Multnomah County Community Wildfire Protection Plan

Plan Update

August 3, 2023

Most Recently Amended October 24, 2023

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Executive Summary

The Multnomah County Community Wildfire Protection Plan (CWPP) is a non-regulatory plan with the purpose of identifying strategies to reduce harm to people, property, infrastructure, and the natural environment from future wildfire and wildfire smoke events. The plan does not create laws or policies, but instead brings partners from local fire agencies, governmental jurisdictions at all levels, and special districts and private-sector partners to create a framework for long-term risk-reduction. The plan serves as starting point for increased collaboration and engagement around risk from these hazards and creates a public accounting of action.

Concern in Multnomah County about wildfire and wildfire smoke disaster has grown considerably since the last version of this plan was published in 2011. The 2017 Eagle Creek Fire and 2020 September Wildfire Smoke Event have shown how significantly risk from these related hazards has increased because of the changing climate, as fire seasons grow longer and hotter. This plan is intended to reflect that increased urgency and to identify the particular risks from these hazards to those in Multnomah County.

Wildfire is a natural process that has occurred for millennia in what is now Multnomah County, and is an important part of the regeneration process of forests and other natural landscapes. Residents of Multnomah County live in an area with stunning and diverse natural environments, and wildfire and wildfire smoke will remain a risk exchanged for that benefit. But it is not an insurmountable risk. The cover of this plan includes a photo of a fern re-growing in the Columbia River Gorge just months after the devastating Eagle Creek Fire. The resilience that nature has to fire is also the goal for human systems, in what has been called 'transformative resilience'[1], where we are not just prepared to bounce back from future disasters but can do so while also adapting to changes and ensuring that everyone in the community shares in that resilience.

Amendments

October 24, 2023 *– Addition of Corbett Water District and West Multnomah Soil and Water Conservation District Information and Action Items, Specification of Adoption Date, Corrections of Minor Errors*

Cover Photos

- *Bracken Fern at Devil's Rest Trail – Lillian Palmer, US Forest Service, May 2018*
- *Smoky Air in Portland – Motoya Nakamura, Multnomah County Communications, September 2020*

[1] Rethinking Resilience to Wildfire, *Nature Sustainability*, David B. McWethy, Tania Schoennagel, Philip E. Higuera, Meg Krawchuk, Brian J. Harvey, Elizabeth C. Metcalf, Courtney Schultz, Carol Miller, Alexander L. Metcalf, Brian Buma, Arika Virapongse, Judith C. Kulig, Richard C. Stedman, Zak Ratajczak, Cara R. Nelson, Crystal Kolden, 2019

Acknowledgements

The federal Healthy Forest Restoration Act (HFRA) is the controlling legislation for Community Wildfire Protection Plans and requires that these plans are ***developed collaboratively by local and state government representatives, in consultation with federal agencies and other interested parties*.**

This plan represents the work of dozens of people who gave their time to build that collaboration and reflect the urgency of wildfire and wildfire smoke risk to this community. The participants in this process are listed below to acknowledge the amount of collaborative effort that went into the development of the plan and to thank the participants for providing their expertise. The plan was completed and posted to the Multnomah County Emergency Management website on August 3, 2023 – with future amendments to be described in the Executive Summary.

This plan is supported by the partners required to collaborate under the HFRA. Multnomah County support indicates the partnership of the local coordinating government; the Oregon Department of Forestry support indicates the partnership of Oregon's agency tasked with forest management; and support is also provided from representatives from all of the fire districts and other partners with fire protection responsibilities within Multnomah County's boundaries. Plan consultation with Federal partners and other parties is shown by the wide diversity of agency participation in this process, including numerous partners involved in developing mitigation strategies for wildfire smoke.

The list of collaborating partners includes people no longer with the agencies listed here and some people may appear more than once because they changed agencies or participated in both wildfire and wildfire smoke components of the plan.

Community Wildfire Protection Plan Update Steering Committee Members

- Chief Scott Lewis, Gresham Fire
- Celeste Duvall, Joint Office of Homeless Services
- Alice Busch, Multnomah County Emergency Management
- Dave Lentzner, Multnomah County Emergency Management
- Aaron Monnig, Multnomah County Health Department
- Tracy Brostrom, Oregon Department of Forestry
- Bill Huserik, Oregon Department of Forestry
- Jen Warren, Oregon State Fire Marshal's Office
- Jonna Papaefthimiou, Portland Bureau of Emergency Management
- Chief Steve Bregman, Portland Fire & Rescue
- Captain Louisa Jones, Portland Fire & Rescue
- Senior Inspector Kim Kosmas, Portland Fire & Rescue
- Katie Dunham, Portland Parks & Recreation
- Laura Lehman, Portland Parks & Recreation
- Angie Kimpo, Portland Water Bureau
- Chief Chris Lake, Sauvie Island Fire

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- Marybeth O'Leary, Bonneville Power Agency
- Chief John Logan, Cascade Locks Fire
- Chief Dave Flood, Corbett Fire
- Julie DiLeone, East Multnomah Soil & Water Conservation District
- Jeff Lesh, Gresham Natural Resources Program
- Kathy Majidi, Gresham Natural Resources Program
- Fire Marshal Gert Zoutendijk, Lake Oswego Fire
- Chief Greg Barnum, Lake Oswego Fire
- Justin Takkunen, Metro Parks and Natural Areas
- Kevin Cook, Multnomah County Land Use
- Tim Lynch, Multnomah County Office of Sustainability
- Tina Lefebvre, Multnomah County Transportation
- Clay Courtright, Oregon State Parks
- Jeff Bolton, PacifiCorp
- Horace Ward, PacifiCorp
- Mike Ansbergs, Portland General Electric
- Jay Jewess, Portland General Electric
- Zach Littlefield, Portland General Electric
- Katy Wolf, Portland Bureau of Emergency Management
- Ken Finney, Portland Bureau of Environmental Services
- Mark Fetters, Portland Bureau of Development Services
- Mindy Brooks, Portland Bureau of Planning & Sustainability
- Sallie Edmunds, Portland Bureau of Planning & Sustainability
- Daniel Soebbing, Portland Bureau of Planning & Sustainability
- Nickole Cheron, Portland Office of Equity and Human Rights
- Beth Gilden, Portland State University
- Chief Jeff Pricher, Scappoose Fire District
- Chief Steve Forster, Tualatin Valley Fire & Rescue
- Deputy Fire Marshal Trace Richard, Tualatin Valley Fire & Rescue
- Assistant Fire Marshal Kate Stoller, Tualatin Valley Fire & Rescue
- Jeremy Goers, US Forest Service
- Dirk Shupe, US Forest Service

Wildfire Plan Additional Content

- Ana Linden, Corbett Water District
- Mary Penfield, Joint Office of Homeless Services
- Brian Gerkman, Multnomah County Sheriff's Office
- Chelsey Peters, Oregon Department of Forestry
- Jenna Trentadue, Oregon Department of Forestry
- Anna Feigum, Oregon Emergency Management
- Amanda Rau, Oregon State University Extension Service
- Rachit Nerwal, Portland Bureau of Emergency Management
- Tony Zanetti, Portland Parks & Recreation
- Lucas Hillier, Portland Homeless Urban Camping Impact Reduction Program
- Edina Na-Songkhla, Portland Police Bureau
- Sergeant Marty Schell, Portland Police Bureau
- John Saltenberger, US Department of the Interior (Northwest Interagency Coordination Center)
- Roland Rose, US Forest Service
- Laura Taylor, West Multnomah Soil and Water Conservation District

Wildfire Smoke Subcommittee

Over the period of the plan revision, the Wildfire Smoke Subcommittee was organized at different times by Multnomah County Emergency Management staff members Jenny Carver, Lisa Corbly, and Arini Farrell.

- Carolina Gomez, Home Forward
- Celeste Duvall, Joint Office of Homeless Services
- Jason Holmgren, Lewis & Clark University
- Mark Dorin, Multnomah County Department of County Assets
- Cory Johnson, Multnomah County Department of County Assets
- Jenny Carver, Multnomah County Department of Human Services
- Renee Curtis, Multnomah County Department of Human Services
- Lee Girard, Multnomah County Department of Human Services
- Erin Grahek, Multnomah County Department of Human Services
- Joe Valtierra, Multnomah County Department of Human Services
- Nadège Dubuisson, Multnomah County Environmental Health
- Brendon Haggerty, Multnomah County Environmental Health
- Dr. Jen Vines, Multnomah County Health Department
- Ben Duncan, Multnomah County Office of Diversity and Equity
- John Wasiutynski, Multnomah County Office of Sustainability
- Peter Brewer, Oregon Department of Environmental Quality
- Jonna Papaefthimiou, Portland Bureau of Emergency Management
- Katy Wolf, Portland Bureau of Emergency Management
- Joel Michels, Portland Occupational Safety and Well-Being
- Kim Anderson, Portland Water Bureau
- Dennis Hughes, Portland Water Bureau
- Beth Gilden, Portland State University

Special thanks to a number of community and neighborhood groups whose work building local resilience and coordination and collaboration with government partners has informed this plan and provided a model for neighborhood-scale resilience.

Special thanks to Anna Bergman of Multnomah County Emergency Management for providing editorial review and proofreading of the plan, and to Jenny Carver and Arini Farrell of Multnomah County Emergency Management for administrative support for the wildfire section, while also convening the wildfire smoke planning process.


OREGON
DEPARTMENT OF FORESTRY


Multnomah
County


CORBETT
DISTRICT
14
19
FIRE
49


FIRE
CITY OF LAKE OSWEGO
OREGON
DEPT.


SAUVIE
FIRE
RESCUE
ISLAND


SCAPPOOSE
RFPD


TVF&R
Tualatin Valley
Fire & Rescue


PORTLAND
FIRE
EST. 1883
RESCUE


OREGON STATE FIRE MARSHAL
PREVENTION
EDUCATION
INVESTIGATION
HAZMAT
STATE OF OREGON
1859
PREMIER PUBLIC SAFETY SERVICES


PORTLAND PARKS
& RECREATION
Healthy Parks, Healthy Portland


GRESHAM
FIRE


FOREST SERVICE
US
DEPARTMENT OF AGRICULTURE


Joint Office of
Homeless Services


PBEM


Metro


PGE


PORTLAND
WATER
BUREAU
FROM FOREST TO FAUCET


BPS


DEQ
State of Oregon
Department of
Environmental
Quality


PACIFIC POWER


ENVIRONMENTAL SERVICES
CITY OF PORTLAND
working for clean rivers


OREGON
STATE
PARKS


Bonneville
POWER ADMINISTRATION


homeforward


NWCC
Northwest Interagency
Coordination Center


Portland State
UNIVERSITY


EAST MULTNOMAH
soil & water conservation district

Chapter 1 - Introduction

1.1 What is a Community Wildfire Protection Plan?

The concept of the Community Wildfire Protection Plan (CWPP) was authorized and defined in Title I of the 2003 Healthy Forests Restoration Act (HFRA)[2]. The intention of the HFRA was to "(protect) communities, watersheds, and certain other at-risk lands from catastrophic wildfire, to enhance efforts to protect watersheds and address threats to forest and rangeland health, including catastrophic wildfire, across the landscape, and for other purposes." Within that goal, the CWPP was created to increase coordination between local, state and federal entities in reducing harm from future wildfires.

The perceived value of CWPP's has increased since 2003, as climate change and population growth in high-risk wildfire areas has made it increasingly difficult to manage wildfire risk through fire suppression. Coordinated, adaptive strategies have become more prominent, and programs and funding at all levels of government has increased to support mitigation – the actions undertaken to reduce risk *before* a disaster. Within the HFRA, the only required elements of a CWPP are to support multi-governmental coordination, and to address wildfire fuel management and the reduction of structural vulnerability to fire. Over time, CWPP's in many jurisdictions have evolved in scope to include other ways of addressing risk.

Figure 1 - A diagram showing the four elements of the disaster cycle. This mitigation plan seeks to lessen the effects of future wildfire and wildfire smoke events before they occur.

A CWPP is a mitigation plan, meaning that it focuses on the long-term reduction of risk from future wildfire and wildfire smoke events. Actions in this plan may touch on response and preparation gaps, but specific operational procedures, for example, are located in response or operational plans. This plan is intended to maintain a focus on actions that can be identified and implemented before the next events occur, where they will hopefully reduce the loss to life, property, natural values, and infrastructure in those events.

Not only can mitigation planning save lives and property through pre-disaster action, it is an efficient way to spend money compared to reactive response. According to FEMA analysis, the implementation of

[2] https://www.govinfo.gov/content/pkg/COMPS-1123/pdf/COMPS-1123.pdf

mitigation strategies in Wildland Urban Interface (WUI)[3] areas saves three to four dollars over time for every dollar spent[4].

Local Natural Hazard Mitigation Plans[5] (NHMP) also have chapters for wildfire and wildfire smoke risks. Those plans are larger and broader as they address multiple hazards. In Multnomah County, those plans identify the CWPP as a primary source for wildfire and wildfire smoke mitigation strategies and work in tandem for addressing risk and identifying grant opportunities. There is overlap in information between the plans, but compared to an NHMP, CWPP's address wildfire and wildfire smoke risk in more detail and develop intensive coordination between stakeholders focused on these specific hazards.

1.2 CWPP Purpose

The specific mission and goals of this plan are identified later in this section. While CWPP's are only required under the HFRA to detail strategies for vegetative fuel treatment and structural wildfire protection, plans can be built out to take on a more holistic view of wildfire risk. The graphic below is from the Fire Adapted Communities Learning Network[6], and shows how a large number of topic areas can be built into strategies for whole community resilience. This plan addresses almost all of these potential elements.

Creating a community that is more fire adapted is the purpose of the plan. CWPPs are becoming a more prioritized nationwide solution for mitigating wildfire risk, as risk reduction is most efficient when it is collaborative and implementable at the property level.

[3] WUI areas are those where wildfire fuel intersects with development. This term is defined later in the document and used as a key element in mapping and analyzing wildfire risk.
[4] Natural Hazard Mitigation Saves Interim Report, FEMA, June 2018
[5] The 2017 Multnomah County Multi-Jurisdictional NHMP (currently being updated) addresses risk from all identified natural hazards in unincorporated Multnomah County and the Cities of Fairview, Gresham, Troutdale, and Wood Village and the Port of Portland and Columbia Corridor Drainage Districts. The City of Portland maintains its own plan, updated in 2022 and called a Mitigation Action Plan (MAP).
[6] The Fire Adapted Communities network has been built over nearly 20 years to provide a clearinghouse of information to the public and local agencies. The webpage is also available in Spanish - https://fireadapted.org/es/home-es/

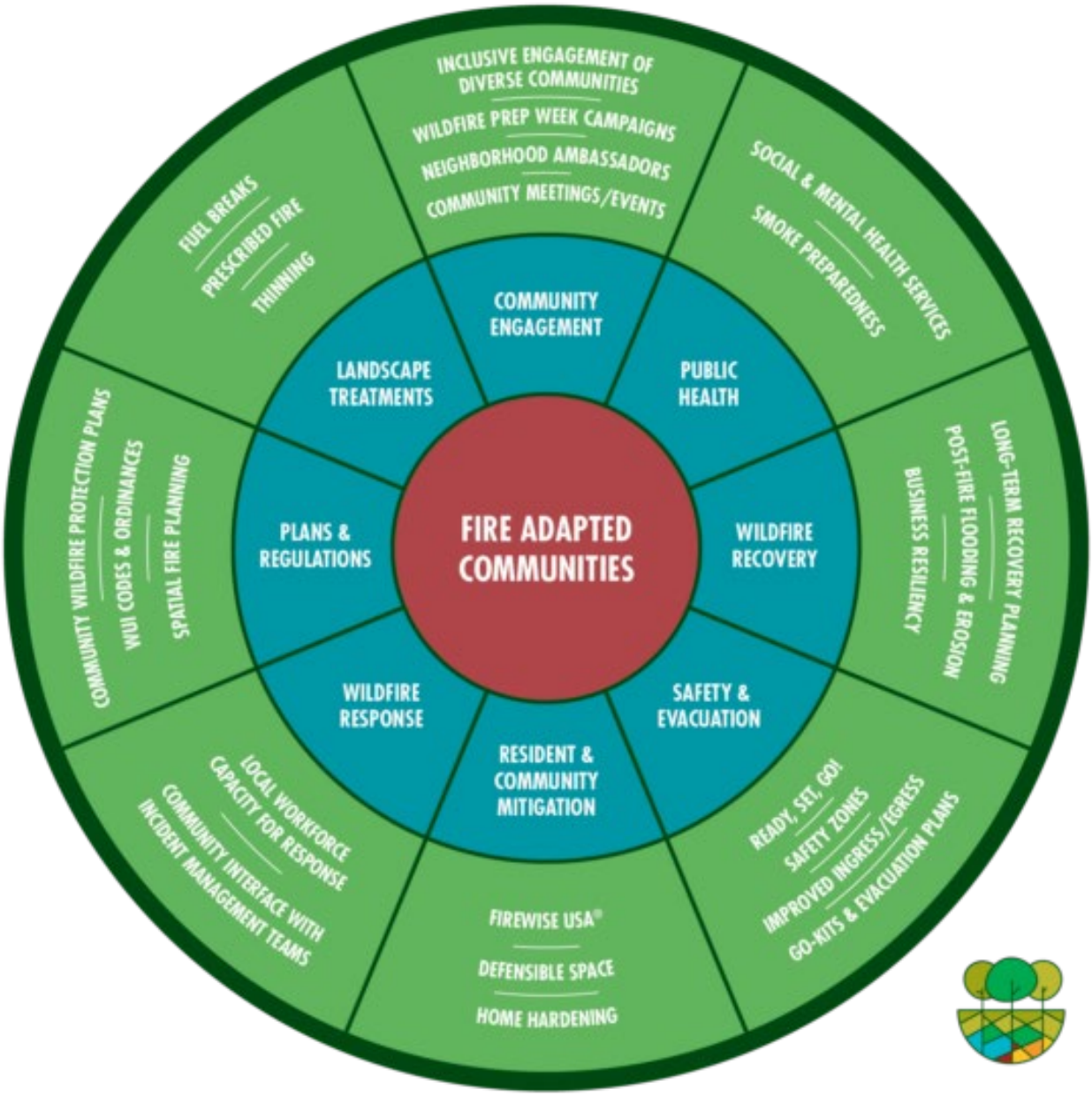

Figure 2 - Fire Adapted Communities Framework Graphic

1.3 How This Update Changes the 2011 Plan

The previous version of this plan was completed in July 2011. That plan was the first countywide wildfire protection plan in Multnomah County and originated from a Wildfire Planning Steering Committee formed in 2010. That committee grew from a 2009 Gap Analysis Report published by the City of Portland to implement mitigation strategies identified within the City's Mitigation Action Plan. The 2011 plan addressed risk across Multnomah County and was developed in partnership with the Oregon Department of Forestry.

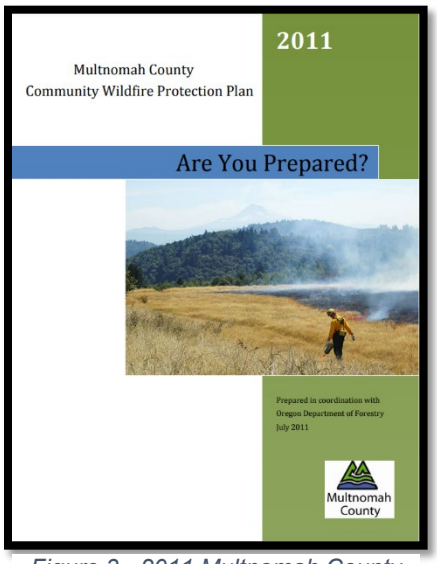

Figure 3 - 2011 Multnomah County CWPP Cover

Some of the strategies originating from the 2009 report are still priorities in 2023. This does not necessarily indicate a lack of successful implementation, as many wildfire and wildfire smoke risk-reduction strategies are long-term and ongoing. Updates to this plan recognize the increased risk and urgency to respond to these hazards as well as to create a more complete evaluation of risk and vulnerability, restore countywide coordination among mitigation planning partners, and identify updated mitigation strategies based on the most up-to-date research and data.

Significant changes to the plan:

- The addition of a Wildfire Smoke section is the most significant change, as this hazard was not addressed in the 2011 plan. The need for more information sharing and collaboration around wildfire smoke risk had been identified as a gap in local Natural Hazards Mitigation Plans.
- The wildfire risk chapters now uses mapping data collected as part of the Pacific Northwest Quantitative Wildfire Risk Assessment (PNW-QWRA), first published in 2018. The 2011 plan combined data available at that time from different sources to create original risk maps. The 2018 PNW-QWRA data is considered to have superseded that data and is expected to itself be superseded by new statewide mapping released later in 2023.
- This plan includes a more extensive consideration of how risk is being altered by climate change and population growth, and how wildfire and wildfire smoke mitigation efforts should be implemented equitably.
- Chapters have been slightly reorganized to better reflect priorities captured at stakeholder meetings. Mitigation strategies are assigned to a single implementing public agency, rather than having actions with responsibility shared by multiple entities. It is hoped that this change will make implementation strategy more clear and will recognize that strategies are more likely to be successful when scaled to the different resources available to fire districts and city and county agencies.

1.4 Why is the Plan Being Updated Now?

- The last six years have been a particularly dynamic period of wildfire and wildfire smoke impact in Multnomah County. The 2017 Eagle Creek Fire and the 2020 September Wildfire Smoke Event were catastrophic-level events that have dramatically indicated the need for ongoing planning and coordination among wildfire and wildfire smoke management partners. Concern at the local, state and Federal level is creating new frameworks and funding for mitigating wildfire and wildfire smoke risk that require a current plan to meet effectively.
- The Eagle Creek Fire led to a FEMA post-disaster grant[7] funding that was used to partially fund the update to this plan.
- As noted above, data used in the 2011 version of the plan has been superseded by newer studies, requiring a revised risk assessment.
- Ten years was already seen as an appropriate timeline for plan revision, based on the changes to urban and natural landscapes over that time and shifting prioritizations of risk and vulnerability. At the time the project began, however, there were no requirements or incentives for communities to update their CWPPs on any set timeline. A new grant established in 2022 is the first to require CWPPs be less than ten years old, creating an additional incentive for meeting that plan revision timeline.

1.5 How this CWPP Update is Organized

The first four chapters of the plan address information related to both wildfire and wildfire smoke, including a brief county profile, description of the update process, regulatory and policy information, and plan implementation goals.

Once the plan moves to defining risk and mitigation strategies, it is divided into separate sections for wildfire and wildfire smoke. This organization is due to the different scope and probability of future impacts between the hazards, and the different stakeholder groups that were involved in developing plan information for each hazard.

While there is some crossover between stakeholder groups, the wildfire portion is most focused on strategies of fire districts and local government land management agencies, while wildfire smoke has a stakeholder group more focused on public health, human services and environmental quality.

Within **the wildfire section**, subsections are organized first by seven plan topic areas, with mitigation strategies classified by each topic for all districts/jurisdictions. This organization is intended to enhance coordination between participating entities that may have similar strategies. The seven topic sections are:

- Organizational Collaboration
- Data and Risk Assessment
- Community Engagement and Resilience Building
- Structural Ignitability

[7] Fire Mitigation Assistance Grant (FMAG) 5195-6

- Land and Vegetation Management
- Fire Prevention
- Operational Coordination and Capacity

The next section is also divided into sections for each participating fire district and their associated participating city agencies and the county, which includes a description of communities at risk and priority fuel treatment locations in those locations. Each of these subsections also lists mitigation strategies where that fire district or jurisdiction is the lead. This second listing of strategies is intended to make it easier for each entity and their constituents to track local mitigation priorities.

Multnomah County Fire Districts and Jurisdictional Partners:

- Cascade Locks Fire
- Corbett Fire (formerly known as Rural Fire Protection District #14)
- Gresham Fire (Including protection services for the Cities of Fairview, Troutdale, and Wood Village, and for Rural Fire Protection District #10)
- Lake Oswego Fire (Including protection services for Riverdale Rural Fire Protection District #11 and the Alto Park Water District)
- Multnomah County
- Portland Fire and Rescue (including protection services in coordination with the Port of Portland)
- Sauvie Island Fire
- Scappoose Fire
- Tualatin Valley Fire and Rescue

Because wildfire smoke risk occurs roughly equally across the entirety of Multnomah County, **the wildfire smoke section** does not break out sections by geography. A Wildfire Smoke Subcommittee developed mitigation strategies through the identification of six guiding priorities, which are how strategies are organized.

1. Preparedness- Actions taken before a wildfire smoke incident to help reduce impacts of the smoke.
2. Community Partnership- Actions that involve engaging with and getting feedback from the community or the organizations that serve the community.
3. Community Outreach- Actions in which information or resources are provided to the community.
4. Caring for the Most Vulnerable- Actions that specifically help to mitigate impacts of wildfire smoke on the populations most sensitive to wildfire smoke.
5. Safety/Shelters- Actions specifically related to emergency shelter spaces and life safety resources and procedures.
6. Collaboration and Coordination- Actions involving multiple agencies or organizations working together.

Using the Maps in this Plan

Many of the maps included in this plan come from interactive map websites, and can therefore be used to locate elements of risk down to the property level. The static maps in the plan can be used for an overall dimension and location of risk, but it is recommended plan readers use the linked sites to be able to view risk in different ways and at different scales.

Maps which have an interactive web link available to the public have a link at the top. Within the link, the layers used for that map are shown. Example - **Interactive version of this map – (Administrative Boundaries - Land Management/Ownership)**

To access this data, one should follow the link and then use the named layers to create the map. The maps in this plan typically use a layer at the second level of data organization – click the box for the first layer and then open sub-layers in that category by clicking the arrow to the left of the box.

Not all of the maps have the same interface, but are all ArcGIS Online maps and use the same symbol to open layers, shown to the right. Clicking on this icon will open a panel that will show the layers needed to recreate a map.

The primary interactive mapping applications used in this volume are:

- Oregon CWPP Planning Tool – Statewide wildfire risk mapping layers, hosted by the Oregon Department of Forestry and Oregon State University. To access layers, first click on the 'Go To Layers' button.
- Oregon Wildfire Risk Explorer – A simplified version of the Oregon CWPP Planning Tool. Not all layers included in this plan are part of this mapping application, but it has been designed to be a version that is easier to navigate and identify and display risk at the property level.
- Oregon Fire Stations and Fire Districts – A statewide viewer hosted by the Oregon state Fire Marshal showing structural fire protection boundaries and locations of fire stations.

1.6 Equitable Planning Goals

Equitable planning for future wildfire and wildfire smoke events requires an understanding of how different members of the community are affected differently by natural disasters. Equitable planning is a response to environmental and climate justice principles, where those with the least resources or barriers to government services are the least able to recover from climate-driven disasters. Social vulnerability increases the risk of catastrophic loss from natural disaster and solutions for mitigating social vulnerability and building community resilience may require multi-method, engaged, place-based approaches[8]. The Federal Emergency Management Agency (FEMA) released its first Equity Action Plan in 2022 to work to reduce disparate impacts to underserved communities.

The location of future fires and exactly who will be the most directly affected cannot be fully anticipated, and building a resilient community requires moving away from one-size-fits-all solutions to find multi-dimensional approaches that recognize the different barriers that exist in accessing government services and resources. Evidence around the world shows that those with less resources and from groups historically underserved by government face greater impacts from wildfire and wildfire smoke, and planning must prioritize not increasing social and economic disparities with each new disaster.

[8] Social Vulnerability and Wildfire in the Wildland-Urban Interface – Literature Synthesis, Northwest Fire Science Consortium, M. Coughlan, A. Ellison, A. Cavanaugh, Fall 2019

Wildfire smoke is easily connected to disparate community impacts as a hazard that is not limited by geography. All county residents face health risks from wildfire smoke, but risks are highest among those who cannot access cleaner air spaces, have existing health risks, are old or young, and/or already live in areas with ongoing chronic poor air quality. Effective response to this hazard requires focusing services on those facing the highest risks.

Wildfire has a perception of being a hazard more likely to impact wealthier residents, and this is broadly true through much of the western United States, where the highest risk homes are often residences on large rural lots or vacation homes. Studies find that the environmental amenities of living in forests and the ability to purchase fire insurance facilitate the settlement of more financially advantaged families in areas with "moderate to very-high potential for high-intensity wildfires."[9]

However, emphasis just on the highest risk areas neglects risks to less resourced communities that may not be surrounded by forest but are located in Wildland Urban Interface areas and are at risk from ember-driven structural fire caused by large wildfires. The Almeda Drive Fire in 2020 in southern Oregon is an extremely stark example of this possibility. In that fire, 65% of the destroyed homes were manufactured housing – a major proportion of local affordable housing – lost in a fast-moving wildfire that is believed to have displaced over 3,000 people, disproportionately members of the Medford region's Hispanic community.

Rural areas of Multnomah County have a larger proportion of older adult residents who may have difficulty receiving alerts and evacuating their homes. Those with mobility limitations may have face greater challenges reducing fire risk on their properties.

And even in locations where residents generally have more financial resources, there will be some with fewer resources, renters, those with disabilities, those who may not speak English as their first language, unhoused residents and other community characteristics that may not be easily captured through census-tract level data analysis[10].

Neighborhood engagement can help to identify specific needs at the individual property level, and a deeper analysis of locations of vulnerable sites such as group homes, care facilities, mobile home parks and unsheltered resident campsites is needed to fully understand these dimensions of unequal risk.

To ensure equity is addressed in this plan, actions should be continuously evaluated for their impacts in increasing or decreasing risk disparities.

1.7 Climate Change Effects

Climate change is a major driver of wildfire and wildfire smoke risk. Although wildfire has always been a part of the ecology of this region and has been driven by naturally occurring drought cycles, there is scientific consensus that risk is rapidly being increased by warming

[9] The unequal vulnerability of communities of color to wildfire, *PLOS One*, I. Davies, R. Haugo, J.C. Robertson, P. Levin, November 2, 2018.

[10] The US Forest Service's Wildfire Risk to Communities web site overlays census-tract social vulnerability information with wildfire risk data – although with different risk mapping measures than are used in this plan. This site is currently the most accessible available data for matching census tracts with higher rates of underserved populations with wildfire risk areas.

temperatures. Information used for this plan to define increasing scope and intensity of wildfire and wildfire smoke events primarily comes from the Sixth Oregon Climate Assessment, published in 2022 by the Oregon Climate Change Research Institute (OCCRI) at Oregon State University.

Climate change is shortening the return rate of wildfire by increasing the rate and severity of droughts, causing vegetation to dry more quickly during longer, hotter summers and extending fire seasons later in the year where they are more likely to coincide with extreme wind events. Higher elevations are becoming more susceptible to fire as they have become warmer and drier and have had declining snowpack that normally maintains moisture in vegetation as it melts through the summer.

The effects of climate change are visible when looking at the rise in Oregon acres burned by major fires year to year. Although there are other factors that may be contributing to these more active wildfire seasons, such as wildfire fuel buildup and increasing population living in high-risk areas, there is a directly understood link between warming temperatures and fire weather conditions[11].

Vapor pressure deficit (VPD)[12] is a measurement of the air's ability to dry out vegetation and is a leading weather phenomenon linked to severe wildfire conditions. As the air becomes drier and windier it causes plants to have to draw more water from the ground, further reducing the amount of moisture in the soil. Climate change has been found to be the cause of between 66-90% of the increase in VPD and subsequent drying conditions that have contributed to major fire seasons[13].

[11] Wildfire climate connection, National Oceanic and Atmospheric Administration
[12] The role of vapor pressure deficit in wildland fire, Wildfire Today, Bill Gabbert, January 26, 2015.
[13] Quantifying contributions of natural variability and anthropogenic forcings on increased fire weather risk over the western United States, *Proceedings of the National Academy of Sciences of the United States of America*, Y. Zhuang, R. Fu, B. Santer, A. Hall, November 1, 2021.

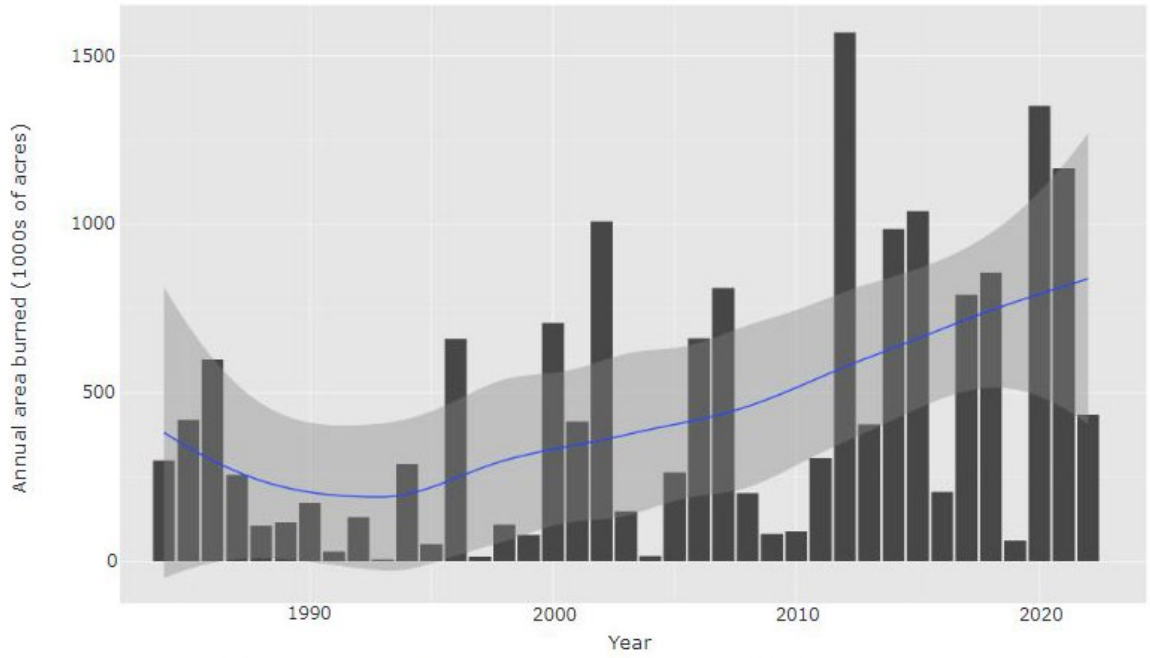

Figure 1. Annual area burned in Oregon from 1984–2022. Fires smaller than 988 acres (400 ha) were omitted. Data from Eidenshink et al. 2007 updated to October 2022 (www.mtbs.gov).

Figure 4 - Chart from the Sixth Oregon Climate Assessment (OCCRI)

It is believed that under a scenario where temperatures increase by 3.6 degrees Fahrenheit (two degrees Celsius), there will be a 50% increase in extreme autumn fire weather in western Oregon compared to the 1800s.

Other identified climate change factors that are increasing risk in Multnomah County are:

- An increase in nighttime temperatures
- Warmer temperatures during dry wind events
- Greater variations in annual rainfall, switching between drier winters that leave less moisture through the summer and wetter winters that cause an increased growth of grasses and small shrubs (fine wildfire fuels)
- Increases in tree mortality for species that require a higher water table[14], and the introduction of new diseases and pests

Increases in wildfire smoke events are magnified by the increase in wildfire risk across the entire region of western North America. Since wildfire smoke can cause chronic health impacts from fires even very far away, an increased number and scope of fires across the western region creates a cumulative increase in impact in Multnomah County. Increased wildfire activity is projected to double unhealthy smoke effects even under only a moderate climate change scenario and triple under a scenario where emissions continue on their current trend.

The smoke effects of the 2020 Oregon fire season was an event surpassing all previous expectations of smoke severity, but such events may become much more frequent. Less dramatic smoke events that still meet thresholds for unhealthy air were once unknown in

[14] Species identified by Metro as suffering die-offs include red alder, western red cedar and Douglas fir.

Multnomah County, but have occurred every five of the last seven summers through 2022, and are expected to only become more frequent as fire seasons continue to grow longer.

1.8 CWPP Mission and Goals

The mission of this plan is to *collaboratively identify and implement strategies for reducing harm from future wildfire and wildfire smoke disasters before they happen.*

The goals identified to support this mission are to:

- Promote public awareness and understanding of wildfire and wildfire smoke risks by collecting multi-jurisdictional risk reduction analysis in one volume.
- Reduce risk to people, property, infrastructure, and the natural environment.
- Develop and maintain collaborative partnerships and funding goals for the implementation of wildfire and wildfire smoke mitigation strategies.
- Increase local resilience to disasters through adaptive strategies, community capacity building, and post-event recovery planning.
- Build long-term, implementable action plans that are responsive to increased risk from changing climate conditions and changes in community population, development, and demographics.
- Prioritize mitigation strategies based on the reduction of disparate impacts to those with barriers to government services and subsequent disaster resilience and recovery.

Chapter 2 - Community Profile

This plan addresses wildfire and wildfire smoke risk across the entirety of Multnomah County.

Multnomah County is located in northwestern Oregon, bounded by the Columbia River to the north, Washington and Columbia Counties on the west and northwest and Hood River and Clackamas Counties to the east and southeast. The county is the smallest in Oregon by area, but has, by far, the largest population in the state. This high population density has significant implications for wildfire and wildfire smoke risk. Multnomah County also has the highest total numbers of residents in the state who face barriers to resilience from these disasters.

2.1 Population Characteristics

The population of Multnomah County grew by approximately 80,000 people between the 2010 and 2020 United States censuses. Nearly all of the population growth in the county occurred in incorporated cities, but this still reflects a large increase in residents at risk from wildfire. City growth has occurred via denser urban cores, at the edges of incorporated limits, and through annexation of rural unincorporated areas.

Population is heavily concentrated in the center of the county, leaving large areas with low population density on the eastern and western reaches, but significant numbers of people still live in those areas, apart from large tracts of public land and privately owned timberlands.

