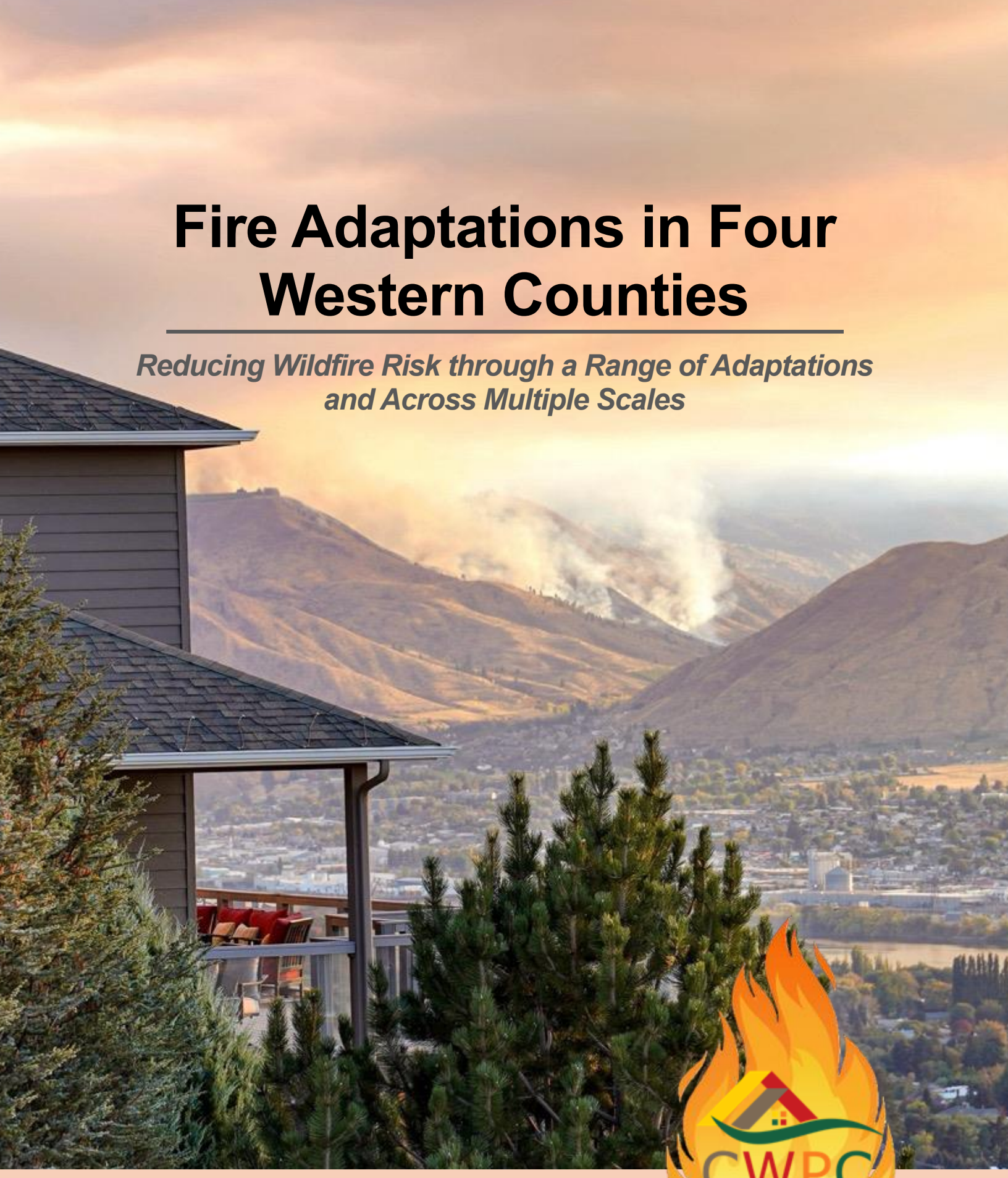
Fire Adaptations in Four Western Counties

Reducing Wildfire Risk through a Range of Adaptations and Across Multiple Scales



Community Wildfire Planning Center
March 2026

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The Community Wildfire Planning Center (CWPC) is a 501(c)3 non-profit organization dedicated to helping communities prepare for, adapt to, and recover from wildfires. More information about CWPC is available at www.communitywildfire.org. This report was authored by Molly Mowery, AICP and Kelly Johnston, RPF. Molly serves as CWPC's Executive Director and Kelly serves as CWPC's Operations Director. This report was prepared without the use of generative artificial intelligence (AI) tools. All content, analysis, and conclusions reflect the independent work and professional judgment of the authors.

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CONTENTS

ACRONYMS

BLM	Bureau of Land Management
COSWAP	Colorado Strategic Wildfire Action Program
C.R.S.	Colorado Revised Statutes
CSFS	Colorado State Forest Service
CWDG	Community Wildfire Defense Grants
CWPC	Community Wildfire Planning Center
CWPP	Community Wildfire Protection Plan
CWSC	Chumstick Wildfire Stewardship Coalition
DCC	Deschutes County Code
EPA	U.S. Environmental Protection Agency
FAC	Fire Adapted Communities
FEMA	Federal Emergency Management Agency
FLUPE	Fire and Land Use Planning Evaluation
GMA	Growth Management Act
GNA	Good Neighbor Authority
GTR	General Technical Report
HIZ	Home Ignition Zone
HFRA	Healthy Forests Restoration Act
HMP	Hazard Mitigation Plan
HVRA	Highly Valued Resources and Assets
ICC	International Code Council
IDL	Idaho Department of Lands
IFTDSS	Interagency Fuel Treatment Decision Support System
IMT	Incident Management Team
IWUIC	International Wildland-Urban Interface Code
LFRA	Loveland Fire Rescue Authority
NEPA	National Environmental Policy Act
NFPA	National Fire Protection Association
NRCS	Natural Resources Conservation Service
SIZ	Structure Ignition Zone
WA DNR	Washington Department of Natural Resources
WCS	Wildfire Crisis Strategy
WROA	Wilderness Ranch Owners Association
WUI	Wildland-Urban Interface

EXECUTIVE SUMMARY

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Wildfires are increasingly leading to devastating social, economic, and environmental impacts across the United States (U.S.) and elsewhere. Although wildfire is a natural process that has important ecological benefits, the total annual average area burned has doubled and fire intensity and frequency has considerably increased in the most recent two decades. This has created conditions that are a significant risk to our communities and ecosystems alike (Hagmann et al. 2021). For example, in the past 10 years more than 50,000 homes have been destroyed by wildfire (Anderson et al. 2025; NIFC, n.d.).

Multiple factors contribute to today's wildfire situation. Development patterns have expanded growth into areas referred to as the "wildland-urban interface" (WUI), putting more homes and people at risk. Fire management systems that rely heavily on fire suppression can change fire behavior, intensity, and severity across landscapes. Climate change has also disrupted natural cycles leading to conditions such as prolonged drought that can exacerbate wildfire activity. To address these factors, communities need a multi-pronged approach toward reducing wildfire risk and increasing fire adaptation. These adaptations are necessary across different scales to comprehensively address the natural and built environments.

Fire Adaptation in Four Western Counties

In recognition of increasing wildfire risk, the U.S. Forest Service launched a national Wildfire Crisis Strategy (WCS) in 2022, with funding from the Infrastructure Investment and Jobs Act (2021) and Inflation Reduction Act (2022). The WCS focused on increasing the pace and scale of forest health treatments and protecting communities from wildfires in 21 high-risk landscapes – 10 initial landscapes with 11 landscapes added the following year. Although originally envisioned as a decade-long effort, the initiative ultimately concluded in 2025 once appropriated funding had been fully utilized and agency priorities transitioned to new programs and authorities.

In many cases, WCS work occurred alongside other mitigation efforts being undertaken by state and local government agencies, non-profits, collaboratives, homeowner associations, and others to address forest health and community resilience. To better understand the connections between WCS activities and locally driven adaptations, this report looked at four western counties and the range of fire adaptations and partners working within each county's jurisdictional boundaries:

- **Boise County, Idaho** (in the WCS Southwest Idaho landscape)
- **Chelan County, Washington** (in the WCS Central Washington Initiative landscape)
- **Deschutes County, Oregon** (in the WCS Central Oregon landscape)
- **Larimer County, Colorado** (in the WCS Colorado Front Range landscape)

These four counties were selected based on inclusion in WCS landscapes as well as other measures such as the extent to which they were implementing local adaptations to address their wildfire risk. Findings presented in this report are based on a combination of stakeholder meetings, field visits, phone interviews, and additional research. This report is part of a larger research project called *Fueling Adaptation: Leveraging Community Capacity to Reduce Wildfire Risk*, which has other research products that focus on additional aspects of adaptation, governance, and communication. Other *Fueling Adaptation* team members included the U.S. Forest Service, Portland State University, and University of Colorado Denver.

Findings from this report showcase the range of adaptations that four counties are taking at different scales: Structure Ignition Zone (SIZ), neighborhood/subdivision, community/countywide, and landscape. These scales help identify where each adaptation has the most influence. Adaptations include local property-level assessment programs, home hardening and defensible space ordinances, landscape fuel treatments, collaboratives, participation in national mitigation programs, adoption of county plans, and more. Counties have also adopted a wildfire hazard and/or risk assessment(s) to inform local decision making, mitigation priorities, and support funding requests.

Implementation and Looking Ahead

Overall, the findings from this report show that communities adapt to fire in many ways and these adaptations rely on a combination of funding, capacity-building, partnerships, relationship-building, public engagement, and sustained action. Adaptations are funded through federal, state, or local sources and vary based on the adaptation, scale, and partnerships. Funding sources range from grants, local taxes, and innovative cost-sharing programs.

The greatest nexus between federal and local fire adaptation work that was funded through the WCS was at the landscape scale. This scale is critical to reducing wildfire risk to adjacent communities through a variety of fuel treatments. The WCS has also left its mark in other ways. For example, data and research projects initially developed to support WCS implementation continue to inform decision making, such as prioritizing local fuels projects or providing insights into community fire adaptation. The WCS also led to capacity-building through increased staffing at U.S. Forest Service and, in some cases, local organizations.

In early 2025, U.S. Forest Service priorities were redirected to focus on active forest management and the WCS was no longer used as the framework for addressing fire and fuel mitigation. The U.S. Forest Service work force was also reduced with the change in administration.

Given the time-limited nature of the WCS, many partners now see the WCS as a one-time injection of funds that allowed for a significant boost in fuel treatments while those funds were available. However, without WCS or similar funding, this will leave a significant gap in wildfire risk reduction on federal public lands within a county's jurisdictional boundaries. Even with federal future funding, challenges will remain – such as the management of biomass and smoke from prescribed fires are significant issues for many of the counties.

Despite the change in WCS as a funding source, many county adaptations at more localized scales were unaffected. This is because they were either under local jurisdiction's authority or were funded through other federal, state, or local sources. For example, the development and implementation of plans and regulations at the local or state level are independent from federal funding. Counties also use other federal or state funding sources that have not changed, such as the Forest Service's Community Wildfire Defense Grant (CWDG) program. Even in cases where plans are created in collaboration with federal partners, such as Community Wildfire Protection Plans (CWPPs), implementation is ultimately retained and led by the community.

Counties are sustaining momentum with many other local adaptation activities. Regardless of the funding source, these local adaptations serve as examples for the many ways that wildfire risk reduction can occur. It also underscores that a variety of actions, partners and investments are needed to achieve a comprehensive approach for fire adaptation. While these four counties are not representative of all western counties, they illustrate successful ways for others – including program managers, land managers, planners, fire officials, and wildfire mitigation specialists – to learn from these experiences and, ultimately, adapt to wildfire.

INTRODUCTION

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This report is organized into the following sections:

- **Introduction:** This section provides background information on this report, why fire adaptation is essential for communities facing increasing wildfire risk, how four counties were selected for further study and the research methodology.
- **Adaptations:** This section takes a detailed look at how different counties have assessed their local wildfire hazard and risk and a range of fire adaptations across different scales.
- **Implementation:** This section further discusses aspects of fire adaptations in terms of funding sources, challenges encountered related to adaptation, and successful strategies for improving implementation.
- **Conclusion**: This section provides a synthesis of findings and includes additional takeaways or insights drawn from the research.

Fueling Adaptation Research Project

This report was developed as part of a broader collaborative research project between the U.S. Forest Service Northern Research Station, CWPC, Portland State University, University of Colorado Denver, and other partners to examine how high-risk landscapes, as identified by the WCS, are adapting to wildfire and how increased federal investments made by the U.S. Forest Service may contribute to such efforts. This research project, entitled *Fueling Adaptation: Leveraging Community Capacity to Reduce Wildfire Risk*, studied three aspects of adaptation: wildfire governance, community-level wildfire adaptation, and communication networks.

CWPC participated in the *Fueling Adaptation* project by contributing research and expertise primarily related to community-level fire adaptation. One of the initial research outcomes produced by the community-level fire adaptation team was a General Technical Report (PNW-GTR-1030) *Adapting to Wildfire: A Review of Ongoing Wildfire Planning and Mitigation Efforts Across 10 Landscapes in the Western United States* (Anderson et al. 2025). This report builds on research published in that report by further exploring four counties in four WCS landscapes.

In addition, other *Fueling Adaptation* research products and deliverables were created collaboratively or individually. For more information about the research project and to view the full suite of research outcomes, visit the *Fueling Adaptation* website.

Need for Fire Adaptations

Wildfires are affecting many communities across the U.S. and other countries. While some wildfires bring beneficial outcomes to an ecosystem, they can also lead to unwanted impacts such as physical harm, property damage, environmental contamination, habitat destruction, hazardous air quality, mental and emotional trauma, economic losses, infrastructure service interruptions, and more (WFCA 2024). The scale and scope of damages from a wildfire depend on several factors that contribute to wildfire risk:

- **Land and resource management**. Activities such as fire suppression, fuel management, grazing, or harvesting can alter ecosystems and natural fire regimes (Hai et al. 2023; Pillar and Overbeck 2025). Some alterations can result in a buildup of fuels, an increase in

invasive species that are highly flammable, or other changes that may cause wildfires to burn with higher intensity, severity, and/or frequency.

