD, 2015)

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 a 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.

Figure 3.d.11. Large portions of the Methow Valley have burned since the last CWPP update. This property, owned by Ken Bevis and Teri Pieper burned in the 2014 Rising Eagle Fire. The aftermath from 2014 is pictured on the left. The same property was pictured again in 2021, displayed on the right. Between the landowners efforts to create defensible space, and the timely assistance of firefighters, this home was saved in 2014, and the burn intensity was lower, fostering the right conditions for a rapid physical recovery on the property. (Source: Ken Bevis & Teri Pieper, 2014/2021)

Holistic Wildfire Fire Recovery Considerations

Figure 3.d.12. Additional considerations for wildfire recovery. (Source: FAC Learning Network, n.d.)

There is no set period for post-fire recovery. Recovery has many permutations. While many of the biophysical impacts are well studied and follow general patterns, financial and emotional recovery are deeply personal journeys.

In a sense, post-fire recovery never truly ends. Well-thought-out recovery planning for individuals, properties, and communities recognizes that recovering from the last fire means building resiliency for the next. The work and determination of Okanogan County residents, their agency partners, and our communities demonstrate the value of collective action to work towards a future where people can live and recreate in a place like Okanogan County, where fire is a natural force on the landscape, and be just as adapted as the landscape itself is for wildfire.

A holistic approach to fire recovery requires significant collaboration between partners. The succeeding section provides further context for many of the governmental and NGO partners involved in the development of this CWPP as of 2024, highlighting their current operations, future goals, and projected needs.

4. Fire Protection & District Capacity

4.a. Local Fire Districts and Organizational Summaries

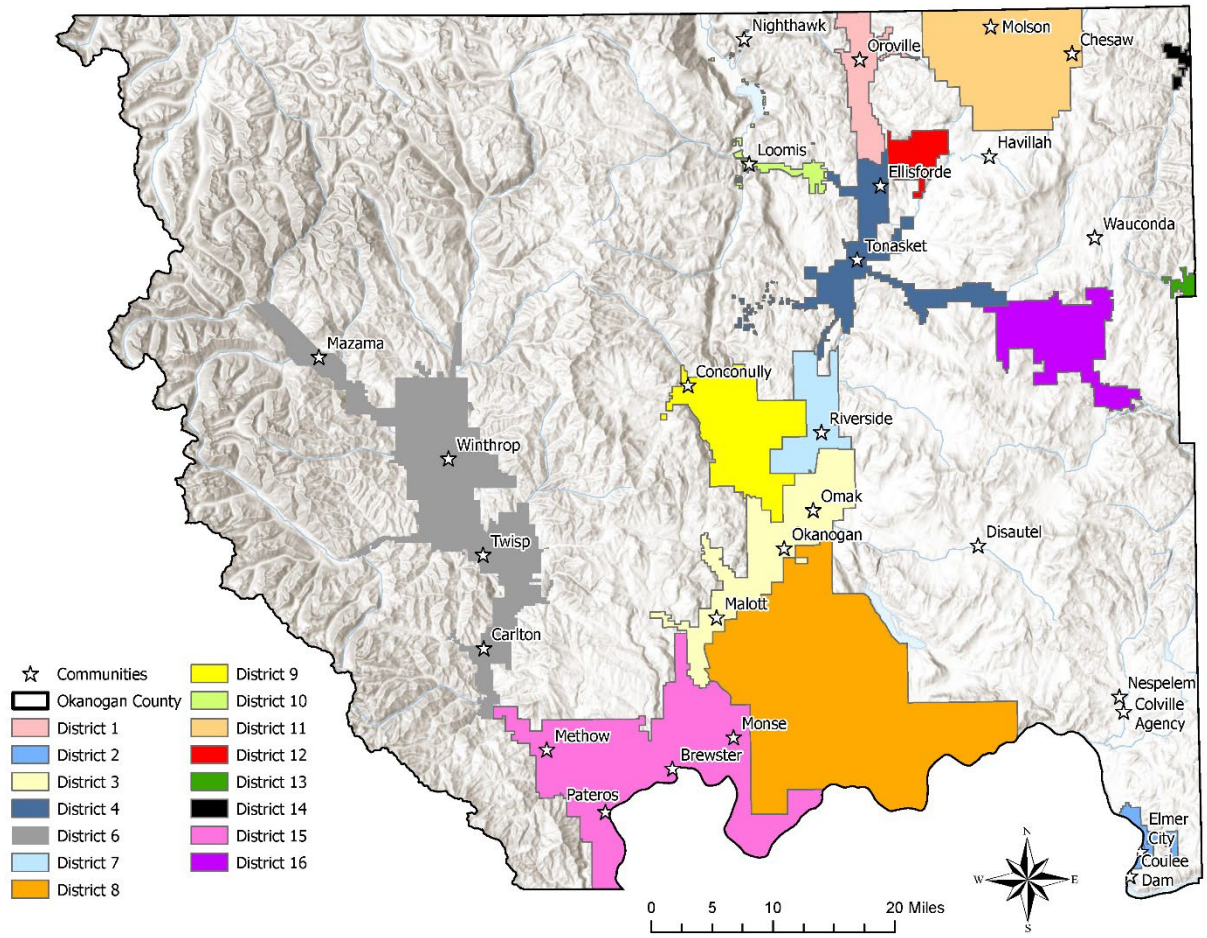


Figure 4.a.1. Fire Districts across Okanogan County.
Source: (Okanogan County, 2024)

City of Okanogan Fire Department

Department Summary
The City of Okanogan Fire Department covers approximately 3.2 square miles of commercial and residential area. The area is mostly on the valley floor with steep pitches of grass and sagebrush hills, as well as benches with residences. There are fire hydrants that cover 96% of the city at this time. There are 30 volunteers in the fire department with a part-time paid Fire Chief.

Volunteers cover both the city and part of Fire District #3. The Department is responsible for mainly structure fire protection but is trained and can respond to wildland fires within the City of Okanogan and Fire District #3 and surrounding areas. The City of Okanogan Fire Department provides lease space to OCFD #3. Residences mixed in with the wildland fuels, steep slopes, erratic winds, and dry summers coupled with elaborate private landscaping schemes can create extreme wildland fire behavior.

Priority Areas

- **Residential Growth**: After little or no growth in the past, the City of Okanogan is experiencing a moderate to heavy expansion, with several new annexations and developments. These areas were previously agricultural areas that have been subdivided into varying densities; the upper benches are R-1 designations, with the valley floor being of denser R-3 zoning.
- **Communications**: Dispatched by Okanogan County Sheriff's Office (OCSO) dispatch on the Pitcher Mountain repeater. Motorola pagers of varying ages, Monitor 4 thru 5 pagers, and new Kenwood 5200 portable radios are utilized. The Department currently has 2 licensed tactical channels in the City of Okanogan for fire department use.
- **Burn Permit Regulations**: The City of Okanogan has a burn permit program that was established in 1989 by City Ordinance #716. The Outdoor burning code has been changed throughout the years to stay in compliance with the Clean Air Act. Permit fees are set by ordinance annually and are issued for one year; there is a period of no burning that starts on June 1 and goes through September 30. Permits are for natural vegetation only, minimal pile size and conditions pertain to each individual permit, and violation of any part of OMC 8.36 results in a citation.

District Needs
The major obstacle that stands before the fire department today is the limited amount of room for expansion of the Okanogan Fire Station; it has reached its capacity. A larger fire station would provide the space needed to increase the equipment cache, provide a large classroom for training scenarios, and set up training aids.

Education grants for materials and staff to meet with the public and educate them on building methods and landscaping to reduce the catastrophic effects of wildfires. The department also needs to increase the recruitment and retention of volunteer firefighters. Currently, the Department has 30 volunteers but needs a number closer to 35 to provide response times under the NFPA standard of 8 minutes. The tax base does not currently provide the funding for paid staff to cover periods of limited staffing during the daytime.

In addition, 4% of the city is not served by fire hydrants; a dispatcher is needed that is solely dedicated to fire and EMS dispatch at the OCSO dispatch center, and the need for a 100' aerial will become a necessity in the future.

City of Omak Fire Department

Department Summary
The City of Omak Fire Department covers approximately 3.3 square miles of commercial and residential area. The area is mostly on the valley floor with steep pitches of grass and sagebrush hills, as well as benches with residences. Residences mixed in the wildland fuels, steep slopes, erratic winds, and dry summers coupled with elaborate private landscaping schemes can create extreme wildland fire behavior.

The Department is centrally located downtown at 16 N Ash Street. There are 30 volunteers in the fire department with a paid Fire Chief. The department is responsible mainly for structure fire protection, but volunteers are trained and respond to wildland fires, vehicle fires, vehicle accidents, hazardous material incidents and assist with some EMS incidents. Volunteers cover both the city and part of Fire District #3. The Department provides lease space to OCFD #3 to store equipment.

Resource Needs
Omak Fire Department needs a new station as it has been at full capacity for quite some time. The new station, with an up-to-date design, would allow future apparatus, as trucks are built bigger, and possibly more apparatus as community growth is still on the rise. This building would need to be large enough to provide living space, showers, and cleaning areas for firefighting gear for adequate health and safety of volunteer firefighters, as well as office space and a larger training room to accommodate all personnel.

The City of Omak also needs back up power. Backup power, such as generators, can sustain city infrastructure in the event of power outages during and after wildland fire events.

Project Priorities
With past fires, such as the Okanogan Complex in 2015, the burn scar has helped mitigate fuel loading in and around the city boundaries. Continuing programs such as Firewise® led by Okanogan Conservation District, with emphasis to continue mitigating fuel loading and guidelines to private landscaping schemes, is extremely beneficial in the prevention of extreme wildland fire behavior.

Town of Conconully Fire Department

District Summary
The Town of Conconully is a small resort community nestled in a valley about 20 miles northwest of the City of Okanogan. The town has 210 residents, mostly retired. There are 189 housing units in the town, of which only 54.5% are permanently occupied housing units.
The town borders National Forest, DNR, BLM, and private lands. The town is flanked by two separate reservoirs managed by the BR (Conconully and Salmon Lake Dams). The southern town limit is Conconully State Park.

In addition to providing support to the town citizens, the Department has an MOU with Fire District #9 to provide structure protection within a 5-mile radius. The Department also provides EMS but does not transport (due to limited capabilities) unless deemed necessary.
The Department is a completely volunteer agency with 12 volunteer firefighters trained in structure and wildfire procedures.

Priority Areas
- **Residential Growth**: Conconully has had a very slow growth rate during the last few years.
- **Communications**: The Department is dispatched through the OCSO Dispatch. Pagers and portable radios do not work in our area because the town rests in a hole between several mountains.
- **Burn Permit Regulations**: The town does have regulations on burning, but they can be hard to enforce.

Additional Issues of Concern
The Fire Hall was condemned in 1980 but continues to be used.

District Needs
A new fire hall to house all of the Department's fire vehicles. A Class A fire engine is needed to replace some aging equipment. Conconully needs an increase of year round water sources for fire suppression. A repeater near town would solve some communication issues due to the geography surrounding Conconully.

The Department needs help with recruitment, retention, and training of volunteers. This is a problem because most residents are beyond the age of joining the department along with most working age folks cannot afford the high price to drive a 40 mile round trip to work to get to the Omak-Okanogan area so they do not live in Conconully very long.

The Department's fire vehicles are old and in need of some major repairs which the town cannot afford. The Department needs a 4 wheel drive brush truck. The fire department budget for the last several years has been a total of $14,000 which does not go far when maintaining vehicles, fire hall, PPE, training, etc.

Town of Coulee Dam Fire Department

District Summary
The Town of Coulee Dam is located in eastern Washington along the Columbia River with a population of 1,010 residents in Okanogan County, and across the Columbia River, there are another 200 residents in Douglas County.

The Okanogan County portion of Coulee Dam lies within the Colville Indian Reservation and forms the southern limit of the Okanogan Highlands. The town has a total area of 0.7 square miles.

There are 6 volunteers in the fire department with NO paid staff. The volunteers perform structure protection and wildland firefighting duties.

Priority Areas
- **Residential Growth:** The population has only increased by 5.2% since 2000, with little or no development in the area.
- **Communications:** The Department is dispatched through the OC Sheriff's Office Communications Center/Dispatch. Tactical communication is still an issue.
- **Property Tax:** A large portion of properties in tribal trusts are exempt from property tax, which creates financial hardship for our town.

Cooperative Agreements
Coulee Dam is part of the Okanogan Mutual Aid Agreement and has a mutual aid agreement with Fire District 3 from Douglas County. The department also has agreements with BIA and BR.

District Needs/Wish List
A repeater near town is needed to solve communication issues throughout the Department's jurisdiction. Narrow banding did not solve this problem it has left the area with only one channel to contact dispatch.

A new fire hall is needed as the current hall will not house all the fire vehicles and equipment and does not provide adequate training areas. The height of the existing hall prohi8bits any new vehicles or equipment over 9' 6".

Firefighter recruitment and retention continues to be a problem that the Department faces annually. This is a problem because most residents are beyond the age of joining the department. The Department needs more training, but this is hard to do with every member working their regular 40+ hour jobs.

Town of Twisp

Summary
The Town of Twisp is a municipal corporation with a jurisdictional area covering roughly 1.18 square miles at the confluence of the Twisp River into the Methow River within the Methow Valley. Twisp's current population is roughly 1,000 residents, and the Twisp business districts provide critical services to Methow Valley residents from Mazama to Carlton.

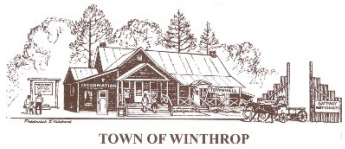
The properties within Twisp were recently annexed into the OCFD #6 service area, however Twisp still provides water/sewer service – including fire hydrant flow within town, police services, street services, and an Emergency Operations Center.

Twisp is currently experiencing rapid residential growth and has many new subdivision proposals. Rural lands adjacent to Twisp include overstocked dry forests and fire prone shrub-steppe vegetation communities and valley landforms that can promote dangerous wildfire behavior. Twisp has experienced many wildfire induced Level 3 evacuations and has lost structures in town due to fire incidents resulting from internal human causes. As the fire season around Twisp has become extended and more intense, Twisp has many needs to increase local wildfire planning and fire prevention resources around and within the town to increase community resilience and prevent catastrophic loss of property and life.

Resources
Municipal Water System with hydrants and fire flow.

Emergency response and communications through the Police Department.

Emergency Operations Center at the Twisp Civic Building with backup power and clean air systems.



Town of Winthrop

Summary
Winthrop's service area is our incorporated limits and includes a mix of residential neighborhoods and commercial areas. Our Comprehensive Plan identifies adjacent "potential annexation areas" as well as "areas of interest." We're located in the Methow Valley at the confluence of the Methow and Chewuch Rivers. Winthrop's population is approximately 580. Over the past decade, we've seen rapid growth of residential construction - both infill and new neighborhoods. The Town has bands of vegetation along slopes and waterways. There are a few forested areas of predominantly Ponderosa Pine mixed with shrubsteppe in undeveloped areas of the town. The Town is surrounded by lower-density housing, agricultural, resource and natural lands in the WUI setting.

Resources
Water system: Winthrop has a municipal water system with a primary well and a backup well that we are working to get authorization for. The water system supplies domestic water for residential and commercial uses and for fire flow within our service area.

Sewer system: Winthrop has a domestic sewer system that serves our population.

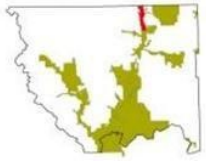
Road network: Winthrop's streets are a mix of public and private roadways, including SR 20 as the primary arterial throughway; connector streets that connect to county roads (Castle Ave, White Ave, Bluff Street), local access streets that serve older neighborhoods, and some private roads that serve subdivisions created in the past 25 years.

Winthrop Barn: The Winthrop Barn has been used as an evacuation center during fires.

Resource Needs
Several water system projects needed to address storage, redundancy, and distribution. Buffers and fuel treatments within and at the perimeter of neighborhoods. AM radio channels to distribute information in real time during wildfire events. Also, transportation planning and building guidelines/standards as detailed below.

Project Priorities
Winthrop has identified the following as priorities to address wildfire protection and readiness:

- Develop & adopt a transportation plan that addresses connectivity issues and ensures all neighborhoods connect with two points of ingress/egress.
- Develop & adopt street standards that implement a system of connected roadways that meet emergency access requirements.
- Roadway improvements and new road construction to ensure safe emergency access.
- Adopt building and landscaping guidelines/standards that minimize fire spread while considering efficient land use and density standards to achieve housing affordability.
- Critical upgrades to the town water system for fire flow, storage, distribution and redundancy. Critical upgrades to the town water system for fire flow, storage, distribution and redundancy.



Okanogan County Fire District #1

District Summary
OCFD #1 covers approximately 2.2 square miles (2 miles in the district and 0.2 within Oroville city limits) along the Okanogan River valley. The City of Oroville sits on the south end of Lake Osoyoos and at the convergence of the Okanogan and Similkameen Rivers. The city is 4 miles south of the Canadian border.

The district and city has one combined Fire Department which is operated by the City of Oroville and contracts with FD #1 for services. All equipment and operations are housed and conducted from the city fire station in downtown Oroville.

The population of FD #1 and city is 3,641 full time residents. There are 25 volunteer firefighters with no fulltime paid staff. The economy is primarily based on agricultural with an influx of tourist during the summer months. There are numerous orchards within the town's limits and a few grape vineyards.

The fire district responds to structural fire, EMS major medical calls and rescue, wildland fire, vehicle accidents, hazardous material calls non-operational, and water rescues. The district/Department responded to 72 calls in 2011. The district will respond as initial attack to incidents on USFS and DNR lands until the responsible agency takes charge.

Priority Areas

- **Residential Growth:** Growth in the area is primarily caused by the proximity to the Canadian market, just 4 miles away in British Columbia, Canada. Three vacation cottage developments have been built on the fringes of the city limits. Over 60% of the property owned on the US side of Lake Osoyoos is owned by Canadians.
- **Communications:** Development of a countywide communication plan is needed; the district is tied to Okanogan County 911 dispatch system. Pagers, portable radios, and mobile phones do not work in all areas as the district is in a low lying area surrounded by mountains.
- **Burn Permit Regulations:** The district/Department does not have a general burn permit program. However, it does issue recreational burn permits, which follow the requirements of IBC 307, once the County Commissioners declare a burn ban in all areas of the County.

District Needs
Localized training available without the need to send each volunteer to training centers outside our local area. A countywide Fire Marshal is needed for enforcement of the fire codes and building inspections.

Okanogan County Fire District #2

District Summary
Originally the Fire District #2 includes an area approximately one-mile-wide beginning at the northern edge of the Town of Coulee Dam and proceeds north approximately six miles.

In 2007, the district annexed to the north and the east, which more than doubled the size of the district. The district now the includes the unincorporated villages of Lone Pine, Riverview, tribal housing subdivision, Koontzville, Seaton's Grove, Belvedere, McGinnis Lake. The district contracts with the Town of Elmer City for fire services.

Rural residences are scattered along both sides of if State Route 155 (Coulee Corridor Scenic Byway) and the Elmer City access road. BR land is located on the south and west sides of the district and Colville Trible trust land is scattered throughout the district.

The district has no paid staff and, therefore relies completely on volunteers. Currently there is 18 trained volunteers for both structure protection and wildland fire.

Fire hydrants are located in the Town of Elmer City, tribal housing subdivision, Lone Pine, and Riverview.

Priority Areas

- **Residential Growth**: Population in the district has remained about the same for the past few years. The Town of Elmer City population is approximately 240 and the remaining district is about 250.
- **Communications:** The district is tied into the Okanogan County 911 response system.
- **Burn Permit Regulations:** The district follows US BIA (Mt. Tolman Fire Center) restriction and guidelines.
    - Permits are required; Mt. Tolman issues permits to unincorporated areas and the Elmer City Hall issues permits for the incorporation town limits.

District Needs
Primary need is a training facility and updated equipment. Maintaining a volunteer firefight work force is very difficult. People do not volunteer much anymore or have reached an age that make it hard for them to a visible asset.

Okanogan County Fire District #3

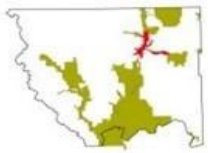
District Summary
OCFD #3 is located in center of Okanogan County and currently has 78 volunteers serving a population of approximately 8,000 over 71 square miles. The area is predominately valley floor with steep slopes to benches, residences are located at the edge of these benches with very little regard to the wildland fuel that abuts their residence.

Fuel types are natural grasses and sage, some areas have sage as tall as 10' in height. The area was heavy towards agriculture until recent years where the loss of orchard ground has provided large tracts of land that provide avenues for fire to enter the district or leave the district whatever the case may be.
The area, which comprises FD #3, is fire prone with a high frequency of lighting ignitions in June, July, August, and September. Additionally, there are frequent human fire starts throughout the region.

There are 3 stations within the fire district - Station 1 is located in downtown Omak, the fire district rents space from the City of Omak; Station 2 is located in downtown Okanogan this station is located approximately 5 miles from the Omak Station, the fire district rents space from the City of Okanogan; and Station 3 is located in Malott a non-incorporated community 7 miles south of Okanogan. Each station maintains its own roster and handles its own recruitment and training. Departments are responsible for mainly structure fire protection but are trained and respond to wildland fires, vehicle accidents, EMS calls, hazardous material spills, and other types of rescues.

Priority Areas
- **Residential Growth**: One challenge FD #3 faces is the large number of houses in the urban/rural fringe compared to twenty years ago. The growing population has expanded further into traditional forest or resource lands and other rural areas. The "interface" between urban and suburban areas and unmanaged forest and rangelands 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. Many property owners in the interface are not aware of the problems and threats they face and owners have done very little to manage or offset fire hazards or risks on their own property. Furthermore, human activities increase the incidence of fire ignition and potential damage.
- **Communications:** FD #3 is tied into the County 911 response system.
- **Burn Permit Regulations:** No burn permit program at this time other than those issued by the Department of Ecology.

District Needs
New/updated Fire apparatus and equipment district wide. Continuing programs such as Firewise® led by the Okanogan Conservation District, with emphasis to continue mitigating fuel loading, and guidelines to private landscaping schemes, is extremely beneficial in prevention of extreme wildland fire behavior.



Okanogan County Fire District #4

District Summary
FD #4 covers 174 square miles and with a population of about 6,000. The district includes the incorporated City of Tonasket and the unincorporated communities of Ellisforde and Crumbacher, as well as a municipal airport. The City of Tonasket is about 20 miles south of the Canadian border.

The town is at the intersection of US Highway 97 and State Highway 20, about 28 miles north of Okanogan, the county seat. Apple, pear, peach, apricot, plum, and cherry orchards, wineries, cattle ranches, dude ranches, farms and rugged mountain wilderness with sage-covered foothills make up the fire district.

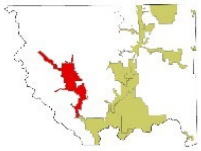
FD #4 is 100% volunteer and currently has 35 volunteers. The district responds to both structural and wildland fires.

Residential Growth
FD #4 growth is moderate to slow.

Communications
FD #4 is tied into the County 911 response system and maintains interoperable with other districts and agencies (DNR & USFS).

Burn Permit Regulations
Burn permits are issued by district personnel and DNR.

District Needs
A satellite station for Crumbacher, Thermal imager, new PPEs (structural and wildland), new SCBAs, replace hoses on fire trucks, and an updated structural engine.



Okanogan County Fire District #6

District Summary
OCFD #6 is a professional organization of volunteer and career firefighters that provide fire, rescue, and emergency response services throughout the Methow Valley in Washington State. Our fire district is located in the eastern foothills of the Cascade Mountains approximately 30 miles south of the Canadian border and 200 miles east of Seattle.

The fire district was founded in 1957 and covers an area of approximately 300 square miles, making it the largest fire district in Okanogan County. OCFD #6 provides fire, rescue, and emergency response from Gold Creek to Lost River including all unincorporated areas within its boundary and the communities of Carlton, Twisp, Winthrop, and Mazama. There are over 5,300 residents living within Okanogan CDF #6 coverage area and over 5,700 structures, consisting of private residents, retail businesses, hotels, and industrial structures. The fire district operates out of four fire stations strategically placed at approximately 10-mile intervals along the main corridor throughout the Valley.

The stations are located in Carlton, Twisp, Winthrop, and Mazama. OCFD #6 is classified as a combination department, which means its staff consists of both career (paid) and volunteer firefighters. There are currently a total of 50 firefighters, 5 career, and 45 volunteers responsible for providing emergency services 7 days a week, 24 hours a day through the response area. Fire District 6's business and planning aspects of the district are the responsibilities of the OCFD #6 Board of Commissioners. The Board consists of three Commissioners who are elected public officials, and a part time secretary. OCFD #6 maintains an extensive year-round training program for all its members consisting of classroom and hands-on skill training.

Resource Needs
Needs for OCFD #6 are to be able to provide service to our public through the years to come with the ability to obtain resources to build a New Twisp Fire Station to house not only the fire apparatus, but possibilities of staff. This building would need to be large enough to provide living space, showers, and cleaning areas for firefighting gear. also provide office space and a larger training room. This building would need to meet the current building code.

Another need would be to have at least 20 members at all for our fires station to assist in incident response, this would help out in our response to our valley as it grows.

Project Priorities
Fire District 6 project priority would be looking to build their new Twisp Station. This would help with providing better use of the site. The need for new members is a very important need throughout our county. For District 6 this would help us in providing a 24/ 7 response to our ever-growing communities. Within these priorities the district would be looking to add a full-time secretary to do fire district work and put on 2 more career Firefighters to help with managing our departments many areas of response.

Okanogan County Fire District #7

District Summary

The district covers 33 square miles and is made up of orchards and other crops grown both within the valley area and on many of the low benches where irrigation water is available. The surrounding foothills are vegetated primarily by sagebrush and various lower growing grasses. Sparse ponderosa pine can be found in a few of the nearby draws.

The district provides coverage for the Town of Riverside (population 348) and is 100% volunteer with around 18 volunteers. The district responds to both structural and wildland fires.

Individual residents in the Tunk Valley have purchased land they hope will eventually house a small fire department. It should be noted that it is 28 miles of gradual incline from the beginning of Tunk Creek Road near Riverside to its culmination at Crawfish Lake; thus the response time for a neighboring fire department to respond to a fire in the upper extent of Tunk Valley could be significant.

Priority Areas

- **Residential Growth:** FD #7's growth is moderate to slow.
- **Communications:** FD #7 is tied into the County 911 response system and maintains interoperability with other districts and agencies.
- **Burn Permit Regulations:** None at this time.

District Needs

A new fire station with a classroom facility and an urban interface engine.

Okanogan County Fire District #8

District Summary
District encompasses 160,000 acres all on the Colville Indian Reservation. The district is bordered on the south by the Columbia River (Brewster/Bridgeport), east and north by Columbia River Road, and west by Highway 97. Borders by Brewster/Bridgeport near Smith Ranch (Wakefield/Cameron Lake) exit.

Population is approximately 350. The terrain is high plateau which breaks down to low elevations on all four compass points with scattered timbers, sagebrush and open grass areas. In addition, wheat field dominate approximately 15,000 acres mostly in central and south-central district.

The district has 30 active volunteer members who are nearly all red card trained. All members receive annual refresher training through DNR and have completed their annual first aid training.

District 8 is a wildland fire only unit – no structure capabilities exist. The district has eight Type 6 engines, one 3,000 gallon tender and one command vehicle.

Priority Areas
- **Residential Growth:** WUI with newcomers.
- **Communications:** The district is dispatched out of the County communications center and is adequate except for tone out issues.
- **Burn Permit Regulations:** Burn permits are issued by Mt Tolman, BIA.

Cooperative Agreements
Mutual aid agreements with Fire District #3 and Mt Tolman, BIA.

District Needs/Wish List
Tone out through county is sporadic; district doesn't use pagers due to terrain features – open to suggestions.

With small budget, ($12,000 annually) vehicle upkeep is a constant concern.

Okanogan County Fire District #9

District Summary
District #9 is about 64 square miles. It is made up of farms, ranches and open range lands. Structures are fairly scattered in most parts. The district does surround the Town of Conconully; however, the town has its own fire department.

FD #9 only has wildland fire equipment; the residents rely on the Town of Conconully Fire Department for structure protection within 5 miles of the town. For other residents, FD #9 has a mutual aid agreement with FD #3 for structure protection. FD #9 borders FS, BLM, DNR, and Washington Fish and Wildlife.

FD #9 is an entirely volunteer fire district with no paid staff and 23 volunteer fire fighters.

Priority Areas
- **Residential Growth:** Little to no growth within the last few years.
- **Communications:** FD #9 is dispatched by OCS Communication Center/Dispatch.
- **Burn Permit Regulations:** Burn permits through Okanogan County and WA Department of Natural Resources.

District Needs
A new fire hall is needed because the trucks are currently stored in a barn owned by Fish and Wildlife during the winter months. The barn has only one heated room big enough for our water tender and one brush truck.

The district needs a water tender, two brush trucks, and draftable mobile pumps.
FD #9 needs a repeater to improve the radio communications.

Volunteers need additional training; however, this is tough to do when all our members work 40 or more hours a week either on their own farms or regular jobs.

Okanogan County Fire District #10

District Summary

District #10 is about 36 square miles. It is made up of orchards, farms, ranches, open range lands and timber. Structures are fairly scattered in most parts. The district surrounds the unincorporated Town of Loomis.

The volunteers are responsible for both wildland fire and structure fire protection. FD #10 borders BLM, DNR, and Washington Fish and Wildlife. FD #10 is an entirely volunteer fire district with no paid staff and 13 volunteer fire fighters.

Priority Areas

- **Residential Growth:** Little to no growth within the last few years.
- **Communications:** FD #10 is dispatched by OCS Communication Center/Dispatch.
- **Burn Permit Regulations:** District 10 follows Washington DNR regulations.

District Needs

A new fire hall to replace the current fire hall in Loomis, which was built in 1963 and is in need of major repairs or replacement.

Update equipment, (i.e. water tender, newer brush trucks, etc.). Volunteers need additional training; however, this is tough to do when all our members work 40 or more hours a week either on their own farms or regular jobs.

Okanogan County Fire District #11

District Summary

Fire District #11 encompasses 71,040 private acres with approximately 550 citizens and an estimated 350 structures. The area is primarily mountainous with numerous drainages and adjoins approximately 300,000 acres of land not protected by any fire protection district.

Historically, the fire regime has been frequent, low-severity wildfires. Fire suppression, coupled with the various land management practices have led to overstocking of small trees and an excess of surface debris and brush. This has led to conditions with higher potential to result in frequent moderate to high-severity wildfires. The FD #11 area is fire prone with a high frequency of lightning ignitions in June, July, August and September. Additionally, there are frequent human fire starts throughout the region. The DNR Urban Interface Risk Assessment program has completed assessments on over 260 structures.

Approximately 30,000 acres of FD #11 is privately managed timber in need of fuels reduction caused by numerous developments with poor forest practice planning i.e., extensive ladder fuels from developments, dog hair thickets and logging slash. This greatly increases the risk of a severe wildfire event in FD #11 either from a lightning strike or human-caused fire.

FD#11 has one centrally located station (Fields Hall), and three 'satellite' stations located in the communities of Molson and Chesaw and at Rawhide Road (located at the junction of Molson and Chesaw Highways).

FD #11 is a completely volunteer fire district with 32 volunteer firefighters who are trained as basic structural and wildland firefighting. The majority of the red carded members are also Firefighter type 1 rated.

Priority Areas

- **Residential Growth:** The district continues to see unchecked development with urban interface neighborhoods. The district is made up of 20-acre parcels surrounded by large and small ranches, isolated mountain homes and cabins. Approximately 70% of land in North Central Okanogan County is under the governmental management of the USFS, WA DNR WA DFW, and the BIA.
- **Communications:** FD #11 is tied into the county 911 response system. The district has its own repeater on Buckhorn Mountain for a fire district tactical channel.
- **Burn Permit Regulations:** Permits are issued by DNR.

District Needs

The district has added a few newer model trucks to the fleet but still needs to continue to upgrade. The current Molson Fire hall and Rawhide hall are housing a pumper truck and brush truck each. But there is a need for a tender on the west side of the district. The nearest tender is located at the Fields Faire hall. In order to make this happen a new fire hall in the Molson Area would be required with a 3 bay station rather than a two bay.
The initial response engines will need to be equipped with rescue gear and extrication gear. Currently if an incident occurs that requires an occupant to be extricated Oroville fire has been toned out for mutual aid. The terrain of the district makes radio transmission difficult; the district added a repeater on Buckhorn Mountain to add a tactical channel, but the need for an additional repeater is needed to reach the west side of the district.

Okanogan County Fire District #12

District Summary
Located in Northern Okanogan County with approximately 9,702 private acres (15.76 square miles) in size and a population of 302 citizens. Tax revenue estimate for 2012 is $11,900. Assessed value real property is $19,358,095. The area within the district is mountainous with rock bluffs, valleys, and many steep drainages.

Okanogan Fire District #12 has one fire station located on Swanson Mill Road approximately in the center of the district. The district has one operation division primarily for the purpose of wildland fire suppression. Every firefighter is trained in current First Aid/CPR, but there are no qualified EMS personnel or equipment.

The district currently has 18 volunteer firefighters (no paid staff) and is governed by a three member Board of Commissioners. All of the officers and fire commissioners have many years of involvement with the district. With an average of 18 volunteers in total, all have some level of experience on large and complex wildfires. Most of the firefighters have received training to the woodland Firefighter 1 level. DNR red cards are kept current with annual refresher classes. A current certification in basic First Aid is required of all firefighters. There are two Single Resource Bosses with several others in training. While wildfire ready, the district lacks in training for structure fires. And, although the district responds to vehicle accidents within the district, personnel are not EMS trained or equipped.

All of Okanogan Fire District #12 is under governmental management by DNR, BIA, BLM, and is adjacent to the USFS.

The western boundary is bordered by Fire District #4, Tonasket, and Fire District #1, Oroville, in the Okanogan Valley. The elevation ranges from 1400 ft. at these boundaries to 3800 ft. on the north where DNR, BLM, and USFS properties border. The eastern boundary is a point approximately one-half mile west of Fancher Lake. The southeast roughly parallels the western side of the Antoine Canyon. The southern boundary traverses broken country to the southwest corner two miles west of Ellisforde.

A wide variety of fuel models exists within FD #12. The lowest elevations are in the south and west with a total gain of 2400 feet rising in the north and east half of the district. This creates an overall southern and western exposure. The fine low elevation grasses are typically dry enough to ignite easily by July. Sagebrush transitions into scattered ponderosa pine forests. This then becomes a complex mix with fir, tamarack and brush. This combination coupled with summertime upslope, up valley winds has historically created many fast moving large fires, very difficult to control. Roadways create the most significant firebreaks. Some overstocking and doghair thickets exist at various points along Swanson Mill Road. Water sources are limited/seasonal and widely scattered. Many water storage tanks are stationed on private lands throughout the district.

The area within FD #12 is fire prone with a high frequency of lightning ignitions in June, July, August, and September. Additionally, there are frequent human fire starts through the area. There are many absentee owners who frequent their property to recreate during the summer and hunting season. The lack of local fire danger knowledge adds to the human caused fires.

Priority Areas

- **Residential Growth:** The district is experiencing unchecked development of interface neighborhoods in mountains and valleys. Mountain homes and cabins are served by primitive county road and primitive auxiliary roads and driveways.
- **Communications:** The district is dispatched out of the County communications center.
- **Burn Permit Regulations:** Permits are issued by DNR.

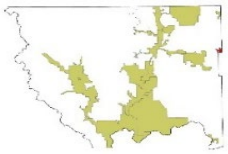
District Needs

An aging fleet of vehicles remains our primary limitation to responses. All but two of our engines are loaned/leased old military surplus. The district owns a 2000 Chevy ¾ ton and a 1995 Ford F-350 purchased through DNR/Military surplus. The district needs to upgrade our overloaded engines with newer vehicles which would be more reliable and would provide the safety margin required by law. In the last year, our water tenders have been upgrade, but they still require some maintenance work to get them fully operational.

The FD #12's fire station is limited by size (two bays) to housing three vehicles year round. This severely limits our response time and capability for approximately 6 months out of the year, when freezing weather becomes a problem. The fire station has no well. The only water on site is a 10,000 gallon tank for seasonal firefighting use. All of the FD #12's water sources are located out of the district. Another fire station better located with a well would provide the district with a water source within the district and storage for additional apparatus. This would also provide room for training and education.

Our district has a 2-watt VHF radio repeater for in-district communications. Due to the steep terrain, our communications has many gaps. While the district now has access to the North County fire repeater which offers better coverage, it is generally reserved for inter-district communications and cannot be used as a tactical frequency. FD #12 would like to apply for a FCC license to increase the power wattage of our 2-watt VHF repeater, in order to improve communications throughout the district.

Some of our truck radios and handheld radios are not capable of all of the required frequencies and should be upgraded to newer, more capable radios. Only some of our radios can communicate on the required National Interoperability channels as recommended by the Department of Homeland Security.



Okanogan County Fire District #13

District Summary
The Okanogan Fire Protection
District #13 is authorized and guided by Title 52 of the Revised Code of Washington for Fire Protection Districts. Its primary responsibility is the protection of structural improvements and developments on lands within its district. It also has joint protection responsibilities with the Washington State Department of Natural Resources for protection from wildland fires.

The fire protection district boundary generally coincides with that of the Republic School District #309, with the addition of an annexed portion extending westward from Ferry County into Okanogan County along the state highway route 20 corridor. The district's area is approximately 473 square miles with a population of approximately 2600 residents that increases seasonally.

Fire district staffing consists of:
- 35 – Firefighters (volunteer)
- 3 - Fire Commissioners (volunteer)
- 1 - District Secretary (part-time paid)
- 1 – Maintenance Worker (part-time paid)

The fire district is generally situated within the wooded valleys of the San Poil River and the Curlew Lake valley, including their tributaries. The valley bottoms are typically open and grassy where agriculture and development has cleared the forests. Uplands are generally wooded. Natural vegetation throughout the district creates a widespread Wildland/urban interface fire threat potential.

Approximately 1/3 of fire district values lie within the city limits of Republic, Washington with remaining values existing in the rural areas of the district.

The local area has an active fire history. Large wildfires have been documented throughout Okanogan County. When large fires occur, citizens are reminded of the threat to their homes, and awareness of hazard fuels peaks for a time. However, the mental vividness of evacuations, warning bulletins, and firefighters and equipment pouring into the community to render assistance dulls with time. It is important for residents to understand the vulnerability of living within dense vegetation where dry summers create the potential for catastrophic fire events.

Priority Areas
- **Residential Growth:** Fire prone developments in subdivisions surrounding Curlew Lake and up tributary creek drainages, and north of the City of Republic on Klondike Mountain.
- **Communications:** Establish another repeater for fire/EMS to cover the dead spots around the boundary area between Curlew Lake and Malo.
- **Fire Fighting Vehicles:** The district will need an additional structural engine for the planned satellite station on the west side of Curlew Lake. The district will need to upgrade the old tender stationed at the East Lake Hall. The tank leaks and the pump is too small for efficient use of the vehicle. Some of the older vehicles in the fleet are higher maintenance than the newer vehicles, and also do not provide as many efficiencies and safety features for firefighters as newer models that are up to the latest standards.

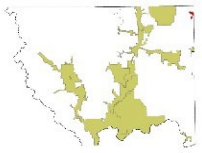
Replacement or refurbishment of older apparatus must be an ongoing program as funding opportunities develop.

- **Burn Permit Regulations:** The fire district does not administer a burn permit system. The fire district has relied upon a system established by the Washington State Department of Natural Resources (DNR) that allows outdoor burning under certain times of the year according to particular rules.

During times of the year when DNR burning rules are relaxed, usually early spring and late fall, the fire district is frequently called out to suppress escaped fires started by homeowners burning grass and debris. Escape fire incidents have a negative impact upon the time and patience of volunteer firefighters. The volunteers are willing to help those in genuine need when fire threatens the community due to accidental reasons, but their enthusiasm wanes when their personal lives are interrupted by fires that have escaped due to poor planning or carelessness. Because of escaped burning incidents, there is a need to develop further cooperation and education between local law enforcement and Fire Chiefs to cooperatively enforce current laws regarding reckless and negligent fire use.

Issues of Concern: The trend of dwindling industrial activity in the fire district will degrade the tax revenues over time. Poor economics will continue to be a limiting factor in providing adequate fire protection unless business and industry can be attracted to the area.

District Needs: Fire district leaders have developed a list of general issues and considerations that pertain to multiple neighborhoods or the district in general, which have been incorporated into the Chapter 5 of this document.



Ferry-Okanogan Fire Protection District #14

District Summary
Located in Northern Okanogan County with approximately 79,953 private acres (124 square miles) in size and a population of 1,700 citizens. The area within the district is mountainous with three major valleys and many steep drainages.

Ferry-Okanogan Fire Protection District #14 has one primary fire station located in Curlew and three satellite stations in the communities of Danville, Malo, and Toroda. The district has two operations divisions (fire and medical), and has a vehicle fleet of three ambulance units and 14 fire apparatuses. Every firefighter is trained in current First Aid/CPR, but there are no qualified EMS personnel or equipment. The district covers 206,000 acres, 322 square miles, in NW Ferry and NE Okanogan Counties.

The district currently has 30 volunteer firefighters and 23 volunteer EMS providers (no paid staff) and is governed by a three-member Board of Commissioners. All of the officers and fire commissioners have many years of involvement with the district. With an average of 30 volunteers in total, all have some level of experience on large and complex wildfires. Most of the firefighters have received training to the woodland Firefighter 1 level. DNR red cards are kept current with annual refresher classes. A current certification in basic First Aid is required of all firefighters. One commander is certified at Incident Command Type 3 and Division Group Supervisor.

Priority Areas
- **Residential Growth:** There continues to be unchecked development of interface neighborhoods in narrow, mountainous valleys. Small ranches and farms make up the majority of development in the larger valley bottoms and some upland areas. Isolated homes and cabins exist in the mountainous areas of the district.
- **Communications:** The valley is difficult place for effective communications. The topography makes radio communication spotty, and the district does not have cell phone coverage to fall back on. Firefighters in the field frequently need contact with people or organizations that are only reachable by phone. The district's own dispatch attempts to make that connection but because the district relies on volunteers, someone to fill that role is not always available. Topography enters into the communications problem again because reported fires are often not easy to spot, due to limited vantage points, and a lot of time can be wasted in getting eyes on them and then trying to calculate a way into that area.
- **Burn Permit Regulations:** The fire district does not administer a burn permit system. The fire district has relied upon a system established by the Washington State Department of Natural Resources (DNR) that allows outdoor burning under certain times of the year according to particular rules.

District Needs
The primary obstacle for obtaining wildland fire training is unpaid time commitments for the several weeks of required training at the ISC 230, 231, & 232 plus ISC 290 and leadership courses.

An aging fleet of apparatus is our primary limitation. The newest vehicle of our fleet is a 1999 F-450 Ford which came to the district surplus from the USFS Colville National Forest in 2005. Much of our heavy rolling stock is late 1960 vintage and up for replacement.

Additionally, the district currently has no water tenders on inventory. This is a gaping hole in our water transport and portable hydrant ability. We have recently acquired one surplus Kenworth tractor truck for building a tender but have not yet amassed the funding to do so.

While the primary station of the district is a new (2004/05) five bay facility located in the town of Curlew, the district is still in need of additional development of stations. The two bay, three apparatus station in Toroda (1998) is adequate for current needs. The single bay, single apparatus stations in Malo and Danville are much less than adequate for current needs. Stations similar to the Toroda station need to be built in both the Danville and Malo locations.

Douglas-Okanogan Fire District #15

District Summary
Douglas/OCFD #15 is located in southern Okanogan County and northern Douglas County in the rural areas surrounding the towns of Bridgeport, Brewster, Pateros and Methow. It borders the Columbia River from Wells Dam to Chief Joseph Dam. The fire service operates from stations in Brewster, Pateros, Methow and Rocky Butte on the Bridgeport Bar.

Previously known as OCFD #5, this district was formed in 1955 to provide fire protection service to the Brewster-Pateros and lower Methow Valley area of southern Okanogan County.
In 2005, the OCFD #5 merged with Douglas County Fire District's 6 and 7, creating the new Douglas/OCFD #15. The coverage area increased to include northern Douglas County including Bridgeport Bar area, Crane and Crane Orchard Road area and a large portion of Dyer Hill surrounding the town of Bridgeport over to the Central Ferry Canyon area above the Crane and Crane warehouses.

District 15 now covers over 250 square miles with a population of over 4,000 which expands during the agricultural season in the summer to as much as 10,000. We respond to all emergencies including structure fires, wildland fires, Vehicle collisions, rescues, as well as EMS.
The district is governed by a board of commissioners, which consists of five elected officials. The district has a paid fire chief and a part-time secretary. Commissioner meetings are scheduled for the second Monday of every month.

District 15 also owns and operates an ambulance service consisting of four full time EMT-I's and five response vehicles. The ambulance station is located at 412 Indian Ave. in Brewster.

Issues of Concern
District 15, as many other volunteer departments, is struggling to maintain an adequate numbers of volunteers. Work, family, society, time constraints, all are contributing factors. FD15 needs to transmission into a combination department with paid and volunteer firefighters or develop a volunteer recruiting plan that will entice locals to join.

District 15 also has facility needs. A station in the Alta Lake Golf Resort area with a staff of volunteers that can respond to fires in the ever-growing housing development of Alta Lake. More than 25 houses have been built there since the 2014 Carlton Complex fire. Also a station in Brewster. FD15 has outgrown the station in Brewster, owned by the City of Brewster. The district pays rent to house equipment there and have to store several apparatus in other locations due to the lack of space interior.

Communication is a concern. Okanogan County Sheriff's Dispatch, in which we are dispatched to emergencies from is converting over to an 800-megahertz format. Currently all our radios support VHF frequencies. Our partnering agencies also operate VHF radios. For us to continue mutual operations with our dispatch and our partnering agencies we will need dual ban radios that can support both formats. These costs are extensive.

Also as part of communications, the district's needs to have a way to educate and communicate with the public in an emergency or public notices, ie: reader boards at our stations or strategically placed in high traffic areas within the district.

Cooperative Agreements
Fire District 15 has agreements with all our neighboring fire and EMS agencies in both Okanogan and Douglas Counties, as well as, Chelan County. The district also has agreements with WA DNR, BLM, USFS, Washington Parks, Washington Fish & Wildlife and the Colville Tribe. We currently operate a "CO-OP" Type 5 wildland engine with the WA DNR South Okanogan Region.

Resource Needs
Volunteer Firefighters; Dual Ban Radios that can use both VHF and 800 megahertz frequencies.

Project Priorities

- **Communication:** Find the ability to continue communication with both our own dispatch (800 MHz) and other agencies running VHF. Also reader boards at our stations or strategically placed within the district to notify the public of emergencies, events, and education opportunities. This would be a good option to communicate with our citizens and those that travel through the area.
- **Volunteers:** Promote ways to entice new memberships or look at the possibility of a combination department (paid staff & volunteers
- **Facilities:** Options for building stations at Alta Lake and recruiting firefighters there as well as continuing to explore option to house apparatus in Brewster area.

Okanogan Fire District #16

District Summary
The Aeneas Valley is located in Northeast Okanogan County approximately 18 miles SE of Tonasket. District boundaries include all private land on both sides of the valley from Peony Creek road to just past the Aeneas Valley Road general store, encompassing approximately 51.5 square miles or 33,000 acres.

The general Aeneas Valley is a broad drainage running NW to SE with numerous smaller drainages dropping into the main valley from the surrounding mountains. The main valley floor at 2,200 - 2,600 feet is bordered to the east and west with mountains reaching up to 6,000. While the lower reaches of Aeneas Valley can be broad and open the topography is typically steeper and rugged approaching the higher elevations.

This topographic arrangement has multiple effects on fuels, demographics, infrastructure, landownership, and wildland fires (see topics below).

The valley floor is much denser in both structures and population with smaller parcels of land with easier access for fire equipment. The valley presents challenges with regards to both weather as well as an adequate water supply, especially in the higher elevations. There are also many isolated homes and cabins with difficult, often single road access and/or closely surrounded with heavy fuels. Most side roads are not maintained so access is, at best, difficult, and in the winter months it can be impossible. The district borders approximately 9 miles of the Okanogan National Forest. In the valley floor the vegetation ranges from grassland to smaller, isolated stands of Ponderosa pine. This trend continues as you move up in elevation, changing to a higher density of trees with 3,500' and up. The Northeast portion of the district borders the Okanogan National Forest with a very high density of ponderosa pines.

Aeneas Valley floor fuel composition is given to a mixture of timber plots, grazing pastures and irrigated agricultural lands. These are also a limited area of scrub brush and indigenous grasses. Stringers of timber extend into the valley floor from intersecting drainages. Both the lower valley area and the upper reaches of the surrounding mountains are dry site, fire prone landscapes.

Adjacent forests of ponderosa pine are intermixed with Douglas-fir and occasional western larch. These timber stands are often thick with heavy ground and ladder fuels. There is also a lack of management of these forested tracks leading to overstocking, unhealthy stands and fire prone conditions. At all levels grass and shrub fuels and needle cast are the primary fire carriers.

The Aeneas Valley is prone to lightning strikes throughout the dry-season summer months. With the rapid increase of population and structures the risk of human-caused fires is increasing. The Washington DNR Interface Risk Assessment program lists the Aeneas Valley as a high-risk area.

Priority Areas

- **Residential Growth:** One of the fastest growing areas in Okanogan County is the Aeneas Valley, which is a textbook example of the Wildland/Urban Interface (WUI). The population base is moving more towards retired couples building their retirement home. There are a few small, home-based businesses as well as those who commute to either Tonasket, Okanogan, or as far away as the West side of the state. The growth in the Aeneas Valley is well documented both by value through the Assessor's Office as well as building permits issued through the Okanogan County Building Department.

- **Communications:** The valley is a difficult place for effective communications. The topography makes radio communication spotty, and the district does not have cell phone coverage to fall back on. Firefighters in the field frequently need contact with people or organizations that are only reachable by phone. The district's own dispatch attempts to make that connection but because the district relies on volunteers, someone to fill that role is not always available.
  Topography enters into the communications problem again because reported fires are often not easy to spot, due to limited vantage points, and a lot of time can be wasted in getting eyes on them and then trying to calculate a way into that area.
- **Burn Permit Regulations:** Enforcement of fire regulations will remain the responsibility of the Department of Natural Resources and the Okanogan County Sheriff's office.
- **Manpower:** Being an all-volunteer organization the manpower available at any given time for an incident can be rather slim with a lot of the same people being repeatedly called upon to respond. In fact during the hot dry summer we tend to have the least amount of people available. Our goal is to have approximately 30 trained firefighters but we can't seem to get much above 20 at any given time. Because as is typical in volunteer organization, about 80% of the work is done by about 20% of the people. The loss of one or two key individuals can severely impact the ability of the fire district to adequately perform its duties.
- **Other:** Unless you're district has a very large tax base not only can't you hire full time employees, but you also cannot provide them with the necessary professional training needed. Seldom mentioned is the fact this problem extends onto the administrative side as well. For the commissioners on down, there are a multitude of RCW's and WAC's which seem to be written for large districts that have to be implemented and followed. Very little training, especially affordable training, is available to cover this area. This exposes the district, as well as the taxpayers, so potentially costly risk and litigation. People are stepping into roles for which they have no training and very little chance of getting it and being expected to perform flawlessly.

District Needs

Currently District #16 has 6 red-carded firefighters. The goal is to have all firefighters trained to NWCG level of FF2. Other goals include trained qualified Engine Boss/Incident Commander Type 4 or higher. The district's biggest challenge is recruiting volunteers from the resident population. Training is limited to available open classes provided by DNR and FS. Our current high training priority is getting our physically able firefighters trained to fight structural fires, complete with SCBA (which is a big financial challenge.)

District #16 is at its desired number of fire department vehicles, but most are 1990's vintage or older and are higher maintenance vehicles requiring more labor hours and therefore not as reliable. The district's goal is to upgrade vehicles and capacities as opportunities permit.

At this time there is not a district supplied place to park our entire fleet of fire apparatus out of the weather. Some equipment is stored at the homes of volunteers who have garage space available. The district has funded and built a small fire station with two bays for apparatus and a small training room. There is electricity but no running water nor septic. Water tanks on our apparatus are filled from the well of a volunteer who lives nearby.

Other needs: A big concern is the availability of an adequate water supply in the district and surrounding area. Therefore, the district needs multiple water tenders. Qualified drivers for water tenders is the most critical skill shortage the district has.

WA DNR West Zone Northeast Region Unit

Summary
Washington State Department of Natural Resources is the state's wildland firefighting force with more than 1,300 employees who fight fire on over 13 million acres of private and state forest land. The DNR has the primary protection responsibilities on private and state forest land throughout the State of Washington. The DNR may also respond to fires outside of DNR jurisdiction that threaten DNR protection. The DNR provides wildland fire prevention and regulation on private and state forestland. The DNR works cooperatively during suppression operations with the private sector, local protection entities, and other State and Federal agencies. The DNR does not provide formal EMT services. Most DNR employees have first-aid training and some, individually may have had EMT and/or first-responder training.

South Okanogan and Highlands Units
These units reside within the Northeast Region of DNR and makeup what is considered West Zone. The Northeast Region Office is in Colville, Washington. Both units within the West Zone cooperate and share equipment, personnel, and resources when initial attack resources are minimal.

The Northeast Region Interagency Communications Center (NEWICC)
NEWICC is the primary dispatch center for Northeast Region DNR staff, maintains lists of "call when needed" Faller Agreements and Heavy Equipment Agreements. Operators are equipped and trained for fire suppression throughout the local units.

DNR helicopter(s)
Helicopters are staged at the Omak Airport initially but can be diverted to other incidents within the state. The helicopter staged at the Omak Airport is usually a UH-1H with helitack crew. There is also a Type 1 helicopter on DNR contract available from a base in Electric City. The actual aircraft available tends to shift between a Blackhawk or K-Max, depending on contract award, and is also available to respond statewide.