Interactive version of this map – (Planning and Cadastral - Estimated Housing Density)[15]

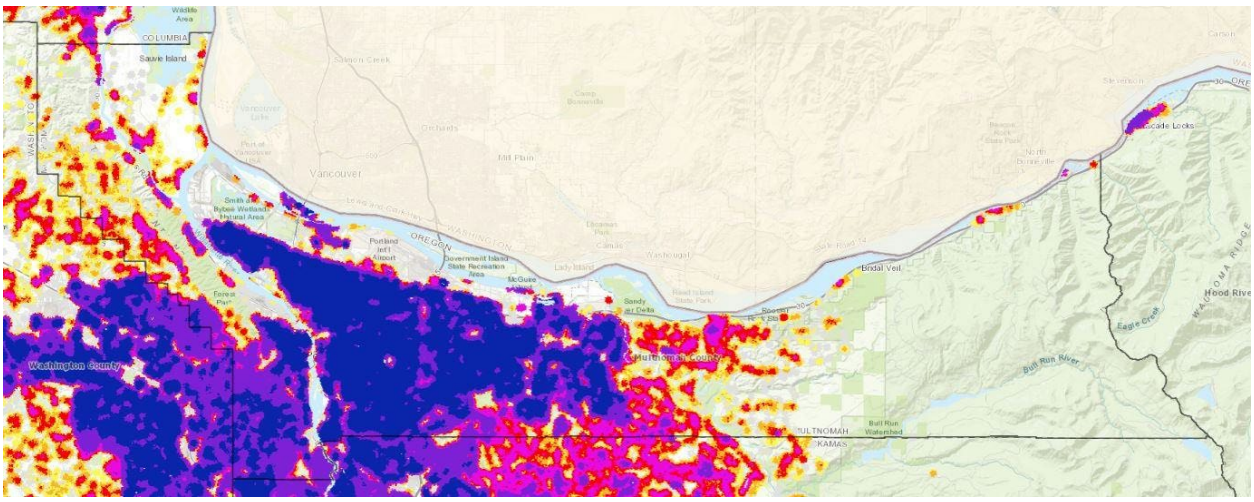

Figure 5 - Population density in Multnomah County. Map hosted at the Oregon Wildfire Explorer, with data from the 2013 West Wide Wildfire Assessment. Darker colored areas have the highest population density, and areas with less than one house per 40 acres are shown with no color.

As risk from wildfire smoke impacts the entire population, the county's population growth represents a significant increase in vulnerability to public health impacts.

[15] When maps from the Oregon Wildfire Explorer are used, the map layers are identified to help readers navigate the website. Map layers at the site can be zoomed and can be searched by address.

2.1.1 Residents at Disproportionate Risk from Wildfire and Wildfire Smoke

In the ten-year span between the last two federal censuses, the county has seen an especially significant increase in its proportion of older adults, who are identified as a population group at higher risk from wildfire smoke. Older adults may also have barriers to accessing certain types of alerts and communication and are more likely to have mobility limitations that may make evacuation or property maintenance for wildfire risk more difficult.

Multnomah County also continues to become more racially and linguistically diverse, with increases in non-white populations and populations who speak English less than very well. The Hispanic/Latino population is projected to be the fastest growing group over the next 40 years[16], indicating a need for continuing collaboration with community organizations serving this population and multi-lingual resources and outreach focused on reducing risk from wildfire and wildfire smoke.

Census statistics indicate that the population in most wildfire prone unincorporated locations such as Forest Park/West Hills, east of the Sandy River, and in the Columbia River Gorge are more likely to be older and less likely to live in poverty, be non-white, or speak a language other than English at home. Census-tract level data is often too broad, especially in rural tracts, to effectively plan for pockets of vulnerability such as group homes, renters, migrant workers, and those with mobility limitations. When risk reduction efforts are extended to all Wildland Urban Interface areas, locations on the edges of cities and near large city parks that could see wildfire risk may change the demographics at risk and are in need of further study.

Unhoused Residents

County residents living without shelter are among the most at risk from both wildfire and wildfire smoke. A Point In Time census is conducted roughly every two years, and the 2022 count found 3,057 unsheltered residents in Multnomah County —an increase of 50% since 2019[17].

Unsheltered residents have less access to cleaner air spaces and less ability to protect themselves from unhealthy air where they live. Provision of emergency cleaner air spaces and respiratory masks have been used to support public health during recent wildfire smoke events. Results from the 2022 count also indicate that 60% of unsheltered residents have one or more disabilities, a much higher rate than the housed population – including about 25% with a physical disability and about 25% with a chronic health condition[18]. Unsheltered residents are also disproportionately likely to be Black/African-American or American Indian/Alaska Native, groups already more likely to suffer from major chronic illnesses, including asthma[19].

The 2022 count found that about 10% of unsheltered residents were living in woods or open space. Unsheltered residents living in woods or open space are at high risk from wildfire, living in areas bounded by fire fuels, having barriers to receiving alerts and warnings, and living in locations that may be hidden from view of emergency responders. Other disabilities disproportionately held in the unsheltered community, such as hearing or vision limitations and developmental disabilities, may also create barriers to emergency alerting and evacuation.

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[16] 2060 growth forecast, Metro, April 30, 2016
[17] All data in this section comes from the 2022 Multnomah County Point in Time Count - Report available here
[18] Respondents could choose multiple answers for disability type, so these two numbers may count the same people in many cases.
[19] Current Asthma Demographics, American Lung Association

Camping in woods or open space also creates wildfire risk, with unsheltered residents relying on open fires for cooking or warming. Campsites have blocked firefighter access in some cases, increasing the risk of a wildfire escaping control. The Joint Office of Homeless Services believes that the number of people camping in woods or open space is likely significantly higher than recorded by the Point in Time count, due to the difficulty of locating or accessing campsites in undeveloped areas and parklands during census counts.

2.2 Land Ownership

The eastern side of Multnomah County has a high percentage of public lands, due to Forest Service Units, Bureau of Land Management properties, Columbia River Gorge parks, local parks, and the Bull Run Watershed. The area also includes large privately held timber tracts. This creates coordination challenges as well as opportunities for mutual support and resource sharing in addressing wildfire risk.

Interactive version of this map – (Administrative Boundaries - Land Management/Ownership)

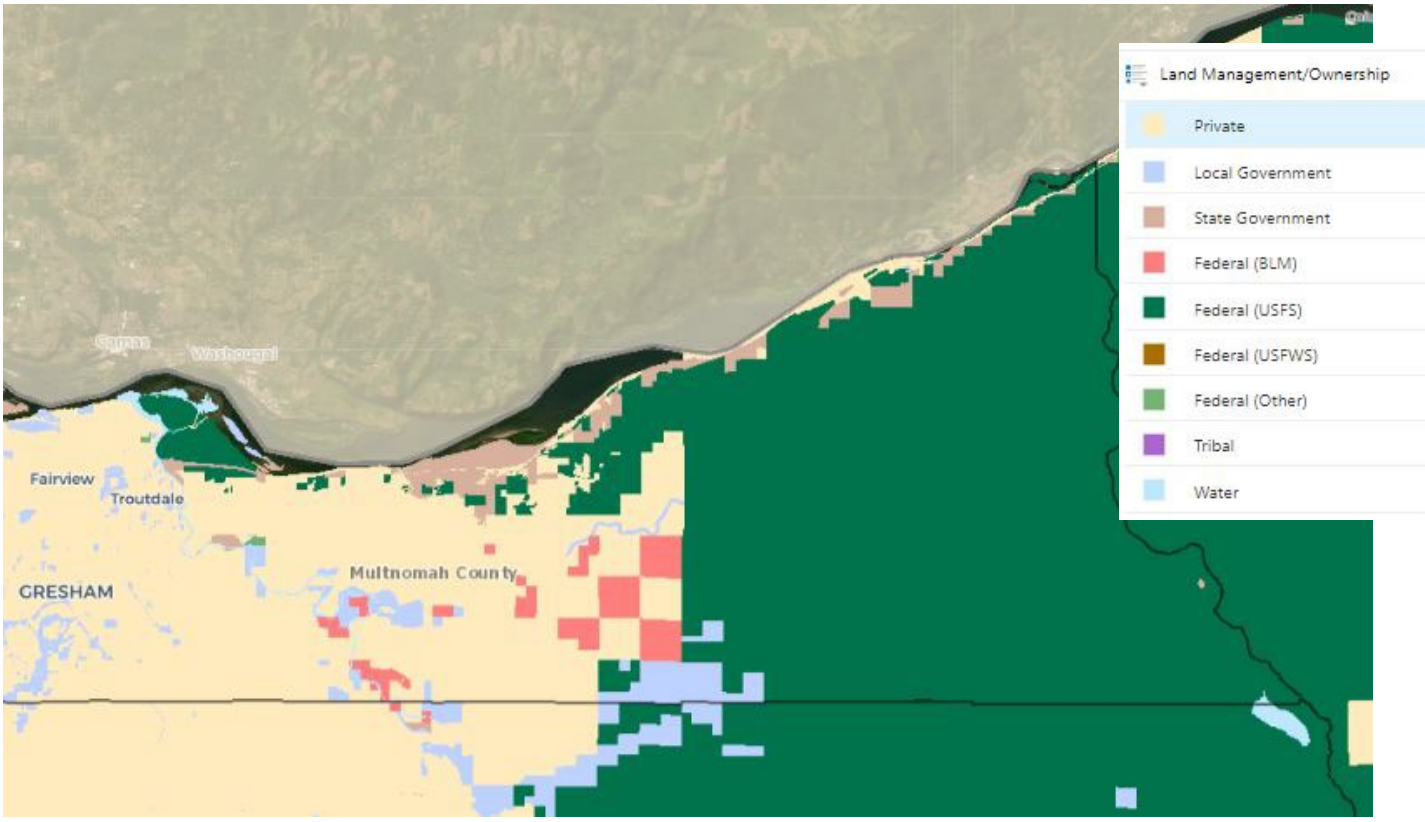


Figure 6 - Land management/ownership in eastern Multnomah County. Map hosted by the Oregon Wildfire Explorer, data from Bureau of Land Management (2015)

The west side of Multnomah County has much less public land, but includes 5,200-acre Forest Park (one of the largest urban forests in the United States), the Sauvie Island State Wildlife Area and timber holdings and BLM properties in the northwest corner.

Public lands in central portions of the county are primarily local and regional parks, but also include Tryon Creek State Natural Area (the only Oregon state park located in a major metropolitan area) at the boundary with Clackamas County.

Interactive version of this map – (Administrative Boundaries - Land Management/Ownership)

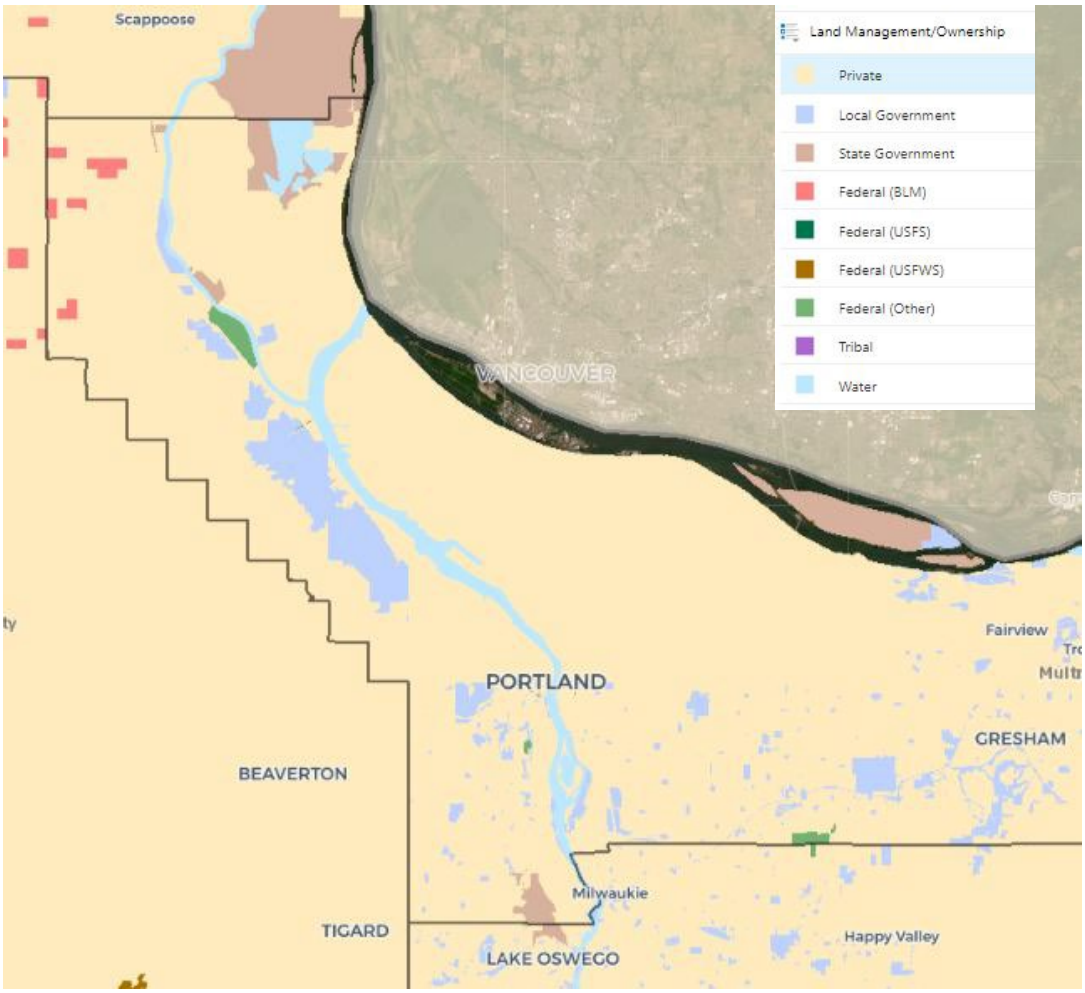


Figure 7 Land management/ownership in western Multnomah County. Map hosted by the Oregon Wildfire Explorer, data from Bureau of Land Management (2015)

2.3 Future Development

Like all urbanized areas of Oregon, the Portland Metropolitan Area has an Urban Growth Boundary (UGB) that defines locations of future urban and suburban development. UGBs were created to preserve farm and forest lands from urban growth, while maintaining an area large enough to provide sufficient housing for 20 years within a developed core. Areas outside the UGB allow only development at very low density and other uses that conform with resource land goals.

Interactive version of this map – (Boundaries/Urban Growth Boundary and Other - Urban and Rural Reserves)

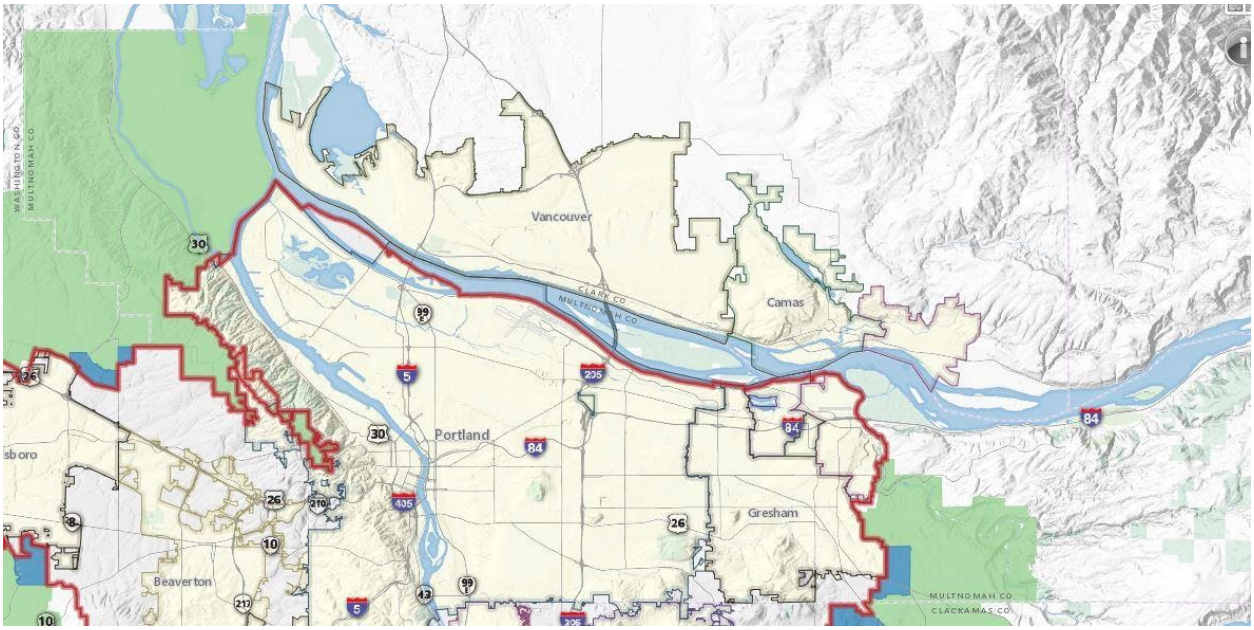


Figure 8 - Urban Growth Boundary of the Portland Metro region outlined in red. Areas in green are rural reserves and areas in blue are urban reserves. Map from Metro.

The UGB in Multnomah County has not expanded for 20 years. The area shown in blue on the above map southeast of Gresham is the only location in Multnomah County identified as an urban reserve, where a future expansion of the UGB would be most likely to occur. Areas in green are rural reserves, where there are high-value farms or forests or natural features, and are designated to remain in those uses for at least 50 years.

The maintenance of forest lands in particular maintains a risk of major wildfire in the rural parts of the county and to communities on the edges of the UGB. However, the UGB's limits on suburban development in those forests also reduces vulnerability from new subdivisions that would create significant fire protection challenges.

Prioritizing denser development to meet housing supply needs within UGB limits also means that dense single and multi-family housing can be expected to be built in Wildland Urban Interface areas near the UGB and in higher-risk areas within city limits such as along ridges and near buttes, vegetated greenways, and road and utility right-of-ways.

High-risk wildfire areas such as Forest Park, Gresham's East Buttes and the west side of the Sandy River are within the UGB. Different locations within the UGB have different zoning designations and different density rules, but critical housing needs are expected to create pressure for increased housing density across the county.

Low-density housing outside the UGB is permitted, but population growth has not occurred in those locations based on 2010-2020 census data.

2.4 Climate

Multnomah County's climate is typical of the Willamette Valley, being relatively cool and free of extreme temperatures and with a long growing season. Wet winters and springs are typical and a dry season usually starts in early July and ends sometime in September. Repeated temperature extremes have been frequent over the last five years and have caused recent fire seasons to begin earlier and end later.

Typical weather patterns in Multnomah County see the bringing of high-pressure systems beginning in late summer/early fall, as cool dry air begins to move down from Canada. These high-pressure systems cause dry winds to blow from the east.[20] If these winds arrive before the return of rain and intersect with the driest period of local vegetation, the highest local wildfire risk conditions are created.[21]

Dry east winds have been a part of nearly every major fire in the county's history. As fire seasons grow hotter and lengthen in time, the rate of extreme risk increases. Climate change may also alter the frequency and timing of these high-pressure systems.

[20] In the 1902 Yacolt Fire, these fire weather conditions were known as 'Devil Winds.'
[21] First east wind event of the season means high fire danger!, Fox 12 Oregon, Mark Nelsen, September 7, 2022

Chapter 3 - Plan Update Process

The plan update process originated with the funding of a Fire Management Grant from FEMA, as part of post-disaster funds made available after the 2017 Eagle Creek Fire. These funds were used to pay for Multnomah County Emergency Management staff time to manage this project.

The stakeholder process kicked off in late 2019. Shortly after the plan kickoff, a Steering Committee to address wildfire planning and a Subcommittee to address wildfire smoke planning were created. Further planning processes were built through these committees.

Shortly after the update kicked off, the COVID-19 pandemic prevented any progress for nearly the entirety of 2020. The extreme 2020 Oregon wildfire and wildfire smoke season and ensuing state policy developments continued to emphasize the need for this update.

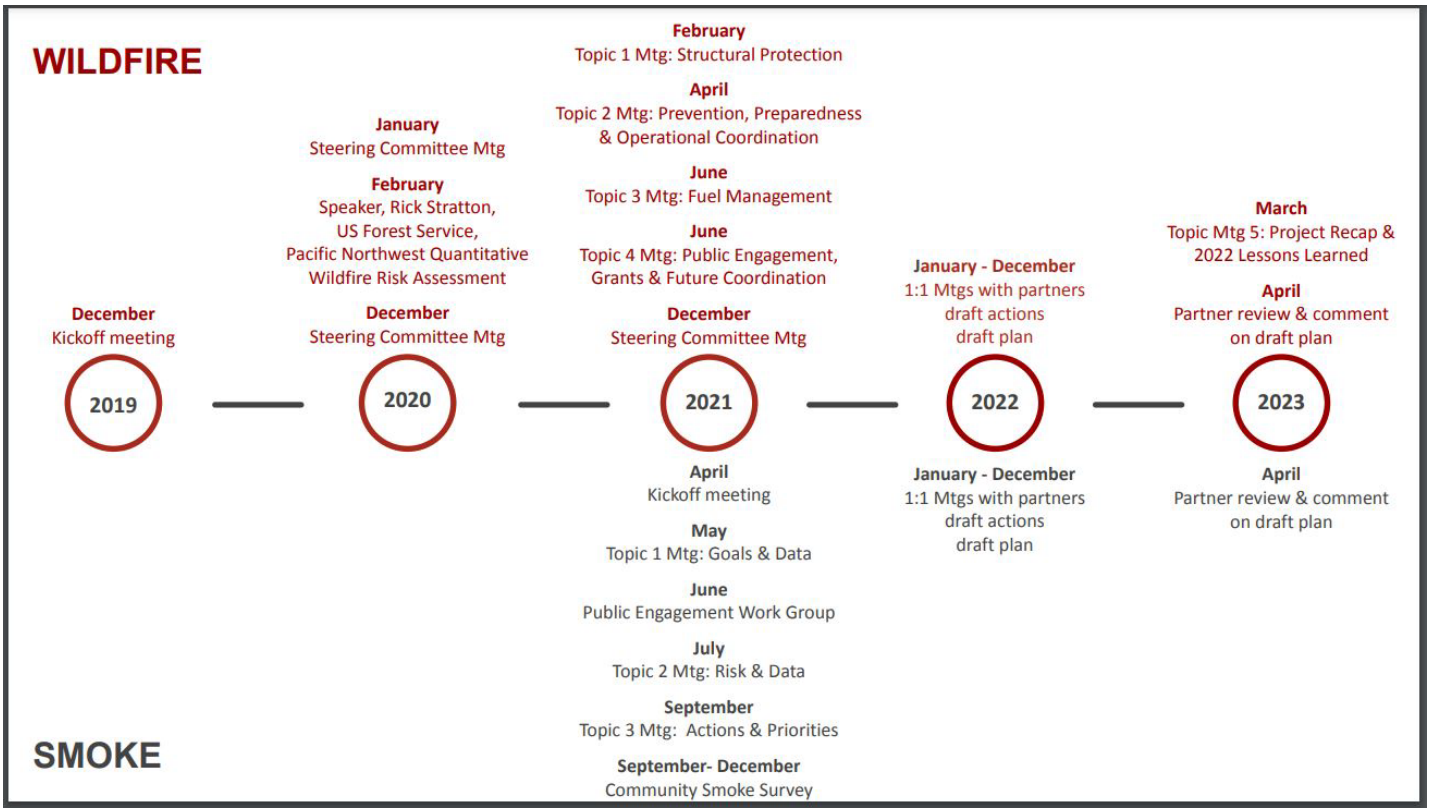
Planning team work was resumed in 2021, with stakeholder meetings held throughout the spring to address mitigation priorities over different topic areas. The wildfire portion of the update took a hiatus through the summer fire season, and work was re-engaged in the fall with a goal of completing the plan in Spring 2022.

Staff shortages and competing priorities prevented the project from meeting that goal before the fire season restarted again in 2022. The project was again prioritized after the 2022 fire season, with a revised goal for completion by Summer 2023. Individual meetings between the project manager and plan stakeholders occurred in 2022 and early 2023.

The COVID-19 pandemic restructured public engagement, with in-person meetings replaced by online meetings. Opportunities to meet with neighborhood and community groups to discuss the project and to collect additional information from residents, and public engagement efforts by local fire districts, were ongoing. A more comprehensive public engagement process regarding the plan update is planned for later in 2023.

Figure 9 - A flyer for a wildfire mitigation meeting held during the plan update process.

3.1 Project Timeline



- ***December 12, 2019*** - CWPP Update Project Kickoff Meeting

- ***January 30, 2020*** - CWPP Steering Committee Meeting
- ***February 28, 2020*** - Wildfire Speaker Event – Rick Stratton, US Forest Service, Co-Author – *Pacific Northwest Quantitative Wildfire Risk Assessment*
- ***December 17, 2020*** – CWPP Steering Committee Meeting

- ***February 11, 2021*** – Wildfire Stakeholder Meeting #1 (Structural Protection)
- ***April 14, 2021*** – Wildfire Smoke subcommittee kickoff
- ***April 29, 2021*** – Wildfire Stakeholder Meeting #2 (Fire Prevention, Preparedness and Operational Coordination)
- ***June 2, 2021*** – Wildfire Smoke Public Engagement sub-group meeting
- ***June 3, 2021*** - Wildfire Stakeholder Meeting #3 (Wildfire Fuel Management)
- ***June 7, 2021*** – Wildfire Smoke Data sub-group meeting
- ***June 22, 2021*** - Wildfire Stakeholder Meeting #4 (Public Engagement, Grants, and Future Coordination)
- ***July 14, 2021*** – Wildfire Smoke subcommittee meeting (Risk & Data)
- ***September 30, 2021*** – Wildfire Smoke subcommittee meeting (Mitigation Actions)

- ***October 26, 2021*** – Wildfire Smoke subcommittee meeting (Mitigation Actions)
- ***December 17, 2021*** – CWPP Steering Committee Meeting
- ***March 7, 2023*** – Wildfire Stakeholder Meeting #5 (Project Recap and 2022 Lessons Learned)
- ***April 25, 2023*** – CWPP Steering Committee Meeting

3.2 Stakeholder Organization

Stakeholder partnership is an essential element of the CWPP process and was a priority for this revision. Along with all of Multnomah County's fire districts and the state forest management agency (ODF), an effort was made to include:

- Federal and state agencies involved in firefighting, fire and smoke mitigation and environmental health
- City and county departments or bureaus with roles in land management, public health and human services, land use, and homeless services
- Electric utility partners
- Regional governmental bodies
- Other local land management and conservation districts and representatives of community organizations.

A more detailed list of participating partners for each hazard are located in the respective Wildfire and Wildfire Smoke chapters.

Chapter 4 - Plan Implementation and Maintenance

The ability to keep a mitigation plan active, implementable, and accountable is essential to long-term project success. Oregon's recent fire and smoke seasons have created momentum for increased coordination and continued momentum and coordination will be needed long after the plan update is completed.

However, maintaining continuity for countywide wildfire and wildfire smoke planning has proven to be difficult. The 2011 CWPP directed a Wildfire Technical Committee (WTC) that had been established before the plan was written, with maintaining the plan and leading implementation of a number of mitigation strategies. After several years, the WTC stopped meeting. Challenges — then and now— include sustaining capacity for prioritizing mitigation and identifying a central body or position that can coordinate meeting planning, information distribution, and maintain contact lists as stakeholders change through job changes and retirements.

For wildfire mitigation, there are eleven fire departments in the county managing fire risk and many other partners involved in firefighting, land management, and other focus areas of need. The fire districts serve very different communities and have varying available resources, making it difficult to scale coordination and programming as well as locate plan maintenance responsibility within any one fire district. Wildfire smoke partners are more centralized due to Multnomah County government's countywide role in environmental health and human services, but still face the same issue with identifying a position that can be funded to manage communication between partners over time.

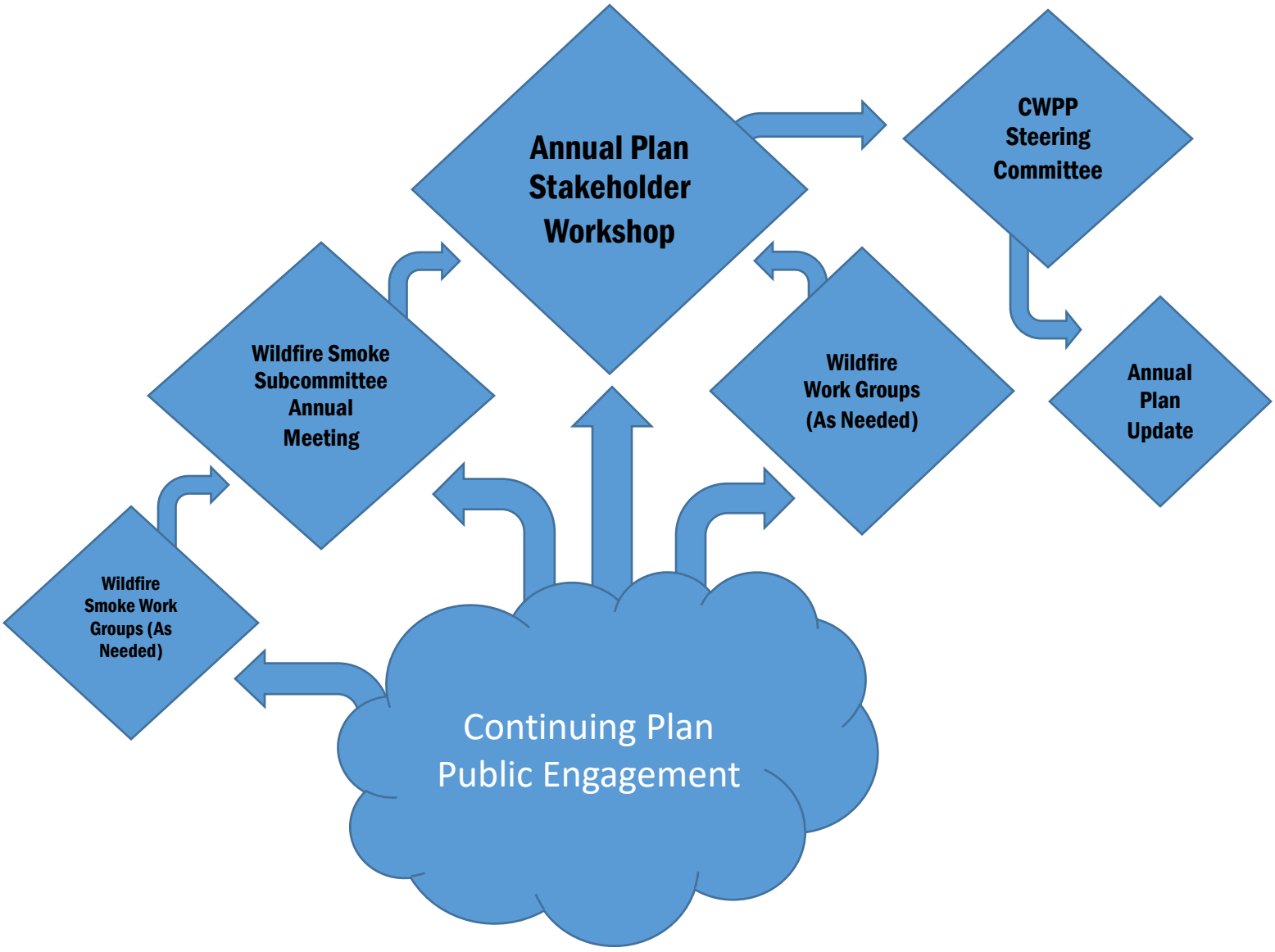
A benefit gained since the last plan is the increased prioritization of state resources for local mitigation, which can potentially be leveraged to support ongoing coordination.

4.1 Plan Maintenance Strategy

The 2011 plan specified a five-year review cycle, with no firm date provided for the plan update. The goal for ongoing stakeholder coordination in this update is to:

- Hold an annual wildfire stakeholder workshop to identify updates to data, coordination goals, and mitigation strategies, and validate that information with the Steering Committee for minor annual updates to the CWPP.
- Identify countywide subcommittees or task forces to address ongoing planning needs in specific topic areas, with these groups meeting at least once per year and reporting out recommendations to the annual stakeholder workshop.
- Maintain and convene the wildfire smoke subcommittee at least annually to identify new or updated mitigation actions. More specific work groups should be created as needed, when specific topic areas become highlighted as in need of deeper analysis.
- Continue regular public engagement throughout the maintenance phase, so future updates will already have access to up-to-date public priorities and identified service gaps. Information received from public engagement activities should be presented at annual plan stakeholder workshops.

- Fully revise the plan within 10 years of this version's adoption, with more frequent revisions developed if required by new risk data, lessons learned from future events, changed funding requirements, or shifts in federal, state, or local policy priorities.



It is recommended that the plan be continuously improved during annual reviews, so that planning momentum and coordination is maintained and the next major update will not require as much effort.

4.2 Policy and Strategic Planning Environment

A critical development in wildfire and wildfire smoke mitigation implementation has been an increase in interest at the state and federal level, after a long period of highly destructive western fires. This has led to additional resources for mitigation and new policy frameworks for reducing risk. A key need for Multnomah County stakeholders going forward is to remain aware of external funding and policy priorities and to align local efforts with these priorities when possible, or to be involved in shaping policy when it does not meet local need.

A major initiative in Oregon was undertaken in 2019 with the establishment of the Governor's Council on Wildfire Response. This Council developed recommendations over nine months and released a report in November 2019 that became the basis of sweeping wildfire and wildfire smoke legislation in 2021. Many new programs are expected to initiate later in 2023, stressing the need to maintain coordination between Multnomah County stakeholders and state-level activities.

- ***Oregon Senate Bill 762 (SB 762)***

SB 762 was passed in the 2021 legislative session as a comprehensive law to attempt to address the growing risk of wildfire and wildfire smoke in Oregon. $220 million was budgeted through the legislation for grants and other programs. After the passage of SB 762, a Wildfire Programs Advisory Council was created to recommend and implement policies to continue improvement of wildfire mitigation and response.

Overall, eleven state agencies were tasked with roles in implementation of SB 762. Some of those agency roles are provided in more detail here:

The **Oregon Department of Forestry (ODF)** was tasked with developing statewide wildfire risk maps that classify Oregon lands into five categories of wildfire risk—extreme, high, moderate, low, and no risk. The maps will also identify a new Wildland Urban Interface (WUI) designation for every tax lot in the state. Lots in high or extreme risk in the revised WUI would potentially be subject to higher building code and defensible space requirements. The maps were initially released in 2022 before being rescinded and will be re-released in 2023. ODF was also tasked with creating a Certified Burn Manager Program to encourage prescribed fire and with the development of a 20-year strategic plan to prioritize large-scale landscape resilience in the face of climate change. ODF manages grant programs created through SB 762, which are noted in the grants section.

The **Oregon State Fire Marshal (OSFM)** is responsible for creating and maintaining the Oregon defensible space code and fire code using model language from the International Wildland Urban Interface Code. These code updates are in final review and are expected to go into effect in late 2023. OSFM is also meeting SB762 priorities with the development of the Response Ready Oregon and Fire Adapted Oregon programs. Fire Adapted Oregon includes a regional Community Risk Reduction Unit, which can provide mitigation support in education, community training, and data analysis. Response Ready Oregon also has regional representatives; they support firefighting mutual aid and modernization of wildfire response capacity.

The **Oregon Department of Land Conservation and Development (DLCD)** released a recommendations report in September 2022, identifying potential changes to state and local

land use planning programs to reduce wildfire risk. Implementation at the DLCD level is expected to take place between 2023 and 2024, and local implementation may begin by 2025. Recommendations include the prioritization of:

- inclusive community information and engagement in planning that creates wildfire adapted communities;
- assessing transportation networks for improved response and evacuation;
- amending new development land use codes for improved response and evacuation and to incorporate additional wildfire risk mitigation requirements;
- preparing for post-disaster wildfire recovery; and
- coordinating CWPPs with local comprehensive plans and codes.

SB762 provisions for wildfire smoke fall to the **Oregon Department of Environmental Quality (DEQ)** and the **Oregon Department of Human Services (DHS)**. DEQ was tasked with developing a program for supporting local smoke response planning and to support their own ability to provide air quality data to communities. DHS was directed to establish a grant program for establishing emergency clean air shelters and improving air filtration systems in public buildings.

The **Oregon Public Utilities Commission (PUC)** was directed to work with power providers to begin developing wildfire protection plans and to continue to develop content requirements for those plans. The PUC coordinated rulemaking for the Public Safety Power Shutoff (PSPS) program and also maintains work groups for risk analysis and community engagement.

- ***Oregon Wildland Urban Interface Code and Fire Code***

As noted above, the Defensible Space Code is in final review as of March 2023. The could would create requirements for maintaining defensible space in areas determined to be in extreme or high-risk locations on the forthcoming ODF maps and mapped in the statewide WUI map. It is currently unknown what, if any, locations in Multnomah County will meet this threshold. Local communities can adopt selected elements of the Defensible Space Code by choice to apply higher standards.

The Oregon Fire Code was most recently updated in 2022 and serves as the state's manual for fire prevention and safety standards for buildings. The code is based on the 2021 International Fire Code. The code does not address wildland fire, but structure measures for fire resistance and protection play a role in preventing structural fire caused by wildfire.

- ***Oregon Building Codes***

Building codes are an important piece of wildfire mitigation when they can make new or rebuilt construction more resilient to wildfire ignition. Broadly, Oregon Building Codes seek to have statewide consistency and generally do not allow different jurisdictions to have stronger or weaker codes. However, there are exceptions that have been created to allow communities with particular natural hazard risks to strengthen codes beyond the statewide standard.

A new permanent rule was created in January 2019 allowing local communities to require more fire-resistant materials when the location of the construction was in an identified wildfire hazard zone. The update driven by SB 762 will make it a requirement to follow these rules when identified as being in a high-risk area under state risk maps. It is not yet known if any such areas will be mapped in Multnomah County.

- ***Local Land Use Planning***

Each local jurisdiction in Multnomah County has land use and zoning codes. Local zoning classifications can include overlays that can provide provisions on land use approvals. Overlays can specifically be for the purpose of managing wildfire risk, or may be designed for other purposes and have effects on wildfire risk. These standards may restrict uses or create requirements when siting new development in a risk area. Development standards may also include preferred plant lists that can be designed to encourage drought- and fire-resistant landscapes.