- **People and development**. People, homes, and other development have expanded in areas referred to as the "wildland-urban interface" (WUI) over the past decades (USDA Forest Service 2025). Increased development in wildfire-prone areas can lead to an increase in the number of human-caused wildfires and places more people and property at risk to wildfire (Radeloff et al. 2018).
- **Climate change.** Climate change is leading to rising temperatures, alterations in precipitation patterns, and other environmental shifts (EPA n.d.). Disruptions to natural cycles are interconnected and can result in earlier snowmelt, prolonged drought, or other conditions that increase dried-out vegetation, rapid fire spread, extreme fire behavior, and extended time periods for wildfire activity (EPA n.d.).

Mitigation measures are necessary to address these factors and reduce wildfire risk. However, factors contributing to a community's wildfire risk are often nuanced and complex. In addition, wildfire risk can reflect decades of prior decisions that cannot easily be undone. In other words, there is no single mitigation that will address the myriad ways that communities are at risk to wildfire.

As a result, communities must look toward multiple strategies to comprehensively address their unique wildfire risks and become more "fire-adapted" – that is, being prepared for wildfire by understanding the risks and taking meaningful steps to reduce potential adverse impacts (USDA Forest Service). Fire adaptations include a range of activities: landscape scale fuel reduction projects such as thinning and prescribed burning, improved capacity for response and suppression, home construction or retrofits with ignition-resistant materials, defensible space, adequate access and water supply for communities and individual lots, and other interventions to reduce wildfire risk in the built and natural environment. Tools or programs such as plans, codes and regulations, and education or outreach campaigns provide a necessary structure for the development and implementation of fire adaptations. Together, the physical adaptations and associated mechanisms can be represented by the Fire Adapted Communities (FAC) framework (Figure 1).

The success of implementing fire adaptations identified in the FAC framework relies on a variety of partners and stakeholders. For example, fuel treatments may rely on federal, state, and local agencies depending on the location of the activity and partnership agreements in place. Other adaptations, such as codes and regulations, may be directed by state and/or local agencies, such as fire and planning departments. Collaboratives, council, homeowner associations, non-profit organizations and many others also play a key role in the development and implementation of adaptations. Because responsibility for fire adaptation is distributed across multiple agencies, and organizations, it's helpful to understand how one investment – such as federal funding under the WCS – joins in with other initiatives and stakeholders.

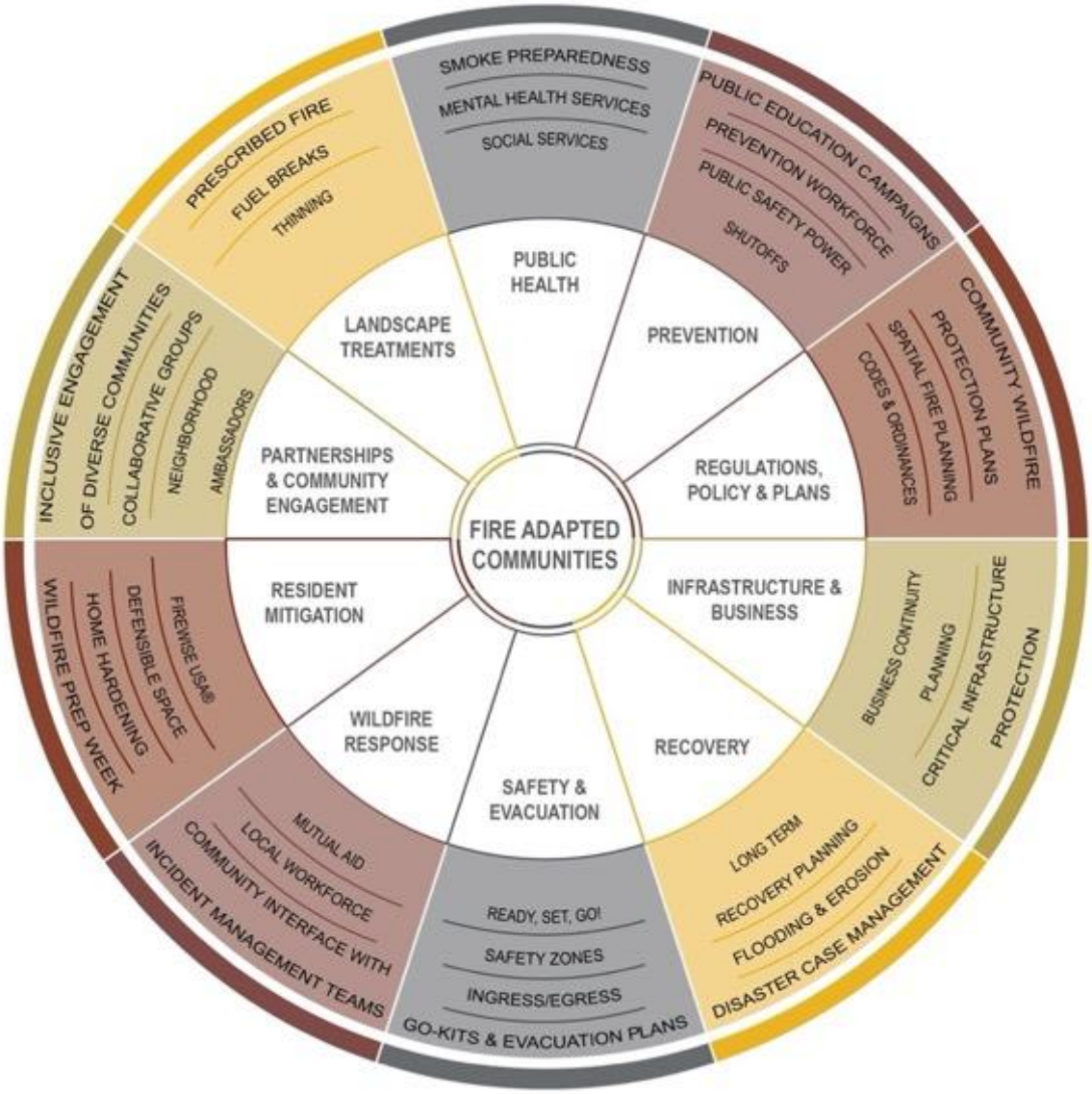

Figure 1. The Fire Adapted Communities wheel highlights activities associated with fire adaptation that range in both the types of activities that can reduce wildfire risk and some of the methods (programs, plans, regulations) that help implement these activities. Image credit: CWPC adapted from the Fire Adapted Communities Learning Network

Focus on Four Western Counties

Understanding fire adaptations across different landscapes and jurisdictional contexts provides insights that can help communities and practitioners assess a range of risk reduction options, replicate successes, navigate similar challenges, and glean insights into their own local efforts. To contribute to these insights, this report takes a closer look at how four counties within four different WCS landscapes (Figure 2) are using fire adaptations to reduce local wildfire risk to communities and landscapes. This report also highlights connections to federal land management and the WCS within each county's jurisdictional boundaries. By providing these examples the intent is that other counties and practitioners engaged in fire adaptation can benefit from understanding these adaptation examples, including how they are being implemented and any successes or challenges.

- **Boise County, Idaho** (Southwest Idaho landscape)
- **Chelan County, Washington** (Central Washington Initiative landscape)
- **Deschutes County, Oregon (**Central Oregon landscape)
- **Larimer County, Colorado** (Colorado Front Range landscape)

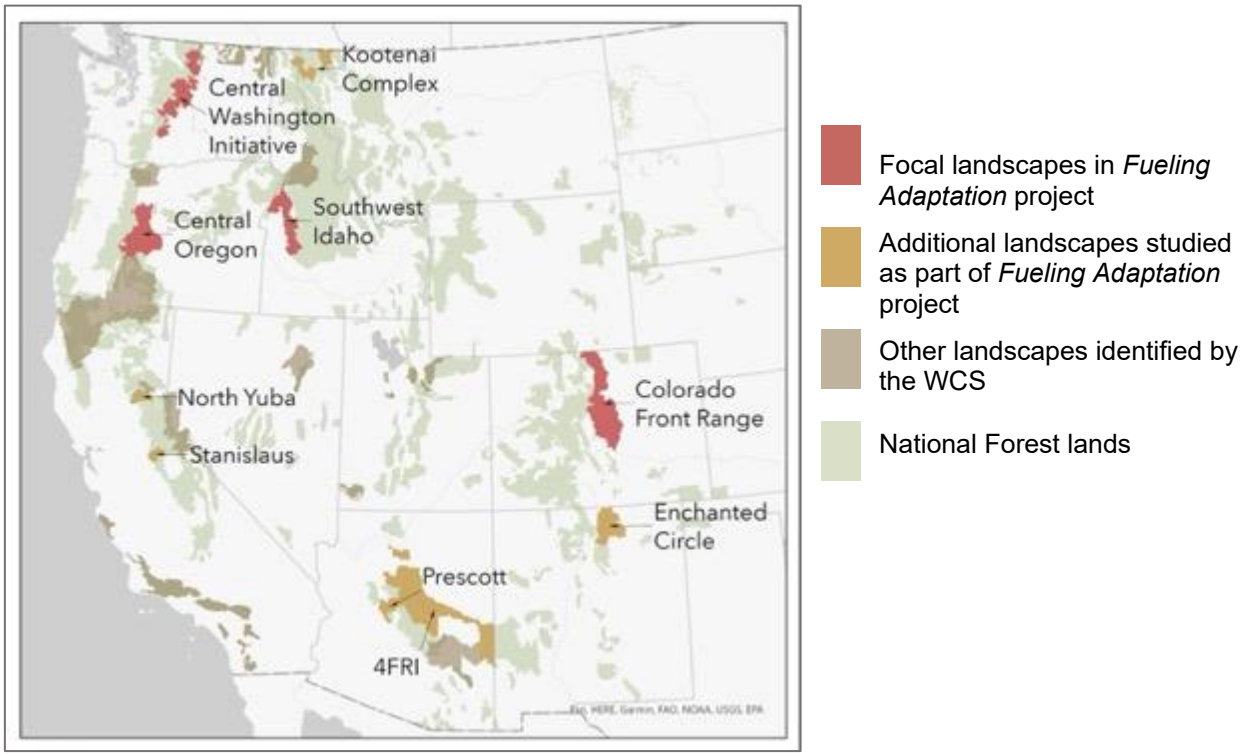

Figure 2. The Fueling Adaptation research project identified four focal landscapes, and four counties were selected within each of these landscapes for additional study. Image credit: U.S. Forest Service with minor legend modifications by CWPC

These four counties were selected based on previous research conducted by CWPC and other Fueling Adaptation research team members, which looked at a combination of adaptations within each WCS landscape. One major driver of county selection entailed undertaking an initial assessment of 40 counties in 10 WCS landscapes to determine how each county was planning for wildfire risk in the WUI through different planning and regulatory tools. CWPC analyzed each of the 40 counties using the Fire and Land Use Planning Evaluation Tool (FLUPE) – a tool developed by CWPC. The FLUPE analysis included criteria such as if and when communities have adopted Comprehensive Plans that address local wildfire concerns and the WUI topics, whether communities have Community Wildfire Protection Plans (CWPPs) that assess wildfire hazard or risk, and whether any regulatory tools (e.g., codes and ordinances) are in place that address hazardous vegetation, building materials, or other concerns in the WUI. From this analysis, counties were scored and sorted into four categories:

- **Initializing** (counties with a FLUPE score of 0-7): counties in the category are at the initial stage of using WUI planning adaptation tools and are still building an approach that identifies the WUI, wildfire hazard, and wildfire risk and connecting this information with potential policies, plans, and regulations. Counties may have limited or no planning adaptations yet in place that address wildfire risk in the WUI.
- **Emerging** (counties with a FLUPE score of 8-14): counties in this category are in the process of developing or may have adopted several planning tools that are designed to address wildfire risk in the WUI, but many opportunities remain to advance adaptations.
- **Consolidating** (counties with a FLUPE score of 15-21): counties in this category have formed an effective or coherent approach to addressing their wildfire risk through the adoption of multiple plans and regulations that have connectivity across these adaptations.
- **Comprehensive** (counties with a FLUPE score of 22-28): counties in this category are furthest along in addressing their wildfire risk in the WUI by adopting and utilizing nearly all available planning and regulatory tools.

Figure 3 shows the FLUPE score and category that each of the four selected counties (Boise, Chelan, Deschutes, and Larimer) are in, based on the analysis conducted in 2023. These counties were selected for further assessment to better understand how they are approaching fire adaptation, specific adaptations that are in place, where successes and learning opportunities have occurred, and any connection points between local fire adaptations and WCS investments. Additional details on the FLUPE and results for all 40 counties are compiled in the General Technical Report (PNW-GTR-1030) Adapting to Wildfire: A Review of Ongoing Wildfire Planning and Mitigation Efforts Across 10 Landscapes in the Western United States (Anderson et al. 2025).