DNR Fire Boss (SEAT on pontoons) aircraft
There are 2 Fire Boss aircrafts staged at Omak throughout fire season, generally starting around June 15th each year. The BIA also supports 1 Fire Boss out of Omak during the same time frame depending on fire conditions. For additional DNR contracted air support on larger fires, South Okanogan and Highlands units have access to 1 Air Attack out of Omak, 1 Air Attack out of Deer Park, 2 Fire Bosses out of Deer Park, 2 CL 415 Scoopers out of Wenatchee and/or Moses Lake, and 2 Q-400 Large Airtankers out of Moses Lake. Again while these resources are stationed in or in close proximity to Highlands and South Okanogan units, they are available as state wide resources and not tied to a specific unit or region.

The DNR South Okanogan Unit
This unit is located in the southwest quadrant of the Northeast Region of the State of Washington. The South Okanogan Unit spans more than 2,300,000 acres and is located geographically within the south half of Okanogan County. The unit is comprised of private, county, state, federal and tribal property ownerships with numerous jurisdictions. Within the unit there are approximately 185,900 acres of state land (including both WA DNR and WDFW managed lands), and approximately 490,000 acres of private land (including private lands within the Colville Reservation).

The South Okanogan Unit has a work center located at the Omak Airport and a remote office in Twisp. South Okanogan Unit Fire Control staff number 49 employees during the peak of fire season

between the Unit Bulldozers and Engine Program. Nine of these employees are permanent full-time employees consisting of 1 Fire Management Officer, 3 Assistant Fire Management Officers, 1 Fire/Prevention Technician, 2 Initial Attack Heavy Equipment Operators, and 2 Engine Leads. The remaining 40 employees are seasonal and comprised of 8 engine drivers and 32 firefighters. The seasonal employment duration for the positions is usually between mid-April and mid-October.

Other South Okanogan programs such as State Lands and Service Forestry also provide fire support during the season. DNR resources are neither trained nor equipped for structure suppression.
The South Okanogan Unit seasonally staffs 10 Type 5 engines. The engines are usually staffed with a four-person firefighting crew 5 days per week and are on offset schedules to provide 7 day a week coverage. Staffing levels vary as fire season begins and draws to an end. A strike team of engines (five engines and a dedicated supervisor) are requested to assist the unit with initial attack when very high or extreme predicted and/or current fire weather or the number of new starts could exceed the local unit's capacity.

The DNR Highlands Unit
This unit is located in the northwest quadrant of the Northeast Region of the State of Washington; and spans approximately 1,788,000 acres. Highlands Unit is located in the northern portions of both Okanogan and Ferry Counties; and is bordered on the north by Canada, on the south by the boundaries of the CTCR, on the west by the foothills of the Cascade Range, and on the East by the Kettle Range. The unit is comprised of private, county, state, federal and tribal ownerships with numerous jurisdictions and interests. Within the Highlands unit, in Okanogan County, there are approximately 230,000 acres of state land (including both WA DNR and WDFW managed lands), and approximately 590,000 acres of private land. Highlands unit also has about 26,785 acres of WA DNR-managed land located in Ferry County. Topographic variations range from 900' to 8,000'. Uplands are a mixture of very rugged, often rocky slopes giving way to either rolling highlands or partially timbered rounded mountains.

The Highlands Unit Fire Program has one work center at Highlands Fire Camp (HFC), two miles south of Loomis. Highlands state lands staff use a work center in downtown Loomis. The Highlands Unit Fire Control staff totals 66 individuals at the peak of fire season as part of either the Unit Bulldozer, Engine Program or the Highlands 20 Handcrew. Of those positions, there are 11 permanent employees consisting of 1 Fire Management Officer, 3 Assistant Fire Management Officers, 1 Handcrew Superintendent, 1 Handcrew Foreman, 4 Handcrew Squad bosses, 1 Fire/Prevention Technician, 1 Initial Attack Heavy Equipment Operator, and 1 Engine Lead.

The remaining 55 employees are seasonal and work from mid-April to mid-October. The Highlands 20 Hand Crew resides and trains at Highlands Fire Camp, until they are needed for fire response anywhere in the Unit or across the state. HFC also has a permanent Heli-spot and Fire Base Camp location. A strike team of engines (five engines and a dedicated supervisor) are requested to assist the unit with initial attack when very high or extreme predicted and/or current fire weather or the number of new starts could exceed the local unit's capacity. Other Highlands programs such as State Lands and Service Forestry also provide fire support during the season. DNR resources are neither trained nor equipped for structure suppression.

The Highlands unit engines are usually staffed with a four-person firefighting crew 5 days per week and are on offset schedules to provide 7 day a week coverage. Staffing levels vary as fire season begins and draws to an end. Both Highlands and South Okanogan Units respond to fire reports from five different dispatching centers, two of which are E-911(Ferry and Okanogan Counties). Both Units also have Incorporated and Unincorporated cities/communities that are experiencing growth into the Wildland Urban Interface. These cities/communities provide a multiplex of rural/urban interface neighborhoods developing in mountainous drainages within perennial fire ecology with a history of complex, costly wildfires.

WA Department of Fish and Wildlife

Summary
WDFW manages approximately 82,500 acres in Okanogan County and is comprised of 3 WLAs. The Scotch Creek WLA is located in central Okanogan County with the headquarters situated near the town of Conconully. Scotch Creek WLA encompasses nearly 24,000 acres and is split into seven management units. It was established in 1991 as a site to support the recovery of the region's sharp-tailed grouse population. The WLA is comprised of a variety of habitats including shrubsteppe, mixed conifer, ponderosa pine, as well as various riparian habitats mixed into the landscape as well.

The Sinlahekin WLA is also located in central Okanogan County with a headquarters located in the Sinlahekin Valley near the town of Loomis. This WLA is comprised of 7 units that total approximately 22,500 acres and the dominant habitat types are shrubsteppe, wetland, and dry forest, which support a range of different wildlife throughout the year, including over 215 species of birds, 60 mammals, about 20 reptiles and amphibians, over 25 fish, and over 90 butterfly species. The Sinlahekin is the oldest WLA in Washington, with the first parcels purchased in 1939 using federal Pittman-Robertson funds to preserve mule deer winter range.

The Methow WLA is located in the Methow River watershed in the western half of Okanogan County with its headquarters situated just outside the town of Winthrop. The Methow WLA is comprised of 8 units totaling roughly 36,000 acres. The area is dominated by a variety of habitats including shrubsteppe, grasslands, and ponderosa pine forests. Meadow-steppe habitats are also found here, and are characterized by wheatgrass, bluegrasses, and a rich component of broad-leaved forbs. Maintaining migration corridors and winter range habitat for the Methow Valley's migratory mule deer herds is the primary goal of most units, but other wildlife from songbirds to salmon also benefit. Many of the units border USFS land.

Resources

Scotch Creek WLA Headquarters Located Near Conconully
3 staff with Red Cards, 1 water tender (1200 gallons), 2 slip tanks for trucks (150 gallons & 70 gallons), and 2 UTV's with 50 gallon tanks.

Sinlahekin WLA Headquarters Located Near Loomis
3 staff with Red Cards, 1 water tender (1200 gallons), 2 slip tanks for trucks (100 gallons), and a skid steer with a dozer blade.

Methow WLA Headquarters Located Near Winthrop
3 staff with Red Cards, 1 water tender (1000 gallons), 3 slip tanks for trucks (50 gallons), 1 brush truck (300 gallons), 1 D3 Dozer, and 1 mini excavator.

Resource Needs
One of the primary needs at all 3 WLAs are new Bendix King radios for staff and trucks. Additionally, WDFW may be better able to assist fire suppression agencies if our managers were trained as Resource Advisers. Lastly, WDFW should partner with other agencies to accomplish cross boundary forest treatments.

Project Priorities
Our priority projects predominantly consist around forest health in the form of pre-commercial thinning, commercial thinning, and prescribed fire. Emphasis should be placed on forests that are overstocked, at high risk for intense fire behavior, and are located within the wildland urban interface.

WDFW Prescribed Fire Program Summary
The WDFW manages two prescribed burn teams, one located in Okanogan and the other burn team located in Yakima.

The prescribed fire program has statewide responsibilities for all WDFW lands to perform prescribed fire duties in all fuel types - grass, shrub steppe, wetlands, prairies, tidal flats, Oak savannas, forested areas. Within these areas the main objectives are to enhance wildlife habitat, ecosystem improvement, and wildfire reduction.

Resources at each Burn team location (Okanogan/Yakima)
All fire qualified personnel within WDFW follow NWCG standards for fire qualification. The prescribed burn program also follows NWCG standards for fire engines. Each burn team has:
1 - type 6, 400 gal. brush engine
1. - Fuels truck with 100 gal. slash fuel and supporting firing equipment for large burn operation.
1- Cache trailer out fitted with 8000' of hose and all supporting equipment for suppression or prescribed fire support
1 mini excavator with transport

Additionally, each burn team location (Okanogan/Yakima) has a large amount of hose, water delivery equipment, and firefighting tools to fully support two five hundred acre burns simultaneously.

Resource Needs
Filling vacancies has been the most difficult hurdle to overcome since Covid. The prescribed fire program has been doing an extensive outreach across the nation to fill but still seeing reduced numbers in applications.

WDFW is not a primary suppression agency and our current workload keeps us busy with prescribed fire, it is difficult to acquire necessary NWCG qualifications that require wildfire task to be completed. Without these tasks getting signed off it is difficult to complete the required qualifications for the position. Currently alternatives are being looked at to alleviate these needs through agreements, fire assignments, and other optional cross walks for qualifications while still meeting all NWCG protocols.

WDFW – Prescribed Fire Program staffing

Senior Staff:	**Each Burn team:**
Prescribed Fire Program Mgr.	Fire Unit Mgr.
Prescribed Fire Operations	Crew Supervisor
Two - Prescribed Fire Planners	Four - crew members

CTCR/Bureau of Indian Affairs

Colville Reservation Summary
The 1,392,265-acre Colville Indian Reservation is located in the north central portion of the State of Washington. The Reservation, the largest in the State of Washington measures approximately 35 miles north to south and 80 miles east to west. About 610,000 acres of the Reservation are in Okanogan County and 782,000 acres in Ferry County.

More specifically, the Reservation is bounded on the east and south by the Columbia River, on the west by the Okanogan River and on the north by the township line common to Townships 34 and 35 north of the Willamette meridian. Much of the Reservation is mountainous covered by conifer forest, but lands bordering the Okanogan and Columbia Rivers are arid and naturally covered with vegetation of steppe environments. About 1,023,700 acres of the Reservation are in tribal trust and the remaining lands are in a non-trust status (owned by private individuals or corporations).
The principal towns on the Colville Reservation are Nespelem, Keller, Elmer City and Coulee Dam in the central portion, Inchelium in the eastern portion, and East Omak on the western boundary. In addition to the Reservation communities, a large number of people live in more rural locations throughout the Reservation. This wildland urban interface with natural vegetation fuel complexes is increasing each year.

Mission and Priorities
Commensurate with the values at risk, wildfire losses will be held to a minimum through timely and appropriate suppression responses, the planned use of prescribed fire, cooperation with other protection agencies, and timely rehabilitation of burned-over land. Fire management activities including fire prevention, pre-suppression, suppression and rehabilitation will be planned, trained for, organized and executed to meet the tribes overall resource management objectives.
Project priorities are developed within the development and planning process of the Colville tribes while adhering to the tribes Integrated Resources Management Plan and associated documents.

Fire management activities covered in 53 BIAM 8.1, past and future supplements to this chapter pertain to forest and range wildfire and prescribed fire activities only. Structural fire protection and responsibility can be found in 25 BIAM Supplement 19.

Resource title and location

<u>Colville Tribal Fire & Rescue</u>
Provides structural and wildland fire suppression to developed areas of the Nespelem, Keller, and Inchelium Districts along with emergency medical services across the Reservation. Employs 20 full time staff. Resources from each station can be moved across districts to support an emerging incident.

Station 1—Nespelem
10 paid resources, 4 are wildland certified (2-3 personnel per shift)

- 1 Engine 1000 gallons
- 1 Ladder Truck 600 gallons
- 1 Tender 3000 gallons
- 1 Rescue Truck 400 gallons

Station 2—Inchelium
10 paid resources, 10 are wildland certified (2-3 personnel per shift)

- 2 Engines 750 gallons
- 1 Tender 3200 gallons
- 1 Rescue Truck 400 gallons

Paschal Sherman Indian School
Provides emergency response within the campus of Paschal Sherman Indian School. Personnel from the school's Facilities Dept. are responsible for fire suppression activities.

Fire Hall—St. Mary's Mission (Omak)
3 paid resources

- 1 Engine 1000 gallons

Mount Tolman Fire Center (wildland fire)
There are three wildland fire districts within the Colville Reservation: Inchelium, Keller, and Omak/Nespelem, with a total of 188 red carded individuals. The firefighting personnel fall within multiple programs within the Colville Tribal Division of Natural Resources. The resources within each district can be moved to other districts to support an emerging incident.

Inchelium Wildfire Management District: Inchelium Sub-Agency

- 3 type VI engines
- 1 type III dozer

Omak/Nespelem Wildfire Management District: Colville Indian Agency (Nespelem)

- 3 type VI engines
- 1 type III dozers

Omak/Nespelem Wildfire Management District: St. Mary's Mission (Omak)

- 1 type VI engine
- 1 type III dozer

San Poil Wildfire Management District: Mount Tolman Fire Center Headquarters (Keller)

- 2 type IV engines (on standby)
- 3 type VI engines
- 1 type III dozer

Cooperative Agreements/Mutual Aid

In order to facilitate coordination of all pre-suppression, and suppression activities on the Colville Reservation the Bureau of Indian Affairs Fire Management and Colville Tribes Emergency Management has entered into agreements with the following agencies to provide logistical and operational support during a wildland fire:

- County Fire Districts:
  - Okanogan Dist. 2 Elmer City
  - Okanogan Dist. 3 Rural Omak, Rural Okanogan, Malott
  - Okanogan-Douglas Dist. 15 Bridgeport, Monse
  - Okanogan Dist. 7 Riverside
  - Okanogan Dist. 8 Cameron Lake
- Bureau of Reclamation Fire Dept.
- City of Grand Coulee Fire Dept.
- City of Okanogan Fire Dept.
- City of Omak Fire Dept.
- Electric City Fire Dept.
- Town of Coulee Dam Fire Dept.

There is a "Master Cooperative Fire Protection Agreement" that expands fire suppression capabilities between the Colville Tribes and:

- United States Department of Interior
  - Bureau of Land Management, Oregon and Washington
    - Spokane District
  - National Park Service, Pacific Northwest Region
    - North Cascades National Park/Lake Roosevelt National Recreation Area
  - Bureau of Reclamation, Columbia-Pacific Northwest Region
    - Grand Coulee Dam
- United states Department of Agriculture
  - U.S. Forest Service, Pacific Northwest and Northern Regions
    - Colville National Forest
    - Okanogan-Wenatchee National Forest
- State of Oregon
  - Department of Forestry
- State of Washington
  - Department of Natural Resources

This agreement requires a local operating plan to be developed and updated between all cooperators annually. A copy of the complete agreement is available for review and reference at the Fire Dispatch Office. It is recommended that the Fire Management Staff annually review their cooperative Agreements and annual operating plans to make sure they are adequately covering areas of potential joint responsibility and cooperation.

USFS – Colville National Forest
Tonasket Ranger District

Summary
The Colville National Forest encompasses roughly 1.5 million acres of forested land in Northeast Washington State. Ranging from the Canadian border to the border with the Colville Indian Reservation to the South and Borders Idaho to the east and the Okanogan Wenatchee National Forest to the West covering portions of Okanogan, Ferry, Stevens, and Pend Oreille Counties. It is comprised of 4 ranger districts with the Tonasket Ranger District being the only ranger district from the forest located in Okanogan County.

The Tonasket Ranger District covers 415,000 acres, including a small northeastern corner of the Pasayten Wilderness. It extends from the Canadian American border south to the Methow Valley-Lake Chelan Divide; and from the Cascade Range east to the Okanogan-Ferry County line. Over half the district borders the CTCR reservation.

The Tonasket Ranger District's primary fire protection responsibility is to the Colville National Forest lands located in Okanogan County and extends to the rest of the Colville National Forest as incident or prescribed fire needs dictate. Secondarily our fire protection responsibility extends regionally and nationally to National Forest System lands across the country. Tonasket fire suppression resources are available nationally to respond to large incidents, bolster fire suppression resources in other areas during times of severe fire danger, or to assist other federal agencies with prescribed burning so long as we maintain adequate resources to protect Colville National Forest lands. Additionally, through statewide and local cooperative agreements with the WA DNR, BIA, BLM, NPS, USFWS, and a majority of the Okanogan County fire protection districts that border Colville national forest lands, Tonasket Ranger District fire resources will respond to other jurisdictions as requested or to suppress fires threatening Colville National Forest lands.

Resources

Tonasket Ranger District Resources Located in Tonasket WA
The Tonasket Ranger District's fire and fuels management organization consists of two Type 6 fire engines staffed with five firefighters each, a ten person fire suppression module, a fire management officer, one operations and one fuels assistant fire management officer, a fuels planner, two fuels technicians, and a fire prevention technician. Other fire suppression qualified "militia" personnel are generally available at the district but numbers vary year to year.

Republic Ranger District Resources Located in Republic WA
Two type 6 engines staffed with 5 personnel, a 10 person fire suppression module, a fire management officer, a fuels assistant fire management officer, an operations fire assistant management officer, and two fuels techs are also available to respond from Republic Washington Located East of Tonasket on the Colville National Forest in Ferry County.

Three Rivers Ranger District resources located in Kettle Falls WA
Two Type 6 engines staffed with 5 personnel, a 20 person type 2 IA crew, a fire management officer, a fuels planner, an operations assistant fire management officer, a fuels assistant fire management officer, and three fuels techs are available to respond from further east on the Colville National Forest located in Kettle Falls WA in Stevens County.

Kaniksu Fire Zone resources located in Newport WA
A type 3 fire engine and a type 6 fire engine both staffed with 5 people, a 10 person fire suppression module, a fire management officer, a fuels planner, an operations assistant fire management officer, a fuels assistant fire management officer, and three fuels techs are available from the furthest east zone of the Colville National forest located across Newport and Sullivan Lake in Pend Oreille county.

Aviation Resources
The Colville NF has a dedicated air attack platform staffed out of Deer Park and generally orders either a type 3 or type 2 "Call when Needed" helicopter during the heat of fire season which is usually staffed out of Deer Park as well.

Other Resources
Additional Resources are available to the Colville National Forest/Tonasket Ranger District as ordered through NEWICC (Northeast Washington Interagency Coordination Center). This includes contract and agency heavy equipment, engines, crews, fallers, overhead and other incident support personnel and supplies.

Project Priorities
Wildfire related projects primarily consist of mechanical and prescribed fire fuels reduction projects on Colville National Forest lands. Where treatments occur and the type and intensity of treatments are prioritized by proximity to critical values and the value's current level of wildfire risk. Some examples of critical values include urban interface, critical infrastructure such as major transportation corridors, power transmission lines, and communications infrastructure. Natural resource values such as watersheds, old growth timber, and threatened and endangered species habitat among other values are also considered in our prioritization. The Colville National Forest has a 20 year plan that identifies project areas where ecosystem restoration and wildfire risk mitigation work will occur and the year in which that work will start. Projects outside of fuels management include fire prevention outreach to the general public through information booths and other outreach methods at various public events in Okanogan County.

USFS – Okanogan-Wenatchee National Forest Methow Valley Ranger District

Summary
The Okanogan-Wenatchee National Forest encompasses 3.8 million acres in Central Washington State from the Canadian border south to the Yakama Indian Reservation, and from the crest of the Cascades east to the Colville National Forest on the northeast end, and generally where forested land stops along the remainder of the eastern border.

It has significant land in Okanogan, Chelan, Kittitas, and Yakima counties, and administers smaller portions of land in Skagit and Whatcom counties for the Mount Baker-Snoqualmie National Forest. It is comprised of 6 ranger districts with the Methow Valley Ranger District being the only district located in Okanogan County.

The Methow Valley Ranger District encompasses 1.3 million acres including land in Okanogan, Chelan, Skagit, and Whatcom counties as well as the majority of the Pasayten Wilderness. It includes all Forest Service land within the Methow River watershed, as well as the Forest Service land accessed by highway 20 west of Washington Pass in Chelan, Skagit, and Whatcom counties up to the border with North Cascades National Park.

The Methow Valley Ranger District's primary fire protection responsibility is to the district as well as the BLM land in the Methow Valley. Fire resources are available for fire and all-risk response nationally depending on local needs and priorities. The district has a strong commitment to assist DNR and county fire districts with fire response within the Methow Valley through cooperative agreements.

In 2022 The Okanogan-Wenatchee National Forest was selected as one of 10 initial investment landscapes as part of the National Wildfire Crisis Strategy, leading to the launch of the Central Washington Initiative (CWI). The CWI landscape encompasses 3,116,000 acres total (2,099,000 acres of National Forest System land and 1,017,000 acres of other federal, state, tribal, private, lands) within Chelan, Okanogan, Kittitas and Yakima counties.

Resources

Methow Valley Ranger District – Winthrop, WA
The Methow Valley Ranger District fire management organization consists of one type 3 fire engine, one type 6 fire engine, a 25 person type 2 initial attack handcrew, a fire management officer, a fuels planner, a suppression assistant fire management officer, a fuels assistant fire management officer, six fuels technicians, a fire prevention technician, and a fire lookout on Leecher Mountain.

Other districts on the Okanogan-Wenatchee National Forest
Each of the districts on the forest (Naches, Cle Elum, Wenatchee River, Entiat, and Chelan) have a very similar organization to the Methow, though most districts staff type 3 engines, and Entiat hosts an Interagency Hotshot Crew – which is a national resource with no local initial attack or fire management responsibility.

Aviation Resources
The Okanogan-Wenatchee National Forest has a smokejumper base in Winthrop with one jump plane and targeted staffing of 30. The Wenatchee Valley Airbase is located in East Wenatchee and has a type 1 helicopter, a type 2 rappel platform, a type 3 shorthaul platform, and a type 3 standard

helicopter with targeted staffing of 35 rappellers and 10 shorthaulers. There is an exclusive-use air attack platform based out of East Wenatchee. The Moses Lake Airtanker Base is capable of loading LATs and VLATs, though number and size of tankers at the base are highly variable based on local and national fire activity.

Project Priorities

Fuels reduction projects on the Methow Valley Ranger District are concentrated on areas that haven't burned in the last twenty-five years that are outside of wilderness. We have current, on-going work in the Libby Creek and Buttermilk drainages. Planning is nearing completion for the unburned land in the Twisp River drainage, and planning is starting for projects in the upper Methow Valley surrounding Mazama. Our goals are to reduce potential for fire to spread across jurisdictional boundaries and to reduce the impact of wildfire on the national forest lands to reduce impacts to communities during and after a fire.

Bureau of Land Management (BLM)

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, Chelan County FDs #1, 3, 6, Douglas FDs #3, 4, 5, 15, Okanogan FD 6.

Okanogan Conservation District

Summary
Practicing Cooperative Conservation Since 1940, The Okanogan Conservation District is a non-regulatory agency and has the mission to help cooperating land managers achieve their conservation goals. Okanogan CD is a sub-division of Washington State government formed under Chapter 89.08 of the Revised Code of Washington.

Conservation Districts (CDs) in Washington State work to develop programs that assists voluntarily landowners and others with conserving all natural resources. Conservation Districts are governed by a Board which consists of five volunteer supervisors; three elected by the local community and two members who are appointed by the Washington State Conservation Commission (WSCC). Three of these members must be directly involved in farming, ranching, or another natural resource industry.

Okanogan CD is bound by the Canada–U.S. border to the north, the crest of the Cascade Mountains to the west, the Columbia River to the south, and the Okanogan-Ferry County boundary line to the east. The district boundary consists of unincorporated Okanogan County, the Colville Reservation, and the incorporated cities and towns that have annexed into the district.

Okanogan CD is primarily grant funded through federal and state sources but also receives funding from private and local sources. The policy and direction of the district is determined by the Board of Supervisors. The district works collaboratively on the ground with local landowners and agricultural users within the district's boundary to care for our natural resources and meet conservation goals.

Issues of Concern (specific to wildfire preparedness)
Okanogan CD's issues of concern are far reaching and cover all those of Okanogan County's residents. The district has been heavily involved with wildfire resiliency and recovery efforts since 2014, primarily, focusing on supporting forest health efforts on private lands to enhance fire resiliency, increasing community resilience for wildfire, and working to recover agricultural infrastructure needs and landscapes in the aftermath of fire.

Programs
Wildfire Resiliency
Resources and information on wildfire protection and resiliency are available, and if requested, the district can schedule a site visit to evaluate your property for wildfire risk. Home risk assessments are free of cost and are available for pre-construction sites or existing homes. Okanogan CD partners with other local agencies and NGOs including WA DNR and OCLTRG to perform these individual and community risk assessments to address wildfire resiliency challenges regarding individual homes, the neighborhood and beyond. The district also partners with WA DNR to implement the NFPA's Firewise USA® program in Okanogan County.

Home-hardening efforts are encouraged to ensure that your home has the ability to defend itself from fire hazard. This might include the use of metal thresholds, 1/8-inch metal screen on windows and vent to prevent ember entry, and the development of defensible space. When available the

district can financially assist cooperators through cost-share programs to install these practices, and to implement forest health projects to reduce fuels and address other conservation concerns.

Okanogan CD can also provide technical assistance and resources related to project planning for agricultural users looking to implement projects related to livestock watering systems, grazing management, irrigation efficiencies, virtual fencing, and other practices that can assist in fire resiliency and fire recovery on agricultural lands.

Wildfire Recovery
Okanogan CD works with local partners to coordinate efforts to recover natural resources and infrastructure loss that occurs from wildfire. The district's recovery program is focused on the recovery of agricultural infrastructure like livestock fencing, watering systems, and shelter belts.

If requested, district staff can provide post-fire assessments to identify immediate and long term-hazards such as hazardous trees, erosion issues, and areas at risk of post-fire debris flows or flooding. When available, the district may be able to provide cost-share for qualified post-fire projects such as restoration planting projects, reseeding, or the replacement of agricultural fencing, watering facilities, and other infrastructure.

Air Quality
Okanogan CD coordinates with local partners, HOA communities, municipal public works, cities and towns, the Okanogan River Airshed Partnership (ORAP), and Okanogan County to offer alternatives to burning for cleaner air and fuels reduction. These efforts include seasonal chipping events, vegetation disposal, and clean-up days for individuals, communities, and cities and towns across the county.

Resource Needs
While the district is a sub-division of the state government, it is primarily funded by grants. Wildfire centric funding resources can vary wildly in availability and scope. Having consistent and predictable funding sources for post-fire recovery, which is often reactive and slow moving compared to economic and environmental realities, is essential for future district operations and those of many of its partners. The scale of need in Okanogan County is constantly increasing, and proper funding is essential for a wildfire-resilient future.

Project Priorities
- Ensure that the CWPP is an active part of future planning for wildfire resiliency and recovery in Okanogan County.
- Provide technical assistance to cooperators wanting to learn how to protect themselves and their communities from negative wildfire impacts.
- Provide cost-share assistance for qualified forest health, wildfire resiliency, and wildfire recovery projects.
- Provide and enhance wildfire education and outreach efforts, resources, and trainings to local communities and partners.
- Push for permanent state level fire recovery and home hardening funding resources in Okanogan County and beyond.
- Communicate wildfire resiliency and recovery needs and concerns to local, state, and federal decision-makers.

Conservation Northwest

Summary
Conservation Northwest has over 4,000 annual supporters and over 18,000 active volunteers and supporters. Our mission is to connect, protect, and restore wildlife and its habitat across the Northwest. Since its founding in 1989, Conservation Northwest has actively participated in land management decisions in Okanogan County for over 20 years.

In Okanogan County, our organization is represented by four individuals, two from the Forest Field Team and two from the Sagebrush Heritage Program. The division of labor between each team follows land management activities conducted in forested landscapes and rangeland, respectively. For the purpose of the CWPP, Forest Field Team member Matthew Danielson will represent our organization.

Resource Needs
Conservation Northwest needs partners to support and collaborate with us to accomplish its mission. Despite being out in the field and helping influence land management, we do not have the personnel or land to conduct fuel reduction treatments ourselves. We can help facilitate, monitor, review, and develop a lot of the work, but like the public, we will depend on land managing agencies to carry out our interests into fuel reduction and wildfire mitigation planning, prescribing, and implementing.

Project Priorities
Our organization prioritizes the equitable distribution of wildfire work, supporting fuel reduction treatments where communities are at risk the most economically and from wildfire. We support wildfire mitigation techniques that decrease wildfire risk over the long term, and we prioritize historical ranges of variability in wildlife populations, forest structure, and vegetation diversity as indicators of forest health.

Smoke policy and management is a priority for our organization. Conservation Northwest advocates for planning when we want smoke through prescribed and managed burns, not accepting when we get it from summer wildfires during extreme weather events.

Clean Air Methow

Summary
Clean Air Methow is a project of the Methow Valley Citizens Council that seeks to create solutions for a sustainably clean airshed and "breathing room" for everybody. Clean Air Methow's scope focuses on the intersection of environmental health and smoke from wildfires, prescribed burning, and residential and agricultural burning.

Public Health
Our work turns to supporting the community in staying safe and healthy in heavy smoke, and promoting fire safety and burn bans. Prolonged episodes of unhealthy smoke exposure such as experienced in the Methow Valley the last several years are increasingly appreciated as true natural disasters. Accordingly, disaster preparedness and response planning are critically needed, utilizing existing infrastructure and developing new systems to help communities cope with several weeks of unhealthy air quality. A concept termed, "Smoke-Ready Communities" has emerged, and defines a community that can adapt to live safely with smoke.

Organization Needs

- Low-cost outdoor monitors throughout Okanogan County
- Low-cost indoor air monitors
- DEPA air purifiers or low-cost box fan air purifiers with MERV-13 filters
- N95 masks
- Air Resource Advisors for Okanogan County wildfires

Project priorities
Public health project priorities consist of reducing wildfire smoke exposure to the communities in Okanogan County. First and foremost, this involved creating clean indoor air spaces through air purifiers. Low-cost monitors provide residents in Okanogan County with a simple and quick way to determine levels of some air pollutants and help them identify when to take actions to improve indoor air quality. Additionally, low-cost indoor air sensors serve as invaluable comparisons for people to see the effectiveness of their indoor air cleaning techniques.

During smoke events, the presence of an Air Resource Advisor (ARA)is another invaluable resource. ARAs are technical specialists that are trained to work on smoke issues from wildland fire. They are deployed nationwide during large smoke events. Air Resource Advisors are dispatched to an incident to assist with understanding and predicting smoke impacts on the public and fire personnel. They analyze, summarize, and communicate these impacts to incident teams, air quality regulators, and the public.

Okanogan County Long Term Recovery Group

Summary
Our organization began as the Carlton Complex Long Term Recovery (CCLTR), which was formed in response to the largest wildfire in Washington State history. It was created to collaborate with and provide coordination and recovery services to those individuals, families, businesses, and communities that are adversely impacted by disaster across Okanogan County. The CCLTR mission also includes efficient planning for strategic investments and actions to ensure that Okanogan County and its communities are better prepared for future disasters.

Following the 2015 wildfire season, the CCLTR became known as OCLTRG (dba: Okanogan County Long Term Recovery Group). The recovery efforts then expanded beyond the footprint of the Carlton Complex Fire to include all of Okanogan County, as well as the neighboring counties of Chelan, Douglas, Stevens and Ferry. While the OCLTRG relies heavily on the efforts and contributions of many, the core team consists of full-time staff members. Since 2014, our team, along with numerous volunteers, donors, partner organizations and former staff members completed site visits on over 1.1 million acres of land, replaced 49 homes in the Rebuild Program (with 100% non-governmental funds), opened case management for over 1,900 cases and assisted families with managing their Disaster Recovery Plans.

Current Resiliency and Preparedness Programs:

- Sign To Save - free emergency address signs
- Map Your Neighborhood - support to organize neighborhood response programs
- Wildfire Ready Neighbors Assessments and Support
- Fire Strong Workshops

During any future disaster, our Disaster Case Management, Volunteer Coordination, Reconstruction Project Management Service programs would also be activated.

Our services have expanded to include community involvement, resilience, preparedness, and mitigation regarding wildfire and other disastrous events that may occur in our service area. Currently, we are collaborating with the following partners:

WA EMD.	Washington State Emergency Management Department
OK EMD.	Okanogan County Emergency Management Department
WAFAC.	Washington Fire Adaptive Communities
DLT	Disaster Leadership Team
FAM.	Fire Adaptive Methow
VOAD	Voluntary Agencies Active in Disaster
FEMA	Federal Emergency Management Agency
DNR	Department of Natural Resources
TODRT	Tonasket/Oroville Disaster Relief Team
PBCRC	Pateros/Brewster Community Resource Center

5. Mitigation & Adaptation Recommendations

5.a. Becoming a Fire Adapted Community (FAC)

It is recommended that Okanogan County, HOAs, neighborhoods, and residents embrace the concept of Fire Adapted Communities (FAC), which is defined by the National Wildfire Coordinating Group as "a human community consisting of informed and prepared citizens collaboratively planning and taking action to safely coexist with wildland fire." This concept can guide residents, fire practitioners, and communities through a holistic approach to becoming more resilient to fire (*Figure 5.a.1.*).

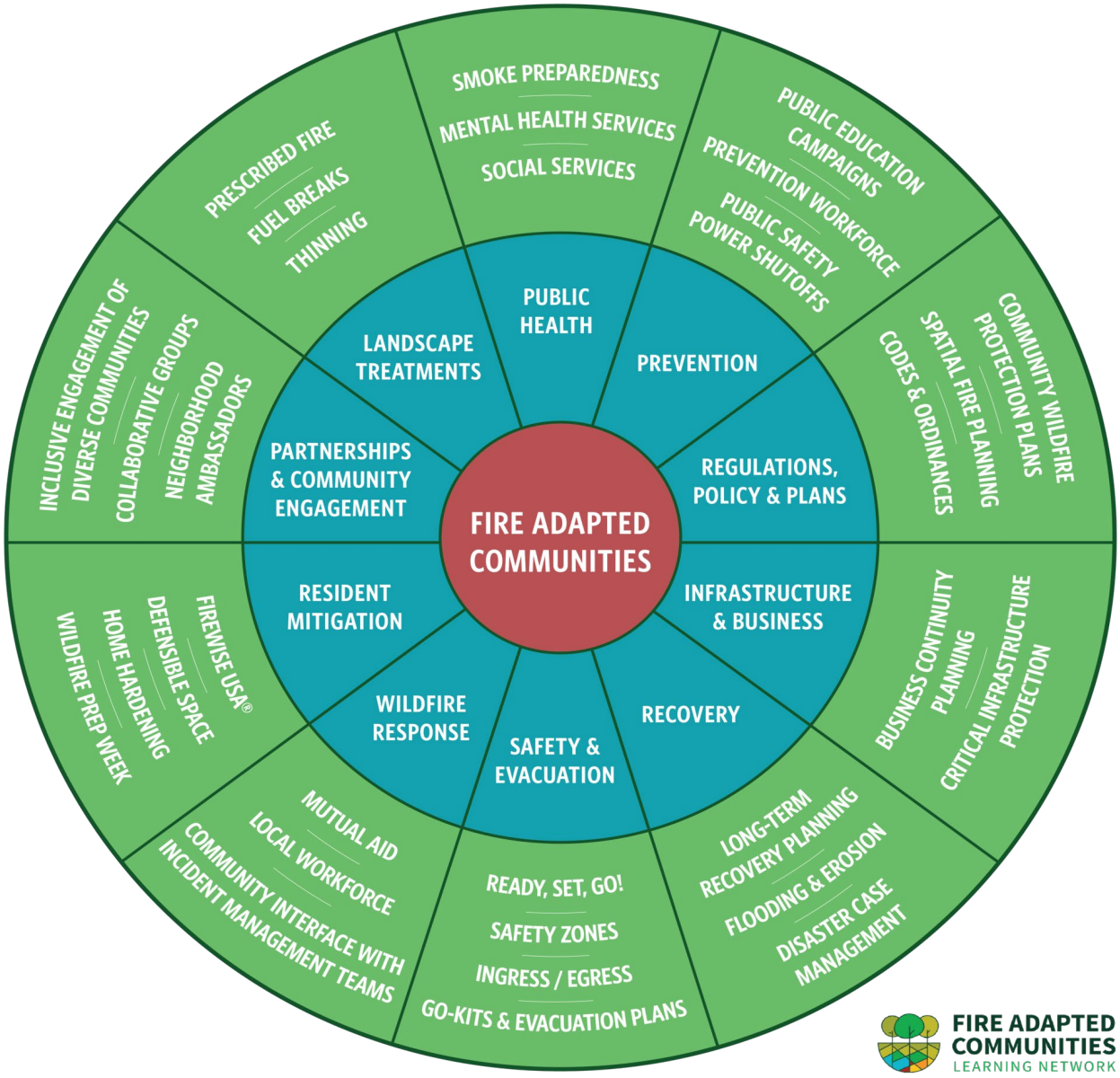


Figure 5.a.1. The Fire Adapted Communities graphic provides specific programs and activities that communities can take part in to help reduce their wildfire risk and increase their resilience.
(Source: FAC Learning Network, nd)

The CWPP sets the stage for fire adaptation, and the next step is on-the-ground action and an ongoing commitment to risk mitigation at all levels of the community, from individual homeowners to neighborhoods and HOAs to Okanogan County, to land managers and other partners. This section of the CWPP includes recommendations and resources for mitigating wildfire risk and enhancing emergency preparedness. Okanogan County and public land managers have an important role to play in implementing the recommendations in this CWPP, and they have made commitments to take on-the-ground action as outlined in Chapter 6.

Individual homeowners, neighborhoods, and HOAs also have a vital role to play in addressing shared wildfire risk. Action and community-building centered around mitigation have reduced wildfire risk and increased community resilience across the mountain west. Mitigation work by residents can spur mitigation by their neighbors (Brenkert-Smith et al. 2013).

The cumulative impact of linked defensible space across private properties can improve the likelihood of home survival and protect firefighters during wildfire events (Jolley 2018; Knapp et al. 2021).

There are many paths to becoming a FAC, certification as a Firewise USA® site by the NFPA is a popular option among over a dozen communities in Okanogan County. Firewise USA® recognition provides recognition provides a collaborative framework to help neighbors in a geographic area get organized, find direction, and resources, such as assistance form WA DNR and OCLTRG, to take action to increase the ignition resistance of their homes and community and to reduce wildfire risks at the local level. The Firewise USA® program, administered nationally by the NFPA and cosponsored by the USDA Forest Service and National Association of Foresters, is jointly administered at the county level by the Okanogan CD and WA DNR.

Recognized sites work hand in hand with state and federal agencies to reduce wildfire risk. Okanogan's oldest Firewise USA® site, Chiliwist, was established in 2013 and was heavily impacted by the 2014 Carlton Complex Fire. The collaborative approach to addressing community-level wildfire concerns, including managing fuels and evacuations (such as developing phone trees and other communication tools), was credited by several residents for saving lives during the evacuations that occurred during Carlton Complex.

While Firewise USA® site recognition is a means of gaining a formal acknowledgment of a community's wildfire resiliency work, there are many informal means of achieving greater wildfire resiliency.

Figure 5.a.2. Eight years after the Carlton Complex Fire, the Chiliwist area is in full swing of its ecological recovery, and its active community members work to maintain Firewise USA® site certification and ensure that recovery from the last fire is resiliency for the next. (Source Source: Aaron Nepean, Cutboard Studio, 2022)

5.b. Individual Recommendations

Mitigate the Home Ignition Zone (HIZ)

During catastrophic wildfires, property loss happens mostly due to conditions in the HIZ. The HIZ includes your home and other structures (e.g., sheds and garages) and the area within 100 feet of each structure (extended out to 200 feet, depending on slope). Firefighter intervention, adequate defensible space, and home hardening measures are common factors for homes that survive major wildfires (IIBHS 2019; Maranghides et al. 2022). Research following the 2018 CA Camp Fire showed that homes were more likely to burn down when they were close to other structures that had also burned when they had vegetation within 100 meters (328 feet) of the home, and when they had combustible materials (firewood, propane tanks, tires, old lumber, etc.) near the home (Knapp et al. 2021).

You can increase the likelihood that your home will survive a wildfire and help protect the safety of firefighters by creating defensible space, replacing, or altering building materials to make your home less susceptible to ignition, and taking steps to increase firefighter access along your driveway.

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 WUI communities and can cause substantial property loss. Neighbors can increase their homes' chances of survival during a wildfire if they work together to reduce hazards in their overlapping defensible space and ensure that all structures are hardened. An isolated structure at the edges of the WUI can potentially survive alone

if mitigation in the HIZ occurs and home hardening practices are implemented. However, as structures and properties become more densely packed, coordination between property owners is required to reduce the mutual risk. This is especially true when the area within the three zones, which are explained in detail in table 5.b.1, overlaps multiple ownerships.

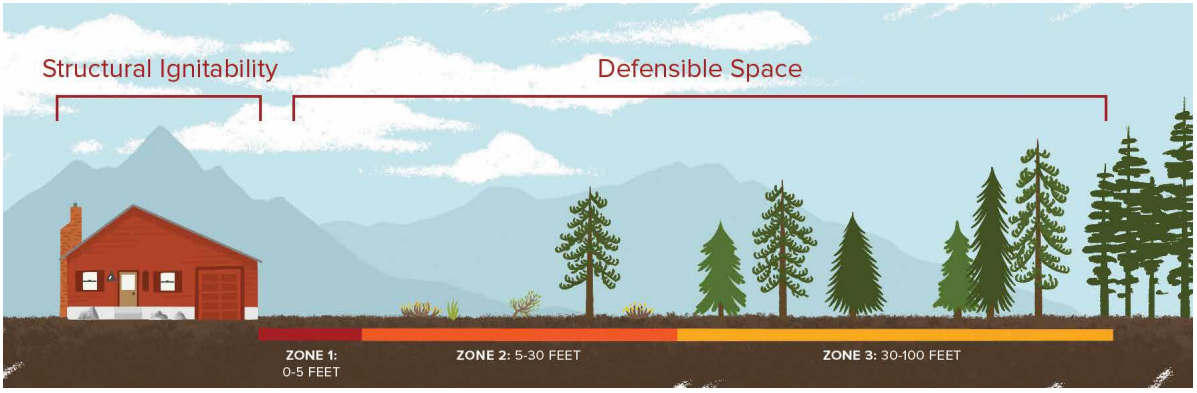


Figure 5.b.1. HIZ graphic displaying the distance between zones.
(Source: Bonnie Palmatory, Colorado State University, nd)

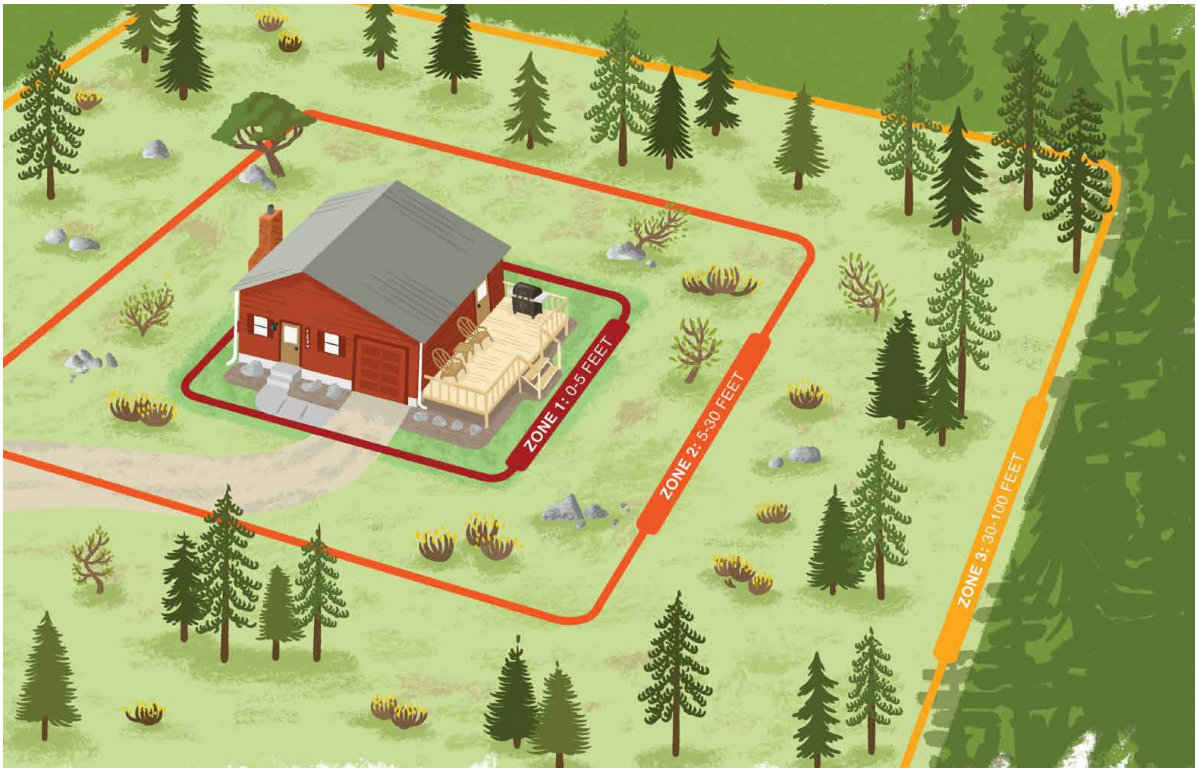


Figure 5.b.2. HIZs recommended by fire management agencies. Using ignition-resistant building materials and removing burnable fuel around primary structures and outbuildings such as sheds and campers/RVs is crucial for increasing your home's chance of surviving a wildfire and creating safe conditions for wildland firefighters.
(Source: Bonnie Palmatory, Colorado State University, nd)

Fortunately, many residents in Okanogan County have already started taking actions to mitigate their home ignition zone (Figure 5.b.2.). For example, 80% of residents who responded to the CWPP survey have removed trees or low limbs on their property, and about ¾ of residents annually remove debris from around their homes. Only around ½ have replaced their roofs with less flammable materials, but most newer homes in Okanogan County already have ignition-resistant roofs. Residents should follow the defensible space and home hardening recommendations outlined in the following sections to increase the chance that their home can stand alone against a wildfire.

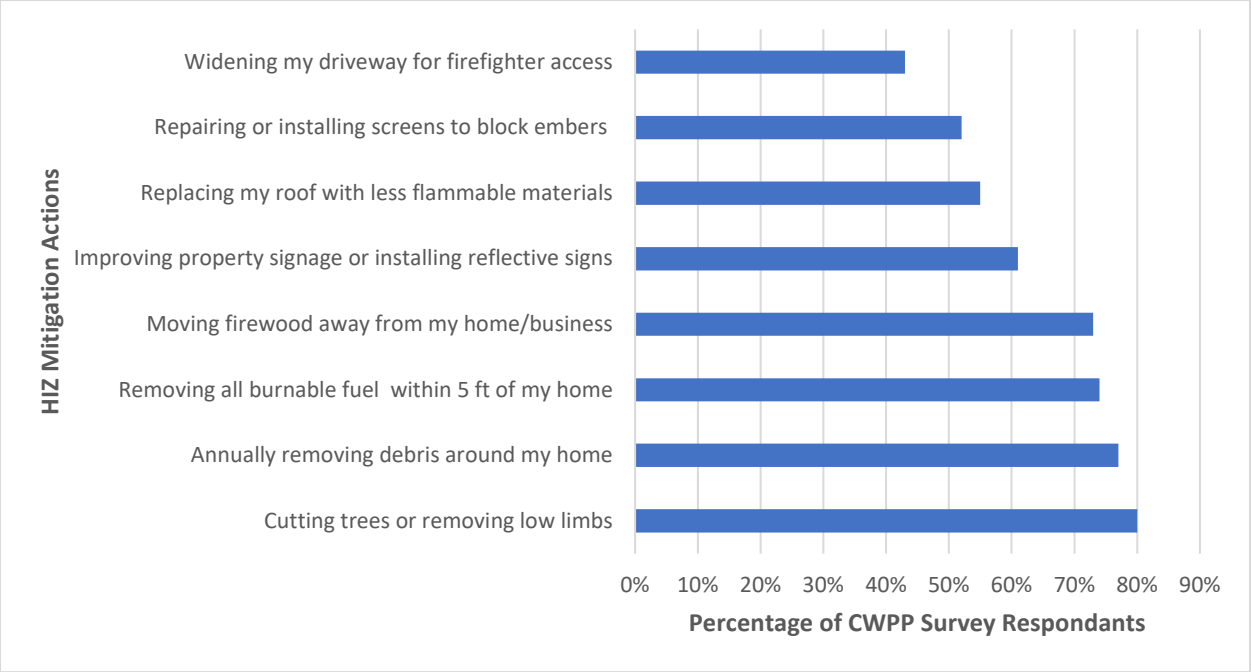


*Figure 5.b.3. Percentage of Okanogan County residents who responded to the CWPP survey and have completed different actions to mitigate risk in their HIZ (**See 0** for a full summary of survey findings).*

Defensible Space

Defensible space is 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 embers (aka firebrands), radiant heat, and direct flame. It is encouraged that residents develop defensible space so that during a wildfire, their homes can stand alone due to the great reduction in hazards they have undertaken without relying upon limited firefighter resources. Defensible space creates a buffer between your home and grass, trees, and shrubs that could ignite during a wildland fire.

Defensible space can slow the spread of wildfire, prevent direct flame contact, and reduce the chance that embers will ignite material on or near your home (Hakes et al. 2017). Substantially reducing vegetation within the HIZ and removing vegetation that overhangs decks and roofs can reduce structure loss, especially for homes on slopes (Syphard et al. 2014).

Do not count on firefighters staying to defend your home—your home should be able to survive a wildfire on its own. There are never enough firefighters to stay and defend every single home during large incidents.

Properties that are not defensible will not often receive firefighter resources due to unsafe conditions and the higher likelihood of home loss.

Defensible space is divided into multiple zones around a home, and recommended practices vary among zones. The WA DNR defines zone one as 0 to 5 feet from the home, zone two as 5 to 30 feet from the home, and zone three as 30 to about 100 feet from the home. Zone three to extended to 200 feet if the structure is placed close the bottom or top of slope. Some organizations call zone one the "noncombustible zone" (0 to 5 feet from the home) and zone two the "lean, clean, and green zone" (5 to 30 feet from the home).

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 HIZ 1 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).

A 2021 study from the University of Colorado-Boulder showed that homeowners living in the WUI in Bailey, CO, typically underestimated the level of risk their home is at due to wildfire, and tended to overestimate the amount of work they have done to protect their property (Simpkins 2021).

Figure 5.b.4. Typically Zone 1 actions are the easiest and cheapest to implement along with home hardening. Instead of looking outward from the home and seeing what needs to be done on the edges, residents must look from the edges inward and see what must be done around the most important values they have. (Source: Okanogan CD, 2022)

Table 5.b.1. HIZ recommendations based on the Colorado State Forest Service publication*: The Home Ignition Zone*, WA DNR's Fire-Resistant Plants for Eastern Washington, and other sources. This is not an all-inclusive list of activities.

Zone 1: 0 to 5 feet from your home – *the noncombustible zone.*
Goal: Prevent flames and embers from having direct contact with your home.
• Create a noncombustible border 5 feet around your home (aka, hardscaping). Replace flammable wood chips with alternatives like dirt, stone, or gravel. • Remove branches that hang over your roof and drop needles onto your roof and remove all fuels within 10 feet of the chimney. • Remove combustible materials (dry vegetation, wooden or cloth furniture, tires, juniper shrubs, etc.) from underneath, on top of, or within 5 feet of decks, overhangs, windows, and doors. • Annually remove dead or dry leaves, pine needles, and dead plants withing 5 feet of your home and off your deck, roof, and gutters. Farther than 5 feet from structures, raking material will not significantly reduce the likelihood of ignition and can negatively affect other trees. • Move firewood or other combustible materials to Zone 3. • Do not use space under decks for storage.
Zone 2: 5 to 30 feet from your home – *the lean, clean, and green zone.*
Goal: Slow the movement of flames approaching your home and lower the fire intensity.
• Irrigate and mow grasses to 4 inches tall or less. If you are unable to irrigate, replace dry grasses with fire-resistant plants that are more drought-tolerant and less flammable. • Remove any accumulated surface fuels such as logs, branches, slash, and mulch. • Remove all common junipers because they are highly flammable and tend to hold a layer of flammable material beneath them. Landscape with plants that have more fire-resistant attributes, like short-statures, deciduous leaves, and higher moisture content. • Remove enough trees to create at least 10 feet* of space between crowns. Measure from the outermost branch of one tree to the nearest branch on the next tree. Create even more space between trees if your home is on a slope. • Favor the retention of aspen trees because this species naturally has high fuel moisture, no low branches, and smooth bark, making them less likely to ignite than conifer trees. • Remove ladder fuels under remaining trees. This is any vegetation that can bring fire from the ground up into taller fuels. • Remove limbs so branches do not hang below 6 feet above the ground, ideally not below 10 feet above the ground. • Keep spacing between shrubs at least 2-3 times their height. • Relocate wood piles and propane tanks to Zone 3. • Remove stressed, diseased, dead, or dying trees and shrubs. This reduces the amount of vegetation available to burn and improves forest health. • Keep shrubs at least 10 feet away from the edge of tree branches. • Ensure that all utility lines are clear of vegetation. • Place gravel barriers around propane tanks and other fuel sources, such as sheds, chicken coops, etc.

Zone 3: 30 to 100 feet from your home
If you live on a slope, this zone should be larger, typically 30 to 200 feet from the home, due to the greater potential for extreme fire behavior.

Goal: Slow movement of flames, move fire to the ground, reduce ember production.