- Each local jurisdiction has a comprehensive plan, which lays out long-term land use and policy statements for future development. Local comprehensive plans must be consistent with state comprehensive land use planning goals, including Goal 7, which addresses natural hazard risk. Local plans address hazard risk, including from wildfire, and how that risk impacts future development plans.
- The Columbia River Gorge Commission Management Plan is an additional layer of land use planning for the Columbia River Gorge National Scenic Area. This plan was most recently updated in October 2020 and includes provisions for reducing wildfire risk and addressing risks being increased by climate change.

Wildfire Smoke

- In response to the 2020 September Wildfire Smoke event, the State of Oregon passed a rule (OAR 437-002-1081) to better protect workers from wildfire smoke risk in occupational settings. Under the rule, employers must consider wildfire smoke as a workplace hazard and complete exposure assessments to monitor employees when particulate matter readings become unhealthy.

Regional Initiatives

- A project funded through a 2019 Regional Disaster Preparedness Organization (RDPO) grant will be to enhance the understanding of the wildland fire risk in the five-county Portland Metro region, focusing on the highest risk wildland-urban interface sites. The first phase will map the highest risk interface sites for each of the five counties and produce a report that outlines specifics of the risk in each site, including information on the vulnerable populations in the area. It will compile national best practices and evaluate gaps in current fire management, recommending next steps. The report is expected in 2023, and findings will be used to inform the next updates to the CWPP.
- Another RDPO-administered project was for a Wildfire Smoke Regional Resilience Toolkit, released in 2021 in partnership with the U.S. Environmental Protection Agency and Metro. The toolkit provides guidance for how to include wildfire smoke hazards in mitigation plans and outlines possible mitigation strategies. The toolkit was used in the development of this plan.

4.3 Grants

Grants are an essential part of successful mitigation implementation, because local jurisdictions often lack budget and other resources to perform all of their risk reduction priorities. As wildfire seasons have lengthened and become more intense, new grant programs have been created to fill that gap.

This list should not be considered to be fully up to date or complete. It is a starting point for identifying funding paths for mitigation implementation and should be reevaluated annually to include newly identified opportunities. Some of the grants are expired as of 2023 and may not necessarily be continuing opportunities. Those grants are included to provide a view of funding priorities that have recently existed and which may inform best practices and indicate priorities for future grants. Local wildfire mitigation stakeholders should continue to work with federal, state, and regional agencies to track new funding opportunities.

Although there has been an increase in external funding available to local jurisdictions specifically for wildfire mitigation, the short-term nature of those opportunities – compared to FEMA's annual grants and predictable post-disaster funding – makes grant planning and management more difficult, so additional resources for grant management may also be needed.

FEMA/Oregon Emergency Management administered grants

- Building Resilient Infrastructure and Communities (BRIC)
    - BRIC grants are annual, nationally competitive, pre-disaster natural hazard mitigation grants that can fund wildfire and wildfire smoke mitigation projects and planning identified in Natural Hazard Mitigation Plans.
- Hazard Mitigation Grant Program (HMGP)
    - HMGP grants are post-disaster grants that are managed in this state by the Oregon Department of Emergency Management, with funding based on a percentage of FEMA relief funds from a declared disaster. While funds are usually prioritized for the type of declared disaster and in the counties where the disaster occurred, there is often additional money available for statewide projects of any type.
- FEMA Fire Mitigation Assistance Grants (FMAG)
    - FMAGs are an active disaster grant specific to wildfire mitigation, based on state requests to FEMA of a threat of major disaster from a fire or fire season. FMAG funds can be used to pay for needed response capacity, including field camps, repair and replacement tools, mobilization and demobilization activities, and equipment, material and supplies.

Oregon Department of Forestry (ODF) administered grants

- Community Wildfire Defense Grant (CDWG)
  - A federal grant program funded the Bipartisan Infrastructure Law to provide $200 million a year nationally for the next five years to develop CWPPs and to implement risk reduction strategies in those plans. The program began in Fall 2022 and will be renewed each Spring. CWPPs must be less than 10 years old for project eligibility.

- *Firewise Community Grant (Expired)*
  - A 2022 grant that was funded through Senate Bill 762 to support fuel treatment efforts outside of Oregon Urban Growth Boundaries.
- *Small Forestland Grant Program (Expired)*
  - A grant created through Senate Bill 762 to support small forestland owners in reducing wildfire risk, completed in 2022.
- *Volunteer Fire Assistance Grants (VFA) (Expired)*
  - A one-time grant, also from the Bipartisan Infrastructure Law, for the purchase of fire shelters. The grant application deadline was in April 2023.
- Wildland-Urban Interface Grants (WUI)
  - To support communities in reducing wildfire vulnerability. Managed through local ODF field offices.

Oregon State Fire Marshal (OSFM) administered grants

- *Community Wildfire Risk Reduction Grant (Expired)*
  - A 2022 grant that was funded through Senate Bill 762 and provided funds for risk reduction projects, equipment, and staffing.
- *Oregon Fire Service Capacity Program (Expired)*
  - Another 2022 opportunity through Senate Bill 762 that provided funds for small to medium sized fire agencies in need of permanent positions for firefighters and fire prevention staff.

Oregon Emergency Management state grants

- State Homeland Security Program (SHSP)
  - Annual homeland security grant program that provides funds via Oregon counties to limit impacts from terrorism events, but may also support catastrophic natural hazard events with connected goals.
- State Preparedness and Incident Response Equipment Grant (SPIRE)
  - A grant that has had two rounds via Oregon House Bill funding and provides for the purchase of specific equipment and vehicles available through pre-identified state procurement.

Regional grants

- Urban Area Security Initiative Grants
  - Annual grants managed by the Regional Disaster Prevention Organization, to identify regional projects that can meet mission areas under FEMA's National Preparedness Framework, including mitigation, community resilience, and long-term vulnerability reduction.

Wildfire Smoke Grants

- *Smoke Management-Community Response Plan Grant (Expired)*
  - A 2022 grant administered by the Oregon Department of Environmental Quality that funded community response plans for smoke and pilot projects promoting alternatives to open burning.
- Wildfire Smoke in Community Buildings Grant
  - A 2023 grant administered by the U.S. Environmental Protection Agency to provide funds for research and studies for the assessment, prevention, or reduction of wildfire smoke hazard in community buildings.

Chapter 5 - Wildfire

The following three sections are for information specifically focused on wildfire risk and mitigation strategy. Wildfire smoke information is not included in this chapter and can be found in its own section in Chapter 6.

The wildfire chapter is made up of a hazard analysis (Section 5.1), a breakdown of mitigation strategies by topic (Section 5.2), and a series of sections for each district/jurisdiction (Section 5.3) to collect local issues and action plans.

Note that all mitigation strategies in these sections provide a current road map for reducing risk, but are not regulatory or binding and may change as available resources and priorities shift over time. Where organizations are noted as ‘implementation partners’ in Section 5.3, they have been listed as a potential coordinating body to assist in implementation, but should not be considered to have responsibility in the furthering of those actions.

5.1 Wildfire Hazard Analysis

5.1.1 Introduction to Wildfire

Wildfire is an uncontrolled burning of any type of vegetation. Wildfires can become structural fires or can be started by structural fires, and the intersection of wildfire and the built environment is a primary issue that this plan attempts to address.

Wildfires are also a critical ecological process in many ecosystems,[22] with species adapted to thrive in regenerated post-fire landscapes. The modern ability to put out wildfires before they threaten development and key natural resources has reduced cycles of burning and regeneration in many locations, but the increased risk from extreme weather is in turn building conditions where wildfire suppression will become more and more difficult.

Any natural landscape has the potential to be the origin point of a wildfire, and the balance between maintaining natural ecosystems and protecting life and property has only grown more challenging with population growth into higher risk areas. Risk is also increasing due to changing conditions whereby "[c]ommunities susceptible to experiencing wildfire hazards can expect not only more frequent large-scale damaging wildfire hazard events but also fires of greater intensity and duration."[23] Wildfire, like all other natural hazards, cannot be fully controlled, but human systems can become more resilient to it, mirroring the adaptability of nature.

The behavior of wildfire−why it starts, how it becomes uncontrolled, and who it puts at risk−is caused by a combination of fuels, weather and topography that make up the Fire Behavior Triangle.[24]

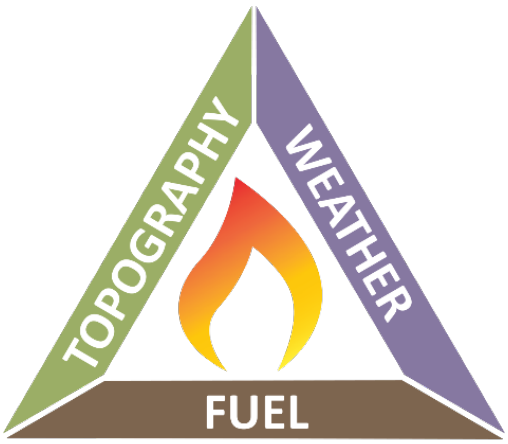


Figure 10 - Diagram from the Oregon State Extension Service.

Fuels

Wildfire fuels are any living or dead ignitable biomass and can be divided into ground fuels and canopy or crown fuels. These fuels can be made up of different types of vegetation, including grasses, shrubs, timber litter (dead vegetation on the forest floor), and trees.

- **Ground fuels** are those below the tree canopy and include fine fuels and ladder fuels.
    - *Fine fuels* are small pieces of vegetation that quickly ignite and burn rapidly when dry. These fuels include grass, leaves, pine needles, and moss.

[22] *Extreme Wildfire Events and Disasters; Root Causes and New Management Strategies*, Edited by F. Tedim, V. Leone, T. McGee, Section 8.6
[23] *Wildfire Hazards, Risks, and Disasters*, Edited by J. Shroder, D. Paton, Section 1.2
[24] Fire FAQs – What is forest fuel and what are fuel treatments, Oregon State Extension Service, S. Fitzgerald, C. Berger, D. Leavell, January 2019.

    - *Ladder fuels* are larger vegetation like shrubs and low-lying branches that lift a fire from an understory into the tree canopy. As flame heights increase, fires become much more difficult to control, so ladder fuels are a common priority for fuel reduction.
- **Crown fuels** (or canopy fuels) are the tops of a tree canopy, high above a forest understory. Once fire reaches forest crowns it becomes extremely intense and fast-moving, as the fire can jump from treetop to treetop and create a wall of flame. Fires at this height can also spread embers up to three miles, where they can start spot fires and ignite structures.

Once wildfire grows and escapes control, it can quickly turn homes and other development into wildfire fuel.

Weather

- **Wind** – Nearly every major fire in the recorded history of Multnomah County has happened during a high wind event. Wind is one of the key determinants of when a major fire will occur as it fans flames with oxygen, blows embers ahead of the fire, and causes sudden runs into new fuel sources. All of these factors can turn small fires into large ones quickly, making fire attack very difficult. High winds are one the key determinants of 'red flag warnings,' when wildfire risk is considered highest.
- **Humidity** – Dry fuels catch fire more easily and burn more quickly, making them another risk factor for rapid wildfire growth and escape from control. During periods of extremely low humidity, these fuels can reach their maximum ignitability potential.
- **Temperature** – The temperature of fuels can increase the likelihood of ignition.[25] Warm winters and long hot summers are drivers of wildfire risk through early season vegetation growth, low snowpack, and long-term drying of vegetation. However, air temperature is not as important a factor in wildfire ignition risk on a given day as winds and low humidity. Major fires can and have started on mild temperature days.

Topography

- **Slope** – Wildfire runs up slopes quickly. As heat from a fire rises, it preheats fuels, and upward drafts cause spot fires to start up the slope as the fire advances. This effect increases as slopes become steeper.[26]
- **Aspect** - The direction a slope faces also matters. South-facing slopes receive more direct sun, resulting in lower humidity, increased loss of moisture, and the presence of drier and lighter fuels,[27] giving those slopes a higher fire risk. North-facing slopes have the opposite effect and have a slightly lower fire risk.

When these elements of extreme fire behavior are elevated, the addition of an ignition source becomes the starting point for a dangerous wildfire. The vast majority of wildfires in Multnomah County are started by humans rather than by natural causes.

[25] Wildland Fire Behavior, National Park Service
[26] Slope effect on Rate of Spread, National Wildfire Coordinating Group
[27] Principles of Wildland Fire Behavior, National Wildfire Coordinating Group

Predicting Wildfire Events

Wildfire risk can be monitored through predictive modeling, based on the elements of wildfire described above. Awareness of periods of extreme risk is essential for preparation and risk reduction actions, as nearly every major recorded wildfire in Multnomah County has occurred during extreme weather and unseasonably dry conditions.

The Northwest Interagency Coordination Center (NWCC) is a local agency serving as a focal point for Pacific Northwest logistical support and intelligence for anticipated and ongoing wildfires. The NWCC provides publicly accessible morning briefings, seven-day outlooks for significant fire potential, and seasonal predictive outlooks, among other services.

Another predictive service is the National Weather Service, which issues Red Flag Warnings when strong winds, high temperatures, and low humidity create a high risk of wildfire. Many activities become restricted during these periods.

Preventative power shutoffs are a new tool across Oregon, including Multnomah County, to reduce the risk of wildfire being caused by electricity transmission equipment. Shutoffs are only performed during the highest periods of measurable risk, so they serve as another key alerting tool of extreme conditions.

5.1.2 The Wildland Urban Interface

Throughout this plan, wildfire vulnerability is described using a designation called the Wildland Urban Interface (WUI). The WUI is defined by the controlling federal legislation as "where humans and their development meet or intermix with wildland fuel." The HFRA continues this definition by dividing the WUI into two zones:

Interface communities are locations where structures are directly adjacent to wildland fuels and there is a clear difference between the locations of development and the fuels. These areas may be densely developed, and fire protection is most likely to be provided by a local fire district.

Intermix communities are locations where structures are scattered at a lower density within a wildland fuels area. Fuels in these areas are continuous through the developed area.

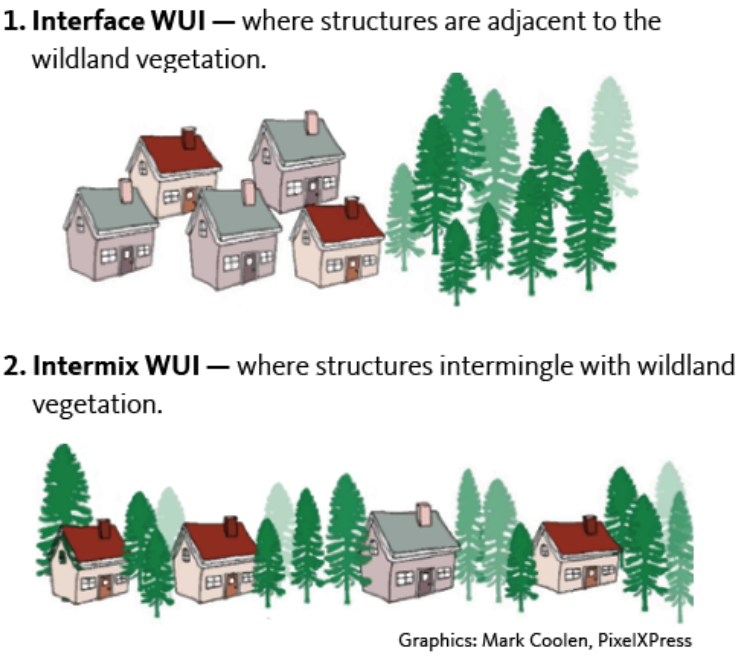


Figure 11 - Graphic showing the difference between interface and intermix areas.

Interface and intermix areas are both common in Multnomah County. Areas with little or no development are not considered to be part of the WUI, nor are urban core areas far enough away from concentrations of wildfire fuel to not be threatened by embers.

The 2011 CWPP defined a WUI area as being 500 feet from hazardous vegetation, and extended that range to as much as 1.5 miles or greater in more heavily forested areas where severe fire behavior could send embers much farther.

The analysis used in this plan indicates a more extensive WUI area, using a 1.5 mile distance from significant fuel sources in all locations, which indicates increased concern about more extreme fire behavior becoming more likely in more locations. In initial statewide mapping, about 4.4% of the land in Oregon was considered to be in the WUI. That percentage is considerably higher in Multnomah County, indicating that even with fire being less frequent here than other parts of Oregon, risk is high due to the large population in proximity to areas with risk of periodic extreme wildfire.

The WUI mapping used in this plan comes from the Oregon Department of Forestry and has not been updated for this plan revision. New mapping is anticipated within the next year that will establish a consistent definition of WUI areas in Oregon, so any additional local analysis will wait to see how effectively that mapping captures Multnomah County's locally perceived risk. The WUI mapping in this plan does not distinguish between interface and intermix areas but does use a tiered risk rating based on wildfire probability.

5.1.3 Planning Process and Stakeholders

One of the primary requirements of CWPPs is that they must be "collaboratively developed by local and state governments, in consultation with Federal partners and other interested parties".[28]

The group assembled for this planning project was a large and diverse group of local stakeholders, representing different areas of expertise. All of the stakeholders were invited to participate in all planning meetings for different elements of wildfire risk to bring a variety of viewpoints to those conversations.

There are eleven fire districts located in Multnomah County, with three of those districts having operations contracted out to departments that are part of this plan. All eight operational fire districts have contributed to the development of plan content and mitigation priorities. As the service areas of these eight districts cover the entire county (except federal management areas and remaining structural unprotected areas), chapters in this plan are organized by district, with information about city department stakeholders located in those chapters.

Those districts are:

- Cascade Locks Fire (opt-in services in structurally unprotected area of eastern Multnomah County)
- Corbett Fire
- Gresham Fire (including contracted service provision for Rural Fire Protection District #10 and the Cities of Fairview, Troutdale, and Wood Village)
- Lake Oswego Fire (including contracted service provision for Riverdale Fire Protection District #11 and the Alto Park Water District)
- Portland Fire and Rescue (Including coordination with the Port of Portland Fire Department)

[28] Preparing a Community Wildfire Protection Plan, A Handbook for Wildland-Urban Interface Communities, 2004

- Sauvie Island Fire
- Scappoose Fire
- Tualatin Valley Fire and Rescue

Interactive version of this map

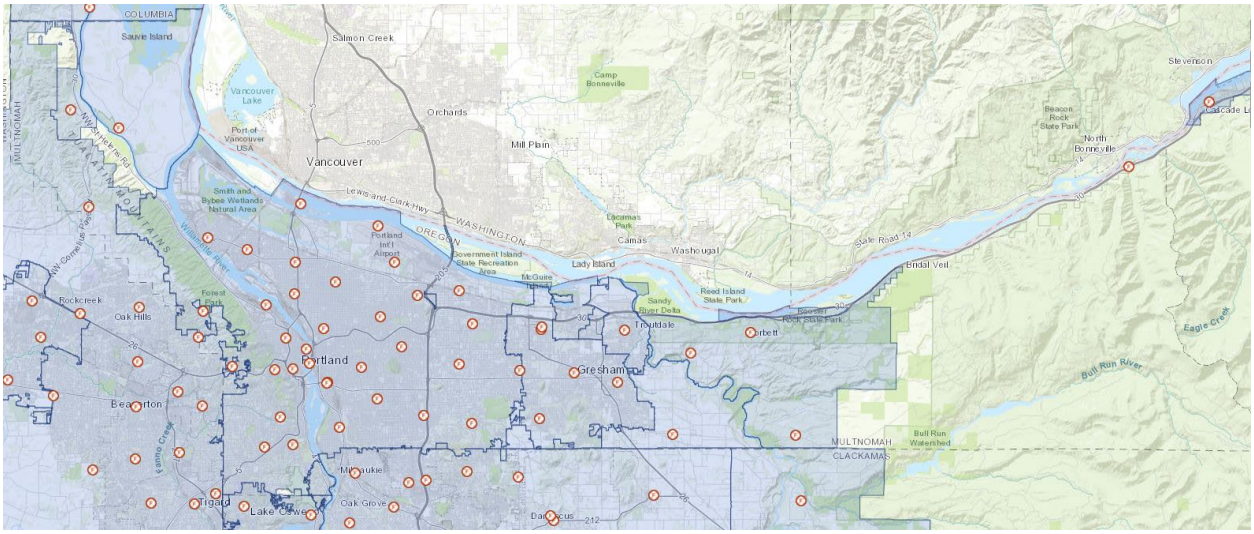


Figure 12 - Location of fire districts and fire stations across Multnomah County. Map from Oregon State Fire Marshal.

State Wildfire Management Partners

Oregon Department of Forestry (ODF)

ODF is the primary state stakeholder for local CWPPs and, as the state entity responsible for forest management, is a statutorily required approver of plans and updates. ODF is also a key firefighting partner within their district boundaries. Multnomah County is represented by three ODF offices in two districts, with the eastern portion of the county served by the North Cascade District's Molalla office and the western portion served by offices in Columbia City and Forest Grove in the Northwest Oregon District. ODF also manages mitigation grants and supports fire prevention programs. Areas within the center of the county are not located in ODF District boundaries, but ODF provides planning support for the entire county's wildfire risk.

Figure 13 - ODF office boundaries in Multnomah County.

Oregon State Fire Marshal (OSFM)

The Oregon State Fire Marshal has recently added regional support for Wildfire Risk Reduction and Response Readiness,[29] with Multnomah County grouped into a Wildfire Risk Reduction region with Clackamas, Clatsop, Columbia, Tillamook, and Washington Counties.[30] OSFM also provides statewide support for fire safety regulation and fire codes, and manages grants for response and mitigation capacities. Joint Policy Bulletins, Technical Advisories, and Interpretations for fire prevention and life safety regulations are hosted on their website.

[29] For details on these programs, see information above about Senate Bill 762.
[30] Response Ready District boundaries differ slightly, with Multnomah County included with the same counties as the Wildfire Risk Reduction Region, but also with Lincoln, Marion, Polk, and Yamhill Counties.

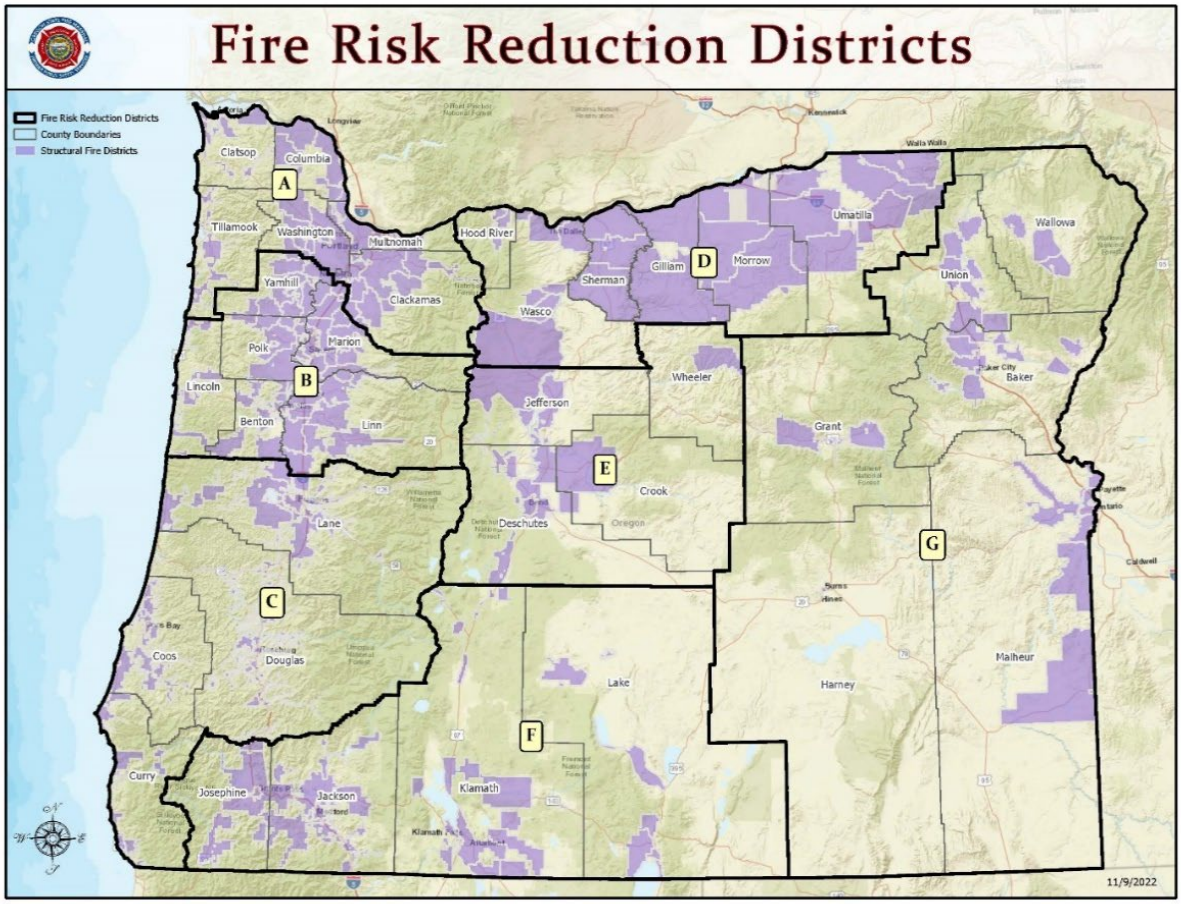


Figure 14 - OSFM Risk Reduction Districts in Oregon. [Response Ready Districts] have different boundaries.

Federal Wildfire Management Partner

U.S. Forest Service (USFS)

The eastern extent of Multnomah County includes two USFS management areas, represented in this plan by wildfire management specialists from the Mount Hood National Forest. USFS is a key partner in initial wildfire attack coordination in their management areas and shared information and resources for wildland fuel mitigation and fire detection.

Interactive version of this map

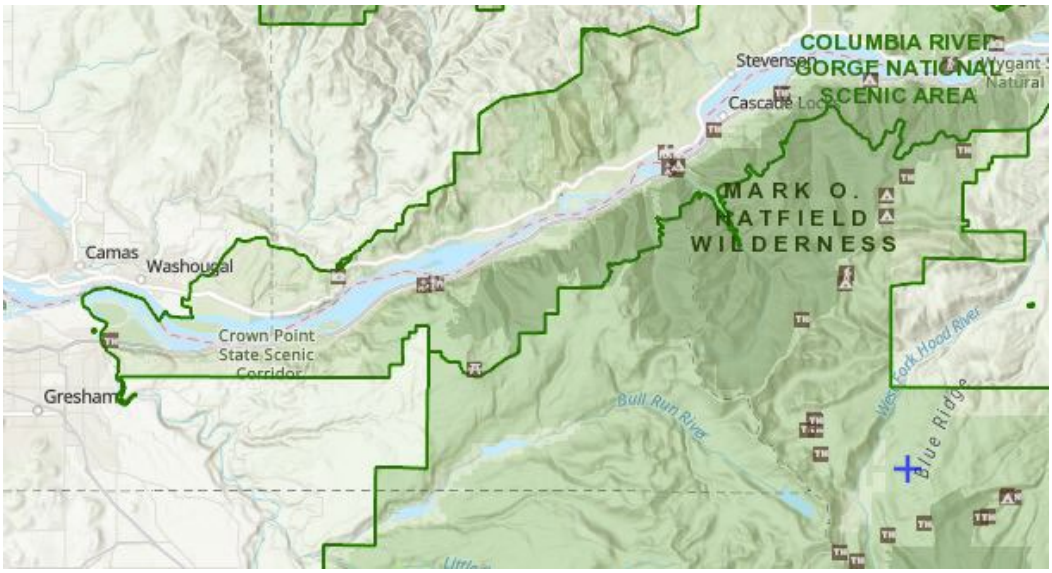


Figure 15 - US Forest Service management boundaries. The area south of the Columbia River Gorge National Scenic Area is all part of the Mount Hood National Forest.

Along with these fire management agencies, a number of other governmental departments, special districts and investor-owned electric utilities participated in this process.

- City of Portland Bureaus
  - Portland Parks and Recreation (PP&R)
  - Portland Water Bureau (PWB)
  - Bureau of Environmental Services (BES)
  - Bureau of Planning and Sustainability (BPS)
  - Bureau of Development Services (BDS)
  - Portland Bureau of Emergency Management (PBEM)
  - Portland Office of Budget and Management – Homelessness and Urban Camping Impact Reduction Program (HUCIRP)
  - Portland Police Bureau (PPB)
- City of Gresham Natural Resources Program
- Multnomah County/Joint City-County Departments
  - Multnomah County Emergency Management (MCEM)
  - Joint Office of Homeless Services (JOHS)
  - Multnomah County Office of Sustainability
  - Multnomah County Department of County Services - Land Use Planning, Transportation
- **Metro Parks and Nature** – Manages 120-130 natural areas across the region, including key wildfire risk areas at Oxbow Park, Willamette Cove, Smith & Bybee Wetlands, and properties adjacent to the Springwater Trail in Gresham. A continuing operating levy originally passed in 2013 and continued by regional voters in 2022 is allowing Metro to create site stewardship plans that align ecosystem restoration goals with wildfire risk reduction, including through invasive species removal, native plantings and prescribed

fire at some sites.[31] These plans are shared with local fire districts, and continuing coordination is needed with firefighting partners and with the public about natural area risk reduction efforts.

- **Oregon Parks and Recreation Department** (OPRD) – Manages several state parks in Multnomah County, including Tryon Creek State Natural Area, Dabney State Recreation Area, Lewis and Clark State Recreation area along the Sandy River, and numerous sites in the Columbia River Gorge. ODF provides wildland fire protection for Oregon state parks.
- Electric Power Utilities – Each of the major power utilities in Multnomah County participated in the development of this plan, with key intersections coming in mutual support of vegetative fuels reduction, fire weather forecasting, fire detection, operational response, and preventative action to reduce wildfire ignition. The three utilities represented in this plan maintain their own annual Wildfire Mitigation plans that define their risk and action strategies for reducing harm from future events.
    - **Bonneville Power Authority** (BPA) – Wildfire Mitigation Plan (2022)
    - **PacifiCorp** (Pacific Power) - Wildfire Mitigation Plan (2023)
    - **Portland General Electric** (PGE) - Wildfire Mitigation Plan (2023)
- **East Multnomah Soil and Water Conservation District** (EMSWCD) is a public unit that serves the entirety of Multnomah County east of the Willamette River. The district is a non-regulatory body that provides education and grants that promote the protection of natural lands and resource lands−including the promotion of native fire-adapted landscapes.
- **West Multnomah Soil and Water Conservation District** (WMSWCD) is the same type of unit as EMSWCD, but serves all areas in Multnomah County west of the Willamette River and all of Sauvie Island. The district guides conservation efforts on privately held lands to benefit wildlife, ecosystems, and the public. WMSWCD has been working with landowners to reduce risk through invasive species management and the promotion of defensible space by benefitting resilient native ecosystems.

[31] Creating healthy habitats and reducing wildfire risk at Graham Oaks, Metro, January 13, 2022

5.1.4 Wildfire Risk Assessment Introduction

Wildfire is not a new phenomenon in what is now Multnomah County. Fire has been part of this landscape since time immemorial and shaped the lives of native residents long before colonization and statehood. Fire is an important determinant of the health of native ecosystems, but can be incompatible with human development, requiring a balanced understanding of risk acceptance, disaster preparation, and resilience building.

Wildfire risk in western Oregon's wet climate has been historically different from other parts of the state. The wet climate supports rapid vegetation growth and typically keeps vegetation moist enough to limit extreme fire behavior through the dry summer period. However, during extended periods of drought this productive growing climate creates a huge mass of dry wildfire fuel. When conditions become severe enough, large 'stand replacement' fires become possible–fires so large that parts of forests are burned to the ground and then completely regenerate.

In comparison, dry forests in other parts of Oregon have historically had lower intensity fires every decade or so that clear forest litter and support the growth of large trees without killing them. It is important to recognize this difference, because a single statewide strategy around wildfire and land management will not have the same effectiveness in these different types of fire-adapted ecosystems.

Some pressing wildfire risks for Multnomah County are that:

- The county contains a variety of natural and built landscapes, creating the potential for many different types, frequencies and severities of wildfires.
- Infrequent but highly destructive fires are normal for the fire ecology of the region but create an extremely dangerous interface with development and the county's large population living in Wildland Urban Interface areas, and those risks may be difficult to mitigate.
- Statewide or regional mapping programs may classify the risk of wildfire in Multnomah County as low because of the smaller annual likelihood of fire compared to other parts of the state, which may impede the communication of wildfire risk and reduce access to statewide mitigation and prevention programs.
- Impacts of climate change, including to fire weather and local wildland ecologies, are altering risk in Multnomah County in ways that are not yet fully understood, and that also add to vulnerabilities to the county's large population.

The West-Side Fire and Climate Adaptation Research Initiative was launched in 2018 and is based in the U.S. Forest Service's Pacific Northwest Research Station. The initiative is working to develop more information about fire behavior in west side forests, which have not been studied as much as dry forests. The 2020 statewide fires burned extensively on the west side of the Cascades, and study indicated that those fires were consistent with the historical scope of wind and drought driven fire-and that adaptation in west side communities will have to be more reliant on "ignition prevention, fire suppression, and community preparedness".[32]

[32] Cascadia Burning: The historic, but not historically unprecedented, 2020 wildfires in the Pacific Northwest, USA; Reilly, Matthew J.; Zuspan, Aaron; Halofsky, Joshua S.; Raymond, Crystal; McEvoy, Andy; Dye, Alex W.; Donato, Daniel C.; Kim, John B.; Potter, Brian E.; Walker, Nathan; Davis, Raymond J.; Dunn, Christopher J.; Bell, David M.; Gregory, Matthew J.; Johnston, James D.; Harvey, Brian J.; Halofsky, Jessica E.; Kerns, Becky K.; Ecosphere, 2022

Figure 16 - Changing wildfire risk conditions in west side forests, from a Story Map called A "New Normal" for West-Side Fire. US Forest Service Pacific Northwest Research Station.

This section will explore different ways of evaluating Multnomah County's wildfire risk, including a look at historical fires and what current risk mapping tells us about the probability of wildfire, where it is most likely to occur, and who and what it puts at risk.

How is Wildfire Risk Determined?

The 2011 CWPP created an original risk map by assigning points for types of fuels, weather considerations, topography, historic fires sites, ignition sources, community values, and fire protection capability. The points were used to score areas as having extreme, high, medium, or low risk.

Since the 2011 plan was approved, new external risk mapping has been created which uses similar inputs in a more complex model to generate an analysis consistent for all of Oregon and Washington. Because of this new mapping, it was determined that a county-specific re-analysis was not required. Overall, the areas identified as being at risk have not significantly changed since the 2011 analysis, and landscape level risk areas are well understood by local fire districts.

Updated mapping is an identified mitigation need described in this plan, but that mapping is more likely to be sought at a neighborhood level and for purposes beyond just fire risk (for evacuation planning for example) to better understand small-scale vulnerabilities caused by unmapped intersections between fire potential and human development.

5.1.5 Wildfire Risk and Vulnerability Data

Nearly all of the data used in this plan comes from the Pacific Northwest Qualitative Wildfire Risk Assessment (PNW-QWRA), a detailed study of wildfire conditions in Oregon and Washington originally published in 2018 by Pyrologix in coordination with the U.S. Forest Service.

Quantitative Wildfire Risk Assessments are a tool that assists land management decision making by characterizing the benefits and risks from fire across a number of values.[33]

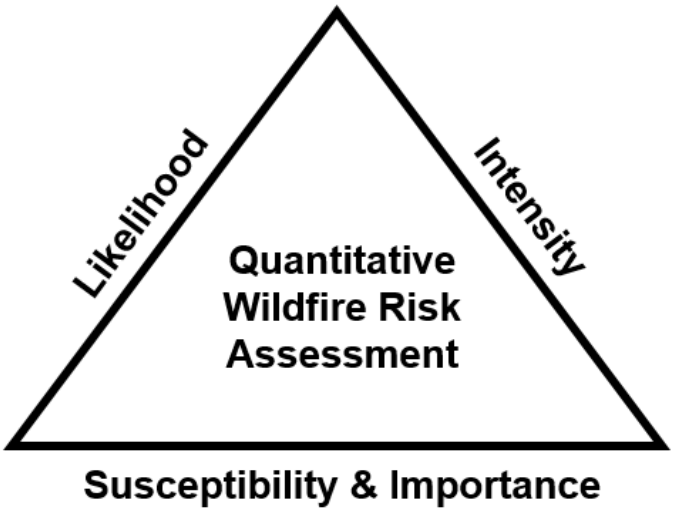


Figure 17 - QWRA analysis process. Figure from IFTDSS.

A number of dimensions of wildfire risk from the QWRA are hosted on the Oregon Wildfire Explorer, a site maintained by the Oregon Department of Forestry, which provides additional layers that can be used for spatial analysis purposes that inform planning. The PNW-QWRA includes an overall risk rating, but that is not used in this plan. Because it is a relative rating for Oregon and Washington and heavily uses annual fire probability in its calculation, it classifies most locations in Multnomah County as at low or moderate risk. This does not effectively capture the risk to Multnomah County from extreme weather driven events and periodic catastrophic fire in such a populated county. Instead, maps have been used that show Wildland Urban Interface areas and potential impact locations, as these better capture the large amount of people and structures at risk from periodic wildfire.

The Oregon Wildfire Explorer has mapping applications for public and planning use[34], with the planning version having additional data layers. The public map is simplified to provide residents tools to evaluate risk where they live and generate site-specific maps.

The PNW-QWRA uses methodology consistent with other QWRAs−assessing in all locations the probability and severity of wildfire hazard multiplied by the exposure and susceptibility of resources in those locations. In this analysis, *exposure* consists of the structures and other resources in a particular location and *susceptibility* is how damaged those resources would be from different intensities of fire.

[33] About Quantitative Wildfire Risk Assessment, Interagency Fuel Treatment Decision Support System
[34] Both versions are publicly available and can be used to generate risk information by address.