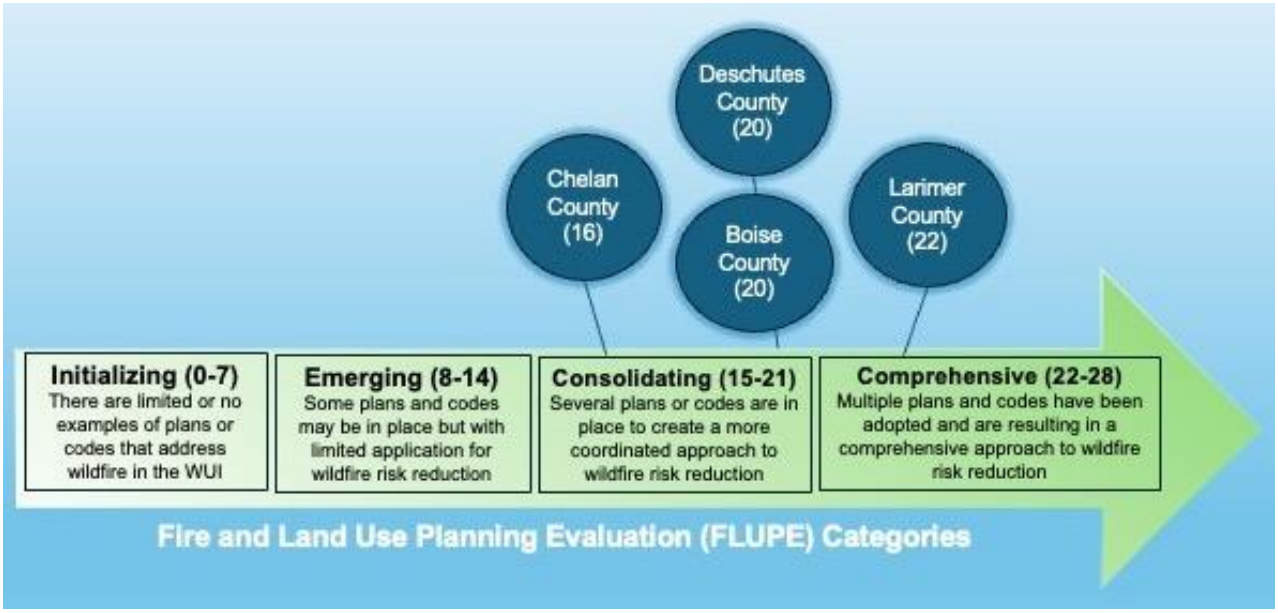

Figure 3. Four counties were selected for further study based on their inclusion in a WCS landscapes and the extent to which they had adopted plans or regulations that address wildfire risk reduction in the WUI. This analysis was based on a Fire and Land Use Planning Evaluation Tool created by CWPC and found that each of the counties was either in the "Consolidating" or "Comprehensive" categories. Image credit: CWPC

Additional factors that contributed to the selection of these four counties included having more than 40% of their county's land area in a WCS landscape, and initial research that federal partners in these areas were engaged in conducting fuel treatments. Table 1 provides a snapshot of each county in terms of its population, housing, land area and ownership, WUI, and WCS landscape information. The table illustrates similarities or differences across the four counties. For example, the four counties have a wide range in population and total housing units, but all have experienced substantial growth in WUI housing between 1990-2020.

TABLE 1. KEY COUNTY STATISTICS (POPULATION, HOUSING, LAND, WUI)

Statistic	*Boise*	*Chelan*	*Deschutes*	*Larimer*
Population [a]				
Total Population (2023)	8,045	79,518	203,026	363,561
Population Change (2010-2023)	+13.0%	+12.0%	+31.4%	+24.9%
Housing [a]				
Total Housing Units (2023)	5,592	38,129	97,064	161,882
Occupied Housing Units (2023)	3,524 (63%)	30,825 (80.8%)	83,197 (85.7%)	151,571 (93.6%)
Vacant Housing Units (2023)	2,068 (37%)	7,304 (19.2%)	13,867 (14.3%)	10,311 (6.4%)
Housing Units Year Built - 2010 or later	472 (8.4%)	3,919 (10.3%)	17,836 (18.4%)	30,815 (19%)
Land Area and Ownership [b]				
Total Land Area (acres)	1,217,572	1,867,650	1,939,051	1,662,748
Private Lands (as % of total area)	19.4%	15.8%	21.8%	40.2%
Federal Lands (as % of total area)	73.3%	80.2%	75.6%	49.0%
State Lands	7.2%	3.5%	2.5%	4.7%
City, County, Other	.1%	.5%	.1%	6.1%
Wildland-Urban Interface (WUI) [c]				
Area in WUI (2020)	3.2%	5.4%	10.3%	10.0%
Housing Units in WUI (2020)	4,628 (85%)	32,659 (87.6%)	78,004 (82.9%)	53,928 (34%)
Growth in WUI Housing (1990-2020)	106.9%	50.5%	177.6%	98.1%
WCS Landscape Information [c]				
Proportion of County in Wildfire Crisis Landscape	41.1%	48.1%	70.7%	48.6%
National Forest Service Lands in Landscape with Fuel Treatment – active treatment only (2014-2023)	6.6%	7.5%	11.0%	7.3%

Data Sources:
a. Headwaters Economics Economic Profile System, County Demographics Report (2023).
b. Headwaters Economics Economic Profile System, County Land Use Report (n.d).
c. Anderson et al. (2025)

Research Methods

As noted, this report builds on previous research outcomes published in the General Technical Report (PNW-GTR-1030) *Adapting to Wildfire: A Review of Ongoing Wildfire Planning and Mitigation Efforts Across 10 Landscapes in the Western United States* (Anderson et al. 2025). Additional research to further inform the four counties analyzed in this report is based on: information obtained through in-person and virtual communications (calls and meetings) with land managers, land use planners, fire officials, wildfire mitigation practitioners, and other federal, state, and local government agency staff, non-profit organizations, academic researchers, and others engaged in fire adaptation work associated with each of the four counties or landscapes; field visits and site tours to select county locations; online research and reviews of state and local legislation and codes; and analyses of relevant reports, journals, and news articles. A mix of in-person and virtual engagement reflected scheduling conflicts, including wildfires or other WCS-related events that coincided with planned stakeholder visits.

All information was collected between 2024 and 2026. Because fire adaptation is a dynamic and evolving process, adaptations highlighted in this report provide a snapshot in time and some of the examples provided are likely to change, such as the adoption of new plans, updates to local ordinances, or changes in program priorities.

Some technical land use tools referenced in this report are focused on the linkages between wildfire risk reduction and planning. Readers interested in further understanding the general concepts of these land use tools are encouraged to explore additional resources. In addition, a helpful resource that further describes wildfire hazard, wildfire risk, and land use planning tools for the WUI is the American Planning Association publication, *Planning the Wildland-Urban Interface* (PAS Report 594, 2019).

FIRE ADAPTATIONS

FIRE ADAPTATIONS

This section highlights adaptation examples being undertaken by the four selected counties: Boise County (ID), Chelan County (WA), Deschutes County (OR), and Larimer County (CO). Adaptations include administration of national or local programs, engagement in land management activities, and adoption of plans and regulations. Not every adaptation in each county is captured; rather, the intent is to collectively showcase how all four counties are successfully using a range of adaptations to achieve their fire risk reduction goals.

Many adaptations occur at different scales and are coordinated and implemented in partnership with federal, state, or other local agencies, non-profit organizations, homeowner associations, residents, or other entities. Adaptations in this section are organized by process and the scale at which they are designed to influence:

- **Wildfire Hazard and Risk Assessments** – techniques used for quantifying and mapping wildfire hazard and risk.
- **Structure Ignition Zone** – scale reflecting the structure and lot or sometimes referred to as parcel scale.
- **Neighborhood / Subdivision** – scale reflecting a collection of structures, either organized informally or formally through a legal structure, and any additional features associated with the neighborhood or subdivision such as parks, common areas, or other amenities.
- **Community / Countywide** – scale reflecting entire communities, the county, or other designated areas within the county such as wildfire hazard zones.
- **Landscape** – scale reflecting areas of the county that may connect to cross-boundary work across the region or within defined landscapes such as national forests.

Wildfire Hazard and Risk Assessments

A necessary step for planning and undertaking fire adaptations on any landscape is the assessment and spatial delineation of wildfire hazard and risk. Although the terms “wildfire hazard” and “wildfire risk” are sometimes used interchangeably or combined to create the term “wildfire hazard risk”, it is important to understand the difference between these two terms and use them appropriately in the community wildfire planning context. While specific definitions of wildfire hazard and wildfire risk may vary across different landscapes, methodologies, and planning documents used within the landscapes, they typically align with the following definitions (Scott et al. 2013; Thompson et al. 2016):

Wildfire Hazard

Wildfire hazard describes the likelihood of a wildland fire occurring and the potential intensity at which it will occur (Mowery et al. 2019). The likelihood of wildfire occurring in these landscapes is a function of the location and density of either “natural” ignitions, or “human” ignitions. It is generally accepted that natural ignitions in these landscapes are caused almost exclusively by lightning, and the location and frequency of ignitions vary based on climate, geological, and vegetation conditions. Human ignitions are caused by any human activities, whether accidental, or intentional. The location and frequency of human ignitions is generally a result of human activity density, activity type, and vegetation conditions (Prestemon et al. 2013).

The intensity component of wildfire hazard is typically a function of the vegetative fuels present and the climate conditions that affect their combustibility. Due to the complexities of modeling the combustibility of human "built fuels" development (e.g., buildings and infrastructure) at the landscape level, built fuels are typically not included in wildfire hazard assessments at this scale, and instead, wildfire hazard is commonly used as a surrogate to describe the wildfire exposure to these built fuels.

Wildfire Risk

Wildfire risk assessment typically encompasses the wildfire hazard of an area with the addition of the factors that contribute to the susceptibility of a community, or the impact wildfire will have on what a community cares about – also referred to as a "value" within the landscape or the community communities. Values are often labelled as Values at Risk or, in more technical publications, Highly Valued Resources and Assets (HVRAs). The concept of wildfire risk is best described using the wildfire risk triangle (Scott et al. 2013), which combines the likelihood of ignitions and the intensity of the fire (the components of wildfire hazard) with the susceptibility of the built environment (Figure 4).

Factors that contribute to the susceptibility component of the wildfire risk assessment may include the following:

- Population demographics
- Public safety
- Ember transport modeling
- Structure and infrastructure susceptibility, including critical infrastructure
- Natural resource values and susceptibility
- Watershed vulnerability
- Socioeconomic values

Figure 4. The wildfire risk triangle combining the inputs of wildfire hazard with susceptibility factors to determine wildfire risk. Image credit: CWPC

Communities typically quantify their HVRAs in terms of their level of importance as part of the risk assessment process. HVRAs such as residential homes, business buildings, or power utility facilities are commonly identified, but each landscape and community is different. Communities may place different priorities or levels of importance on their locally identified HVRAs.

Depending on the landscape, the HVRAs may likely be comprised of structures, critical infrastructure (facilities for maintaining essential community public health and safety, economic, social, or cultural functions), watersheds, and cultural and natural resources (e.g., critical species and habitat, recreation values, timber). Additional HVRAs that a community may identify include historical sites, community facilities, outdoor recreation areas, resort areas, significant employment centers, or other features that are important to the community identity or socio-economic function. Assessments may be led by a range of agencies and organizations, typically bringing together a coalition of stakeholders. In some cases, federal land management including national forest staff and Forest Service researchers are involved, in other cases state agencies or nonprofits are leading these processes.

Defining the Wildland Urban Interface

Once the spatial identification of wildfire hazard and risk is determined, most landscapes and communities use this information to spatially define the WUI. Establishing the WUI area is key for applying land use planning policies, zoning, and other regulation tools intended to mitigate the wildfire risk.

Most landscapes and communities identify two primary classifications of the WUI: intermix and interface (Mowery et al. 2019):

- An **intermix WUI** is where development, such as structures, is interspersed or scattered throughout wildland vegetation. An intermix WUI is often found in rural, ex-urban, or large-lot suburban developments.
- An **interface WUI** is where development, such as structures, is grouped near areas with wildland fuels. There is a clear line of demarcation between development and vegetation, which may appear as an abrupt edge between a highly urbanized or suburban neighborhood and a wildland area.

County Approaches to Wildfire Hazard and Risk Assessments

Boise County

The 2023 Boise County Community Wildfire Protection Plan (Boise County, 2023) references the U.S. Forest Service Wildfire Risk to Communities (n.d.) online map to determine the ranking of Boise County risk of homes to wildfire, compared to the wildfire risk to homes in other U.S. counties. From this it was determined that, on average, the populated areas of Boise County have a risk greater than 99% over other counties in the U.S.

The Boise County CWPP used the Interagency Fuel Treatment Decision Support System (IFTDSS) (n.d.) to determine landscape level burn probability outputs to provide a surrogate “relative magnitude and distribution of risk”. The IFTDSS is a combined effort of the U.S. Bureau of Indian Affairs, the U.S. Bureau of Land Management (BLM), the U.S. Fish and Wildlife Service, the U.S. National Park Service, and the U.S. Forest Service, and is available for use by land managers across the U.S. The outputs of this product are based on Likelihood, Intensity and Susceptibility, and Importance. It is focused on supporting fuel treatment location decisions.

The Boise County CWPP also uses the Idaho Department of Lands (IDL) Fire Hazard Map modeling methodology found in the IDL Forest Action Plan to more accurately determine the probability of damage to HVRAs and better delineate the WUI within the County. This uses Slope, Aspect, Vegetation, Fire Occurrence, and Wildland Urban Interface locations as inputs.

The WUI layer used by IDL was composed of the layers originally developed by the U.S. Forest Service and BLM using a geospatial analysis in 2023. Where counties have defined and mapped their WUI as part of their Community Wildfire Protection Plans (CWPPs), these WUI polygons were substituted in place of the U.S. Forest Service or BLM layers.

Boise County was one of the counties that mapped the WUI as part of the CWPP (Figure 5). The county adopted the IDL supported definition of the WUI as: “An area where developed lands interact with undeveloped lands and include the infrastructure and natural resources that communities rely on for existence”. The County’s CWPP further describes the WUI as being “found in remote, scattered development areas to highly developed urban areas and everywhere in between”. The mapping of the Boise County CWPP followed the following process:

1. The U.S. Bureau of Land Management ownership layer was used with all private land extricated.
2. A 1.5-mile buffer was applied to all private lands
3. The buffer was overlayed on the U.S. Geological Survey Hydrologic Unit Code (HUC) 12 watersheds layer for the county
4. The watersheds that were encompassed by more than 50% of the buffer were selected
5. The 1.5-mile buffer was then extended to the selected HUC12 watersheds.