- Store firewood and propane tanks at least 30 feet away and uphill from your home and away from flammable vegetation. Store even farther away if your home is on a slope.
- Move campers/RVs, boats, detached garages, storage buildings, barns, and other large structures at least 50 feet away from your home.
- Mow or trim grasses to maximum height of 6 inches. Grasses can be taller in zone 3 than zone 2 because of the greater distance from your home, but shorter grass is always better for reducing potential flame lengths and therefore radiant heat exposure.
- Remove enough trees to create at least 6- to 10-foot spacing* between the outermost branches of remaining trees. Create even more space between trees if your home is on a slope.
- Favor the retention of aspen trees because this species naturally has high fuel moisture, no low branches, and smooth bark, making them less likely to ignite than conifer trees.
- Remove limbs so branches do not hang below 6 feet above the ground, ideally not below 10 feet above the ground.
- Remove shrubs and saplings that can serve as ladder fuels.
- Remove heavy accumulations of dead trees and branches and piles of fallen leaves, needles, twigs, pinecones, and small branches. Thin trees to increase spacing and remove ladder fuels to reduce the likelihood of torching, crown fires, and ember production.
- Consult with a qualified forester to develop a plan to manage your property to achieve fuel reduction and other goals, such as creating wildlife habitat.

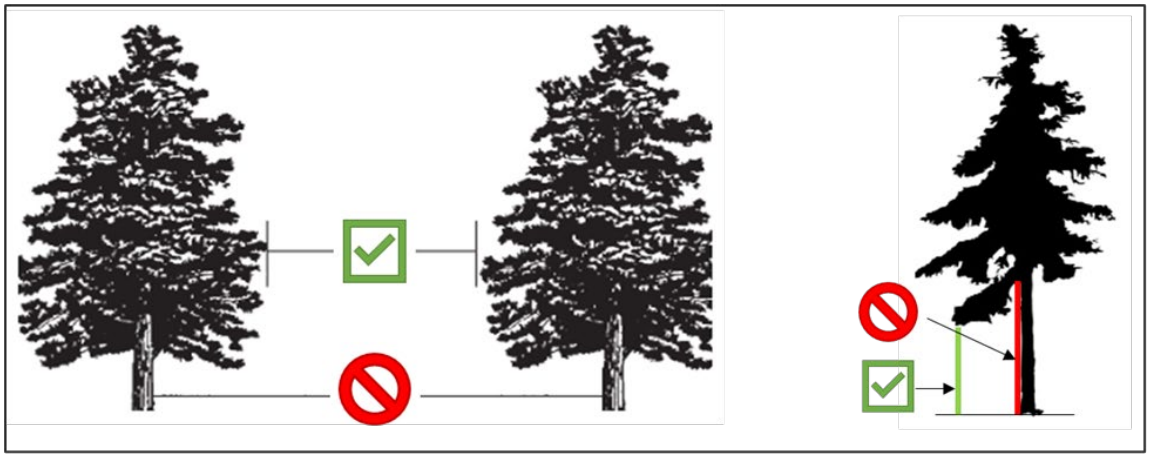


Figure 5.b.5. Spacing between tree crowns is measured from the edge of tree crown to tree crown, NOT from tree stem to tree stem (left). The height of limbs above the ground is measured from the ground to the lowest point of the limb, NOT from where the limb attaches to the tree (right). (Source: Ember Alliance, nd)

Some homeowners in the WUI are concerned that removing trees will destroy the forest and reduce the aesthetic and monetary value of their property. In Okanogan County, there are many stands of timber and other vegetation that are close to homes and other structures. The reality is that nothing will decrease the aesthetic and monetary value of your home as much as a high-severity wildfire burning all the vegetation in the community, even if your home survives the fire. Forest management

and management on other lands such as in the shrubsteppe can look messy and destructive in the first years following treatment; however, grasses, shrubs, and wildflowers will respond to increased light availability after tree removal and create beautiful ecosystems with lower fire risk (Figure 5.b.6.). By engaging in the forest management on their property, homeowners are engaging in a form of ecological restoration that not only helps improve the safety of their homes and properties, but also can improve wildlife habitat, benefit species of plants that prefer more open conditions, and return parts of the WUI to conditions more akin to their appearance and function prior to the implementation of fire suppression in the early 20th century.

Many property owners enjoy their land even more after conducting effective fuel treatments. Removing trees can open incredible views of mountains, rivers, and rock formations, and wildlife is often attracted to forests with lower tree densities and a greater abundance of understory plants. Reducing fuel loads and increasing the spacing between trees increases the chance that your home and your neighbors' homes will survive a wildfire, and most importantly, it increases the safety of wildland firefighters working to protect your community**.** Cost-shares, technical assistance, and other services are available from agencies like WA DNR, Okanogan CD, and other state and local agencies. It is the responsibility of homeowners and property managers to ensure that they receive proper permits from relevant state agencies, including WA DNR and WA DOE, if actions, such as large-scale timber thinning or work adjacent to or in wetlands, require such permits in line with state law.

Figure 5.b.6. Grasses, shrubs, and wildflowers quickly respond to increased light availability after tree removal, resulting in beautiful ecosystems with lower fire risk. The green star in each photo indicates the same tree. (Source: Jefferson County CD, nd)

Home Hardening

The practice of making a home less likely to ignite from the heat or direct contact with flames or embers. It is important to remember that embers can ignite homes even when the flaming front of a wildfire is far away. Home hardening involves reducing this risk by changing building materials, installation techniques, and structural characteristics of a home. Home hardening measures are particularly important for WUI homes; 50% to 90% of homes ignite due to embers rather than radiant heat during wildfires (Babrauskas 2018; Gropp 2019).

Home hardening involves modifying your home to reduce the likelihood of structural ignition. Fire that is not immediate to a home can still threaten the structure as long-range embers travel. Homes in denser neighborhoods are also at risk of short-range embers from nearby homes, which could lead to structure-to-structure ignitions.

Buildings cannot be made fireproof, but the chance of your home surviving wildfires increases when you reduce structural ignitability through home hardening in tandem with the creation and maintenance of defensible space. See Figure 5.a.6. depicts important home hardening measures.

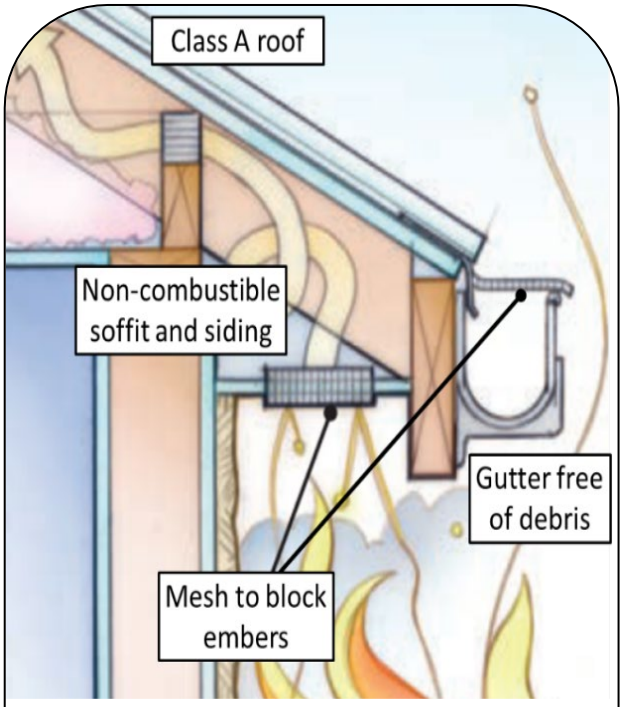
Roofs, vents, windows, exterior siding, decks, and gutters are particularly vulnerable to wildfires. Research on home survival during wildfires demonstrates that enclosed eaves and vent screens can reduce the penetration of wind-born embers into structures (Hakes et al. 2017; Syphard and Keeley 2019).

Multi-pane windows have greater resistance to radiant heat. Windows often fail before a home ignites, providing a direct path for flames and airborne embers to enter a home.

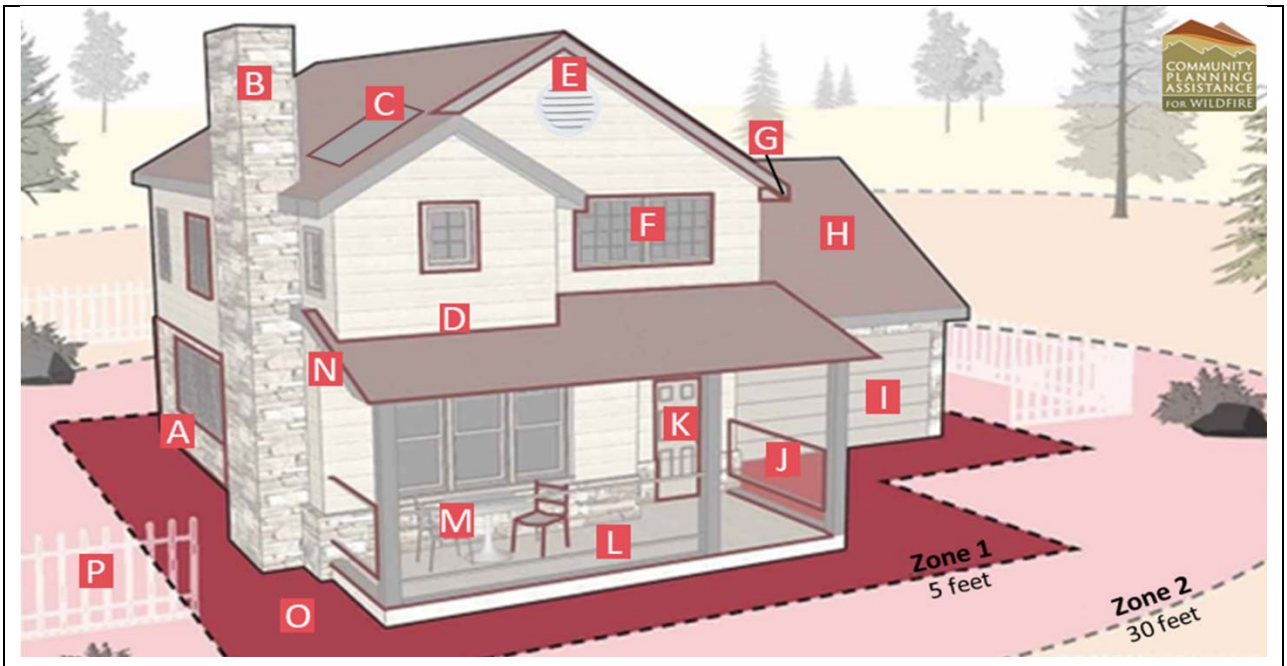
It is important to replace wood or shingle roofs with non-combustible materials such as composite, metal, or tile. Ignition-resistant or noncombustible siding and decking further reduce the risk of home ignition, particularly when homes also have a 5-foot noncombustible border of dirt, stone, or gravel. Non-wood siding and decking are often more durable and require less routine maintenance.

Keep home-hardening practices in mind and use ignition-resistant materials if you replace a damaged roof or remodel your home.

There are many low-cost actions you can start with to harden your home (Table 5.b.16.).



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



Low-cost actions:

- Cover chimneys and stovepipe outlets with 3/8th to ½ inch corrosion-resistant metal mesh.
- Minimize debris accumulation under and next to solar panels.
- Cover vent openings with 1/16th to 1/8th inch corrosion-resistant metal mesh. Install dryer vents with metal flappers and keep closed unless in use.
- Clear debris from roof and gutters regularly.
- Install metal flashing around and under garage doors that goes up at least 6 inches inside and outside the door.
- Use noncombustible lattice, trellis, or other decorative features.
- Install weather stripping around and under doors.
- Remove combustible materials from underneath, on top of, or within 5 feet of deck.
- Use noncombustible patio future.
- Cover all eaves with screened vents.
- Establish and maintain a 5-foot noncombustible buffer around the home.

Actions to plan and save for:

B. Use noncombustible or ignition resistant siding and trim (e.g., stucco, fiber cement, fire-retardant treated wood) at least 2 feet up around the base of your home.
E. Use multipaned glass for skylights, not materials that can melt (e.g., plexiglass), and use metal flashing.
F. Install a 6-inch vertical noncombustible surface on all gables above roofs.
G. Install multi-pane windows with at least one tempered-glass pane and metal mesh screens. Use noncombustible materials for window frames.
H. Install noncombustible gutters, gutter covers, and downspouts.
I. Install ignition-resistant or noncombustible roofs (composite, metal, or tile).
J. Install 1-hour fire rated garage doors.
A. Install a 1-hour fire rated doors.
B. Use ignition-resistant or noncombustible decking. Enclose crawl spaces.
C. Use noncombustible eaves.
F. Replace wooden fences with noncombustible materials and keep at least 8 feet away from the home. Keep combustible fences at least 20 feet away from the home.

Figure 5.b.7. A home can never be made fireproof, but home hardening practices decrease the chance that flames, radiant heat, and embers will ignite your home. (Source: Community Planning Assistance for Wildfire with modifications to include information from CALFIRE 2019 and Maranghides et al. 2022)

Annual Safety Measures and Home Maintenance in the WUI

Reviewing safety protocols, creating defensible space, and hardening your home are not one-time actions but are part of *annual* home maintenance when living in the WUI. During a wildland fire, homes that have clear, defensible space are identified as sites for wildland firefighters to engage in structure protection, and homes that are not safely defensible will not usually receive firefighter resources.

The following annual activities can assist in wildfire risk reduction and expand personal and community wildfire resiliency.

- ✓ Check fire extinguishers to ensure they have not expired and are in good working condition.
- ✓ Review your family's evacuation plan and practice family fire and evacuation drills.
- ✓ Verify that your home telephone number, cell phone, and/or email are properly registered for emergency notifications.
- ✓ Review the contents of your "go-bag" and make sure it is packed and ready to go. Your go-bag should include supplies to last at least three days, including cash, water, clothing, food, first aid, and prescription medicines for your family and pets. Keep important documents and possessions in a known and easily accessible location so you can quickly grab them during an evacuation.
- ✓ Pay attention to red flag-day warnings from the National Weather Service and stay vigilant. Ensure your family is ready to go in case of an emergency.
- ✓ Walk your property to identify new hazards and ways to maintain and improve current defensible space. Take pictures of your defensible space to help you monitor regrowth and determine when additional vegetation treatments are necessary.
- ✓ Clear roofs, decks, and gutters of pine needles and other debris. Remove all pine needles and flammable debris from around the foundation of your home and deck. Remove trash and debris accumulations within 30 feet of your home. Repeat throughout the 2024 as necessary.
- ✓ Properly thin and prune trees and shrubs that have regrown in home ignition zones 1 and 2 (0-5 feet and 5-30 feet from your home). Remove branches that overhang the roof and chimney. Prune trees and shrubs that are encroaching on the horizontal and vertical clearance of your driveway.
- ✓ Mow grass to a height of 4 inches or less within 30 feet of your home, camper / RV, sheds, and barns. If possible, keep your lawn irrigated, particularly within 30 feet of your home. Consider replacing dry grasses with drought tolerant and fire resilient native plants that are more drought tolerant and less flammable.
- ✓ Check the visibility of your address and remove vegetation that obscures it.
- ✓ Dispose of leaves, needles, and branches during slash drop-off dates organized by tribal and local government.
- ✓ Get slash piles chipped through programs provided by the Okanogan Conservation District, Clean Air Methow, local towns and cities, and the Colville Tribe.
- ✓ Check screens over chimneys, eaves, and vents to make sure they are in place and in good condition.
- ✓ Ensure that an outdoor water supply is available for responding firefighters. Put a hose and nozzle in a visible location. The hose should be long enough to reach all parts of your home.

Mitigation Barriers and Opportunities

Homeowners and residents in the WUI share concerns about mitigating risk and maintaining safe conditions in their HIZ. **Table 5.b.1**. proposes several opportunities to address these challenges.

Table 5.b.1. *Common concerns from residents in the WUI and potential solutions to encourage mitigation measures in the HIZ (Source: Ember Alliance, 2023).*

Concern	Potential solutions
I don't have the resources to invest in defensible space.	Creating adequate defensible space can take time and a significant financial investment. Fortunately, there are **effective, low-cost measures** that residents can start with: ✓ Annually remove leaves, needles, and other vegetation from roofs, gutters, decks, and around the base of homes. ✓ Use hand tools like a pole saw to remove tree branches that hang less than 10 feet above the ground. ✓ Remove combustible materials (dry vegetation, wooden picnic tables, juniper shrubs, etc.) from underneath, on top of, or within 5 feet of decks. ✓ Remove downed logs and branches within 30 feet of all structures. ✓ Participate in community slash pickup dates. ✓ Apply for cost-sharing grants with your neighbors to subsidize the creation of defensible space, as the Firewise® microgrant program administered by WA DNR. ✓ Research tax credits that will offset the costs or the work you want to do.
I am afraid that removing trees will destroy the forest and reduce the aesthetic and monetary value of my property.	The reality is that nothing will decrease the value of your home as much as a high-severity wildfire burning all the vegetation in the community, even if your home survives the fire. Drive around the community and look for homes that have followed the guidelines for defensible space. Some properties in Okanogan County have exemplary defensible space and beautiful landscaping at the same time. Read the "*Fire Resistant Plant Guide for Eastern Washington*" by Al Murphy, WSU Master Garden Program and published by WA DNR to learn about wildfire resistant landscaping plants. As an added benefit, fire-resistant landscaping is often more drought tolerant. Choosing native plants also improve wildlife habitat. Restored ecosystems can be aesthetically pleasing, benefit wildlife and light-loving wildflowers and grasses, and protect your home from high-severity wildfires.

My neighbors haven't mitigated risk on their property.	Some residents in Okanogan County are rightfully concerned about high hazards on their neighbors' properties, surrounding public land, HOA open space, etc. Your HIZ might overlap with your neighbor's property. Given the high fire risk in the area, it is important that residents across Okanogan County create defensible space and harden their homes. Ideas to inspire action by your neighbors include: ✓ Working with your Community Ambassador, your HOA, local agencies, and other community groups to help educate your community about the benefits of defensible space and home hardening. ✓ Organizing walking tours to visit the property of residents with exemplary defensible space and demonstration landscapes such as the "Fire Resistant Demo Landscape" and interpretive trail at the Winthrop Public Library. Witnessing the type of work that can be done and seeing that a mitigated property can still be aesthetically pleasing can encourage others to follow suit. ✓ Inviting your neighbors over for a friendly conversation about the risk assessment in this CWPP. Review resources about defensible space together, discuss each other's concerns and values, and develop joint solutions to address shared risk.

Figure 5.b.8. Fire-resistant landscaping in zone 1 can be aesthetically pleasing and more drought tolerant, requiring less watering during the summer. Limbed and thinned trees in zone 2 (as seen in the background of this photo) can create beautiful, open conditions that allow understory vegetation to flourish under higher light conditions and provide habitat for wildlife. (Source: WA DNR/Washington State University Master Gardener Program, 2021)

5.c. Community-wide Recommendations

The CWPP is a useful planning document, but it will only affect real change if residents, neighbors, Okanogan County, other community groups, and agency partners come together to address shared risk and implement strategic projects. This section of the CWPP discusses the concept of linked defensible space and mosaic landscapes and provides relative hazard ratings and specific recommendations for CWPP plan units in Okanogan County. CWPP plan units are groups of neighborhoods with shared fire risk. We encourage residents within CWPP plan units to organize and support each other to effectively reduce wildfire risk and enhance emergency preparedness.

Linked Defensible Space

The HIZ of individual residents can overlap that of their neighbors, so wildfire hazards on one property can threaten adjacent properties. Structures that are on fire can emit significant radiant heat and embers and endanger homes and structures near them.

Neighbors can increase their homes' chances of survival during a wildfire if they work together to create linked defensible space. Linked defensible space also creates safer conditions and better tactical opportunities for wildland firefighters. Defensible space projects that span ownership boundaries are better candidates for grant funding due to their strategic value, either through state and federal programs or through non-profits.

Some residents can be reluctant to create linked defensible space for a variety of reasons. Those looking to encourage their neighbors to take action may have to lead by example to stimulate action. If executed well, individual defensible space projects can act as a reference for how to implement projects and inspire coordination between neighbors.

Mosaic Landscapes

Varied fuel types are known to slow the spread of fire, and heterogeneous landscapes (landscapes with multiple fuel types and trees of different sizes and ages) are more typical of historical forest conditions (Duncan et al. 2015). Many communities and neighborhoods in Okanogan County are situated within mosaic landscapes due to the ecological and topographic diversity of our region. Maintaining or creating a mosaic landscape in neighborhoods can help slow fire spread by changing the fuel types as it moves across a hill or valley.

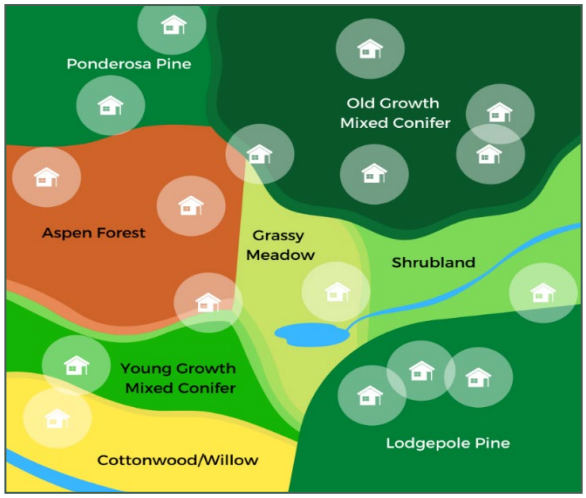


Figure 5.c.1. Example of a mosaic landscape in a neighborhood. Each home has defensible space around it, and the landscape is varied throughout, providing tactical opportunities for firefighters working to defend homes.
(Source: The Ember Alliance, nd)

A mosaic landscape can be created in many ways. For example, a neighborhood could have a few acres of old-growth conifer trees next to a couple acres of aspen stands and a few acres of young regenerating conifer trees by a large grassy meadow. This can be arranged in many ways for aesthetic and tactical purposes and will resemble a patchwork quilt or mosaic art.

The homes in these patches still need to have adequate defensible space, but this would create a more diverse landscape where fire may move slower as it transitions between forest types and unforested locations like shrublands or meadows. A slower fire movement means firefighters have time to defend more homes in the neighborhood. It also creates a diversity of biomes that both residents and wildlife enjoy.

Evacuation Preparedness

Evacuation preparation is the responsibility of each resident in Okanogan County. The best way to get out quickly and safely during an evacuation is to be prepared with a go-bag and have a family evacuation plan before the threat of wildfire is in your area.

Figure 5.c.2. Evacuation levels have an increased scale of severity. If you feel that you are in danger, even at a Level 1 alert level, evacuate. (Source: Chelan County EM/Okanogan CD, 2024)

Coordinating Evacuations

Residents and visitors need to speak with and coordinate with family members about what they are expected to do and make necessary plans **before** wildfire impacts the area.

Children - Residents are concerned about school-aged children who might be home alone during an evacuation. Parents should work with their neighbors to develop a plan for how their children would evacuate if they were to be home alone. Do they have a go bag ready? Where will they go? Can a neighbor assist?

Physical Limitations/Health Needs - Residents may have family members or neighbors with physical limitations who might struggle to evacuate safely and quickly. Family members or individuals living alone also need to address the unique needs and vulnerabilities that arise from mobility or hearing impairments during an evacuation. Do residents have medications, devices, or other items necessary for their individual needs? Is their go bag ready? Can their neighbors be helpful?

Pets – What will they need to evacuate? Prepare crates, leashes, food, water, medications, and vaccine and health records so they are accessible and ready.

Livestock - Residents with livestock trailers or large camper vehicles should plan to leave during voluntary evacuation notices to allow time for their preparations and create more space on the roads for other residents during a mandatory evacuation. It is important to have a plan for where to take livestock to reduce some of the chaos and uncertainty created by wildfire evacuations.

Ingress/Egress - If you live in an outlying area without a secondary road, it is crucial that you are prepared to leave immediately! We can not predict the direction wildfire will come from and you need to be prepared to evacuate timely and safely.

PLEASE NOTE:

Evacuation "safe zones" (locations your community is asked to evacuate to) are incident-dependent. Being **signed up for Okanogan County Emergency Alerts** and being aware of travel routes can assist in identifying personal evacuation routes.

Okanogan County Emergency Alerts System

Okanogan County has a mass notification system called Everbridge, which allows Emergency notifications and advisories to be pushed out quickly, well before first responders can arrive. The system has several different ways to allow citizens to receive alerts/emergency notifications. The most accurate way is for individuals to create an account for their specific location. They can add up to 5 locations within the boundaries of Okanogan County. The second would be to sign up for the non-emergency county-wide advisories.

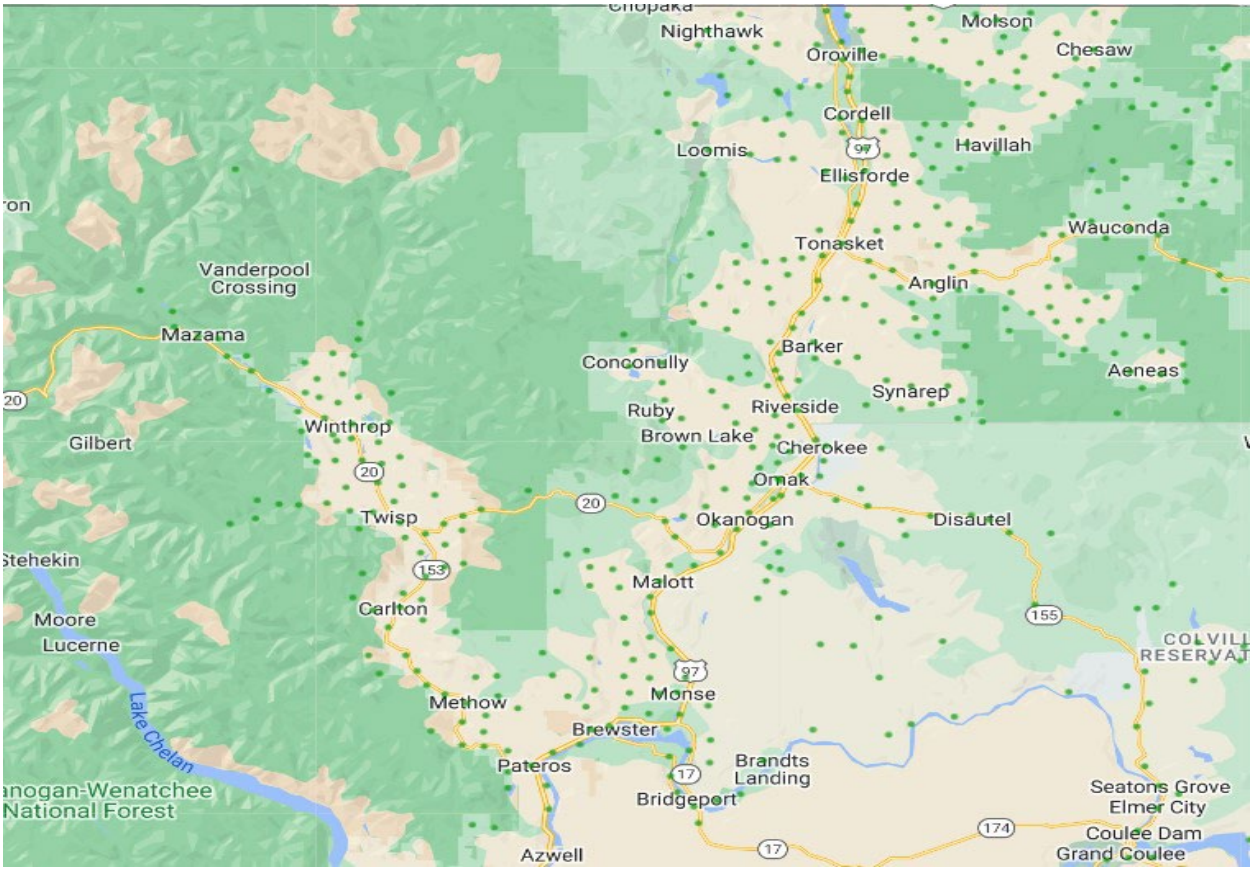


Figure 5.c.3. As of 2024, there are 10,633 Okanogan County Residents that have created an account. This figure displays the relative location of emergency alert sign ups as of June 2024. (Source: OCEM, 2024)

Preparing an Evacuation Plan

Families with any of the aforementioned concerns should put extra time into having go bags ready for all family members and animals on the property and using the earliest evacuation warnings to leave in the event of a wildfire rather than waiting for mandatory evacuation orders. Having a plan in place ahead of time can ensure prompt evacuations and save lives during wildfires.

According to data from the Okanogan County CWPP community survey, only 79% of respondents have evacuation plans. Evacuation plans are an essential element of ensuring personal safety, the safety of loved ones, and the community on a wildfire-prone landscape.

Some residents have family members or neighbors with physical limitations who might struggle to evacuate in a timely manner. Family members or individuals living alone also need to address the unique needs and vulnerabilities that arise from mobility or hearing impairments during an evacuation. Other residents are concerned about school-aged children who might be home alone during an evacuation. Parents should work with their neighbors to develop a plan for how their children would evacuate if they were to be home alone. Adult children whose parents live in assisted living or nursing homes may have concerns about the group home's protocol for red flag days, evacuation preparedness, and actual evacuation. Does the facility have enough transport vehicles to safely evacuate all home residents? Does the facility have established plans and contact information to help reunite families with evacuees? Families with these concerns should put extra time into having go bags ready and using the earliest evacuation warnings to leave in the event of a wildfire rather than waiting for mandatory evacuation orders. Having a plan in place ahead of time can ensure prompt evacuations and save lives during wildfires.

Residents with livestock trailers or large camper vehicles should plan to leave during voluntary evacuation notices to allow time for their preparations and create more space on the roads for other residents during a mandatory evacuation. It is important to have a plan for where to take livestock to reduce some of the chaos and uncertainty created by wildfire evacuations.

OCLTRG can provide assistance with individual and neighborhood evacuation plans.

Sheltering-in-Place

It is entirely natural for residents and property owners to want to play a role in the defense of their home and property from an active wildfire or to simply remain with their home whilst sheltering in place. Sheltering-in-place is not recommended for wildfires unless all other means of ingress-egress are blocked or otherwise physically impassable. Sheltering-in-place during a wildfire is an act of last resort and should not be taken lightly.

If you have a means of safe evacuation, you should evacuate. If you can identify “safe zones” locations where you can take adequate refuge from an approaching fire, utilize them only if you believe you have no other alternative. A safe zone allows for a separation between you and fire of at minimum four times the maximum flame height and is maintained on all sides; they should not be located downwind of a fire and on terrain that favors rapid fire spread.

The above advice is not an endorsement of sheltering-in-place, only an explanation of a worst-case situation. If you are afforded the opportunity to evacuate, **you should take it.**

Follow evacuation etiquette *to increase the chance of everyone exiting the evacuation area in a safe and timely manner during a wildfire incident:*

- Okanogan County uses emergency alerts and asks residents to register for emergency notifications through: https://okanogancounty.org/departments/emergency_management/okanogan_county_alerts/okanogan_county_alert_system.php.
- Leave as quickly as possible after receiving an evacuation notice.
- If you feel you have sufficient time do these tasks immediately:
    - Close all windows, vents and doors, and remove lightweight curtains.
    - Shut off your gas utilities.
    - Turn on your home lights.
    - Lock your doors.
- Have a go-bag packed and ready during the wildfire season, especially on days with red flag warnings.
- Leave with as few vehicles as necessary to reduce congestion and evacuation times across the community.
- Drive safely and with headlights on. Maintain a safe and steady pace. Do not stop to take pictures.
- Yield to emergency vehicles.
- Follow directions of law enforcement officers an emergency responders.
- If your evacuation route(s) are burning, go to your designated “safety zones”.
- Do not reenter the evacuation area until you are officially informed it is safe.
- If your home or property has been damaged by a fire (including smoke damage), contact your insurance company before reentering.

Accessibility and Navigability for Firefighters During an Incident

Address signs

Installing reflective address numbers can save lives by making it easier for firefighters to navigate to your home at night and under smokey conditions. Reflective signs are available from Okanogan County, making it an easy and inexpensive action you can accomplish to protect firefighters and your family. Mount reflective address signs on noncombustible posts, not on stumps, trees, wooden posts, or chains across driveways. Chains across driveways might be removed during wildfire suppression to facilitate access to your property. Make sure the numbers are clearly visible from both directions on the roadway.

Figure 5.c.4. While aesthetically pleasing, this style of addressing for a property would be practically invisible to firefighters at night, if there is heavy smoke in the area, or if they are moving rapidly through an area. (Source: Eli Loftis, Okanogan CD, 2023)

Driveways

It's important to ensure that emergency responders can locate and access your home. Narrow driveways without turnarounds, tree limbs hanging over the road, and down trees by the road impacts accessibility and safety for firefighters, and they may not be able to defend your home during a wildfire event (Brown, 1994).

Some roads in Okanogan County have accessibility and navigability issues, such as narrow widths, inadequate vertical clearance for engines, and heavy fuel loading on the sides of the road. These unsafe road and driveway conditions could turn firefighters away from attempting to defend homes. According to the NPFA, driveways and roads should have a minimum of 20 feet of horizontal clearance and 13.5 feet of vertical clearance to allow engines to safely access the roads (O'Connor 2021).

Where possible, residents should improve roadway access, and where this is not feasible, it is vital that homeowners take measures to harden their homes and create defensible space. Some actions to increase access to your home are simple, such as installing reflective address numbers, and others take time and investment, such as widening driveways to accommodate fire engines.

Survivable Roadways	Potentially Non-Survivable Roadways
	
	

Figure 5.c.5. Some roads in Okanogan County have been well mitigated by removing tall trees and saplings, removing limbs on the remaining trees, and keeping grass mowed (left images). Other roads could experience potentially non-survivable conditions because they are lined by thick forests that have an abundance of ladder fuels (right images). (Source: The Ember Alliance, nd)

Shared Driveways and Community Roads

Residents, Okanogan County, HOAs, and individual property owners can work together to ensure emergency responders are able to locate and access everyone's home. Narrow roads without turnarounds, tree limbs hanging over the road, and lots of dead and down trees by the road may make firefighters choose not to defend your home during a wildfire event (Brown 1994).

Where feasible, Okanogan County and HOAs should improve roadway access by widening road networks and creating turnarounds and pullovers to accommodate fire engines and two-way traffic during evacuation. The community can apply for grants and work with the WA DNR, Okanogan CD, OCLTRG, and other organizations to remove trees from along roads to reduce the chance of non-survivable conditions occurring during wildfires. Residents can remove trees along driveways and prune low-hanging branches to increase horizontal and vertical clearance. According to the National Fire Protection Association, driveways and roads should have a minimum of 20 feet of horizontal clearance and 13.5 feet of vertical clearance to allow engines to safely access the roads (O'Connor 2021).

Steps to enhance firefighter safety and access to your home:

- Install reflective address numbers on the street to make it easier for firefighters to navigate to your home under smokey conditions and at night. Make sure the numbers are clearly visible from both directions on the roadway. Use noncombustible materials for your address sign and sign supports. **Installing reflective address numbers can save lives and is inexpensive and easy to accomplish.**

- Address roadway accessibility for fire engines. Long, narrow, steep, and curving private drives and driveways without turnarounds significantly decrease firefighter access to your property, depending on fire behavior.

- Fill potholes and eroded surfaces on private drives and driveways.

- Increase fire engine access to your home by removing trees along narrow private drives and driveways so the horizontal clearance is 20-feet wide, and prune low-hanging branches of remaining trees so the unobstructed vertical clearance is at least 13.5 feet per the National Fire Protection Association (O'Connor 2021).

- Park cars in your driveway or garage, not along narrow roads, to make it easier for fire engines to access your home and your neighbors' homes.

- Clearly mark septic systems with signs or fences. Heavy fire equipment can damage septic systems.

- Clearly mark wells and water systems. Leave hoses accessible for firefighters to use when defending your home, but **DO NOT** leave the water running. It is dangerous to leave water running when you evacuate and can reduce water pressure to hydrants across the community negatively impacting the ability of firefighters to defend your home.

- Post the load limit at any private bridges or culverts on your property.

- Leave gates unlocked during mandatory evacuations to facilitate firefighter entrance to your property.

- Leave exterior lights on to increase visibility.

If time allows, leave a note on your front door confirming that all parties have evacuated and providing your phone number and other contact information.

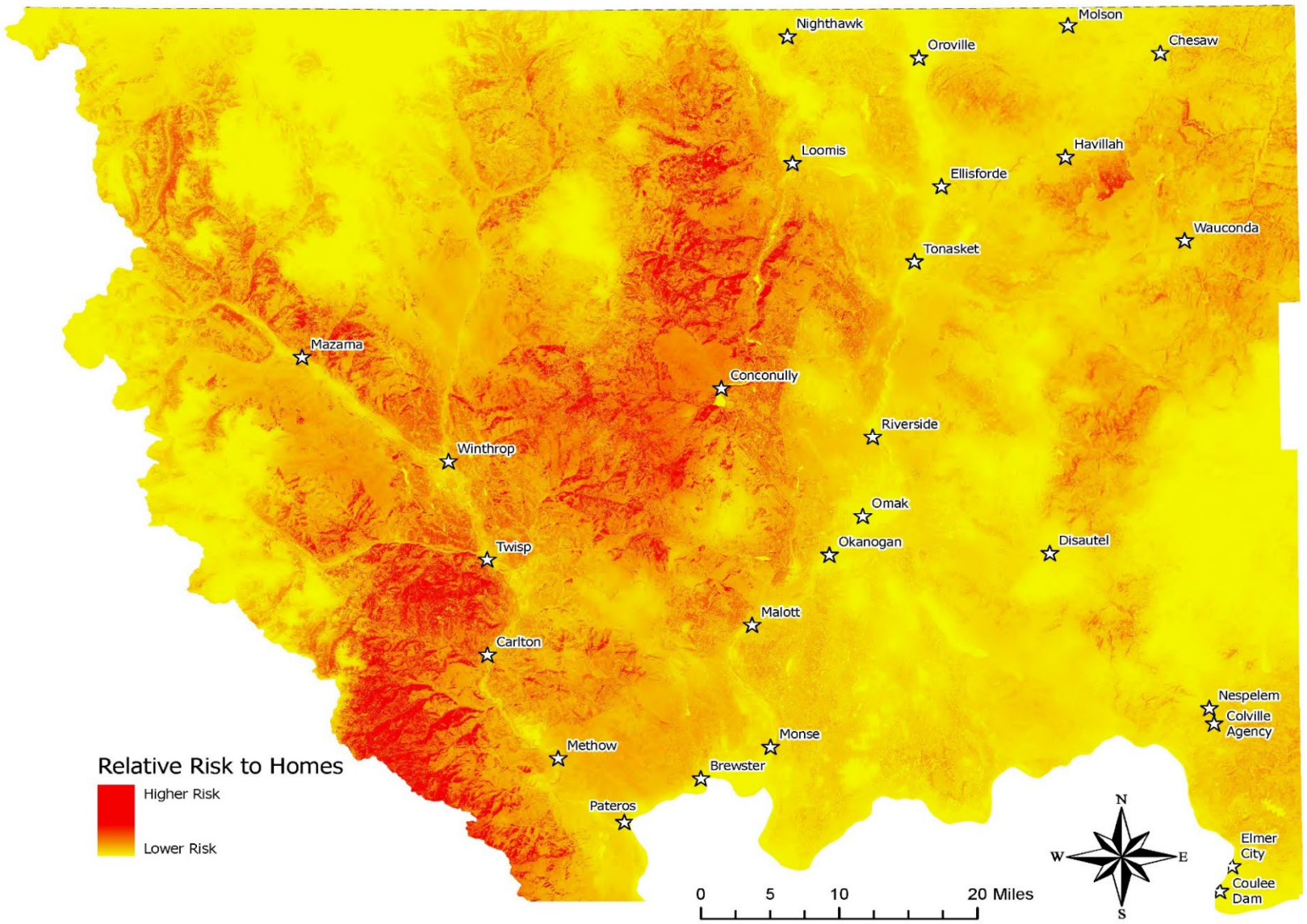


Figure 5.c.6. All residents within Okanogan County are exposed to elevated fire and should take recommended actions in this CWPP seriously. Wildfires in much of the county, within the fringes and the core of the WUI, have the potential to imperial homes, buisnesses, and lives. (Source: Risk Management Assistance Dashboard, 2022)

Considerations for Vulnerable Populations

Social factors influence how an individual or a community may be impacted in the event of a wildfire. This so-called social vulnerability is due to a lack of access to resources. The resources that are lacking can include infrastructure, social support, health, and financial means (Cutter et al. 2003). While Okanogan County at large may be well prepared for wildfire after engaging in this CWPP planning process, there is potential for some to fall through the cracks or struggle to engage in necessary mitigation and preparation work, which makes them more at risk in the event of a fire.

Poverty, racial and ethnic discrimination, age, and physical ability are frequently factors that are associated with social stratification and result in resource inequity (Crowley 2020; Cutter et al. 2003; Davies et al. 2018; Emrich et al. 2020; Hewitt, 2013; Ojerio et al. 2008). Additionally, we can not exclude those that have limited English proficiency, social skills or mental capacity as barriers to effective communication. Proximity to response resources is also a factor. Thus, it is important to consider how to ensure that all community members can participate in the wildfire preparedness actions outlined in this CWPP.

Population and Demographics

As of the 2020 census, Okanogan County's total recorded population is composed of 42104 people, roughly 8 individuals per square mile. This represents roughly a 5.2% increase since the 2010 census (Census Bureau nd). As estimated by the Census Bureau, the 2023 population of the county was 43,127, 89% is White, 1% Black, 12.3% Native American, 1.2% Asian, 0.3% Pacific Islander, 22.5% Hispanic or Latino (Census Bureau nd).

The median household income in 2020 was $58,218 in Okanogan County, the median household income statewide in Washington was $91,306. 17,005 households were identified within 21,720 housing units (Census Bureau nd). The countywide employment rate stands at 52.5%. 18.9% of the population lived below the poverty line. The largest industry for civilian employment overall was educational services, health care, and social assistance (Census Bureau nd). 20.7% of the population was employed in agriculture or natural resource extraction or management. 63% of agricultural producers in Okanogan County are 65 years old or older. (US Census Bureau 2020). Agriculture has been seeing a national trend of a decline in younger primary agricultural producers and an increase in the average age of primary agricultural producers. (Manly 2019). Okanogan County also follows this national trend (average primary operator age - 57.1 in 2007, 58.8 in 2012). The median age in Okanogan County was 42.9, 22.4% of the population were aged 65 years old or older (Census Bureau nd).

Although demographic data is important for accessing resources for the community, it is not the most important point for an individual.

It is important that you ask yourself as a community member living in a Wildfire Area the following questions:

- How am I vulnerable to Wildfire?
- How is my household vulnerable to Wildfire?
- How is my neighborhood vulnerable to Wildfire?
- How is my community vulnerable to Wildfire?

Each of these questions should be easy for you to answer for yourself. If not, connect with those around you and determine what the vulnerabilities mean to you, your family, your neighborhood and your community when it comes to wildfire.

Some examples might be:

- Is my home as "hardened" or as safe as can be for ember resistance?
- Is my personal property and land defensible to wildfire?
- Do I have a wildfire response plan?
- Is my household aware of the steps to take if a wildfire is present in our neighborhood?
- Do my neighbors need assistance that I can offer in response?
- Does everyone have a "go bag" in case an evacuation is needed?
- Do you know how or where you are going if you need to evacuate?

A follow-up question is:

- How can I change my approach to wildfire so that my household, my neighborhood, and my community are less vulnerable?

The bottom line is that if we reside in Okanogan County, we are vulnerable to wildfire. Wildfires are necessary for our ecosystem, and we (humans) need to understand and steward our lands in the safest way and with the best practices possible.

Pre-fire Considerations
Before a fire, it is important to ensure that preparation and potential evacuation communication materials are available in other languages spoken in Okanogan County. The sole use of English in materials makes it difficult for people with lower proficiency in English to understand. This includes children, elders, people with low literacy, and people who primarily speak other languages. Materials that use images and diagrams rather than words can make sure the broadest audience can understand any materials that Okanogan County distributes about wildfire.

Another major barrier is the ability to do the work recommended in this plan. Populations that may be impacted by this include those in lower income brackets who do not have the resources to harden their homes (i.e., by replacing their roofs, siding, and decks with non-combustible construction materials) and those with physical disabilities or impairments that keep them from doing the physical labor often involved in preparation and mitigation actions themselves. This CWPP is a great way to begin addressing economic disparity because it can provide a basis for Okanogan County to apply for grant funding to support mitigation work on behalf of the community.

To truly reduce the economic barrier at a community level, community leaders must design programs that are accessible for all income brackets and elders. For example, providing mitigation services such as a community chipping program that is free for residents who fall within lower income brackets or those with physical limitations can encourage those residents to mitigate their properties when they may have otherwise found it inaccessible. Similarly, volunteer days can help those who are not physically able to engage in pre-fire protection of their home by connecting physically able community members with them to help do home hardening work.

Post-fire Considerations
Following a fire, households are often solely responsible for their own recovery. While this is challenging for everyone, this is a particular issue for those without equal access to the social aid that is available, like FEMA recovery funds, information on the internet, and claims for insurance (Laska and Morrow 2006; Méndez et al. 2020). Groups impacted by this can include older adults, undocumented folks, and those who speak English as a second language or not at all.

While planning for post-fire is less of a focus of this CWPP, it is worth mentioning that community ties are as important after a fire as they are in trying to reduce the impact of a potential fire.

Communities that consider who will need the most assistance after a fire ahead of time are better able to get those folks the help they need quickly.

In the declaration of a "Wildfire Disaster" in Okanogan County, The Okanogan County Long Term Recovery Group (OCLTRG) will activate in conjunction with Okanogan County Emergency Management to provide key relief, short-term recovery, and long-term recovery services to our vulnerable populations, coordinating with Okanogan CD, WA DNR, CTCR, and other entities.

Figure 5.c.7. A thank you note to firefighters. (Source: Okanogan CD, 2015)

6. Project Action Recommendations

6.a. Implementation Recommendations for Fuel Treatments and Ecological Restoration

> "Given the right conditions, wildlands will inevitably burn. It is a misconception to think that treating fuels can 'fire-proof' important areas... Fuel treatments in wildlands should focus on creating conditions in which fire can occur without devastating consequences, rather than on creating conditions conducive to fire suppression."
> (Reinhardt et al. 2008)

Objectives and Benefits

Fuel Treatments

Fuel treatments are a land management tool for reducing wildfire hazard by decreasing the amount and altering the distribution of wildland fuels. Common goals of stand-scale fuel treatments are to reduce the risk of active or passive crown fires and to reduce fire intensity. This is achieved by removing trees, increasing the distance between tree crowns, removing small trees, shrubs, and low branches to increase the distance between surface fuels and tree crowns, and removing downed trees and other dead vegetation (Agee and Skinner 2005). Fuel treatment methods include tree thinning, pruning, pile burning, broadcast prescribed burning, and fuel mastication.

Strategically located, high-quality fuel treatments can create tactical options for fire suppression (Jolley 2018; Plucinski 2019; Reinhardt et al. 2008). Fuel treatments along trails, ridgelines, and other features can allow firefighters opportunities to use direct or indirect suppression techniques to contain fire spread.

Many of the partners involved in the development of this CWPP update are involved in the implementation of the fuel treatments in Okanogan County, including the USFS, WA DNR, WDFW, Okanogan CD, and CTCR, amongst others.

Private property owners across Okanogan County have implemented fuel treatments at varying scales. The Pine Forest and Edelweiss communities in the Methow Valley have been very effective in reducing fuels on common ground and private parcels, utilizing funds cost-share funds from WA DNR and Okanogan CD. Community leadership, an individual owner taking coordinated action to reduce fuels is essential to ensure that beneficial fuel treatments are implemented in the heart of the WUI, where peoples, homes, and infrastructure are congregated. Fuel treatments on private lands adjoining federal, state, or tribal lands benefits not only the property owner, but the public at large by expanding the area of treated acres. In some cases, landowners take proactive measures to manage fuel on their properties has led to the prioritization of neighboring federal and states lands for treatment.

Ecological Restoration

Ecological restoration is the process of assisting the recovery of an ecosystem that has been damaged, degraded, or destroyed (SER 2004). Many forests in the western United States have been damaged, degraded, or destroyed because of changes to their historical fire regimes following Euro-American colonization.

An example of a restoration project includes installing beaver dam analogs (BDAs) to help raise water tables and provide ecological benefits (figure 6.a.1.). Organizations such as the Methow Beaver Project, Okanogan Highlands Alliance (OHA), and others do this work in Okanogan County to help

restore beavers to watersheds, where historically they were trapped out as a result of the fur trade that initially brought fur traders to the region. This serves as a form of ecological restoration that both restores wetland functions and fosters greater fire resiliency. Streams modified by beavers, as well as those altered to mimic beaver activity, provide additional water resources that persist longer into the drier periods of the summer and fall. Increasing local humidity, keeping local vegetation green longer into the season, and moist soils around these wetlands can impede the spread of wildfires, and provide refuge for wildlife and potentially for people during wildfires.

Figure 6.a.1. Pictured in February 2023 (left), a BDA project installed in 2022 by the Methow Beaver Project on Chiliwist Creek, which was burned in the 2014 Carlton Complex Fire. Pictured in May 2023 (right), another BDA project was installed in 2016 by OHA along Triple Creek in the Okanogan Highlands.
(Source: Okanogan CD, 2023)

In some cases, fuel treatments can achieve both ecological objectives and wildfire risk reduction. Restoration treatments in dry-mixed conifer and ponderosa pine forests tend to achieve both fuel treatment and ecological restoration objectives by reducing fuels and lower the stand density within the forest, which is more in line with historic conditions pre-fire. Fire exclusion has led to forests in much of Okanogan County becoming excessively dense. The closing of canopies reduces habitat for shade-intolerant plants, and more enclosed forests are less optimal for providing cover for wildfire species that prefer more open conditions.

During treatment, the retention of "leave trees" within units can provide significant nest stands for goshawk, great gray owl, and western gray squirrel. Patches, or in some cases large acreages within units, or retain trees still provide habitat for species more inclined to closed canopies while still reducing fuel loading in the surrounding area. Slash management can also play a restorative role in local ecologies by providing cover for wildfire. Higher elevation slash piles provide cover for snowshoe hare (*Lepus americanus*), essential prey items for Canada lynx, while piles in proximity to wetlands can support amphibians and other small vertebrates and invertebrates.

Fuel treatments that take the history and ecology of the many ecosystems of Okanogan County can provide greater fire resiliency while facilitating a return to proper ecosystem function. Nevertheless, in some cases a more rigid form of fuel treatment may be required in order to better ensure public safety. A treatment that creates a forest with widely, evenly spaced trees could serve as an effective fuel treatment but would not achieve ecological objectives in most forest types.

Finding a balance between supporting local ecosystems while also ensuring public safety and the long-term sustainability of the landscapes that Okanogan County residents rely on, requires cross disciplinary coordination between land managers, and active and well-informed public involvement in order to be successful.

Treatment Types Covered in the CWPP

This CWPP covers fuel treatments in the HIZ 3, stand-level fuel treatments, and roadside fuel treatments, each with their own objectives and benefits:

Fuel Treatment Category	Primary Objectives and Benefits
Defensible space in HIZ 3 (30-100 feet away from the home)	Reduce surface fuels, reduce tree density, and increase the distance between surface and canopy fuels. Moderate fire behavior near structures and increase their chance of surviving a wildfire. Increase safety and access for wildland firefighters. Increase the visibility of structures from roadways to assist wildland firefighters with locating and accessing your home. Coordinate with partners when HIZ 3 overlaps neighboring properties to address shared wildfire risk. Linked defensible space creates safer conditions and better tactical opportunities for wildland firefighters. Defensible space projects that span ownership boundaries are better candidates for grant funding due to their strategic value.
Stand-level ecological restoration/fuel treatments	Reduce surface fuels, reduce tree density, and increase the distance between surface and canopy fuels. Restore ecological conditions to create more fire-resilient ecosystems. Reduce the likelihood of high-severity wildfires near communities. Create tactical opportunities for fire suppression.
Roadside fuel treatments	Dramatically reduce or eliminate surface and canopy fuels. Reduce the likelihood of non-survivable conditions along roadways during wildfires. Create tactical opportunities for fire suppression. Increase the visibility of structures from roadways to assist wildland firefighters.

General Recommendations

General Recommendations for Home Ignition Zone 3 and Stand-scale Treatments

Local knowledge and professional expertise are needed to design effective, site-specific fuel treatments based on the best available science. Specific fuel treatment recommendations are dependent on forest type, tree density, fuel loads, terrain, land use, and management objectives. The location and purpose of treatments also matter. Treatments in large, forested areas can include the retention of individual trees and groups of trees. Evenly and widely spaced trees might be reasonable in the HIZ 3, but this tree arrangement would not be appropriate for restoration-style fuel treatments.

Treatments in HIZ 3 (30-100 feet away from the home) can restore historical vegetation structures and plant communities, but it is most important to focus on reducing wildfire risk to the home, creating safe conditions for firefighters, and increasing the visibility of your home from the road for firefighters. Homeowners often enjoy the more open forest around their home because it lets in more light, which encourages understory grasses and shrubs to grow and, in turn, can increase wildlife sightings near their home. HIZ 3 often overlaps neighboring properties and requires residents to work together to address shared wildfire risk.

For all fuel treatments, it is important to address surface fuels. Forest management operations often increase surface fuel loads and can fail to achieve fire mitigation objectives if fuels created by the harvest activities (also known as slash) are not addressed (Agee and Skinner, 2005). Slash can include small trees, limbs, bark, and treetops.

Mitigating the impacts of tree removal on soil compaction and erosion is also important when treatments occur near streams and riparian ecosystems. Treatments should be monitored for colonization of invasive, weedy plants that might require control through integrated weed management. It's always a good idea to take pictures of treatments before and after to help evaluate effectiveness and monitor changes over time.