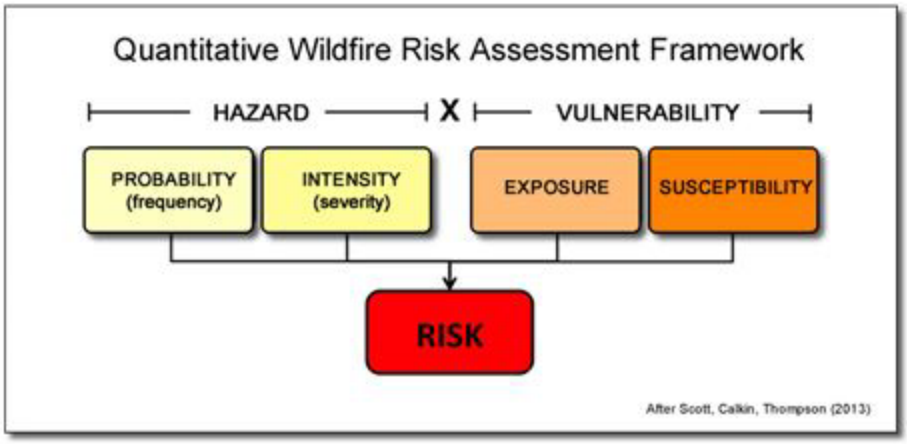


Figure 18 - The elements of a Quantitative Wildfire Risk Assessment from page 9 of the PNW-QWRA.

The baseline for mapping wildfire risk in the PNW-QWRA is the location of a potential wildfire of 250 acres or more. This provides a good foundation for understanding where risk exists for fires to escape control, but may omit some small-scale risk, although many known areas of isolated risk in urban areas are successfully captured by the analysis.

Another limitation of the PNW-QWRA is that it is a snapshot of risk at a moment in time and must be updated frequently to account for changes in risk caused by climate change and new development. A revised PNW-QWRA analysis is expected to become available later in 2023.

A statewide ODF risk map is expected to supersede the PNW-QWRA data when it is released in 2023, and how the revised PNW-QWRA may support future local CWPP uses is not currently known. It is expected that statewide and regional risk mapping will continue to be an active project, and local stakeholders will have to be proactive in assessing and integrating new mapping as it is released.

5.1.6 Wildfire History

Four historic fire events (or group of events) are described with greater detail in this section. These fires represent some of the wildfire types of highest concern:

- Large wilderness fire
- Large mixed forest wildfires
- Small urban wildfire
- Catastrophic weather-driven WUI event

History shows that some of the largest fires in Oregon's recorded history have occurred in northwest Oregon, such as the Tillamook Burn between 1933 and 1951, the million-acre 1865 Silverton Fire, and the 1849 Siletz Fire. Fires from the mid-19th century are not included in this section because they predate modern wildfire management and response, but they further indicate the historic prevalence and risk of infrequent but extremely large wildfires in this region.

- ***EAGLE CREEK FIRE (2017)***

On September 2, 2017, the Eagle Creek Fire ignited in the Columbia River Gorge. For years, concern of a large fire in the gorge had been feared, and smaller incidents had occurred periodically during late-summer wind events. By the time the Eagle Creek Fire was controlled over two months later, it stood as the largest fire in this county since at least the 1902 Yacolt Burn.

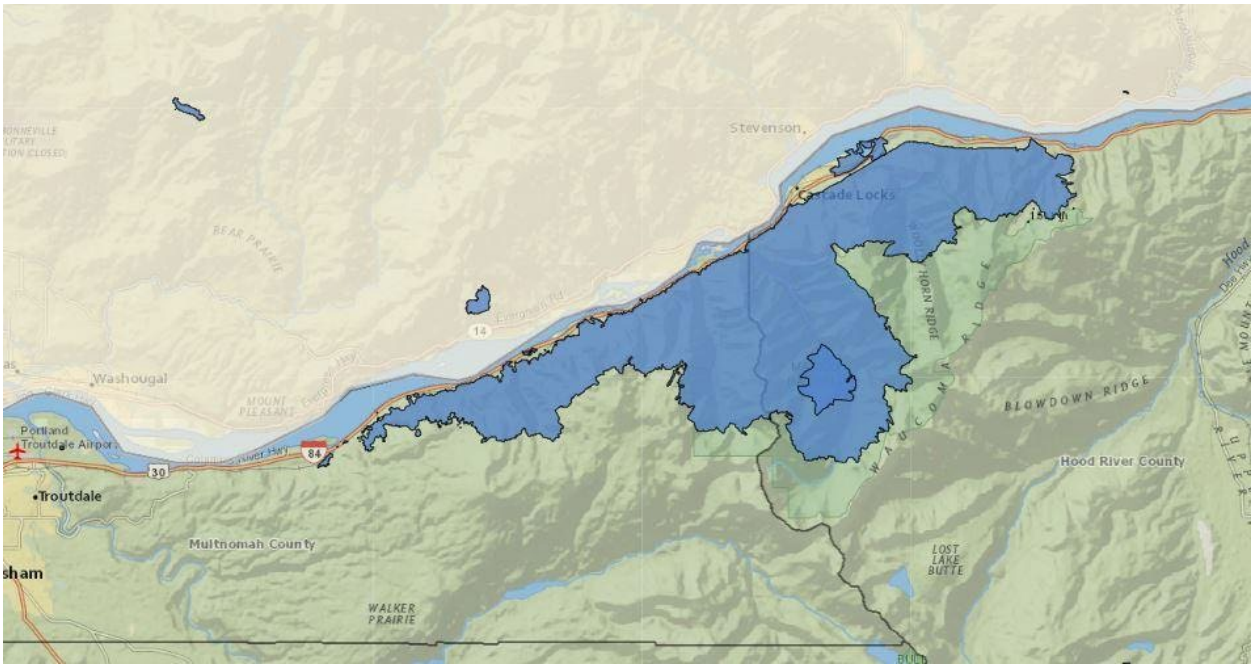


Figure 19 - Perimeter of the Eagle Creek Fire. The origin point was right in the center of this area, at the county line between Multnomah and Hood River Counties. Smaller spot fires started by embers crossing the Columbia River into Washington are also shown. [Map from US Forest Service](#).

The day the fire started, strong easterly winds were blowing and the Columbia River Gorge was exceptionally dry. In these highly dangerous conditions, a recreational trail user threw a lit firework from the Eagle Creek Trail into a steep canyon at about 4:30pm. Air resources were used to attack the fire in the first four to five hours, but the rapid spread trapped 150 hikers who were forced to spend the night in place before being evacuated the next day.

The fire moved quickly over the next days as the high winds drove it rapidly to the west. By the end of September 4, the fire had grown to over 14,000 acres and had pushed all the way towards Bridal Veil, at the western extent of the final fire perimeter. The communities of Bridal Veil, Corbett, Dodson and Warrendale were placed on Level 3 evacuation notice (Go!), the historic Multnomah Falls Lodge was threatened, and spot fires started across the Columbia River in Washington.

September 5 was the single largest day of growth as the fire reached to almost 30,000 acres as it moved mostly south into steep terrain in the heart of the Mark O. Hatfield Wilderness, moving closer to the protected Bull Run Watershed. The fire also began to move to the east, pushing to Highway 84 just across from the Bonneville Dam.

As the fire continued, it began to slow and shifting winds began to primarily move the fire eastward, where it flared up to threaten Hood River County communities beginning on September 10. Remaining fire growth in Multnomah County was at the southward boundaries of the fire perimeter.

Figure 20 - Looking west along the Columbia River from Angel's Rest. Photo US Forest Service

When the fire was considered to be under control on November 30, it had burned about 48,000 acres in Multnomah and Hood River Counties, cost $20 million to fight, destroyed four structures and caused four minor injuries.[35] At the peak of response, 1,060 personnel fought the fire to prevent it from spreading into populated areas and destroying cultural resources.

Areas burned in the fire were almost entirely federal lands.[36] Some of the most significant post-fire impacts were long-term closures of area transportation routes and highly valued recreational areas. Trains were stopped for three days, Highway 84 was closed at least partially for 19 days, and parts of the Historic Columbia River Highway were closed as late as the winter of 2021 because of post-fire landslide risk. Burn scar areas created ongoing risk of flooding, rock fall and debris flow on steep slopes above the gorge and in interior valleys.

Within two years of the fire, 70% of closed trails had been reopened,[37] and the forest's resilience to fire was in evidence. The fire burned almost exclusively in forested areas (primarily Western Hemlock Zone), which are in an ongoing regeneration process,[38] with the presence of invasive weeds among the primary management concern.[39]

As with most large fires, burn severity was mixed, with about 15% of the fire perimeter seeing high severity soil impacts (red), 30% with moderate effects (yellow), and the remaining 55% with low impacts (green).

[35] Eagle Creek Fire, At A Glance Facts, May 2018 – US Forest Service
[36] About 1,300 acres burned on state lands and just 232 acres of private land were located in the fire perimeter.
[37] 'The Gorge Isn't Dead': Weekend Marks 2 Years Since Eagle Creek Fire, Oregon Public Broadcasting, Meerah Powell, August 31, 2019.
[38] A Year On, See How the Eagle Creek Fire Changed the Columbia River Gorge, Northwest Public Broadcasting, Cassandra Profita, September 6, 2018
[39] Forest Regeneration After Eagle Creek Fire, Columbia River Gorge National Scenic Area

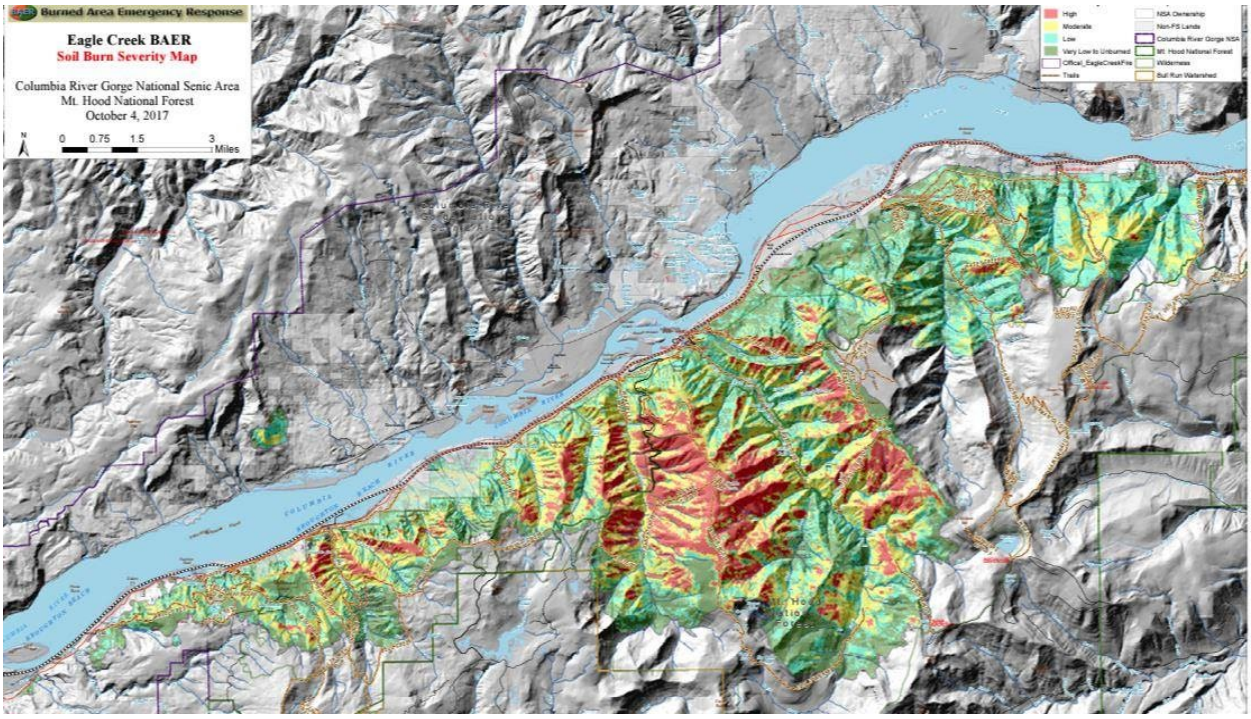


Figure 21 - Soil burn severity map of the Eagle Creek Fire showing locations of higher and lower intensity. Areas in red are high intensity, yellow is medium intensity and green is low intensity. Map from US Forest Service.

The fire was a confirmation of large wildfire risk in Multnomah County forests. The relatively small loss of structures was a testament to effective fire suppression efforts, but the fire was traumatic for communities that were forced to rapidly evacuate, and the long-term loss of popular recreational spaces affected the community at large. Winds moved the fire quickly through Multnomah County but then shifted, helping prevent the fire from moving farther into the county's Wildland Urban Interface areas. Fire remains unpredictable, but east county residents must remain aware of risks as similar or even larger fires are still very possible.

- ***WEST HILLS/FOREST PARK FIRES (1940, 1951)***

It has been a longer time since a severe fire has burned the West Hills/Forest Park area, but history shows that major fires are a significant recurring risk there as well. During very active wildfire conditions in northwest Oregon (the recurring fires of the Tillamook Burn occurred from 1933-1951), the West Hills area suffered multiple fires. The largest previous fire had been the 1889 Balch Creek Canyon fire (see under other fires), and a large 1939 fire in Dutch Creek Canyon in Columbia County that burned in similar fuels, topography, and conditions.

Figure 22 - 1940 Wildfire burning along NW Germantown Road, as seen from Downtown Portland. Photo from The Oregonian photo archives

The length of time since the last major fire in this area indicates a growing risk. The west side of Multnomah County has a mix of old-growth forest and mixed forests and grasslands that intersect with human uses. Buildups in wildfire fuels in some areas are increasing the probability of a large fire, and additional development has increased vulnerability. These historic fires also provide a sense of what recurrence intervals may be for uncontrolled fires driven by extreme weather conditions.

The 1940 Bonny Slope Fire started on August 17 during a period of high temperatures and strong winds. Three hundred twenty-five people fought the fire and 150 homes were evacuated. About 3,000 acres in Forest Park burned, destroying 11 structures along Bonny Slope between Skyline Boulevard and Cedar Mill. The cause of the fire was never determined.

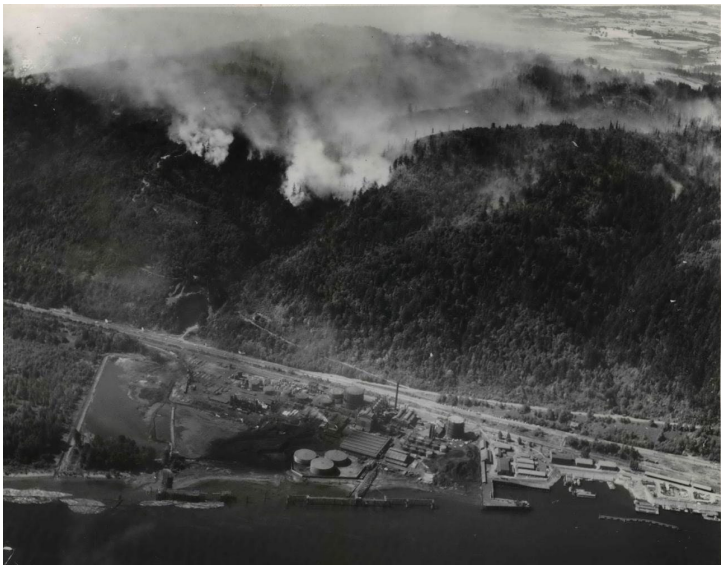


Figure 24 - 1951 wildfire coming over the ridge towards the Willamette River in Portland. Photo from The Oregonian photo archives

Figure 23 - Damage from the 1951 wildfire in Forest Park. Photo from The Oregonian photo archives

The next major West Hills/Forest Park fire started on August 19, 1951, near Leif Erikson Road in Forest Park. Over 500 City of Portland staff battled the fire, which crossed Skyline Road and spread into Bonny Slope and broke towards Forest Heights. Forest fire conditions in 1951 were considered to be unusually severe in western Oregon, with extremely dry conditions.[40]

The fire burned about 2,400 acres in the heart of Forest Park and served as a call for increased wildland fire training in the City of Portland. The Portland Parks Bureau later evaluated the burned area, with natural post-fire recovery resulting in a high amount of regeneration of deciduous trees[41] that have shaped the current forest mix.

- ***PORTLAND URBAN WILDFIRE (2019)***

A small 2019 fire in the City of Portland is included, as it shows that risk from wildfire can exist even at very small scales outside of large wooded tracts and can harm urban neighborhoods. When conditions are severe enough, almost any vegetated areas can become an ignition point for wildfire that can threaten nearby development.

[40] Comparative ratings of 1951 forest fire weather in western Oregon, United States Forest Service.
[41] Forest Park Planning Team Identifies Desired Future Condition, 2007.

Figure 25 - - Aftermath of the urban wildfire on SE 82nd Avenue in Portland. Aerial photo from Portland Fire and Rescue

The 2019 fire was caused by arson, and burned about four acres in an overgrown grassy lot that had previously been a golf driving range along NE Siskiyou Street and NE 82nd Avenue, not far from Rocky Butte. The fire occurred on August 26, 2019, during a red-flag warning when fire weather was considered to be extreme.

Although the fire was extinguished quickly, the small fire burned five structures, including two businesses and three homes, and destroyed a large number of cars parked in a commercial lot. The fire had limited long-term impact, but it caused about as much structural damage as the Eagle Creek Fire because of where it started.

The fire raises a need for continuing management of small risk areas in all Multnomah County communities with preparation activities, fire prevention efforts, and fuel treatments.

- ***ALMEDA DRIVE FIRE, JACKSON COUNTY, OREGON (2020)***

The Almeda Drive Fire is the only fire included in this chapter that occurred outside of Multnomah County, burning in Southern Oregon during the destructive 2020 Oregon wildfire season. Although the location of the fire occurred in a different wildfire regime, this event is still notable because of what it shows us about catastrophic weather-driven wildfire in urban locations and how wildfire is increasingly threatening populations with barriers to preparedness, resilience, and recovery.

The 2020 Oregon wildfire season burned over 1 million acres and destroyed over 4,000 homes. The Almeda Drive Fire was not one of the larger fires of the season in size, only burning about 3,000 acres (about 6% the size of the Eagle Creek Fire). The fire was contained in about a week, but despite its small size the Almeda Drive Fire was the single most destructive fire in all of Oregon in 2020, destroying at least 2,600 homes and killing three people.

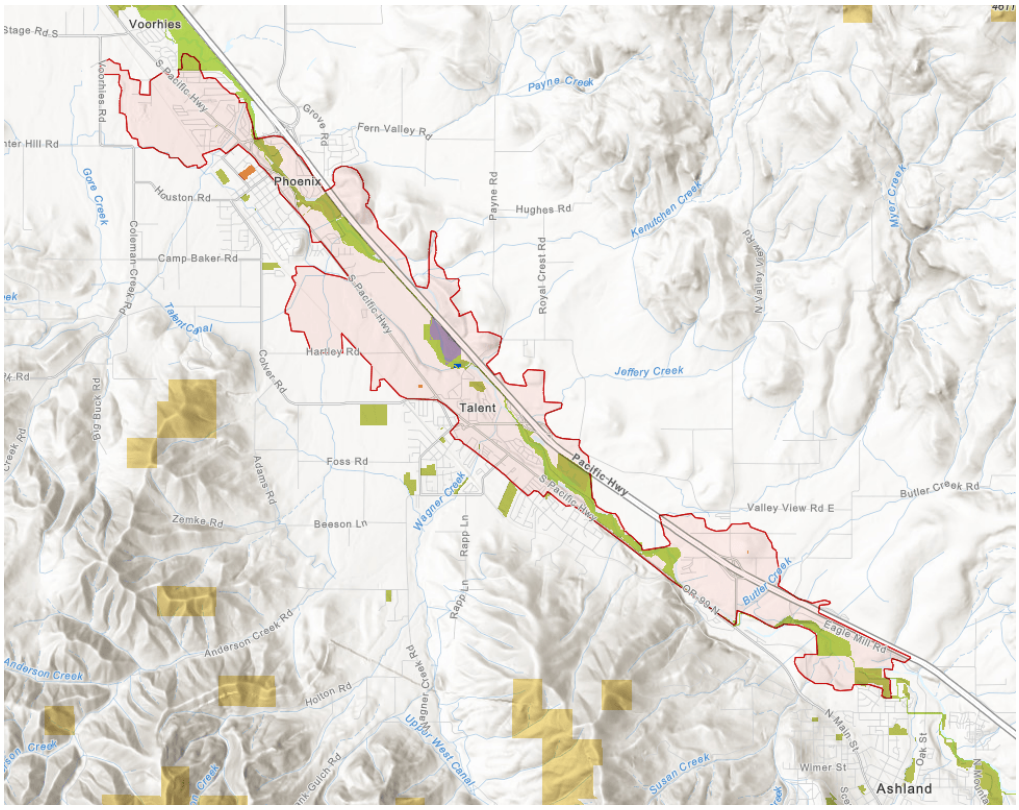


Figure 26 - A map showing the burn area of the Almeda Drive Fire. Map created by Rich Nauman. Green areas are city and county parks, and the purple area is a federal rest area on Interstate-5.

The Almeda Drive Fire started on September 8, at the same time that extreme drought conditions intersected with a statewide high-wind event, creating dozens of new fires and exploding existing fires into infernos across Oregon. The cause of the Almeda Drive Fire is still as yet unknown, but the origin point was identified in a grassy field surrounded by homes and a wastewater treatment plant.[42]

With winds gusting 40 miles per hour, the fire moved five miles along Interstate 5 to the edge of the City of Talent just two hours after ignition. Four hours after ignition it had moved another four miles along the highway to the City of Phoenix.[43] Nearly all of the fire's destruction occurred in a single afternoon.

Of the some 2,600 structures burned, 1,500 were manufactured homes mostly located in a series of densely built parks. These manufactured homes were a considerable portion of the Medford region's affordable housing. Those impacted were disproportionately Hispanic, many of whom did not have fire insurance. The event was a mass displacement disaster, with, by one account, more than 3,000 people dislocated from neighborhoods, schools and services.

The elements of this fire that are significant for Multnomah County wildfire mitigation planning are that:

- the fire started and fully burned in an urban valley, not in wildlands or forested uplands;

[42] Two years later, Almeda Fire remains under investigation, Ashland.news, Bert Etling, September 6, 2022
[43] Mapping the Almeda Drive Fire, Rich Nauman, ESRI, October 9, 2020.

- the fire started as a grass fire and traveled through transportation right-of-ways, and woods and invasive shrub fuels along the Bear Creek Greenway and other parklands; and
- the fire was especially harmful to locations with dense, lower-cost housing where residents faced significant barriers to resilience and recovery.

Other Fires of Note

Bull Run Watershed Fires – 1493, 1663, 1693, 1873, 1881

Research of trees in the Bull Run Watershed show how wildfire has been a periodic event even in the extremely wet old-growth forests of Multnomah County. The fire in 1493 is believed to have burned the entire watershed, while the other years noted here averaged about 5,000 acres burned per event.[44]

1889 – Balch Creek Canyon Fire

This fire burned approximately 9,000 acres, beginning in a canyon adjacent to what is now the Willamette Heights neighborhood in Portland. The fire burned west over the ridgeline of the West Hills into what is now the Cedar Mill neighborhood of Portland. This is the largest fire in western Multnomah County in over 100 years.

1900 – Tryon Creek

The area that is now Tryon Creek State Recreation Area had been a timberland used for charcoal production. A fire in 1900,[45] of unknown size, reportedly burned down the trees and ended the site's suitability for industrial use.

September 1902 – Yacolt Burn

The Yacolt Burn was a series of fires that became one of the largest wildfire events in the recent history of the region. The majority of impact from the fire occurred in Washington, but the first fire is believed to have started in Multnomah County by children attempting to burn a hornets' nest, with blowing embers then igniting fires in Washington.

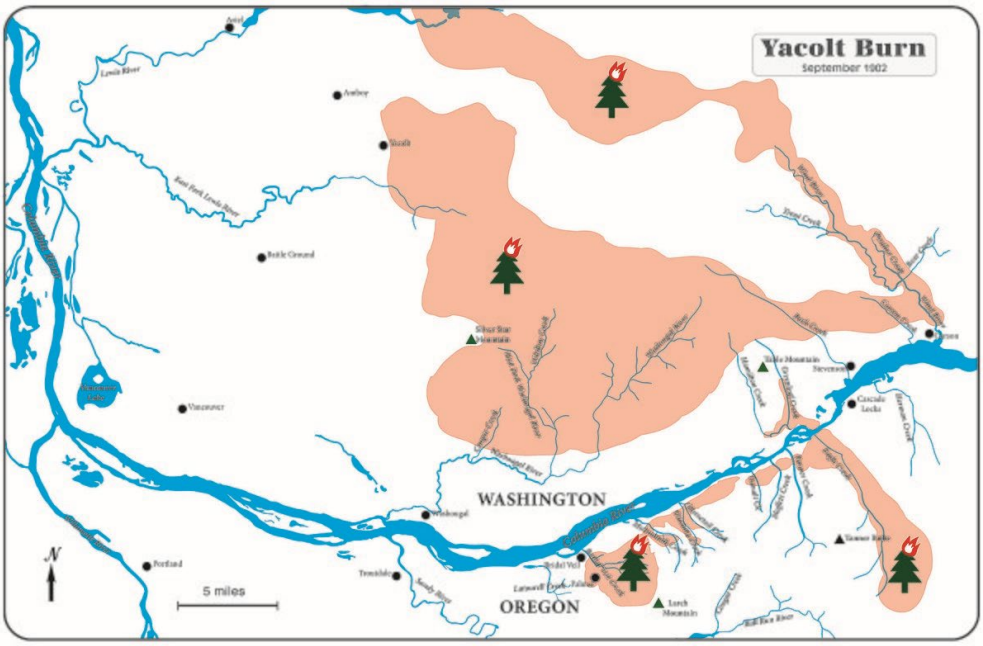


Figure 27 - Map of the burn area of the Yacolt Burn. Map from Wikipedia

[44] About the Bull Run Watershed, Portland Water Bureau.
[45] Tryon State Park, Oregon Encyclopedia

The initial fire started on September 8, after a dry summer and during a strong easterly September wind event.[46] The fire burned 238,000 acres in total.

September 1971 – Skyhook Fire

The Skyhook fire burned nearly 2,000 acres in the Mount Hood National Forest and on private timberlands in Hood River and Multnomah Counties. The fire was in a logging area[47] and was started by slash pile burning fanned by 60 mile per hour winds.[48]

October 1991 – Falls Fire

The Falls Fire burned 1,430 acres[49] in steep terrain between Multnomah Falls and Bridal Veil in the Columbia River Gorge, pushed west by 20 mile per hour easterly winds. The fire required the evacuation of 75 residents in Bridal Veil and reportedly came within 10 feet of the Multnomah Falls Lodge, which had been covered in fire retardant. The Columbia Gorge Scenic Highway was closed between Larch Mountain and Multnomah Falls.

Figure 28 - 1971 Skyhook fire in eastern Multnomah County. Photo from the 1971 National Forests in the Pacific Northwest report.

August 2001 – Mocks Crest Fire

This fire started at the base of the Willamette Bluff in Portland, in an industrial area below homes. During the five-alarm fire, flames rose to 100 feet[50] in height before City of Portland firefighters were able to get it under control with no homes lost, after five hours and 38 acres burned. The cause of the fire was reported to be sparks from a passing train which were fanned into a large fire by 18-20 mile per hour winds. The same area saw a smaller ten-acre fire the next year, burned again in 2011,[51] and again in 2018 in the same location as the 2011 fire,[52] which was able to be quickly suppressed because of a lack of wind.

Powell Butte Fires, 2002-2012

Powell Butte, in East Portland, has been the site of a number of small brush fires over the last twenty years. The 603-acre City of Portland nature park has also been the site of controlled burns to limit grassy fuels.

[46] The Yacolt Burn of 1902, University of Washington State Climatologist, September 2015.
[47] 1971 National Forests in the Pacific Northwest report.
[48] Information from 2013 Hood River Community Wildfire Protection Plan.
[49] https://www.oregonlive.com/history/2017/09/eagle_creek_fire_not_first_tim.html
[50] https://www.seattlepi.com/local/article/Train-started-blaze-gives-Portland-a-big-night-1062322.php
[51] https://www.portlandoregon.gov/fire/article/365650
[52] https://www.portlandoregon.gov/fire/article/365616

Wildfires occurred in 2002, 2003, and 2012. None of these fires caused significant damage and in total burned less than 100 acres.

September 2005 - Vista House Fire

A 10-acre fire that started on a trail about half a mile from the Vista House, just off the Historical Columbia River Highway. The cause was not determined and Corbett Fire provided the initial attack.

2020 Sauvie Island Grass Fire

A 91-acre grass fire of unknown origin[53] started near a beach at Willow Bar on Sauvie Island on July 25, in the middle of the long, destructive statewide drought and wildfire season. The fire was located just across the Columbia County line on the island, but the fire was extinguished by Sauvie Island Fire with support from Portland Fire and Rescue brush units, and the Multnomah County Sheriff's Office helped summer visitors exit the island.

Figure 29 - Smoke from the 2020 Riverside Fire as it moved just outside of Estacada, in Clackamas County. Photo from the U.S. Forest Service.

2020 Labor Day Fires

Although no major wildfires escaped control in Multnomah County, the wind-driven explosion of fire in September continued to raise awareness of risk, and created a catastrophic local wildfire smoke event. Forest Park in Portland was closed for the first time in history because of the extreme risk.[54]

The massive 138,000 acre Riverside Fire in neighboring Clackamas County destroyed over 50 homes and caused at least a Level 1 evacuation zone (Be Ready) across the entire county. Although there were no evacuation levels established in Multnomah County, concern was high in neighborhoods closest to Clackamas County. Some Clackamas County residents fleeing the Riverside Fire found evacuation shelter in official and spontaneous sites in Multnomah County.

5.1.7 Wildfire Probability and Location

Probability of wildfire can be determined through analyzing historical frequencies of fires over long periods of time, and by developing models of expected return periods of fire based on different types of wildfire fuels and climates.

Determining probability, however, is challenging because of the unpredictable nature of when and where fire starts and which fires become large enough to cause damage. As many as 98% of all wildfires less than 250 acres and 99% of all reported wildfires are suppressed in the initial

[53] Portland Fire & Rescue twitter, July 25, 2020 (includes video)
[54] Neighbors near Portland's Forest Park organize to reduce wildfire danger, Oregon Public Broadcasting, Sage Van Wing, June 5, 2022

attack.[55] The specific frequency and location of fire in Multnomah County is highly dependent on rare weather-driven conditions intersecting with the elements of the wildfire behavior triangle and an ignition source. Additional factors that contribute to a fire escaping control, such as starting in an area without early detection or in an otherwise difficult location to access, are also factors.

Wildfire being relatively infrequent in this climate adds to difficulty in modeling fire probabilities, compared to larger historical fire datasets built from tree-ring research in drier locations. Wildfire in this region is also very subject to natural climatic cycles that create periods of higher and lower risk and cause clusters of events. Western Oregon is believed to have had a period of widespread fire between 1400 and 1650, followed by a low fire period between 1650 and 1800.[56] Fire frequency since 1800 has been heavily influenced by increased settlement and then by effective fire suppression. Impacts of climate change are also a challenge for current analysis.

That said, return intervals for wildfire can be established and modeled based on fuel types. This analysis of 'fire regimes' classifies how ecosystems have co-evolved with fire and adapted to and influenced naturally occurring fire patterns. These regimes have been altered by human activities, including more frequent fire ignition and fire suppression.

Fire regime analysis was the primary tool used in the 2011 version of this plan. The map of surface fuel groups shown below stands in for previous fire regime data. In these fuel groups, timber litter areas are those with closed canopies leading to slow-burning ground fires (unless under severe weather conditions) because of a lack of undergrowth.[57] Timber understory fuel groups have a larger amount of forest floor debris and shrub growth.

Interactive version of this map – (Fire Model Inputs and Fuelscapes - Fuel Model Groups)

[55] The challenge of quantitative risk analysis for wildland fire, Forest Ecology and Management, Mark A. Finney, 2011
[56] Regional synchroneity in fire regimes of western Oregon and Washington, USA, Forest Ecology and Management; P.J. Weisberg, F.J. Swanson; 2003
[57] Surface Fire Behavior Lookup Tools, National Wildfire Coordinating Group

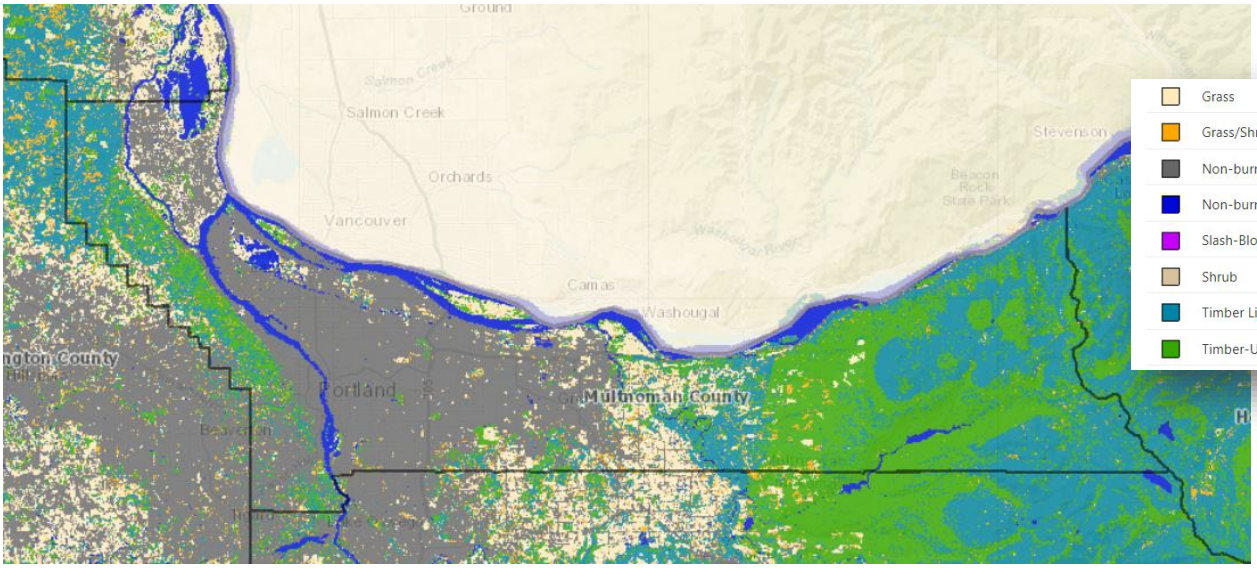


Figure 30 - Map showing locations of wildfire fuel groups in Multnomah County. Map information from the PNW-QWRA, with updated analysis conducted after the Eagle Creek Fire.

Generally, fire regimes in Multnomah County forests indicate infrequent but severe burning, with recurrence of stand replacement fire happening every 50-200+ years, depending on the timber fuel group. Grass and shrub areas have much more frequent burn cycles in this analysis, burning over less than every 35 years, but with lower intensity. Some analyses of the high-severity regimes in western Oregon place cycles for stand replacement fire at well over 200 years.

The PNW-QWRA has provided a new fire burn probability map that identifies an annual chance of a fire greater than 250 acres. Areas in Multnomah County were classified in low, moderate, and high risk of burn probability, in a classification relative to all other locations in Oregon and Washington.

- Areas of high probability are shown in yellow, and were evaluated to have a 0.2-2% chance (50 to 500 year event) of having a fire over that size in a given fire season.
- Areas of moderate probability are shown in green (aqua), and were evaluated to have a 0.02%-0.2% chance (500 to 5,000 year event) of having a fire over that size in a given fire season.
- Areas of low probability are shown in blue, and were evaluated to have a less than 0.02% chance (less frequent than every 5,000 years) of having a fire over that size in a given fire season.

Interactive version of this map – (Wildfire Threat - Burn Probability)

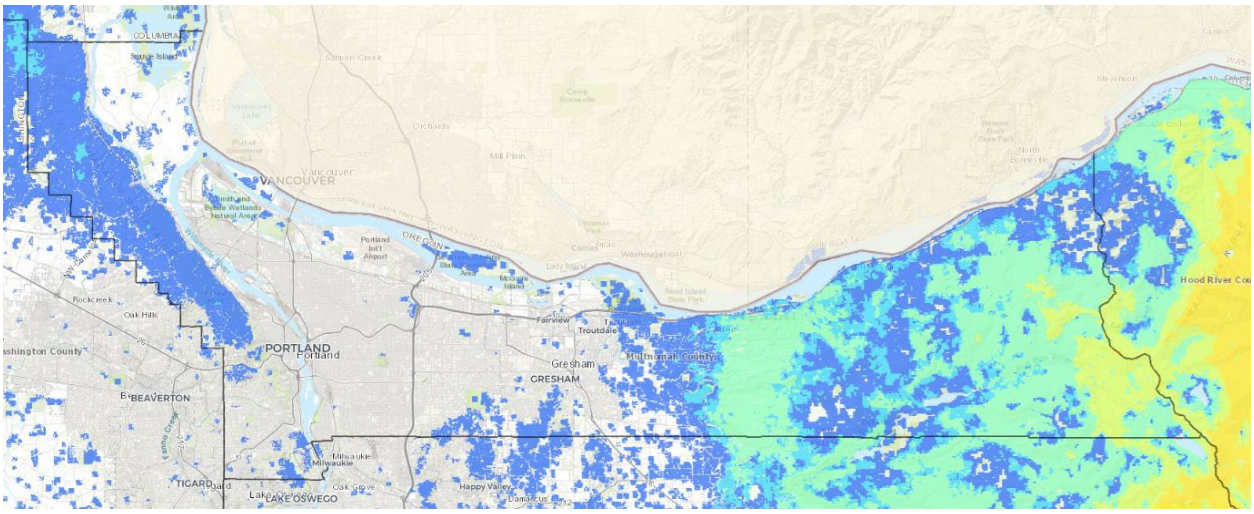


Figure 31 - Map showing burn probabilities across Multnomah County. Data comes from the 2018 PNW-QWRA.