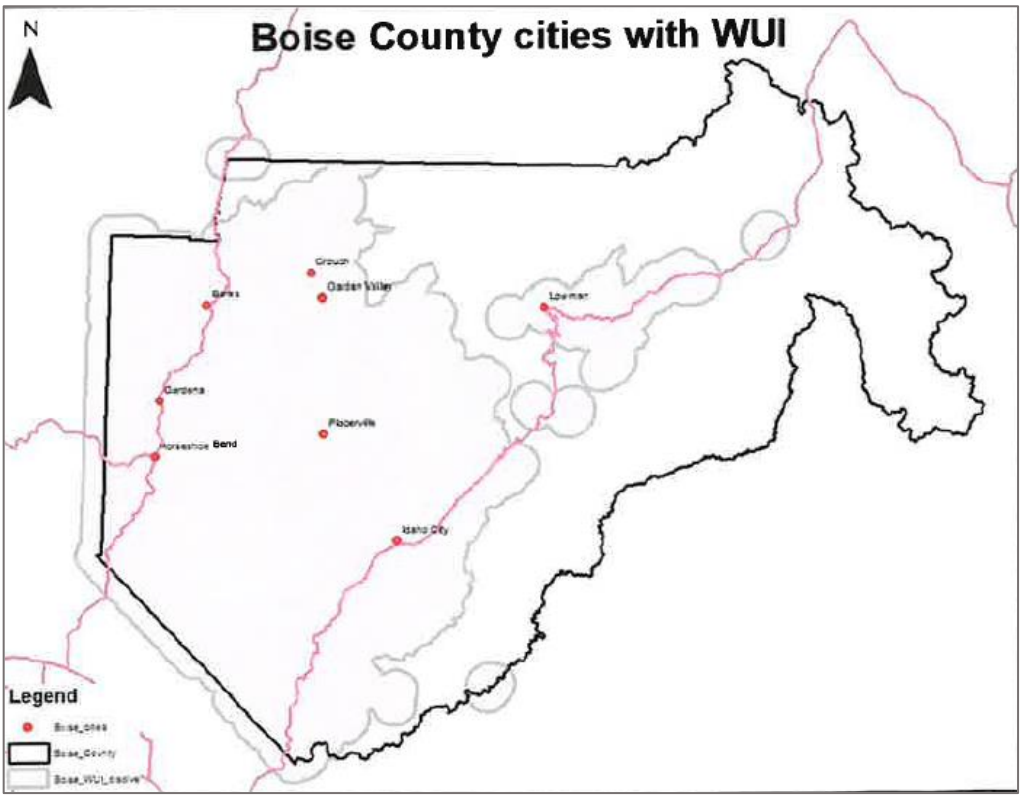

Figure 5. Map of the Boise County WUI using the IDL Fire Hazard Map modeling methodology and the IDL supported mapped definition of the WUI (image credit: Boise County, Idaho CWPP 2023)

Chelan County

There are three wildfire hazard assessments that are used in Chelan County.

Chelan County Community Wildfire Plan Hazard Assessment

The 2025 Chelan County Community Wildfire Protection Plan provides a comprehensive wildfire hazard assessment based on potential fire behavior (Intensity) and probability. Additional hazard assessment mapping in the CWPP provides radiant heat and ember exposure to both structures and critical inventory (Figure 6). Finally, the CWPP mapping also includes an Expected Net Value Change which provides an assessment of the overall potential impacts of wildfire on property, drinking water, infrastructure, timber, wildlife, ecosystem conditions, agriculture, and recreation in Chelan County. The mapping and methodology used in the CWPP was incorporated into the Chelan County Hazard Mitigation Plan.

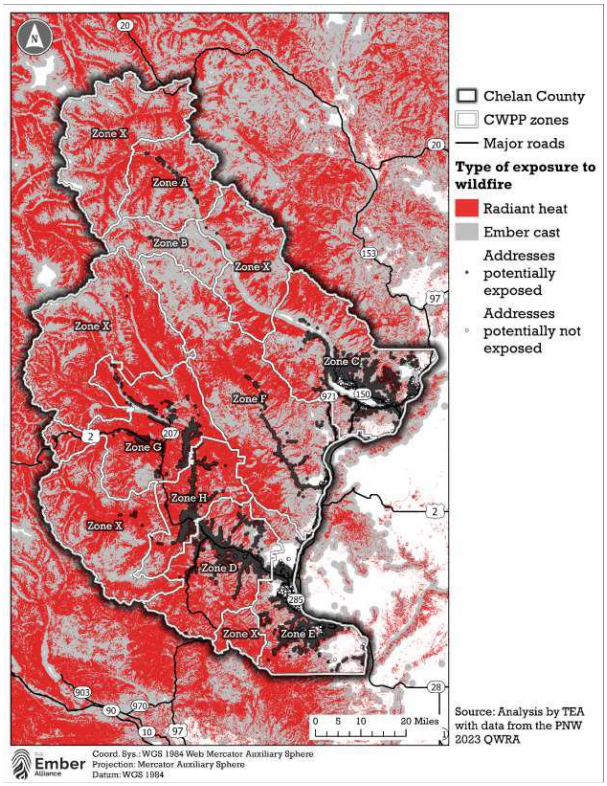

Figure 6. Map of radiant heat and ember exposure from the 2025 Chelan County CWPP (Map Credit: Ember Alliance)

The Ember Alliance developed the CWPP risk assessment for Chelan County. The predictions of crown fire behavior and flame length from the 2022 Pacific Northwest Quantitative Wildfire Risk Assessment (McEvoy et al. 2023) were used to assess the risk that radiant heat and short-range and long-range ember cast can pose to structures. The production, transport, and ability of embers to ignite recipient fuels are guided by complex processes, so the Ember Alliance utilized a simplified approach that assumes the following:

- The ability of direct flame exposure to ignite structures depends on flame length. We identified structures with >50% probability of loss from direct flame exposure following the methodology of Abo El Ezz et al. (2022).
- Radiant heat can ignite structures when extreme fire behavior occurs within 33 yards (30 meters) of structures. The distance cutoff for radiant heat comes from Beverly et al. (2010). Extreme fire behavior was defined as areas with >5% probability of ≥8-foot flame lengths (Beverly, et al. 2010).
- Short-range embers can ignite homes within about 110 yards (100 meters) of high-grade passive crown fire and active crown fire. The distance cutoff for short-range comes from Beverly et al. (2010). Caggiano et al., (2020) also found that a vast majority (95%) of home losses during WUI fires occurred within 100 meters of wildland vegetation.
- Long-range embers can ignite homes within 0.5 mile (850 meters) of high-grade passive crown fire and active crown fire (Caggiano, et al. 2020).

Fire Danger Rating Areas

The Chelan County Wildland-Urban Interface Code found within Chapter 3.29 of Title 3 Building Regulations references the Central & Northeast Washington Interagency Fire Danger Operating Plan, and specifically the Chelan Mountain or Valley Fire Danger Rating Areas delineate in the plan, as a surrogate for a wildland-urban interface area.

Washington State Department of Natural Resources Hazard Mapping

The Washington State Department of Natural Resources is currently working on the development of a state-wide wildfire hazard assessment that can be used to support the implementation of local level regulations, including a risk assessment and the delineation of the wildland urban interface.

Deschutes County

Deschutes County is delineated into CWPP planning areas and these planning areas are now using the Oregon Wildfire Risk Explorer CWPP Planning Tool (n.d.) for spatially assessing wildfire hazard and risk.

The methodology for the CWPP Planning Tool is based on the 2023 PNW Quantitative Wildfire Risk Assessment Methods (n.d.). This tool provides local jurisdictions with several special layer options, such as Average Flame Length (Intensity), Burn Probability, Integrated Expected Wildfire Risk (Risk to cumulative HVRA's with burn probability included), Integrated Conditional Wildfire Risk (Risk to cumulative HVRAs if a fire occurs – burn probability not included), Wildfire Risk to Individual HVRAs. Users can generate "customized" reports that are area or local jurisdiction specific and include a range of information that is helpful in developing CWPPs (Figure 7).

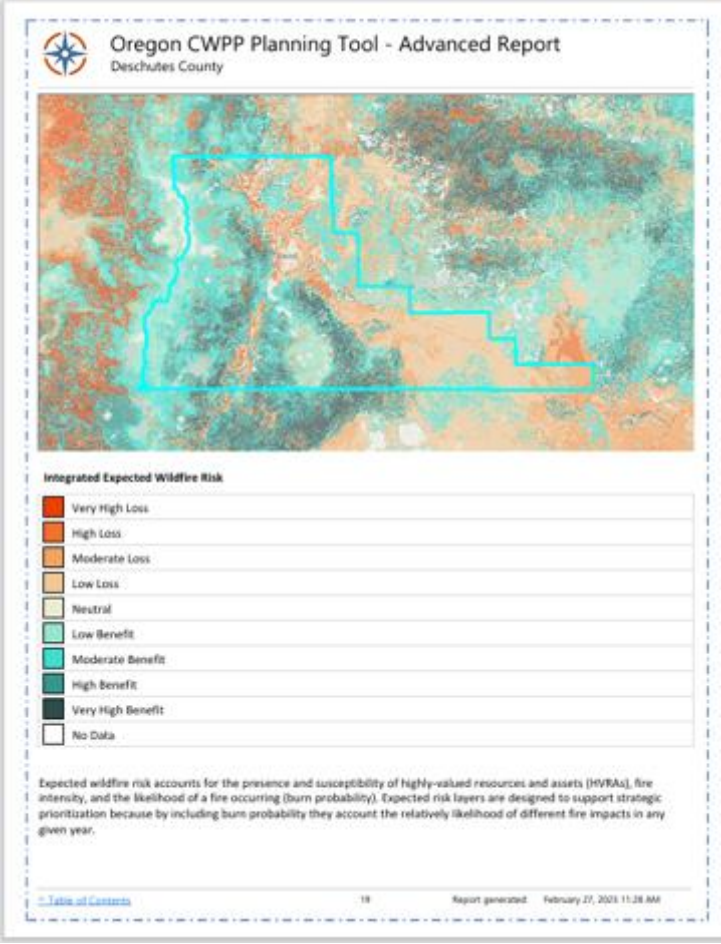

Figure 7. The Integrated Expected Wildfire Risk Map of the Oregon CWPP Planning Tool Advanced Report

Larimer County

The Larimer County Building and Land Use Planning Regulations reference the Larimer County Wildfire Hazard Areas map and Wildfire Mitigation Area Map in the application of requirements (Figure 8). The Wildfire Hazard Map was generated solely on the wildfire potential from vegetation, while the Wildfire Mitigation Area Maps were developed accounting for the presence of current and future potential development lands.

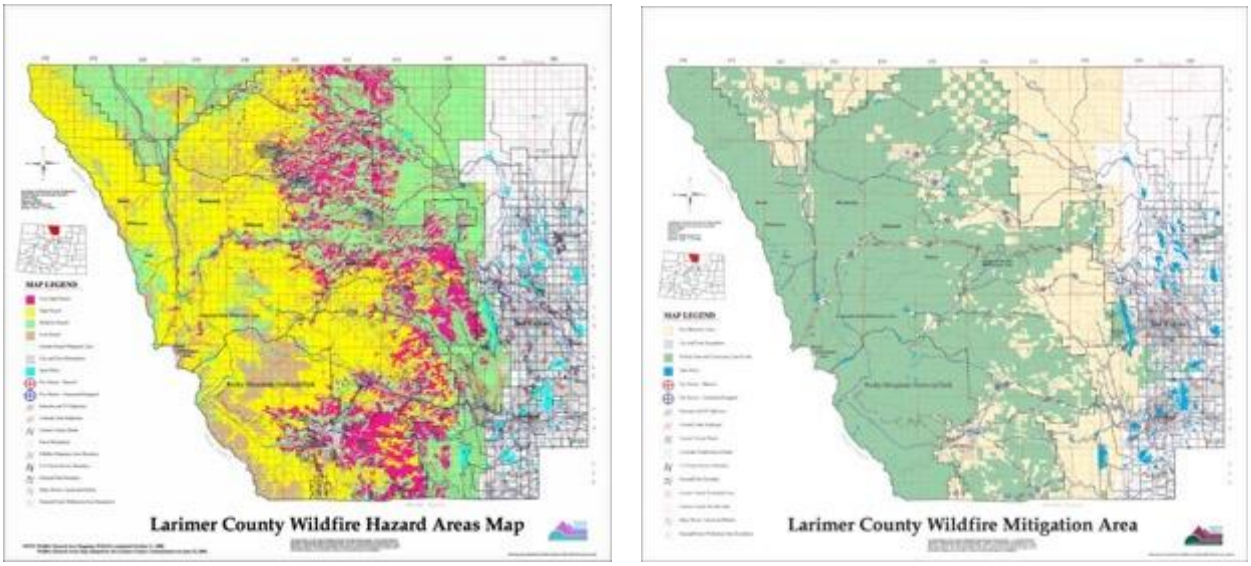

Figure 8. The Larimer County building and land use planning regulations reference the Larimer County Wildfire Hazard map (left) and Larimer County Wildfire Mitigation map (right)

CWPP Wildfire Hazard and Risk Assessments

There are 25 CWPPs within Larimer County that each include associated wildfire hazard and risk assessments that were undertaken using various methodology; however, the Larimer County Wildfire Hazard Map and Wildfire Mitigation Map are used in these CWPP areas, with the exception of the Loveland Fire Rescue Authority Fire Protection District, to administer the County's wildfire development requirements in unincorporated areas of the county.

Loveland Fire Rescue Authority

The Loveland Fire Rescue Authority (LFRA), one of the fire protection districts in Larimer County, provides its own "Wildland Urban Interface and Wildfire Zone" map, which is closely aligned with the Larimer County map (Figure 9). This LFRA map is used for administering LFRA wildfire requirements that supersede the county requirements.

Colorado Resiliency Code Board

The Colorado Resiliency Code Board adopted the Colorado Wildfire Resiliency Code in July 2025, which requires local jurisdictions to meet or exceed the requirements of the code. The code is linked to mapping in the Colorado Wildfire Risk Explorer, including the referenced wildfire hazard, risk and wildland urban interface mapping. The mapping for Larimer County and LFRA is already more restrictive than the state mapping. As of January 1, Larimer County adopted an updated code, which is more restrictive than the state code. LFRA is in the process of adopting an updated code that is also more restrictive than the state code.