General Recommendations for Roadside Fuel Treatments

The width of an effective roadside fuel treatment (distance to the left and right of a road) is dependent on slope. It is recommended that treatments extend 150 to 240 feet off the downhill side of the road and 100 to 150 feet off the uphill side. Wider treatments are necessary on the downhill side on steeper slopes due to the exacerbating effect of slope on fire intensity when fires travel uphill (Dennis, 2005). Important aspects of all roadside fuel treatments include:

- Removing limbs overhanging the road to create ***at least*** 13.5 feet of vertical clearance.
- Trees should be removed alongside the road to create at least 20 feet of horizontal clearance.
- Removing trees to create ***at least*** 10-feet crown spacing between remaining trees within the roadside treatment zone specified.
- Removing shrubs and regeneration that can serve as ladder fuels.
- Mowing grasses adjacent to the road.
- Remove slash following fuel treatments.

Along important evacuation routes that could experience extreme congestion, roadside treatments should be more aggressive and consist of near removal of all trees within at least 30 feet of roadways. Clearcutting along roads when surrounding forests remain dense can cause problems with snow drifting, so shaded fuel breaks might be more appropriate in areas where drifting is more likely, or snow fences might need to be installed.

Some residents find roadside fuel treatments aesthetically displeasing because of the removal of so many trees, but these treatments are vital for increasing the safety of residents and firefighters in this community. Roadside treatments must dramatically reduce fuel loads to effectively reduce the risk of non-survivable conditions developing during wildfires.

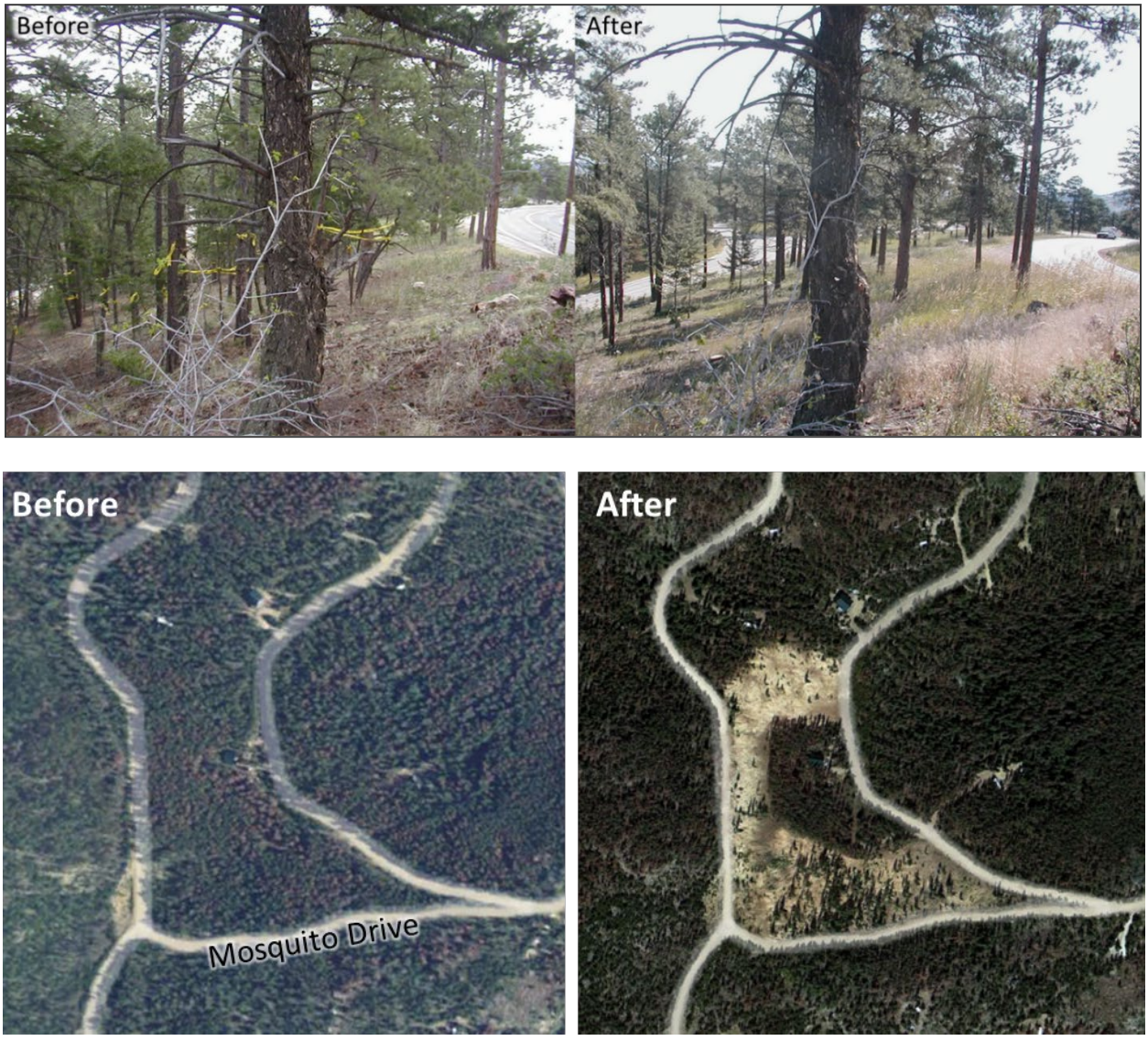


Figure 6.a.2. Effective roadside fuel treatments remove enough trees to result in widely-spaced crowns, remove ladder fuels (seedlings, saplings, shrubs, and low limbs), and reduce surface fuels. More dramatic tree removal along roadways can create even safer roadside conditions where appropriate.
(Source: Genesee Foundation (top) and USDA/FPAC/GEO/Google Earth (bottom), nd)

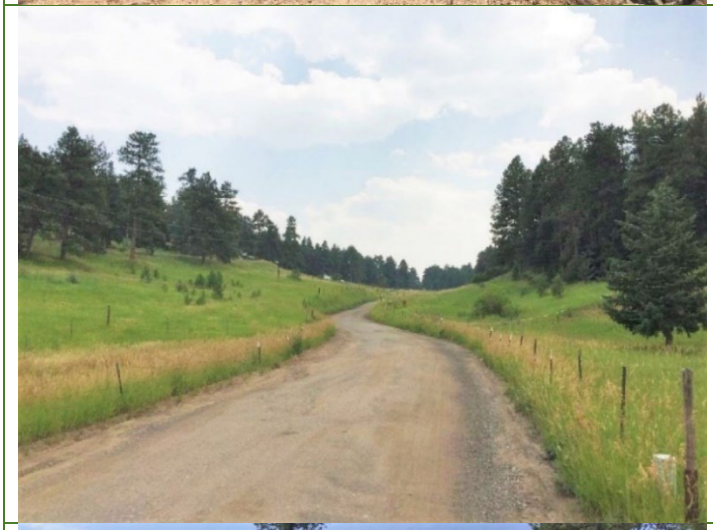
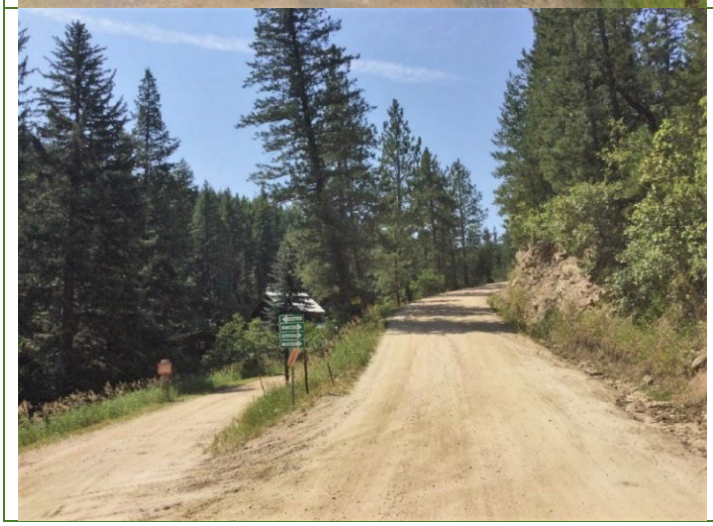
Roadway example	Suggestions for improvement
	• Clear trees and tall shrubs away from the roadways • Clear extra space on the downhill side • Create regular pullouts and turnaround locations for engines
	• Mowing along the side of the road is recommended for the tall grasses. • The trees along this roadway are back from the road and upslope of the road. Trees should be removed to further away, but this would be lower priority than other roadways.
	• Remove trees that are leaning over the roadway because they could fall and trap residents during an evacuation • Clear all trees on the sides of the roadways • Install mirrors on switchbacks to improve visibility

Table 6.a.1. Examples of conditions of roadways and actions available to improve them. (Source: The Ember Alliance, 2024)

Approaches to Slash Management

Forest management operations, such as thinning and harvesting, often increase surface fuel loads and can fail to achieve fire mitigation objectives if fuels created by the harvest activities (also known as slash) are not addressed (Agee and Skinner, 2005). Slash can include small trees, limbs, bark, and treetops. Slash management is a critical step in the forest management process. It is unwise, ineffective, and even dangerous to conduct poor-quality fuels treatments that fail to reduce canopy fuels, result in increased surface fuel loads, and do not receive maintenance treatments. Such treatments can lead to a false sense of security among residents and fire suppression personnel (Dennis, 2005), and they divert limited funds away from more effective, strategic projects.

Leaving untreated slash within roadside fuel treatments is particularly counterproductive and may create an extreme fire hazard per RCW 76.04.660 that may result in enforcement action by the WA DNR. The risk of active crown fire might be lower after a thinning operation, but untreated slash in fuel treatments can burn at high intensities and endanger the lives of residents stuck on roadways during a wildfire. Slash is easier and cheaper to manage along roadways due to access, and roads can serve as highly effective holding features for controlled burning of grass in the spring and fall and pile burning in the winter.

Figure 6.a.3. Chipping can provide a means of slash disposal that reduces smoke emissions and can support soil health. Chipping is typically not an option for burnt material due to the heavy wear inflicted on the machinery. (Source: Okanogan CD, 2015)

Managing slash can be difficult in Okanogan County and North Central Washington more broadly due to limited access to biomass (such as biochar) and timber industries. Various methods for in-situ management of slash include mastication with heavy equipment or lop-and-scatter. A drawback to these and other similar methods is that the fuel is not consumed or removed from the site, merely being modified and rearranged. These methods do provide benefits, however for nutrient cycling and water retention. The creation of wildlife habitat mounds or piles can provide a means of disposing of slash, but are not practical at large scales and require certain site characteristics to be effective in supporting wildlife habitat. Prescribed burning and pile burning are the most effective means of disposing of slash on site, though these methods produce smoke (which can have deleterious impacts on seasonal air quality) or can when improperly implemented, lead to damage to surrounding vegetation or additional fires. WA DNR should be contacted with questions regarding silvicultural burning regulations and permitting on private and state forest lands.

One particular challenge of slash management that is applicable from the smallest of defensible space projects to large-scale forest health treatments is managing potential pest and pathogen outbreaks that can negatively impact forest health and fire resiliency. Pine ips (*Isp ssp*.), or engraver beetles, are a frequent issue when dealing with fresh pine slash, particularly in the Methow Valley. Active in the early spring, the beetles are naturally adapted to take advantage of winter-damaged trees and find slash piles to be excellent brooding areas. A secondary period of activity occurs in the mid-summer after the first brood reaches maturity. Pine isps can severely damage pine that is already drought-stressed, damaged, or already impacted by another forest pest or pathogen. Homeowners and managers alike can reduce the risk of pine isp infestations by minimizing the amount of pine slash created between December and June and rapidly disposing of any that is created during that period by chipping or burning.

6.b. Implementation Recommendations for Air Quality

Color - Category	Index Value	AQI
		Concentration of Fine Particles (PM2.5) (µg/m^3)
Green - Good	0-50	0 - 12.0
Yellow - Moderate	50-100	12.1 - 35.4
Orange - Unhealthy for Sensitive Groups	101-150	35.5 - 55.4
Red - Unhealthy	151-200	55.5 - 150.4
Purple - Very Unhealthy	201-300	150.5 - 250.4
Dark Red - Hazardous	301-500	250.5 - 500

Figure 6.b.1. The Air Quality Index (AQI) for PM 2.5 (prior to changes in EPA standards). Large areas of Okanogan range between 50-150 throughout the year, with spikes above 150 due to frequent wildfires. (Source: Clean Air Methow, nd)

Our aspirations to prepare and adapt our communities for current and future fire regimes must acknowledge smoke as a secondary threat accompanying fire. While the prescriptive use of fire to promote forest health and protect public safety can be considered "good fire," from a public health and safety perspective, there is no such thing as "good smoke," though smoke does play a positive biophysical role in the development of some plant species. As such, a fire-adapted community must address the impacts of smoke on public health, economic, social, and community, and develop preparedness and exposure reduction strategies to mitigate them. In short, this CWPP and other plans can also help Okanogan County become a "smoke-ready" or "smoke-adapted" community.

Even when subtracting wildfire smoke, Okanogan County, perhaps surprisingly, has some of the highest smoke pollution in Washington State from sources that include winter woodsmoke, outdoor residential burning, and agricultural and silvicultural burning. Our region has also been one of the heaviest hit by wildfire smoke in recent decades, with a predicted 2-5 fold increase in wildfire smoke days by the year 2050. Furthermore, some parts of Okanogan County may be designated as in"non-attainment" of the National Ambient Air Quality Standard for PM2.5 in 2025 (see below). For these reasons, our community must consider how to reduce the incidence and severity of wildfires and work to reduce smoke sources wherever possible, as well as exposure to smoke.

In Action Item List I, this plan recommends critical activities to reduce wildfire risk, such as home hardening that includes residential thinning and clearing of limbs, brush, and trees, and dramatic increases in the use of prescribed fire (both broadcast and pile burning) through the creation of prescribed burn cooperatives and on public lands by USFS and WDFW. These activities could generate more smoke and potentially harmful smoke exposures. However, with thoughtful strategies, smoke exposure can be minimized, e.g., through the promotion of alternatives to the burning of cleared fuels, such as residential programs offering free chipping or organics disposal. Smoke from prescribed fire is heavily regulated and typically far less than wildfire. However, sensitive individuals in communities very near large-scale projects such as Edelweiss in Winthrop, Conconully, Toats Coulee, or Libby Creek and Twisp River may need directed household-level outreach. Such outreach can teach both the purpose and value of prescribed fire to improve forest health and protect public safety, as well as how to minimize smoke exposure. As needed, interventions such as portable air cleaners or, in extreme circumstances, help with temporary relocation can be provided to smoke-vulnerable, low-income households. Interagency coordination of land managers, air quality regulators, and local public health and community-based organizations will be crucial.

Figure 6.b.2. The winter inversion layer in fall of 2023. (Source: Clean Air Methow, 2023)

The primary means of protecting and enhancing air quality for public health in the United States is through implementing National Ambient Air Quality Standards (NAAQS), administered by the Environmental Protection Agency (EPA). These standards address six pollutants that harm human health: ozone, carbon monoxide, sulfur dioxide, lead, nitrogen oxides, and particulate matter (EPA 2024). Particulate matter 2.5 microns in diameter or smaller (PM2.5) is the primary pollutant of concern in smoke.

The Clean Air Act, passed in 1963 and amended in 1977, is the primary legal authority governing air resource management. The Clean Air Act provides the principal framework for national, state, and local efforts to protect air quality. Under the Clean Air Act, the EPA's OAQPS (Office for Air Quality Planning and Standards) is responsible for setting NAAQS standards for pollutants that are considered harmful to people and the environment. OAQPS is also 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).

In February 2024, the EPA finalized changes to the NAAQs for fine particulate matter, PM 2.5, lowering the annual average of acceptable levels of PM 2.5 under the Clean Air Act from 12.0 to 9.0 micrograms per cubic meter (μg/m3) to better align with known health impacts (EPA 2024). Okanogan County had previously met the NAAQs for PM 2.5, but as a result of this rule adjustment, portions of or all of Okanogan County will likely be considered in non-attainment, or violation, of the

NAAQs, even when subtracting out wildfire smoke as "exceptional events." The EPA has one year to make decisions on final designations. Once a non-attainment designation is established, the State of Washington is required to develop and implement a State Implementation Plan (SIP) aimed at reducing pollutant levels and achieving compliance with the air quality standards. The SIP outlines various control measures, strategies, and regulations to mitigate pollution sources and improve air quality. The EPA closely monitors the progress of these plans and may impose sanctions or enforce federal implementation plans if states fail to meet their air quality improvement obligations. Overall, non-attainment designation triggers a series of regulatory actions and measures to address air quality concerns and protect public health. As the non-attainment designation has not yet been finalized as of the adoption of this CWPP, it is unclear if all or only portions of Okanogan County will be so designated if a non-attainment declaration is issued. All recommendations are intended for the whole county. They are applicable regardless if a non-attainment declaration is issued or not.

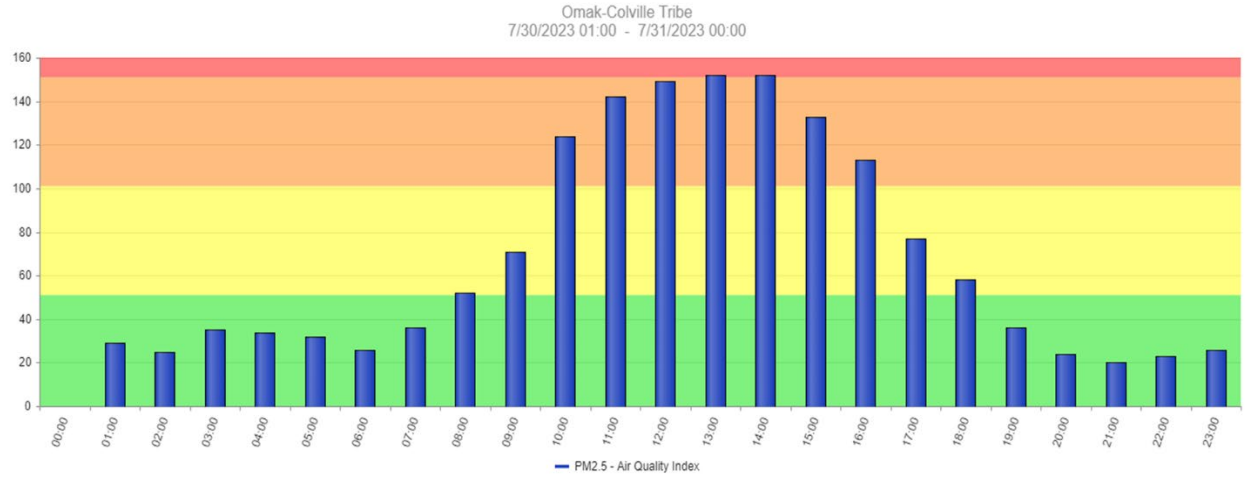


Figure 6.b.3. A graph of the AQI for July 30th, 2023, from the Omak sensor. The Eagle Bluff fire had begun in the northern Okanogan Valley the previous day. A shift of the winds on the 30th brought the smoke column southward. (Source: WA DOE, 2024)

Smoke emissions from fires can significantly impact an area and the airsheds that surround it. Smoke from large wildfires can also travel hundreds of miles to impact communities far away from its source. Smoke is a complex mixture of gases and fine particles, including PM2.5, water vapor, carbon dioxide and monoxide, ozone, PAHs, nitrogen oxides, and other chemicals. PM2.5 is typically the component of greatest concern for health impacts as it is small enough to bypass many of the body's natural defenses to air pollutants in the respiratory system, lodge deep in the lungs, and initiate a cascade of inflammatory reactions. Short- and long-term exposures to PM 2.5 can harm human health, contributing to and exacerbating cardiovascular and respiratory disease, causing low birth weight, premature births, and other issues. As mentioned previously, Okanogan County must cope with extreme levels of seasonal wildfire smoke and PM 2.5 from other sources during almost every season of the year.

Large-scale influences on smoke travel include latitude, altitude, prevailing hemispheric wind patterns, and mountain barriers. Topography and vegetation cover also affect air movement patterns on a smaller scale. Major river drainages are subject to temperature inversions, which trap smoke and affect dispersion, causing local air quality problems. This occurs most often during the summer and fall months and can affect many communities in Okanogan County. Wintertime inversions are less frequent but can trap smoke from home heating, winter silvicultural burning, and pollution from other sources.

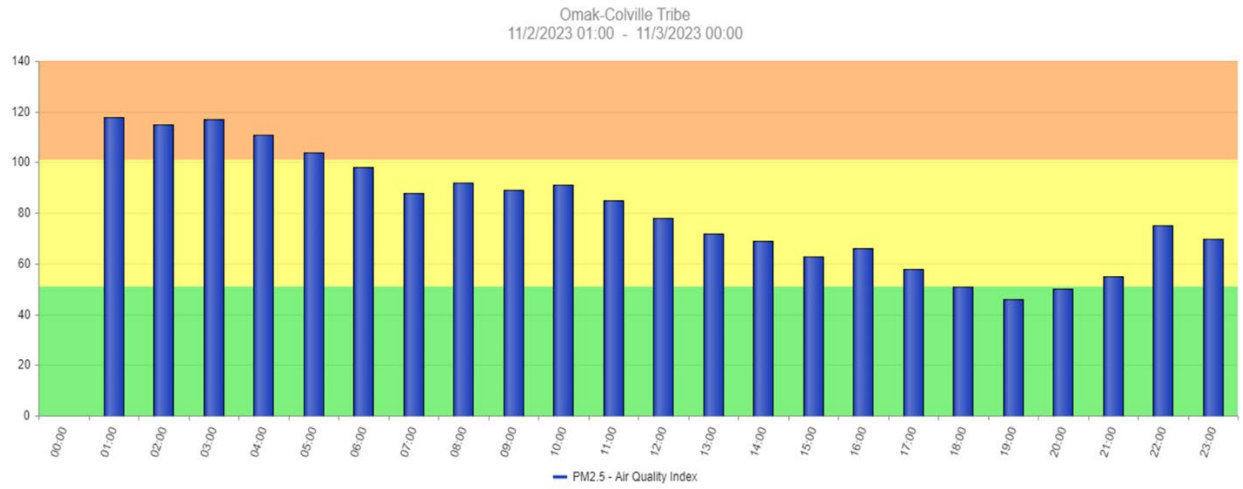


Figure 6.b.4. AQI for November 2nd, 2023, from the Omak sensor. In the absence of wildfire, air quality across portions of the county can range widely due to point sources of PM 2.5 like outdoor burning, home heating, and additional emission sources. (Source: WA DOE, 2024)

Community wildfire protection planning is an opportunity to think broadly about the ways that a place is affected by wildfire and develop effective preparedness, response, hazard mitigation, and recovery programs. The adverse impacts of wildfire smoke on physical and mental health, safety, well-being, agriculture and livestock production, economy, workers, recreation, community vitality, and more are becoming more evident. Integration of planning and programs to minimize the negative impacts of fire while considering air quality will comprehensively promote healthy, safe communities in fire-adapted ecosystems.

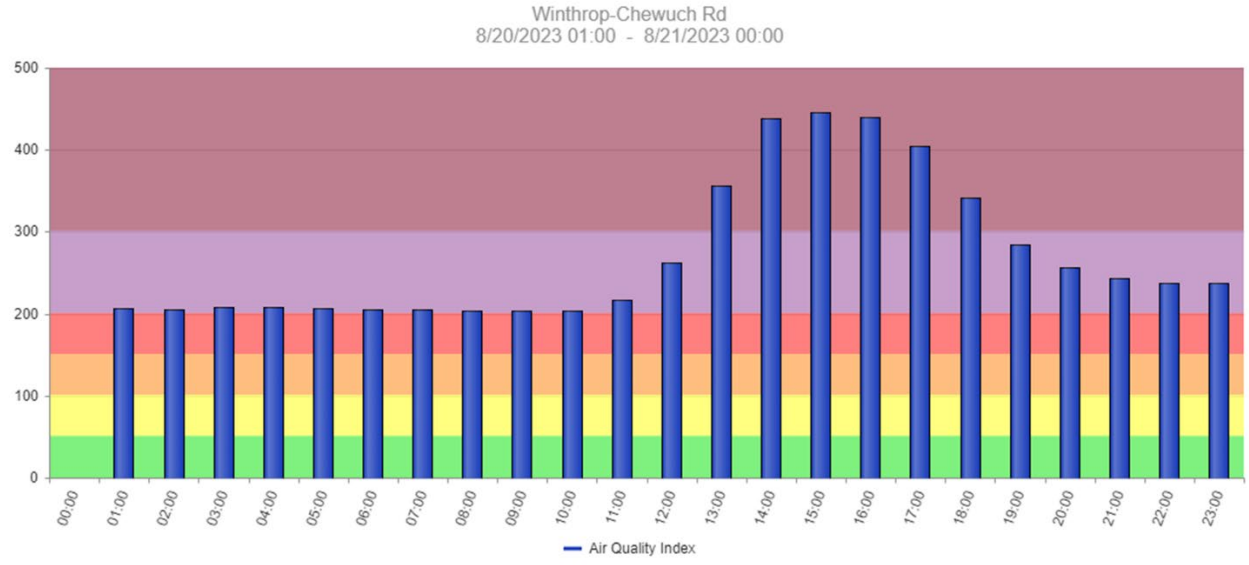


Figure 6.b.5. AQI for August 20th, 2023, from the Winthrop sensor. Wildfire smoke from fires burning in the North Cascades, Canada, and elsewhere compounded to produce extremely hazardous air quality conditions throughout the day. (Source: WA DOE, 2024)

During a wildfire event, safeguarding the welfare of the impacted community is a crucial part of the planning process. While swift and effective evacuation protocols and routes are important when homes and neighborhoods face the dangers of wildfires, we must acknowledge that all residents residing in proximity to the wildfire may experience hazardous levels of wildfire smoke. Ensuring access to clean indoor air becomes critical for every member of the community, especially those most susceptible to the adverse effects of smoke. HEPA air purifiers, along with DIY air purifier kits, emerge as accessible and cost-effective resources for community members to establish clean air spaces indoors during smoke episodes.

Figure 6.b.6. The Okanogan Conservation District and partners across the county have had great participation and success in both reducing wildfire risk and reducing burning green waste by organizing community clean-up days, chipping events, and funding the rentals of community green waste dumpsters.
(Source: Eli Loftis, Okanogan CD, 2023)

6.c. Project Action Recommendation Table

This section includes project action recommendations identified by the CWPP planning committee and partners with consultation from technical experts and direct input from community members via the CWPP community survey, public meetings, and mapped values at risk (figure 6.c.1.). These recommendations align with CWPP core values and aim to accomplish the objectives listed below.

Action Items: Each action item is listed under the most relevant CWPP topic category. Categories themselves do not follow any specific priority order; however, action items are grouped according to their identified priority (low, medium, or high).

Activity Description: Each action item description explains the proposed activity, the project goal, and outcomes, and serves as a starting point for the assignment of resources to guide collaboration and implementation efforts.

Priority (P): Each action item is prioritized as a low-, medium-, or high-priority. See table legend.

CWPP Objectives:

1. To reduce the area of WUI land burned and losses experienced because of wildfires
2. Prioritize the protection of people, structures, infrastructure, and unique ecosystems contributing to our way of life and the sustainability of the local and regional economy
3. Educate communities about the unique challenges of wildfire in the WUI
4. Establish mitigation priorities and develop mitigation strategies in Okanogan County
5. Strategically locate and plan fuel reduction projects
6. Provide recommendations for alternative treatment methods, such as modifying forest stand density, herbicide treatments, fuel reduction techniques, and disposal or removal of treated slash
7. Meet or exceed the requirements of the National Fire Plan and FEMA for a County-level Wildfire Protection Plan

Status/Timeline: Action items are described as ongoing, short-term, mid-term, or long-term based on when they are anticipated to be accomplished. Ongoing action items may already be underway and are expected to continue indefinitely. Short-term actions may be feasibly implemented within the calendar year or 1-2 years with existing resources and authorities. Mid-term actions can potentially take 2-5 years and require the acquisition of additional resources to be accomplished. Long-term actions may take 5-10 years or more and require a multi-year planning process as well as new or additional resources and/or authorities to implement.

Lead Agency: The organization(s) expected to target an action item project and organize resources, find appropriate funding, and oversee activity implementation, monitoring, and evaluation.

Partner Organizations: Partner organization(s) that play a supportive or technical role in the implementation of an action item, in a formal or informal context depending on the action item. Partner organizations may be able to assist in the implementation of action items by providing supplemental resources, technical assistance, and expertise to the coordinating organization.

Project Location: Indicates the focus area within Okanogan County where an action item is proposed to take place. Some items may be focused on a specific area; however, there are also many projects that are applicable throughout Okanogan County.

Approved Firewise USA® Action Plans or other approved community wildfire mitigation or action plans, regardless of their status at the time of writing, are incorporated into this plan. Action or mitigation plans for communities drafted after this plan are considered part of this CWPP and will be adopted into the plan at the next scheduled update.

All action items identified in this CWPP are implementable should local entities and their partners garner funding, staff time, and community support and identify a high chance for success regardless of ranked priority at the time of writing. This listing is an aspirational view of the wildfire resiliency in Okanogan County. It is up to the CWPP planning committee, other partners, and the residents of Okanogan County to work towards this future in the spirit of cooperation. To do, in the words of the father of American forestry, Gifford Pinchot, "the greatest good of greatest number in the long run."

Residents, community groups, public land managers, county, state, and federal agencies, and non-profit conservation groups can take strategic action to consider status/timeline, financial cost, resources, capacity, and authorities during the short-, mid-, and long-term implementation phases (defined below). Action item projects and activities may have a low financial cost but require other action, such as a fundamental shift in attitudes and behavior to prioritize wildfire risk mitigation. Actions may also be more substantial and require new relationships, collaboration, and commitment across the community to connect resources, apply for grants, and make incremental steps towards meaningful change.

Status/Timeline Implementation Phases:

Short-term actions	Mid-term actions	Long-term actions
• Can be implemented within the calendar year or 1-2 years. • Can be accomplished within the current funding capacity for the fire district and, and residents. • Can occur within the context of the current organization, partner organization, or volunteer base, with modest expansion. • Can capitalize on current relationships with emergency response partners and land managers.	• Can be implemented within 2-5 years. • Will require expansion of the current organization, partner organization, or volunteer base. • Requires new cooperative relationships with emergency response partners, land managers, and non-profit organizations. • Actions that are already in the planning stages and have some portion of funding already identified.	• Can be implemented within 5-10+ years. • Requires multi-year planning and funding for implementation to occur at a later time. • Requires extensive grant funding and resources. • Requires additional staffing beyond the current capacity and additional volunteers.

Commitment to Revision: The partners involved in the CWPP update recognize that conditions on the ground and financial constraints are fluid and subject to change. As such, for this CWPP to have a meaningful positive impact the partners commit to having periodic meetings to assess the impact of the current document, update it informally as needed, and to formally update it as deemed appropriate in 2029, and complete a new CWPP in 2034.

Glossary of Acronyms Present in the Table

BIA	Bureau of Indian Affairs
BLM	Bureau of Land Management
BR	Bureau of Reclamation
CAFÉ	Community for the Advancement of Family Education
CAM	Clean Air Methow
CTCR	Confederated Tribes of the Colville Reservation
CWI	Central Washington Initiative
DAHP	Washington State Department of Archaeology and Historic Preservation
DOH	Washington State Department of Health
EMD	Emergency Management Division
FAM	Fire Adapted Methow
FSA	Farm Service Agency
HOA	Homeowners Association
NCWFHC	North Central Washington Forest Health Collaborative
NRCS	Natural Resource Conservation Service
NCPBA	North Cascades Prescribed Burn Association
Okanogan CD	Okanogan Conservation District
OCFD	Okanogan County Fire District
OCDPW	Okanogan County Dept. of Public Works
OCEM	Okanogan County Emergency Management
OCLTRG	Okanogan County Long Term Recovery Group
OCNWCB	Okanogan County Noxious Weed Control Board
OKPUD	Okanogan County Public Utility District
OPH	Okanogan Public Health
ORAP	Okanogan River Airshed Partnership
PCL	Potential Control Line
POD	Potential Operation Declination
USFS	United States Forest Service
VSP	Voluntary Stewardship Program

WA DOA	Washington Department of Agriculture
WA DNR	Washington Department of Natural Resources
WA DOE	Washington Department of Ecology
WSDOT	Washington State Department of Transportation
WDFW	Washington Department of Fish and Wildlife
WiRe Center	Wildfire Research Center
WLA	Wildlife Area
WSCC	Washington State Conservation Commission
WSP	Washington State Patrol
WUI	Wildland Urban Interface

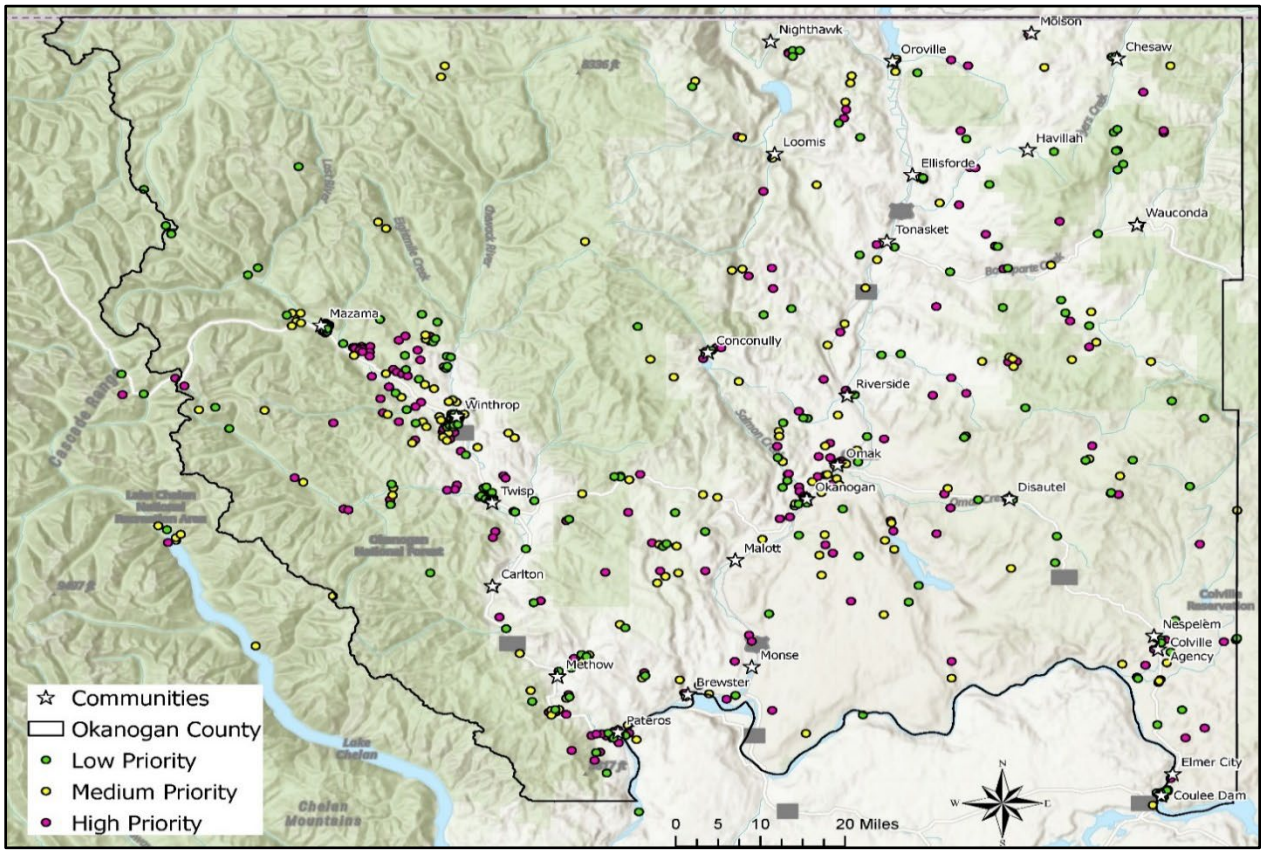


Figure 6.c.1. Mapped Values at Risk of Wildfire. (Source: Okanogan CD, 2024)

The colored dots represent personal and community values at risk of wildfire across Okanogan County, according to 300+ community members who attended the community meetings during the development of the CWPP. Participants were provided with maps of their surrounding area and asked to mark the places they identified as a value at risk of wildfire. Values marked included important roadways, critical infrastructure, areas with ingress/egress concerns, areas of historical or cultural importance, recreational areas, individual homes, and more. Each person was given three dots and asked to identify their values by priority in accordance to color.

2013 Priority Treatment Areas with Additional 2024 Areas Highlighted

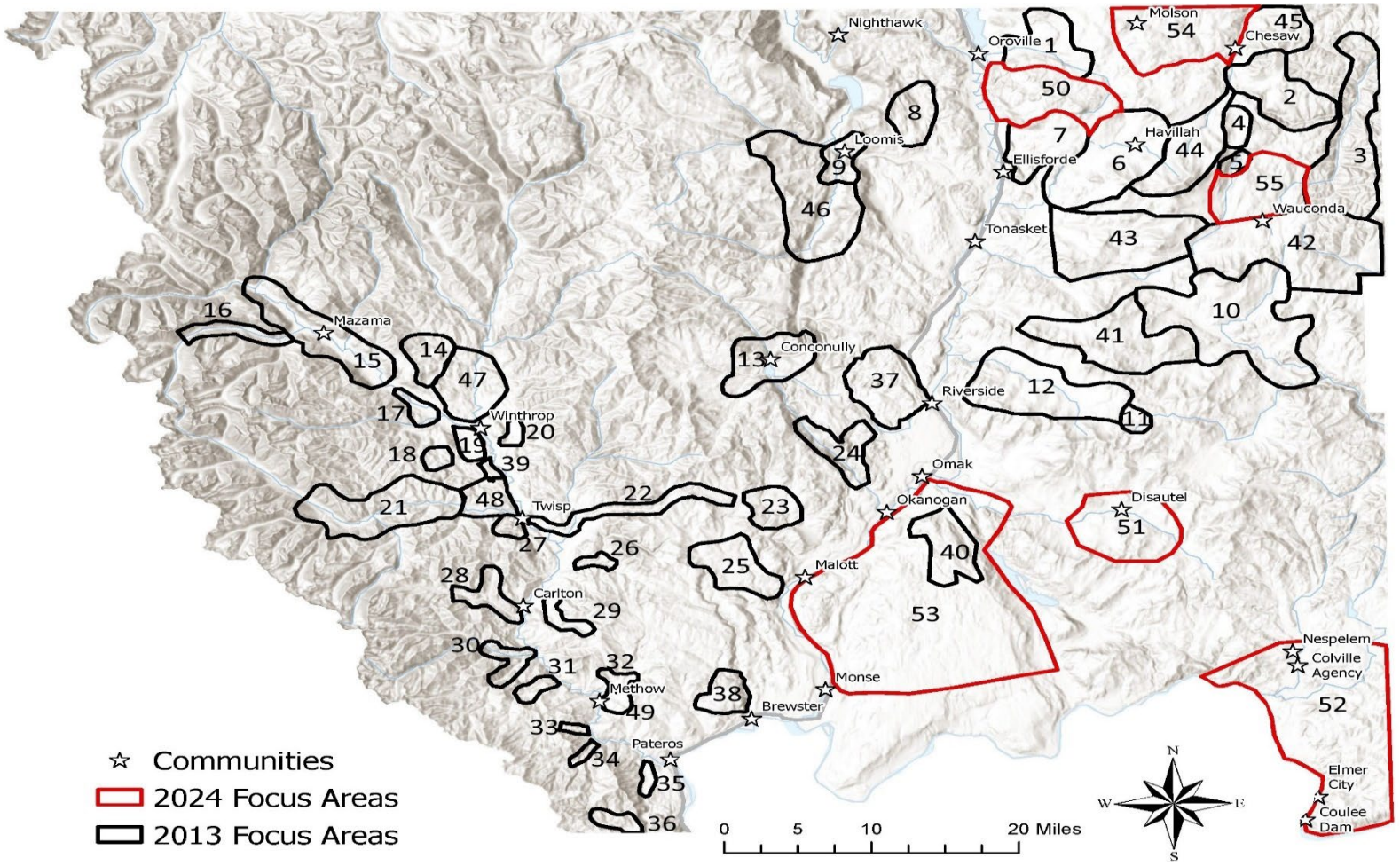


Figure 6.c.2 This map includes the 2013 forest health and fuel project areas identified as a high priority by the 2013 CWPP planning committee at the time and additional areas (in red) marked by the 2024 CWPP planning committee. The 2013 focus areas remain a high priority, in addition to the 2024 areas. Treatments in many of these areas require an 'all hands all lands' approach and significant coordination between private, local, state, tribal, and federal partners to achieve. See action item Category E for the full details and specific project action recommendations for forest health and fuel treatment projects. (Source: Okanogan CD, 2024)

High-Priority Treatment Areas

Project ID Number	Project Name	Forest Health/Fuel Treatment Types
1	Nile Mile	Defensible Space
2	Pontiac Ridge	Defensible Space, Forest Mgmt, Roadside Fuels
3	Toroda Creek	Defensible Space, Forest Mgmt, Roadside Fuels
4	Lost Lake	Defensible Space, Forest Mgmt, Roadside Fuels
5	Bonaparte Lake	Defensible Space, Forest Mgmt, Roadside Fuels
6	Havillah	Defensible Space, Forest Mgmt, Roadside Fuels
7	Mount Hull	Defensible Space, Forest Mgmt, Roadside Fuels
8	Wannacut	Defensible Space
9	Loomis	Defensible Space, Forest Mgmt, Roadside Fuels
10	Aeneas Valley	Defensible Space, Forest Mgmt, Roadside Fuels
11	Crawfish Lake	Defensible Space, Forest Mgmt, Roadside Fuels
12	Twin Creeks Development	Defensible Space, Forest Mgmt, Roadside Fuels
13	Conconully	Defensible Space, Forest Mgmt, Roadside Fuels, Post-Fire Debris Flows
14	Upper Rendezvous	Defensible Space, Forest Mgmt, Shrubsteppe Mgmt, Roadside Fuels
15	Mazama	Defensible Space, Forest Mgmt, Roadside Fuels, Post-Fire Debris Flows
28	Libby Creek	Defensible Space, Forest Mgmt, Roadside Fuels

Project ID Number	Project Name	Forest Health/Fuel Treatment Types
16	North Cascade Highway	Defensible Space, Forest Mgmt, Roadside Fuels
17	Wolf Creek	Defensible Space, Forest Mgmt, Roadside Fuels
18	Pine Forest	Defensible Space, Forest Mgmt
19	Twin Lakes	Defensible Space, Forest Mgmt, Shrubsteppe Mgmt, Roadside Fuels
20	Bear Creek	Defensible Space
21	Twisp River	Defensible Space, Forest Mgmt, Roadside Fuels
22	HWY 20 Corridor	Forest Mgmt, Roadside Fuels, Infrastructure Hardening
23	Buzzard Lake	Forest Mgmt, Shrubsteppe Mgmt, Roadside Fuels
24	Salmon Creek	Defensible Space, Forest Mgmt, Roadside Fuels, Post-Fire Debris Flows, Riparian Habitat
25	Chiliwist	Defensible Space, Forest Mgmt, Shrubsteppe Mgmt, Roadside Fuels
23	Buzzard Lake	Forest Mgmt, Shrubsteppe Mgmt, Roadside Fuels
24	Salmon Creek	Defensible Space, Forest Mgmt, Roadside Fuels, Post-Fire Debris Flows, Riparian Habitat
25	Chiliwist	Defensible Space, Forest Mgmt, Shrubsteppe Mgmt, Roadside Fuels
26	Benson Creek	Defensible Space, Forest Mgmt, Roadside Fuels
27	Alder Creek	Defensible Space
46	Upper Sinlahekin	Defensible Space, Forest Mgmt, Forest Mgmt Roadside Fuels

29	Texas Creek	Defensible Space, Forest Mgmt, Roadside Fuels
30	Gold Creek	Defensible Space, Forest Mgmt, Roadside Fuels
31	McFarland Creek	Defensible Space, Forest Mgmt, Roadside Fuels
32	French Creek	Defensible Space, Forest Mgmt, Roadside Fuels
33	Swaram Creek	Defensible Space, Forest Mgmt, Roadside Fuels
34	Black Canyon	Defensible Space, Forest Mgmt, Roadside Fuels
35	Alta Lake	Defensible Space, Forest Mgmt, Shrubsteppe Mgmt, Roadside Fuels
36	Antoine Creek	Defensible Space, Forest Mgmt, Roadside Fuels
37	Limebelt	Defensible Space, Forest Mgmt, Roadside Fuels
38	Harmony Heights	Defensible Space, Forest Mgmt, Roadside Fuels
39	Hoot N Holler	Defensible Space, Forest Mgmt, Roadside Fuels
40	Camron Lake	Defensible Space, Shrubsteppe Mgmt, Roadside Fuels
41	Bannon Creek	Defensible Space, Forest Mgmt, Shrubsteppe, Roadside Fuels
42	Wauconda	Defensible Space, Forest Mgmt, Roadside Fuels
43	Cayuse	Defensible Space, Forest Mgmt, Shrubsteppe Mgmt, Roadside Fuels
44	North Fork Bonaparte	Defensible Space, Forest Mgmt, Roadside Fuels
45	Buckhorn	Defensible Space, Forest Mgmt, Roadside Fuels
47	Lower Rendezvous	Defensible Space, Forest Mgmt, Shrubsteppe Mgmt, Roadside Fuels
48	Twisp/ Methow Confluence	Defensible Space, Forest Mgmt, Roadside Fuels
49	Lower French Creek	Defensible Space, Forest Mgmt, Roadside Fuels
52	Nespelem to Coulee Dam	Defensible Space, Forest Mgmt, Shrubsteppe Mgmt, Roadside Fuels, Infrastructure hardening
53	Greater Cameron Lake	Defensible Space, Shrubsteppe Mgmt, Roadside Fuels
54	Molson	Defensible Space, Forest Mgmt, Roadside Fuels
55	Bonaparte Creek / Walker Lake	Defensible Space, Forest Mgmt, Roadside Fuels, Post-Fire Debris Flows

Table Legend:

Status / Timeline (S / T)

O	Ongoing
ST	Short term (1-2 years)
MT	Medium Term (2-5 years)
LT	Long Term (5+ years)

Priority (P)

L	Low Priority	Projects identified as non-urgent to implement when time permits, and capacity and resources are available.
M	Medium Priority	Projects in a non-urgent state that can adjust on a flexible timeline, to be implemented as soon as time permits, and capacity and resources are available.
H	High Priority	Projects identified as urgent, to implement ASAP, and have the greatest impact to life, critical infrastructure, and navigation and coordination in emergency events.