This analysis provides some additional clarity for the probability of fire impacting county residents at a property level, which cannot necessarily be understood from return intervals of fire over an entire ecosystem. However, the extremely long duration between events at the property scale may give residents the impression of less risk, and the PNW-QWRA notes that these probabilities do not fully account for extreme climate conditions. This analysis also appears counter to fire regime analysis, because it shows the towering east county forests as having higher burn probability than more mixed-severity forests in the western part of the county. This may reflect fire protection analysis, as a 250-acre fire in more remote locations with rugged topography would cause much less vulnerability and would be managed differently than a similarly sized fire in Forest Park or outside Corbett.

In recent history, since the urban settlement of the county and under modern fire suppression capabilities, fire frequencies can be very roughly estimated from events. Two extremely large fires have occurred in the Columbia River Gorge over the last 120 years, while the Forest Park/West Hills area has seen three major fires over that time period. This is still, however, a small number of events from which to draw conclusions and cannot effectively account for increasing risk from climate change effects.

Potential Locations of Future Fires

The likeliest locations of future wildfires are already shown by probability data. Factors that especially influence where future fires may be more likely are given further consideration in this section.

Projected flame heights are an indication of where a wildfire can more rapidly spread and escape initial attack. Fires with just four feet of flame height become too intense for fire responders to attack directly and are high enough to create fire spread from embers landing ahead of the main fire. The map below shows areas in the county with conditions most likely to have flame heights of four feet or higher. Much of the highest probability is concentrated in the timber understory forest regimes in the east of the county, which is partly why those areas have higher probability of 250-acre-or-greater fire than more vulnerable WUI areas. However, fires of these heights are also projected in parts of Forest Park/West Hills, Gresham's East Buttes, along the Sandy River, and other locations.

Interactive version of this map – (Wildfire Threat - Probability of Exceeding 4' Flames)

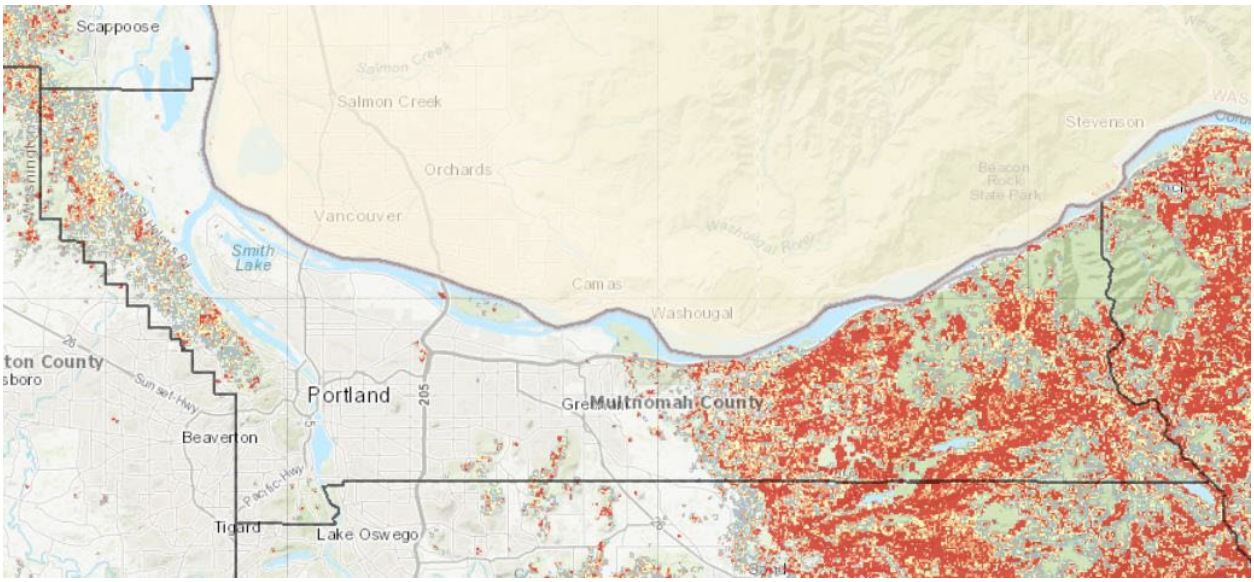


Figure 32- Locations of projected flame heights greater than four feet. Data from the 2018 PNW-QWRA .

The other major factor in evaluating where fires are most likely to start is where wildfire fuel overlaps with intensive human uses. Wildfires are either caused by a variety of human sources or by lightning.[58] Some human causes of recent major fires have been arson, fireworks, open burning, cigarettes, power infrastructure, and equipment and vehicles.

In southern and eastern parts of Oregon, lightning is a significant cause of wildfire ignition, but it is rarely a factor in fires in Oregon's Willamette Valley and Coastal Range. Lightning can occur in Multnomah County, and lightning-driven wildfire is especially dangerous because it can start wildfires in multiple locations at once, making it much more difficult to prevent fires from escaping control. Summer thunderstorms are unusual in northwest Oregon, but there is some evidence that weather pattern disruptions caused by climate change are altering the distribution of lightning events.[59] Because of the potential catastrophic nature of weather-driven wildfire in Multnomah County, it will be important to continue to monitor potential changes in late summer/early fall weather systems.

Interactive version of this map – (Fire History and Active Fires - Fire Locations 1992-2019)

[58] There are a few very rare other natural causes, such as volcanoes and meteors.
[59] Variation of lightning-ignited wildfire patterns under climate change, *Nature Communications*, F. Perez-Invernon, F. Gordillo-Vazquez, H. Huntreiser, P. Jockel, February 10, 2023

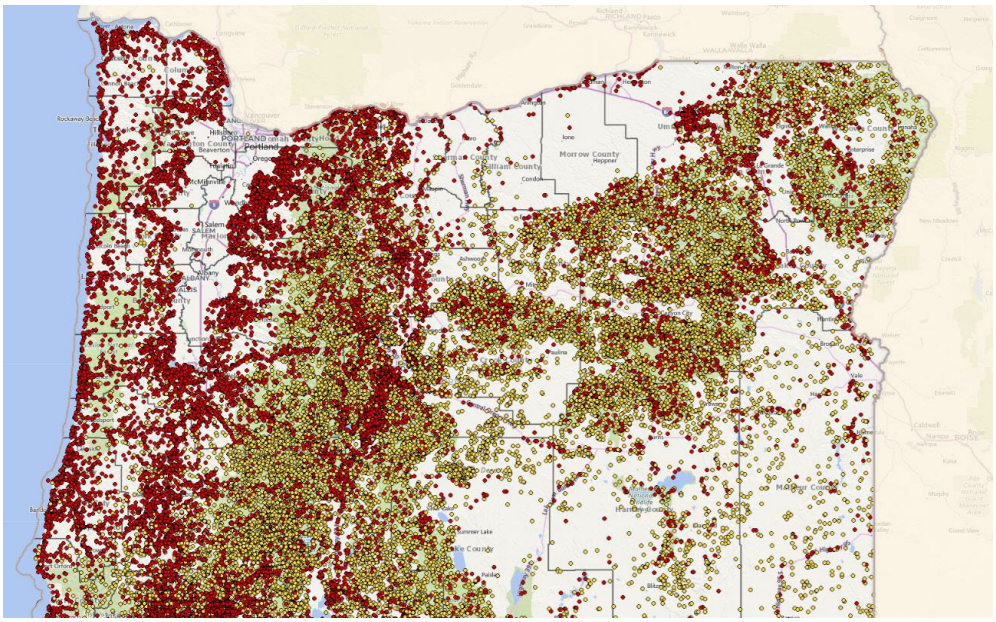


Figure 33 - Map showing locations of wildfires between 1992 and 2019 as recorded by the Oregon Department of Forestry. Human-caused fires are red and lightning-caused fires are yellow, showing the tremendous disparity in wildfire causation in different parts of the state.

Wildfires in Multnomah County over a 27-year period show almost none being caused by lightning. Vegetated areas where people live, work, and recreate are the most likely ignition points of future wildfire. The risk from human ignition in populated areas during extreme weather conditions is of particular concern, as these ignition locations may not be well captured as risk areas in burn probability or fire regime mapping.

Interactive version of this map – (Fire History and Active Fires - Fire Locations 1992-2019)

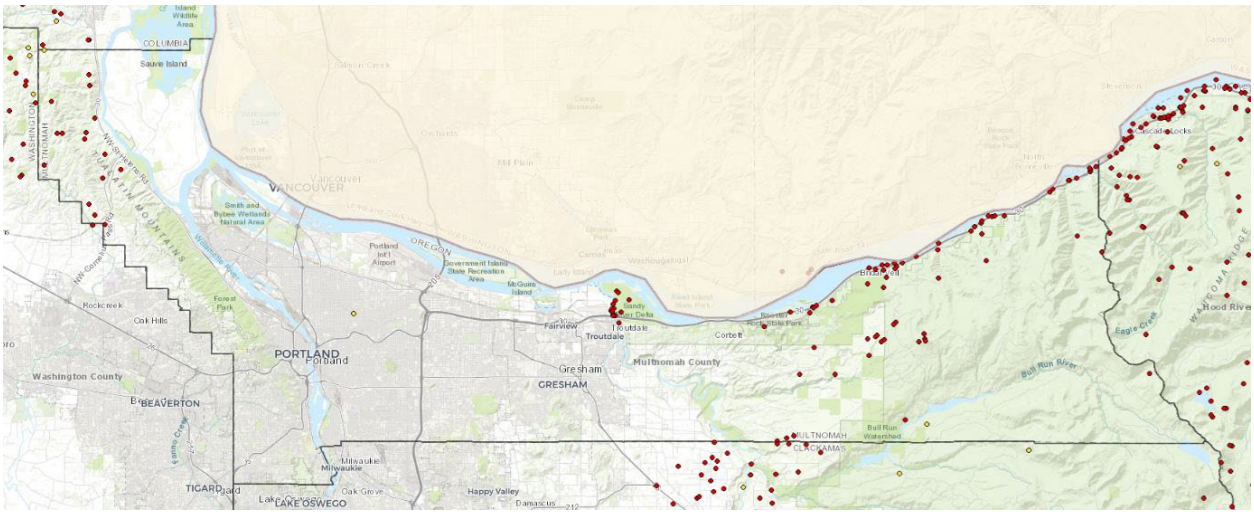


Figure 34 - Map showing wildfire ignition sites in Multnomah County between 1992 and 2019. Human-caused fires are marked in red, and lightning-caused fires in yellow. Note that this data is provided by ODF, so data was not collected in urban core areas between the agency's service boundaries.

The tables and charts below have been provided by the Oregon State Fire Marshal (OSFM), with greater detail of ignition sources over the period between 2016-2020. This information collects fire data from the entire year and of fires of all sizes–creating some limitation in understanding which risks may be the most significant during extreme fire weather.

But the data does further demonstrate that wildfire in Multnomah County is a human-driven event, with only 1% of over 11,000 outdoor fires in that time period being of natural cause. This data underlines the importance of fire prevention tools and public engagement to prevent fires during high-risk periods.

The five-year trend identified in the OSFM data shows a sharp increase in outdoor fires over the previous four years. It is not known what the cause of this rise is, although longer fire seasons may contribute, as well as the increase of unsheltered residents living outdoors. All defined types of fires increased in that time period, but outdoor fires increased the most.

Multnomah County – Fire Incidents by Category 2016 – 2020

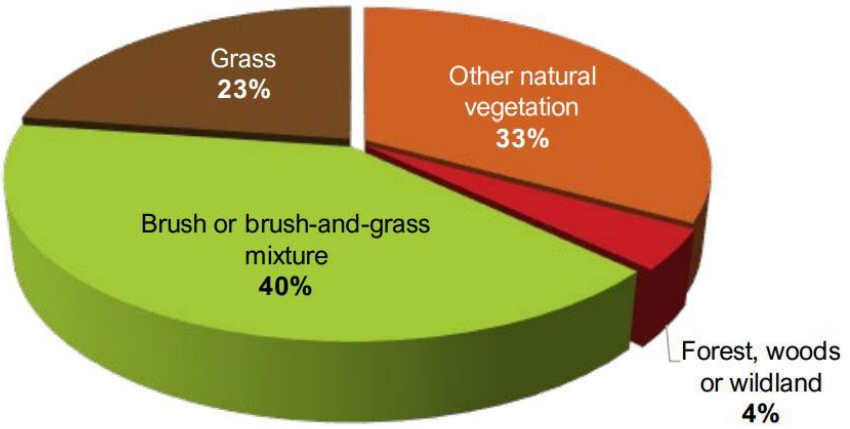
Structure Fires: (houses, buildings, cooking, chimneys, mobile property-fixed structure, etc.)
Total: **3,822** Annual Average: **764** Five-Year Trend: **+10%**

Vehicle Fires: (cars, trucks, trains, aircraft, boats, RVs, etc.)
Total: **2,096** Annual Average: **419** Five-Year Trend: **+14%**

Outdoor Fires: (natural and cultivated vegetation, outside rubbish/trash, outdoor equipment, etc.)
Total: **11,013** Annual Average: **2,203** Five-Year Trend: **+27%**

Other Fires: (fires reported without a specific incident type)
Total: **211** Annual Average: **42** Five-Year Trend: **-74%**

Natural Vegeation Fires by NFIRS Incident Type 2016 - 2020



Cause of Ignition	Fires	Pct
Unintentional	6,841	62%
Intentional	1,957	18%
Undetermined	1,631	15%
Other	288	3%
Under investigation	143	1%
Act of nature	77	1%
Failure of equipment or heat source	60	1%
Not Reported	16	<1%

Outdoor Fires Cause of Ignition

Outdoor Fires Top 10 Heat Sources

Heat Source	Fires	Pct
Cigarette	4,541	41%
Undetermined	2,679	24%
Lighter: cigarette, cigar	719	7%
Hot or smoldering object, other	613	6%
Heat from other open flame or smoking materials, other	519	5%
Flame/torch used for lighting	497	5%
Hot ember or ash	278	3%
Fireworks	251	2%
Heat from undetermined smoking material	157	1%
Spontaneous combustion, chemical reaction	94	1%

5.1.8 Wildfire Vulnerability

Due to the difficulty in predicting the time and location of future fires, for Multnomah County, for Multnomah County the potential *impacts* of future fire are the most important to understand in evaluating risk. By focusing on the vulnerability of people, structures, infrastructure, and key

natural resources, Multnomah County can become more resilient to fire across the whole county.

Two maps are used in this plan to express vulnerability:

- A Wildfire Urban Interface (WUI) map, which shows locations where development is within or near wildfire risk areas. This map is based off of ODF's statewide WUI analysis, current as of 2017.
- A Potential Impact Map, which identifies locations where wildfire would be most damaging to important resources. This map was created as part of the PNW-QWRA and includes critical infrastructure, recreation sites, housing unit density, historic structures, timber, municipal watersheds, and wildlife habitat among vulnerable resources.

These maps work well together as a full measure of vulnerability. The WUI map includes neighborhoods that are not in locations with fire ignition risk but are close enough to potential burn locations that embers could put them at danger from a structural conflagration. However, the WUI map does not include vulnerability where there are less than one residence per 40 acres, so risks to valuable resources other than housing are not captured. The Potential Impact Map fills that gap and also provides more varied levels of impact across the county, making it more suitable for identifying specific locations of highest mitigation need.

Both of these maps are also shown under each fire district subsection to provide a more local snapshot of vulnerability. Both maps are available to the public and can be used to determine vulnerability at a property level.

Interactive version of this map – (Planning and Cadastral - Oregon WUI Hazard Rating)

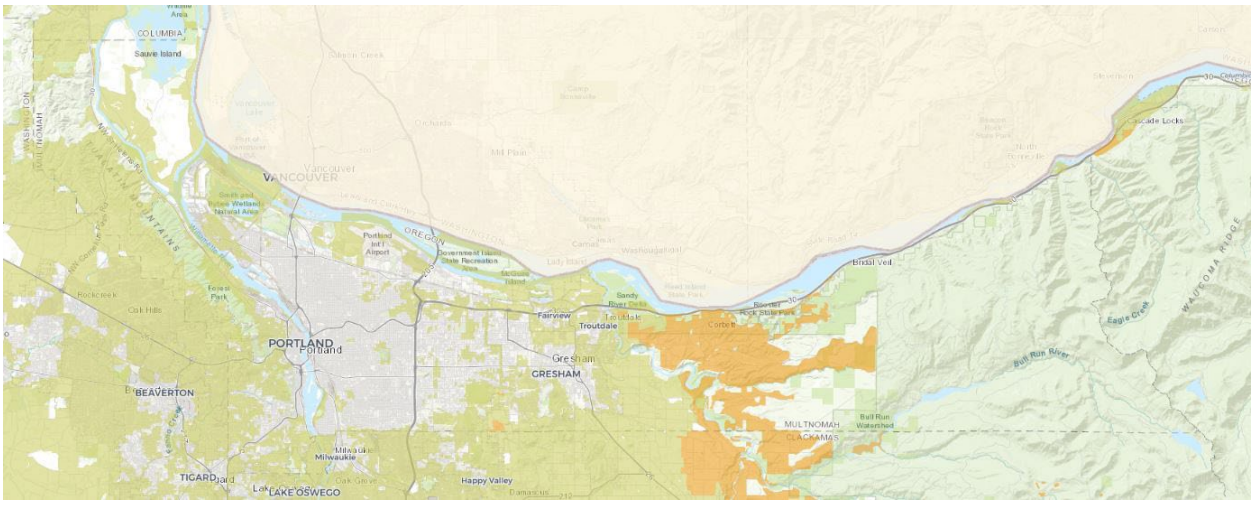


Figure 35 - Multnomah County WUI Hazard. Orange areas are those with moderate hazard (relative to statewide ratings) and green areas have lower hazard.

The WUI map, shown above, identifies the location where development and wildfire risk intersect, and also classifies that risk into degrees. The orange areas have higher WUI risk than the green areas, due to being closer to areas with higher potential for large fires. However, the map indicates broad susceptibility to wildfire in Multnomah County and can be used to more fully identify residences and businesses where enhancing defensible space and wildfire preparation would be valuable.

The WUI map is also an effective tool for identifying neighborhoods and other residential locations with residents that may not be aware of their wildfire risk and would face significant barriers to recovery from wildfire loss.

The Potential Impact map classifies risk into very high (dark red), high (red), moderate (orange), and low (yellow) impacts and also includes locations where fire could be a benefit to natural systems (green) and would not immediately threaten structures or infrastructure.

Interactive version of this map – (Wildfire Potential Impacts - Overall Potential Impact)

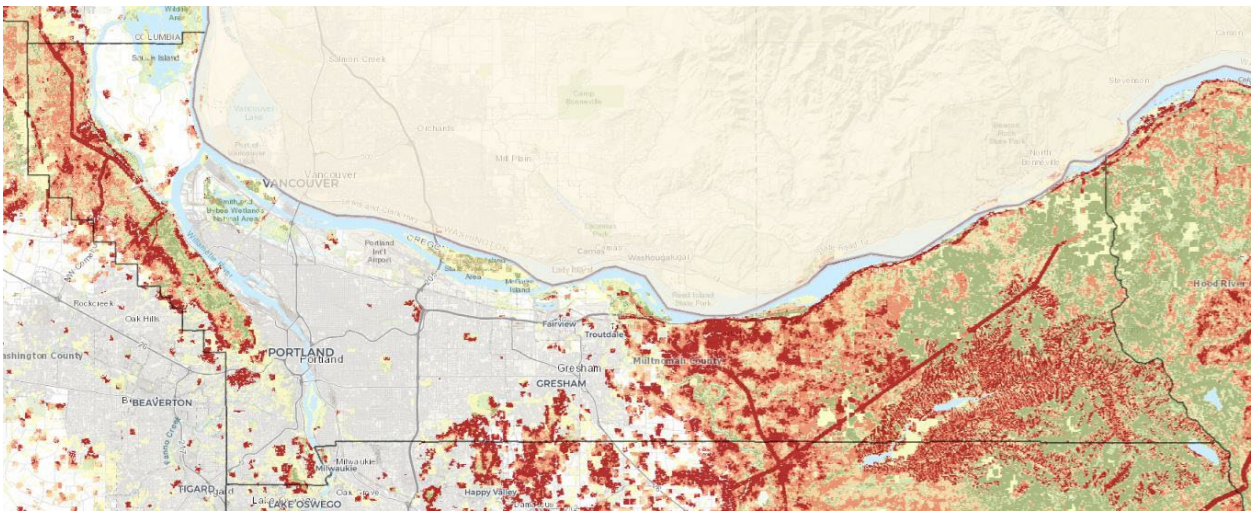


Figure 36 - Map showing overall potential impact of wildfire across Multnomah County. Map from PNW-QWRA.

This map does not classify areas of impact in relation to fire probability. This also makes the map valuable for planning purposes, as it reflects the uncertainty of where extreme weather driven-fire may occur in the future and instead focuses on areas most needing fire suppression, risk awareness and preventative action by residents and land managers.

Equity Impacts

The PNW-QWRA does not currently include social vulnerability as a factor in its overall impact mapping, although this is being considered as an additional input in the next version. Developing a better understanding of where wildfire risk creates increased risks to underserved populations is likely to be best determined at the local level and will be an ongoing priority for plan participants.

Infrastructure and Cultural Resources

Types of infrastructure that are included in the potential impact analysis are electric transmission lines, railroads, highways, cell towers, recreational sites, and historic buildings. Wildfire can shut down infrastructure during events and can damage even non-burnable facilities at high intensity. Some of these infrastructure types are also subject to damage and disruption from post-fire debris slides.

Watersheds are also included in the analysis, and the Bull Run Watershed in the southeast of the county is one of the most important civic assets, as the source of drinking water for residents of Portland and other communities in the region. A significant wildfire could be harmful to the water system by causing eroded sediment and debris to enter reservoirs. A more detailed consideration of the Bull Run Watershed is included in the City of Portland subsection.

Natural Resources

Effects to timber resources and to land and aquatic ecosystems are part of the impact mapping as well. Ecosystem effects are measured by how fire helps or harms certain endangered species in their range, and how it impacts the condition of local forests and other vegetation types. Many of these natural resource considerations benefit from low-intensity wildfire.

5.1.9 Concurrent Hazards and Recovery Planning

Post Wildfire Flood and Land Movement

Wildfire causes significant risk of flooding and increased runoff for years[60] after a fire. Wildfires destroy vegetation that holds slopes in place and also chemically alter the soil to make it much less able to absorb water. When heavy rains occur within the first few years after a fire, rates of runoff increase in speed and can cause flooding or carry sediment, rocks and trees in a dangerous channelized debris flow[61] that can travel over a mile, depending on the terrain.

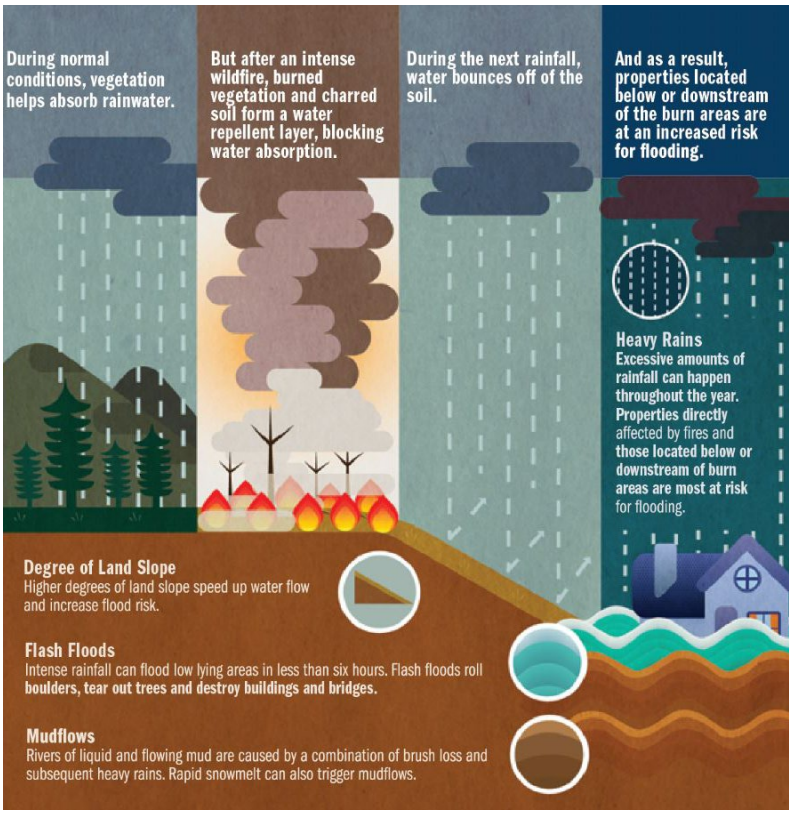


Figure 37 - Graphic from the National Flood Insurance Program explaining the risk of post-wildfire flood. More information on this risk can be found from the National Weather Service.

This effect was seen after the Eagle Creek Fire, as a huge area of increased flood and landslide risk was mapped and efforts were made to stabilize slopes in the Columbia River Gorge and prevent landslides from blocking highways and rail corridors. Despite these efforts, a fatal landslide occurred in the Dodson area of eastern Multnomah County in January 2021. The Dodson landslide occurred in a high-risk area with a history of previous landslides, but was also within the burn perimeter of the Eagle Creek Fire, which likely contributed to the tragic event.

The most recent catastrophic example of post-fire debris flows was in 2018 in Montecito, California. Huge fires burned through December 2017, and when a storm front moved in on January 8 with heavy rain, flows of debris as much as 15-feet high swept into the city and killed 23 people.

The lengthening of fire seasons is increasing this risk, as it becomes more likely that recently burned areas will interface with winter storms in a shorter time-frame. This plan does not contain mitigation strategies for post-wildfire landslide risk, which may also be part of Natural Hazards Mitigation Plans under examinations of landslide/land movement risk. Post-fire landslide conditions on U.S. Forest Service lands are mapped by Burned Area Emergency Response

[60] https://www.usgs.gov/centers/california-water-science-center/science/post-fire-flooding-and-debris-flow
[61] Information on post-fire debris flow is available from the Oregon Department of Geology and Mineral Industries (DOGAMI). DOGAMI is currently studying how wildfires impact channelized debris flows, with a project based on Eagle Creek and a number of 2020 Oregon fires expected to be completed in 2024.

(BAER) teams, with data used to evaluate post-fire threats and to attempt to stabilize areas with increased risks.

Post-Earthquake Fire

The risk of wildfires after an earthquake are not well studied. Fire is a common consequence of earthquakes, but risk is primarily understood as an urban, structural risk. If a large earthquake occurred at the peak of fire season, it is not inconceivable that a large wildfire could be triggered from burning structures or equipment. This concurrence of events is unlikely (major earthquakes have a roughly 300-500 year return interval in Multnomah County), but it would be difficult to fight a wildland fire in a post-earthquake environment with blocked and damaged roads and extreme emergency response needs across the county.

Recovery Planning

Multnomah County will be updating its recovery plan in the coming years, as part of a regional effort to define how to equitably and efficiently bounce back from disasters. The regional framework that was created in 2019 through the Regional Disaster Prevention Organization is intended for use in all hazards, but does not contain specific recovery strategies for wildfire.

Because specific locations of wildfire risk can be mapped and include the potential for significant loss of homes and life, it is recommended that future recovery planning include wildfire stakeholders and develop specific county strategies for avoiding disparate impacts to underserved communities in post-wildfire recovery

Section 5.2 - Wildfire Topics

This section contains Multnomah County's wildfire mitigation strategies, broken into seven topic areas identified during stakeholder meetings. Each of the seven sections outlines objectives of that topic and provides some background information on why gaps in these topic areas should be addressed and why they matter to wildfire resilience.

Some mitigation strategies may overlap different topics, but each action has been placed in a single topic area. Mitigation strategies are also listed by district/jurisdiction in Section 5.3 to make them more easily searchable by location.

Each section also includes areas where a more detailed equity lens is warranted, to ensure that strategies do not exclude communities from mitigation strategies or increase social and economic disparities before or after disasters.

All plan stakeholders were invited to participate in discussion of all topics. Future planning to maintain and implement the plan may see these topics addressed through subcommittees or work groups, where stakeholders may focus on particular areas of interest or expertise.

5.2.1 Organizational Collaboration

Maintaining shared collaboration across Multnomah County's fire districts, governmental partners, jurisdictions, and other stakeholders was identified as a key goal in this plan update process. This concern is a recognition of the increased urgency of wildfire mitigation and preparation, and the value of sharing ideas and resources across jurisdictions.

Re-establishing mitigation partnerships with entities that were part of the 2011 plan but not this update is a priority, as is identifying new partners that play additional roles in land management and structural protection. Additional partners are also important for addressing impacts from cascading disasters that include wildfire, and for including wildfire resilience in recovery plans.

Equity Considerations

- Wildfire stakeholder engagement should continue to be built with community-based organizations that could support improving risk awareness and identifying additional communities at risk in WUI areas that would face significant barriers in a wildfire response or during wildfire recovery.

Mitigation Strategies	Lead Agency/Jurisdiction
Seek grant funding to support fuels reduction and creation of defensible space around homes. Identify grant resource strategies to apply for and manage HMGP, BRIC, SHSP grants and funds obligated through Senate Bill 762. Use multi-jurisdictional approaches to build coalitions and pool resources.	Portland Fire & Rescue Public Education
Re-invigorate Neighborhood Emergency Teams (NETs) with concrete projects such as a neighborhood wildland interface disaster planning program, outreach, and participation in community Firewise fuel mitigation volunteer events.	Portland Fire & Rescue Public Education
Partner with local businesses/non-profits to build wildfire mitigation capacity.	Portland Fire & Rescue Public Education
Target a broader audience by engaging non-traditional partners such as organizations with sustainability programs and the insurance and real estate industries.	Portland Fire & Rescue Public Education
Coordinate meetings with all Firewise communities in the Portland Metro area.	Portland Fire & Rescue Public Education
Provide presentations to organizations that meet regularly and have high visibility in the community: Neighborhood Associations, Granges, Rotaries, Sierra Club, BARK, Garden Clubs, Audubon Society, World Forestry Center, etc.	Portland Fire & Rescue Public Education

Mitigation Strategies	Lead Agency/Jurisdiction
Maintain communication with the Public Utility Commission to determine how statewide utility management policy can be aligned with city planning and environmental management goals.	Portland Bureau of Planning & Sustainability
Partner with other fire departments, public agencies, news sources, and community organizations to raise awareness around wildfire safety, preparedness and evacuation.	Tualatin Valley Fire & Rescue
Build relationships with additional wildfire stakeholders across fire district boundaries and identify strategies for integrating them into future mitigation and preparedness planning efforts. Some potential groups could be from the insurance industry, watershed councils, and community-based organizations.	Multnomah County Emergency Management
Assess resource and funding support needed for Multnomah County Emergency Management to maintain a central position for organization of ongoing countywide wildfire mitigation efforts, including convening meetings, maintaining group member lists, and mitigation grant planning.	Multnomah County Emergency Management
Align countywide CWPP priorities, when possible, with planning priorities in connected wildfire risk areas that cross county lines and fire districts and emergency management agencies in neighboring counties.	Multnomah County Emergency Management
Support regional wildland firefighting equipment grants and other potential projects available through RDPO UASI funding.	Multnomah County Emergency Management
Determine if Multnomah County should become a participating county in Oregon State University Extension Service to coordinate additional wildfire mitigation expertise and program support.	Multnomah County Emergency Management
Build wildfire specific components in the upcoming update to the Multnomah County Recovery Plan.	Multnomah County Emergency Management

5.2.2 Data and Risk Assessment

The most pressing need for future data and risk assessment action is to monitor state and federal mapping efforts and align local mitigation planning with the new analysis or identify gaps in those products.

More localized mapping would be valuable in developing updated local wildfire overlays to identify parcel level fuel mitigation projects, inform building codes, and enforce fire prevention regulations.

Because of the current prominence of wildfire risk, new mapping products are being created by a number of sources, and can continue to be refined or combined to add dimensions to local risk understanding. One new mapping product is the Wildfire Risk to Communities site, produced by the US Forest Service, which includes dimensions of social vulnerability that can be overlaid against wildfire risk areas. The site also includes other information that can be used to assess home risk, and tips for reducing that risk.

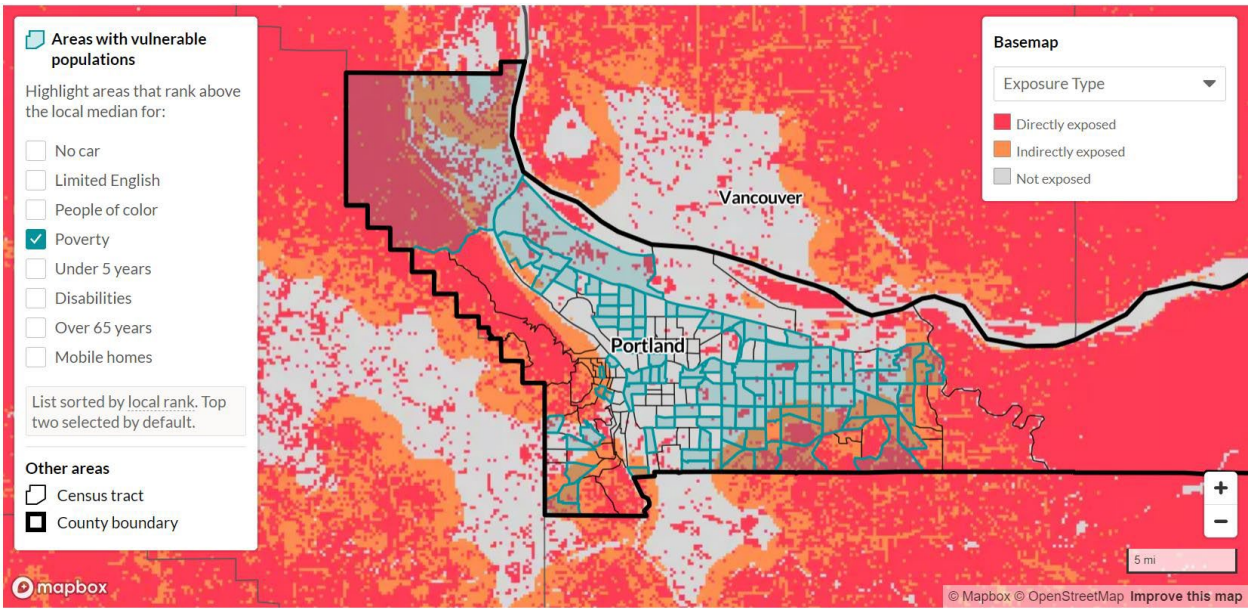


Figure 38 – Wildfire Risk to Communities map showing census tracts with higher than average poverty rates overlaid with areas with wildfire exposure risk.

Additional mapping products can be developed locally to improve risk awareness. Current risk maps are not necessarily easily translatable to the general public, so the development of streamlined and engaging ways to provide information and interpret data could bring significant returns in neighborhood resilience.

Many data needs expressed in this plan are outside of public risk assessment. Data collection and visualization is also needed to assess wildfire fuel loads, evacuation risks, and other site-specific wildfire risk factors,

Equity Considerations

- The locations of those who face disparate impacts from fire and live in WUI areas have not yet been analyzed in detail and are not included in current aggregated vulnerability mapping. Assessment of new data tools to support this goal should be ongoing.
- Mapping and data tools can be made more accessible by being available in different languages and by working with organizations to develop risk communication techniques that best fit the needs of different communities.

Mitigation Strategies	Lead Agency/Jurisdiction
Develop a local vulnerability analysis to refine priorities for outreach and mitigation projects.	Gresham Fire
Develop structural and fuel loading assessments for the Oxbow Parkway area.	Gresham Fire
Obtain and evaluate new wildfire risk assessment maps and other data being created through Senate Bill 762 and the Regional Disaster Preparedness Organization.	Lake Oswego Fire
Refer to International Wildland-Urban Interface Code for definition of WUI standards and associated WUI map, created by Metro, to update and amend City policies, regulations, and codes to strengthen requirements for fire-resistant building materials, and enable the establishment of defensible space around homes and businesses while continuing to protect the natural resources within wildfire hazard zone areas.	Portland Fire & Rescue Public Education
Work with local fire agencies to develop more detailed risk assessments using local and community-derived data.	Portland Fire & Rescue
Map all roads, bridges and driveways in the local Communities at Risk and prioritize homes that have dead-ends, and cannot support emergency service vehicles (grade, length, vegetation, turnarounds) for defensible space and fuels reduction projects.	Portland Fire & Rescue
Develop a series of recommendations for tracking vulnerability data (including houseless populations) throughout the county and revise the Wildfire Hazard Analysis and the Wildland Urban Interface to reflect the new information.	Portland Fire & Rescue Special Ops
Identify tools from state wildfire risk reduction initiatives that can be used to refine local planning hazard mapping.	Portland Bureau of Planning & Sustainability
Inventory and map evacuation routes in Portland Parks & Recreation parks and natural areas, including emergency vehicle access routes, and share with emergency responders and other jurisdictions.	Portland Parks & Recreation
Better define Wildland Urban Interface areas and map them to identify locations for seasonal use restrictions on Portland Parks & Recreation managed natural areas.	Portland Parks & Recreation
Build GIS layers from online mapping resources that be can integrated into district fire plans.	Scappoose Fire
Identify grants to support GIS projects to develop Story Maps and other engaging, accessible and broad-ranging public wildfire risk materials.	Multnomah County Emergency Management

Mitigation Strategies	Lead Agency/Jurisdiction
Explore platforms for developing and maintaining a countywide mapping application showing active and planned fuel treatment project locations.	Multnomah County Emergency Management

5.2.3 Community Engagement and Resilience Building

Building community resilience is an essential way to reduce wildfire risk, as it empowers residents to make change in their own neighborhoods, rather than having to wait for governmental funding and capacity to reach them. This capacity building can also better link residents with fire districts and other fire mitigation partners to best identify community needs and improve information sharing.

Objectives of strategies in this section are to increase resilience through risk-aware, self-supporting communities and to ensure that communities have the information needed to keep them safer from wildfire, delivered in ways that are accessible and usable.