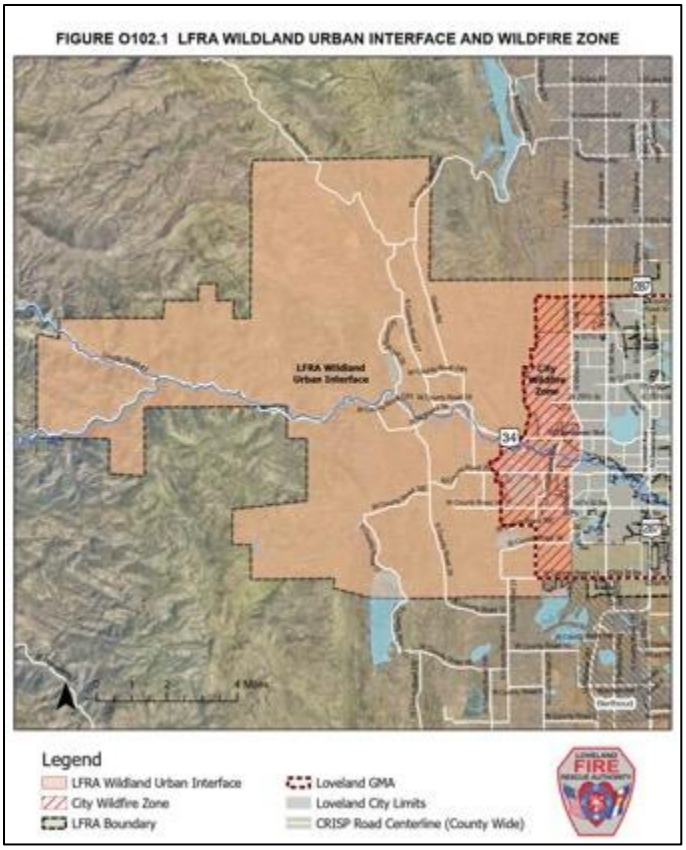

Figure 9. Loveland Fire Rescue Authority Wildland Urban Interface and Wildfire Hazard Map used to administer the LFRA wildfire development requirements (Loveland Fire Rescue Authority. n.d.)

Structure Ignition Zone Adaptations

The Structure Ignition Zone (SIZ), also known as the Home Ignition Zone (HIZ), refers to the primary building (e.g., home, business) and the area surrounding the building extending out to 100 feet or more, depending on site conditions, and including any associated accessory structures, vegetation, landscaping, stored items, or materials in which the combined condition determines the vulnerability of the primary structure to convective, radiant, or ember heat transfer of a wildfire. SIZ is broadly defined in this report based on wildfire assessment requirements for structures and the surrounding areas as identified in NFPA 1140*, Standard for Wildland Fire Protection* (2022), but state and local definitions of the SIZ or HIZ may vary.

Counties are using a range of voluntary and regulatory fire adaptations to address wildfire risk in the SIZ, including home and property assessment programs, building codes, and defensible space ordinances. Some of these activities are initiated or required by the state while others are developed and implemented locally.

Home & Property Assessment Programs

Home and property assessment programs provide a way to educate and engage property owners on actions they can take to reduce wildfire risk to their structure and property. Guidance is based on national standards and best practices but is typically customized for the local environment (e.g., forest type) and unique property conditions. These programs also help home or business owners address vulnerabilities on existing homes and properties. Each county has established a wildfire home or property assessment programs; two examples are highlighted below.

Wildfire (Parcel Level) Risk Assessments in Chelan County

Residents in Chelan County can request free wildfire risk assessments through their local fire district or the Cascadia Conservation District. Assessments can also be requested through the state's Wildfire Ready Neighbors program, which is administered by the Washington Department of Natural Resources (WA DNR). Under this program, residents in select counties sign up for an in-person home assessment consultation from a trained expert, receive a Wildfire Ready Plan, and access additional resources. WA DNR tracks the number of neighbors that have signed up for the Wildfire Ready Neighbors program, how many home visits or forest health consultations have been requested, and the number of actions participants committed to take on their properties.

Wildfire Partner Program in Larimer County

Larimer County established a Wildfire Partner Program in 2023, based on the success of similar programs elsewhere in Colorado. The program is administered under the Emergency Services Division of the Larimer County Sheriff's Office and provides tools, training, and support for local fire districts and departments to offer comprehensive Home Ignition Zone Assessments to residents. The program supports other local initiatives, such as community wildfire mitigation efforts, grant funding coordination, promotion of local resources, and Wildfire Safety Inspections required for certain building permits and planning applications, including Short Term Rentals.

Building and Landscaping Regulations

Regulating the SIZ through the adoption and enforcement of codes and ordinances can be done at the state level, local level, or both. This type of adaptation is designed to ensure components of the SIZ (e.g., structure, landscaping) meet specific standards or requirements to increase a structure's survivability during a wildfire. This is typically done by requiring ignition-resistant building materials (roofs, siding, decks etc.), water sources for response, access for emergency responders, removal of flammable vegetation or other combustible materials near structures, and other modifications.

Larimer County and Loveland Fire Rescue Authority Wildfire Requirements

In July 2025, the Colorado Wildfire Resiliency Code Board adopted a Colorado Wildfire Resiliency Code which sets forth minimum requirements for all newly constructed buildings and structures, significant additions, repairs, and remodels in the WUI, as designated by the state or local jurisdictions. Applicable governing bodies across the state (as defined by the code) are required to comply with the state code requirements by July 2026.

Larimer County adopted a new Wildfire Resiliency Code in September 2025 that took effect on January 1, 2026. The code is administered through their County's Building Division. The County amended the Code to combine the most stringent state requirements alongside local requirements that were developed and enforced by the Loveland Fire Rescue Authority (LFRA), a fire protection district whose service area covers 248 square miles across portions of unincorporated Larimer County, the city of Loveland, and several other local communities.

Some of LFRA's requirements evolved over time as LFRA incorporated fire science and learned from losses that occurred during the 2021 Marshall Fire. For example, LFRA created strict landscaping requirements that only allowed ignition-resistant materials (rock, gravel, pavers) within five feet of the exterior of a home and did not allow for any plantings in this area. Although the state code made an exception for ignition resistant plantings in this zone, the new County code carried LFRA's requirements forward so that exception was removed. LFRA and County

wildfires requirements are now the same to create more consistency and uniformity across the entire area for homeowners and developers. LFRA also spent a lot of time previously working with the development community over many years prior to the recent code updates (Figure 10). This created trust and fostered education so that there was more support for the adoption of the newly amended county Wildfire Resiliency Code.

Figure 10. Site visit images from LFRA, from left to right: LFRA Fire Marshal Carie Dann (far right) explains their collaborative process for updating wildfire regulations; non-combustible fencing around a private property; a local homebuilder describing ignition-resistant construction techniques used on exterior siding. (Image credits: CWPC)

Deschutes County

The State of Oregon previously passed legislation that was intended to require property owners in identified wildfire hazard areas to comply with structure hardening and defensible space requirements. However, public outcry prompted the legislature to repeal this requirement under SB83 (2025) and provide local jurisdictions the authority to adopt wildfire requirements at their discretion. Deschutes County opted to move forward with structure hardening requirements for new residential construction based on the International Residential Code (section R327).

The City of Sisters, an incorporated municipality in Deschutes County, has also adopted both a local defensible space code and home hardening requirements that align with R327 for applicability within their jurisdiction. The code is administered by the City of Sisters Community Development Department. Other jurisdictions in the County have shown interest in advancing local landscaping and/or structure hardening requirements to address wildfire risk.

Neighborhood / Subdivision Adaptations

Counties are addressing wildfire risk at the neighborhood and subdivision scale through fire adaptations. Like other scales, some adaptations are voluntary while others are implemented and enforced through codes and regulations, as illustrated in the following examples.

Wildfire Coordination Programs

Wilderness Ranch Firewise Site in Boise County

Wilderness Ranch is a residential subdivision in Boise County, 12 miles northeast of Boise. The subdivision has 273 lots and almost 1,200 acres—800 of which is common area owned by the Wilderness Ranch Owners Association (WROA). In 2002, Wilderness Ranch became one of twelve nationally recognized Firewise pilot communities in the country and has maintained its designation since then thanks to continued engagement from local volunteer residents. Boise County also has two other Firewise USA communities: Two Ravens at Tall Pine and Wapiti Creek Summer Homes.

Firewise USA® is a voluntary program administered by the National Fire Protection Association that helps communities get organized, find direction, and take action to reduce wildfire risks at the local level. Recognized communities, now referred to as Firewise USA Sites, are required to have a minimum of eight dwelling units and a maximum of 2,500. The process includes completing a community wildfire risk assessment, making a three-year action plan with annual communitywide priorities, and implementing actions. Typical actions include community education workshops, organizing a Firewise Day, and providing information at local events. Volunteer hours and costs are tracked to document investments and meet program reporting criteria. Since its inception, the program has thousands of recognized sites across the country.

Figure 11. An overview of the Wilderness Ranch subdivision in Boise County, which became a recognized Firewise USA community in 2002 and has continued to maintain this national designation. (Image credit: CWPC)

Wilderness Ranch has an active Firewise Committee that has helped them organize events and activities to reduce wildfire risk across the subdivision. Activities have included designating a site where property owners can deposit woody debris and fuels, limbing trees and thinning brush along the subdivision's roads to improve evacuation routes, implementing a multi-phased fire mitigation and forest management plan in the common area, and helping homeowners take action to reduce wildfire risk on their individual properties. The WROA also maintains a website with informational resources for homeowners.

Chumstick Wildfire Stewardship Coalition in Chelan County

Founded nearly two decades ago, the Chumstick Wildfire Stewardship Coalition (CWSC), a registered 501(c)3 non-profit, serves the greater Leavenworth area's residents and landowners to promote wildfire resilience and forest restoration. Through educational workshops, town hall meetings, home and landscape assessments, a chipping program, and other planning activities, CWSC focuses its work on protecting communities and values at high risk from wildfire (Figure 12). Educational messages encourage residents in their geographic focus to take action before, during, and after a fire.

Although the CWSC is an independent organization, many of its activities are conducted in partnership with Chelan County Fire District 3, Cascadia Conservation District, Chelan County, and other local, state, or federal entities. Stakeholders frequently cited this project as a local example of how successful coordination on the ground supports wildfire activities.

Figure 12. An outreach flyer from a town hall hosted by the Chumstick Wildfire Stewardship Coalition, which featured forestry and wildfire experts and opportunities for the residents to learn more. (Image credit: CWSC Facebook page)

Regulations for Neighborhoods and Subdivisions

Wildfire regulations at this scale can take different forms and can be initiated by different entities. Deschutes County staff have worked closely with developers and other stakeholders, including national forest staff, over the past decade to ensure two new communities (Tree Farm and Westside Transect Zone) meet different objectives. The objectives include reducing wildfire risk to homes and properties, providing emergency access to areas, allowing for ongoing management of hazardous fuels, minimizing sprawl, and preserving or expanding public access to recreational amenities such as open space. These outcomes have been achieved through collaborative planning, voluntary or regulatory requirements to address wildfire and other concerns, maintenance provisions, and public-private partnerships.

Tree Farm Community in Deschutes County

The Tree Farm is a neighborhood development / master planned community located in Deschutes County, just west of Bend's city limits. The development was a working tree farm before being sold for residential development and consists of 50 two-acre homesites that are clustered within the site to preserve more than 400 acres of open space. The community is adjacent to the Deschutes National Forest and Shevlin Park (managed by Bend Park & Recreation District).

The land use planning and application process began in 2014 but was met with pushback amid concerns including the potential loss of wildlife habitat and wildfire safety. Developers from Brooks Resources Corporation met with project opponents to collaborate on an outcome that protected more open space, integrated additional wildfire risk reduction measures into the planning and development phases and created mechanisms for long term maintenance. These measures included:

- Tree Farm developers partnering with the U.S. Forest Service, Oregon Department of Forestry, and Bend Park and Recreation District in 2016 to conduct a prescribed burn on 82 acres of open space. This activity helped reduce fuels prior to land development and make the area safer for future residents and Bend's west side (Figure 13).
- Designing homes and properties as a Firewise USA® site from the beginning to meet national program recognition requirements that could be maintained over time.
- Meeting land development, building, operations, and evacuation standards for wildfire safety as outlined in the HOA's Wildfire Protection Management Plan. This governance document is included in the HOA's Covenants, Conditions, Restrictions and Easements and are administered and enforced by the Architectural Review Committee.

Figure 13. Vegetation on the Tree Farm in Deschutes County is managed to reduce wildfire threat and protect wildlife habitat (Image credit: U.S. Forest Service)

- Transferring more than 300 acres of permanent open space on the western portion of the property from The Tree Farm to Trust for Public Land and ultimately to Bend Park and Recreation District to expand Shevlin Park, improve access for visitors and residents of Bend, protect wildlife habitat, and allow for continued maintenance of fuels.

Westside Transect Zone in Deschutes County

In 2019, Deschutes County Board of County Commissioners approved the Westside Transect Zone. The purpose of the new zone was to "accommodate and provide standards for land located between urban and rural, forested, park or federal areas that provides a transitional residential development pattern with densities ranging from one unit per 2.5 to 10 acres to guide development of communities which are designed and managed to protect wildlife habitat and establish and maintain wildfire mitigation and prevention strategies" (DCC § 19.22.010). The zone is adjacent to west side of Bend; not only is wildfire risk reduction important to the homes within the zone but this area also serves as a strategic location for responding to and managing potential wildfires that would threaten the city.

Many regulatory requirements in the Westside Transect Zone are based on the Tree Farm's approved land use planning and governance documents (DCC § 19.22). Every subdivision in the Westside Transect Zone must prepare and submit a Wildlife Habitat Management Plan, Wildfire Mitigation Plan, and Stewardship Community Plan. The Wildfire Mitigation Plan is required to include defensible space, enhanced construction design and materials to prevent ignitions from

wildfire, ongoing vegetation management, and other provisions. Deed restrictions and/or restrictive covenants that implement lot- or parcel-specific and applicable general provisions of the Wildlife Habitat Management and Wildfire Mitigation Plans are mandated and enforced by the HOA.

Figure 14. Low-density residential development in Westgate, one of the subdivisions in the Westside Transect Zone in Deschutes County, allows for management of defensible space and vegetation to reduce wildfire threat. (Image credit: U.S. Forest Service)

Community / Countywide Adaptations

Many fire adaptations at this scale take the form of plans, regulations, or programs that support engagement across a large area. For example, plans provide a mechanism to gather specific types of data and information and organize it in a manner that delivers useful knowledge and a roadmap for future decision-making.

Plans can directly or indirectly support wildfire risk reduction. Land use plans can integrate information on wildfire hazards and potential impacts on development and steer development to areas with lower hazard. Multi-hazard or wildfire-specific hazard plans can provide in-depth analysis on wildfire risk to community values and amenities. Plans can also align with or reference one another to reduce duplication, avoid conflict and leverage the appropriate information for a holistic approach for planning safe communities.