Topic Items:

Item A: **Fire Prevention and Mitigation Efforts**

i.e. home risk assessments, home-hardening, Firewise USA®, and similar programs, activities that encourage individual and community action

Item B: **Enhancements of Infrastructure**

i.e. facility upgrades, telecommunications, roadways, power grid, water resources

Item C: **Community Outreach and Education**

i.e. community engagement and public education efforts

Item D: **Enhancements of Local Resources and Capacity**

i.e. equipment, staffing, and other resources

Item E: **Fuel/Forest Health Treatment Implementation**

i.e. small- and large-scale treatments; defensible space, thinning, prescribed burning, wildlife habitat improvements

Item F: **Post-Fire Recovery**

i.e. pre-planning and post-fire recovery actions, recovery from the last fire is preparation for the next

Item G: **Evacuation and Emergency Response**

i.e. pre-planning and active incident management, coordination of people and resources

Item H: **Cultural and Economic Viability**

i.e. actions to protect objects and areas of cultural significance and economic value

Item I: **Public Health**

i.e. actions to preserve and protect physical and mental health, including air quality issues

Item A: Fire Prevention and Mitigation Efforts								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
A1	Offer incentives and/or an incentive program for Xeriscaping	Offer an incentive program for xeriscaping. Provides an alternative landscaping option to replace lawns with fire-resistant plants that are native to dry and arid landscapes. Reduces the need for watering, mowing, and will save water for instream flow, agriculture, or other needs.	**L**	1, 2	**O**	Okanogan CD	WA DNR, Towns	Throughout the WUI in Okanogan County
A2	Develop an internal information database	Develop or enhance an existing database for multi-agency coordination and information sharing for Incident Management Teams (IMTs). Multiple entities in Okanogan County provide a form of risk assessment services to property owners. The data from reports such as HIZ assessments may be useful to IMTs during an incident. A digital database shared between agencies would allow information to be easily accessible. Challenges to consider would include digitization of records, and privacy concerns.	**L**	1, 2	**LT**	WA DNR, Okanogan CD, USFS, CTCR	OCLTRG	Throughout Okanogan County
A3	Provide resources for widespread chipping	Programmatic funding for widespread chipping program through Okanogan County for private lands, businesses, agriculture.	**M**	1, 6	**O**	Okanogan CD	ORAP	Okanogan County
A4	Develop an incentivized defensible zone treatment program for communities	Develop an incentive program for defensible zone treatments for communities, rural subdivisions, and housing clusters—partner with OCLTRG to utilize the Equitable Mitigation program for residents unable to participate in cost-share. Continue support and incentives for existing defensible space treatments and programs.	**M**	1, 5, 6	**MT**	Okanogan CD	CTCR, WA DNR, Firewise USA® sites, towns and cities, OCLTRG	Within the core WUI of Okanogan County

Item A: Fire Prevention and Mitigation Efforts								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
A5	Provide incentives for the maintenance and promotion of home defensible space treatments	Provide incentives, financial, and technical assistance to property owners to maintain already implemented defensible space, and to complete new fuels mitigation projects within all three home ignition zones (HIZ) for individuals and communities.	**M**	4, 1	**MT**	Okanogan CD, OCLTRG	CTCR, WA DNR, Firewise USA® sites, towns and cities, OCLTRG	Within the core WUI of Okanogan County
A6	Support and develop models of best practices for home hardening and defensible space	Sponsor community-based fire-safe demonstration projects in the wildland urban interface incorporating forest health principles and defensible space. The Winthrop Public Library's demonstration landscape and trail is a prime example of this kind of activity in our region.	**M**	1, 3	**MT**	WA DNR	Okanogan CD, USFS, WA DNR, WDFW, OCFDs, CTCR, OLTRG, CAM, FAM	
A7	Collaborate to create defensible space for vulnerable populations	Collaborating and systematizing assistance for vulnerable populations in each community who need this support to ensure work gets done. Increased volunteers will create numerous public benefits to neighborhoods and communities. Conduct research, develop and/or manage, or support research, development and/or management of, equitable mitigation programs (EMP) that rely on volunteers, donated agency and NGO crews, and grant-funded contractors and crews to serve* underserved, overburdened, and/or historically marginalized community members. (*conduct HIZ mitigation and home hardening; provide home and community risk assessments; provide consultation on how the targeted community members can best access resources, information and assistance).	**M**	2, 4	**O**	OCLTRG	CTCR, WA DNR, Okanogan CD, WA Insurance Commissioner's Office, Firewise USA® sites, Towns and Cities	Throughout the WUI in Okanogan County

Item A: Fire Prevention and Mitigation Efforts								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
A8	Host legislative tours and education	Inform the legislature and other leaders of local issues, concerns, and projects to improve the understanding and acceptance of fire's role in Eastern Washington and Washington's forests.	**M**	1, 3	**O**	Okanogan CD	Any/All Partners	Okanogan County and adjoining areas
A9	Work with local forest collaboratives to enhance the value of cross boundary management and public/private partnerships for wildfire mitigation and forest health	Work with forest collaboratives — existing partnerships that include land management agencies, conservation groups, timber industry, and local government—to build social license, address barriers, and leverage resources to develop landscape-scale restoration and management projects on national forests and other lands where appropriate.	**M**	1,2,3,4	**O**	NCWFHC	CTCR, USFS, WA DNR, Okanogan CD	Throughout Okanogan County
A10	Establish standards for urban density management relative to wildfire resiliency	Identify and adopt appropriate standards for urban density - construction materials and standards, landscaping, buffers, vegetation management.	**M**	1, 2, 3	**O**	Towns and Cities	OCEM, Okanogan County Planning Dept., County Commissioners CTCR, WA DNR, Okanogan CD	Okanogan County

Item A: Fire Prevention and Mitigation Efforts								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
A11	Expand Membership in the Firewise USA® Program across Okanogan County	Firewise USA® certification is a program that allows communities to take direct action in reducing wildfire risk and gain access to resources, including Firewise USA® micro-grants and other funding resources, to work collaboratively to implement various beneficial projects.	**M**	1, 3	**O**	Okanogan CD and WA DNR	OCLTRG, OCFDs, OCEM, CTCR, Existing Firewise USA® Communities	Throughout Okanogan County, with focus on maintaining Methow Valley communities and increasing the numbers elsewhere.
A12	2024 OKPUD Wildfire Mitigation Plan	Required by HB1032, Okanogan PUD will develop and implement a wildfire mitigation plan aimed to reduce the threat of utility involved wildfires.	**H**	2, 3, 4	**O**	OKPUD		OKPUD Service Territory
A13	Dedicated crews to service fuel projects within cities and towns	Perform analysis of landscape factors in fire spread around municipalities. Develop a program for fuel reduction projects that can create defensible space and buffers within and around municipalities.	**H**	2	**MT**	Okanogan CD	WA DNR, Towns and Cities	Incorporated Towns of Okanogan County
A14	Develop resources for Towns with BMPs to guide dense developments (row homes, town houses etc.)	Develop recommendations for best management practices (BMPs) regarding fire resistant building materials, sprinklers, and vegetation management/buffer guidelines that can be adopted into codes and standards for dense development.	**H**	2	**MT**	Okanogan County Planning	WA DNR, Towns and Cities	Incorporated Towns of Okanogan County

Item A: Fire Prevention and Mitigation Efforts								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
A15	Create a Dedicated Home Hardening Cost-Share Program	Provide financial incentives and technical assistance to property owners to retrofit existing structures to be more fire resilient. Partner with OCLTRG to assist vulnerable populations who may be unable to contribute to cost-share and/or match requirements.	**H**	2	**MT**	WA State Legislature	WA DNR, Okanogan CD, WA Insurance Commissioner's Office, Firewise USA® sites, Towns and Cities, OCLTRG	Throughout the WUI in Okanogan County
A16	Non-Vegetative Fuel Removal Program	Conduct research, develop and/or manage, or support research, development and/or management of, programs that help remove and dispose of non-vegetative fuels that typically accumulate with time at people's homes – tires; old furniture and other household and yard-related items; old cars, mowers, trucks etc.; gas cans, old oil, paint, paint thinner etc.; old appliances; discarded fencing, lumber, railroad ties and old barns and sheds; paper and cardboard products; and other flammable materials.	**H**	1, 3	**ST**	Okanogan CD, WA DNR, CTCR, OCLTRG, FAM, Okanogan Public Workers, Towns and Cities	Firewise USA® Communities	Throughout Okanogan County
A17	Continue offering and providing home risk assessments and community assessments	Individual wildfire risk assessments of homes through programs such as Wildfire Ready Neighbors, and Wildfire risk assessments of communities such as Community Risk Assessments required by the Firewise USA® program.	**H**	1, 3	**O**	Okanogan CD, WA DNR, CTCR, OCLTRG	USFS, BLM, Firewise USA® Communities, OCFDs	Throughout Okanogan County

Item A: Fire Prevention and Mitigation Efforts								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
A18	Develop fire risk portfolios for towns and cities	Given the high risk of wildland fire moving into town and cities in Okanogan County, fire risk assessment should be undertaken to provide dedicated and detailed understandings of existing risks and means to mitigate them at a local level. These portfolios would be utilized to inform future CWPP updates, and planning at the municipal and county levels.	**H**	1,2,3,4,5,6,7	**LT**	Towns and Cities	OCEM, Okanogan County Planning Dept., County Commissioners CTCR, WA DNR, Okanogan CD	Towns and Cities
A19	Establish a biochar program to support large-scale fuels reduction efforts with orchards and forest health needs	A biochar program would support the reduction of fuel load on forest floors, rangeland, and any other land use types that have higher relative fire danger and activity in Okanogan County. Provide landowners with a way to reduce the amount of dry woody debris on their operations or private properties at a low cost to them, decrease fuel loads on forested lands, and greatly increase air quality by reducing pile burning from slash and agricultural pruning's/tear outs. Provide carbon rich biochar to landowners for soil amendments, soil remediation, and a renewable energy source such as, bio-oil. Stimulate ag viability by reducing pruning costs for orchardists and can greatly reduce fertilizer costs when utilized as a soil amendment. This program would provide Okanogan CD with the ability to staff a full-time Air Quality Specialist, and 3 interns to help run Okanogan CD's chipper, Forest Health cost share projects, and a CharBoss kiln.	**H**	1,2,3,4,5,6,7	**LT**	Okanogan CD	WA DNR, WA DOE, CTCR, USFS, Local Orchardists	A centralized location in Okanogan County

Item A: Fire Prevention and Mitigation Efforts								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
A20	Fire tool inspections and IFPL education	Continued Implementation of Wildfire Education to the logging community and logging operations regarding required equipment on active logging sites and how IFPL levels impact those operations.	**H**	2	**O**	WA DNR	USFS	
A21	Develop a Prescribed Burn Association (PBA) for Okanogan County or Multiple PBAs to cover the geographically distinct section of the county Support PBAs, TREX events, and cooperative burning opportunities	Development of Prescribed Burn Associations that organize community efforts and fire resources, enable small landowners and non-agency land managers to collaboratively implement prescribed fire on their lands. PBAs provide the best option to perform important hazardous fuel reduction treatments on private lands in the Wildland Urban Interface, which in turn creates locations to anchor wildfire suppression operations and enhance the value of prescribed fires utilized on public lands by easing the process of implementing cross boundary burns, in coordination with federal, state, and tribal authorities. The PBA and its partners will facilitate meaningful workshops and trainings to increase the communities' knowledge and skillsets of prescribed burning and perform public outreach in support of permitted, safe and effective, legal outdoor burning.	**H**	1, 4, 5, 6, 7	**LT**	Okanogan CD	NCPBA, Clean Air Methow, USFS, WA DNR, WA DOE WDFW, OCFD, CTCR,	Okanogan County

Item B: Enhancements of Infrastructure								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
B1	Assess improvements of bridges, cattle guards, culverts, and limiting road surfaces	Unmaintained, unmarked, or under engineered structures such as bridges, cattle guards, culverts and road surfaces can be an impediment to fire suppression activities and can create issues during post fire recovery, the blowing out of undersized culverts during post-fire debris flows being prominent example. Mapping, marking, and periodic reassessments of those infrastructures can assist in readily accessing areas during incidents, and identify areas for post-fire mitigation if needed.	**M**	2	**O**	Okanogan County Public Works	County Commissioners, WSDOT, WA DNR, USFS, CTCR, BIA, BR, Private Landowners	Throughout Okanogan County
B2	Invest in infrastructure improvements to the irrigation districts and companies	May include the development and availability of dry hydrants or even pressurized hydrants for emergency services use.	**M**	2	**O**	Irrigation Districts	County Commissioners, WSDOT, WA DNR, USFS, CTCR, BIA, BR, Private Landowners	Throughout Okanogan County
B3	Investment in water storage facilities. Both water storage tanks and or landscape scale storage	Evaluate needed distribution of facilities and appurtenant infrastructure necessary for emergency water availability on a geographic scale.	**M**	2	**O**	County Commissioners	WA DOE, BR, Okanogan CD, Private Landowners	Throughout Okanogan County
B4	Construction of missing links in road system	Once transportation plan and roadway standards are in place, we may need to construct some critical connections.	**M**	2	**MT**	Okanogan County Public Works, Towns and Cities	WSDOT, CTCR (Dept. of Transportation)	Throughout Okanogan County

Item B: Enhancements of Infrastructure								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
B5	Develop a pilot project to provide for the mapping, marking, and acquiring technology to dynamically post potential evacuation routes	Dynamic systems to denote evac routes during incidents that are responsive to changes on the ground and managed remotely can be a helpful asset if utilized in the proper context and locations. However, the feasibility and reliability of such systems, if they were to be developed for wildfire, is yet to be assessed. These systems would likely not be usable in isolated areas and would instead be utilized in well-travelled population centers, like towns. This action item does not negate the reality that posting static evacuation route makers is not considered a safe practice for wildfire evacuations (see action item B11 for static signage that is helpful in this context). A pilot project is needed to assess if these systems are a realistic option for Okanogan County communities.	**M**	2,7	**MT**	Town of Twisp/Town of Winthrop	WSDOT, Okanogan County	Town of Twisp/Town of Winthrop
B6	Improve cellular phone tower coverage for redundancy during wildfires and power outages.	Develop back up cell towers so that the public can stay connected to emergency alerts and report new emergencies during wildfire events.	**M**	2,7	**MT**	Town of Twisp/Town of Winthrop	Okanogan County, Cellular Network Providers	Upper Methow Valley/areas near Twisp and Winthrop
B7	Seek grant funding for back-up power for City wide infrastructure in the City of Omak.	Install adequate back-up power generators to sustain emergency power to all city infrastructure in the event of power outages during wildfire events. Explore making this available for other cities and towns.	**M**	2	**O**	City of Omak		City Of Omak

Item B: Enhancements of Infrastructure								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
B8	Expansion of weather stations, air quality monitors, and other meteorological monitor systems.	Detailed information about weather conditions is vital for successful fire resiliency, managing for safe and beneficial prescribed burns, suppression of active incidents, monitoring for the risk of post-fire hazards such as debris flows, and alerting the public to potentially hazardous air quality issues. Okanogan County's weather is variable due its large size and position at the crossroads of the Cascades, Rockies, and Columbia Plateau, compounded by the diverse topography. Expanding the number of weather stations, air quality sensors, and other equipment providing data can provide needed nuance to management decisions and provide additional non-fire related benefits for local agriculture and recreation.	**M**	1,2,7	**MT**	ORAP, Okanogan CD, WA DNR (Geological Survey), CTCR (Air Quality Program), Clean Air Methow	Washington State University, WA DOE, Private landowners, land management agencies	Throughout Okanogan County
B9	Transportation Updates for Twisp and Winthrop.	Adopt a plan for connected network of roads through all neighborhoods to ensure a minimum of two points of access for each neighborhood.	**H**	2	**MT**	Town of Winthrop/ Town of Twisp	WSDOT, Okanogan County	Towns of Twisp and Winthrop
B10	Deploy permanent reader boards at the intersections of major roadways.	Placing reader boards at the intersections (such as intersection SR 20 with SR 153) that can display general fire safety information, notices of prescribed burn activity, and other information will facilitate the transmission of information to the public at multiple locations and increase both pass and active awareness of conditions.	**H**	1	**MT**	OCEM	County Public Works, County Commissioner's Office, OCFDs, WSDOT	Throughout Okanogan County

Item B: Enhancements of Infrastructure								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
B11	Post signs along identified primary and secondary access routes.	Identify major routes of travel, ingress and egress points, providing consistent signage around county identifying where roads go. Signs posted should not describe routes as emergency evac routes, as doing so may be counterproductive during as fire, as evacuees may follow signage marked as emergency evac routes towards active fires. These signs should provide accurate information about distances to other places and resources in the county. For an action item that may potentially be utilized to denote evacuation routes see B5.	**H**	1	**ST**	OCEM, USFS	County Public Works, County Commissioner's Office, OCFDs, WSDOT, CTCR (Dept. of Transportation) .	Throughout Okanogan County
B12	Thin vegetation and widen PUD and Okanogan Electric Co-op transmission lines in high-risk areas.	Reduce risk of powerline ignited fires, similar to fires that have occurred elsewhere in Washington and California.	**H**	5	**O**	OK PUD, Okanogan County Electric Co-op, Nespelem Valley Electric Co-Op	Adjacent landowners	Throughout Okanogan County
B13	Ensure emergency response facilities are operable during wildfire events with the towns of Twisp and Winthrop	Install adequate back-up power generation, air filters, and communications equipment in Emergency Response Facilities that can withstand prolonged power outages and acute poor air-quality events.	**H**	2	**MT**	Town of Twisp/Town of Winthrop	OCEM	Town of Twisp/Town of Winthrop

Item B: Enhancements of Infrastructure								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
B14	Oroville North End Water Main Replacement Project	The "North End" of Oroville's water system consists of nearly 40,000 lineal feet of aging and undersized water transmission main. The transmission main stretches approximately 4 miles from the city limits north to the Canadian border and is within Okanogan County. The existing water mains experience frequent leaks and are too small to provide adequate fire flow and service pressures. The aging water line is very undersized for fire flow and needs to be replaced with a 12" main in order to properly protect the properties from the lake to the mountain in this stretch. This project could be broken into 4 stages or done as one hopefully to be completed in one year.	**H**	1	**ST**	City of Oroville	WA DOE, WSDOT	City of Oroville and adjoining areas.

Item C: Community Outreach and Education								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
C1	Chainsaw and Other Equipment Workshops	Chainsaw safety workshops empower land managers to implement the recommendations provided during home risk assessments.	**L**	1,3	**O**	Okanogan CD	WA DNR, USFS, NCPBA, Firewise USA® Communities	Throughout Okanogan County
C2	Rapid risk assessment and property owner surveys to inform evidence-based community wildfire risk education efforts	Conducting professional rapid assessments of home risk and coupling with a property owner survey to evaluate where gaps in knowledge or language exist. This will help stakeholders make informed decisions as to how to best help property owners to effectively manage their risk before and during wildfire events.	**L**	1,3	**ST**	FAM	WiRe Center, USFS	Methow Valley
C3	Reflective Address Signs and Numbers	Construct and install standardized signage for critically identified areas. Provide signage to the public through event, HIZ assessments, and other means.	**L**	1,2	**ST**	OCLTRG, Okanogan CD	OCFDs, WA DNR, Okanogan County Public Works, CTCR	Throughout Okanogan County
C4	Build a library with photos and graphics demonstrating home-hardening, defensible space, and fuels reduction projects in Okanogan County	Providing local examples of fire resiliency that residents can recognize in their daily lives is extremely impactful for communicating fire resiliency principles. A photo and graphic library would also enable more cohesive messaging across agencies' outreach and communications.	**L**	1,3	**O**	Okanogan CD	Any/All Partners	Throughout Okanogan County

Item C: Community Outreach and Education								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
C5	Support for public forums on prescribed fire	Funding to support 1-2 public meetings per spring/fall burning in locations near planned or current burns to hear community feedback, discuss the purpose of Rx burning and more.	**L**	3	**ST**	Clean Air Methow	ORAP Members, NCPBA	Throughout Okanogan County
C6	Regular field tours to educate the public on how wildfire impacts forest health, wildlife, and other ecosystem functions and services.	Field tours hosted by the various land management agencies provide opportunities for the public and partners to learn about specific land management issues revolving around wildfire. These tours have the added effect of facilitating dialogue and networking across physical, economic, and political boundaries.	**L**	1,2,3,4,6,7	**ST**	Land Management Agencies	Okanogan CD, CTCR, Yakama Nation, NCPBA, Okanogan Land Trust, Methow Conservancy, Okanogan Highlands Alliance, Conservation Northwest, MVCC	Throughout Okanogan County
C7	Develop demonstration homes, landscapes, and interpretive trails and signage for wildfire resiliency education	Develop, support, participate in, and lead efforts to create temporary and permanent demonstration homes, landscapes, and interpretive sites to engage community members in learning about HIZ mitigation, home hardening, impacts and effects of prescribed fire versus wildfire, etc. Develop, support, participate in, and lead collaborative community workshops, classes, field trips to these demonstration and interpretive sites.	**L**	3	**MT**	Okanogan CD	Okanogan County, WA DNR, USFS, CTCR, OCLTRG, FAM, Clean Air Methow, Towns and Cities	Throughout Okanogan County

Item C: Community Outreach and Education								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
C8	Increase capacity for Community Science	Implement Community Science programs by partnering with local organizations and recruiting volunteers to actively participate in species data collection, post-fire hazard conditions, fuel loading, and project coordination. Increase capacity in agencies and other entities to hire dedicated positions to train and direct volunteers to opportunities on public lands, coordinate with biologists to facilitate volunteer engagement in survey and monitoring efforts and develop data collection and management tools to support project implementation.	**L**	3,4,6,7	**MT**	Okanogan CD, WDFW, WA DNR	Yakama Nation, CTCR, BLM, USFS, NRCS, Okanogan Land Trust, Methow Conservancy, Okanogan Highlands Alliance, Conservation Northwest	Throughout Okanogan County
C9	Develop a Pilot Student Internship Program for Natural Resources	Support and partner with the Methow Valley School District in its development of student internships and other means to develop career pathways for young adults in natural resources, the trades, and public health.	**L**	3,4,6,7	**MT**	Methow Valley School District	Okanogan CD WA DNR	Methow Valley School District
C10	Outage Education and Outreach	Related to OKPUD WMP, outreach material should be developed to educate the public on OKPUD fire season practices, outage preparedness, and OKPUD response to fire-caused outages. Copies of handouts will be given to Okanogan CD, WA DNR, and OCLTRG.	**M**	1,3	**ST**	OKPUD	OCEM, Okanogan CD	County-wide within OKPUD Service Territory
C11	Neighborhood Ambassador Program in the Methow Valley	Working with identified lead volunteers at the neighborhood level to promote wildfire preparedness engagement and action within the neighborhood. Actions to include home hardening, fuels reduction, and evacuation planning.	**M**	1,3	**ST**	FAM, WA DNR	Okanogan CD, OCLTRG	Methow Valley

Item C: Community Outreach and Education								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
C12	Public Outreach and Fire Prevention Efforts by USFS Tonasket Ranger District	The Tonasket Ranger District will continue with prevention and education outreach through interactions with schools, at public events such as parades/fairs, and through posting prevention messages at sign boards across the district.	**M**	1,3	**O**	USFS	Okanogan CD, WA DNR	Various events and locations
C13	Develop an outreach program dedicated to communicating wildfire resiliency, habitat management, and other principles to landowners in the sagebrush steppe of the Okanogan and Methow Valleys	Wildfire is a natural force across all habitats in Okanogan County, not just forests. Developing specific outreach tools and messaging to property owners and residents that live within the large areas of sagebrush steppe will enable partner agencies and orgs to communicate best practices for reducing wildfire risk in that environment while also seeking to support the retention of the wildlife habitat value and other ecosystem services provided by the sage-brush steppe.	**M**	1,3	**ST**	WDFW	WA DNR, Okanogan CD, CTCR	Okanogan and Methow Valleys, lower elevation portions of the Colville Reservation, Chesaw.
C14	Establish a CWPP Standing Committee	Develop an ongoing collaborative wildfire working group or standing committee for Okanogan County fire agencies and others to convene quarterly or periodically to discuss CWPP-related issues. The Committee will also help ensure cross-jurisdictional cooperation, collaboration, and communication about projects, needs, and funding opportunities.	**M**	1,2,3,4,5,6,7	**O**	Okanogan CD	Core Planning Group Members	Throughout Okanogan County

Item C: Community Outreach and Education								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
C15	Create and/or disseminate materials promoting the beneficial uses of fire on the landscape	Informing the public about the beneficial uses of prescribed (Rx) fire and continuing to keep already aware and interested people interested and enthusiastic about Rx fire is vital to success of various fuel treatment projects implemented by federal, state and tribal entities, and potentially in the future PBAs.	**M**	1,2,3	**O**	WA DNR	Okanogan CD, WA DOE, WDFW, USFS, BLM	Throughout Okanogan County
C16	Continue Support and Implementation of Wildfire Educational PreK-12 Programs	This includes visits to schools, targeting events with children, and Smokey Bear presentations to reduce wildfire occurrence and severity.	**M**	1,3	**O**	Okanogan CD	School Districts, USFS, WA DNR, USFS	Throughout Okanogan County
C17	Healthy Forests Safe Communities Collaboration	Develop a better connection between forest/rural landscapes and the increasingly urbanized population to promote forest health and protect communities from wildfire.	**M**	1,3,4,5	**O**	USFS, WA DNR	Okanogan CD, CTCR, Yakama Nation, Okanogan Land Trust, Methow Conservancy, Okanogan Highlands Alliance, Conservation Northwest	Throughout Okanogan County
C18	Education Grant to Okanogan Fire Department	Additional funds would enable Okanogan Fire Department to meet with and educate the public on home hardening, defensible space, and other fire resiliency.	**M**	1,2,3	**O**	Okanogan Fire Department	Okanogan CD, WA DNR	City of Okanogan

Item C: Community Outreach and Education								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
C19	Okanogan County Smoke Readiness Outreach and Education Program	Public outreach will be conducted to inform and educate residents of Okanogan County about smoke readiness and how to become a smoke-ready community. Including different communication strategies.	**M**	1,2,3	**O**	Clean Air Methow	ORAP, OPH, Okanogan CD	Initially the Methow Valley expanding to greater Okanogan Co.
C20	Communication role for Prescribed Fire (Rx) burning. Public Outreach	Funding to support in person to work with all land managers (public and private) and other partner orgs to communicate to the public during Rx fire seasons, spring and fall. Coordinate communications between different land managers and burners, etc.	**M**	1,3,5,6	**MT**	NCPBA	Okanogan CD, WA DNR, USFS, CTCR (Mt. Tolman Fire Center)	Okanogan County
C21	Host educational events demonstrating effective fire risk reduction property management actions relevant to in town properties in the upper Methow Valley	Host educational events demonstrating effective fire risk reduction property management actions relevant to in town properties.	**M**	1,2,3	**ST**	Town of Twisp/Town of Winthrop	Okanogan CD, WA DNR, Towns	Town of Twisp/Town of Winthrop
C22	General Education of the CWPP	Continuing outreach efforts to provide education on the non-binding CWPP and provide frequent status updates on CWPP projects to the public through social channels and traditional media sources (newspapers, newsletters, radio, etc.).	**M**	1,2,3,7	**O**	Okanogan CD	All Partners	Throughout Okanogan County

Item C: Community Outreach and Education								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
C23	Reader Boards for Okanogan-Douglas-fire District 15	Additional funds to enable Okanogan-Douglas-fire District 15 to develop reader boards at stations and high-traffic areas would assist the district in communicating with residents and visitors about current conditions and evacuations.	**M**	1,2,3	**ST**	Okanogan-Douglas-fire District 15	Okanogan County, Okanogan CD, WA DNR, WSDOT	Throughout Okanogan-Douglas-fire District 15's service area.
C24	Implementation of general wildfire educational programs	Provide consistent generalized information on fire risk to the public, providing the educational and technical basis for many of the fire mitigation and prevention actions described in the CWPP.	**H**	1,2,3	**O**	Okanogan CD, WA DNR	OCFDs, OCEM, USFS, CTCR	Throughout Okanogan County
C25	Enhanced Communication of Burn Restrictions and Regulations	Providing the public with material and notice of all burn bans, restrictions, and burning regulations. This includes sign posting, in-field regulatory contacts, and radio ads to reduce wildfire occurrence and severity.	**H**	1,2,3,4	**ST**	WA DOE, WA DNR, Okanogan County, CTRC (Air Quality Program), Mt. Tolman Fire Center	ORAP	Throughout Okanogan County
C26	Dedicated air resource advisor(s) for Okanogan County	Funding to support an Air Quality Resource advisor for Okanogan County during prescribed fire and wildfire smoke season.	**H**	3	**ST**	Interagency Wildland Fire Air Quality Response Program	ORAP Membership	Okanogan County
C27	Support and develop unified messaging for prescribed fire and managed wildfire	This action would support and advocate for coordinated messaging that aligns with the best available science on wildfires benefits to local ecosystems and encourage the application of Rx fire across public and private lands.	**H**	1,3	**ST**	WA DNR	Okanogan CD, WDFW, USFS, BLM, NCPBA, CTCR (Mt. Tolman Fire Center)	Throughout Okanogan County

Item C: Community Outreach and Education								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
C28	Seek and support social science input and data for existing and/or new innovative wildfire resiliency practices and outreach education	Bolstering of state agencies applied science teams to inform community engagement by supporting, conducting and evaluating research on behaviors, motivators, barriers, public communications methods, and engagement can magnify the value of outreach actions. Incorporating social science insights and research findings into wildfire preparation, response and recovery plans to ensure well-informed and effective engagement approaches for the targeted communities provides necessary nuance to complex issues and challenges. Research and develop, or support research and development of, customized community outreach and engagement approaches, strategies and plans based on specific local needs, capacities, values, and perceptions and engagement plans should relate to wildfire awareness, the many ways to prepare oneself, family, friends, pets, livestock, land, and both for mitigation of fire risk and for evacuation and relocation during a fire eases the process of disseminating that information.	**H**	1,2,3,4,6,7	**O**	Okanogan CD	Okanogan County, WA DNR, USFS, OCLTRG, Universities	Throughout Okanogan County
C29	Develop capacity to serve the Spanish-speaking community of Okanogan County	Nearly 17% of Okanogan County residents do not speak English as a first language. Developing the capacity to more adequately serve those residents includes hiring Spanish-speaking staff, producing and translating educational outreach materials and resources into Spanish (including this plan and future editions), and other means of communication and community engagement.	**H**	1,2,3,4	**ST**	Okanogan CD	OCLTRG, CAFÉ, WA DNR, WA DOE, OCEM, OCFDs, Okanogan County Commissioners	Throughout Okanogan County
C30	Implement the three goals of the National Wildfire Cohesive Strategy	Develop and implement educational programs targeted at permitting authorities to affect development standards and land management practices to create safe and effective firefighting response, landscape restoration, and fire-adapted communities.	**H**	1,2,3,4,5,6,7	**LT**	USFS, WA DNR	All Partners	Throughout Okanogan County

Item C: Community Outreach and Education								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
C31	Develop pamphlets for builders/homeowners within the Towns of Winthrop and Twisp about creating fire-resistant landscaping and structures	Create and distribute pamphlets for builders/homeowners about creating fire resistant landscaping and structures.	**H**	1,2,3,4	**ST**	Town of Twisp/Town of Winthrop	Okanogan CD, WA DNR, Towns, CTCR	Town of Twisp/Town of Winthrop
C32	Assist communities in assessing information regarding insurance education	Collaboration of partners to enhance community education regarding insurance.	**H**	1,2,3,4	**O**	OCLTRG	Okanogan CD, WA DNR, WA Insurance Commissioner's Office	Throughout Okanogan County
C33	Reduce the number of human-caused fire starts in shrubsteppe landscapes through outreach and education	Increase enforcement and engagement for corrective actions (e.g., burning during a burn ban). Conduct regular language-accessible public awareness campaigns regarding the risk of fire in the shrubsteppe. Engage transportation departments, electric utilities/transmission line operations, and railroads to ensure fire-preventative best practices along rights-of-ways in shrubsteppe landscapes. Review fire ignition source data annually to refine ignition prevention outreach and engagement strategies specific to shrubsteppe landscapes.	**H**	1,2,3,4	**MT**	WA DNR, WDFW, WA Conservation Commission	Okanogan County, CTCR, BLM, USFS, NRCS, Conservation Northwest	The shrubsteppe of Okanogan County

Item C: Community Outreach and Education								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
C34	Collaborate with local tourism-centric businesses (hotels, recreation guiding etc.) and land managers to develop and disseminate outreach education for visitors to Okanogan County about wildfire risks and fire resiliency	Okanogan County residents have expressed significant concerns with the potential for non-residents unfamiliar with living with wildfire on the landscape to accidentally cause an ignition that may lead to a major wildfire incident. Tourism is a major economic enterprise in Okanogan County and balancing the needs of educating the visiting public about wildfire while still attracting visitors to our area is key. Looking to examples from other jurisdictions, including Sevier County, TN, and Larimer County, CO (the sites of Great Smokey Mountain NP and Rocky Mountain NP respectively), direct collaboration between local and state governments and businesses can provide that balance. Activities may include: 1) Developing refrigerator magnets with information about wildfire resiliency and evacuation, working with local hotels to place them on in-room refrigerator units 2) Placing infographics at central locations and along major routes of transit for visitors, 3) Developing generic outreach items and safety information targeted specifically to tourists and non-county residents.	**H**	1,2,3,4	**ST**	Okanogan CD	WA DNR, USFS, CTCR, Local Business, Okanogan County	Throughout Okanogan County

Item D: Enhancements of Local Resources and Capacity								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
D1	Monitoring Equipment	Equipment with the primary goal of improving the monitoring of wildfires in the county, as well as improving response times and providing additional options.	**L**	1,2,4,5,6	**O**	Okanogan CD	WA DNR, USFS, Okanogan County Commissioners, VSP Working Group, CTCR	Throughout Okanogan County
D2	Fire Probability Monitoring	The VSP Monitoring program will be spatially monitoring multiple environmental concerns (Geologically Hazardous Areas (GHA), Frequently Flooded Areas, and Fish & Wildlife Conservation Areas) that can be directly or indirectly impacted by wildfire activities. GHAs will be spatially monitored using a combination of slope/elevation, NDVI vegetation layers, precipitation layers, and any identified wildfire history/risk layers. The intention of these combined layers is to identify landslide risk across the county for BMP implementation. Additionally, monitoring aims to utilize published models and scientific research to implement wildfire forecasting. A primary goal of these forecasting maps is to aid local firefighters in focusing strategies for incident suppression.	**L**	1,2,4,5,6	**ST**	Okanogan CD	WA DNR, USFS, Okanogan County Commissioners, VSP Working Group, CTCR	Throughout Okanogan County
D3	Fiscal support for burning equipment or personnel through Conservation Northwest	Financially support equipment to increase prescribed and managed wildfire. Conservation Northwest has limited funding to support equipment (dozer, personnel, drones, etc.) and will be interested in spending on actions that benefit risk reduction in the highest-risk communities or that benefit important wildlife habitat.	**L**	1	**ST**	Conservation Northwest	WA DNR, Okanogan County Commissioners, USFS, Okanogan CD, NCPBA, CTCR	

Item D: Enhancements of Local Resources and Capacity								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
D4	New 100' aerial ladder for Okanogan Fire Department	The need for a 100' aerial ladder has been identified by the Okanogan Fire Department as it looks towards future firefighting needs within its jurisdiction.	**L**	2	**MT**	Okanogan Fire Department	Okanogan County, CTCR	City of Okanogan
D5	New Bendix King Radios for WDFW staff and trucks	WDFW administers 3 WLAs in Okanogan County. Improved radio equipment would enable rapid communication and allow WDFW employees to better interface with partner agencies during incidents, coordinating response on WLAs and adjacent lands.	**L**	2	**ST**	WDFW		Scotch Creek, Sinlahekin, Methow WLAs
D6	Satellite/Ground Line Emergency Call Boxes	Cell service is lacking or extremely spotty in many of the rural portions of the county. The installation of emergency call boxes on the roadside, or in heavily trafficked public areas like parks or post-offices (e.g. the Wauconda post-office) would enable residents to report fires and contact EMS for other emergencies.	**L**	2	**ST**	OCEM	WSDOT, Okanogan County Public Works, CTCR	Isolated areas of the county such as Wauconda, Loomis, Nighthawk etc.
D7	Access Funding for an Evacuation Resource Center	Given the frequency of emergency evacuations in Okanogan County, creating a dedicated resource center, serving both responder and public needs, can assist in the implementation of evacuations of all kinds.	**M**	2	**LT**	OCLTRG	OCEM, WA EMD	TBD
D8	Seek grant funding for new Fire apparatus for the City of Omak	Omak Fire Department will need in the future to update existing Fire apparatus to deliver the best fire protection as possible to the community.	**M**	2	**LT**	City of Omak	Okanogan CD	City of Omak

Item D: Enhancements of Local Resources and Capacity								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
D9	Water curtain systems for towns	Water curtain systems have been utilized during wildfires to reduce the risk of ember contact with structures. Strategic deployment of water curtains may help reduce the risk of ember driven structural ignitions during a wildfire in densely populated areas with the right topography.	**M**	1	**MT**	Okanogan County	Towns, Fire Districts	Core WUI
D10	Updated Equipment for OCFD #10	OCFD #10 needs additional equipment such as water, and upgraded brush trucks, to address suppression needs within its jurisdiction.	**M**	2	**ST**	OCFD #11	Okanogan County, Loomis Residents	Loomis
D11	New/updated fire apparatus and equipment for OCFD #3	Recent residential growth in the central Okanogan Valley within OCFD #3's service has increased the need for up-to-date fire apparatuses and other equipment to meet the needs of the district and its residents.	**M**	2	**ST**	OCFD #3	Okanogan County	Central Okanogan Valley
D12	New Omak Fire Station	Build new station to accommodate all current and future apparatus, living quarters, showers, and cleaning areas for firefighting gear for adequate Health and Safety of volunteer firefighters and provide office space and a larger training room to accommodate all personnel.	**H**	2	**MT**	City of Omak	Okanogan CDFD #3	City Of Omak
D13	Equipment such as chainsaw and pruners, that can be rented by homeowners	Expand resources across the county similar to the Methow Recycles tool library.	**H**	2	**ST**	Okanogan CD	WA DNR, OCFDs, Okanogan County EM	Throughout Okanogan County
D14	Installation of radio repeater in close proximity to Coulee Dam	The Town of Coulee Dam Fire Department identified the need for a radio repeater to resolve communication challenges through the department's jurisdiction. Current narrow banding systems have not resolved the issue, and the area is limited to only channel to contract dispatch.	**H**	2	**ST**	Town of Coulee Dam Fire Department	Okanogan County Public Works, CTCR	Town of Coulee Dam

Item D: Enhancements of Local Resources and Capacity								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
D15	Increase access to equitable mitigation program	Increase capacity to vulnerable populations for fuels reductions and fire-adapted activities on private lands.	**H**	2	**O**	OCLTRG	Okanogan CD, WA DNR, Local Fire Districts, Okanogan County EM, FAM and other NGOS, Religious Orgs	Throughout Okanogan County
D16	New Loomis Fire Hall	The current Loomis fire hall, constructed in 1963, is no longer sufficient to service Okanogan County Fires District 10's needs. A new fire hall would enable proper storage of existing vehicles and equipment, allow for an expansion of the department's fleet, and provide additional indoor training spaces.	**H**	2	**ST**	OCFD #10	Okanogan County, Loomis Residents	Loomis
D17	New Coulee Dam Fire Hall	The current fire hall for the Town of Coulee Dam Fire Department does have sufficient space to house the department's vehicles or equipment and is limited in what type of equipment it can accommodate due to the low height of the existing building (only 9'6"). The space also lacks adequate training areas. The construction of a new fire hall would enable proper storage of existing vehicles and equipment, allow for an expansion of the department's fleet, and provide additional indoor training spaces.	**H**	2	**ST**	Town of Coulee Dam Fire Department	Okanogan County Public Works, CTCR	Town of Coulee Dam
D18	New Okanogan Fire Hall	The Okanogan Fire Department's current fire station has reached capacity. As the city experiences a period of expansion, this requires additional space for equipment storage and classrooms for training.	**H**	2	**ST**	Okanogan Fire Department	Okanogan County	City of Okanogan

Item D: Enhancements of Local Resources and Capacity								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
D19	Expanded interdepartmental recruitment of volunteer firefighters and resources for firefighter retention	Firefighter recruitment and retention is a common issue across Okanogan County's fire districts and departments, which are predominantly staffed by volunteers. Additional funds via grants for training, expanded facilities, and direct recruitment efforts would assist in maintaining and expanding the current pool of volunteer firefighters and assist in retaining them.	**H**	2	**ST**	Fire districts and Fire Departments	Okanogan County, CTCR, BIA, Mt. Tolman, WA DNR, State Fire Marshall's Office (WSP), Legislative Representatives	Throughout Okanogan County
D20	New Twisp Fire Station	Twisp was annexed in OCFD #6 in 2023. A new fire station needs to be built in Twisp to provide essential services to the town. This has been identified as a high priority need for the district. The station needs to provide storage spaces for vehicles, gear, and equipment, and provide living space, showers, and other amenities for firefighter personnel.	**H**	2	**ST**	OCFD #6	Town of Twisp, Okanogan County	Town of Twisp
D21	Alta Lake Fire Station	Alta Lake, in SW Okanogan County, has seen significant development in years past (25 plus homes built since 2014) in an area that is at high risk of wildfire. Okanogan-Douglas-fire District 15 and local residents have identified the need to build a fire station to accommodate volunteer firefighters and equipment to readily respond to incidents in the area.	**H**	2	**ST**	Okanogan-Douglas-fire District 15	Okanogan County	Alta Lake
D22	New Brewster Fire Hall	Okanogan-Douglas-fire District 15's current Brewster fire hall is no longer sufficient to house the district's equipment and apparatuses needed to serve the Brewster area. Currently some of that equipment is stored elsewhere due to this lack of space. A new fire station or renovation to expand the existing building would amend this issue.	**H**	2	**ST**	Okanogan-Douglas-fire District 15	Okanogan County	City of Brewster

Item D: Enhancements of Local Resources and Capacity								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
D23	Address the issue of north county 911 calls being routed to British Columbia	Currently, some areas of northern Okanogan County are only served by Canadian cell towers, which has led to 911 calls being routed to British Columbia. Working with telecom companies and other entities to improve cell service and work with Canadian authorities to better communicate cross-border calls will assist in amending this issue.	**H**	2	**ST**	OCEM	Local telecom companies, Province of British Columbia	Northern Okanogan County.
D24	Okanogan-Douglas-fire District 15 Dual Ban Radio Upgrades	Local fire districts require upgrades to existing modernized radio systems for their agencies and the ability to interconnect with partners. Okanogan-Douglas County District 15 staff have identified the need to upgrade the district's current radio systems to ensure they are able to receive both VHF and 800 megahertz frequencies.	**H**	2	**ST**	Okanogan-Douglas-fire District 15	Okanogan County	Throughout Okanogan-Douglas-fire District 15's service area.

Item E: Fuel/Forest Health Treatment Implementation								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
E1	Develop Goat Management Incentive Program	Targeted grazing by goats has been demonstrated to be an environmentally friendly and relatively cost-effective means of reducing vegetative fuels. Incentive programs to encourage the raising and handling of goats, and financial assistance for interested landowners to utilize targeted goat grazing, can both reduce fuels and support local agriculture and ag-viability.	**L**	1,2,4,5	**ST**	Okanogan CD	WA DNR, WA DOA	Private properties within the WUI in Okanogan County
E2	OKPUD Vegetation Management	Removal of vegetation within Okanogan PUD ROW corridors. Rotational cycle throughout system. Vegetation is trimmed back or removed to prevent vegetation caused outages and/or vegetation-powerline contacts.	**M**	1,2,4,5	**O**	OKPUD		County-wide within OKPUD Service Territory (rotational cycle on specific areas of system)
E3	Prescribed Fire Maintenance burning Lost Rx	Maintenance burning in previously burned units from early 2000's in the WUI to maintain fuels treatment effectiveness and prevent wildfire from impacting Aeneas Valley.	**M**	5	**O**	USFS		USFS land south of Aeneas valley in the Lyman Lake area
E4	Maintenance burning at Upper Aeneas Rx	Maintenance burning in previously burned units from early 2000's in the WUI to maintain fuels treatment effectiveness and prevent wildfire from impacting Aeneas Valley.	**M**	5	**O**	USFS		USFS land south of Aeneas valley in the Tunk Mtn and Bannon Mtn area

Item E: Fuel/Forest Health Treatment Implementation								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
E5	Prioritize and implement baseline surveys for shrub steppe SGCN and conduct regular monitoring of SGCN populations to assess status and trend	Conduct initial surveys as a first step to establish baseline information about species distribution, habitat occupancy, and other considerations. Each biennium, target a set of species for baseline surveys efforts. This may include developing and piloting new survey protocols. Initial survey protocols should consider future needed monitoring in their design and make recommendations for monitoring frequency and approach. As of 2024, the following SGCN wildlife from the 2015 State Wildlife Action Plan require baseline surveys. Future survey needs may expand to additional species, including plants, as guided by newer iterations of the State Wildlife Action Plan. Track population health as a critical aspect of understanding how threats and conservation measures are affecting species. Build from baseline survey information to develop and implement efficient and regular monitoring strategies for each SGCN, grouping species together as appropriate for efficiency. Include demographic research to identify sources of mortality and vulnerable life stages; research to improve understanding of habitat needs, seasonal movements, and dispersal; and research on intraspecific competitive interactions.	**M**	4	**MT**	WDFW	WA DNR, Yakama Nation, CTCR, Okanogan CD, Okanogan County, BLM, USFS, NRCS, Conservation NGOs	Throughout Okanogan County with emphasis on the shrub steppe.
E6	Prescribed burning on Mt. Anne	Prescribed fire treatments on Mt. Anne in WUI to reduce impacts of high severity fire on natural resources and local residents.	**M**	5	**O**	USFS		USFS land North of Aeneas Valley in the Mt. Anne area

Item E: Fuel/Forest Health Treatment Implementation								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
E7	Prescribed burning on Cayuse Mtn.	Prescribed fire treatments on Cayuse Mtn. in WUI to reduce impacts of high severity fire on natural resources and local residents.	**M**	5	**ST**	USFS		USFS land Northeast of HWY 20 on Cayuse Mtn.
E8	Maintenance burning on Sneed Mtn	Maintenance burning in previously burned units from early 2000's in the WUI to maintain fuels treatment effectiveness and prevent wildfire from impacting Aeneas Valley.	**M**	5	**ST**	USFS		USFS land South of Aeneas Valley on Sneed Mtn.
E9	Mutton thin and pile	Hand thin, piling, and burning of piled material on approximately 720 acres to reduce risk of high severity fire and improve POD boundary north of Conconully.	**M**	5	**O**	USFS		USFS land Northeast of Conconully.
E10	Bailey thin and pile	Hand thin, piling, and burning of piled material on at least 225 acres to reduce risk of high severity fire and improve POD boundaries south of Aeneas valley.	**M**	5	**ST**	USFS		USFS land South of Aeneas Valley in the Bailey Mtn. Area
E11	Crawfish excavator piling	Excavator piling and burning of slash from Crawfish restoration timber harvest activities. Approximately 318 acres of fuels reduction to reduce risk of high severity fire and reinforce pod boundaries.	**M**	5	**O**	USFS		USFS land between Bailey and Tunk Mtn.
E12	Reed Ridge thin and pile	Hand thin and piling and pile burning of up to 3500 acres to reduce risk of high severity fire South of Conconully.	**M**	5	**ST**	USFS		USFS land West of Conconully in the Reed Ridge area.

Item E: Fuel/Forest Health Treatment Implementation								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
E13	Mt. Anne thin and pile	Hand thinning and piling of approximately 500 acres to be followed up with pile burning to reduce the risk of high severity fire and improve POD boundaries in the Mt. Anne area.	**M**	5	**O**	USFS	DNR	Forest Service land North of Aeneas Valley in the Mt. Anne area.
E14	Crawfish Reserve Treaty Rights Lands Thin and Pile	Hand thinning and piling of 172 acres to be followed up with pile burning along POD boundary in the Crawfish Restoration Analysis area.	**M**	5	**ST**	USFS	CTCR	Between the 100 and 30 road south of Aeneas Valley in the Crawfish Lake area.
E15	Scotch Creek WLA Forest Health	Continue thinning efforts in the Limebelt to create fuel breaks, Chesaw to reduce conifer encroachment, and Chopaka for fuels reduction (~60 total acres).	**M**	5	**ST**	WDFW		Scotch Creek WLA
E16	Sinlahekin WLA Forest Health	Continue thinning efforts in the Sinlahekin, Buzzard Lake, and Chiliwist and conduct Rx fire operations at Carter Mountain (~100 acres).	**M**	5	**ST**	WDFW		Sinlahekin WLA
E17	Provide assistance to private road owners to reduce fuels adjoining the road	Costs shares, grants, access to work crews, other means of support to private landowners, HOA etc. to reduce fuels along private roads and driveways.	**M**	4,5	**MT**	Okanogan CD	WA DNR, County Public Works, CTCR, HOAs, Firewise USA® communities	Throughout Okanogan County, focusing on the core WUI
E18	Re-entry of home site defensible space treatments	Assist previous recipients of WADNR Service Forestry, Okanogan CD, and other cost-shares to maintain or expand upon previous defensible space treatments.	**M**	1,2,4,5,6	**LT**	Okanogan CD & WA DNR	USFS, Firewise USA® Communities	Throughout Okanogan County

Item E: Fuel/Forest Health Treatment Implementation								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
E19	Facilitate the development of policies within land management agencies with jurisdiction over shrubsteppe landscapes for fire management and restoration consistent with WSRRI Long-Term Strategy	Policies across land management agencies that are consistent with the WSRRI Long-Term Strategy include: 1) Expand the action taken during fire suppression damage repair to include actions that support shrub steppe restoration where feasible. 2) Avoid actions in fire suppression damage repair that may negatively impact shrub steppe restoration. 30 Determine if changes to currant Washington law are needed to facilitate inclusion of ecological restoration activities in fire suppression damage repair phase and make recommendation if changes are needed.	**M**	1,4,6,7	**MT**	WA DNR, WDFW, WSCC	Okanogan CD, Okanogan County, BLM, USFS, NRCS	The shrubsteppe of Okanogan County
E20	Continued support of an All Hands All Lands approach to fire resiliency in Okanogan County	Actively participate in federal land use, planning processes and fuels reduction to affect positive changes.	**M**	2,7	**O**	WA DNR	USFS	Throughout Okanogan County
E21	Enhanced interagency prescribed fire coordination	Coordinate prescribed burning with other authorized burning across federal, tribal, and state boundaries, and coordinate governmental efforts with any PBAs formed within the lifespan of this CWPP.	**M**	1,7	**O**	Land Management Agencies	NCPBA, Okanogan CD	
E22	Municipal Vegetation management plans and guidelines	Identify areas of greatest risk in town. Develop a plan and guidelines for vegetation treatments. Increase project connectivity across public and private boundaries.	**M**	1,2,3,4,5	**ST**	Land Management Agencies	Towns and Cities, Okanogan CD, Okanogan County Noxious Weed Board	Urban areas

Item E: Fuel/Forest Health Treatment Implementation								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
E23	Develop shrubsteppe native seed strategy	Compile information about provenance and currently available supply of native plant ecotypes. Conduct gap analysis of what is available and what is needed and identify seed zones to use as framework to guide production investments. Develop and include recommendations for mechanisms to expand production and recommended habitat restoration seed mix prescriptions that establish appropriate plant communities and provide wildlife species benefit (e.g., greater sage grouse preferred forbs, pollinator nectar and host plants) while maximizing establishment probability and minimizing cost.	**M**	4,6,7	**MT**	WA DNR, WDFW, WA Conservation Commission	Okanogan CD, Okanogan County, BLM, USFS, NRCS	The shrubsteppe of Okanogan County
E24	Promote and increase participation with groups such as ORAP and CAM	Develop effective partnerships and planning for air quality impacts from wildfire and prescribed fire.	**M**	3	**ST**	Okanogan CD, Clean Air Methow, CTCR	WA DNR, WA DOE, EPA	
E25	Work collaboratively with ranching NGOs and livestock producers to support and provide incentives for the use of prescribed fire and other fuels management tools on grazing lands	Provide BMPs and other technical support to NGOs and livestock producers to employ prescribed fire.	**M**	1,2,3,4,6,7	**MT**	WA DNR, WDFW, WA Conservation Commission	Okanogan CD, Okanogan County, BLM, USFS, NRCS	The shrubsteppe of Okanogan County

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Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
E26	Establish an equipment pool available for use by agricultural users and landowners for fuel treatment work	While many agricultural producers have equipment that can perform dual functions of farm work and fuel treatment, more specialized equipment, including that need to implement prescribed fires, are costly. Equipment pools enable producers to implement collaborative fuel treatments when it is convenient for them to do so with the assistance of governmental agencies or NGOs.	**M**	4	**MT**	WA DNR, WDFW, WA Conservation Commission	Okanogan CD, Okanogan County, BLM, USFS, NRCS	Throughout Okanogan County
E27	Restoration of departed landscape surrounding Conconully to reduce risk of high severity wildfire	Comprehensive suite of fuels treatments covering up to 63,212 acres including commercial thinning, small tree thinning, piling of slash, pile burning, and broadcast burning across a majority of the FS land in Analysis Area.	**H**	1,2,5,6	**MT**	USFS		USFS Land in surrounding the Conconully and SW Portion of the Tonasket Ranger District
E28	Restoration of departed Landscape in the Toats Coulee area on the NW portion of the Tonasket Ranger District	Comprehensive suite of fuels treatments covering up to 92,016 acres including commercial thinning, small tree thinning, piling of slash, pile burning, and broadcast burning across a majority of the FS land in Analysis Area to reduce the risk of high severity wildfires.	**H**	1	**MT**	USFS		USFS Land in the Toats Coulee area on the NW Portion of the Tonasket Ranger East of Loomis

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Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
E29	Restoration of departed Landscape in the Tunk Mtn. area on the SE portion of the Tonasket Ranger District	Comprehensive suite of fuels treatments covering up to 55,998 acres including commercial thinning, small tree thinning, piling of slash, pile burning, and broadcast burning across a majority of the FS land in Analysis Area to reduce the risk of high severity wildfires.	**H**	1	**LT**	USFS		USFS Land in the Tunk Mtn. area on the South-Central Portion of the Tonasket Ranger South of Aeneas Valley
E30	Restoration of departed Landscape in the Dugout Mtn. area on the SE portion of the Tonasket Ranger District to reduce risk of high severity wildfire	Comprehensive suite of fuels treatments covering up to 36,214 acres only a portion of which lies in Okanogan County which will include commercial thinning, small tree thinning, piling of slash, pile burning, and broadcast burning across a majority of the FS land in Analysis Area.	**H**	1	**ST**	USFS		USFS Land in the Dugout Mtn. area on the SE Portion of the Tonasket Ranger District South of Aeneas Valley
E32	Restoration of departed Landscape on Mt. Hull	Comprehensive suite of fuels treatments covering up to 20,256 Acres including commercial thinning, small tree thinning, piling of slash, pile burning, and broadcast burning across a majority of the FS land in the analysis area to reduce the risk of high severity wildfires.	**H**	1	**O**	USFS	DNR, BLM	USFS Land in the Mt. Hull area on the North Central Portion of the Tonasket Ranger District East of Oroville

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Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
E33	Provide cost-share to assist private property owners in reducing fuel loads through home site defensible space treatments	Provide cost-share to assist private property owners in reducing fuel loads, utilizing WA DNR service forestry programs, and cost-share through Okanogan CD when grant funds are available.	**H**	4	**O**	Okanogan CD & WA DNR	USFS, Firewise USA® Communities	Throughout Okanogan County
E34	Restoration of departed Landscape on Buckhorn Mtn. to reduce risk of high severity wildfire	Comprehensive suite of fuels treatments covering up to 67,720 acres the majority of which falls in Okanogan County which will include commercial thinning, small tree thinning, piling of slash, pile burning, and broadcast burning across a majority of the FS land in the analysis area.	**H**	1	**ST**	USFS	DNR, BLM	Forest Service Land in the Buckhorn Mtn. area on the Northeast Portion of the Tonasket Ranger District East of Chesaw
E35	Methow WLA Forest Health	Conduct PCT, commercial thinning, and Rx fire operations in overstocked forests within the WUI including Ramsey Creek (210ac, potential fuel break at the ridgetop), Little Cub Creek (170ac, adjacent to neighborhoods in the Rendezvous with options for cross-boundary treatments), and the Golden Doe (80ac, steep slope adjacent to homes and communications infrastructure on McClure Mtn).	**H**	4	**ST**	WDFW	Potentially CWI Partners	Methow WLA

Item E: Fuel/Forest Health Treatment Implementation								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
E36	Fuels mitigation along the primary and secondary access routes in the County to ensure these routes can be maintained in the case of an emergency	Reduce fuel loading along public rights-of-ways in Okanogan County as a mitigation tool for helping to create fuel breaks and ensure the ROWs remain open during active wildfires.	**H**	1	**ST**	County Public Works and WSDOT	County Commissioner's Office, USFS, DNR, BIA, Okanogan CD, CTCR (Dep. of Transportation)	Primary and secondary access routes
E37	Restoration of departed landscape on the south/west side of Twisp River to reduce high severity wildfires and strengthen POD boundaries	Comprehensive suite of fuels treatments covering up to 24,140 Acres including commercial thinning, small tree thinning, shaded fuel break construction, piling of slash, pile burning, and broadcast burning across a majority of the FS land in the analysis area.	**H**	4	**LT**	USFS	DNR, BLM	USFS lands on the south/west side of Twisp River
E38	Develop a collaborative grant program that focuses on the control of invasive annual grasses and the reduction of surface fuels	Landscapes infested with invasive annual grasses (Cheat Grass) are burned 4x more frequently, hotter, and faster moving than land with healthier native grass populations. Develop a collaborative grant focusing invasive annual grass control will enable partner agencies and orgs to communicate the needs on the landscape and best places to target. While also receiving funding for the efforts.	**H**	4	**ST**	Okanogan CD	OCNWCB, WA DNR, WDFW, CTCR, OCPW	Throughout Okanogan County

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Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
E39	Restoration of departed landscape in Buttermilk and Libby Creek areas to reduce high severity wildfires and strengthen POD boundaries	Comprehensive suite of fuels treatments covering up to 50,000 Acres including commercial thinning, small tree thinning, piling of slash, pile burning, and broadcast burning across a majority of the FS land in the analysis area.	**H**	4	**O**	USFS	DNR, BLM	USFS lands in the Libby Creek and Buttermilk Creek areas
E40	Restoration of departed landscape on the south/west side of Twisp River to reduce high severity wildfires and strengthen POD boundaries	Comprehensive suite of fuels treatments covering up to 24,140 Acres including commercial thinning, small tree thinning, shaded fuel break construction, piling of slash, pile burning, and broadcast burning across a majority of the FS land in the analysis area.	**H**	4	**LT**	USFS	DNR, BLM	USFS lands on the south/west side of Twisp River
E41	Restoration of departed landscape on the north/east side of Twisp River to reduce high severity wildfires and strengthen POD boundaries	Comprehensive suite of fuels treatments covering up to 53,009 Acres including commercial thinning, small tree thinning, shaded fuel break construction, piling of slash, pile burning, and broadcast burning across a majority of the FS land in the analysis area.	**H**	4	**LT**	USFS	DNR, BLM	USFS lands on the north/east side of Twisp River

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Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
E42	Restoration of departed landscape in the upper Methow Valley to reduce high severity wildfires and strengthen POD boundaries	Comprehensive suite of fuels treatments covering up to 60,000 Acres including commercial thinning, small tree thinning, shaded fuel break construction, piling of slash, pile burning, and broadcast burning across a majority of the FS land in the analysis area.	**H**	4	**LT**	USFS	DNR, BLM	USFS lands in the upper Methow Drainage around Mazama including Goat Creek, Cub Creek, Fawn Creek.
E43	Develop Potential Operational Delineations (PODS) and Potential Controls Lines (PCL) across the shrubsteppe landscapes of Okanogan County	Develop PODS and PCLs across the shrub steppe landscape for fire response planning and ensure collaboration and understanding across agencies. Prioritize completing this in landscapes in Core Areas, Growth Opportunity Areas, and Corridors as defined by the WSSRI Long Term Strategy.	**H**	1,2,5,6	**MT**	WA DNR, WDFW, WA Conservation Commission	Okanogan CD, Okanogan County, BLM, USFS, NRCS, CTCR	The shrubsteppe of Okanogan County
E44	Implement the National Wildfire Crisis Strategy in Okanogan County	Collaboratively utilize funds awarded by Congress to the Okanogan-Wenatchee NF, (the CWI), and the Colville National Forest to implement the goals of the National Wildfire Crisis Strategy and action items listed in this CWPP.	**H**	1,2,3,4,5,6,7	**MT**	USFS	WA DNR, CTCR, Okanogan CD, WDFW	National Forests and adjacent private and public lands

Item E: Fuel/Forest Health Treatment Implementation								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
E45	Develop the necessary information and guidance for managing fuels to reduce the risk of unplanned, high-severity fires, consistent with ecosystem management objectives and support the use of prescribed and managed fire, in addition to other fuels management approaches, in shrubsteppe landscapes	Map priority shrubsteppe lands where fire return intervals can be restored to more natural regimes and areas where it currently cannot. Update this regularly. Identify and prioritize areas in need of pre-fire fuels reduction. Identify areas where cheatgrass is dominant and prioritize treatment.	**H**	1	**MT**	WA DNR, WDFW, WA Conservation Commission	Okanogan CD, Okanogan County, BLM, USFS, NRCS	The shrubsteppe of Okanogan County
E46	Facilitate natural movement of wildlife by removing or easing fencing barriers	Work with willing landowners to replace or retrofit traditional fencing on the landscape with wildlife friendly versions such as those with smooth wire or with virtual fencing. In proximity to grouse leks, ensure fences are marked to minimize collisions. Explore opportunities to install virtual fence towers on public lands, thereby providing coverage for surrounding landscape and incentivizing landowner use of virtual fence technology.	**H**	4	**MT**	WDFW	WA DNR, Yakama Nation, CTCR, Okanogan CD, Okanogan County, BLM, USFS, NRCS, Conservation NGOs	Throughout Okanogan County with emphasis on the shrubsteppe.