Because of the Eagle Creek Fire and the 2020 Oregon wildfire season, as well as recognition of increasing climate-driven risks, awareness of wildfire risk is very high among some county residents. In a recent survey conducted as part of the Multnomah County NHMP update, wildfire was rated as the fourth most concerning hazard, after earthquake, wildfire smoke, and extreme heat–all hazards with a wider geographical scope.

However, there is still much to be done in continuing to communicate risk to new residents and those who may not be aware of their risk–and to maintain risk awareness if there are upcoming periods with lower fire activity.

Firewise Communities and Other Neighborhood-Level Organizations

Figure 39 - Firewise USA logo

Firewise USA is a national program administered through the National Fire Protection Association that provides a framework for residents in a local area to organize and develop neighborhood-driven wildfire mitigation strategies, especially for defensible space of homes. The national program provides materials, publicity, and support for groups to help build their program, and local fire districts have provided technical expertise to help these programs build their capacity. There are also some grants that give priority to projects in Firewise communities, and some fire insurance policies have discounts for homeowners who are part of the program.

It is not necessary for neighborhood groups interested in wildfire mitigation to join Firewise USA specifically, although the success of groups already formed in Multnomah County provides a model for how new groups can be formed and supported. But any network building between neighbors to share resources and information will increase their resilience ahead of the next wildfire disaster.

Public Messaging and Engagement

Wildfire resilience also requires that residents are aware of risk and have pre-event knowledge of alert messaging and evacuation protocols, whether they are at their residences, or where they work or recreate.

Evacuation levels are an example of a public messaging priority. When disaster strikes, having existing awareness of these levels will reduce confusion and inaction at a time when decisions must be made quickly. Promotion of Public Alerts, an opt-in messaging service, is another way to raise risk awareness and preparation.

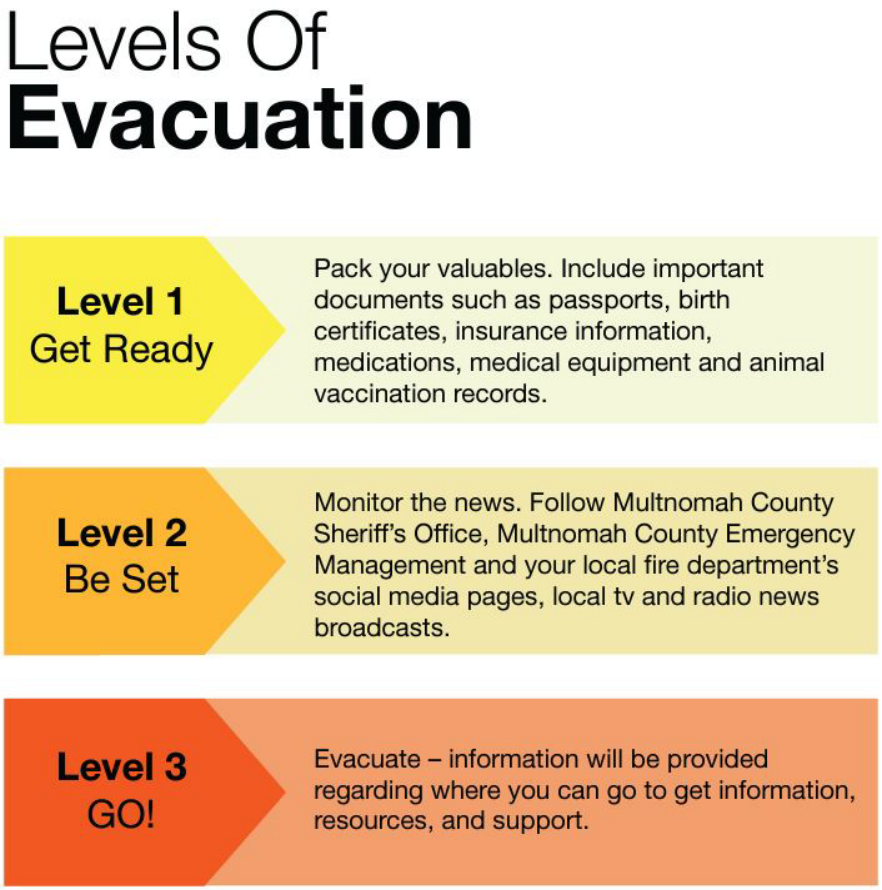


Figure 40 - Multnomah County evacuation levels. Often the time between Level 2 and Level 3 can be very short.

Equity Considerations

- Outreach materials have limitations in reaching some residents and need to use a variety of methods and mediums to reach the whole community.

- Building Firewise USA communities or other neighborhood level organizations may be more difficult for residents with less resources and time to dedicate to wildfire risk reduction.

Mitigation Strategies	Lead Agency/Jurisdiction
Continue to work on community preparedness for evacuations, including planning for moving livestock and other evacuation barriers faced by rural residents.	Corbett Fire
Develop strategies for adopting, funding, and implementing National Fire Protection Association Community Risk Reduction Standards within the Life Safety Division of Gresham Fire, to enhance education and prevention initiatives in Wildland Urban Interface areas.	Gresham Fire
Conduct annual community meetings in high-risk areas, including the East Buttes and Springwater Corridor, to educate residents about defensible space and other measures to reduce structural ignitability. Use meetings to solicit feedback on wildfire risk-reduction projects that would have wide community support.	Gresham Fire
Assist in developing a community-driven pre-disaster plan and other strategies for strengthening community response outside of the City of Gresham limits, particularly in neighborhoods with one-in, one-out road access.	Gresham Fire
Provide wildfire risk education and home assessment assistance in communities that are in high risk locations, and encourage them to become certified Firewise communities.	Lake Oswego Fire
Encourage communities to develop a neighborhood driven pre-disaster plan including evacuation routes, telephone call-down trees, and other strategies for strengthening community response.	Lake Oswego Fire
Work directly with communities targeted for fuels reduction treatments to gain support for projects prior to implementation.	Portland Fire & Rescue Public Education
Conduct community meetings in areas of the city located in wildfire hazard zones to educate communities on defensible space and measures that can be taken to reduce structural ignitability, and work towards becoming Firewise Communities.	Portland Fire & Rescue Public Education
Educate landowners in the Wildland Urban Interface about reducing wildfire hazards, and encourage them to participate in the Firewise Program.	Portland Fire & Rescue Public Education
Establish an information network, developing community risk reduction classes to educate homeowners on ways to reduce the risk of wildfires and learning about fire-resistant plants, and signing-up volunteers sign-up for fuel mitigation events in established Firewise Communities	Portland Fire & Rescue Public Education
Implement a model Firewise and ecologically sound landscaping project at Portland's Fire and Rescue Station 27 in Forest Park. Scope and seek funding for a project to explore and demonstrate defensible space, planting and landscaping options for fire-resistive native groundcover, shrubs and mature trees to achieve goals for wildfire protection and watershed health. Design and install one or more demonstration areas to showcase wildfire resistant plantings.	Portland Fire & Rescue

Mitigation Strategies	Lead Agency/Jurisdiction
Develop and distribute Wildland Urban Interface information to Communities at Risk located in wildfire hazard zones.	Portland Fire & Rescue Public Education
Promote the use of 211 telephone information system and signing-up for PublicAlerts.org to inform residents about what actions to take during wildfires and other emergencies.	Portland Fire & Rescue Public Education
Utilize active community organizations' social media networks to engage residents including electronic newsletters and links on websites.	Portland Fire & Rescue Public Education
Empower community leaders to remain engaged and continue to motivate the community through partnership with local fire departments and Firewise/USA program.	Portland Fire & Rescue Public Education
Encourage Communities at Risk located in wildfire hazard zones to become certified Firewise Communities.	Portland Fire & Rescue Public Education
Use active websites with changing banners and coordinated Twitter messaging (and other appropriate social media) to get people's attention.	Portland Fire & Rescue Public Education
Use QR codes to reach people who use those information mediums to encourage PublicAlerts.org signups and learn about wildfire risks, and post codes in parks and natural areas.	Portland Fire & Rescue Public Education
Develop a listing of outreach events that organizations and active citizen groups in Communities at Risk may be planning to identify outreach partnership opportunities.	Portland Fire & Rescue Public Education
Provide presentations to organizations that meet regularly and have high visibility in the community: Neighborhood Associations, Granges, Rotaries, Sierra Club, BARK, Garden Clubs, Audubon Society, World Forestry Center, etc.	Portland Fire & Rescue Public Education
Develop a listing of outreach events of organizations and active citizen groups to identify opportunities for partner outreach.	Portland Parks & Recreation
Support the development of a Firewise Community in Holbrook.	Scappoose Fire
Continue periodic public trainings, webinars, and presentations to reduce wildfire ignition risk and increase home resilience.	Tualatin Valley Fire & Rescue
Continue to provide social media, educational information and handouts that encourage residents' ability to be self-sufficient in managing risk on their properties.	Tualatin Valley Fire & Rescue
Gather survey information from unhoused residents about unmet needs and community wildfire risk awareness.	Multnomah County Emergency Management
Provide simple, graphic-based materials for homeless service contractors to distribute to unhoused communities before each wildfire season. Materials could address wildfire risk reduction, evacuation messaging, and how to limit wildfire smoke vulnerability.	Multnomah County Emergency Management
Explore ways to foster countywide Firewise Community coordination for sharing of information, best practices, and mutual support. Determine if there are ways for existing Firewise Communities to provide support to new groups with an interest in neighborhood-based resilience.	Multnomah County Emergency Management

5.2.4 Structural Ignitability

Limiting the risk of structures catching fire during a wildfire event is one of the most important strategies for preventing loss from future fires. Structural fire during wildfires is most often caused by embers, which can travel three miles or more ahead of a large fire.[62] The embers (also called firebrands) can start structural fires on roofs, in gutters, under structures, or in closely surrounding vegetation, then leading to fire transmission from structure to structure.

It has been estimated that 90% of structural fires during wildfires are caused by embers. Although it is possible for a structure to catch fire just from the residual heat or flames as a wildfire moves through, wildfire will often pass through areas at lower intensity but still cause enormous structural damage. Risk can be reduced by making structures less likely to ignite from embers by managing the space around a structure and building or retrofitting buildings with wildfire-resistant building materials.[63]

Figure 41 - Aerial photo of damage from the 2018 Camp Fire in California. Structures have burned to the ground even as much of the adjacent vegetation has survived the fire. In some locations, trees suffered more damage from being in proximity to burning homes than from the main line of wildfire. Photo – Owen Bettis, Deer Creek Resources

Defensible space is the buffer created between a structure and vegetation. This space acts as a fuel break to slow the movement of fire around a structure, and prevent ember-driven ignition from being passed to the structure.[64]

[62] Why Defensible Space?, Insurance Institute for Business and Home Safety.
[63] According to the Institute for Business & Home Security, wildfire-resistant building materials do not cost more money.
[64] Defensible Space, Ready for Wildfire, Cal Fire.

The area around a structure is called the home ignition zone, and wildfire mitigation education uses a three-zone strategy to promote defensible space.[65]

- Zone 1: 0-5 feet from structure (Immediate Zone)
  - Reduce the chance of ignition from embers
    - Harden the home with ignition-resistant siding, roofs, decks, attic vents, eaves, and windows.
    - Regularly clean debris from roof and gutters.
    - Use noncombustible mulches and landscaping
    - Do not store combustible materials like firewood or lumber under the structure or under decks.
- Zone 2: 5-30 feet from structure (Intermediate Zone)
  - Create a landscape that will not transmit fire to the structure
    - Remove ladder fuels under trees and branches hanging over the structure
    - Create defensible space around outbuildings
- Zone 3: 30-100 feet from structure (Extended Zone)
  - Reduce the speed of wildfire as it moves through the area
    - Remove dead vegetation.
    - Eliminate ladder fuels under trees.
    - Potentially extend the zone if the structure is at the top of a steep slope

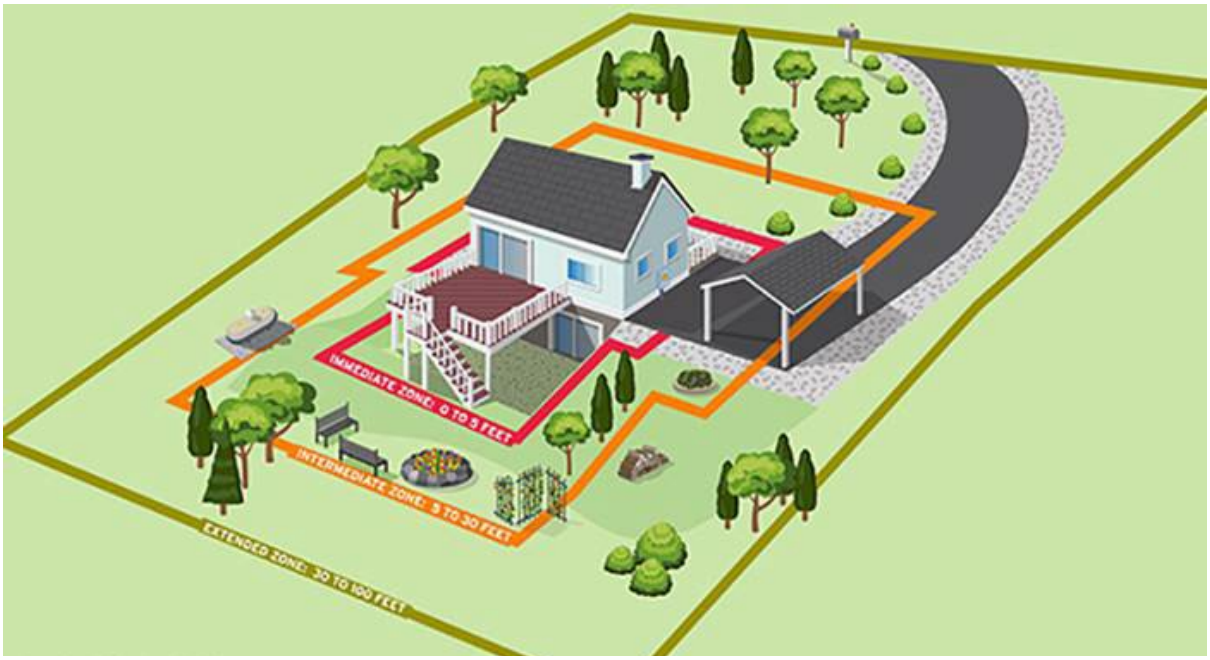


Figure 42 - Diagram showing the home ignition zone. National Fire Protection Association

[65] Zone descriptions from the Insurance Institute for Business & Home Security.

Home Defensible Space Resources:

- Ignition Resistant Homes, Wildfire Risk to Communities, US Forest Service
- Keeping Your Home and Property Safe from Wildfire: A Defensible Space and Fuel Reduction Guide for Homeowners and Landowners, Oregon State University Extension
- Oregon Defensible Space, Oregon State Fire Marshal
- Preparing Homes for Wildfire, National Fire Prevention Association
- Wildfire Defensible Space for the Farm and Ranch (Webinar), Oregon State University Extension

As noted in the case study of the Almeda Drive Fire, challenges can be increased when structures are located very close to each other. Defensible strategies for manufactured home parks are to essentially follow Zone 1 guidelines for clearing dry vegetation and flammable mulches from directly around the home and to consider the use of more fire resistant materials for decks, fences and exterior siding.[66] It is common for outreach materials explaining defensible space to show large houses on rural forested lots, so they may not be effective messaging tools for those living in denser neighborhoods.

Home Assessments

Many local fire districts are already successfully conducting home assessments to assist residents in identifying how they can improve defensible space on their properties. These programs increase risk awareness, develop effective site-specific mitigation strategies, identify residents with resource or ability limitations for maintaining defensible space, and build relationships with residents living in high-risk areas.

Planning and Building Codes

Some strategies for home defensible space may conflict with other goals, such as retaining trees and other vegetation on properties to support tree canopy goals, ecological values, and high-value view areas. An ongoing challenge is to create local codes that can best meet multiple goals, including structural safety.

Local stakeholders will need to coordinate with state partners to assess whether changes in state building code regulations can be used to require more fire-resistant building materials in new or rebuilt construction in WUI or other high-risk areas.

Equity Considerations

- County residents have differing resources and abilities for maintaining properties.
- Renters may not have the funds or authority to manage wildfire risk where they live.
- There is a greater difficulty in maintaining home ignition zones in densely built parts of the WUI, such as townhouses, manufactured home parks, or where Accessory Dwelling Units are common.
- Full awareness of structural ignition risk reduction requires multi-lingual communications and the use of varied communication strategies.

[66] Mobile Home Wildfire Safety, Fire Safe Marin

Mitigation Strategies	Lead Agency/Jurisdiction
Continue to develop programs to improve defensible space around homes by supporting Firewise programs and assisting residents with financial or mobility limitations for managing their properties.	Corbett Fire
Develop planning code amendments in the City of Gresham to support wildfire mitigation strategies, including consideration of a wildfire overlay.	Gresham Fire
Obtain structural ignitability data through structural triage data assessment collection for homes in strategic planning areas.	Gresham Fire
Seek and support grant funding and cost-share programs to support fuels reduction projects and the creation of defensible space around homes.	Gresham Fire
Develop a local wildfire prevention campaign to promote defensible space and reduce structural ignitability within the Home Ignition Zone.	Portland Fire & Rescue Public Education
Identify strategies to support under-represented populations (elderly, low income, disabled, BIPOC communities) with fuel mitigation to create defensible space around homes.	Portland Fire & Rescue Public Education
Coordinate fuel mitigation/management projects with established Firewise Communities and available resources	Portland Fire & Rescue Public Education
Become more familiar with the International Wildland Urban Interface Code and determine whether or not adoption would be beneficial and appropriate in Multnomah County.	Portland Fire & Rescue
Develop a program to offer no-cost wildland/urban interface evaluations for both new development and existing homeowners.	Portland Fire & Rescue Public Education
Maintain and expand home assessment programs, with increased collaboration between Fire Districts.	Portland Fire & Rescue Public Education
Provide assessments for commercial/industrial buildings and encourage creation of defensible space through fuel mitigation and hardening of structures.	Portland Fire & Rescue Public Education
Empower homeowners that live in a wildfire hazard zone to participate in educational sessions through the Firewise program, or other provided seminars, to learn how to effectively harden their homes, and create defensible space around their homes.	Portland Fire & Rescue Public Education
Develop strategies for property inspections for ignition risk at times of initial home occupation in a wildfire hazard zone.	Portland Fire & Rescue Public Education
Obtain structural ignitability intelligence by conducting wildland-urban interface home assessments and data collection (including GIS points) for homes in wildfire hazard zones.	Portland Fire & Rescue Public Education
Develop more fire-resilient landscaping standards, such as recommending fire-resistant plants instead of like-for-like replacements. Use Firewise resources and the International Wildland-Urban Interface code to guide city codes and standards.	Portland Fire & Rescue Public Education
Maintain defensible space around Portland Bureau of Environmental Services critical infrastructure.	Portland Bureau of Environmental Services
Review planning and zoning codes to clarify and identify opportunities to address vegetative fuel management around structures.	Portland Bureau of Planning & Sustainability
Evaluate and create defensible space of at-risk Water Bureau infrastructure in high-risk fire zones throughout the city	Portland Water Bureau
Use Firewise defensible space principles around buildings and infrastructure in the Bull Run Watershed Closure Area	Portland Water Bureau

Mitigation Strategies	Lead Agency/Jurisdiction
Incorporate new construction best practices when designing or renovating buildings in the Bull Run Watershed Closure Area	Portland Water Bureau
Support defensible space projects identified through home assessments.	Sauvie Island Fire
Designate staff time to continue defensible space assessments in the Holbrook community and support defensible space grants.	Scappoose Fire
Determine a method to review defensible space around new development and maintain evaluation and permitting of established fuel breaks,	Multnomah County Land Use
Coordinate with fire districts to review and update zoning codes. Consider expanding wildfire codes into non-resource zones, and align programs with Senate Bill 762 land use programs.	Multnomah County Land Use
Maintain engagement with fire districts to ensure planning codes meet wildfire safety needs.	Multnomah County Land Use

5.2.5 Land and Vegetation Management

The other federally required CWPP topic, along with addressing structural ignitability, is to develop strategies for reducing ignition risk from wildfire fuels. Wildfires may be reduced when there are fewer locations with enough vegetative fuel to quickly generate large fires that escape firefighter control. Strategic fuels reduction can be developed on a landscape scale and is most likely to succeed when aligned with larger land management planning processes and goals.

The previous section on structural ignitability focuses on managing wildfire fuel on properties. Objectives of actions in this section focus on strategies for aligning land management goals and facilitating cooperation between public and large private landowners to reduce risk in large open spaces and to adjacent development.

Tables are included in each fire district section in Chapter 7, outlining their priority locations for future fuels reduction projects (which may also include defensible space projects) and providing a direct justification for future fuels reduction grants.

Mechanical Vegetation Management

Most wildfire fuel reduction in Multnomah County occurs through thinning, pruning, and mechanical removal of vegetation. On a landscape level, fuel reduction can reduce the intensity of future fires and potentially improve environmental values when integrated with resource management goals, such as the restoration of oak savanna habitat. Mechanical management is very labor intensive, creating a need for resource planning for staff and equipment to perform the work, and strategies for disposing of debris.

Figure 43 - A prescribed burn at Quamash Prairie Natural Area in Washington County, performed in coordination with a wildland fire team from the Confederated Tribes of Grande Ronde. Metro

Prescribed Burning

Risk mapping shows that some areas of Multnomah County would benefit from wildfire, because they are isolated from development and fire is overdue for improving habitat values. Prescribed fire is the use of controlled low-intensity burning that reduces fuel buildup while also providing ecosystem benefits of wildfire and has been used for decades in parts of Multnomah County, especially in areas with lower-intensity ground fuels such as grass and invasive shrubs. Prescribed fire can be difficult to implement widely because of potential health impacts to the large adjacent population and the density of key transportation infrastructure that could be disrupted by smoke. Continuing to assess the feasibility of prescribed burn locations is a part of ongoing multi-dimensional fuel management strategy.

Fuels Management Limitations

Although fuel treatment is an important part of this plan, it should also be noted that large-scale fuel treatment is not as effective at reducing wildfire intensity in wet forests as it is in dry forests. Fuel management should not be seen as tool that limits the need for continuing risk awareness, fire prevention and suppression efforts, and robust alerting and evacuation planning.

In dry forests, fire suppression and land management practices have caused fuel buildup that has, over time, turned frequent low-intensity fires into large, high-intensity fires. In this region, large, infrequent high-intensity fires have always been part of wildfire behavior. During extreme fire-weather conditions, as in the statewide wind-driven 2020 Labor Day fires, fuel treatment efforts performed before the fires west of the Cascades were not found to have had any impact on reducing fire severity.[67] Maintaining fuel reduction benefits in wet climates is much more difficult, as vegetation regrows quickly and management needs to be renewed repeatedly in the same locations.

Fuel treatment is still a favored strategy however, where reducing ground fuels and ladder fuels in WUI areas may reduce the risk of severe fire where forests closely intersect with residences.[68] Fuel treatments in disturbed forests may preserve the health of trees adapting to climate change and may also be effective in areas with more frequently burning, lower-severity fuels such as grasses and shrubs. Thinning vegetation to maintain defensible space around structures and infrastructure is likely to be the most beneficial application, so that those valued assets are more likely to survive when wildfires do happen.

Invasive Species

Removal of invasive species is an attractive approach to fuels management because it addresses reducing fire risk while restoring native fire-adapted ecosystems. Invasive plants can change wildfire risk by adding to fuel loads and changing the nature of fire progression. Scotch Broom and Himalayan Blackberry are common invasive shrubs in this region, and spread rapidly in disturbed areas, becoming thick ladder fuels that can become the source of a crown fire.[69]

Figure 44 - Scotch Broom growing in Clackamas County. Photo Clackamas Soil and Water Conservation District.

Invasive species are difficult to control, as their success is based on their ability

[67] Cascadia Burning: The historic but not historically unprecedented 2020 wildfires in the Pacific Northwest, USA, Ecosphere, M.J. Reilly et al; 2022, pgs 11-12.
[68] Fire FAQs – What is forest fuel and what are fuel treatments, Oregon State University Extension Service, S.A. Fitzgerald, C. Berger, D. Leavell; January 2019.
[69] Fire Prevention, East Multnomah Soil and Water Conservation District

to easily spread and resist management. Building collaboration between Soil and Water Conservation Districts and other natural resource organizations and wildfire risk managers may be a way to leverage funding.

Debris

Slash is vegetative debris from a number of potential sources and is a persistent wildfire risk. Slash—whether from fuel reduction projects, left over from winter storms, as part of agricultural and forestry activities, yard debris, or other land management projects—can be difficult to dispose of safely. In the past, burning of slash piles was common, but as wildfire seasons continue to lengthen the times of year and locations where open burning can occur are becoming more limited. Escaped slash burns have caused a number of wildfires, including five fires that started in high winds in Clatsop County in November 2022, burning nearly 500 acres well after burn bans had ended.

Figure 45 - The US Forest Service using a smokeless air curtain burner to turn debris into biochar. A large burner can process a ton of debris every hour.

Chipping or hauling debris are the most common other methods for disposing of debris. Both require equipment and are labor intensive. Biochar can be made by burning debris and is a useful soil conditioning product. Smokeless air curtain burners have been used by the U.S. Forest Service for decades, as they are a safer method for burning debris to create biochar. The feasibility of methods that require expensive equipment can be assessed through shared or pooled resources.

Urban Planting and Forestry

Additional fuel is being created each year due to increased tree mortality caused by disease, invasive pests, and tree species replacement caused by climate change. Forestry practices can be reviewed to determine how to best replace dead trees.

Within cities, jurisdictions can re-evaluate risk from urban trees and landscaping. Urban planting lists are used to promote beautification and ecological values, but may need to be revised to better prioritize fire and drought resistance.

Utility and Transportation Right of Ways and Infrastructure Protection

Vegetation management may be able to be coordinated through shared interests and resources among those with land management requirements in utility or transportation right-of-ways. Protecting infrastructure with the same techniques as structural protection principles should also be a consideration when designing projects on public lands.

Equity Considerations

- Including social vulnerability in risk mapping can support identifying locations where fuels management work can benefit less resourced residents, or those with other barriers to resilience.

Mitigation Strategies	Lead Agency/Jurisdiction
Partner with private and public land managers, including power utilities, to reduce hazardous fuel loading in forested lands, open space, and other vegetated corridors.	Gresham Fire
Identify continuing funding sources for fuels reduction processes, including contracts for felling, brush treatment, and on-call forestry service.	Gresham Fire
Provide hazardous fuels assessment and mitigation training to City Natural Resources management and staff.	Portland Fire & Rescue Public Education
Coordinate between agencies/jurisdictions to maximize effectiveness of vegetation management projects.	Portland Fire & Rescue Public Education
Partner with managers of forested areas to reduce invasive vegetation and ladder fuels in natural area boundaries that abut communities located in a wildfire hazard zone.	Portland Fire & Rescue Public Education
Support property owners in replacing invasive species on their properties with native, fire-resistant plants.	Portland Fire & Rescue Public Education
Create incentives for and address barriers to encourage fuel reduction and defensible space, including updates for related city policies.	Portland Fire & Rescue Public Education
Develop a program for Parks Bureau staff about wildfire fuels assessment, how to create defensible space, and initial wildfire response training and safety.	Portland Fire & Rescue Public Education
Incorporate climate forecasting, adaptive management and functional assessments when revising site-specific management plans.	Portland Bureau of Environmental Services
Consider additional updates to City Plant list with more robust identification of fire-resistant plantings, and identify tree species resilient to drought and hotter summers to replace dying trees.	Portland Bureau of Planning & Sustainability
Train Portland Parks & Recreation staff who work in natural areas in fire science and how to perform hazardous fuels assessments at Parks-managed natural areas in order to target fuel reduction efforts.	Portland Parks & Recreation
Obtain funding for long-term vegetation management in key locations.	Portland Parks & Recreation
Support the Protect The Best program to stop the spread of invasive species in natural areas.	Portland Parks & Recreation
Consider wildfire risk when assessing and developing ecological prescriptions for management of large, publically owned natural areas. Include wildfire risk in new management plans and updates to existing plans.	Portland Parks & Recreation
Develop a comprehensive vegetation management treatment program for Portland Parks & Recreation properties, considering mechanical removal and other strategies.	Portland Parks & Recreation

Mitigation Strategies	Lead Agency/Jurisdiction
Coordinate with Portland Parks & Recreation's existing Ecologically Sustainable Landscapes Initiative to plant wildfire-resistant vegetation.	Portland Parks & Recreation
Create defensible space in mapped high-risk wildfire Bureau properties through fuel mitigation in heavily camped areas.	Portland Water Bureau
Thin trees on key arterial routes to maintain evacuation routes.	Scappoose Fire
Support the development of grants or other opportunities that could facilitate the shared use of air curtain burners by fire districts and resource management agencies across the county or region, to safely dispose of vegetative debris.	Multnomah County Emergency Management
Support land management projects with private landowners in the Tualatin Mountains (ex. NW McNamee Road area) of Western Multnomah County to create native fire-resilient landscapes and enhance defensible space.	West Multnomah Soil and Water Conservation District

5.2.6 Wildfire Prevention

In the sort of extreme fire weather conditions that have been a consistent part of historical local fires, firefighters can quickly become overwhelmed by the speed and intensity of new ignitions. Even when conditions are extreme, catastrophic fire can be avoided if it can be prevented from starting in the first place, making fire prevention incredibly important in reducing wildfire risk to Multnomah County.

The objectives of actions in this section are to raise awareness of wildfire ignition risks and reduce activities that can lead to ignition during extreme fire weather. Some actions overlap between fire prevention and public communication goals.

Fire Prevention Policies

The restriction of high-risk activities during dangerous wildfire conditions is a primary strategy for preventing fires.

Countywide outdoor burn ban periods are determined annually by the Multnomah County Fire Defense Board, and yard debris burning is determined on a district by district basis,[70] when approved by the Oregon Department of Environmental Quality.

Other high-risk activities, such as camping and fireworks use, have also seen increasing restrictions as the risk of wildfire has increased year over year, although policies are not standardized by jurisdiction across the county. Determining what threshold of conditions should lead to park closures is a coordination need.

Fire Risk Signage

Signs indicating fire risk are an effective tool for raising risk awareness and reminding residents of fire prevention policies. Siting and funding additional signs could be a low-cost method of reducing ignition risk.

Figure 46 - A USFS peacock fire danger sign in the Siuslaw National Forest in Oregon.

Power Utility Prevention Programs

Oregon power providers have begun managing a Public Safety Power Shutoff (PSPS) program as a preventative measure in risk areas with heavy wildfire fuels. Within Multnomah County, the first PSPS program was developed for the 2022 wildfire season by Portland General Electric (PGE),[71] which provides residential and business power to the vast majority of rural, forested areas. PGE meteorologists monitor fire weather conditions and initiate a de-energization of power lines when risk thresholds, primarily determined by high winds and low humidity, are exceeded. This power shutoff prevents lines

[70] Yard debris burning is never allowed in the City of Portland.
[71] Pacific Power also has a PSPS program, but no locations in their Multnomah County service area have been identified under the program as of Spring 2023.

impacted by falling trees from being an ignition source, especially in areas with high winds and challenging terrain.

Interactive Version of This Map

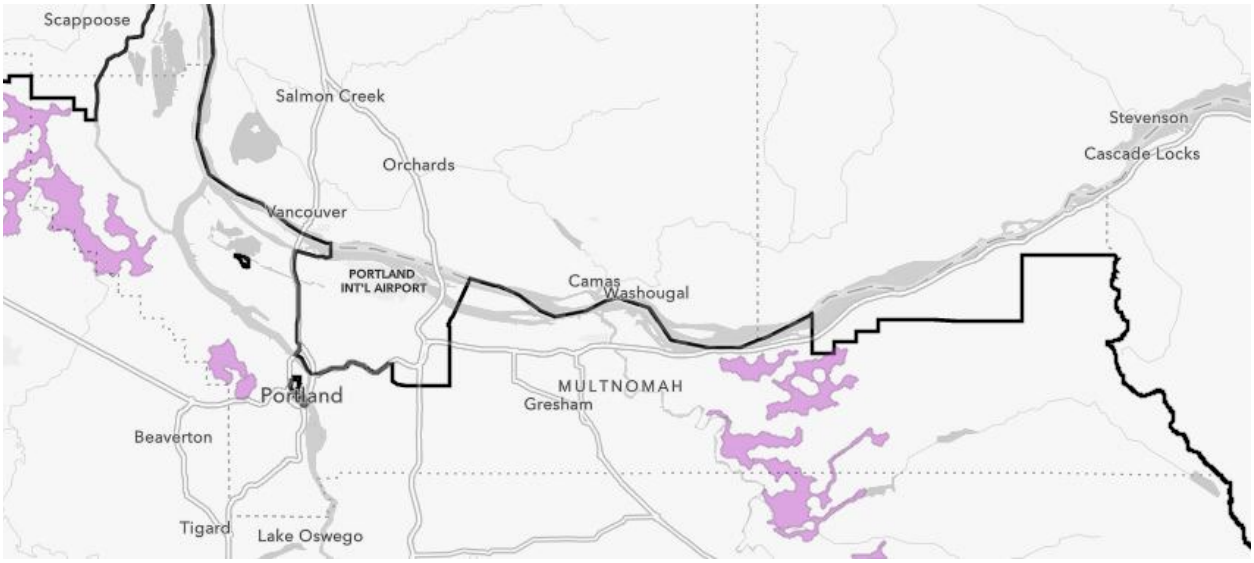


Figure 47 - Map of current PGE PSPS areas in their Multnomah County service area. Note that areas are continuously reviewed and current mapping should always be validated at the PGE website.

The PSPS program was implemented in a high-risk weather event in September 2022, with planning having already occurred to reduce health risks to those within power shutoff areas that would be most likely to be harmed by a multi-day power shutoff.

This planning process has also strived to build coordination between power utilities and local fire districts and governments to improve weather forecasting and fire detection and identify mutually beneficial fuel mitigation projects in areas outside the boundaries of utility right-of-ways that could still be impacted by downed power lines.

Equity Considerations

- Communication of wildfire risk during extreme risk periods needs to be accessible and multi-dimensional, including to unsheltered residents and recreational land users.
- Long-term preventative power shutoffs can create risks for residents that require powered medical equipment and refrigerated medicines.

Mitigation Strategies	Lead Agency/Jurisdiction
Support fuel mitigation work under power lines and coordinate with Multnomah County Transportation to improve vegetation management along county road right-of-ways.	Corbett Fire
Develop chipping program to reduce flammable debris, including completing grants to procure chipping equipment.	Corbett Fire
Determine interest in the City of Troutdale for adopting a backyard burn policy similar to existing policies in the Cities of Fairview, Gresham, and Wood Village.	Gresham Fire
Seek opportunities for wood chipper program grants that may include contract services for fuel reduction or removal. Use as an essential part of the education and awareness of the risk of wildfires occurring in wildfire hazard zones.	Portland Fire & Rescue Public Education
Develop full analysis of where fire prevention codes and environmental regulations are complimentary or contradictory.	Portland Fire & Rescue Public Education
Develop fire management plans for recreational/open areas - when to limit access or close parks due to fire risk or active fires.	Portland Fire & Rescue
Identify opportunities for community debris disposal collection sites that recycle or compost vegetative material	Portland Fire & Rescue Public Education
Work with Park Rangers, State Park Managers and Oregon Department of Transportation to patrol wildfire hazard zones areas to reduce unsanctioned camping.	Portland Fire & Rescue Public Education
Increase public awareness of wildfire hazards by posting information on existing placards in recreational areas, such as Smoky Bear fire danger dials, fire danger infographic signs, etc.	Portland Fire & Rescue Public Education
Establish an agreed upon fire danger rating system and develop agency protocols. Consider adopting the "National Fire Danger Rating System" (NFDRS) and install signs at key points in the City. Partner with the Oregon Department of Forestry to align with "Industrial Fire Protection Levels" (IFPL) throughout wildfire season, and related fire danger levels for public use. Install Smoky Bear Fire Danger signage (Peacock signs) around forested areas in City to raise awareness.	Portland Fire & Rescue Public Education
Review and potentially refine City contract specifications for machinery operations during wildfire season and during 'Red Flag' weather conditions.	Portland Fire & Rescue Public Education
Develop preparation plans for managing post-storm debris before wildfire season begins.	Portland Fire & Rescue Public Education
Work with landowners in highly visible wildfire risk areas to provide temporary and permanent signage.	Portland Fire & Rescue Public Education
Conduct fire inspections in sanctioned houseless communities to identify fire prevention opportunities	Portland Fire & Rescue Public Education
Engage unhoused community members residing within wildfire hazard zones about fire use dangers, and provide accessible materials with specific guidance.	Portland Fire & Rescue Public Education
Clarify timing of prohibited activities in mapped high-risk wildfire areas managed by Bureau of Environmental Services and determine how to	Portland Bureau of Environmental Services

Mitigation Strategies	Lead Agency/Jurisdiction
effectively message risk to the public. Align signage strategy with that used by Parks Bureau at trailheads.	
Determine in-house enforcement mechanism for prohibited activities creating wildfire risk in Bureau of Environmental Services managed natural areas.	Portland Bureau of Environmental Services
Increase Park Ranger staff and clarify rules for enforcement of open fire bans and other park policies.	Portland Parks & Recreation
Evaluate the feasibility of undergrounding power lines in the Bull Run Watershed Closure Area	Portland Water Bureau
Create fire risk signage for Water Bureau managed natural areas, and develop a sign maintenance staffing plan.	Portland Water Bureau
Install and maintain a wildfire risk (peacock) sign at Logie Trail Road near Rainbow Lake.	Scappoose Fire
Assess the feasibility of grants for providing fire prevention and suppression equipment - such as flameless stoves and fire buckets - to unsheltered communities in unincorporated vegetated areas.	Multnomah County Emergency Management

5.2.7 Operational Coordination and Capacity

Multnomah County's eight operational fire districts along with state and federal partners coordinate operational response for wildfire across the county. Coordination for messaging and evacuation involves additional partners from law enforcement, emergency management, parks departments, human services and others.