Local government typically leads the processes of plan development and adoption. Federal partners such as the U.S. Forest Service and other partners (e.g., non-governmental groups) can be consulted or included in the planning. This engagement is most common with CWPPs but is not limited to such plans.

Comprehensive Plans

Comprehensive plans serve as the long-term vision and blueprint for how a county (or other jurisdiction) seeks to grow, protect and develop its land and resources, provide services and amenities for the public, and address other topics. Comprehensive plans typically cover a 10–20-year planning horizon, although interim updates may occur more frequently. Depending on the state, the adoption of comprehensive plans may be required by law. For example, all cities and counties in both Idaho and Oregon are required to adopt comprehensive plans and those plans must address areas subject to natural hazards.

The extent to which wildfire is addressed in comprehensive plans can vary broadly due to factors such as state requirements for addressing natural hazards (as discussed above), a community's history with wildfires, level of stakeholder interest in wildfire, and currency of the plan in relation to these or other factors. While all four counties have a comprehensive plan, how each plan contributes to fire adaptation depends on the inclusion and specificity of relevant goals and policies and whether they are implemented. Table 2 summarizes how each county's comprehensive plan addresses wildfire and broad state requirements related to comprehensive plans and hazards for additional context.

Wildfire Hazard Policies in Larimer County

Colorado's planning requirements are tied to communities above a certain population size or other specified criteria as set forth in C.R.S. 30-28-106. For counties in Colorado adopting a comprehensive plan (also referred to as a master plan), the inclusion of a hazards element is optional. Despite this, Larimer County has included a number of hazard-focused policies that encompass wildfire directly or indirectly. These include developing hazard mitigation programs, discouraging development in hazard areas, creating and maintaining defensible space around structures, and collaborating with private forest management in multi-jurisdictional approaches to improve forest health and reduce fuel loads. Volume 2 of the county's Comprehensive Plan includes an appendix with implementation strategies based on topic (e.g., hazard mitigation, code compliance, agriculture, land division) to further advance policies.

Wildfire Resilience Policies in Chelan County

Washington's Growth Management Act (GMA) requires that the fastest-growing cities and counties in the state must adopt and periodically update comprehensive plans and development regulations to guide future growth. Comprehensive plans adopted by Washington counties and cities must address specific elements, including land use, housing, capital facilities, utilities, rural, transportation, economic, parks and recreation, and climate change and resiliency (RCW 36.70A.070).

Chelan County is updating its comprehensive plan to meet state requirements, including developing a new Climate Element. Per state law, wildfire must be addressed in the land use element and new resiliency subelement. The land use element must reduce and mitigate the risk to lives and property posed by wildfires by using land use planning tools, such as adoption of portions or all of the IWUIC or developing building and maintenance standards consistent with the Firewise USA program or similar program designed to reduce wildfire risk, reducing wildfire risks to residential development in high risk areas and the wildland urban interface area, separating human development from wildfire prone landscapes, and protecting existing residential development and infrastructure through community wildfire preparedness and fire adaptation measures (RCW 36.70A.070(1)). The new resiliency subelement must address natural hazards created or aggravated by climate change, including sea level rise, landslides, flooding, drought, heat, smoke, wildfire, and other effects of changes to temperature and precipitation patterns (RCW 36.70A.070(9)(b)(ii)).

TABLE 2: SUMMARY OF WILDFIRE POLICIES IN COMPREHENSIVE PLANS

	Boise County	Chelan County	Deschutes County	Larimer County
Plan Name	Boise County Comprehensive Plan	Chelan County Comprehensive Plan 2017-2037	Deschutes County 2040	Larimer County Comprehensive Plan
Status of Plan	Adopted in 1994 with subsequent revisions and updates; last updated in July 2024.	County is updating its plan with an anticipated completion date of June 30, 2026.	Plan was voted to be adopted in 2024 but has undergone reconsideration and is still under appeal.	Adopted in 2019 and replaced the 1997 Larimer County Master Plan.
Organizational Approach to Wildfire	Wildfire is primarily addressed in Chapter 6 Natural Resources and Chapter 7 Hazardous Areas; wildfire is also included as an area of special concern.	Wildfire is currently addressed in the Resource Element and Parks & Recreation Element. County is developing a new climate resiliency element per state legislation.	Wildfire is addressed in the Farm and Forest Resources Chapter and Natural Hazards Chapter.	Wildfire is addressed in Watersheds and Natural Resources and included in content related to resiliency and hazard mitigation planning. Plan is organized based on Colorado Resiliency Framework.
Notable Wildfire Policy Topics	Wildfire policies are focused on education of the public and developers, restriction or limits on development in hazardous areas, and support for Unified Land Use Ordinance for safe development.	Wildfire policies are primarily related to timber/land management, recreation planning opportunities; broader hazard policies relate to safe development.	A range of wildfire policies support fire protection, air quality, updated mapping, wildland-urban interface, and forest management.	A range of wildfire policies support resident education, defensible space, emergency management and hazard mitigation, collaboration, risk reduction, and sustainable best management practices.
Alignment with HMP and CWPP	References County's All Hazards Mitigation Plan.	No references to HMP or CWPP.	References local CWPPs and County Natural Hazards Mitigation Plan.	Incorporates Multi-Jurisdictional Hazard Mitigation Plan by reference.
State Requirements for Adoption of Comprehensive Plans	All cities and counties in must adopt a comprehensive plan (Idaho Code 67-6508).	Designated cities and counties under the GMA must adopt a comprehensive plan (RCW 36.70A.040).	All cities and counties in Oregon must adopt a comprehensive plan (ORS 197.175).	Cities and counties above a certain population size must adopt a master plan (C.R.S. 30-28-106).
State Requirements for Addressing Natural Hazards	It's **required** for Idaho counties to address hazardous areas in their Comprehensive Plans. Other relevant required topics include natural resources.	It's **required** for designated counties in Washington to address natural hazards and climate resilience in their Comprehensive Plans.	It's **required** for counties in Oregon to address areas subject to natural hazards and forest lands in their Comprehensive Plans. Other relevant required topics include forest lands.	It's **optional** for Colorado counties to address natural hazards in their Comprehensive Plans.

Community Wildfire Protection Plans

A Community Wildfire Protection Plan (CWPP) is a voluntary plan to assess wildfire hazard and risk and prioritize actions that reduce risk to people, homes, businesses, watersheds, cultural resources, infrastructure, natural ecosystems, and other values or resources within a defined planning area. CWPPs were formally created through the Healthy Forests Restoration Act (HFRA) of 2003 to incentivize communities to take local action by prioritizing federal funding for hazardous fuel reduction projects. CWPPs, as defined by HFRA, must meet a set of minimum requirements, including being collaboratively developed by applicable local, state, federal, and tribal partners. Many states have also developed additional guidance or requirements for CWPPs to be approved by the state forestry agency.

Local CWPPs in Deschutes County

The CWPP planning process provides an opportunity to engage a diverse group of stakeholders to offer input and produce outcomes that reflect community values and expertise. Project Wildfire facilitates updates to local CWPPs for seven community areas within Deschutes County: Greater Redmond, Greater Bend, Sunriver, Greater La Pine, Greater Sisters, Upper Deschutes River, East and West Deschutes County. The CWPPs document fire history, fuel hazards and ecotypes, various accomplishments, prioritized recommendations and preferred treatment methods, and actions for wildfire response, fire protection, fire adapted communities, and restoring resilient communities. Each plan is updated and revised on a five-year cycle to maintain its relevance and contents. There is some interest to combine these plans into one document to streamline repetitive content but individual community actions and other relevant information unique to each area would be retained.

Hazard Mitigation Plans

A Hazard Mitigation Plan (HMP) identifies potential hazards within a planning area, assesses the risk of those hazards to populations, property, and critical facilities, and includes a mitigation strategy on how to reduce risks. Although these plans are voluntary, the Federal Emergency Management Agency (FEMA) requires state, local, tribal, and territorial governments to have approved and adopted hazard mitigation plans to be eligible for certain types of non-emergency disaster assistance, including funding for mitigation projects. To remain eligible for funding, jurisdictions must also update their hazard mitigation plans and resubmit them for FEMA approval every five years. A hazard mitigation plan can be developed at state, local, or regional (multi-jurisdictional) levels.

CWPP and HMP Alignment in Chelan County

Chelan County's updated Multi-Jurisdictional Hazard Mitigation Plan (HMP) was approved by FEMA in December 2024; the County's updated 2025 CWPP was adopted by the Board of County Commissioners in March 2025. Recent updates to both plans provided an opportunity to align and integrate wildfire hazard data across plans and coordinate the stakeholder engagement process. For example, the CWPP Wildfire Subcommittee included many of the same HMP planning committee members (Chelan County, local cities, fire districts and departments, Cascadia Conservation District, and the Chelan County Flood Control Zone District) and added several other state and federal agencies, county districts, and non-profit organizations specific to informing wildfire planning needs. CWPP data was also developed in conjunction with the wildfire chapter of the HMP. Updated CWPP maps of burn probability, fire behavior class, structure exposure to embers and radiant heat, and critical infrastructure exposure were used in MJHMP hazard assessment to identify the extent and location of wildfire hazards in the planning area.

These and other alignments allowed for a more streamlined planning process and avoided unnecessary duplication.

Regulations

Regulations provide a mechanism for Counties to put planning goals, policies, and other strategies into action. Fire-related regulations can be designed to address multiple aspects of mitigation, response, and recovery for the public and first responders. Similar to plans, regulations that address land use and the built environment are developed and adopted by local government agencies. However, other stakeholders and partners can play a vital role by supporting their adoption or aligning other voluntary efforts (e.g., educational programs) with regulations.

Subdivision Regulations in Boise County

Boise County's comprehensive plan prioritizes safer development for wildfire through education, fuel mitigation, and compliance with their Amended Unified Land Use Ordinance (#2024-02). Boise County's Amended Unified Land Use Ordinance requires that subdivisions prepare and submit a fire protection plan which meets the County's Road Standards, applicable wildfire regulations, and signed by the applicable fire district or agency responsible for fire protection (§ 5.11).

Road standards include provisions for driveways, fire apparatus access roads, and marking of roads and fire protection equipment (§ 3.2.B). Fire plans must provide parcel information and meet specifications for a range of access, water supply, fuel management, improvements and others. Examples of specific requirements include:

- Access, ingress and egress, regarding both roadways and driveway standards;
- Water supply sources, and a layout showing the location of potable water lines, wells, fire hydrants, valves and service lines; and the materials of construction and the dimensions of all water system components;
- Building construction information pertinent to fire safety;
- Defensible space, fuel types, vegetation on site;
- Fire evacuation plan;
- Identification of the responsible fire protection agencies and their funding source(s);
- Proposed on-site and off-site improvements pertaining to streets, water supply, sanitary sewer systems, fire protection facilities, and utilities;
- Any proposed preliminary restrictive covenants; any relevant provisions which might be contained within protective covenants are to be recorded with the plat, including a face note for the recording instrument number of the Covenants, Conditions, and Restrictions.

Other fire-related provisions may also apply. For example, proposed building in areas where topographical slopes are greater than fifteen percent, or where adverse conditions associated with slope stability, erosion, or sedimentation are present must submit a slope stabilization and re-vegetation plan with efforts made to use species that tend to recover from fire damage and do not contribute to rapid fire spread (§ 5.14.B.7). Conditional use permits are also subject to terms and conditions which includes fire hazards (§ 4.3.C.2).

Larimer County Recovery Ordinance

An important aspect of fire adaptation is how a community will recover and rebuild if they experience a wildfire that results in home losses or other impacts. Larimer County's history with wildfire and other disasters prompted them to develop a Disaster Rebuild Program, which was codified in Article 14 of the Larimer County municipal code. One of the program's primary purposes was to assist disaster survivors (residents and businesses) in rebuilding after the Cameron Peak Fire, which destroyed 461 structures in Larimer County in 2020 (Lyell 2020), by offering flexibility in meeting land use regulations, such as modified permitting and approval procedures.

Part of the Disaster Rebuild program established a formal process for temporary emergency housing and accessory structures when a property owner is rebuilding (§14.2.1). For example, a property owner could obtain a permit for temporary emergency housing when a building permit has been issued for repair or replacement of a permanent dwelling or prior to building permit issuance when the owner has provided an acceptable plan and timetable for rebuilding a permanent dwelling. To support homeowners in navigating temporary housing under the Rebuild Program, the County also created informational fact sheets.

Education and Outreach Programs

All of the counties use education and outreach strategies to engage with residents, businesses, and other stakeholders on wildfire prevention, preparedness, mitigation, and recovery topics. These efforts may be coordinated formally through organized programs or informally on an as needed basis and may be led by different local, state, or federal agencies and organizations. Education and outreach are also closely tied to other adaptations, such as the development and implementation of plans, regulations, fuel management, and more.

Project Wildfire (Deschutes County)

For several decades, Project Wildfire has been instrumental in providing wildfire mitigation, coordination, funding, and collaborative opportunities for residents and neighborhoods across Deschutes County. Project Wildfire's origins stretch back decades. Following the 1990 Awbrey Hall Fire that destroyed 22 homes in Bend, local leaders took an active interest in addressing wildfire threats through mitigation, prevention, and planning. In 2000, Deschutes County Board of County Commissioners adopted an ordinance to create a Project Impact Steering Committee to develop and implement mitigation strategies from natural disasters. This ordinance became Chapter 8.24 in the Deschutes County Code and was amended in 2004 as the Project Wildfire Steering Committee, with the purpose of serving as a local coordination group for the County.

Project Wildfire supports residents and neighborhoods through a variety of activities, including the creation and maintenance of dozens of Firewise Communities, dissemination of educational information through its FireFree Program, creation of guidance on evacuation, identification of funds for fuels reduction projects in high priority communities, development of local Community Wildfire Protection Plans, and organization of community cleanup events. Along with its steering committee, Project Wildfire has a neighborhood coalition subcommittee that meets monthly to discuss current topics, needs, and activities.

Landscape Adaptations

Forest and fuel management is a primary mitigation strategy in all four landscapes. Related to this, the smoke impacts of wildfires, and even more importantly, the smoke impacts from prescribed fire, is emerging as an important topic. More about smoke impacts is discussed in the Implementation Section of this report.