Item E: Fuel/Forest Health Treatment Implementation								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
E47	Targeted Road Way Fuel Reduction Treatments	Project specifically addresses fuel reduction on county roads 2045-Loup Loup Canyon Road (M.P. 4.78-12.7), 2065-Buzzard Lake Road (M.P. 3.1-13.7), and 2048-Peacock Mountain Road (M.P. 0.00-2.44). These are county roads that are highly used recreational routes and are adjacent and access to a large amount of Public Land (Federal, DNR and WDFW) and private parcels. The OCDPW Road department would like funds to go towards the purchase and operation of an excavator mounted disc mulcher (masticator head), that would be mounted on currently owned 2023 Cat Excavator. To go along with the purchase of equipment, compensation for cost of operation of currently owned equipment use for areas not cleared with the disc, and wages. This project would be done in stages, covering the span of several months due to other maintenance schedules and work loads. Future use of the equipment purchase would allow for continued fuel reduction and maintenance of this road system and numerous others throughout the county that are adjacent to public and private forest lands. With current Road Department equipment, the cost per week (5-8 hour work days) including wages is roughly $16,000. With the purchase of the Masticator Head, the productivity would increase and the man hours lowered. Estimated cost of the Masticator Head, including mounting, pluming, and guarding of the machine would be around $70,000.	**H**	1,2,5,6	**MT**	OCDPW, Okanogan CD	OCEM, CTCR, WDFW, WA DNR, USFS	County roads 2045-Loup Loup Canyon Road (M.P. 4.78-12.7), 2065-Buzzard Lake Road (M.P. 3.1-13.7), and 2048-Peacock Mountain Road (M.P. 0.00-2.44).

Item E: Fuel/Forest Health Treatment Implementation								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
E48	Develop the necessary information and guidance for managing fuels to reduce the risk of unplanned, high-severity fires, consistent with ecosystem management objectives and support the use of prescribed and managed fire, in addition to other fuels management approaches, in shrub steppe landscapes	Map priority shrub steppe lands where fire return intervals can be restored to more natural regimes and areas where it currently cannot. Update this regularly. Identify and prioritize areas in need of pre-fire fuels reduction. Identify areas where cheatgrass is dominant and prioritize treatment.	**H**	1	**MT**	WA DNR, WDFW, WA Conservation Commission	Okanogan CD, Okanogan County, BLM, USFS, NRCS	The shrubsteppe of Okanogan County

Item F: Post-Fire Recovery								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
F1	Increased seed stock required for post-fire replanting and habitat resources	Working collaboratively to acquire or otherwise develop and maintain seed stocks required to replant in the aftermath of wildfires on public and private lands. Including a special focus on resources for shrub steppe species like big sagebrush and antelope bitterbrush.	**M**	2	**MT**	WA DNR, WDFW	NRCS, Okanogan CD, Conservation Northwest	
F2	Post-Fire Debris Flow and Erosion Control Material Rapid Action Repository	Property owners typically lack ready means of addressing immediate and long-term post fire hazards such as debris flows and erosion. Developing a repository of materials for immediate mitigation of risk, such as wattles and other catchment structures, that can be provided to property owners at little or no cost, can rapidly increase the response of mitigation for those issues on private lands. Saving time, money, and potentially property and lives.	**M**	2	**ST**	Okanogan CD	WA DNR, USFS, Okanogan Emergency Management	
F3	Establish clear emergency grazing resources.	Develop a grass banking plan in each pre-disaster emergency plan, with identified potential locations for livestock producers to take animals to temporarily access grazing while resting burned pastures to allow for recovery (i.e., CRP, cover crop, cropland, neighbors).	**M**	2	**MT**	USFS, BLM, WDFW, WA DNR	Okanogan CD, Okanogan County EMD, OCLTRG, Cattlemen's Association, Farm Bureau, FSA, NRCS	
F4	Establishment of a permanent state level fire recovery cost-share grant program	Wildfire recovery is a long process for many. The current fire recovery funding model at the state level is reactive and does not fully support the needs of Okanogan County residents or other Washingtonians who experience losses or varying forms during a wildfire. A permanent state funding source for immediate recovery needs. Land, equipment, and hazardous material disposal.	**H**	1	**ST**	WA DNR, WSCC	Okanogan CD, OLCTRG, OK County Commissioners, WA DOE	

Item F: Post-Fire Recovery								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
F5	Expand and enhance collaboration with aquatic and terrestrial organizations in pre-fire recovery planning	Facilitate and communicate with aquatic and terrestrial resource experts to enhance post-fire recovery and restoration in terrestrial habitats.	**H**	1	**ST**	WDFW, WA DNR, WA DOE, USFS, BLM, other land management agencies	Okanogan CD, OLTRG, OK County Commissioners,	
F6	Enhance, conserve and rehabilitate riparian ecosystems functions	Complexity in riparian systems may yield greater resistance to wildfires. Complex riparian systems may not be enough to stop fire, they can still provide refugia during and after a fire for both wildlife and livestock. These systems are also critically important habitats and seedbanks for recovery as well as helping the river- or stream-scrapes resilient to elevated run-off and/or post-fire debris flows.	**H**	6	**O**	WDFW	Okanogan CD, Cascade Fisheries, Methow Beaver Project, Methow Salmon Recovery Foundation, CTCR, Okanogan Highlands Alliance, Okanogan Land Trust, Methow Conservancy, Trout Unlimited, other restoration practitioners and organizations included	Throughout the WUI in Okanogan County

Item F: Post-Fire Recovery								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
F7	Develop more robust and interconnected postfire debris flow monitoring systems and procedures	Post fire debris flows are a major hazard and may linger for years in the aftermath of a wildfire. The negative, and often repeated, impacts of those debris' flows require considerable monitoring, and frequent interagency collaboration to address land management, water quality, infrastructure, and public safety concerns. The development of an easily accessible, for both agencies staff and the public, means of communicating specific concerns for post-fire debris flows within a given area, along with an increase the number of debris flow monitoring systems installed on the ground in Okanogan County, will assist in the mitigation of these issues. Including rapid data gathering to assist in the implementation of time sensitive federal and state programs in the aftermath of a debris flow such as the NRCS Emergency Watershed Protect program.	**H**	2	**MT**	USGS, WA DNR, NWS	Okanogan CD, USFS, Okanogan County Public Works, OCEM, NRCS	
F8	General Pre-Fire Recovery Research and Monitoring	Support, participate in, lead – both collaboratively and separately – research, data-gathering, inquiry and study to identify what post-fire impacts are most likely for specific areas and for specific population groups. Support or participate in planning actions to address the research findings and ensure best possible post-fire impacts.	**H**	2	**O**	All Partners	Okanogan CD Any/All Partners	
F9	Maintain a ready supply of seed	Establish agreements with existing storage facilities to have a supply of seed available to respond after fire in Core Areas, Growth Opportunity Areas, and Corridors in the shrub steppe as defined by the WSSRI Long-Term Strategy and in the forested and wooded ecosystems of Okanogan County. Expand seed storage capacity in alignment with increasing personnel and equipment capacity to deploy and utilize seed in restoration and fire-response projects.	**H**	2	**MT**	USFS, BLM, WDFW, WA DNR,	Okanogan CD, OCEM, OCLTRG, Cattlemen's Association, Farm Bureau, FSA, NRCS	

Item F: Post-Fire Recovery								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
F10	Access and maintain startup funding resources for individual, community, land and economic unmet needs after wildfire and subsequent events	If the financial burden of recovery is going to exceed the available resources after the wildfire or subsequent event, the community will need access to recovery funding. Having this available and ready to activate reduces the recovery timeline significantly.	**H**	2	**MT**	OCLTRG	All Partners	
F11	Enhanced coordination between NGOs and public agencies to provide landscape recovery resources to private landowners	Multiple government agencies play a role in post-fire recovery, these agencies have differing programs, timelines of service, and rules and regulations dictating how they are able to engage with the public in the aftermath of a fire. Enhancing and expanding coordination between government agencies and NGOs such as OCLTRG, FAM, and others, through pre-fire recovery planning, can enable those NGOs to assist private landowners in connecting with the appropriate agency to assist them in a timelier manner.	**H**	2	**ST**	OCLTRG	Noxious Weed Board, Okanogan CD, WA DNR	

Item G: Evacuation and Emergency Response								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
G1	Install solar batteries at facilitates most likely to be utilized as evacuation center (e.g. schools, communities centers etc.) to provide backup power for evacuation centers in the event of power loss, and to reduce power demand by evacuees on the local grid	Supplemental power systems for evacuation centers can provide several immediate benefits during an incident including backup power in the event of power loss, lowering grid use by concentrated groups of evacuees, and providing piece of mind. While gasoline or diesel generators can provide these benefits, solar batteries remove logistical hurdles of ensure sufficient fuel is available while having a secondary benefit of lower emissions. The inspiration for this action item comes from Noosa Shire, Queensland, Australia, which was heavily impacted by the 2019-2020 "black summer" bushfires, leading to large scale evacuations. Collaboration between the University of Southern Queensland, the Australian Federal Government, and local residents identified the need for supplemental power systems in aftermath, leading to the installation of solar batteries at two designated evacuation centers. Not only does the batteries provide assurances that power will be available during future incidents, but also provide an avenue for local students to learn about green energy. As schools often play a role as evacuation centers in Okanogan County, this kind project present multiple benefits beyond fire resiliency and recovery if implemented collaboratively.	**L**	1,2,3,4	**MT**	Okanogan CD	OCEM, CTCR, WA DNR, WA DOE, Local School Districts, Libraries, Community Centers	Likely Evacuation Centers in Okanogan County
G2	Connect dead end roads, where feasible, in one-way in, one-way out drainages to provide an additional escape route	Means of ingress and egress are vital for evacuations in isolated parts of the county. While not all dead-end roads can be connected into the wider road system, locating and reworking those that can increase fire resiliency.	**M**	1	**MT**	OCEM, WSDOT, CTCR (Dep. of Transportation)	County Public Works, County Planning Department, USFS, BLM, DNR, BIA	Outer portion of the WUI in Okanogan County

Item G: Evacuation and Emergency Response								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
G3	Create volunteer neighborhood networks that coordinate with local emergency responders to plan for evacuation scenarios on an annual basis	Provide resources to guide volunteer neighborhood networks to establish evacuation and emergency response plans for their neighborhoods, and routinely update on an annual basis	**M**	1	**MT**	Towns and Cities, and Unincorporated Communities	Okanogan CD, OCEC, OCLTRG, FAM	Towns and Cities, and Unincorporated Communities
G4	Ensure Towns, County, State, Federal, and Tribal response teams are coordinated on emergency response and evacuation plans at the local level, including ensuring that evacuation advisories and orders are disseminated as efficiently and effectively as possible	Planning for evacuations for wildfire is an extremely difficult task due to the nature of how incident are initiated and spread. Wildfire evacuations require a considerable amount of cross jurisdictional communication between responding agencies and partners. Ensuring that towns and cities have draft generic fire evacuation plans, having regular pre-planning meetings between responding agencies, and having the communication systems in place to ensure that evacuation advisories and orders are communicated to the public through as many means as possible (OCEM Emergency Alert System, social media, radio etc.) regardless of the incidents location in Okanogan County or the issuing agency is essential for the future success of evacuations in Okanogan County.	**H**	2	**MT**	Towns and Cities, OCEM, OCFDs, Sheriff's Office, CTCR, BIA Mt. Tolman, USFS, WA DNR	Okanogan CD, OCLTRG, FAM	Throughout Okanogan County

Item G: Evacuation and Emergency Response								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
G5	Development of community evacuation plans and alternate safety zones	Develop specific community evacuation plans for high-risk areas in Okanogan County and create general guidelines for evacuation that can be easily communicated to the public as part of the enhanced cross jurisdictional coordination details above.	**H**	2	**MT**	Towns and Cities, OCEM, OCFDs, Sheriff's Office, CTCR, BIA Mt. Tolman, USFS, WA DNR	Okanogan CD, OCLTRG, FAM	Towns, limited access communities, areas with longest response times for emergency personnel
G7	Coordinate with livestock owners to develop evacuation and/or shelter in place plans for animals	Livestock are extremely economically valuable assist that are difficult to manage during wildfire or other natural disasters. While Okanogan County residents have had success in some cases of developing in-the-moment plans for evacuation and sheltering in place of livestock, developing formalized guidelines, designated livestock evacuation centers, and other plans can ease concern and make evacuations more efficient.	**H**	2	**ST**	OCEM	County Public Works, Cattlemen's Association, Farm Bureau, FSA, BLM, USFS, Okanogan CD, WA DOA, WA DOE, CTCR, BIA	Rangelands of Okanogan County
G8	Consolidate relevant fire response data from community mitigation and preparedness efforts	Collect data from Firewise USA® communities to be made available to fire response agencies regarding water sources, fuel breaks, community infrastructure, etc.	**H**	1	**ST**	Okanogan CD	OCFD, WA DNR, Firewise USA® Communities	Throughout Okanogan County

Item G: Evacuation and Emergency Response								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
G6	Development of draft community post-evacuation re-entry plans for towns and cities if large numbers of structures within the communities burn during a wildfire event	Wildfire transitioning from the wildland and rural areas into areas of urban development can lead to significant loss or damage to homes, business, and vital infrastructure. Non-vegetative fuels in an urban setting include large volumes of material such as plastics and heavy metals found in electronics and automotive parts, which can produce toxic smoke that can lead to severe smoke damage to structures. All these wildfire impacts in an urban environment can create severe immediate threats to the safety of returning evacuees, and potentially create sources of pollution that can have negative health effects for humans and animals. Local, county, state, tribal, and federal authorities in Okanogan County must work together to develop draft re-entry plans to manage these issues in the event that a major wildfire moves into a developed community, akin to fires that have occurred in Pine City and Malden, WA, Paradise, CA, Lahaina, HI, and Jasper, AB. These re-entry plans must address the coordination and management of re-entry priorities of essential services and residents, air quality monitoring, damages assessments, waste removal and demolition, site reclamation, full service and utility reinstatement, insurance adjustment, temporary and mid-term housing solutions, and rebuilding requirements.	**H**	1,2,4,7	**ST**	OCEM, OCPH, OCFDs, Sheriff's Office, CTCR, Towns and Cities, WA DOE, WA EMD, WA Insurance Commission, EPA	OCLTRG, FAM, USFS, WA DNR	Towns, cities, and concentrated areas of development.

Item H: Cultural and Economic Viability								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
H1	Increase prescribed burning that benefits recreation, tourism, and collective resource use	Encourage burning where fire will stimulate wildflower regeneration, bighorn sheep and mountain goat viewing areas, and where hunting opportunities will benefit (grouse, deer, elk, moose).	**L**	6	**O**	WA DNR, CTCR	All Partners	Throughout Okanogan County
H2	Develop regular interagency and community reviews, independent of the CWPP coordination process, that asses the overall cultural and economic benefits of particular wildfire mitigation actions	Develop the means to identify prescriptions that will benefit culturally important or at-risk plants and animals and tailor prescriptions to reflect local environmental characteristics; find and demonstrate where forest structure is already resilient to wildfires as future goal to manage for.	**L**	1,4,5,6,7	**O**	Okanogan CD	All Partners	Throughout Okanogan County
H3	Prioritize fuel reduction actions that are equitable	Focus fuel reduction actions in areas that have the highest risks of wildfire and will do the greatest good for the greatest number in terms of reduce wildfire susceptibility.	**L**	4	**O**	WA DNR, CTCR	Land management agencies, NGOs	Throughout Okanogan County
H4	Support cultural and traditional burning	Support traditional and cultural burning by indigenous people both on and off of federally designated reservation land.	**M**	6	**O**	WA DNR, CTCR	Land management agencies, NGOs	Throughout Okanogan County

Item H: Cultural and Economic Viability								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
H5	Support continued innovation and investment in the forest products sector	Support continued innovation and investment in the forest products sector to utilize and add value to restoration by-products and small diameter wood, including cross-laminated timber (CLT), mass timber, biochar, and biofuels and associated co-products.	**M**	1,2,3,4,5,6,7	**O**	WA DNR, USFS, CTCR	Washington State Legislature	Throughout Okanogan County
H6	Purchase of Tub Grinders	Purchase a tub grinder(s), for use by local agricultural producers to reduce the need for burning of tree trimming or pull outs, reducing air quality impacts from local Ag. This equipment can also be utilized for forest health fuel treatments in certain cases.	**H**	6	**ST**	WA DOE	Okanogan CD, CTCR	Throughout Okanogan County
H7	Initiate a feasibility study to redevelop milling resources in Okanogan	The economics of timber harvest limit the ability of both state and private land managers to conduct economically viable fuel reduction projects, as milling resources for Okanogan County and North Central Washington more broadly are limited by location and road access. A feasibility study, meant to research if a new mill in Okanogan County is a viable option to address, would provide necessary support to redevelop those resources, or identify alternative means of lowering costs while still providing an economic stimulus through fuel treatments.	**H**	1,2,3,4,5,6,7	**MT**	Okanogan County Commissioners, CTCR	Okanogan CD, WA DNR, USFS	Throughout Okanogan County
H8	Expand archeological capacity	Increase archeological capacity at entities that implement wildfire resiliency, habitat restoration, or ground disturbing work, including leveraging opportunities to share archeologist staff and resources between entities. Ensure appropriate training for field staff such as inadvertent discovery training. Address capacity gaps, if possible and desired, within Tribes and at DAHP.	**H**	2,6	**MT**	WA DNR, WDFW, WA Conservation Commission	Okanogan CD, Okanogan County, BLM, USFS, NRCS, Yakama Nation, CTCR, DAHP	Throughout Okanogan County

Item I: Public Health								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
I1	N95 mask distribution	Funding to purchase 2,000 N95 masks for the public to use during a smoke episode to reduce exposure to PM2.5	**L**	2,3,4	**O**	OPH	ORAP, Okanogan CD, WA DNR, CTCR, OK Public Health, WA DOE, CAM, ORAP, Public Works	Throughout Okanogan County
I2	Improving burn ban communication: coordinated burn ban system to allow residents to quickly find related information	Create easier means of accessing information on burn bans and communicate to the public the risks of violating burn bans.	**M**	2,3,4	**ST**	WA DNR, WA DOE, CTRC	OCFDs, OCEM, ORAP, Okanogan CD	Throughout Okanogan County
I3	Indoor air quality monitoring for vulnerable households	Funding to purchase ~500 indoor air sensors to be distributed to vulnerable populations in Okanogan County. Awareness of indoor air is greatly increased when homeowners can view the real-time smoke pollution inside their home and see improvements when using an air cleaner.	**M**	2,3,4	**MT**	CAM, OPH	ORAP, Okanogan CD, WA DNR, CTCR, OK Public Health, WA DOE, Public Works	Throughout Okanogan County
I4	Indoor air quality monitoring for businesses to support economic resiliency	Purchasing ~500 indoor air sensors to be distributed to businesses in Okanogan County. With the outlook of wildfire smoke episodes only increasing in the future, businesses are going to have to adapt to smoke and the needs of tourists and residents. Advertising clean air during a smoke episode could help attract more business and also show that a business or public space is a clean air center for people to go to if they cannot clean their own air at home.	M	2,3,4	**MT**	CAM, OPH	ORAP, Okanogan CD, WA DNR, CTCR, OK Public Health, WA DOE, Public Works	Throughout Okanogan County

Item I: Public Health								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
I5	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.	**H**	2,3,4	**ST**	CAM, OPH	ORAP, Okanogan CD, WA DNR, CTCR, WA DOE, Public Works	Throughout Okanogan County
I6	Train health care and social service providers to enable high quality care and reduce exposure to wildfire smoke	Funding to support annual training for health care and social services providers on the topics of PM2.5, wildfire smoke exposure and how to reduce exposure for their patients.	**H**	2,3,4	**ST**	CAM, OPH	ORAP, Okanogan CD, WA DNR, CTCR, OK Public Health, WA DOE, Public Works	Throughout Okanogan County
I7	Support schools in monitoring indoor and outdoor air quality to protect students	Many schools are beginning to monitor indoor and outdoor air quality in support of keeping students healthy and safe; however, most lack the knowledge and training to interpret and apply the data to decision making appropriately. If a conversion factor is not applied, these sensors can significantly overestimate smoke pollution (up to 2-3 fold) yet most school staff responsible for looking at purple air numbers are unaware of either the conversion factor or the time-series averaging. Training to help school staff better understand their low-cost sensor tool is critical to the appropriate use and health-protective actions made on the basis of this data.	**H**	2,3,4	**O**	WA DOE, School Districts	Okanogan CD, CAM, OPH, CTCR (Air Quality Program)	

Item I: Public Health								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
I8	Wildfire smoke preparedness and resiliency program assistant or contracted support	Funding to support additional help for smoke-preparedness and during a wildfire smoke episode to increase capacity.	**H**	2,3,4	**O**	OPH	ORAP, Okanogan CD, WA DNR, CTCR, OK Public Health, WA DOE, Public Works	Throughout Okanogan County
I9	Establish an air cleaner distribution system	Develop a sustainable distribution system to operate on an ongoing basis. Annual purchase of ~500 indoor air cleaners or DIY box fan kits for distribution to vulnerable households and community spaces.	**H**	2,3,4	**O**	CAM/OPH	ORAP, Okanogan CD, WA DOE, CTCR, WA DNR, Public Works	Throughout Okanogan County
I10	Ensure increases in prescribed fire that do not adversely impact public health	Support public health's participation (i.e. fund) in discussions about increasing prescribed fire to identify, fund and deliver interventions that protect the public and vulnerable populations from smoke exposure (outreach and education, indoor air cleaners, additional sensors) as well as increase awareness of the importance of Rx fire and smoke regulation with Rx fire.	**H**	1,2,3,4,5,6,7	**O**	CAM/OPH	ORAP, Okanogan CD, WA DNR, CTCR, OK Public Health, WA DOE, NCPBA	Throughout Okanogan County
I11	Create campaign and program to increase public awareness of the mental health impacts of wildfire and wildfire smoke	Many individuals who have experienced wildfire events first hands are impacted by PTSD, anxiety disorders, and other mental health challenges. Understanding the impacts of those challenges upon individuals, their families, and communities, and provided means of addressing them, can uplift people and help recover from the less than visible scars of wildfire. Living through wildfire smoke episodes can similarly impact mental health and is closely related to fire trauma for many.	**H**	2,3,4	**O**	OPH	Mental Health Providers	Throughout Okanogan County

Item I: Public Health								
Item #	**Action Item**	**Activity Description**	**P**	**CWPP Objectives**	**S/T**	**Lead Agency**	**Partner Organizations**	**Project Location**
I12	Develop training and counseling resources for natural resource professionals	Provide trauma training or counseling for natural resource agency personnel on how to interact with those in emergencies. Ease the mental health burden for natural resource professionals when assisting victims in emergencies, possibly through partners like the Red Cross.	**H**	2,3,4,7	**ST**	Okanogan CD	All Partners	Throughout Okanogan County
I13	Create and/or retrofit large capacity community spaces and indoor areas with air cleaning/ cooling systems	Providing vulnerable community members with access to clean air during extreme smoke events and all community members means of staying active during wildfire smoke periods.	**H**	2,3,4	**ST**	CAM	Towns and Cities, Schools, CTCR, OCEM	

CWPP as a Living Document

It is highly recommended that the partners involved in the development of the 2024 CWPP meet regularly to ensure accountability, participate in cross-boundary programs and projects, and assess developments towards community priorities in the succeeding years after the adoption of this update. It is recommended that a formal update of the Okanogan County CWPP be conducted every 5 years, at minimum. CWPPs greater than 10 years old are outdated and can exclude communities from successfully applying for necessary and competitive funding opportunities. Furthermore, the landscape of wildfire can dramatically change in a decade, as has already been experienced in Okanogan between the 2013 CWPP and the present day.

County-level CWPPs can be stand-alone documents or nested in a FEMA Hazard Mitigation Plan as the wildfire chapter or part of the wildfire chapter. In either case, minimum requirements set forth by HFRA must be met. A CWPP should be updated every 5 years.

a) Efforts in local jurisdictions should aim to consolidate planning efforts as appropriate to move towards a 5-year update cycle on CWPPs—as a result many local jurisdictions are moving towards 'housing' the CWPP in the County HMP to simplify and consolidate planning efforts with other natural hazard mitigation planning.

The term ''community wildfire protection plan'' means a plan for an at-risk community that (A) is developed within the context of the collaborative agreements and the guidance established by the Wildland Fire Leadership Council and agreed to by the applicable local government, local fire department, and State agency responsible for forest management, in consultation with interested parties and the Federal land management agencies managing land in the vicinity of the at-risk community; (B) identifies and prioritizes areas for hazardous fuel reduction treatments and recommends the types and methods of treatment on Federal and non-Federal land that will protect 1 or more at-risk communities and essential infrastructure; and (C) recommends measures to reduce structural ignitability throughout the at-risk community.

The update to this plan can either be a preface to this document or a new document that integrates with this one. The update to this plan should include:

- A description of progress made since the CWPP was created.
- A description of demographic changes in the community and other important infrastructure changes.
- Identification of new risks in the community.
- Updated risk analysis if major changes have happened between revisions.
- Updated and prioritized projects for the community with maps and descriptions.

The suggested review process involves:

- Reviewing the existing CWPP
- Engaging partners that have a vested interest in the plan
- Hosting collaborative meetings
- Documenting completed projects and demographic and landscape changes
- Developing updated wildfire risk reduction priorities
- Updating maps
- Distributing updated drafts to key partners for review and input prior to final approval
- Finalizing with core team signatures and submitted to WA DNR and FEMA

Glossary

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 2018b).

Built environment includes human-made or modified landscapes, structures, and infrastructure systems that bring together people, services, and economic activities (USGCRP 2023).

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

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

Canyon: A long, deep, very steep-sided topographic feature primarily cut into bedrock and often with a perennial stream at the bottom (NRCS 2017).

Chute: A steep V-shaped drainage that is not as deep as a canyon but is steeper than a draw. Normal upslope air flow is funneled through a chute and increases in speed, causing upslope preheating from convective heat, thereby exacerbating fire behavior (NWCG 2008).

CWPP (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 2018b).

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

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. The WA DNR defines three zones of defensible space: zone 1 (HIZ 1) as 0 to 5 feet from the home, zone 2 (HIZ 2) as 5 to 30 feet from the home, and zone 3 (HIZ 3) as 30 to about 100 feet from the home (WA DNR 2021).

Draws: Topographic features created by a small, natural watercourse cutting into unconsolidated materials. Draws generally have a broader floor and more gently sloping sides than a ravine or gulch (NRCS 2017).

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 of the Washington Front Range, 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 (Babrauskas 2018).

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 2018b). 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 manner in which 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 2018b).

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

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 2018b).

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 2018b).

Fire severity. Degree to which a site has been altered or disrupted by fire; loosely, a product of fire intensity and residence time (NWCG 2018b). 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, Sherriff et al., (2014) define high-severity fires as those killing more than 80% of overstory trees.

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 2018b).

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 2018b).

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 2018b).

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 2018b).

Fuelbreak: A natural or manmade change in fuel characteristics which 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 2018b).

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 2018b).

Fuels: Any combustible material, most notably vegetation in the context of wildfires, but also including petroleum-based products, homes, and other man-made materials that might combust during a wildfire in the WUI. 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 2018b).

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

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 2018b).

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 survive 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 2018b).

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 and Pohl 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 2018b).

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 persons, 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 HIZ, and structural changes to increase the chance a structure will survive 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 2018b).

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/.

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 low 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 2018b).

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 2018b).

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

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 2018b).

Ravine: Topographic features created by streams cutting into unconsolidated materials and that are narrow, steep-sided, and commonly V-shaped. Ravines are steeper than draws (NRCS, 2017).

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 2018b).

Roadside fuel treatment: A natural or manmade change in fuel characteristics along a roadway which 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 2018b).

Saddle: A low point on a ridge or interfluve, generally a divide or pass between the heads of streams flowing in opposite directions. The presence of a saddle funnels airflow and increases windspeed, thereby exacerbating fire behavior (NRCS 2017).

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 so as 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 which can be used with relative safety by firefighters without the use of a fire shelter (NWCG 2018b).

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 2018b).

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 2018b).

Spot fire: Fire ignited outside the perimeter of the main fire by an ember (NWCG, 2018b). 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 2018b).

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 2018b).

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

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

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 2018b).

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 2018b).

Values at risk: Aspects of a community or natural area considered valuable by an individual or community that could be negatively impacted by a 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 2018b).

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).

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 (Forge 2018). Strategic wildfire mitigation across the WUI can increase the safety or residents and wildland firefighters and reduce the chances

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Appendix A. Introduction to Wildfire Behavior and Terminology

Fire Behavior Triangle

Complex interactions among wildland fuels, weather, and topography determine how wildfires behave and spread. These three factors make up the sides of the fire behavior triangle, and they are the variables that wildland firefighters pay attention to when assessing potential wildfire behavior during an incident (NWCG 2019).

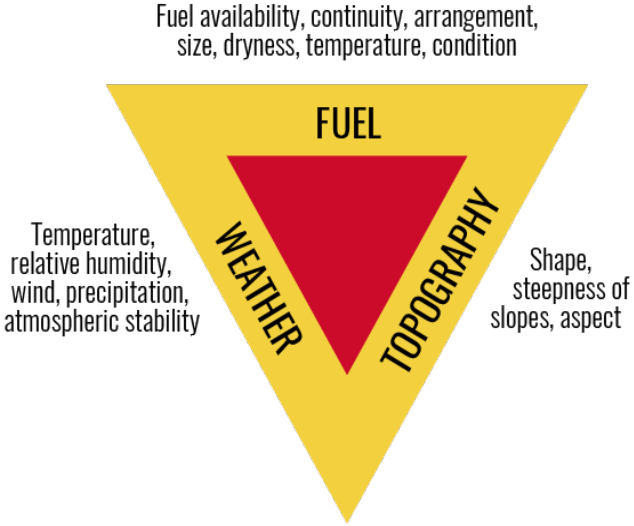


Figure A.1. Interactions between fuels, weather, and topography dictate fire behavior. (Source: California State University, nd)

Fuels

Fuels include live vegetation such as trees, shrubs, and grasses, dead vegetation like pine needles and cured grass, and materials like houses, sheds, fences, trash piles, and combustible chemicals.

Grasses and pine needles are known as "flashy" fuels because they easily combust and burn the fastest of all fuel types. If you think of a campfire, flashy fuels are the kindling that you use to start the fire. Flashy fuels dry out faster than other fuel types when relative humidity drops or when exposed to radiant and convective heat[1]. Fires in grassy fuel types can spread quickly across large areas, and fire behavior can change rapidly with changes in weather conditions.

Dead branches on the surface dry out slower than flashy fuels, release more radiant heat when they burn, and take longer to completely combust. The rate of spread is fast to moderate through shrublands depending on their moisture content, and long flame lengths can preclude direct attack by firefighters. Shrubs and small trees can also act as ladder fuels that carry fire from the ground up into the tree canopy.

Dead trees (aka, snags) and large downed logs are called "heavy fuels", and they take the longest to dry out when relative humidity drops and when exposed to radiant and convective heat. Heavy fuels release tremendous radiant heat when they burn, and they take longer to completely combust, just

[1] Radiant heat transfer occurs by short-wavelength energy traveling through air. Radiant heat is what you feel when sitting in front of a fire. Radiant heat preheats and dries fuels adjacent to a wildfire, which initiates combustion by lowering the fuel's ignition temperature. Convective heat transfer occurs when air is heated, travels away from the source, and carries heat along with it. Convective heat is what you would feel if you put your hand in the air above an open flame. 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.

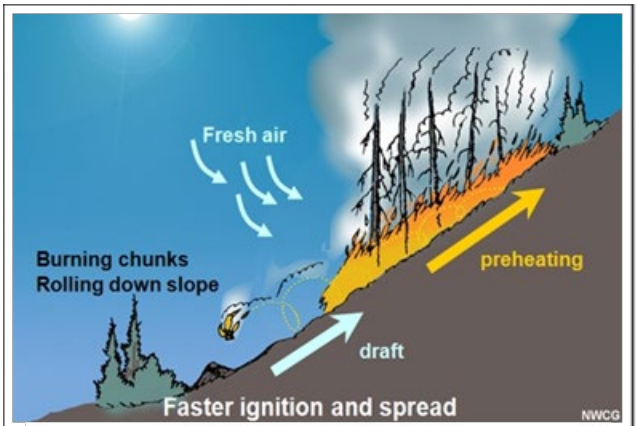
like a log on a campfire. Fire spread through a forest is slower than in a grassland or shrubland, but forest fires release more heat and can be extremely difficult and unsafe for firefighters to suppress. An abundance of dead trees killed by drought, insects, or disease can exacerbate fire behavior, particularly when dead trees still have dry, red needles (Moriarty et al 2019; Parsons et al 2014).

Topography

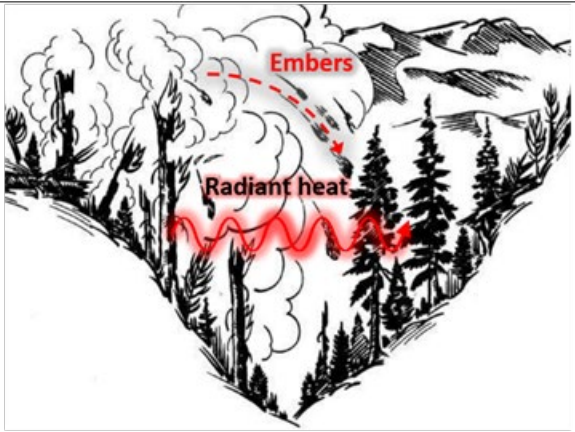
Topography (slope and aspect) influences fire intensity, speed, and spread. In the northern hemisphere, north-facing slopes experience less sun exposure during the day, resulting in higher fuel moistures. Tree density is often higher on north-facing slopes due to higher soil moisture. South-facing slopes experience more sun exposure and higher temperatures and are often covered in grasses and shrubs. The hotter and drier conditions on south-facing slopes mean fuels are drier and more susceptible to combustion, and the prevalence of flashy fuels results in fast rates of fire spread.

Fires burn more quickly up steep slopes due to radiant and convective heating. Fuels are brought into closer proximity with the progressing fire, causing them to dry out, preheat, and become more receptive to ignition, thereby increasing rates of spread. Steep slopes also increase the risk of burning material rolling and igniting unburnt fuels below.

Narrow canyons can experience increased combustion because radiant heat from fire burning on one side of the canyon can heat fuel on the other side of the canyon. Embers can easily travel from one side of a canyon to the other. Topography also influences wind behavior and can make fire spread unpredictable. Wildfires burning through steep and rugged topography are harder to control due to reduced access for firefighters and more unpredictable and extreme fire behavior.



Slope increases fire spread through radiant and convective heating (source: NWCG).



Fires can easily cross narrow canyons (source: U.S. Forest Service).

Figure A.2. Steep slopes and topographic features such as narrow canyons exacerbate fire behavior.

Weather

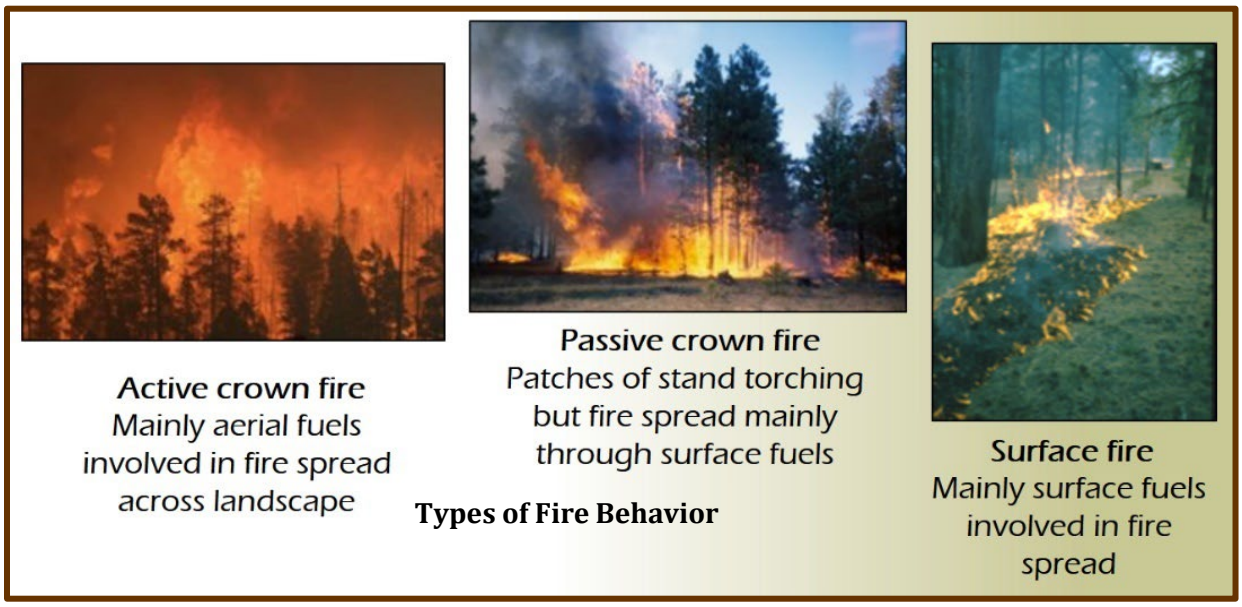
Weather conditions that impact fire behavior include temperature, relative humidity, precipitation, and wind speed and direction. The National Weather Service uses a system called a red flag warning to indicate local weather conditions that can combine to produce increased risk of fire danger and behavior. Red flag warning days indicate increased risk of extreme fire behavior due to a combination of hot temperatures, very low humidity, dry fuels, strong winds, and the presence of thunderstorms.

Direct sunlight and hot temperatures impact how ready fuels are to ignite. Warm air preheats fuels and brings them closer to their ignition point. When relative humidity is low, the dry air can absorb moisture from fuels, especially flashy fuels, making them more susceptible to ignition. Long periods of dry weather can dehydrate heavier fuels, including downed logs, increasing the risk of wildfires in areas with heavy fuel loads.

Wind influences fire behavior by drying out fuels (think how quickly your lips dry out in windy weather), increasing the amount of oxygen feeding the fuel, preheating vegetation through convective heat, and carrying embers more than a mile ahead of an active fire. Complex topography, such as chutes, saddles, and draws, can funnel winds in unpredictable directions, increasing wind speeds and resulting in erratic fire behavior.

Table A.1*. Red flag days are warnings issued by the National Weather Service using criteria specific to a region.*

National Weather Service – Spokane Forecast Office Red Flag Warning Criteria	
Option 1	**Option 2**
Relative humidity less than or equal to 15%	Widely scattered dry thunderstorms
Wind gusts greater than or equal to 25 mph	Dry fuels
Dry fuels	



Wildfire Threats to Homes

Wildfires can ignite homes through several pathways: radiant heat, convective heat, and direct contact with flames or embers. The ability for radiant heat to ignite a home is based on the properties of the structure (i.e., wood, metal, or brick siding), the temperature of the flame, the ambient air temperature, and distance from the flame (Caton et al. 2016). Ignition from convective heat is more likely for homes built along steep slopes and in ravines and draws. For flames to ignite a structure, they must directly contact the building long enough to cause ignition. Flames from a stack of firewood near a home could cause ignition to the home, but flames that quickly burn through grassy fuels are less likely to ignite the home (although the potential still exists). Fires can also travel between structures along fuel pathways such as a fence or row of shrubs connecting a shed and a home (Maranghides et al. 2022). Some housing materials can burn hotter than the surrounding vegetation, thereby exacerbating wildfire intensity and initiating home-to-home ignition (Mell et al. 2010).

Figure A.3.

Homes built mid-slope and at the top of steep slopes and within ravines and draws are at greater risk of convective heat from wildfires. A wildfire could rapidly spread up this steep slope and threaten the home above.

Homes can be destroyed during wildfires even if surrounding vegetation has not burned. During many wildland fires, 50 to 90% of homes ignite due to embers rather than radiant heat or direct flame (Babrauskas 2018; Gropp 2019). Embers can ignite structures when they land on roofs, enter homes through exposed eaves, or get under wooden decks. Embers can also ignite nearby vegetation and other combustible fuels, which can subsequently ignite a home via radiant heating or direct flame contact. Burning homes can release embers that land on and ignite nearby structures, causing destructive home-to-home ignitions, as evidenced by the destructive 2021 Marshall Fire in Boulder County. Structural characteristics of a home can increase its exposure to embers and risk of combustion, such as wood shingle roofs and unenclosed eaves and vents (Hakes et al. 2017; Syphard and Keeley 2019). Embers can also penetrate homes if windows are destroyed by radiant or convective heat. See your community's CWPP for specific recommendations to harden your home against wildfires.

Resources for More Information on Fire Behavior

- Introduction to Fire Behavior from the National Wildfire Coordinating Group (9:57 minute video)
- The Fire Triangle from the National Wildfire Coordinating Group (7:26 minute video)
- Understanding Fire Behavior in the Wildland/Urban Interface from the National Fire Protection Association (20:51 minute video)
- Understanding Fire from California State University (website)
- S-190 Introduction to Wildland Fire Behavior Course Materials from the NWCG (PowerPoints, handouts, and videos)

Appendix B. CWPP Planning Process & Community Risk Assessment Methodology

CWPP Planning Process

The Okanogan Conservation District received funding through the Washington State Conservation Commission's Forest Health and Community Wildfire Resiliency grant program to lead the development of this CWPP update in October 2023. These funds were derived from Washington's Climate Commitment Act of 2021. Initial work with the CWPP began in November 2023, with Okanogan CD wildfire program lead, Eli Loftis and communication and outreach specialist, Emmy Engle attending a specific CWPP development training provided by the Ember Alliance at the 6th Annual Cohesive Wildland Fire Management Conference Strategy Workshop held in Santa Fe, NM. This training provided Okanogan CD staff with the relevant knowledge, information, and resources, including the template from which this document was developed.

Community engagement, partner commitment, and follow-through make CWPPs successful. A wide variety of partners and representatives from Okanogan County were engaged to develop the recommendations set forth in this CWPP. Through the end of 2023 and into early 2024, Okanogan CD staff worked with WADNR and OCEM personnel to identify partners agencies, community leaders, NGOs, and other community representatives to be involved in the process. Two categories of partners were identified: the CWPP's core group composed of representatives from state, federal, and tribal government agencies, fire districts, towns and cities, and the Okanogan Conservation District. These members attended frequent planning meetings and were involved directly in planning efforts and implementation. The second group was the CWPP general group, created to include all additional partners such as NGOs, Firewise USA® leaders, and community leaders or individuals with interests in the CWPP's development. Partners in this group were involved indirectly, receiving frequent communication, planning meeting notifications and summary notes, and asked for partner input during decision-making processes throughout the document's development.

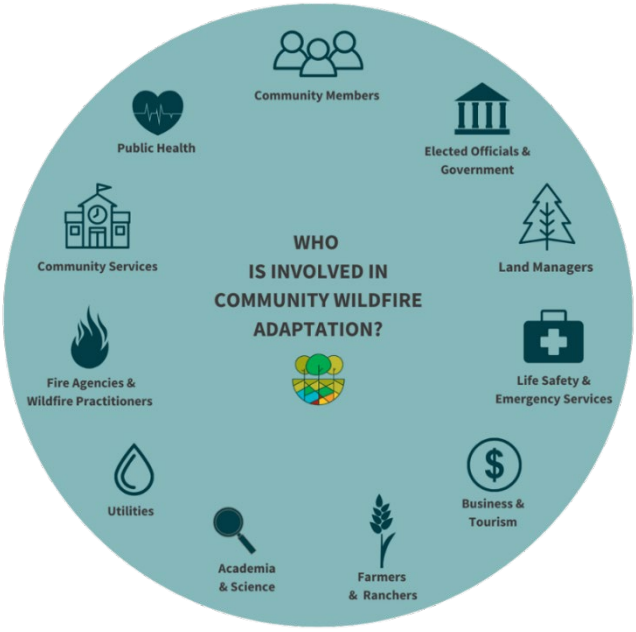


Figure B.1. Wildfire adaptation is a process that involves a wide array of people, groups, and organizations that contribute to the overall effort. (Source: FAC Learning Network, nd)

The first step of the community engagement process was to develop a community-wide survey to receive input on a variety of factors related to wildfire preparedness including the public's values and concerns regarding wildfire. Okanogan CD partnered with OCEM to distribute the survey with Okanogan County residents via the Emergency Alerts System. The survey was shared in early January

2024 and remained open for the duration of the planning process until June 2024. The survey was a great success and received 725 responses (See Appendix C for survey data analysis).

There was an initial partner kickoff meeting held at the end of January 2024 in the Okanogan County Commissioner's Room. Over 100 partners were identified and invited to attend, the meeting was offered as a hybrid option and 48 people attended (32 in-person and 16 remotely). The first part of the meeting served as an overview for the 2024 CWPP update, goals and needs, a proposed timeline, next steps, and partner questions or comments. The second half of the meeting served as the first CWPP planning meeting and members of the core committee were asked to stay. The CWPP planning committee continued to meet for planning sessions two times per month at the Okanogan CD office until June 2024. There were 9 meetings in total.

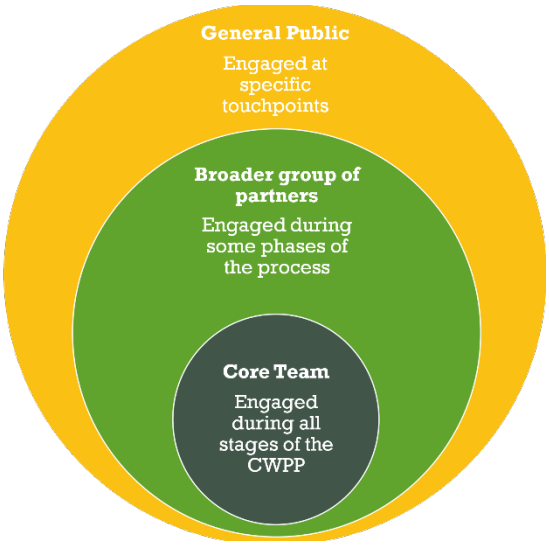


Figure B.2. Coordination is essential for the success of a CWPP, and the tiered levels of engagement utilized in the 2024 Okanogan CWPP process allowed a wide array of partners to effectively engage with one another and the CWPP throughout the process.
(Source: The Ember Alliance, nd)

A major focus for community engagement included 5 public community meetings held in March 2024 and April 2024. These meetings took place across the county in Tonasket, Okanogan, Nespelem, Winthrop, and Pateros to allow a public space and opportunity to provide input on community values at risk of wildfire, concerns about wildfire, and community-focused needs or specific project actions for the CWPP. Each community meeting was well-attended for its respective area. The Winthrop meeting had the highest attendance with over 100 participants, and all together over 300 Okanogan County residents participated and provided input. These meetings included an overview of the CWPP and presentation, a mapping exercise to identify individual values and priorities, project action open-discussion, and a Q&A session with the public, local fire officials, and other CWPP partners. In addition to the five community meetings, by special request members of the Chiliwist community met with staff from Okanogan CD, USFS, WA DNR, BLM, and OCEM in a separate meeting held at the Okanogan CD office in April 2024, two Chiliwist community leaders attended. Meeting summary notes are available for all community meetings at the Okanogan Conservation District website or upon request.

Figure B.3. Staff from the USFS Methow Valley Ranger District and BLM introduce themselves at the start of the March 28th 2024 CWPP community meeting held in Winthrop.
(Source: Craig Nelson, Okanogan CD, 2024)

In April 2024, Okanogan CD and WA DNR staff attended the After the Flames conference hosted by Coalitions & Collaboratives, Inc. in Estes Park, CO, to engage with wildfire professionals from across the United States and Canada specific on post-fire recovery challenges. Several action items in the CWPP were developed in light of conversations with conservation district and fire district staff from Larimer County, CO and Sevier County, TN.

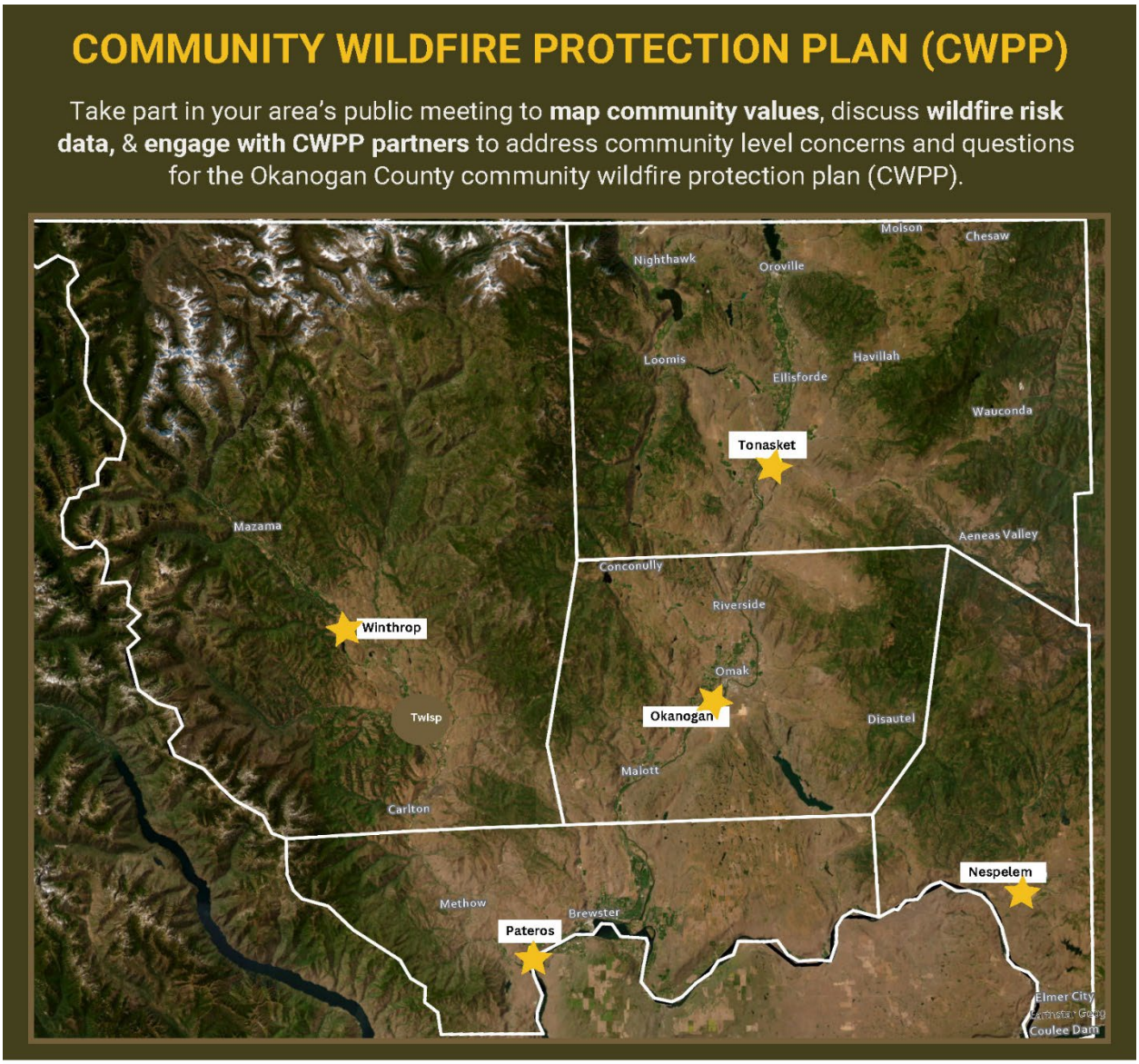


Figure B.4. An example of the flyer utilized to promote the community meetings. (Source: Emmy Engle, Okanogan CD, 2024).

That same month Okanogan CD's wildfire program lead Eli Loftis attended a post-fire workshop held in Spokane hosted by WA DNR, where multiple partner agencies contributed action items that were incorporated into the initial drafts of the action item tables. In June, Loftis attended the International Association for Society and Natural Resources' annual conference in Cairns, QLD, Australia to engage with social scientist and wildfire professionals from the United States, Canada, and Australia to support Okanogan CD's already existing collaborations with natural resource social scientists and learn about Australian wildfire resiliency and recovery practices that could positively influence the CWPP's development.

From February to June 2024, the core partner group met regularly to discuss numerous elements of the CWPP and to complete tasks such as defining the WUI (for additional details see subsection below), making initial drafts of new sections not previously included in the 2013 update, and developing and ranking action items. These meetings concluded in June with the beginning of wildfire season, as many of the agency personnel involved with deployed or detailed to incidents occurring in Washington and elsewhere. Over the summer Okanogan CD staff worked in coordination with core planning group partners, particularly the Town of Winthrop, WA DNR, USFS, and CTCR, and general groups members OCLTRG, CNW, and CAM, to refine already developed material and create a draft that would be distributed for internal partner comment before being released for an informal public comment period.