Mutual aid between fire response agencies is used frequently, and support coordination has been considered to be effective and durable by plan stakeholders. Coordination with state and federal wildland firefighting support has also been effective, with continuing efforts for identifying gaps and improvements.

Objectives of this section are to identify where improved countywide coordination can benefit wildfire response among local, state, and federal partners, and how opportunities for improving wildland firefighting capacity can be shared and scaled across districts.

Figure 48 - Scappoose Rural Fire Protection District performing wildland firefighting training in 2023.

Communications Interoperability

Ensuring fire response communications systems can work together across jurisdictions is a need requiring continuous attention. As new communications systems are integrated by

response agencies, reassessment is required for their translatability with mutual aid partners and the resolution of any barriers caused by encryption.

Fire Detection

Early detection of new fires can make the difference between a controlled event and a disaster. A key development in local detection has been the growing use of panoramic high-definition cameras that can detect smoke from miles away and throughout the year. Portland General Electric is piloting the use of these cameras in Multnomah County, and can coordinate with local agencies to share detection information and plan for additional camera sites.

Fire spotting by parks staff and users is also essential, and operating procedures and ongoing education can be tools for assuring that reports of new fires are reported to response personnel as soon as possible.

Alerting and Evacuation

Available alerting systems are effective at reaching large numbers of people through both opt-in and automatic systems. However, there are limitations for reaching everyone at risk.

Parts of the county with steep terrain have areas without cellular service, which is particularly problematic for unhoused communities and recreational users that do not have access to other phone or computer communication methods. Some rural residents may be less likely to receive alerts on cell phones or through social media.

People in parks may not be able to identify their location within the park, preventing them from navigating evacuation paths, reporting injuries and special evacuation needs, or reporting locations of spotted fires. When preventative or unplanned power shutoffs occur, cell towers may run out of backup power and prevent people from getting phone alerts in those areas during the highest risk conditions.

Analog alerting systems such as sirens or warnings broadcast from arriving fire trucks may be needed, especially when extreme fire risk requires immediate evacuation before law enforcement resources can be deployed to perform house-to-house notifications.

More localized evacuation planning and mapping is a need, and could assist in identifying neighborhood scale gaps, including capacity for evacuating residents with mobility limitations and those with livestock. Pre-identifying evacuation zones through interagency coordination may streamline decision-making. Alerting should also be coordinated across jurisdictions, including with neighboring counties, so overlapping alerts do not create confusion or messaging fatigue.

Wildland Fire Training

County fire districts are structural fire districts and respond most frequently to medical emergencies and structural fires. Maintaining wildland firefighting capability is needed, through training and specialized equipment. Building capacity of personnel can be achieved through integrated training programs, sharing of staff resources to support wildland responses in other locations, and pursuing new funding for seasonal wildland crews.

Structurally Unprotected Areas

Areas that are vulnerable to wildfire but have no publicly funded structural fire protection have been a concern in Oregon for some time. Risks to homes in these areas are heightened because state firefighting resources have a scope limited to forest protection, not structural protection and home or building fires could be a source of a wildfire. In the largest remaining structurally unprotected area in Multnomah County, over 90,000 acres in the eastern Columbia River Gorge, it is expected that it would take over twenty minutes for state resources to arrive to a new fire. Other smaller locations also exist in other parts of the county, and should be assessed for future fire protection planning.

Access

Firefighter access to new wildfire ignitions can make the difference between quick control of a new fire or a large event. Some ways in which access can be limited are by:

- Overgrown or otherwise impassable fire roads
- Bridges, rural roads and driveways too small or narrow for engines
- Locked gates in areas owned by large public or private land managers
- Access paths being blocked by encampments

Equity Considerations

- Evacuation planning must be prioritized for those with access and mobility limitations, including those with disabilities, those living in multi-generational households, unhoused communities, those living in group homes or care facilities, those with a lack of personal transportation, and those needing support to evacuate pets and livestock.
- Rural residents in structurally unprotected areas may face higher risk of loss from wildfire.

Mitigation Strategies	Lead Agency/Jurisdiction
Seek a funding partner to support wildland fire training for Gresham Fire personnel, recognizing that city and county locations outside of ODF service boundaries may have more limited subsidized training options.	Gresham Fire
Increase Gresham Fire staffing to meet suppression and training goals.	Gresham Fire
Coordinate on any logging road or trail decommissioning to ensure emergency access or secondary egress is not reduced for one-in, one-out access neighborhoods.	Gresham Fire
Initiate an awareness campaign on the safety benefits of existing private properties upgrading their addressing signage to meet new development standards	Gresham Fire
Have information available through dispatch to first responders to assist unhoused residents, including assuring these residents receive emergency response information. Develop interagency partnerships to	Gresham Fire

Mitigation Strategies	Lead Agency/Jurisdiction
develop a communication plan and identify other coordinated risk reduction efforts.	
Use controlled burns in Portland Parks and Recreation properties and Metro locations serviced by Portland Fire as a training tool for potential wildland response.	Portland Fire & Rescue Ops/Special Ops
Conduct a wildland firefighter training assessment of Portland Fire & Rescue and make recommendations for enhancing wildfire training standards.	Portland Fire & Rescue Special Ops
Develop operational procedures for the potential loss of cell towers in wildfire emergencies in Skyline Ridge area, specified Tualatin Mountains locations, Rocky Butte, and Powell Butte	Portland Fire & Rescue
Inventory existing water resources and identify alternative water sources to support potential wildfire fighting efforts. Provide signage for these sources and update computer-aided dispatch.	Portland Fire & Rescue
Implement rural road addressing (including length of driveways) and other signage for emergency response.	Portland Fire & Rescue Public Education
Enhance programs supporting citizens located in areas with limited cellphone access to ensure emergency notifications reach everyone located in wildfire hazard zones.	Portland Fire & Rescue Public Education
Coordinate with power companies to identify potential additional placements of fire detection cameras in rural forested areas.	Portland Fire & Rescue Special Ops
Identify the standard to which basic wildland firefighters will be trained. Work with partners to train all incident personnel for basic wildland firefighting and the Incident Command System (e.g. firefighters).	Portland Fire & Rescue Special Ops
Create a program to hire and train a local hand crew and utilize them for off-season vegetation management of ladder fuel mitigation, and defensible space projects.	Portland Fire & Rescue Special Ops
Identify and address any shortages in wildland training and qualifications in line leadership positions such as Operations Section Chief, Division Group Supervisor (DIVS) and Task Force Leader (TFLD)	Portland Fire & Rescue Special Ops
Revisit mutual aid agreements to ensure they are current and applicable.	Portland Fire & Rescue Emergency Ops
Review and update the Forested and Wildland Interface Areas Fire Protection Plan	Portland Fire & Rescue Special Ops
Improve emergency radio communication between City first responders and Portland Parks & Recreation City Nature staff.	Portland Fire & Rescue
Develop a Communications Plan for new wildfire ignitions that coordinates communications between Portland Parks & Recreation staff who work in natural areas and first responders.	Portland Parks & Recreation
Train Portland Parks staff who work in natural areas on policies and safety procedures when discovering a fire.	Portland Parks & Recreation
Install Pano AI Camera at Powell Butte in SE Portland for early fire detection, seeking potential funding support from Pano or other partners.	Portland Water Bureau
Create wildfire evacuation route signage within the Bull Run Watershed Closure Area.	Portland Water Bureau

Mitigation Strategies	Lead Agency/Jurisdiction
Develop an evacuation plan that identifies specific routes to move people off the island, considering limited access routes and summer visitor's unfamiliarity with local roads.	Sauvie Island Fire
Assess alerting procedures, especially for periods with high-volumes of visitors during periods of high wildfire risk.	Sauvie Island Fire
Build out Holbrook Fire Station to be able to be staffed with sleepers.	Scappoose Fire
Identify training opportunities for Incident Command System positions that coordinate resources – liaison, public information, command and general staff, aviation support.	Scappoose Fire
Enhance coordination with local and regional partners to plan for and resource share unmanned aviation planning and equipment.	Scappoose Fire
Shore up mutual aid agreements and communication with neighboring districts to clarify response planning in areas where Scappoose Fire would be the first on-scene for a wildfire.	Scappoose Fire
Improve access to wildland areas by partnering with local park organizations to deploy fire locks at park gates.	Scappoose Fire
Assess where district boundaries or response communication protocols can be re-evaluated to lower response times by area districts.	Scappoose Fire
Convene forums for residents in the structurally unprotected areas in eastern and western Multnomah County to explore alternatives for establishing structural fire district protection.	Multnomah County Emergency Management
Create an Alert and Warning Annex to the Multnomah County Emergency Operations Plan that prioritizes communicating wildfire risk to underserved communities.	Multnomah County Emergency Management
Continue to organize annual exercises to test operational wildfire coordination, alternating scenarios between the east and west sides of the county.	Multnomah County Emergency Management
Support fire districts in the development of fire response best practices for rural addressing.	Multnomah County Land Use
Determine evacuation zones in unincorporated areas that can streamline determination and communication of evacuation levels.	Multnomah County Sheriff's Office

Section 5.3 – Fire Districts and Other Agencies

The subsections in this section provide more detailed information about risks, gaps, and mitigation planning for the local fire districts and associated city and county agencies.

Each section includes Wildland Urban Interface and potential impact maps for that jurisdiction or district. Mitigation strategies are included in this chapter as well, so that users of this plan can more easily track action planning in their local area.

Also included in each section are Communities at Risk and priority fuel reduction areas for each fire district. ‘Communities at Risk’ is a designation of prioritized areas for prevention and response efforts. The Oregon Department of Forestry initially created a statewide designation in 2001, which were the fire district and city boundaries throughout Multnomah County. The 2011 CWPP further defined these areas to a more local level in most cases, to identify the particular needs of different neighborhoods and communities within those boundaries. Fire districts in this plan have reviewed the list and updated them where needed, to account for increased risk or new development. Risk categories for each Community at Risk table may vary slightly between communities.

5.3.1 Cascade Locks Fire

Cascade Locks Fire is the fire department for the City of Cascade Locks, which is located entirely within Hood River County.

Cascade Locks does not have a station or any official service area in Multnomah County, but the department provides contracted service to opt-in residents in the structurally unprotected area east of Corbett Fire's service area, including the unincorporated communities of Dodson and Warrendale.

Interactive Version of this Map

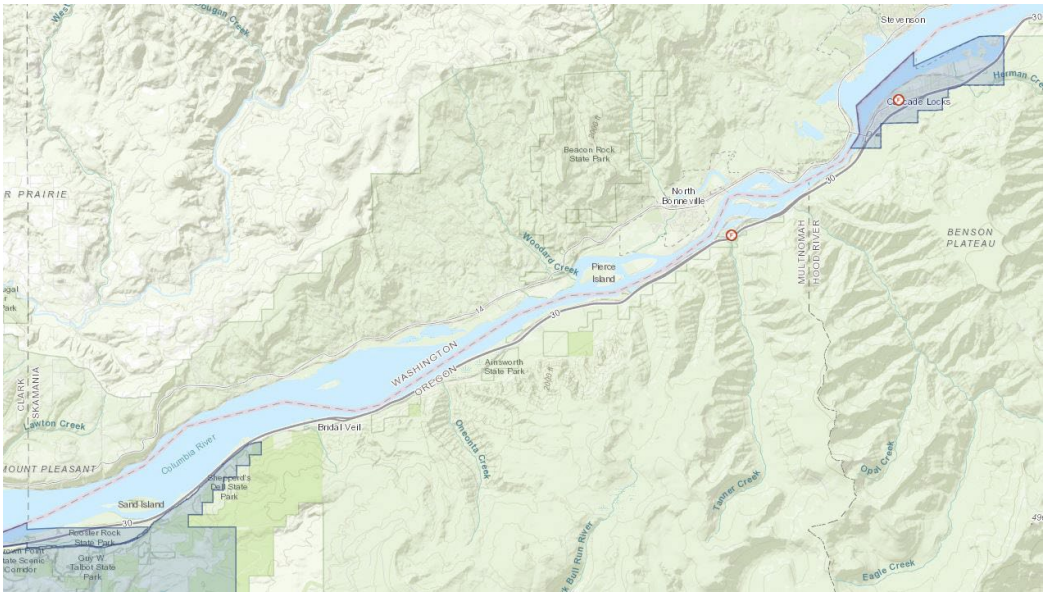


Figure 49 - Map showing the service area boundaries of Corbett Fire to the West and Cascade Locks Fire to the east. The structurally unprotected area in between includes the unincorporated areas of Warrendale and Dodson. The fire station shown in the unprotected area is for fire suppression at Bonneville Dam.

Within Multnomah County, Cascade Locks' key priorities are to maintain coordination with Corbett Fire for response within the structurally unprotected area, and with other large land managers for access routes through forested areas where Cascade Locks Fire would be an initial responder.

No actions are included for Cascade Locks Fire, and district priorities for protective services and fuel reduction are located in the Hood River County CWPP.

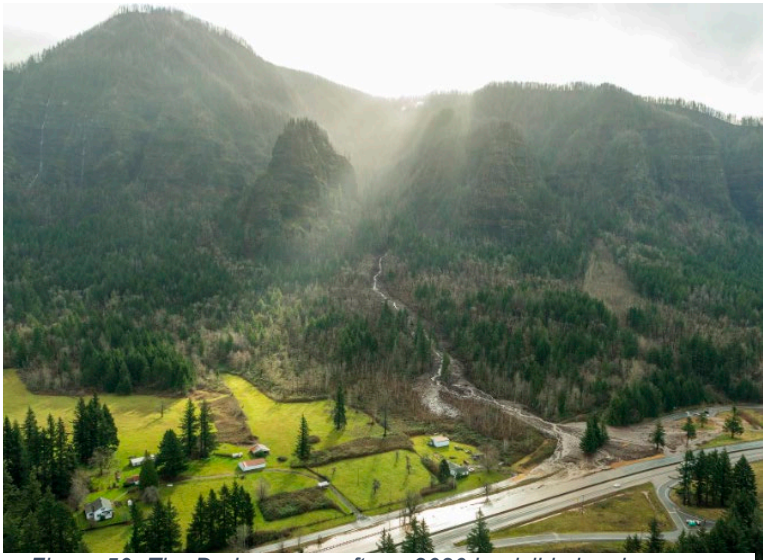


Figure 50- The Dodson area after a 2020 landslide in a burn scar location from the Eagle Creek Fire. Photo - ODOT

An action is included in the Multnomah County section for the continuing assessment of the feasibility of creating a new structural protection district, or joining the current unprotected area into an existing district.

Interactive Version of this Map – (Planning and Cadastral - Oregon WUI Hazard Rating)

Figure 51 - WUI areas in the structurally unprotected area west of Cascade Locks. The two areas are the Dodson/Warrendale area and the location of the Bonneville Dam. Map data from ODF WUI Hazard Rating.

5.3.2 Corbett Fire

Corbett Fire, previously known as Rural Fire Protection District #14,[72] provides service to areas including the unincorporated communities of Corbett, Springdale, Aims, Latourell and Bridal Veil, covering a 40-square-mile-area east of the Sandy River through much of the Columbia River Gorge and south all the way to the Clackamas County line. Approximately 4,000 people live within Corbett Fire's service boundaries.

The district has three fire stations−the main station located in Corbett and stations in Springdale and Aims.

Interactive Version of This Map

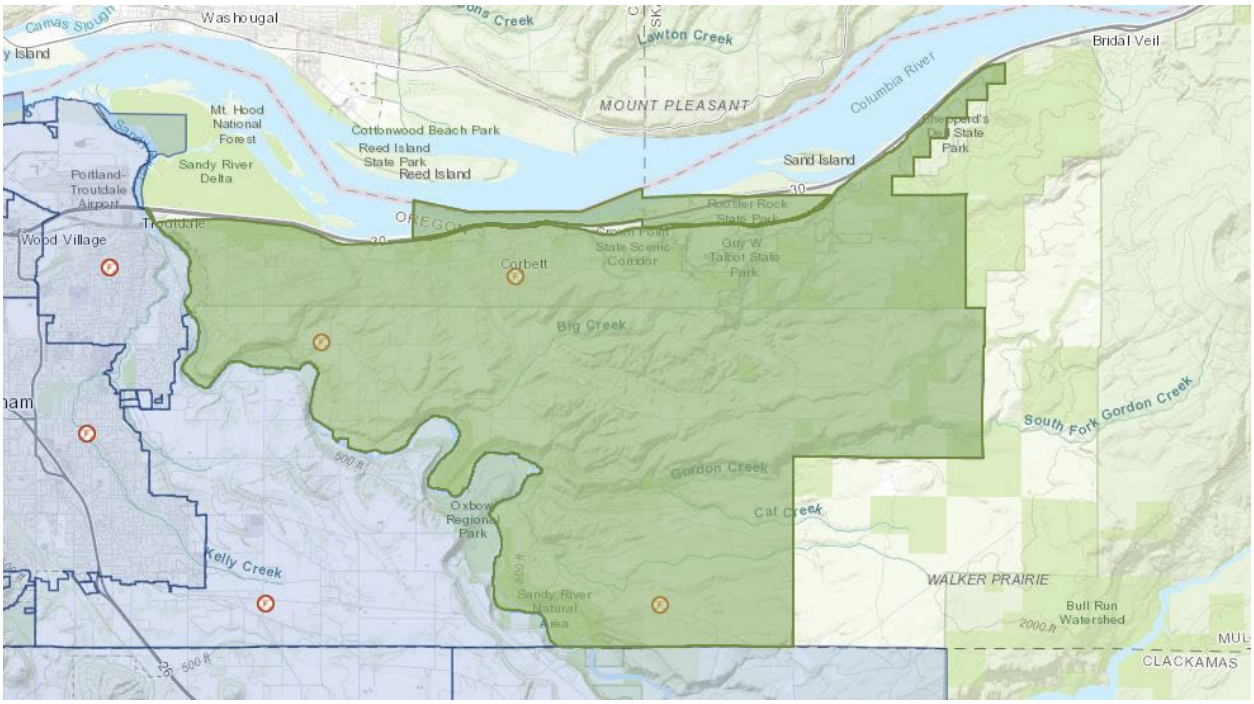


Figure 52 - Location of Corbett Fire's service area, with the main station shown in the north center part of the area. Map from the Oregon Office of the State Fire Marshal.

Corbett Fire's service area has steep slopes and homes surrounded by heavy fuels adjacent to numerous state parks, large private timber tracts, and Bureau of Land Management and US Forest Service holdings. Based on the statewide WUI hazard rating generated by ODF, Corbett Fire's service area includes nearly all of the highest risk WUI areas in Multnomah County. The

[72] The name was officially changed in 2017 to better reflect the community served – Rural Fire Protection District #14 is still used for some business purposes and may still be used interchangeably in statewide or regional maps.

region also includes heavily used recreational areas, significantly expanding the population served, especially during the summer.

Interactive Version of this Map – (Planning and Cadastral - Oregon WUI Hazard Rating)

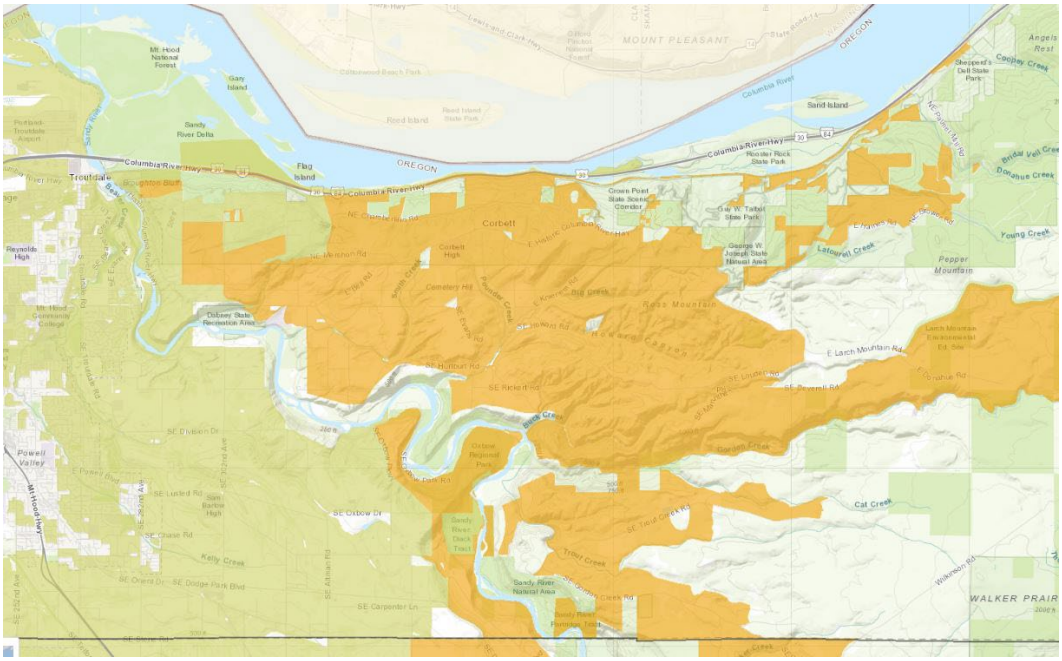


Figure 53 - Map showing WUI hazard ratings in areas served by Corbett Fire. Orange indicates moderate risk and green is lower risk, based on statewide ODF criteria. Map from ODF statewide WUI Hazard map.

Interactive Version of this Map – (Wildfire Potential Impacts - Overall Potential Impact)

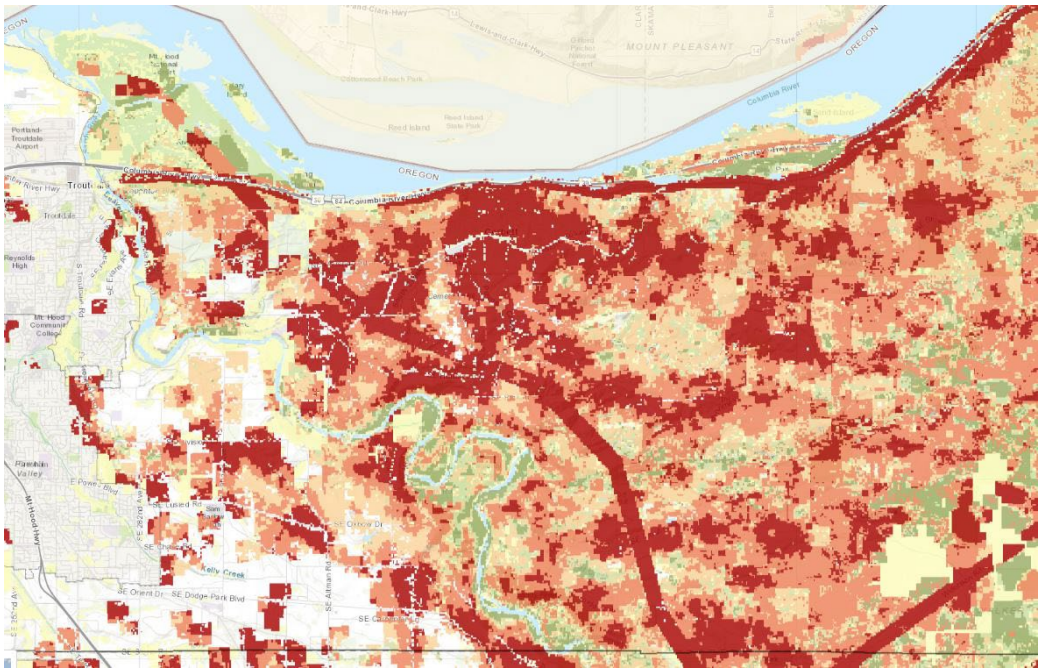


Figure 54 - Map showing overall potential wildfire impact, as determined by the PNW-QWRA. Areas in dark red have the highest potential impact from wildfire.

Figure 55 - Corbett Fire Engine 61 at Multnomah Falls. Photo Corbett Fire.

Corbett Fire has a staff of two part-time employees and 30 volunteers as of June 2023, creating a strong level of response capacity for the population served.

In response to the wildland fires of 2017 and 2020, Corbett Fire purchased three additional all-season rigs that can be used as brush rigs in summers.[73] This provides additional rapid response capacity for fire suppression and road clearance. During the Labor Day windstorm in 2020, Corbett Fire received eighteen assistance calls over three hours.

The Corbett community approved a Fire District Bond in November 2022 that will allow additional storage and training space and the development of strategic water resources.

Other Corbett Fire priorities have include developing a local Firewise community to promote community resilience and defensible space, and continuing to offer address signs to rural residents to improve identification of home sites during emergencies. A Firewise community has

[73] https://flashalert.net/id/CorbettFire/144748?alert=1

now been established for the entire Corbett Fire service area, making it one of the largest such communities in Oregon.

Some risks noted during the planning process are from downed power lines and overgrown transportation right-of-ways. Much of the Corbett Fire area is within a PGE Public Safety Power Shutoff zone, for pre-emptive power de-energization when wildfire conditions become extreme.

The Corbett Water District serves about 3,000 residents in the Corbett area, and has infrastructure located in high-risk WUI areas. The Water District uses a gravity system to provide water to customers from Gordon Creek, making it the only large-scale provider in the county to use surface water (rather than from reservoirs or groundwater), creating an increased relative risk of low flow in the summer.

Corbett Fire Mitigation Actions

Action No.	Mitigation Type	Mitigation Action	Lead Agency	Supporting Partners
1	Community Engagement and Resilience Building	Continue to work on community preparedness for evacuations, including planning for moving livestock and other evacuation barriers faced by rural residents.	Corbett Fire	Multnomah County Emergency Management, Multnomah County Animal Services, Multnomah County Sheriff's Office, Oregon State Fire Marshal
2	Structural Ignitability	Continue to develop programs to improve defensible space around homes by supporting Firewise programs and assisting residents with financial or mobility limitations for managing their properties.	Corbett Fire	East Multnomah Soil and Water Conservation District, Oregon State Fire Marshal, Multnomah County Emergency Management
3	Wildfire Prevention	Support fuel mitigation work under power lines and coordinate with Multnomah County Transportation to improve vegetation management along county road right-of-ways.	Corbett Fire	Multnomah County Transportation, PGE, Bonneville Power Administration, Cascade Locks Electric
4	Wildfire Prevention	Develop chipping program to reduce flammable debris, including completing grants to procure chipping equipment.	Corbett Fire	Oregon Department of Forestry, Oregon State Fire Marshal
5	Structural Ignitability	Implement defensible space projects around Corbett Water District critical infrastructure.	Corbett Water District	US Bureau of Land Management
6	Wildfire Prevention	Improve water storage and fire-season water availability by upgrading aging pressure reducing control valves and constructing an Aquifer Storage and Recovery (ASR) well.	Corbett Water District	

Communities at Risk

Location	Priority	Defensible Space	Access	Water	Public Lands	Private Lands	Camping Uses	Protection Capability	Ag/Yard Burning	Community Outreach	Communications	Steep Slopes	Description
Alder Meadows Road	Low	●	●	●	●	●		●		●		●	This is a community of about six homes that are in need of defensible space as well as continued fuels reduction on adjacent lands. Water would need to be transported here. Access is limited to one way in and out.
Bridal Veil	High		●	●	●	●	●	●		●		●	This is a small community that has a large number of recreational users visiting throughout the year, so there is an opportunity for community outreach. There is no water available. There is good defensible space around the structures, but heavy timber surrounds the community. Access is limited to one way in and out.
Columbia Avenue	Medium	●	●			●		●		●		●	This is a community of about 6 homes that are in dire need of defensible space as well as continued fuels reduction on adjacent lands. There is a hydrant, so water supply is sufficient. Access is limited to one way in and out.
Deverell Road	Low	●	●	●		●		●		●		●	Deverell is a small community that has a number of long, steep, one-way driveways with no signage. There are a few homes with no defensible space and there is no water here.
Donahue Road	High	●	●	●	●	●		●		●		●	This area represents less than 5 homes, but is rich in community values, as it is the primary watershed providing drinking water to Corbett area residents. As such, important infrastructure is located here including a water reservoir and operation head works. There are heavy fuels in this area as well as commercial forest management activities (Longview Fiber and Frank Timber).
Haines / Thompson Mill Roads	Medium	●	●			●		●		●	●		This area has only about 6 homes, but also includes the Antec commercial laboratory, which may use hazardous materials. Access is limited to one way in one way out. The community would benefit from defensible space as well as fuels treatment in the surrounding forest lands.

Location	Priority	Defensible Space	Access	Water	Public Lands	Private Lands	Camping Uses	Protection Capability	Ag/Yard Burning	Community Outreach	Communications	Steep Slopes	Description
Howard Road	Low	●	●	●		●		●		●		●	This is a larger community of about 20 homes, which sits on a steep canyon. Access is extremely limited with one way in and out. There are steep, long driveways. Water would need to be transported here to fight fire. The homes are in need of defensible space and it would be beneficial to continue fuels reduction efforts onto adjacent forest lands.
Latourell / Alex Barr Roads	High	●	●	●		●		●		●		●	There are about 20 homes in this community. Alex Barr has a steep gravel road and both Latourell and Alex Barr are one way in and out. Water would need to be transported here to support firefighting efforts. Defensible space is needed around homes and continued fuels reduction is needed on the south side of Latourell.
Maffet Road	Low	●	●	●		●		●		●			This is a small community of about 5 homes. The access in this area is 1-way, but it isn't steep and can be accessed fairly easily. There are heavy fuels in the area and no water available for wildfire fighting.
Mannthey Road	Medium		●	●	●	●		●		●		●	Mannthey Road is a community of about 10 homes that have fairly good defensible space. Fuels reduction is needed around the community to really protect the structures from a fire spreading from forest lands. There is no water here, and access is poor with only one way in and one way out.
Red Elder, Fern Road, Hemlock Roads	High	●	●	●		●		●		●		●	This community has about 15 residences. Access is limited to steep one-way in and out roads.
Rickert to O'Regan Roads	Medium	●	●	●		●		●		●		●	This is a community of about 15 homes that are in need of defensible space. Heavy timber surrounding the community should also be treated to reduce the spread of fire. Access is very poor with steep, gravel one way roads and poor address signage. Water would need to be transported here.

Location	Priority	Defensible Space	Access	Water	Public Lands	Private Lands	Camping Uses	Protection Capability	Ag/Yard Burning	Community Outreach	Communications	Steep Slopes	Description
Sandy River Delta	Medium		●	●	●		●	●	●				Thousand Acres is part of the US Forest Service, who contracts with Corbett Fire for fire suppression. This area has high fuels comprised of invasive species including Himalayan Blackberry and Scotch Broom. There are many potential ignition sources, as it is adjacent to Interstate 84 and Rail Road, has an off-leash dog park that has heavy recreational use. The Columbia Gorge National Scenic Area is working on restoration of native vegetation and eradication of the Himalayan Blackberry.
Toll, Brower & Palmer Mill Roads	High	●	●	●		●		●		●		●	This is a community of about 20 homes. Although there is a draft site on Toll Road, water would need to be transported to Brower and Palmer Mill during a wildfire event. This area has very poor access, with one-way egress on steep, narrow gravel roads.
Trout Creek Road/ Aims Community	Medium	●	●	●		●		●		●			Trout Creek is home to over 50 residences. The community lies at the eastern edge of the Corbett RFPD with extended response times from the main station. The Aims Community is located along the southern Multnomah County/Clackamas County border. Any response here would likely be coordinated with Clackamas Fire District #1. It is surrounded by managed forestlands. Johannesen Road is one way in one way out, and there is a pond there for water. Groce Road is one way in and out, does not have sufficient water.

Priority Fuel Mitigation Location	Project Details
Entire Corbett Fire service area	Home defensible space projects identified through Firewise program, especially for residents with barriers to vegetation and structure management. Locations beneath power lines and county road right-of-ways.
Alder Meadows Road	Defensible space and projects on adjacent landscapes

Priority Fuel Mitigation Location	Project Details
Columbia Avenue	Defensible space and projects on adjacent landscapes
Deverell Road	Defensible space
Donahue Road	Defensible space and projects on adjacent landscapes
Haines/Thompson Mills Roads	Defensible space and projects on adjacent landscapes
Howard Road	Defensible space and projects on adjacent landscapes
Latourell/Alex Barr Roads	Defensible space and projects on adjacent landscapes
Maffett Road	Projects on adjacent landscapes
Mannthey Road	Projects on adjacent landscapes
Red Elder, Fern Road, Hemlock Roads	Defensible space
Rickert to O'Regan Roads	Defensible space and projects on adjacent landscapes
Sandy River Delta	Support native species restoration
Toll, Brower & Palmer Mill Roads	Defensible space
Trout Creek Road/ Aims Community	Defensible space

5.3.3 Gresham Fire (including Rural Fire Protection District 10 and the Cities of Fairview, Troutdale, and Wood Village)

Gresham Fire is Multnomah County's second largest urban fire district by population served, with service across east county cities and rural areas from the City of Gresham's border with the City of Portland to the west bank of the Sandy River. In total, Gresham Fire's seven stations responded to nearly 17,000 calls in 2019, with 435 of those being structural or outdoor fire responses.

Fire protection service for the Cities of Fairview, Troutdale, and Wood Village is provided through an Intergovernmental Agreement, and these cities receive the same wildfire protection and suppression services (among other services) as the City of Gresham. A Four City Fire Service Board meets quarterly to coordinate fire and emergency services.

Gresham also provides service to Rural Fire Protection District 10 through a separate Intergovernmental Agreement for service in the City of Maywood Park and a number of unincorporated locations surrounding Gresham's city limits.

Mitigation actions, communities at risk, and priority fuel treatment areas are included as a single table for all of the locations that are served by Gresham Fire.

Interactive Version of This Map

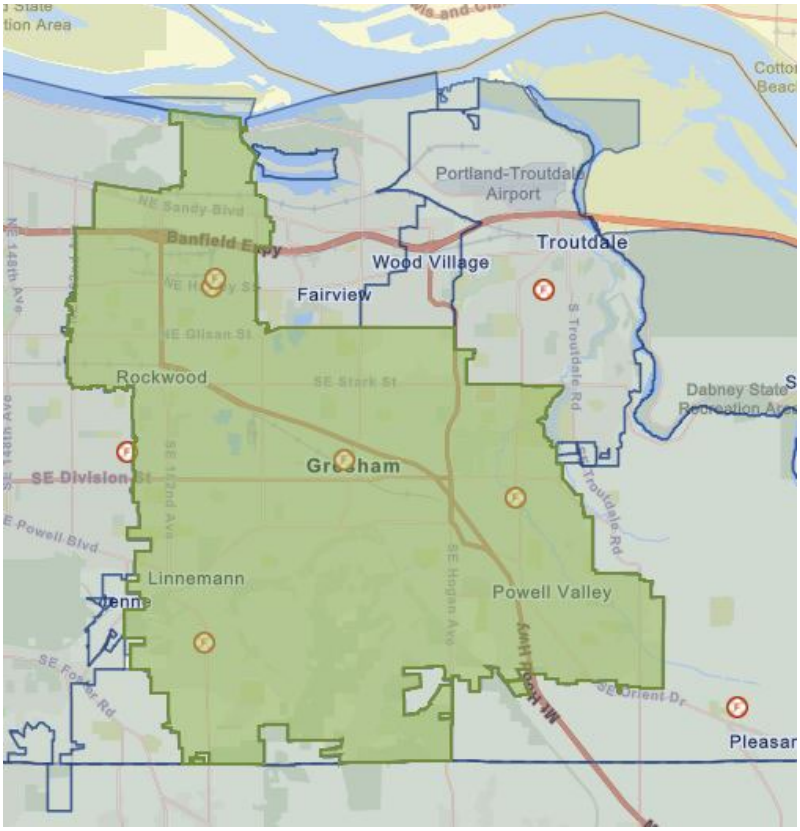


Figure 56 - Gresham Fire service area in the City of Gresham, with boundaries of Fairview, Troutdale, and Wood Village also shown. Map from Oregon State Fire Marshal's office.

Within the City of Gresham, the most notable wildfire risk area is at the East Buttes, a series of extinct volcanoes that now are part of a park and trail system, but also include neighborhoods in and adjacent to the buttes.

Rural Fire Protection District 10 (RFPD 10)

Interactive Version of This Map

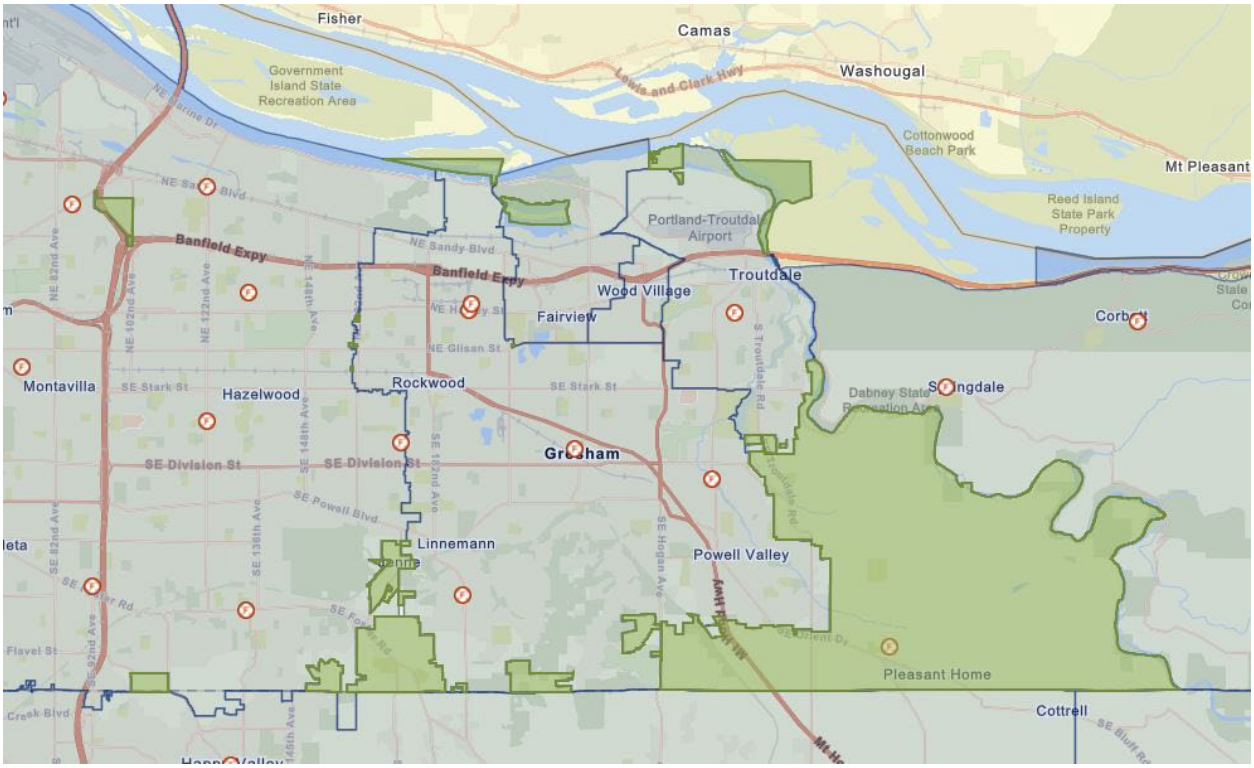


Figure 57 - Service area of Rural Fire Protection District 10, with widely located unincorporated areas and the City of Maywood Park in the top left. Map from Oregon State Fire Marshal.