Forest and Fuel Management

The general intention of fuel treatment is to change the expected fire behavior in strategic locations for the purpose of reducing radiant, convective, and conductive (embers) heat transfer exposure to HVRAs and reducing the intensity and/or rate of spread of wildfires to help fire suppression resources a better opportunity in success. In the planning and implementation of fuel treatment, ideally, the following inputs are considered:

- The fuel treatment units are strategically located and are accessible to support fire suppression resources and/ or defensible space.
- The fuel treatments are designed to change fire behavior typically through reduction in intensity, and/or rate of spread.
- Topography and terrain features are considered in the design.
- Local ecological, vegetation dynamics, and forest health concerns or objectives are incorporated.
- The mitigation of potential compounding hazards, such as slope stability, or flooding are incorporated.
- Social and economic values are incorporated.
- Long-term maintenance is considered and planned for as part of future implementation.

All four counties have taken slightly different approaches to their landscape fuel management, but working with national forests through the Good Neighbor Authority program (GNA) plays a pivotal role in the landscape level fuel management success for all of them. GNA is an instrument of the USDA Farm Bill (Agriculture Improvement Act), allowing the U.S. Forest Service and BLM to enter into cooperative agreements with states, counties, groups of counties, and federally recognized Tribes. Under GNA, different levels of government can combine resources including funding, staff, and contracting, to address wildfire risk and forest health across ownership boundaries.

Boise County

Much of the success of wildfire fuels mitigation within Boise County has been attributed to collaborative governmental relationships, which were expanded with the advent of the WCS. Both the Idaho Department of Lands Good Neighbor Authority agreement with the U.S. Forest Service and the direct GNA between Idaho County and the U.S. Forest Service (IDL. n.d.) have allowed for new approaches, directly, and as part of the All-Lands Partnership (ALP) – a coalition of land management agencies, businesses, nonprofits and community members working together in the Southwest Idaho Landscape to pool funding and expertise to collaboratively plan and implement landscape-scale mitigation work. The ALP has allowed organizations to use common risk modeling platforms, and engagement in the landscape, including GNA agreements with partners like Tribal governments, Conservation Corps, National Forest Foundation, The Nature Conservancy, National Wild Turkey Federation, Great Basin Institute, and Southern Idaho Timber Protection Agency.

Without the GNA, county staff suggested that there would not be a county program in existence due to the costs that would otherwise be born directly by local taxpayers. In fact, analysis by county staff suggests that Boise County taxpayers only pay for 10% of the county wildfire mitigation program, with the rest being federally funded or funded through other grants. The GNA has not only allowed Boise County to create a collaborative structure, but with the addition of the WCS funding it has also allowed for successful development of landscape level fuel treatments across multiple land ownerships.

Lowman Community Example

The unincorporated community of Lowman in Boise County is a local example of an integrated approach of landscape level treatments with community engagement. Much of Lowman's fire adaptations have demonstrated an ongoing and sustained combination of strategic fuel treatment work that aligns across private properties. This has been undertaken by the combined efforts of volunteer residents, contractors, and U.S. Forest Service mitigation work. This community is largely self-sufficient and is totally geographically isolated, with little to no cell coverage. It has been surrounded and cut off by wildfires multiple times. Although Lowman is not in the Southwest Idaho Landscape (SIL) and thus not eligible for SIL funding, the U.S. Forest Service Ranger Station responsible for the lands surrounding Lowman is very engaged in addressing WUI vulnerabilities. This has allowed for the establishment of a strong community partnership; subsequent to the severity of the 2024 fire season, this also resulted in the creation of the Lowman Community Wildfire Working Group that now meets monthly and actively engages with the residents and public.

Chelan County

Chelan County has engaged with the Blue Forest Partnership (Robbins 2024), through a Forest Resilience Bond to undertake treatments on U.S. Forest Service land by leveraging federal, state, private, county, and utility district money. The County's Natural Resources Department is leading implementation efforts on the Okanogan-Wenatchee National Forest, in partnership with the U.S. Forest Service and local partners to reduce fire risk and safeguard the communities around Lake Wenatchee and Plain. Blue Forest is a non-profit conservation finance organization with the purpose of connecting people, with financing, and science for ecosystem restoration and the protection of HVRAs. Chelan County was one of the first counties in the Pacific Northwest to leverage the Washington GNA program to implement these practices on national forest lands under the Blue Forest program.

Larimer County

Agencies within Larimer County have also taken advantage of the GNA program through the Colorado State Forest Service to undertake successful cross-boundary fuel treatments on federal, state, and private lands in strategic locations within the Colorado Front Range Landscape.

Thunder Mountain Fuels Reduction Project

The Estes Valley Watershed Coalition, a nonprofit organization that was created to lead local flood recovery and restoration projects in the Estes Valley, has been successfully collaborating with partners to implement projects supporting water, forest health, and wildlife. One of their projects, the Thunder Mountain Fuel Reduction Project, has the goal of protecting communities within the Estes Valley from catastrophic wildfire and reducing potential wildfire impacts on waterways and the water supply of the Estes Valley and the Colorado Front Range. These treatments are linked to and enhance planned treatments within adjacent Rocky Mountain National Park.

Protecting the Gateway to the Rockies Project

In November 2025, Larimer County was the successful recipient of a U.S. Forest Service Community Wildfire Defense Grant (CWDG) to fund an extensive "Protecting the Gateway to the Rockies" project. Project activities will include:

- Mitigation treatments to establish and enhance defensible space on as many as 900 parcels.
- Education on wildfire preparedness and Home Ignition Zones practices through up to 75 community events.
- Landscape-scale wildfire mitigation treatments covering up to 500 acres on open spaces and larger properties.
- Strategic fuels treatments along up to seven miles of key roadways.
- Enhancement of community capacity to manage the abundance of post-treatment woody biomass through up to 30 community events.
- Improvements in evacuation plans and procedures.

The project boundaries, analysis and justification were largely undertaken as part of the 2023 Estes Valley Community Wildfire Protection Plan.

Deschutes County

Deschutes County has been successful in working with the Oregon Department of Forestry, federal partners and private landowners on several projects throughout the County. GNA has allowed for strategic fuel treatments that extend across county, state, federal, and private land parcels.

Joint Chiefs Partnership – Rosland Road Fire Example

There are several examples of multi-jurisdictional mitigation projects within Deschutes County that have withstood the test of fire. One example of collaborative success is the Greater La Pine Joint Chief's Project, funded through a partnership between the USDA Natural Resources Conservation Service (NRCS) and the U.S. Forest Service. This project addresses fuel treatments on federal land and adjacent private land. In July of 2020, fire managers attribute the successful suppression of the Rosland Road fire, and subsequent protection of the nearby Newberry Estates subdivision to the fuel treatment that was completed just the year prior. The fuel treatment work was completed between 2014 to 2015, and the follow up prescribed fire application was undertaken in 2019. Figure 15 demonstrates the comparison of fire effects in the untreated area, with significant crown fuels consumption, to the fire effects of the treated are with only surface fuel consumption, low scorch heights, very little crown fuels involvement, and very low mortality of mature trees.

Figure 15. Photo of the comparison of fire effects resulting from the July 2020 Rosland Road Fire (Deschutes National Forest) between the untreated side of a road that the treated side of the road (Photo Credit: U.S. Forest Service)

Tree Farm Example

The Tree Farm development, as discussed in the previous section, is an example of a private land development in which fuel treatments that were previously carried out by the agricultural landowner have been translated into the requirements of a development agreement between the developer and Deschutes County. The property is directly adjacent to U.S. Forest Service land and Shevlin Park, a City of Bend Open Space.

Requirements are identified in a Wildfire Protection Management Plan. Within the plan, the developer and the HOA are committed to maintaining and improving the fuel treatments, based on direction from the Oregon Department of Forestry and in alignment with the work being undertaken on adjacent U.S. Forest Service lands and Shevlin Park. The fuel treatments also account for ecosystem values and wildlife habitat. This commitment is required through the plan, deed restrictions and policies to be carried forward by any future land ownership. Finally, the Tree Farm HOA has included a permanent line-item budget for wildland fire fuel reduction in the permanent open space.

IMPLEMENTATION

IMPLEMENTATION

Implementing fire adaptations relies on a combination of activities, such as funding, coordination across different agencies and organizations, stakeholder engagement, public outreach and education, formation of local or regional collaboratives, work force development and capacity building, and development of landowner assistance programs. This section shares examples of key funding sources, implementation challenges, and strategies to move forward.

Funding for Fire Adaptations

Funding is a critical component for supporting the implementation of many fire adaptations discussed in this report. Funding across the four counties varied from short-term opportunities such as time-bound grants or term-limited positions to sustained financing mechanisms that may offer longer-term predictability. Counties were using multiple funding streams from local, state, and federal sources. Funding sources include the following examples below.

Federal Funding Sources

WCS funds were used for both capacity-building and mitigation work. For example, counties coordinated landscape adaptations with state and federal partners or non-profits, many of which had hired new staff funded through WCS investments. WCS funds were also used to support mitigation projects on public and private property and landowner assistance programs (cost-share agreements) primarily at the landscape scale.

Another critical source of funding for counties has been the Community Wildfire Defense Grants Program. CWDG funds help communities either develop or update CWPPs or implement mitigation work identified in CWPPs. CWDG was also funded through the Infrastructure Investment and Jobs Act, Public Law 117-58, at the same time as the broader WCS, but was administered by the U.S. Forest Service through a separate program than national forest management.

Deschutes County, Larimer County, and Chelan County have each been the recipient of CWDG awards. Other federal funding sources included those from the Natural Resources Conservation Service (NRCS). Many of these federal funds were directed to landscape scale adaptations that this report outlines in previous sections.

State Funding Sources

State funding sources are also a critical channel to support county mitigation work. In some cases, these funds were directed through state wildfire risk reduction grant programs. For example, Deschutes County frequently cited Oregon's SB 762 legislation as a major source of funding that provided more than $220 million for communities to conduct wildfire mitigation activities. In 2025, the State approved HB 3940 to create a new fund for wildfire mitigation based on a new tax on oral nicotine products. This sets up a dedicated revenue stream for wildfire resilience through a new Landscape Resiliency Fund and Community Risk Reduction Fund. Other related features of the bill include expanded grants for wildfire-resilient structures. In addition to offering their own funding programs, states may also serve important intermediary roles to distribute federal funds, such as CWDG grant program funds.

Local Funding Sources

Local funding sources also play a major role in funding adaptations. For example, Chelan County entered into a partnership with Blue Forest to finance the treatment of 6,000 acres within their Upper Wenatchee Pilot Project through the development of a Forest Resilience Bond project. The bond supplements dollar commitments from the county and other agencies to pay into forest health projects (Robbins 2024). LFRA, within Larimer County, passed a tax levy to fund the purchase of additional mitigation equipment and staffing in their district. Estes Park, a city within Larimer County, also passed a local sales tax which includes dedicated funding for wildfire mitigation.

Implementation Challenges

Each of the four counties experienced challenges associated with implementing one or several fire adaptations. Some challenges were related to a specific scale or type of adaptation, while others were broadly tied to the national forest management, including the WCS, or were associated with influences that were national in scope. Some of these challenges were shared across several counties while others were unique to a specific county.

Landscape Adaptations

National Environmental Policy Act (NEPA)

The National Environmental Policy Act (NEPA) requires federal agencies, such as the U.S. Forest Service and the Bureau of Land Management, to assess the environmental effects of proposed fuel treatment projects on federal land. Through the NEPA process, the environmental, social, and economic effects of fuel treatment projects are assessed. The process also includes a public review and comment opportunity on the evaluations. Each federal agency is responsible for developing their own internal regulations and procedures for the NEPA process guided by oversight from the Council on Environmental Quality. Many of the landscapes identified the length and complexity of the NEPA process, even with streamlined processes for hazardous fuel reduction, as a barrier to moving projects from the planning stages to “shovel ready”.

Boise County has found some increased efficiency in streamlining the NEPA process with their projects by incorporating projects with nearby U.S. Forest Service projects using the Shared Stewardship program and GNA through:

- increased collaboration, focusing resources on priority, and often combining larger landscape level treatment areas, reducing repetitive NEPA analysis, and
- accelerating the planning and implementation process and increasing combined capacity for faster reviews.

Biomass Removal or Disposal

The disposal or removal of biomass is typically one of the most challenging aspects of fuel treatment, and this was reflected in feedback from all of the landscapes. Woody biomass is the resulting product of fuel management treatments. Depending on the tactic, biomass removal can account for a significant percentage of treatment costs; in some cases, to the point of implementation impedance (Mansuy et al. 2025.; Mitchell and Smidt M. 2019.) However, the larger issue is often how and where to dispose of the biomass. Factors that influence the strategies and tactics for biomass are:

- Type and quality of biomass
- Piece size of biomass
- Total volume of biomass
- Site density and ground disturbance concerns
- Site access
- Air quality concerns
- Prescribed fire condition alignment
- Ecosystem health concerns
- Processing and loading locations
- Availability of receiving facilities
- Transport distance to receiving facility

Typical methods for disposal are prescribed fire (pile burning and broadcast burning), curtain burning, mastication or mulching, commercial harvesting, transport, or chipping and transporting. Transported biomass is typically hauled by truck to commercial land fill sites for burial, or conversion to compost; co-generation sites for the development of electricity; to a lesser extent the higher quality biomass is transported to forest product processing facilities for use in the production of dimensional lumber, plywood, wood fuel (pellets), engineered wood products, or pulp products (cardboard and paper).

Larimer County Biomass Research

In April 2024, Larimer County partnered with a consulting organization to research local challenges with woody biomass. The report, “Rooted in Resilience: A New Vision for Woody Biomass Management in Larimer County” (2025) provides a nuanced understanding of the challenges and identifies potential solutions with an actionable strategy for local implementation in Larimer County moving forward. Key findings from the report include:

- Wildfire is a significant and persistent threat to Larimer County’s forests, residents, and economy.
- There are varying perspectives on what successful forest treatment and restoration entails. Based on land manager context and goals.
- Strict federal and state regulations complicate the development of technologies like air curtain burners.
- Existing biomass management infrastructure and markets are insufficient.
- Three key needs to improve woody biomass management in Larimer County:
    1. Infrastructure & capacity to reach and manage material,
    2. Processors and end use for low-grade material (e.g., slash, residue) at high volumes,
    3. Cooperative aggregation and market development for biomass at scale.
- Approximately 100,000 bone dry tons of woody biomass utilization in Larimer County; instead, a multifaceted approach is required.
- There is no single, universally promising solution to woody biomass utilization in Larimer County; instead, a multifaceted approach is required.
- Development of a Biomass Processing Network may help.