That public comment period was held from September 16th through the 30th and included an additional public comment meeting held at the Okanogan PUD's hearing room and included four members of the public and agency partners. Public comment was received from seven individuals, ranging from comments given verbally at the meeting held at the Okanogan PUD to written correspondence sent via email. Public comments and supplemental partner comments were processed and addressed by Okanogan CD Staff, and the final draft was submitted to Maurie Goodall, Okanogan County Emergency Management Director, on November 7th 2024 for approval by the Okanogan County Commissioners, which was received on November 18th 2024. Per HFRA, the CWPP was also submitted to George Geissler, WA DNR State Forester, for review.

WUI Delineation

Delineating the 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, can serve as a strategic location for wildland firefighting, and 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 or residents and wildland firefighters and reduce the chances of home loss.

The WUI map utilized in this CWPP were developed by Okanogan CD's wildfire resiliency planner Dylan Streeter in consultation with the CWPP Core Planning Group, which focused on adding more nuance to the CWPP as previously defined in the 2013 CWPP. Conversations, primarily between Okanogan CD, USFS, WA DNR, and CTCR, led to a delineation of the WUI that was based on GIS data provided by Okanogan County. The WUI was designated as all area of the counties within three miles of an address point, expect those areas at the edge of that definition where the boundary could be aligned to already existing potential operational delineations (PODs). PODs are a network of linked linear control features that could be utilized to managing fire spread during both wildland fires and prescribed burns.

In addition to the WUI designation utilizing a three-mile radius around homes, and secondary "core" WUI was defined utilizing a one-mile radius. This reflects the need to prioritize areas that are closer in proximity to structures and communities for various forms of treatment that are meant to provide immediate fuel reduction benefits.

Fire Regime History and Behavior
Fire behavior molding was conducted utilizing data sets provided by the USFS, WA DNR, and WDFW. This data was designed to characterize broad scale patterns of historical fire regimes for use in regional and subregional assessments. Any decisions based on this data should be supported with field verification when applied on the ground. Okanogan County's pyrodiversity is extremely varied, and project planning must reflect that in order to be successful in addressing wildfire risks while also facilitating natural ecosystem function.

Evacuation
Evacuation concerns were reviewed in conversations between the CWPP Core Planning Group, Okanogan County residents, the Okanogan Sheriff's office, and other entities. No specific molding was conducted.

Roadway Survivability
Roadway survivability is difficult to assess. Unless specifically called out all comments regarding roadway survivability in this document are general in nature.

Risk Assessment
The risk assessments were developed utilizing the 2013 CWPP as a base, and were largely developed by Okanogan CD staff in consultation with staff from CTCR, USFS, BLM, WDFW, WA DNR, local fire districts, and municipal staff from Winthrop and Twisp. Okanogan CD and WA DNR have large volumes of community specific data derived from home ignition zone and forest health assessments, which along with personal and professional observations by all relevant partners where utilize to symphyses new risk assessments atop the general structure previously developed in the 2013 CWPP.

Fuel Treatment Prioritization
Fuel treatments were prioritized per the policy with the respective agency responsible for their implementation.

Appendix C. Community Survey Methodology and Results

Overview

Methodology

In 2023, a community survey adapted from a previous questionnaire created by the Ember Alliance was developed. Our goal was to gain insights and thoughts about wildfire risk and community preparedness from a broad collection of residents.

We had a unique opportunity to utilize the Okanogan County Emergency Alert System to inform Okanogan residents of the community survey and the importance of their input. This approach helped us reach a diverse audience and collect a substantial number of responses. Additionally, we promoted the survey on the Okanogan Conservation District website, though partner's social media channels, and at community events. In total, we received 725 responses.

The survey questions were created to be intentionally broad in order to capture general thoughts and concerns about wildfire preparedness. We encouraged respondents to provide detailed information to better understand the community we serve.

Notable Insights

Demographics

Most residents of Okanogan County own their homes (94.8%) and live in single-family house (93.8%). Renters expressed concerns about their ability to prepare their homes due to their non-owner status. For example, one respondent noted, "As a renter, I am limited in what I can do," while another said, "I rent. Property owners should manage or alter the landscape but probably won't." The majority of survey respondents are full-time residents (76.5%), but there is a significant number of seasonal residents and tourists that also utilize the area. Although the majority of respondents have an evacuation plan, notably 21% do not. Additionally, many Okanogan County residents do not speak English as a first language, as highlighted by request for wildfire risk information in Spanish. This diversity in resident, and level of prepares is important to recognize when considering education, home hardening, and evacuation preparedness.

Wildfire Knowledge

The majority of survey respondents (81.7%) strongly agree that they understand the degree to which their community is at risk from wildfire (Figure C1). Comparatively, only 68.4% strongly agree that they know the steps to reduce wildfire hazards around their home or business (Figure C1). This gap suggests that while residents are aware of wildfire risks, they are less confident about the measures needed to mitigate those risks. This underscores the need for education and outreach surrounding property hardening measures within Okanogan County.

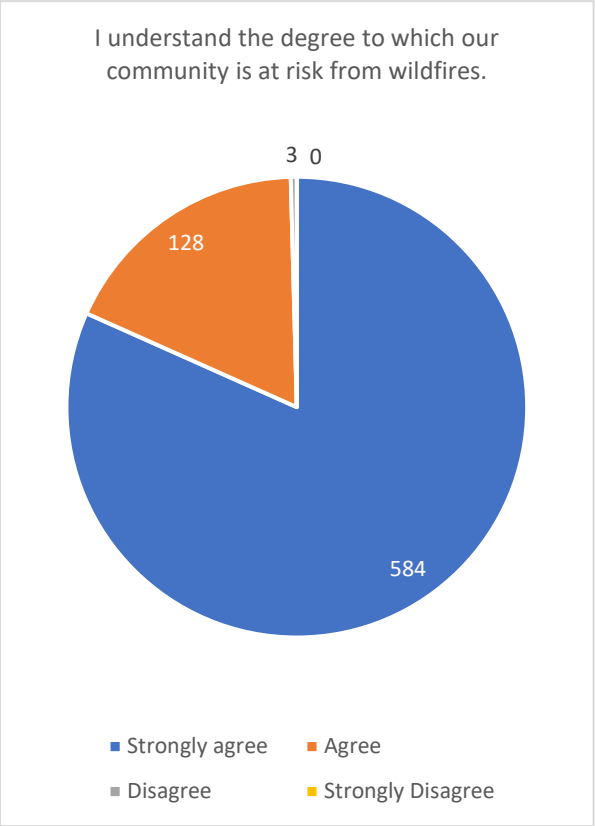


Figure C.1. Pie charts displaying the number of residents who strongly agree (blue), agree (orange), disagree (gray), and strongly disagree (yellow) to statements about wildfire knowledge.

Wildfire Mitigation: Tree Cutting

Most respondents support tree cutting as a wildfire mitigation measure. This was true for managing their own trees on personal property (94.1% agreed or strongly agreed) , in community open spaces (82.9%), along evacuation routes (94.8%), and by the U.S.F.S. and the WA DNR on public land (95.2%).

Concerns were also raised about fire mitigation practices potentially damage 'traditional & accustom areas for gathering traditional foods & medicines.' While the community generally supports tree cutting for wildfire mitigation, it is important to educate around the nuances of tree cutting and the possible trade-offs considering tree placement, wildlife habitat, wildfire mitigation, forest health, and environmental health. Further, community spaces where the location where the public was least likely to support tree cutting, so it may make sense have sensitivity and public discussion when considering removal in these areas.

In general, an overarching concern within this section of the survey was a lack a fire mitigation on adjacent properties. This included concerns about National Forest property, neighbor's property, and easements. There was a sense of helplessness, due to an inability to feel control over their fire risk.

Wildfire Mitigation: Controlled Burning

Controlled burning, including pile burning and prescribed burns, was widely supported among respondents. However, nearly three times as many people disagreed, or strongly disagreed with pile burning as compared to prescribed burning (Figure C2). There was a large mixture of written responses concerning this topic with some advocating for lifting or shortening burn bans to allow for more wood pile burning, while others asked for more ways to dispose of woody debris such as access to woodchippers. Some respondents indicated concerns for air quality due to burning of woody materials, while others noted that they had no other accessible way to dispose of plant material outside of burning. One respondent wrote, "Fire Bans: Residents get limited in their ability to eliminate fuels and their property becomes more dangerous."

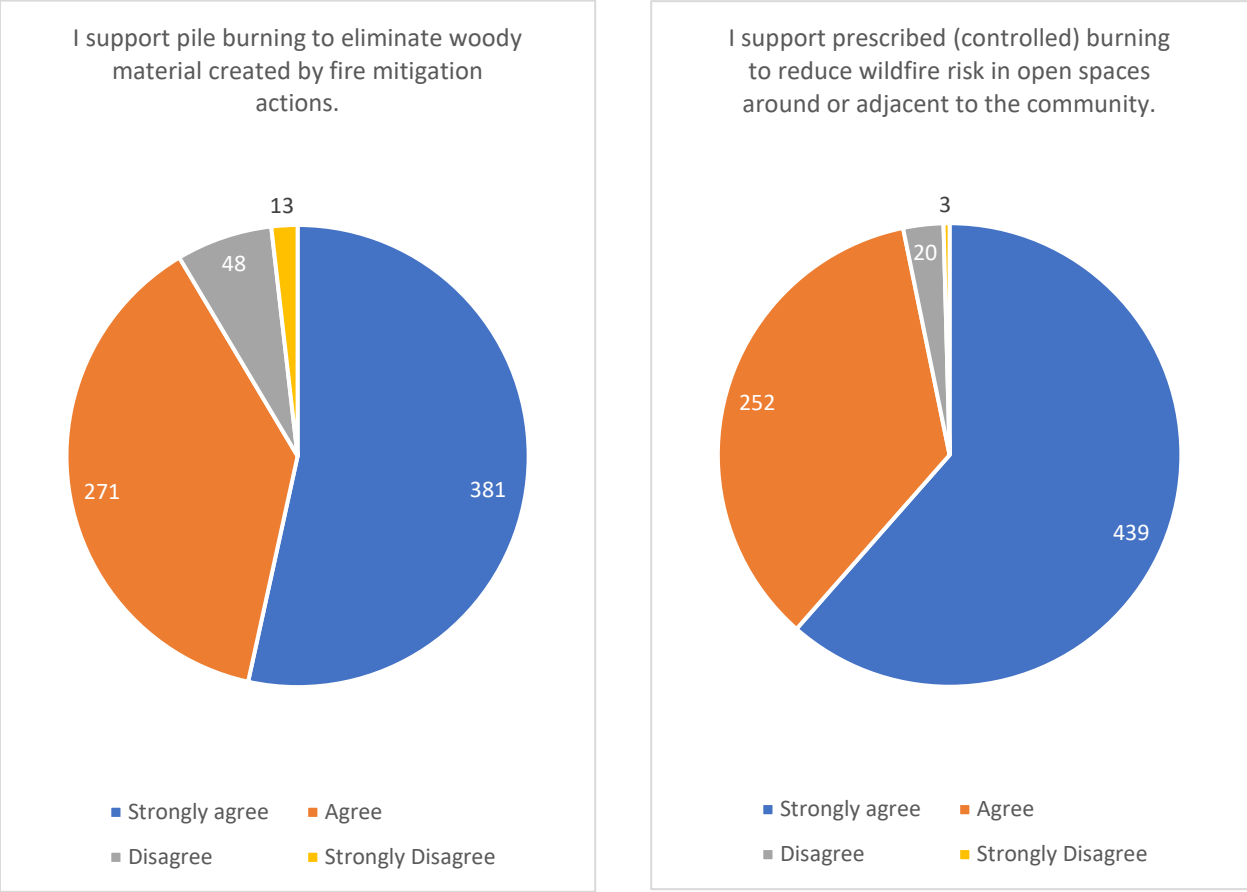


Figure C.2. Pie charts displaying the number of residents who strongly agree (blue), agree (orange), disagree (gray), and strongly disagree (yellow) to statements about controlled burning.

Wildfire concerns

Respondents expressed the highest concern about two issues related to wildfires: 1) Loss of insurance coverage due to wildfire risk, with 71.0% of residents very concerned, and 2) Receiving timely and accurate information about the incident (68.6% very concerned) (Figure C3). Specifically, multiple residents requested a more centralized location to look for information such as a single website which hosts wildfire alerts and evacuation routes. It was noted that there are barriers such as lack of service and confusion due to differing systems between Okanogan County and the Coville reservation.

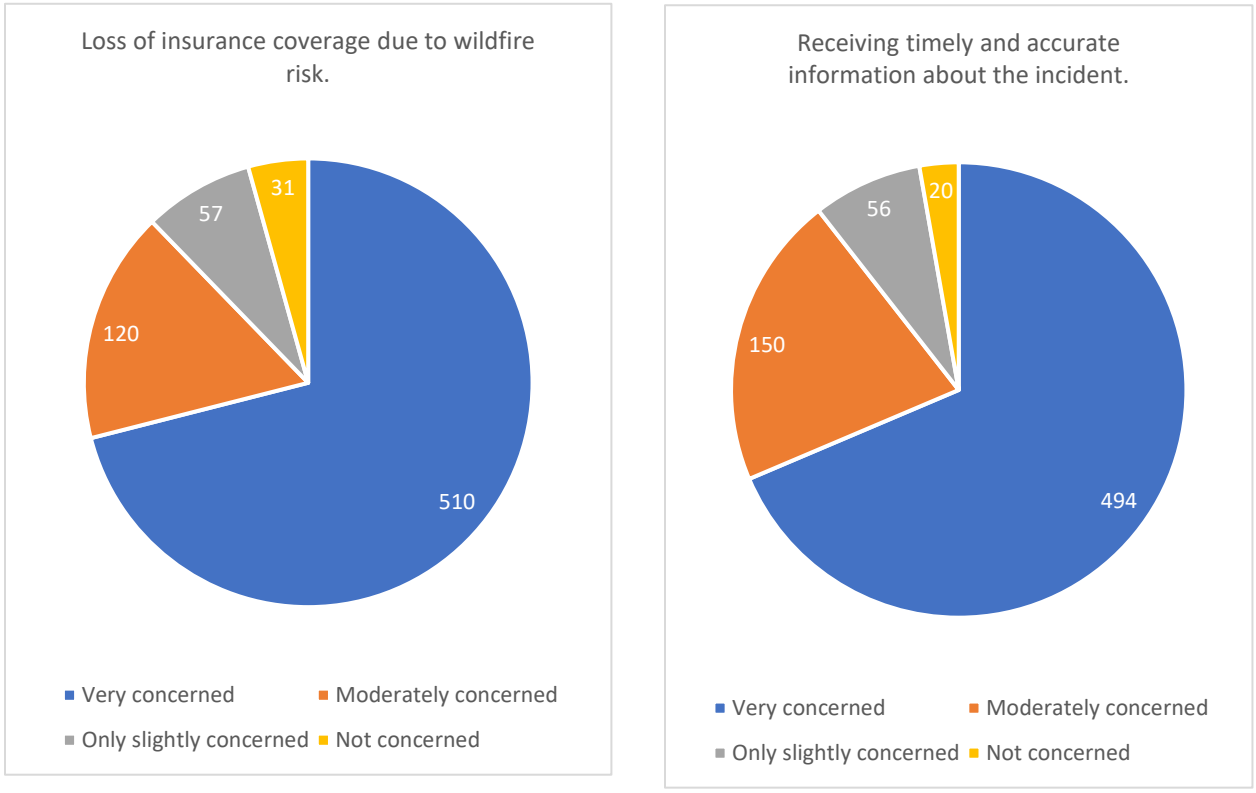


Figure C.3. Pie charts displaying the number of residents who strongly agree (blue), agree (orange), disagree (gray), and strongly disagree (yellow) to statements about wildfire concerns.

Wildfire mitigation barriers

Within the Okanogan County community, there is a gap between understood community risk of wildfire and completion of wildfire mitigation projects. The most cited barriers are lack of finical resources (35%), physical inability to complete work (33%), and limited means to dispose of downed trees, limbs, and other slash material (32%) (Figure C4). These barriers were much more commonly mentioned than lack of knowledge (15%), indicating that while respondents understand the necessary mitigation actions, they lack support and resources. This finding underscores that importance of grants and other resources that can aid Okanogan County residents in preparing their property and completing home hardening practices.

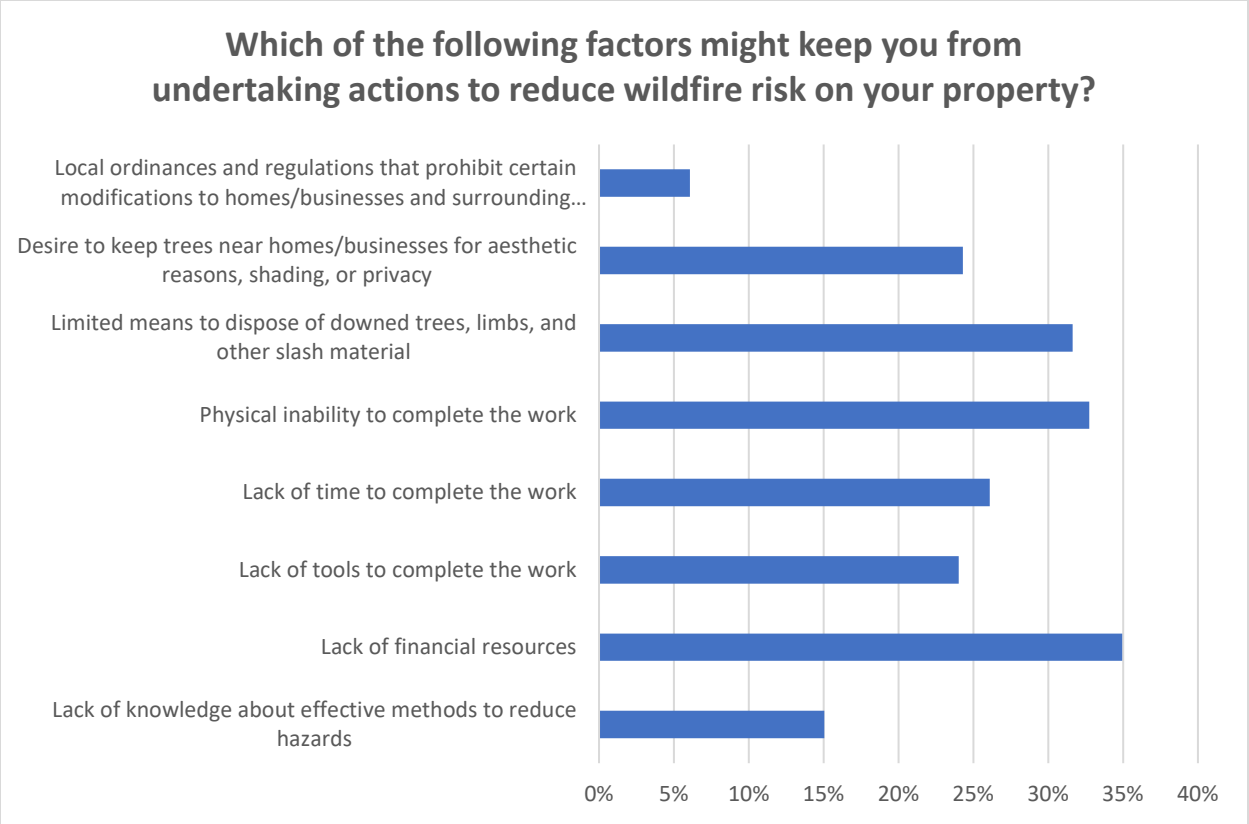


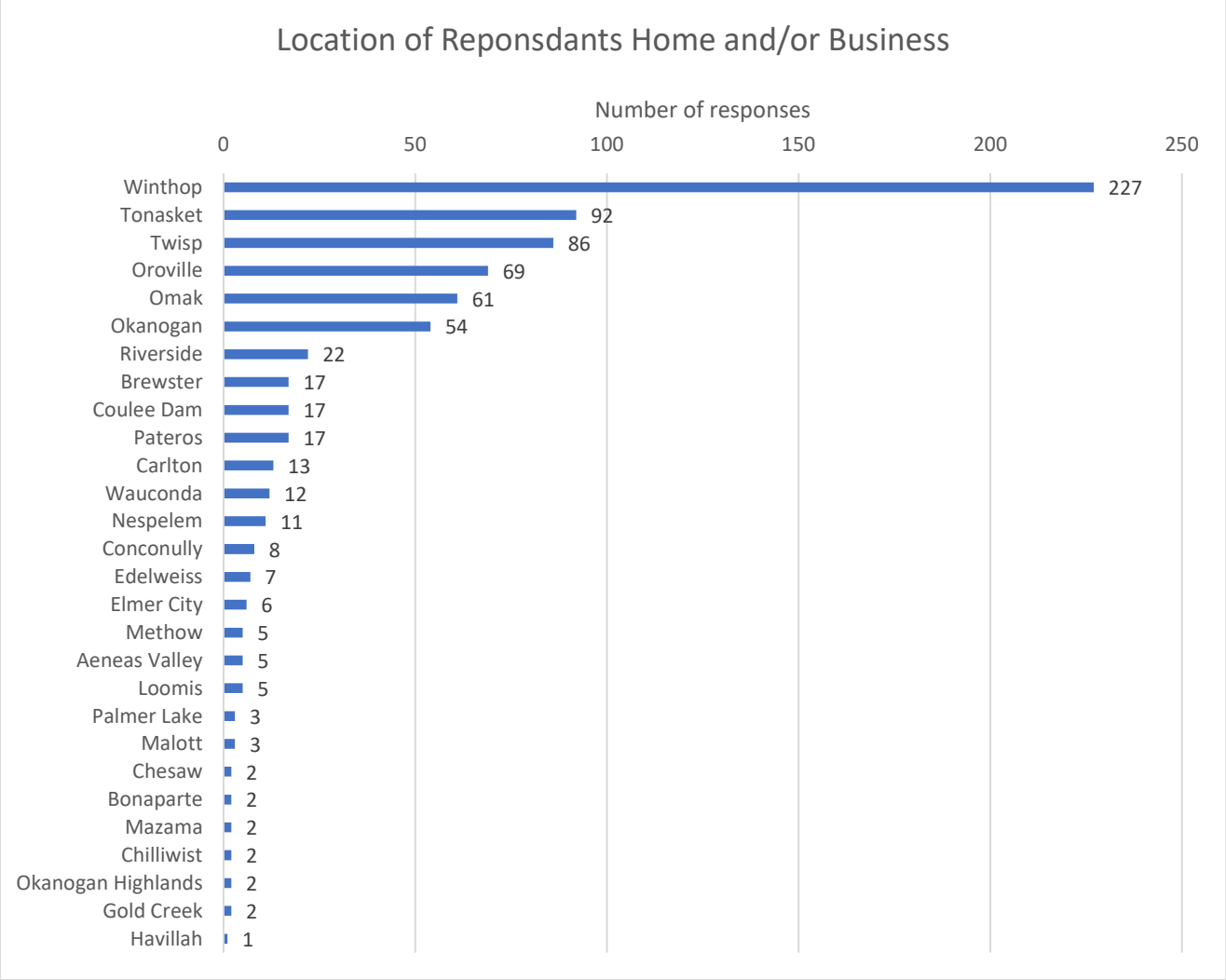
Figure C.4. A bar chart displaying percentage of agreement with statements about barriers to wildfire mitigation on respondent's properties.

Summary:

The survey results and community insight highlight both the strengths and challenges in wildfire preparedness and mitigation within Okanogan County. While residents show strong support for various mitigation practices, such as tree cutting and burning, there are significant concerns and nuances that are necessary to consider. The gap between understanding wildfire risks and the implementation of mitigation measures underscores the importance of enhancing education, resources, and support for residents. Addressing barriers like financial constraints and limited disposal options, while fostering effective communication and coordination will be crucial in strengthening overall wildfire resilience.

Survey Results

Section 1: About you and your home/property/business



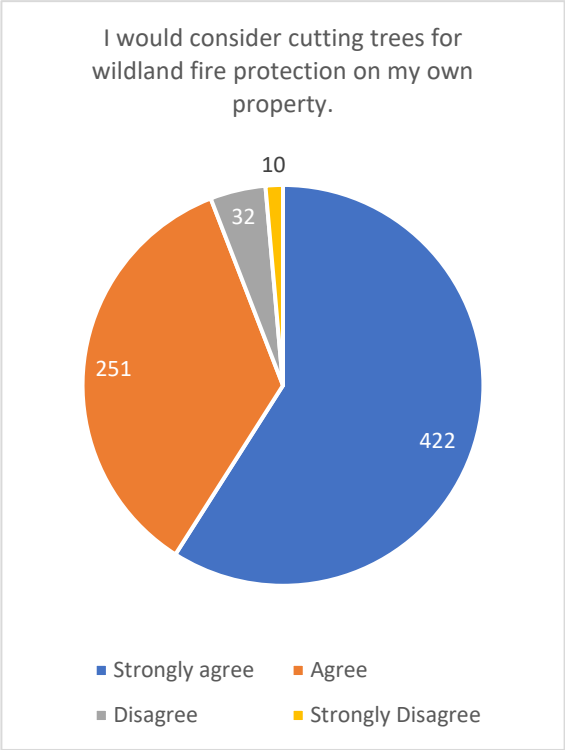
Own home	Rent home	Own business	Rent business
671	37	43	8

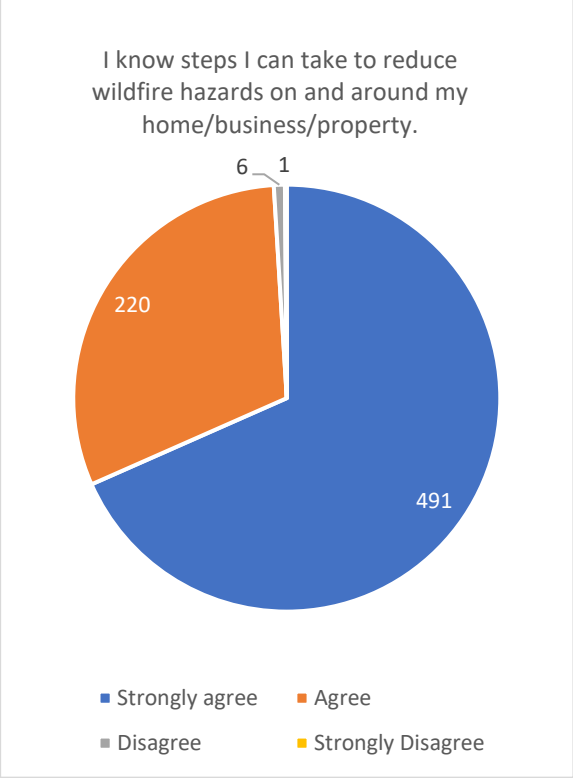
Single-family home	Multi-family dwelling	Standalone business structure	Multi-business structure	Other
677	9	20	13	36

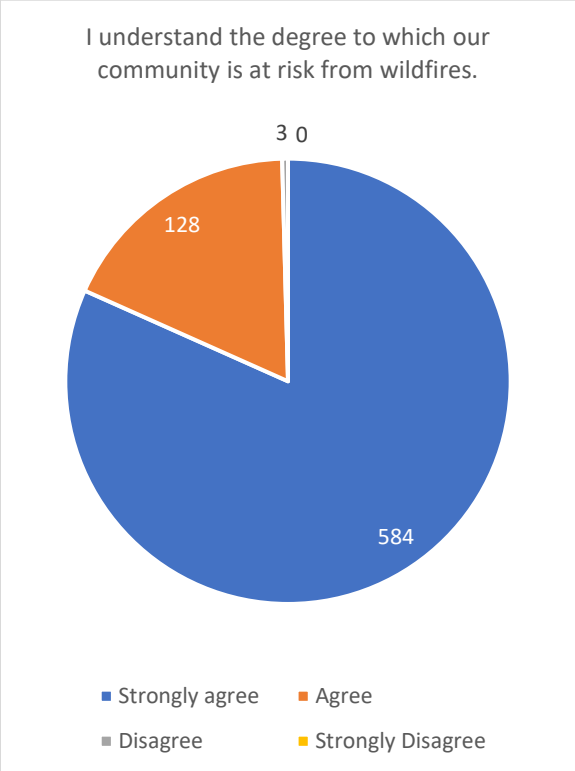
Full-time resident	Seasonal resident	Non-resident	Short-term rental owner	Long-term rental owner	Owner of undeveloped lots	Business owner	Other
541	133	22	4	7	32	30	12

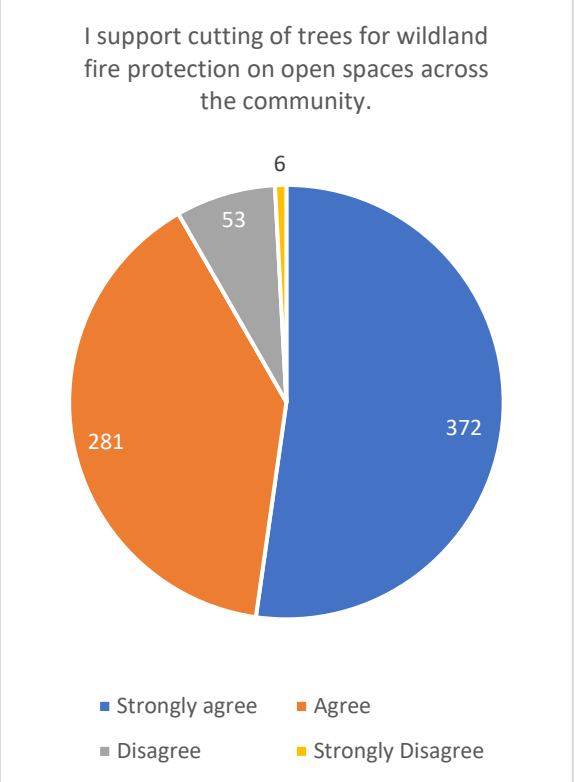
Section 2a: Wildfire knowledge

Please select the degree to which you agree or disagree.

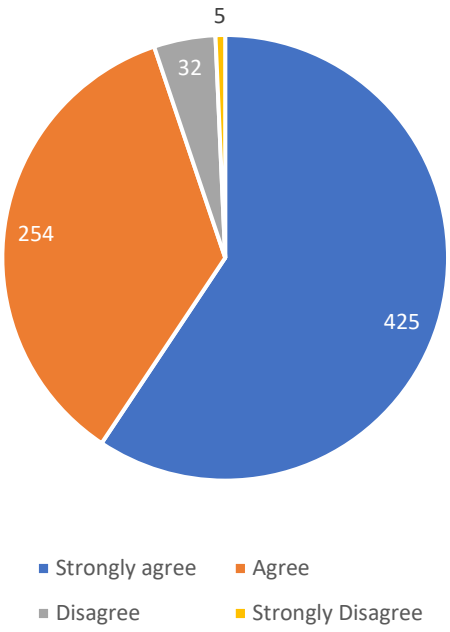




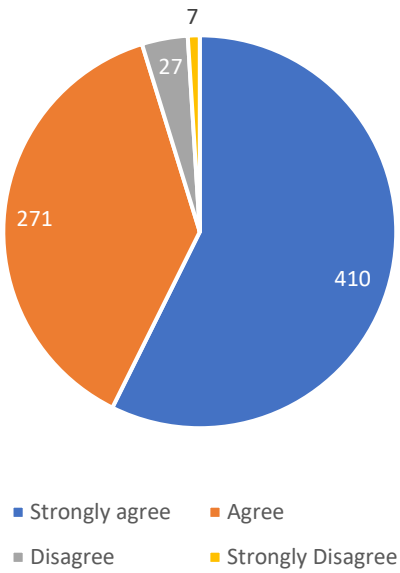




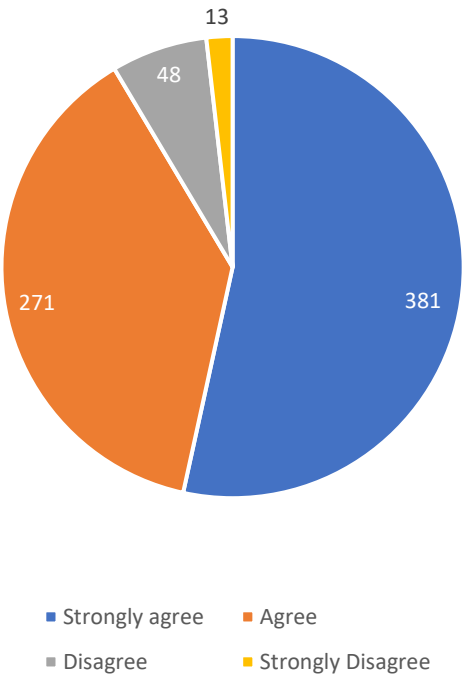
I support cutting of trees along roads to enhance the safety of roads in case of an evacuation.



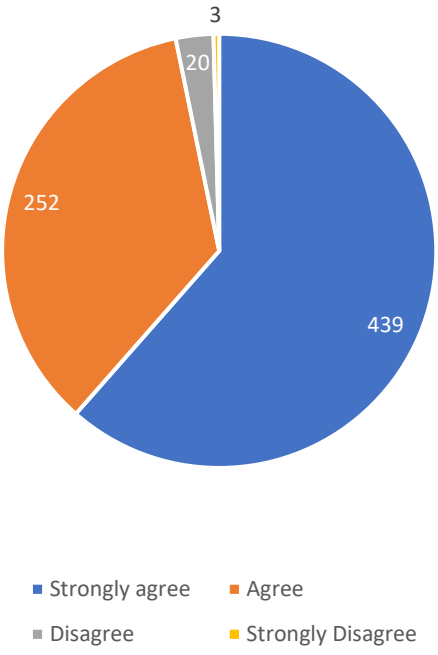
I support land managers such as the U.S. Forest Service or WA Department of Natural Resources cutting trees to mitigate wildfire risk on public land around the community.



I support pile burning to eliminate woody material created by fire mitigation actions.

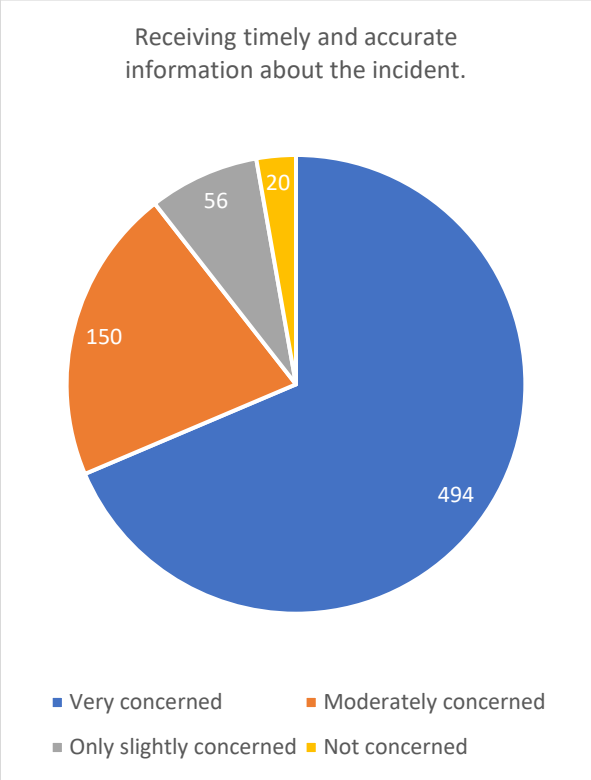


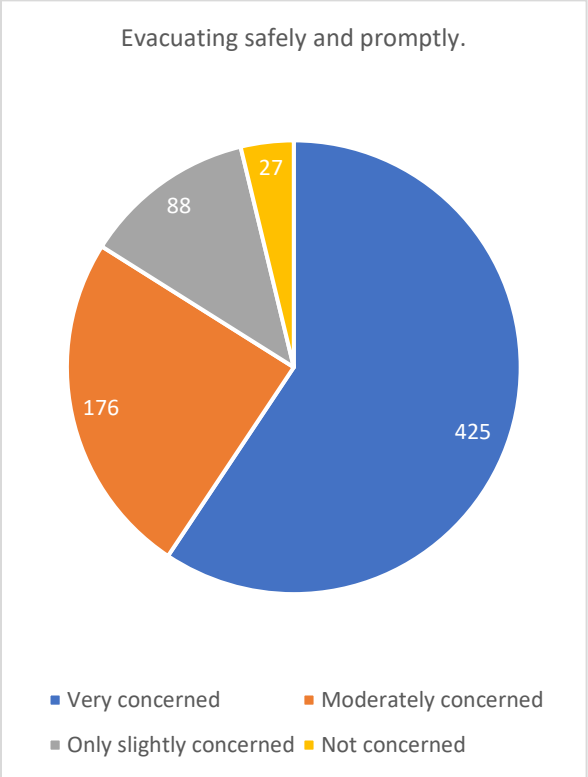
I support prescribed (controlled) burning to reduce wildfire risk in open spaces around or adjacent to the community.

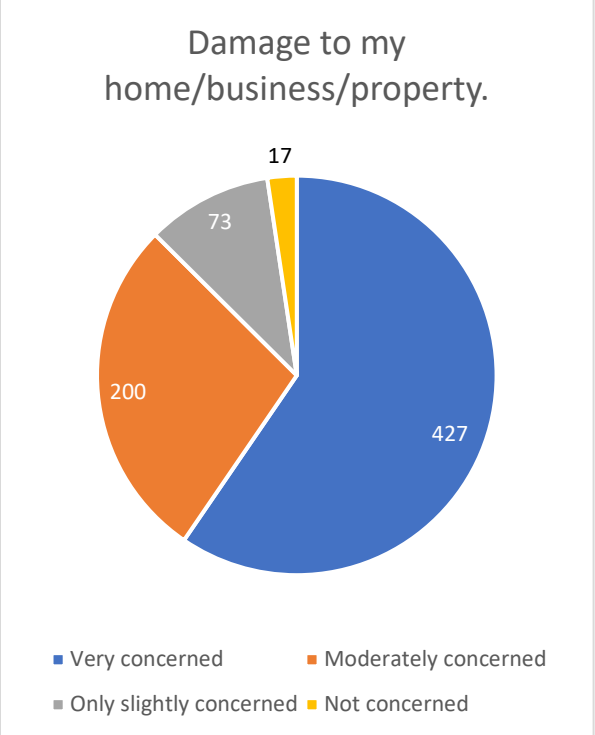


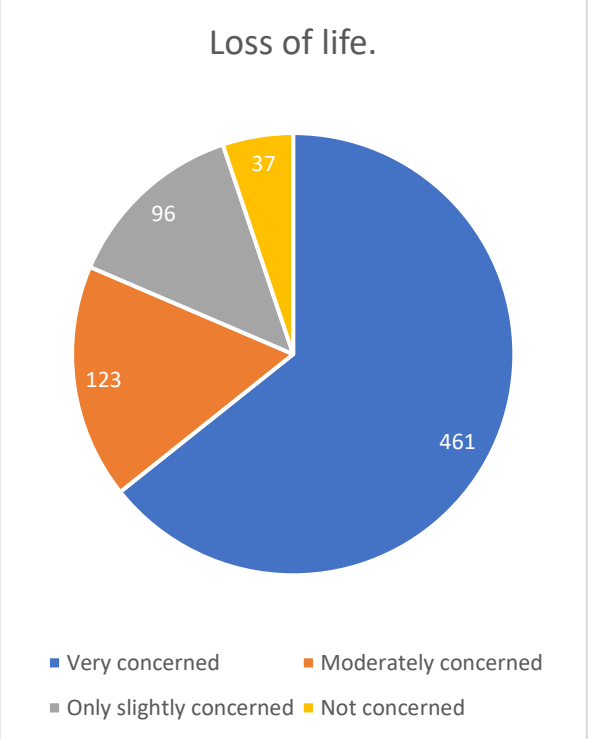
Section 2b:

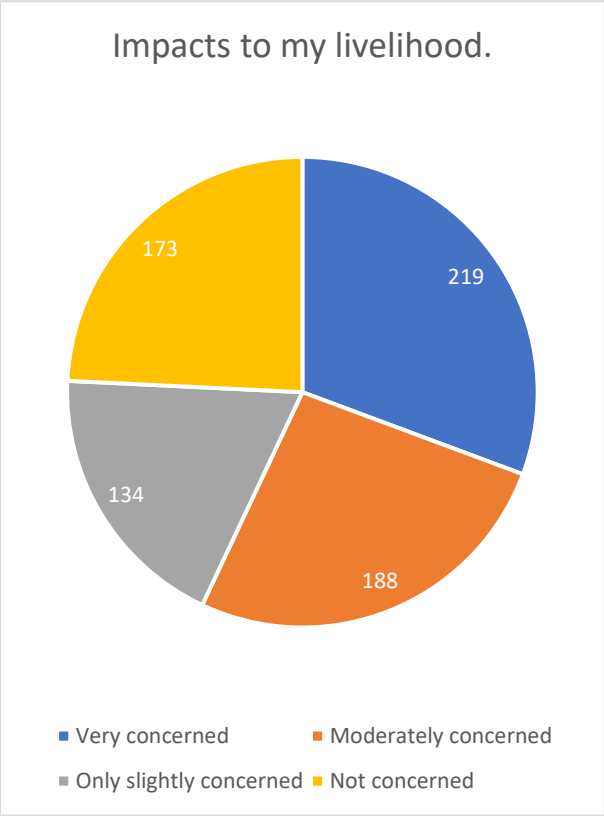
Please select how concerned you are about the following issues if a wildfire were to occur in the community.

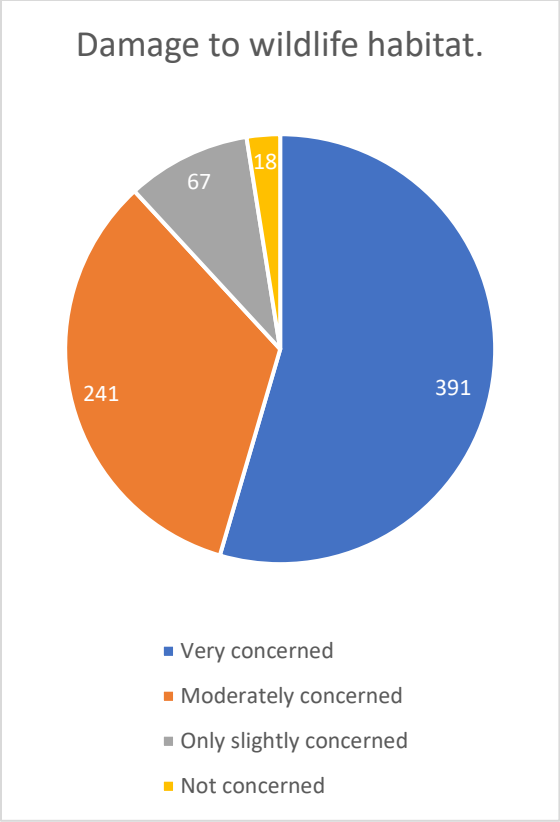


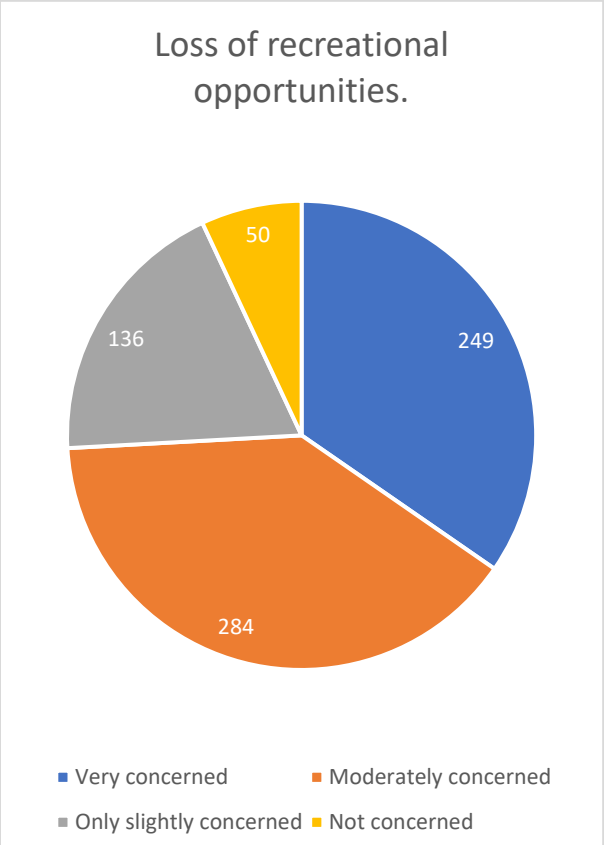


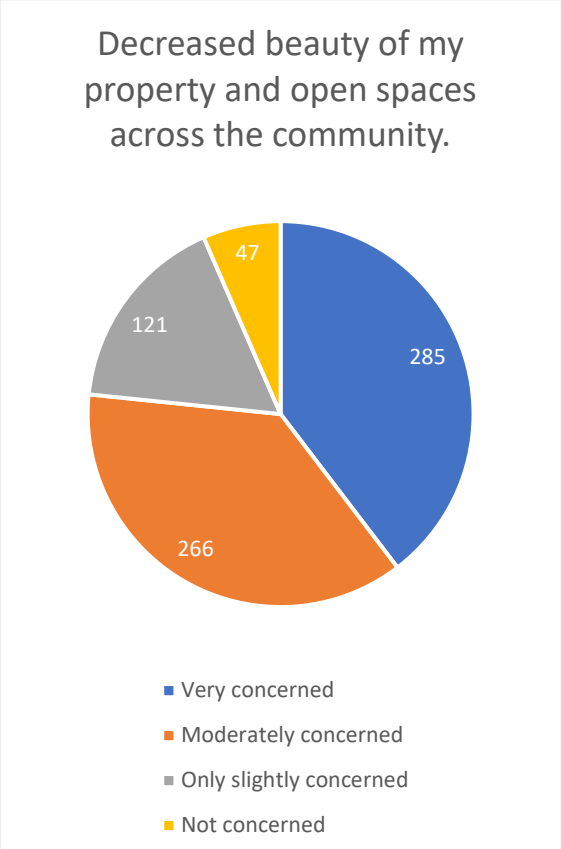


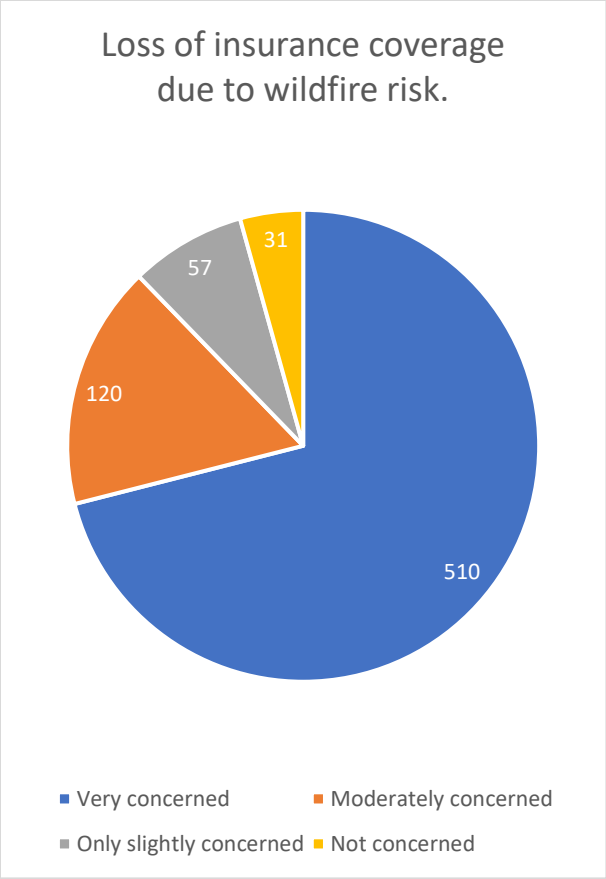


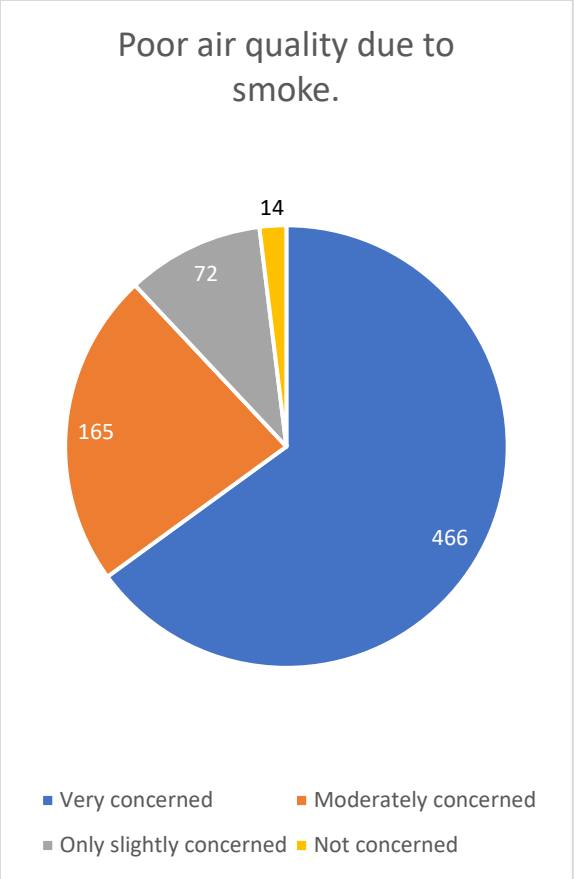

Impacts to my livelihood.
219
188
134
173
Very concerned
Moderately concerned
Only slightly concerned
Not concerned

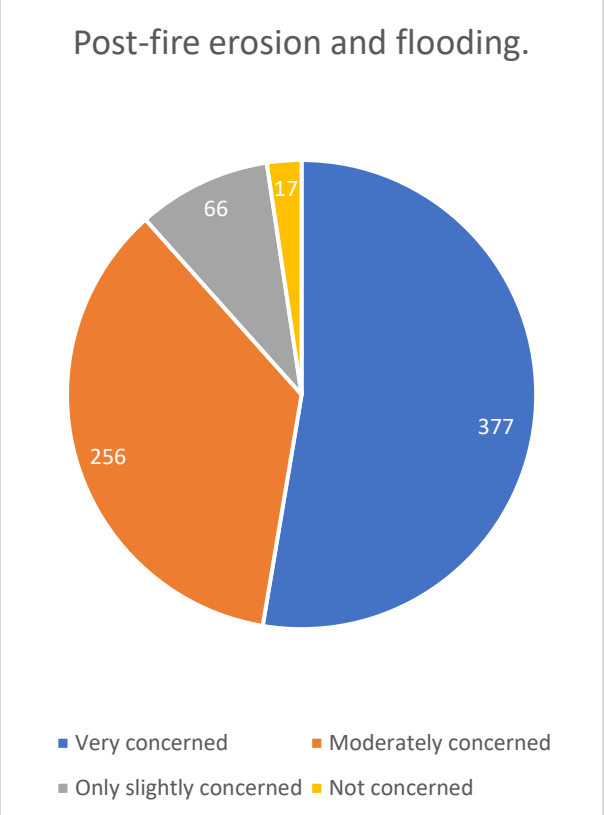

Damage to wildlife habitat.
391
241
67
18
Very concerned
Moderately concerned
Only slightly concerned
Not concerned


Loss of recreational opportunities.
249
284
136
50
Very concerned
Moderately concerned
Only slightly concerned
Not concerned

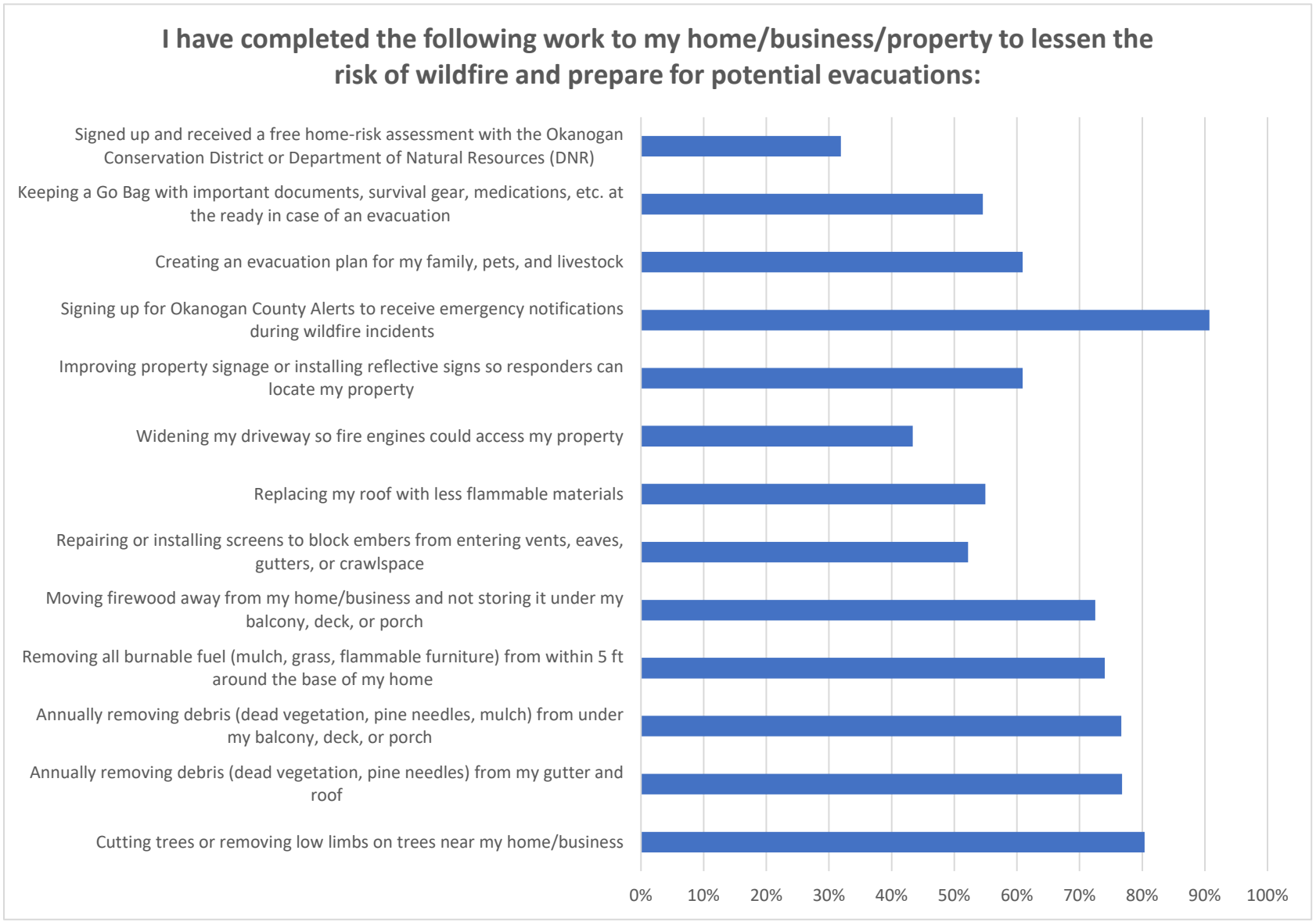

Decreased beauty of my property and open spaces across the community.
285
266
121
47
Very concerned
Moderately concerned
Only slightly concerned
Not concerned


Loss of insurance coverage due to wildfire risk.
31
57
120
510
Very concerned
Moderately concerned
Only slightly concerned
Not concerned

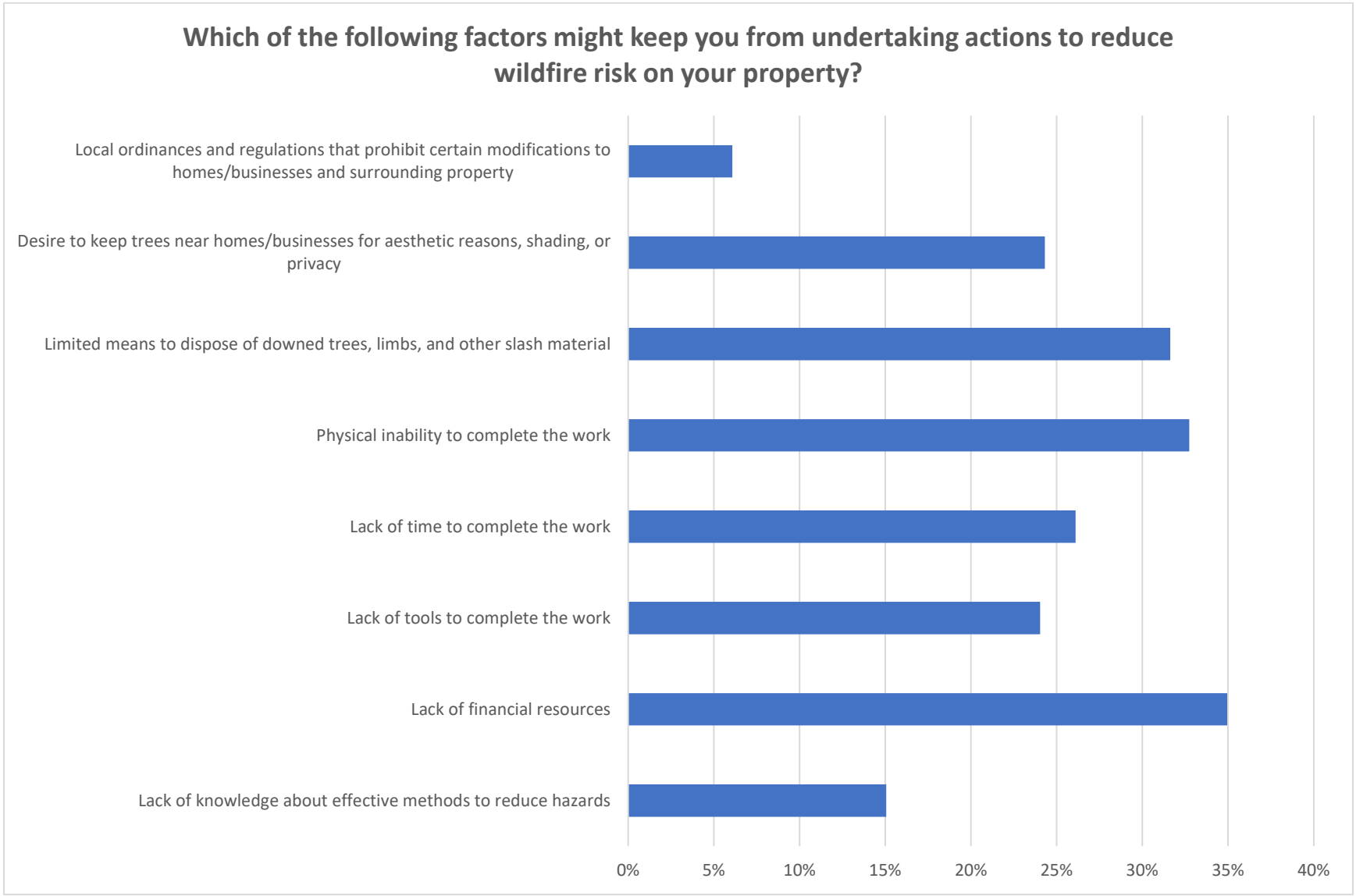

Poor air quality due to smoke.
14
72
165
466
Very concerned
Moderately concerned
Only slightly concerned
Not concerned


Post-fire erosion and flooding.
17
66
377
256
Very concerned
Moderately concerned
Only slightly concerned
Not concerned

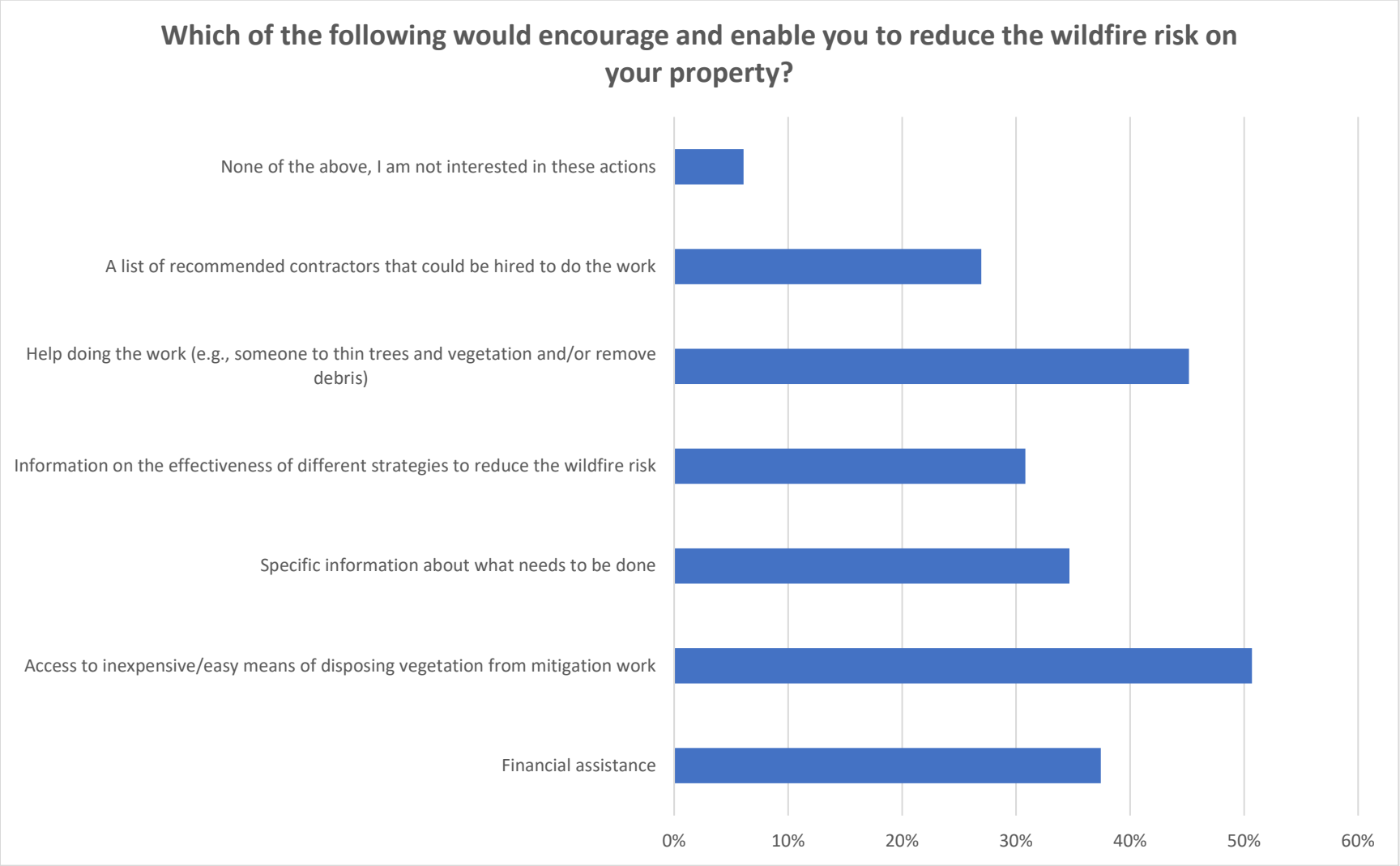
Section 3a:


I have completed the following work to my home/business/property to lessen the risk of wildfire and prepare for potential evacuations:
Signed up and received a free home-risk assessment with the Okanogan Conservation District or Department of Natural Resources (DNR)
Keeping a Go Bag with important documents, survival gear, medications, etc. at the ready in case of an evacuation
Creating an evacuation plan for my family, pets, and livestock
Signing up for Okanogan County Alerts to receive emergency notifications during wildfire incidents
Improving property signage or installing reflective signs so responders can locate my property
Widening my driveway so fire engines could access my property
Replacing my roof with less flammable materials
Repairing or installing screens to block embers from entering vents, eaves, gutters, or crawlspace
Moving firewood away from my home/business and not storing it under my balcony, deck, or porch
Removing all burnable fuel (mulch, grass, flammable furniture) from within 5 ft around the base of my home
Annually removing debris (dead vegetation, pine needles, mulch) from under my balcony, deck, or porch
Annually removing debris (dead vegetation, pine needles) from my gutter and roof
Cutting trees or removing low limbs on trees near my home/business
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%

Section 3b:


Which of the following factors might keep you from undertaking actions to reduce wildfire risk on your property?
Local ordinances and regulations that prohibit certain modifications to homes/businesses and surrounding property
Desire to keep trees near homes/businesses for aesthetic reasons, shading, or privacy
Limited means to dispose of downed trees, limbs, and other slash material
Physical inability to complete the work
Lack of time to complete the work
Lack of tools to complete the work
Lack of financial resources
Lack of knowledge about effective methods to reduce hazards
0%
5%
10%
15%
20%
25%
30%
35%
40%

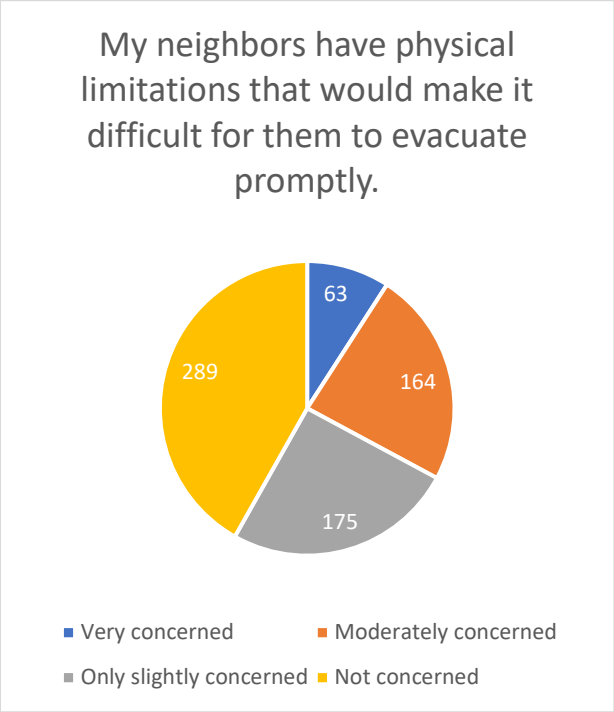
Section 3c

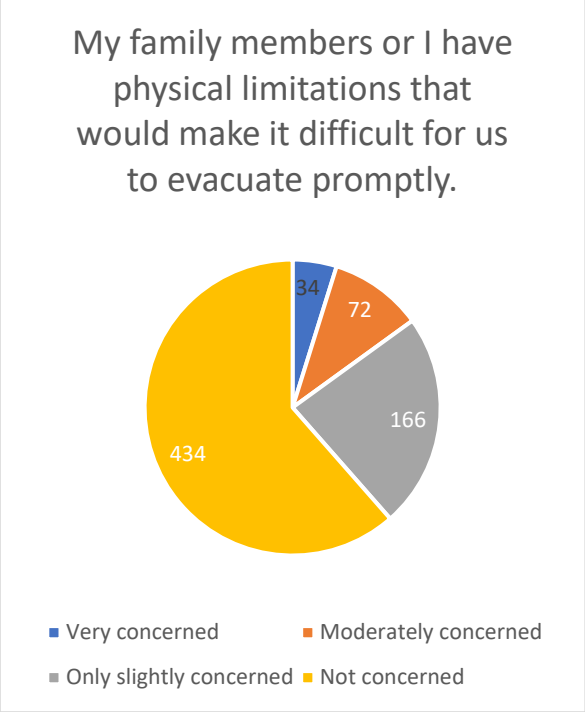

Which of the following would encourage and enable you to reduce the wildfire risk on your property?
None of the above, I am not interested in these actions
A list of recommended contractors that could be hired to do the work
Help doing the work (e.g., someone to thin trees and vegetation and/or remove debris)
Information on the effectiveness of different strategies to reduce the wildfire risk
Specific information about what needs to be done
Access to inexpensive/easy means of disposing vegetation from mitigation work
Financial assistance
0%
10%
20%
30%
40%
50%
60%

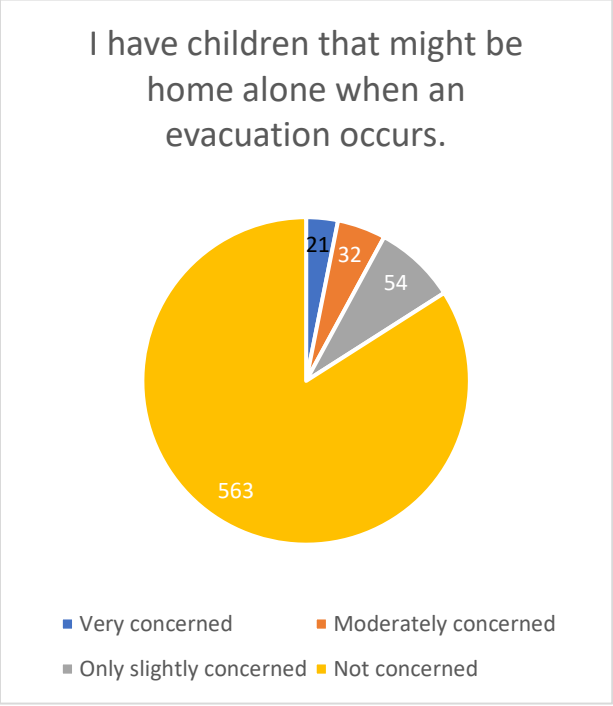
Section 3d:

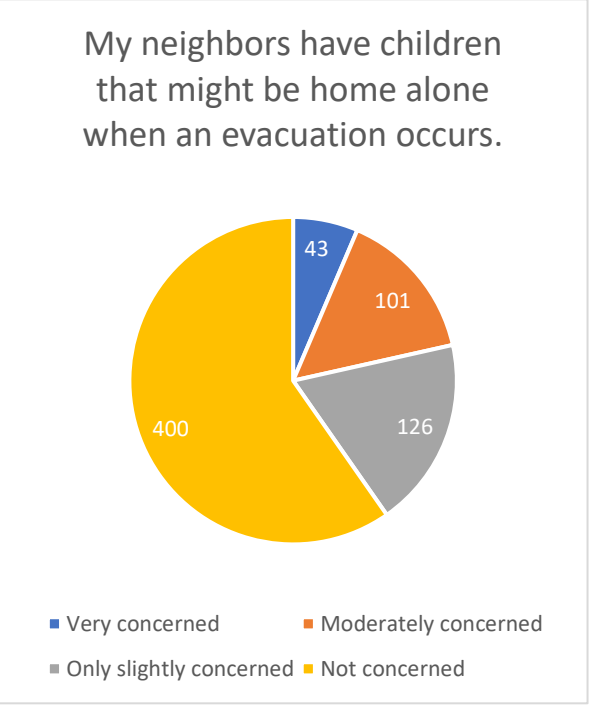
Does your family have an evacuation plan for if a wildfire were to occur in the community?

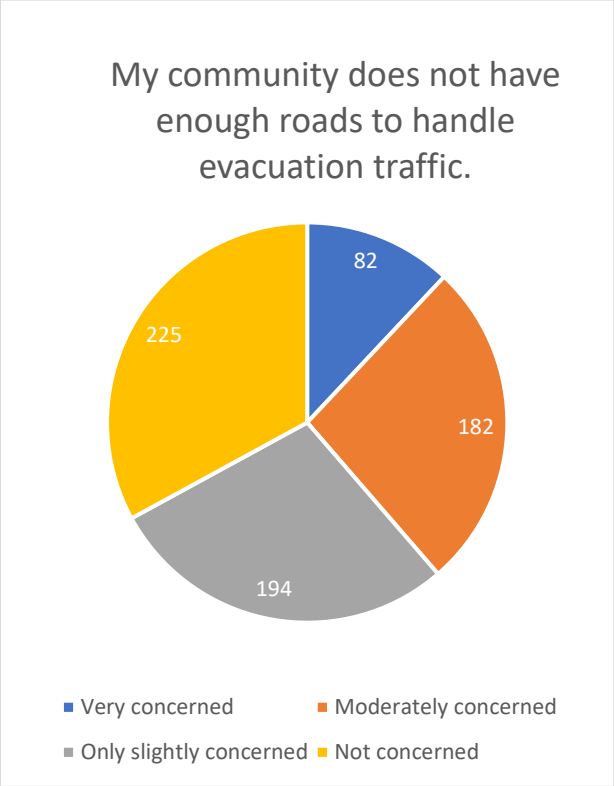
Yes	No
559	149

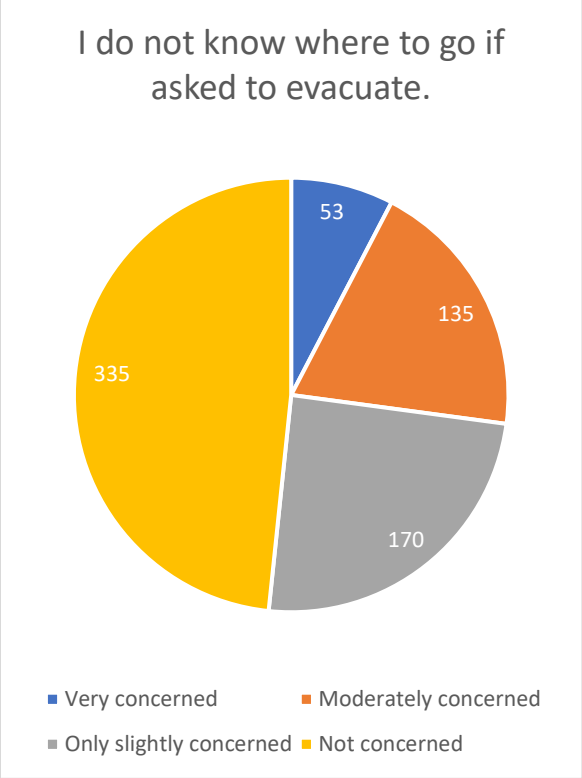


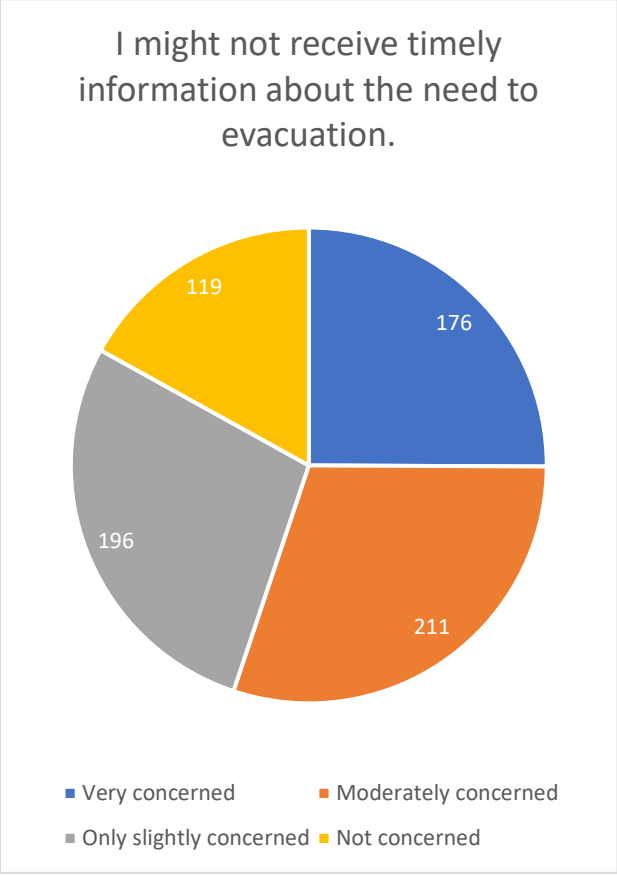


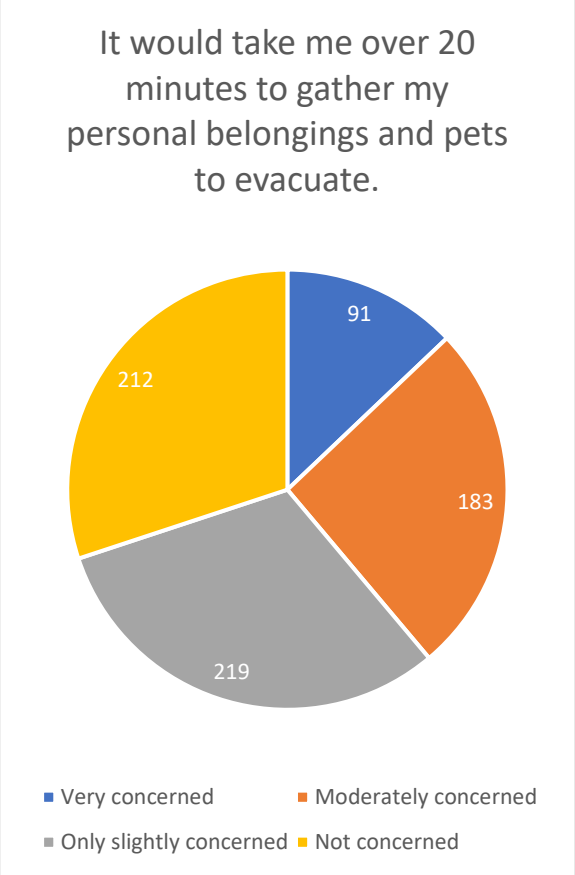


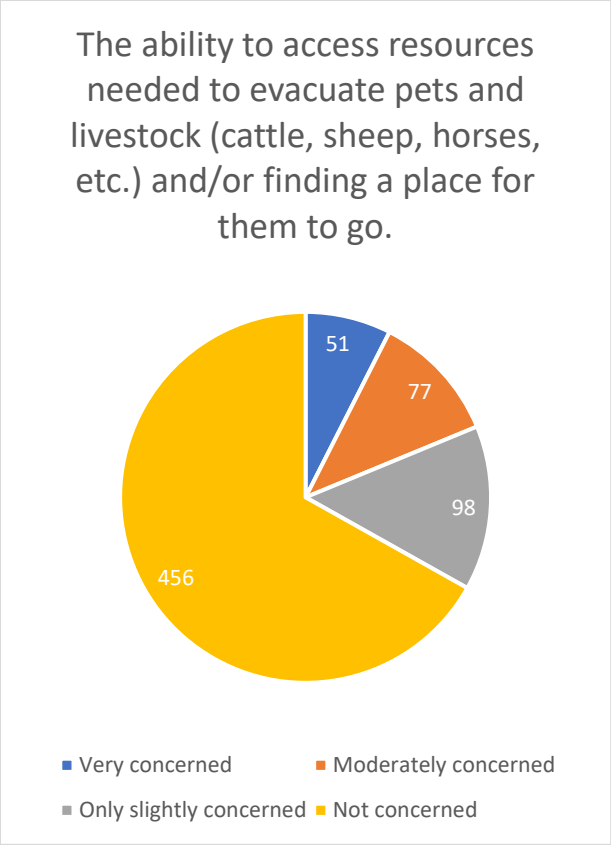


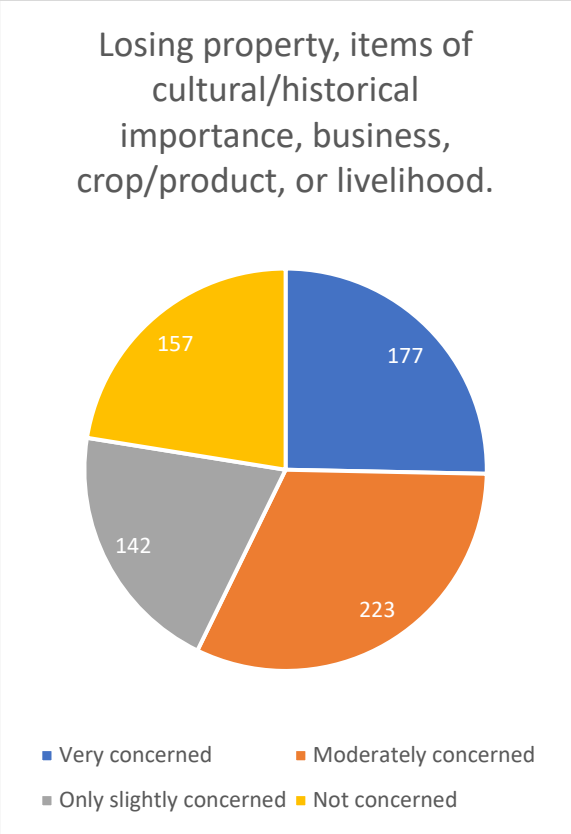

My community does not have enough roads to handle evacuation traffic.
82
182
194
225
Very concerned
Moderately concerned
Only slightly concerned
Not concerned


I do not know where to go if asked to evacuate.
53
135
170
335
Very concerned
Moderately concerned
Only slightly concerned
Not concerned

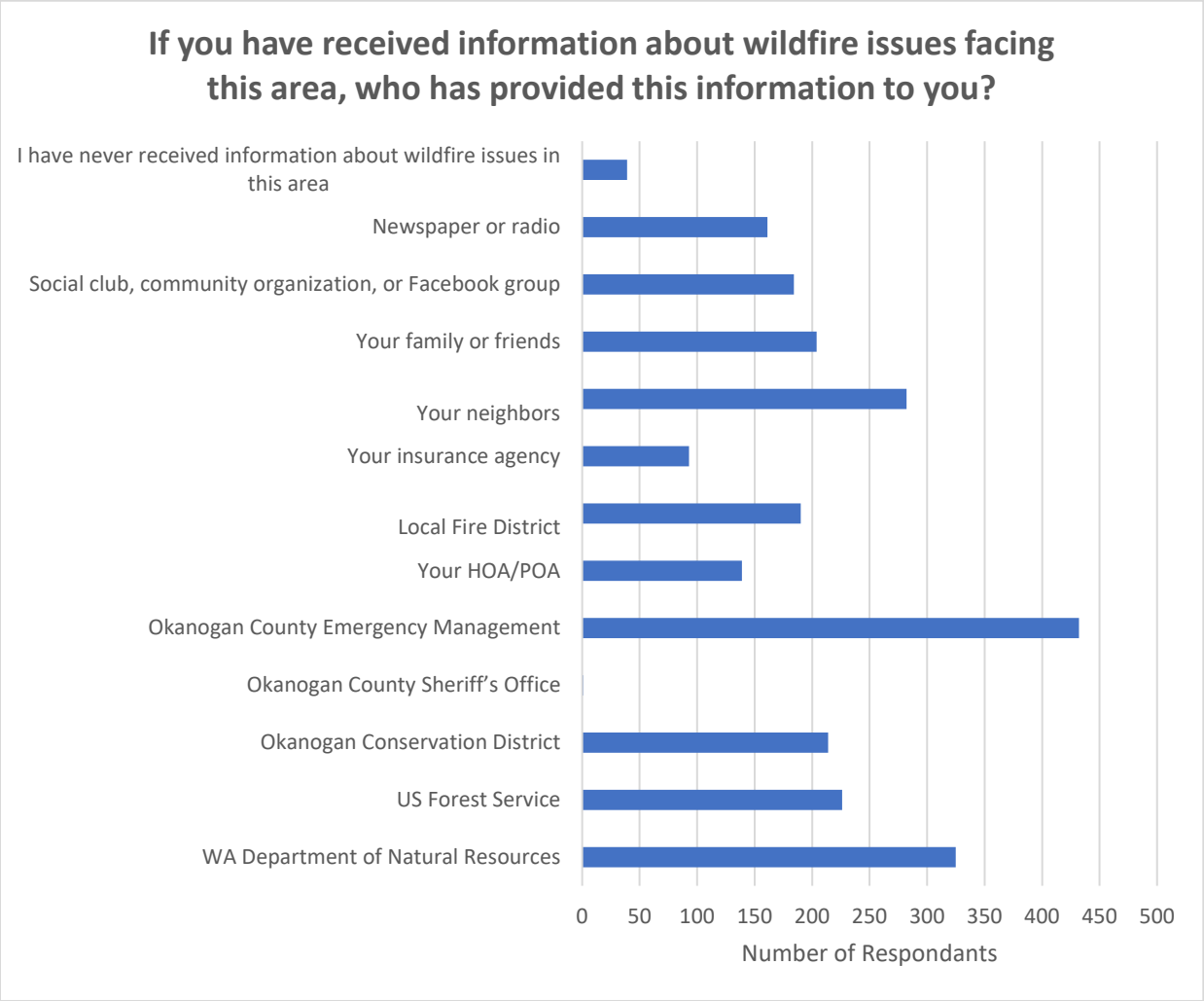

I might not receive timely information about the need to evacuation.
176
211
196
119
Very concerned
Moderately concerned
Only slightly concerned
Not concerned

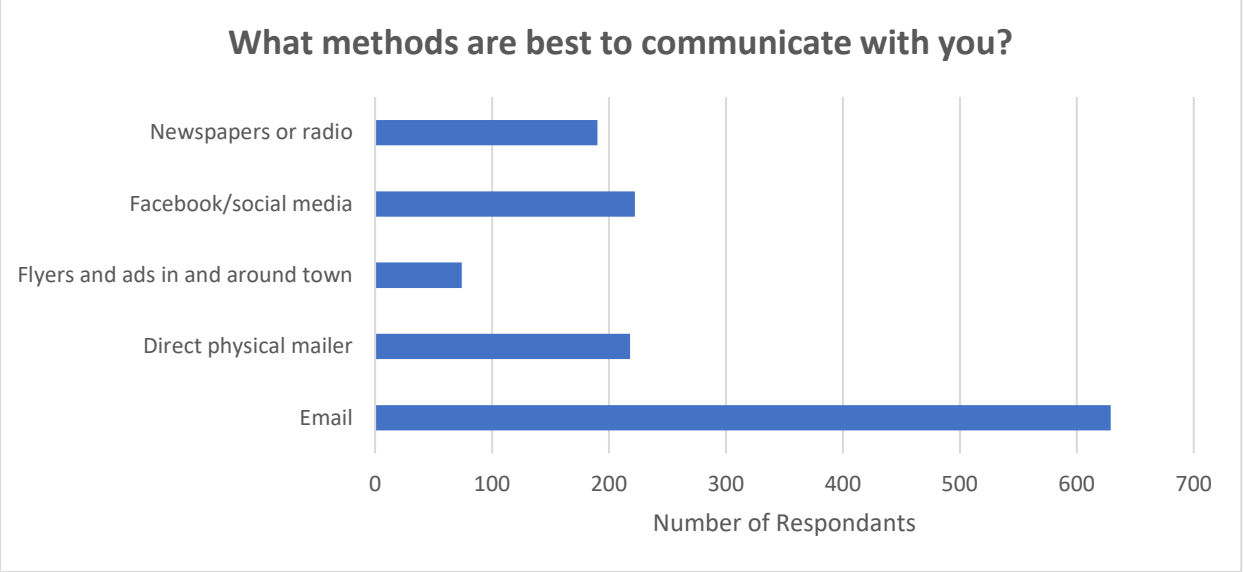

It would take me over 20 minutes to gather my personal belongings and pets to evacuate.
91
183
219
212
Very concerned
Moderately concerned
Only slightly concerned
Not concerned


The ability to access resources needed to evacuate pets and livestock (cattle, sheep, horses, etc.) and/or finding a place for them to go.
51
77
98
456
Very concerned
Moderately concerned
Only slightly concerned
Not concerned


Losing property, items of cultural/historical importance, business, crop/product, or livelihood.
177
223
142
157
Very concerned
Moderately concerned
Only slightly concerned
Not concerned

Section 4


If you have received information about wildfire issues facing this area, who has provided this information to you?
I have never received information about wildfire issues in this area
Newspaper or radio
Social club, community organization, or Facebook group
Your family or friends
Your neighbors
Your insurance agency
Local Fire District
Your HOA/POA
Okanogan County Emergency Management
Okanogan County Sheriff's Office
Okanogan Conservation District
US Forest Service
WA Department of Natural Resources
0 50 100 150 200 250 300 350 400 450 500
Number of Respondants


What methods are best to communicate with you?
Newspapers or radio
Facebook/social media
Flyers and ads in and around town
Direct physical mailer
Email
0 100 200 300 400 500 600 700
Number of Respondants

Appendix D. Integrated Plans Described

20-Year Forest Health Strategic Plan Eastern Washington – 2017

The Forest Health Strategic Plan provides an overview of the landscape level challenges of managing unhealthy forests on a drying landscape in Eastern Washington. It establishes a collaborative mission for Washington's forest managers and public to restore and mange forested landscapes in a manner that reduces the risk of largescale wildfire events and increases the overall resilience of Washington's dry forests and associated aquatic ecosystems in Eastern Washington. It five goals are:

1. "Accelerate the pace and scale of treatments,
2. Strategically focus work to protect communities and values at risk,
3. Promote rural economic development and use of restoration by-products,
4. Respect and integrate diverse landowner objectives, and
5. Monitor progress and adapt strategies over time to ensure treatment effectiveness."

In support of these goals, the plan calls for the implementation of 1.25 million acres of forest health treatments, including the application of prescribed fire, in high priority watershed by 2037 (WA DNR 2017).

Multi-Hazard Mitigation Plan, Okanogan County, Washington – 2021

Okanogan County Department of Emergency Management is dedicated to the protection of life, property, economic, environmental, and historic and cultural resources throughout the county. Seeking to inform and educate the public and reduce the vulnerability of citizens and infrastructure in Okanogan County through comprehensive disaster planning and mitigation.

Hazard mitigation is sustained action to reduce or eliminate the long-term risk to human life and property from hazards. Multi-hazard mitigation planning is a process used by state, tribal, and local governments to engage stakeholders, identify hazards and vulnerabilities, develop a long-term strategy to reduce risk and future losses, and implement the plan, taking advantage of a wide range of resources. A state mitigation plan demonstrates commitment to reduce risks from natural hazards and serves as a guide for decision makers for reducing the effects of natural hazards as resources are committed.

The Okanogan County, Washington Multi - Hazard Mitigation Plan was updated in 2021 by the Okanogan County MHMP planning committee in cooperation with Northwest Management, Inc. of Moscow, Idaho.

This plan satisfies the requirements for a local multi-hazard mitigation plan and a flood mitigation plan under 44 CFR Part 201.6 and 79.6.

Washington Shrubsteppe Restoration and Resiliency Initiative Long Term Strategy 2024-2054 – 2024

The Washington Shrubsteppe Restoration and Resiliency Initiative (WSRRI) provides a vision for resilient shrubsteppe landscapes in Washington, implemented through collaborative partnerships to benefit the wildlife and human communities that rely on one of Washington's most historically expansive landscapes that in modern times has been truncated to 20-40% of historic extent (WSSRI 2024). WSSRI will implement a long-term strategy for shrubsteppe conservation that supports ecosystem function while addressing challenges in wildfire fire preparedness, response, and

recovery. The Cold Springs/Pearl Hill fire of 2020 burned 410,000 acres in Douglas and Okanogan Counties, predominantly in shrubsteppe. The driving focus of WSRRI is to defend the core, grow the core, and connect the core. Developing fire resilience around core shrubsteppe habitats, expanding those habitats through restoration efforts, and recreating interconnectivity between previously disjointed habitat fragments. The Washington Departments of Fish and Wildlife and Natural Resources provided data from WSRRI that was incorporated into this document.

Washington State Smoke Management Plan

WA DNR, WA DOE, U.S. Forest Service, National Park Service (NPS), 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.

Protection of public health and preservation of the natural attractions of the state are high priorities and can be accomplished along with a limited, but necessary, outdoor burning program. Public health, public safety, and forest health can all be served through the application of the provisions of Washington State law and this plan, and with the willingness of those who do outdoor burning on forest lands to further reduce the negative effects of their burning.

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. Although the portion of total outdoor burning covered by this plan is less than 10 percent of the total air pollution in Washington, it remains a significant and visible source.

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 (RCW 70A.15).

The plan provides regulatory direction, operating procedures, and advisory information regarding the management of smoke and fuels on the forest lands of Washington State. It applies to all persons, landowners, companies, state and federal land management agencies, and others who do outdoor burning in Washington State on lands where the DNR provides fire protection, or where such burning occurs on federally-managed, unimproved forest lands and tribal lands of participating Indian nations in the state.

The plan does not apply to agricultural outdoor burning and open burning as defined by Washington Administrative Code (WAC) 173-425-030 (1) and (2), nor to burning done "by rule" under WAC 332-24 or on non-forested wildlands (e.g., range lands). All future reference to burning in this plan will refer only to silvicultural burning unless otherwise indicated.

Washington State Wildland Fire Protection 10-Year Strategic Plan – 2019

Developed by WA DNR, the Strategic plan serves as a source of guidance for natural resource, forest, and wildfire management in Washington. The plan aims to achieve four goals:

- **"Washington's preparedness, response, and recovery systems are fully capable, integrated, and sustainable.**
- **Landscapes are resilient.** In the face of wildland fire, they resist damage and recover quickly.

- **Communities are prepared and adapted for current and future fire regimes.**
- **Response is safe and effective.** There is zero loss-of-life of firefighters or public, from wildlands fires."

Outlining 40 different strategies to accomplish those goals, the plan is applicable to all wildfire response agencies, emergency responders, forest health practitioners, and the community at large. The Strategic plan identifies the top 25 places in Washington most likely to be exposed to wildland fire, adapted from Soctt et al. 2018. Tonasket, Omak, Twisp, Okanogan, Winthrop, Brewster, and Malott are ranked as numbers 8,10,11,14,17,18, and 24 respectively (WA DNR 2019). Furthermore, both Riverside and Oroville rank in the top 35 (Scott et al. 2018).

USFS Wildfire Crisis Strategy

In 2022 the USFS released the National Wildfire Crisis Strategy, a robust strategy meant to address wildfire challenges in areas that poses the most immediate threat to communities, critical infrastructure, and natural resources. Through the strategy, USFS will work with states, tribal governments, and other partners to address wildfire risk, protect communities, and improve forest health.

As part of the strategy, 10 initial investment landscapes were selected to implement an all hands, all lands effort to achieve the aims of the Wildfire Crisis Strategy. The Okanogan-Wenatchee National Forest was selected as one of those 10 initial investment landscapes, leading to the launch of the Central Washington Initiative (CWI). The CWI landscape encompasses 3,116,000 acres total (2,099,000 acres of National Forest System land and 1,017,000 acres of other federal, state, tribal, private, lands) within Chelan, Okanogan, Kittitas and Yakima counties**.**

In 2023, the Colville National Forest was selected as part of 11 additional landscapes to receive funding under the Wildfire Crisis Strategy, supporting forest health and fire resiliency in Ferry, Pend Oreille, Okanogan, and Stevens counties.

Burned Area Emergency Response (BAER) Plans

Wildfires can cause complex problems, from severe loss of vegetation and soil erosion to a decrease in water quality and possible flash flooding. THE BAER Program addresses post-fire emergency stabilization of these and other post wildfire problems, in order to protect public safety and prevent further degradation of the landscape and to mitigate post-fire damages to cultural resources.

The BAER program is designed to address emergency stabilization issues related to wildland fire. The program is utilized by all federal land management agencies. The BAER teams perform emergency Stabilization actions within one year of wildfire containment. These actions are intended to stabilize and prevent unacceptable degradation to natural and cultural resources, minimize threats to life or property resulting from the effects of a fire, or to repair, replace, or construct physical improvements necessary to prevent degradation of land or resources.

Appendix E. Shrubsteppe in Okanogan County

The Shrubsteppe in Okanogan County

Extending from the northern edge of the Okanogan Valley in British Columbia before expanding out across the majority of Eastern Washington and portions of Oregon and Idaho, the Columbia Plateau (EPA Eco Region Level 3) is characterized by a mix of shrubs, grasses, and forbs (WDFW 2024; WSSRI 2024). The lower elevation portions of Okanogan County around the Okanogan and Methow Rivers make up the northern limits of Washington's shrubsteppe habitat, encompassing the EPA Eco Region Level 4 Okanogan Valley ecoregion.

Figure E.1. A Columbian sharp-tailed grouse surveys the area from atop a tree.
(Source: Ben Carroll, Okanogan CD, 2019)

As a result of the rain shadows of the Cascades and Rocky Mountains, the geologic history of the Columbia Plateau, and other factors, the shrubsteppe of Okanogan County is the driest of the area's local habitats. It is dominated by drought-tolerant species such as sagebrush (*Artemisia*) species, the most abundant being Wyoming big sagebrush (*A. tridentata wyomingensis*), and antelope bitterbrush (*Purshia tridentata*). In some areas, layers of algae, moss, and/or lichens form cryptobiotic crust patches, which play a role in soil stabilization and other ecosystem services (WDFW 2024). Shrubsteppe is a major habitat for many species of plants and animals, many of whom depend heavily on it for their survival (WSSRI 2024). Shrubsteppe obligated species in Okanogan County include Columbian sharp-tailed grouse, pronghorn, pygmy short-horned lizard (*Phrynosoma hernandesi*), sagebrush lizard (*Sceloporus graciosus*), white-tailed jackrabbit (*Lepus townsendii*), burrowing owl (*Athene cunicularia*), and historically the greater sage-grouse (*Centrocercus urophasianus*) (WDFW 2023; WSSRI 2024).

Shrubsteppe is an imperiled habitat in Washington, with estimates suggesting that 60-80% of historic shrubsteppe habitat in the state has been converted to other land covers, primarily agriculture (WSSRI 2024). Shrubsteppe habitats occur in roughly half of their historic land area in the United States. Considerable portions of the shrubsteppe in Washington, including in Okanogan County, have been converted into non-native annual grasslands dominated by invasive grasses, namely cheatgrass (*Bromus tectorum*), one of the most pervasive and problematic invasive weeds in western North America (Molvar et al. 2024; WSSRI 2024). Competition from cheatgrass and other invasives has dramatically reduced the abundance of the native perennial bunchgrasses, such as bluebunch wheatgrass (*Pseudoroegneria spicata*), that characterized the understory of many shrubsteppe communities (Molvar et al. 2024). Whilst historically, the shrubsteppe was a landscape characterized by discontinuous patches of shrubs, grasses, and forbs, invasive non-native annual grasses and forbs have created near continuous fuel loads.

This landscape conversion to non-native annual grasses and forbs, coupled with overgrazing, the expansion of human communities into the shrubsteppe, and the exclusion of natural fire, along with

Figure E.2. Grazing is major land use on the shrubsteppe that is vital for the local economy of Okanogan County. (Source: Mike Baden, WSCC, 2024)

other factors, has altered fire regimes, resulting in regimes with more frequent fires of greater extent and severity (WSRRI 2024). Wildfire is a natural disturbance agent in the shrubsteppe, but the ahistorical fire regimes now experienced on the landscape in recent decades have radically altered fire's impacts. Most shrubsteppe habitat is within the WUI and is at the highest risk of any habitat for human-caused ignitions of fire. Compounded by climate change, fires move rapidly and intensely when ignited, driven by winds across a landscape primed to burn readily, leading to the loss of valuable wildlife habitat, rangeland, homes, and, in some cases, human lives. More frequent and intense fires disrupt the regeneration of native vegetation, creating prime conditions for invasive grasses and forbs to dominate post-fire landscapes, fueling the intensity of future fires and modifying the character of the shrubsteppe beyond recognition in some areas (Weddell 2001).

Shrubsteppe is an ecologically and economically essential part of Okanogan County's landscape. The Labor Day fires of September 2020 resulted in catastrophic impacts to the state of the shrubsteppe in Okanogan County and beyond at an unprecedented rate and scale. The Cold Springs/Pearl Hill Fire burned 410,000 acres in Okanogan and Douglas Counties, mostly in shrubsteppe and adjacent agricultural land, largely in a period of only one day (WSSRI 2024).

When considering best practices for managing wildfire resiliency and recovery in the shrubsteppe, three pressing questions arise:

1) How do private and public land managers preserve and expand shrubsteppe habitat while supporting agricultural uses of the Okanogan and Methow Valleys?

2) How do managers and the public balance the need to remove vegetation in close proximity to buildings, roads, and other infrastructure, accommodating growth for housing and businesses and reducing fire risk, with the need to improve habitat for shrubsteppe obligated species?

3) When irrigation causes increased growth and fuel build-up, how do we reconcile our desired goals of irrigating shrubsteppe landscapes for food production and fire safety while simultaneously trying to reduce vegetation density in the shrubsteppe?

Shrubsteppe Initiative

Published in March 2024, the Washington Shrubsteppe Restoration and Resiliency Initiative (WSRRI) Long Term Strategy 2024-2054 provides a voluntary guide and publicly available spatial data of core shrubsteppe areas with which to address those questions and others when looking toward the future of fire resiliency and recovery in Okanogan County's shrubsteppe. Building upon the ideas of collaboration, synergy, and efficiency, the long-term strategy is guided by seven principles:

1. Focus on Shrubsteppe Wildlife and Habitat Conservation
2. Support Working Lands and Rural Communities
3. Strategically Target Investments
4. Accelerate the Pace and Scale of Conservation and Restoration
5. Support and Build Upon Existing Efforts and Capacity
6. Incorporate Diverse and Traditional Perspectives
7. Proactively Address Equity and Environmental Justice
8. Monitor Results and Adapt Strategies

The strategy aims to achieve four goals:

1. Human communities in the shrubsteppe landscape are better protected, prepared, and resilient to wildland fire, engaged in shrubsteppe conservation, and economically viable.
2. The extent, frequency, and severity of wildland fire in the shrubsteppe landscape are similar to pre-1800s fire return intervals, while taking into consideration changes in land use, climate, and other modern factors.
3. Habitat quantity and quality is increased to support healthy wildfire populations and communities.
4. Populations of Species of Greatest Conservation Needs (SGCN) are representative, ensuring they can adapt to changing conditions; resilient so they are able to persist despite disturbance; and redundant, such that they can withstand catastrophic events.

Future shrubsteppe management in Okanogan County supported by WSSRI and wildfire management within the context of the CWPP are complementary and mutually supportive of the same overall goal: to ensure a sustainable, ecologically diverse, economically viable, and safe

landscape for all. Many management strategies for reducing wildfire risk on the shrubsteppe can support healthy ecosystem functions, "defending the core" of the shrubsteppe habitat by managing invasive grasses that fuel fires and other efforts. Where fire has negatively impacted the shrubsteppe, targeted post-fire restoration can "grow the core" and augment existing wildlife habitat and livestock range. Post-fire restoration efforts, and proactive efforts to treat areas around infrastructure and homes, reducing excessive vegetative fuels while implementing restoration practices, can further "connect the core." This interconnectivity of habitat segments fosters greater demographic and genetic exchange between populations of wildlife and plants and fosters greater post-fire resilience by creating corridors of travel for wildlife and plants to return to impacted areas more easily during the early stages of succession post-fire (WSSRI 2024).

Reduction of fuels on the shrubsteppe can be mutually beneficial for humans and wildlife. Many property owners in the shrubsteppe are eager to manage what they rightly consider to be potentially hazardous accumulations of bitterbrush, sagebrush, and exotic grasses. Mechanical removal and other methods, including targeting grazing of excess fuels around homes and other structures, combined with targeted rehabilitation and restoration of shrubsteppe areas, both pre and post-fire, not only reduce the risk to infrastructure and homes but also assist in the transitioning of that area to more historical, more fire-adapted, conditions.

Figure E.3 An emerging technology, virtual fencing has the dual benefit of reducing the need for physical fences that are vulnerable to fire damage, and removing barriers for wildlife such as pronghorn and grouse. (Souce: Mike Baden, WSCC, 2024)

Appendix F. Funding Opportunities for Wildfire Hazard Mitigation and Emergency Preparedness

There are many funding opportunities from federal, state, and local agencies as well as non-profits to assist in forest health and wildfire mitigation projects. These funds can increase capacity but cannot cover all the costs of fire mitigation needed within the valley. Residents and partners must put forth funds and time to complete this work.

Opportunities from Local and State Agencies in Washington

- The Okanogan Conservation District can provide technical assistance and financial support (typically through cost-share) to qualified projects relating to fire resiliency and landscape recovery. Funding availability is depending on what grants are presently active, and the rule governing those grants provided the relevant funding agency and Okanogan CD's rules.
- Property owners wish to reduce fuel loads on their property can request assistance through WA DNR's Service Forestry program. WA DNR's financial assistance program for wildfire resilience and forest health, formerly referred to as the cost-share program, focuses on technical and financial assistance to implement forest health or wildfire mitigation treatments or to help landowners write forest management plans. Non-federal owners of forestland who own less than 5,000 forested acres in Washington state are eligible to participate in the cost-share program.

Funding from Federal Agencies

- **Building Resilient Infrastructure and Communities (BRIC) grant program** supports states, local communities, Tribes, and territories as they undertake large-sale projects to reduce or eliminate risk and damage from future natural hazards. Homeowners, business operators, and non-profit organizations cannot apply directly to FEMA, but they can be included in sub-applications submitted by an eligible sub-applicant (local governments, Tribal governments, and state agencies).
- **Hazard Mitigation Assistance Grants Program (HMGP)** provides funding to state, local, Tribal, and territorial governments so they can rebuild in a way that reduces, or mitigates, future disaster losses in their communities. This grant funding is available after a presidentially declared disaster.
- **Assistance to Firefighters Grants (AFG)** help firefighters and other first responders obtain critical resources necessary for protecting the public and emergency personnel from fire and related hazards.
- **Fire Prevention & Safety (FP&S) Grants** support projects that enhance the safety of the public and firefighters from fire and related hazards.
- **Staffing for Adequate Fire and Emergency Response (SAFER)** grants directly fund fire departments and volunteer firefighter organizations to help increase their capacity.
- **Community Wildfire Defense Grants** (CWDG) are funded annually through the National Forest Service and help communities take action on implementation projects outlined in recent CWPPs.

Opportunities from Non-Governmental Organizations

- Coalitions and Collaboratives, Inc. manages the **Action, Implementation, and Mitigation Program (AIM)** to increase local capacity and support wildfire risk reduction activities in high-risk communities. AIM provides direct support to place-based wildfire mitigation

organization with pass-through grant funding, on-site engagement, technical expertise, mentoring, and training on mitigation practices to help high-risk communities achieve their wildfire adaptation goals.

Supporting Fire Protection District

- All of Okanogan County's fire districts and departments are heavily dependent on volunteers. Volunteering with your local fire district can provide needed support essential to ensure that district's are able to continue to provide services.
- The **Staffing for Adequate Fire and Emergency Response (SAFER)** grants can help fund staff capacity for fire departments.
- The **Assistance to Firefighters Grants (AFG)** can provide critical response resources for firefighters and emergency responders.

Signature Page

The Okanogan Community Wildfire Protection Plan (CWPP) fulfills the three requirements of the Healthy Forests Restoration Act (HFRA) of 2003 and is agreed to by the Okanogan County Commissioners.

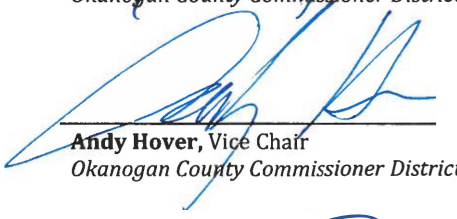
The CWPP was collaboratively developed with input from interested parties, members of the public, fire districts, and private, county, state, tribal, and federal agencies managing land or responsible for wildfire preparedness, response, and recovery efforts in Okanogan County. It promotes a county wide wildfire hazard mitigation concept through leadership, collaboration, professionalism, and excellence, guiding the way to a safe and sustainable future for Okanogan County, ensuring that people, structures, infrastructure, wildlife, livestock, unique ecosystems, natural resources, and cultural heritage are protected and resilient to wildfire.

The CWPP identifies and prioritizes areas for hazardous fuel reduction treatments and recommends the types and methods of treatment to protect communities and measures to reduce structure ignitability throughout Okanogan County.

Okanogan County Commissioners

Jon Neal, Chair
Okanogan County Commissioner District #3

11-18-2024
Date



Andy Hover, Vice Chair
Okanogan County Commissioner District #2

11-18-2024
Date

Chris Branch, Member
Okanogan County Commissioner District #1

11-25-2024
Date

Washington Department of Natural Resources

George Geissler, State Forester
Washington Department of Natural Resources

1/7/25
Date

Okanogan Conservation District

Washington State

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