Prescribed Fire and Smoke

Prescribed fire is typically the most cost-effective and, in many cases, the most ecologically appropriate method for biomass reduction or removal as part of landscape level treatments. Fire is a dominating natural disturbance in most natural terrestrial ecosystems. Therefore, mechanical or hand mitigation treatments are often combined with prescribed fire as part of achieving ecosystem restoration objectives. However, many practitioners responsible for fuel treatments and prescribed fire are faced with increased complexities associated with managing prescribed fire smoke from these projects.

The public health impact of wildfire and prescribed fire smoke has been an increasing topic of concern. In a 2024 Fact Sheet, the U.S. Environmental Protection Agency (EPA) published that "Wildland fires - including both wildfires and prescribed fires - account for 44% of the nation's primary emissions of fine particulate matter (PM 2.5). EPA recognizes the increasing challenges and human health impacts that wildland fire and smoke pose in communities all around the country" (EPA 2024).

In March 2023, the U.S. Government Accountability Office (GAO) was asked to review the issues surrounding the effects of wildfire and the EPA's role on the topic (GAO 2023). The GAO found that the EPA could take a more active role in working with federal land managers on mitigating smoke issues related to forest management activities, such as prescribed fire.

Although public acceptance of prescribed fire use has generally increased, the increased frequency of multiple large fires burning throughout even longer periods of each year and the impacts on air quality extending across the continent and in some cases even across the world, have also increased awareness of smoke impacts on air quality and decreased the public tolerance for smoke. As a result, some jurisdictions have either significantly reduced their prescribed fire activity or are exploring alternatives for biomass removal, such as Larimer County. In Deschutes County, key partnerships and outreach are allowing more prescribed fire to successfully be implemented, as highlighted below.

Planning and Regulatory Adaptations

Existing development poses a significant challenge for communities seeking to become fire adapted, and this is also true in the four counties. For example, Boise County expressed this when they shared that many of the County's existing subdivisions with one-way in access and steep and long driveways would not have been allowed to be built under today's regulations. Similarly, counties acknowledged that even with the best of codes for building construction it is difficult to address housing stock that is built prior to the adoption of a code because codes are not retroactive. Further, CWPC's FLUPE analysis found that although the four counties had adopted robust plans and regulations to address wildfire, there were some gaps or inconsistencies in local application and enforcement.

In some cases, the presence of state-initiated WUI codes, hazard assessments, or risk assessments created public confusion or backlash, or seemed to delay local decisions to adopt regulations until further direction was available from the state. For example, in Washington many counties have delayed adopting a WUI code until a statewide wildfire hazard and risk maps are available from DNR.

WCS Coordination and Administration

Another facet of implementing fire adaptations is whether and how local planning and mitigation activities aligned with WCS priorities and implementation timelines. Some of the themes that arose during discussions with local stakeholders included:

- Confusion between what the WCS was, whether it was different from other national frameworks, such as the National Cohesive Strategy, and whether some programs such as CWDG were part of the WCS.
- Participation in WCS-related research varied. Some counties expressed feeling stretched thin or were confused by the multiple studies or research projects occurring within their landscapes at the same time. Although not all of these were connected to the WCS, repeatedly tapping the same counties for hosting field tours, responding to interviews, or participating in other research requests limited some of their capacity to participate in this research.
- Differing knowledge of the WCS or expectations of WCS funding based on several factors, including whether counties were doing landscape scale work, what level of direct communication they had with the federal agencies, and what was occurring with other topics such as Forest Service budget shortfalls that impacted availability of funding.
- Some counties mentioned that challenges remained even when there was available funding for mitigation projects. For example, two counties mentioned it was difficult to find locally qualified contractors with the capacity to take on more work within short timeframes. In other cases, steep or remote terrain that was difficult to access increased the mitigation costs and limited how many acres could be treated.

Finally, another significant challenge experienced during the term of this research was related to changes in priorities and funding in 2025 under the new administration. This resulted in a federal work force reduction and early retirements within the U.S. Forest Service, some grant funding being pulled midstream, and shifts in roles or responsibilities. These changes impacted all of the counties either directly or indirectly.

Additional Challenges

Other implementation challenges cited were more widespread in scope. For example, the rising cost of home insurance in high wildfire risk areas was mentioned by all four counties but extends beyond their county boundaries. Research indicates that these trends are reflected across all four states in which the counties are located – Washington, Colorado, Oregon and Idaho (Whitman 2025; Nick 2025; Castillo 2025; Woodhouse 2025). Even as rising insurance rates have gained national attention, there is currently no single accepted solution that helps homeowners predictably decrease premiums and retain guaranteed coverage, making it more difficult to determine which fire adaptation(s) should be prioritized to address this challenge.

Other challenges expressed by counties included difficulty in trying to engage geographically isolated communities – particularly in areas with limited cellular or WIFI coverage, overcoming mistrust of state or federal agencies, and staff turnover and the loss of institutional knowledge.

Strategies for Success

Despite experiencing challenges, counties have developed well-tested and innovative ways to successfully implement fire adaptations. Strategies include creating sustained funding streams, building partnerships and developing public engagement programs, capacity-building, and leveraging opportunities following wildfire events.

Partnerships & Outreach

One of the most common strategies that all four counties are engaged in is the development of collaboratives. Some of these result from the WCS, such as the development of Southwest Idaho

All-Lands Partnership which includes Boise County. Other collaborative efforts pre-dated the WCS, such as work being undertaken in Chelan County through the Chumstick Coalition, Deschutes County's Project Wildfire, or the formation of the Northern Colorado Fireshed Collaborative. In cases where collaborative efforts were in place, several local, state, or federal stakeholders engaged in the WCS landscapes noted that it was easy to direct WCS investments through these existing channels. More insights into collaborative wildfire governance in two of the WCS landscapes (Colorado Front Range and Southwest Idaho) is also available from the *Fueling Adaptation* governance research team's products.

Another success was the notable presence of local sparkplugs, champions, or staff highly engaged and dedicated to wildfire mitigation. In each of the counties, there were individuals from the county or engaged in WCS landscape work who were playing an outsized role in adaptations, such as successfully obtaining a high amount of grant funding, leading local efforts, meeting with residents over multiple months or years to create buy-in for achieving mitigation in their neighborhood, engaging closely with the public on sustained education efforts, and working with local developers to adopt forward-thinking wildfire regulations. These relationships not only built trust but seemed to yield long term support for wildfire mitigation within areas of the county.

Deschutes County

Due to the topography of the Deschutes River drainage in relation to the surrounding plateau, wind, and air flow patterns characteristic of the Bend area, some prescribed fire activities have resulted in smoke impacts on the local populations of the Bend and greater Bend area. This prompted the EPA, the U.S. Forest Service, the Oregon Department of Forestry, the University of Oregon, Deschutes County, and other state and local agencies and NGOs to use this area as a study area for the West Bend Prescribed Fire Pilot (University of Oregon. 2024). The project was initiated to determine some forward direction in increasing prescribed fire on the landscape, while also reducing the risk to public health.

In 2023, the West Bend Prescribed Fire Pilot Project was initiated with a multi-agency tabletop exercise, which was followed up with prescribed fire implementation in May of 2024. As part of the project, agencies were able to communicate, collaborate, and learn together in new ways using the Incident Management Team (IMT) structure. There were also improvements to public health support, forecasting, and inter-agency coordination that will benefit future prescribed fire projects. Specifically noted, there were successes in the reach, consistency, and utility of public health communications. In the end, the project was successful in achieving 1,864 of the planned 1,977 acres of prescribed fire.

This project opened the door to an ongoing commitment from agencies to continue working together and led to the drafting of the PNW Regional Joint Statement of Intent for advancing the shared goals and priorities. Locally, the project concept was continued in which 694 acres were successfully burned. Noting this was less than 2024, the limitations were not within the program delivery, but due to other priorities that limited project implementation. There is also an intent to replicate this project in Washington State (Chelan County).

Related to this project, the Central Oregon Fire Cooperative (three counties) also maintains a website that includes wildfire, health, and air quality information, and prescribed fire updates to keep residents informed of conditions (Figure 16).

Figure 16. The Central Oregon Fire Cooperative website.

In Boise County, the U.S. Forest Service and BLM have taken proactive steps to increase local awareness and acceptance of smoke from prescribed fire projects occurring in the area. Federal agencies advertise in advance and communicate using emails to local fire chiefs, emergency managers, and local dispatch. They also disseminate information to local communities via social media channels (Facebook and Next Door) and on websites. Local County staff indicate that residents generally understand why prescribed fire smoke is present and appreciate that the work is being completed for public safety and forest health. This said, the complex terrain in the county, limited communications, and limited access present some significant challenges in managing and communicating prescribed fire information

Proactive Capacity-Building

Another mentioned success was the leadership role that counties took in different aspects of mitigation work. For example, Chelan County attributed some of their success to having a dedicated grant writer who could pursue funding opportunities for the county. Boise County staff were proactively setting up mechanisms to transfer institutional knowledge across roles, noting that with limited staff this was important to sustain efforts through budgets or staffing changes.

Leveraging Opportunities

Local stakeholders frequently referenced previous wildfires as being instrumental in gaining public buy-in and motivating action for mitigation activities. For example, the Awbrey Hall Fire that burned in Bend and Deschutes County in 1990 was frequently cited as the initial catalyst for action while more recent fires continue to reinforce support for local programs. Similarly, Larimer County mentioned several wildfires, including the Bobcat Gulch Fire, High Park Fire, Cameron Peak Fire, and Alexander Mountain Fire that led to public support for wildfire mitigation, including approval of a local tax measure for LFRA to fund additional equipment and staffing.

CONCLUSION

CONCLUSION

The four counties studied in this report were selected based on their inclusion in a WCS landscape and adaptations being undertaken either prior to the WCS or resulting from the WCS. Additional study of these four counties occurred through in person site visits, stakeholder discussions, and other research to reveal more understanding of which adaptations were being implemented, their relationship to the WCS, and other insights. Some adaptations were found to be a result of the WCS and other adaptations occurred independently.

Much has changed since the WCS was initiated. National priorities have been redirected to active forest management, and in some cases, funding and staffing are no longer available for several mitigation projects discussed in this report. However, many important insights can be gleaned from the four counties about fire adaptation regardless of the funding source(s). These insights provide opportunities for practitioners and decisionmakers to learn more about fire adaptation.

Key Themes and Takeaways

Key themes and takeaways that emerged from assessing adaptations occurring within or connected to the four counties are summarized below.

A Range of Adaptations Across Scales

The WCS was designed using a U.S. Forest Service effort to identify high risk landscapes, emphasizing both landscapes with high numbers of buildings at risk, and places where there were long histories of collaborative risk reduction. Although the WCS is no longer a national strategy, risk reduction remains an active concern for the U.S. Forest Service in all of these places. Further, some U.S. Forest Service staff indicated they are still using WCS outputs such as analytics to inform planning, communication, and analysis of concerns on the landscape. However, all four counties are using different national, state, or locally developed assessments to drive local decisions and adaptations. The proliferation of assessments helps communities take ownership of wildfire risk but may make it difficult to accurately compare mitigation successes over time if different measures are being used to quantify risk reduction.

Counties are implementing a variety of adaptations at different scales to address wildfire risk. Adaptations at the building and lot scale were largely being undertaken through property assessment programs and regulations for structure hardening and defensible space. Adaptations at the neighborhood / subdivision scale focused on both voluntary activities, such as HOA participation in the Firewise USA® program, and regulatory efforts such as the implementation of local wildfire mitigation requirements. Counties have also adopted community or countywide plans that set forth goals and actions that address land use planning and wildfire risk reduction, and in many cases have adopted a range of regulations to implement these plans. Finally, adaptations at the landscape scale include forest and fuel treatments. Some adaptation examples, such as the Tree Farm in Deschutes County, also offer insights into how multiple adaptations can be implemented across different scales and sustained over time.

For all types of adaptation efforts, coordination programs, education, partnerships, and collaboration across scales were essential elements for implementation. In this complex collaborative environment, the advent of the WCS and increased funding by the U.S. Forest Service was most directly related to county efforts in collaborative work emphasizing fuel treatments and/or supporting partners, such as GNA funding for county-level mitigation staff.

Additional support for planning and mitigation came from the CWDG program which was administered separately from national forest planning and management. However, some adaptations were implemented independently from WCS investments, such as local adoption of plans and regulations. Building a better understanding of how federal support, including how U.S. Forest Service funding relates to activities across a range of scales, can further enhance coordination and effectiveness.

Implementation Challenges and Successes

Counties are often dependent on a wide range of funding from federal, state, and local sources for their adaptations. In this environment, the lack of sustained funding to implement WCS was a challenge for many partners. These challenges also coincided with other changes or uncertainties from other federal funding sources for disasters and mitigation, such as FEMA. In some cases, projects that relied on WCS funds were either paused or ended unless alternative sources were identified. In other cases, many county-level adaptations, including partnerships and collaboratives, regulations, plans, and assessment programs were being funded from other state and federal funding sources, such as the CWDG program or NRCS funds, and were able to continue.

Other challenges related to implementing adaptations include the disposal of biomass, managing smoke impacts associated with prescribed burning, the slow pace of environmental reviews for mitigation projects, and mitigating poorly planned existing development. Although challenges are expected when undertaking fire adaptations, many of the counties navigated these through creative financing and capacity-building. The development of new partnerships or leveraging of pre-existing coalitions and collaboratives was also frequently cited as successful examples of how work is coordinated to support wildfire activities.

In summary, the WCS helped elevate opportunities for counties to collaborate with federal partners to make investments in wildfire risk reduction, primarily emphasizing landscape-level fuel treatments. The vegetation management needs on federal public lands remain daunting, and without sustained and consistent funding there are uncertainties about all-lands wildfire risk reduction within these counties' jurisdictional boundaries. The counties are also implementing many other adaptations that pre-dated the WCS and will continue to occur. Maintaining and aligning adaptation goals across scales, agencies, organizations also presents both a critical need and opportunity.

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