RFPD 10 was founded in 1935 and provides two fire stations and a fire training center staffed by Gresham Fire. Gresham Fire's brush unit is located at RFPD 10's Station 76, built in 2015, which serves a 14-mile rural area west of the Sandy River with some of Gresham Fire's highest wildfire risk.

Notable areas included in RFPD 10's area include major risk areas at Oxbow Regional Park, the unincorporated community of Pleasant Valley, and unincorporated areas southeast of Powell Valley.

City of Troutdale

Of the three cities with fire services contracted to Gresham Fire, Troutdale has the highest risk from wildfire and the largest areas where fuel reduction and defensible space projects would be beneficial. Troutdale is located at the mouth of the Columbia River Gorge and has incorporated limits on both sides of the steep, forested banks of the Sandy River as well as a densely vegetated floodplain along Beaver Creek.

Troutdale would likely be the first incorporated community to have an evacuation order and be the first to potentially receive embers from a large east wind driven fire in the Columbia River Gorge. Because of its proximity to risk areas, most of the City of Troutdale is considered to be a WUI area. Gresham Station 75, owned by RFPD 10, is located in Troutdale.

Cities of Fairview and Wood Village

Fairview and Wood Village have identified wildfire risk as a low concern in their most recent Natural Hazard Mitigation Plan update. Both cities are smaller enclaves between other incorporated cities and are therefore buffered from wildfires coming from rural areas. Both cities have parks and a small number of vegetated undeveloped lots that could be ignition sources of highly localized fires.

Despite this lower risk, the majority of both cities are still considered WUI areas because of their proximity to potential large wildfires, especially from the east. However, unlike Troutdale, since neither city has much potential wildfire ignition locations within city limits, they also have few potential wildfire impact areas as defined in the PNW-QWRA.

Interactive Version of this Map – (Planning and Cadastral - Oregon WUI Hazard Rating)

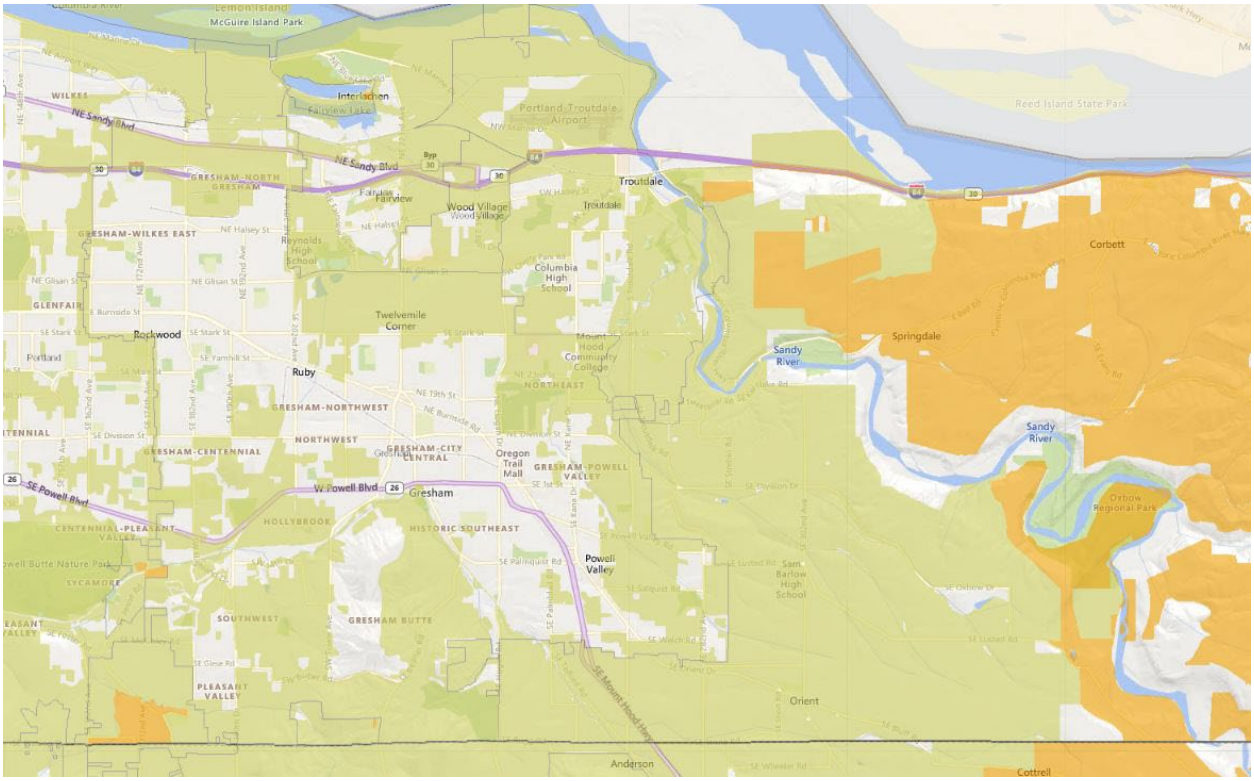


Figure 58 - Map showing WUI Hazard Areas in Gresham service areas, which are widespread. Orange areas have higher risk, identified around Oxbow Park and Pleasant Valley.

Interactive Version of this Map – (Wildfire Potential Impacts - Overall Potential Impact)

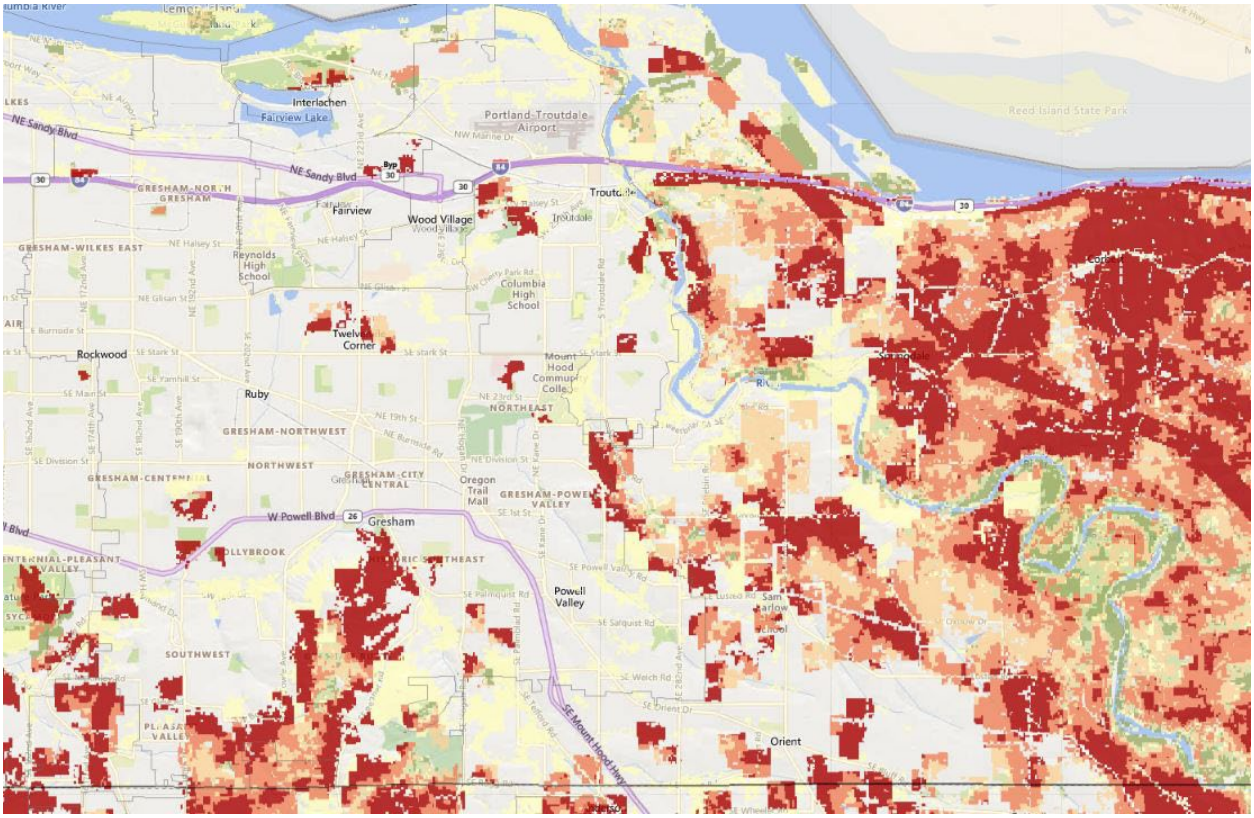


Figure 59 – PNW-QWRA map showing potential impact of wildfire in Gresham Fire service areas. Dark red areas face the highest impact. The East Buttes and RFPD 10 areas southeast of Gresham show the largest high impact areas. Portions of Troutdale also have notable risk.

A primary issue in Gresham is for staffing capacity for initiatives around community engagement and property level fuels reduction. Fuels reduction in parks and other large public tracts may also reduce risk to neighborhoods served by Gresham Fire. An ongoing process is the coordination of fire prevention policy with the other city governments served by Gresham Fire.

A number of locations in high-risk fire areas have emergency response access issues with one-way-in/one-way-out roads.

Gresham Fire (including Rural Fire Protection District 10 and the Cities of Fairview, Troutdale, and Wood Village) Mitigation Strategies

Action No.	Mitigation Type	Mitigation Action	Supporting Partners
1	Data and Risk Assessment	Develop a local vulnerability analysis to refine priorities for outreach and mitigation projects.	Gresham Emergency Management
2	Data and Risk Assessment	Develop structural and fuel loading assessments for the Oxbow Parkway area.	Metro Parks and Natural Areas
3	Community Engagement and Resilience Building	Develop strategies for adopting, funding, and implementing National Fire Protection Association Community Risk Reduction Standards within the Life Safety Division of Gresham Fire, to enhance education and prevention initiatives in Wildland Urban Interface areas.	Oregon State Fire Marshal
4	Community Engagement and Resilience Building	Conduct annual community meetings in high-risk areas, including the East Buttes and Springwater Corridor, to educate residents about defensible space and other measures to reduce structural ignitability. Use meetings to solicit feedback on wildfire risk-reduction projects that would have wide community support.	Gresham Emergency Management, Multnomah County Emergency Management
5	Community Engagement and Resilience Building	Assist in developing a community-driven pre-disaster plan and other strategies for strengthening community response outside of the City of Gresham limits, particularly in neighborhoods with one-in, one-out road access.	Multnomah County Emergency Management, Multnomah County Sheriff's Office
6	Structural Ignitability	Develop planning code amendments in the City of Gresham to support wildfire mitigation strategies, including consideration of a wildfire overlay.	Gresham Urban Design and Planning, Gresham Natural Resources Program
7	Structural Ignitability	Obtain structural ignitability data through structural triage data assessment collection for homes in strategic planning areas.	
8	Structural Ignitability	Seek and support grant funding and cost-share programs to support fuels reduction projects and the creation of defensible space around homes.	Gresham Emergency Management, Gresham Natural Resources Program, City of Fairview, City of Troutdale, City of Wood Village, Multnomah County Emergency Management, East Multnomah Soil & Water Conservation District
9	Land and Vegetation Management	Partner with private and public land managers, including power utilities, to reduce hazardous fuel loading in forested lands, open space, and other vegetated corridors.	Portland General Electric, Bonneville Power Administration, Gresham Natural Resources, Metro Parks and Natural Areas, Oregon State Parks. Oregon Department of Forestry
10	Land and Vegetation Management	Identify continuing funding sources for fuels reduction processes, including contracts for felling, brush treatment, and on-call forestry service.	Gresham Emergency Management, Gresham Natural Resources Program, City of Troutdale

Action No.	Mitigation Type	Mitigation Action	Supporting Partners
11	Wildfire Prevention	Determine interest in the City of Troutdale for adopting a backyard burn policy similar to existing policies in the Cities of Fairview, Gresham, and Wood Village.	City of Troutdale
12	Operational Capacity and Coordination	Seek a funding partner to support wildland fire training for Gresham Fire personnel, recognizing that city and county locations outside of ODF service boundaries may have more limited subsidized training options.	Oregon State Fire Marshal
13	Operational Capacity and Coordination	Increase Gresham Fire staffing to meet suppression and training goals.	Oregon State Fire Marshal
14	Operational Coordination and Capacity	Coordinate on any logging road or trail decommissioning to ensure emergency access or secondary egress is not reduced for one-in, one-out access neighborhoods.	Metro Parks and Natural Areas, Oregon State Parks, Forestry Tract Landowners
15	Operational Coordination and Capacity	Initiate an awareness campaign on the safety benefits of existing private properties upgrading their addressing signage to meet new development standards	Gresham Urban Design and Planning, Multnomah County Land Use, City of Troutdale
16	Operational Coordination and Capacity	Have information available through dispatch to first responders to assist unhoused residents, including assuring these residents receive emergency response information. Develop interagency partnerships to develop a communication plan and identify other coordinated risk reduction efforts.	Gresham Community Services, Gresham Emergency Management, Gresham Police, Multnomah County Emergency Management, Multnomah County Sheriff's Office, Joint Office of Homeless Services

Communities at Risk

Location	Priority	Defensible Space	Access	Water	Public Lands	Camping Uses	Ag/Yard Burning	Community Outreach	Communications	Steep Slopes	Description
Blue Lake	Low	●	●		●		●	●			Blue Lake is a recreational area that is managed by Metro. The residential area around Blue Lake is concentrated along Interlachen Road which provides only own way in and one way out. Many of the homes along Interlachen Road have cedar shake roofs. The residential area is adjacent to grassland that dries out significantly in summer months and provides ample fuel to start a wildfire. The dry grasslands coupled with exposure and potential ignition sources from residential development and the recreationists that use Blue Lake make it a Community at Risk.
Lower Sandy River Bend	High	●	●	●	●	●	●	●		●	This community is a heavily vegetated residential area adjacent to the Sandy River. It is characterized by steep slopes, heavy fuels, poor access and limited water supply. The area includes: Jackson Park Road, Sandy Dell and Wilson Road, which all provide only one way in and one way out for residents. Sandy Dell is a gravel road, presenting additional difficulties for emergency service vehicles and Wilson Road is extremely steep. Wildfire hazard awareness has increased since 2011 because of local events.
Oxbow Parkway	High	●	●	●	●	●		●	●	●	This area is a high priority area for prevention efforts because it is difficult to access, there are heavy fuels and steep slopes, and the homes are in a canyon that presents communications issues. In addition, it is a high use recreation area that increases potential wildfire ignition sources. In 2001, Gresham Fire completed a Structural Protection Plan that articulates water supply needs, response tactics and resources needed for each of the following neighborhoods: Homan Road, Oxbow Parkway, Hosner Terrace, Francis Street, Camp Collins and Oxbow Park. Structural triage was also completed for this area in 2001. The community has neighborhood associations that meet regularly and are well-organized.
Ritchie Road	Low						●				This is a unique community at risk, as it is characterized by agricultural lands with residential properties intermixed, The nurseries in the area have special provisions to burn large quantities of woody debris, and many homeowners are concerned about the potential of embers reach their homes, escaped fires, and smoke abatement.

Location	Priority	Defensible Space	Access	Water	Public Lands	Camping Uses	Ag/Yard Burning	Community Outreach	Communications	Steep Slopes	Description
Walters Hill - Gresham Butte	High	●	●	●	●	●		●		●	The Walters Hill area extends from Telford Road southwest, crossing the Multnomah/Clackamas County border. This is a high priority area for wildfire prevention activities because it is characterized by heavy fuels and steep slopes that restrict access. Some roads are one way in-one way out. Development is intermixed throughout the area and there is limited water supply for fighting a potential wildfire. Ambleside Road is particularly at risk because there is a bridge here that cannot support emergency service vehicles, water supply is very limited, and it is adjacent to Metro's green space. The residents may not be aware of the high wildfire risk in their community. This level of hazard coupled with exposure makes this CAR an excellent place to target for community outreach and other prevention efforts.
Wistful Vista	Medium	●	●					●			This community is characterized by heavy fuels and restricted access. Wistful Vista Road is the only way in and out. Due to the adjacent urban areas, the homeowners may have a false sense of security regarding wildfire hazards.

Priority Fuel Mitigation Location	Project Details
Beaver Creek Greenway (Troutdale)	Defensible space projects and management of greenway landscape to promote a fire-resilient ecosystem
Blue Lake	Defensible space projects and grassland management
Lower Sandy River (Gresham, Troutdale, Unincorporated Multnomah County)	Defensible space projects, ladder fuels and invasive vegetation management in landscapes adjacent to development
Oxbow Park	Native landscape restoration areas near residences, defensible space projects
Walters Hill-Gresham Butte	Defensible space projects and management of adjacent landscapes
Wistful Vista	Defensible space projects

5.3.4 Lake Oswego Fire (including Riverdale Fire District 11 and the Alto Park Water District)

The Lake Oswego Fire Department provides fire protection, prevention, rescue, and emergency medical service to about 50,000 residents. The vast majority of those people are in Clackamas County, but Lake Oswego Fire also serves small areas within the Lake Oswego city limits at and around Mount Sylvania and in a southern part of Tryon Creek State Natural Area. Lake Oswego Fire also provides contracted service to unincorporated portions of Multnomah County that make up part of Riverdale Fire District 11 and the Alto Park Water District.[74] Riverdale Fire District 11 serves the Dunthorpe and Riverdale neighborhoods southeast of Lewis and Clark University, and the Alto Park Water District is a fire district with about 40 residents. All service within Multnomah County is provided from stations located in Clackamas County.

Interactive Version of These Maps

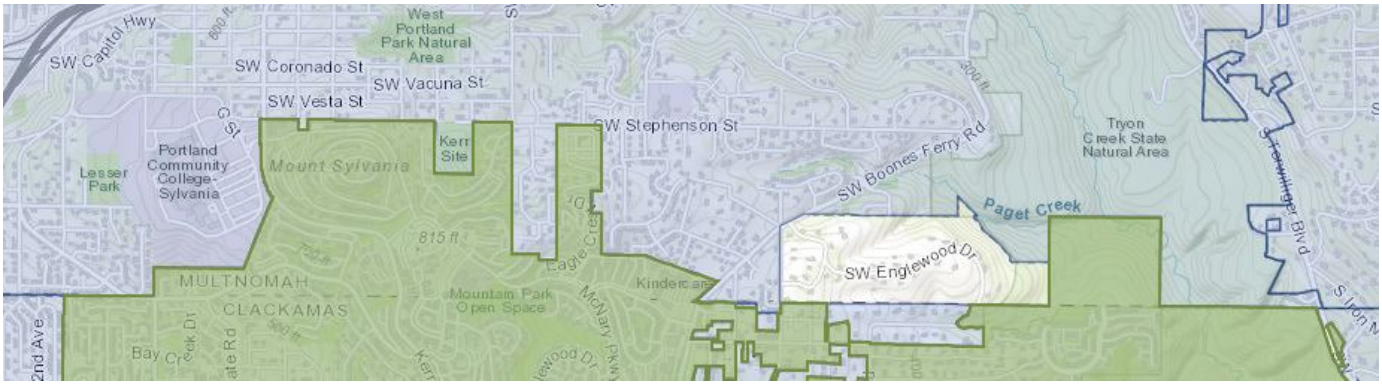


Figure 60 - Lake Oswego service areas inside of Multnomah County. The unshaded area along SW Englewood Drive is the Alto Park Water District and is also part of Lake Oswego Fire's service area. Map from the Oregon State Fire Marshal's office.

[74] Despite its name, the Alto Park Water District only provides fire services to its residents.

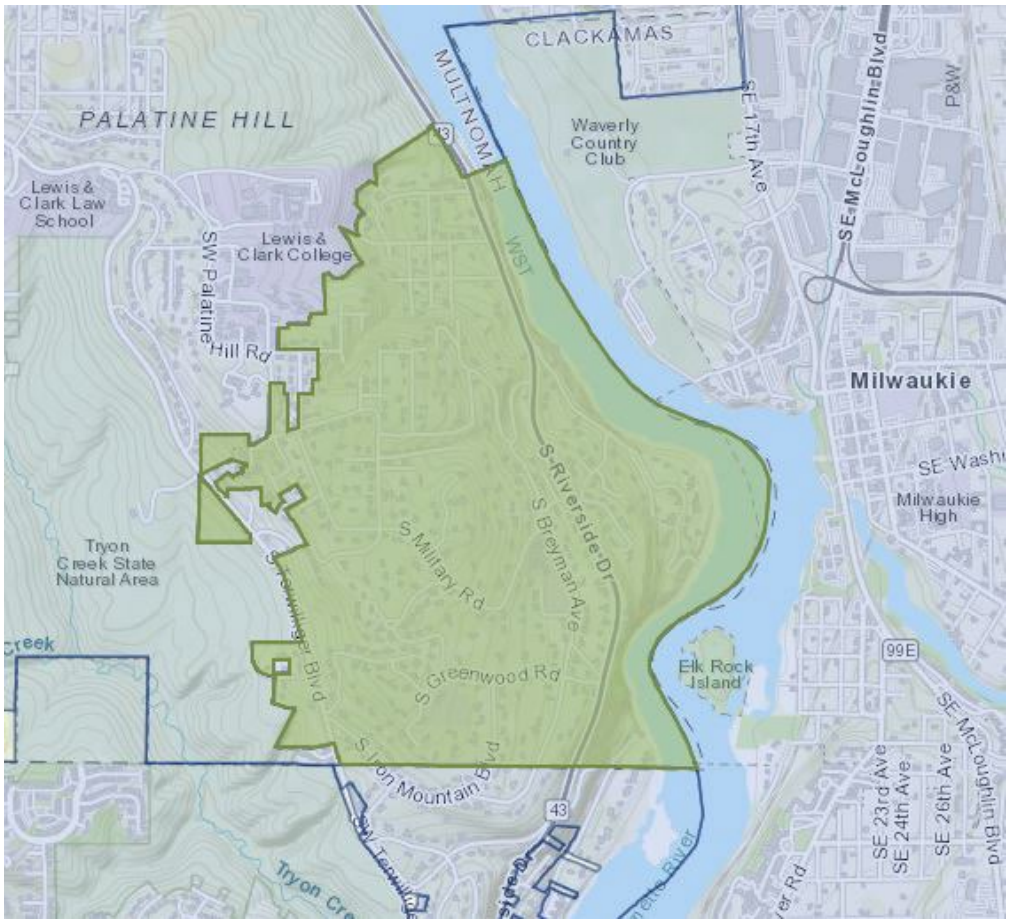


Figure 61 - Service area of Riverdale Rural Fire Protection District 11. Map from Oregon State Fire Marshal.

Coordination between Lake Oswego Fire, Portland Fire, Oregon State Parks, and Clackamas County is a main issue for the district in Multnomah County. Areas of common goals are in strategy and grants for fuel management, fire detection, risk communication, and operational coordination around risk in Tryon Creek State Natural Area. Areas of risk noted also include the Mountain Park neighborhood.

Wildfire protection in Rural Fire Protection District #11 has similar concerns, also being adjacent to Tryon Creek State Natural Area. River View Natural Area also lies to the north of the district, in the City of Portland and adjacent to Lewis and Clark College.

Interactive Version of this Map – (Planning and Cadastral - Oregon WUI Hazard Rating)

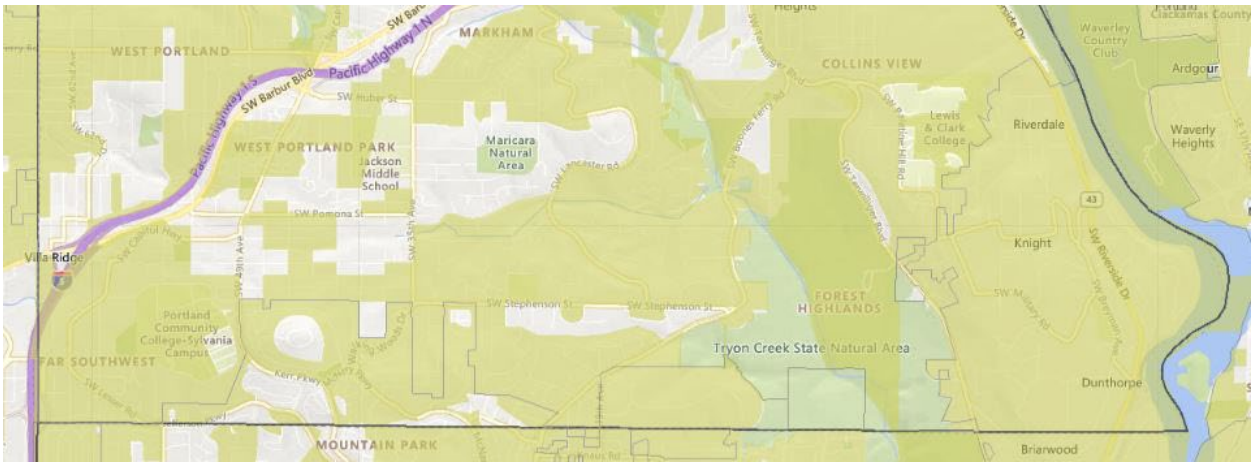


Figure 62 - Map showing WUI areas in green in Lake Oswego Fire service boundaries in Multnomah County. Most areas are considered to be in the WUI. Map from Oregon Department of Forestry statewide WUI Hazard Rating map.

Interactive Version of this Map – (Wildfire Potential Impacts - Overall Potential Impact)

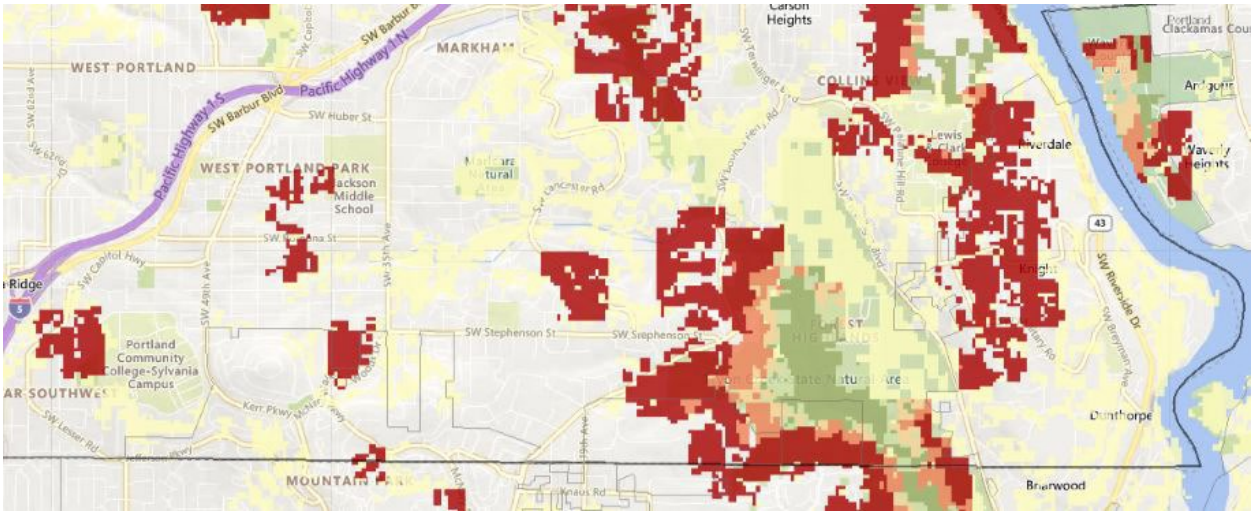


Figure 63 - Map showing wildfire impact in Lake Oswego Fire service areas, with dark red areas being the most impacted by wildfire. Neighborhoods surrounding Tryon Creek State Natural Area face high risk from any future wildfires.

Lake Oswego Fire Mitigation Strategies

Action No.	Mitigation Type	Mitigation Action	Supporting Partners
1	Data and Risk Assessment	Obtain and evaluate new wildfire risk assessment maps and other data being created through Senate Bill 762 and the Regional Disaster Preparedness Organization.	Oregon Department of Forestry, Regional Disaster Preparedness Organization
2	Community Engagement and Resilience Building	Provide wildfire risk education and home assessment assistance in communities that are in high risk locations, and encourage them to become certified Firewise communities.	Oregon State Fire Marshal, Multnomah County Emergency Management
3	Community Engagement and Resilience Building	Encourage communities to develop a neighborhood driven pre-disaster plan including evacuation routes, telephone call-down trees, and other strategies for strengthening community response.	Multnomah County Emergency Management, Multnomah County Sheriff's Office

Communities at Risk

Location	Priority	Defensible Space	Access	Water	Public Lands	Private Lands	Camping Uses	Protection Capability	Burning	Preparedness	Communications	Steep Slopes	Description
Mountain Park	High	●	●		●		●	●		●		●	The homes in this community are close together, are surrounded by heavy vegetation and are on very steep slopes, ranging from 100 ft to 1000 ft. There are some green belt trails that would provide some limited access for firefighting. A few years ago, the City cleared some of these trails for brush truck access. Priorities for this community are preparedness and defensible space.
Riverdale/Dunthorpe	Medium	●	●		●			●				●	Riverdale/Dunthorpe is home to many incomparable estates that appear on the National Historical Registry, designed by acclaimed architects and design firms. These homes are surrounded by high bluffs on the west banks of the Willamette River and steep terrain throughout. Access for firefighters is limited in areas. Water supply is accessible. Working on educating and encouraging community to become Firewise certified.
Tryon Creek	Medium	●	●	●	●		●			●		●	There is a residential area surrounding this State Park. The park has an older stand of mature trees, but defensible space around homes is needed. Access and water are limited here and it is used for camping and recreation, which presents some outreach opportunities. Lake Oswego Fire shares protection with Portland Fire and they review response strategies annually.

Priority Fuel Mitigation Location	Project Details
Mountain Park Areas	Neighborhood defensible space mitigation projects.
Tryon Creek	Defensible space projects based on home assessments and in coordination with Firewise community activities.
Riverdale/Dunthorpe	Neighborhood defensible space mitigation projects.

5.3.5 City of Portland

Wildfire protection service in Portland is provided by the Portland Bureau of Fire and Rescue (PF&R), which has service area limits that match the incorporated limits of the city. PF&R serves the largest population of any fire department in Oregon, with 750 employees and 31 stations across the city. Although PF&R is also Oregon's most urban fire district, the city contains areas of significant wildfire risk, and increasing preparedness for "low frequency, high consequence events such as wildfire" are a key element of the bureau's 2020-2023 Strategic Plan.

Interactive Version of This Map

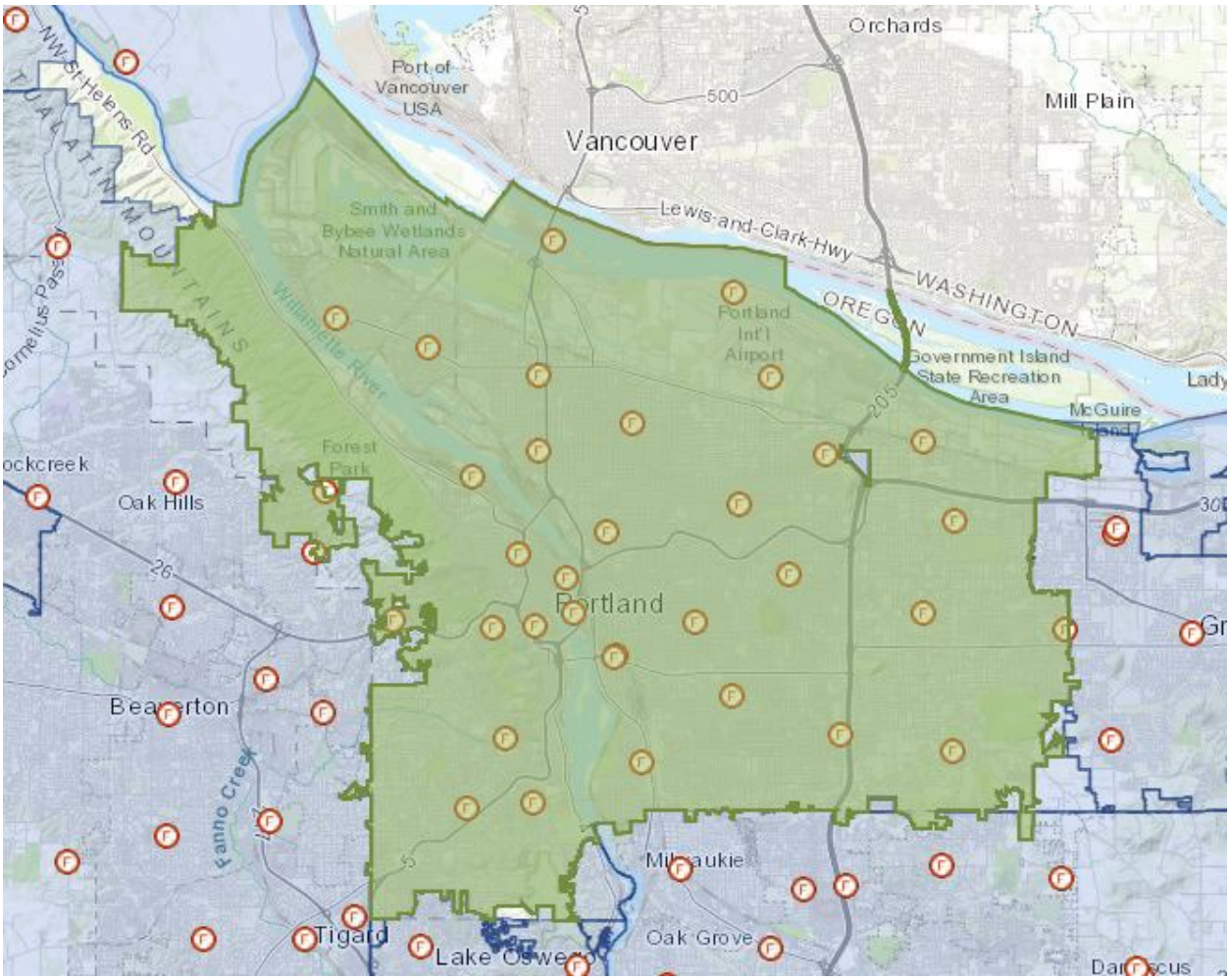


Figure 64 - Map showing Portland Fire and Rescue boundaries and fire stations. PF&R has some fire protection locations where the City of Portland crosses into Clackamas County. Map from Oregon State Fire Marshal.

A number of other Portland bureaus also play major roles in wildfire mitigation planning and participated in the development of this plan.

- **Portland Bureau of Parks & Recreation (PP&R)** – PP&R is the largest land management agency in the City of Portland, with 154 parks and nearly 8,000 acres of

natural areas.[75] PP&R was one of the lead bureaus in the development of the 2009 risk analysis report that became the origin of the 2011 Multnomah County CWPP, and identified park areas of highest concern as Forest Park, Powell Butte, and the Willamette Bluffs. The PP&R Urban Forestry program has a 2004 Urban Forest Management Plan, which promotes the building of the city's tree canopy to, among other goals, improve livability and watershed health.

- **Portland Water Bureau (PWB) –** PWB manages property and infrastructure in locations around the city. The Bull Run Watershed is the largest and most important PWB asset, with fire prevention, detection, and suppression being the most important strategies to prevent post-wildfire erosion from degrading water quality. Protection of PWB infrastructure from fire across the city is a priority.
- **Portland Bureau of Planning and Sustainability (BPS) –** BPS manages land use and zoning codes and long-term comprehensive planning in Portland. This includes the application of environmental overlay zones to protect natural resources, including forests and woodlands, which have intersections with wildfire fuel mitigation programs. BPS also manages planting lists to promote native ecosystems and reduce invasive species.
- **Portland Bureau of Environmental Services (BES) –** BES manages Portland's wastewater and stormwater and manages about 1,000 acres of open space. Management of these spaces, both accessible and restricted, includes assessments for environmental quality and wildfire risk.
- **Portland Bureau of Building Services (BDS) –** BDS manages the city's building regulations in Wildfire Hazard Zones, which restrict roofing and siding materials. The Wildfire Hazard Zone uses topography and the hazard and distribution of wildfire fuels to develop a risk rating. BDS also provides educational information around managing structural risk from wildfire.
- **Portland Bureau of Emergency Management (PBEM) –** PBEM manages emergency response for the city, and is a lead partner in local evacuation planning and supporting mitigation project development.
- **Portland Office of Budget and Management – Homeless Urban Camping Impact Reduction Program (HUCIRP) –** HUCIRP is tasked with managing public space by coordinating cleanup and removal of unsanctioned campsites, while implementing harm/impact reduction strategies and coordinating services opportunities for unhoused residents. Many unsanctioned campsites have been located in wildfire hazard zones (WHZ) in Portland, where they increase the risk of fire ignition and leave residents at risk from wildfire.
- **Portland Police Bureau (PPB) –** PPB has a role in the enforcement of restricted activities during wildfire risk periods and in leading evacuation efforts during events.

[75] https://www.portland.gov/parks/park-system-numbers

Interactive Version of this Map – (Planning and Cadastral - Oregon WUI Hazard Rating)

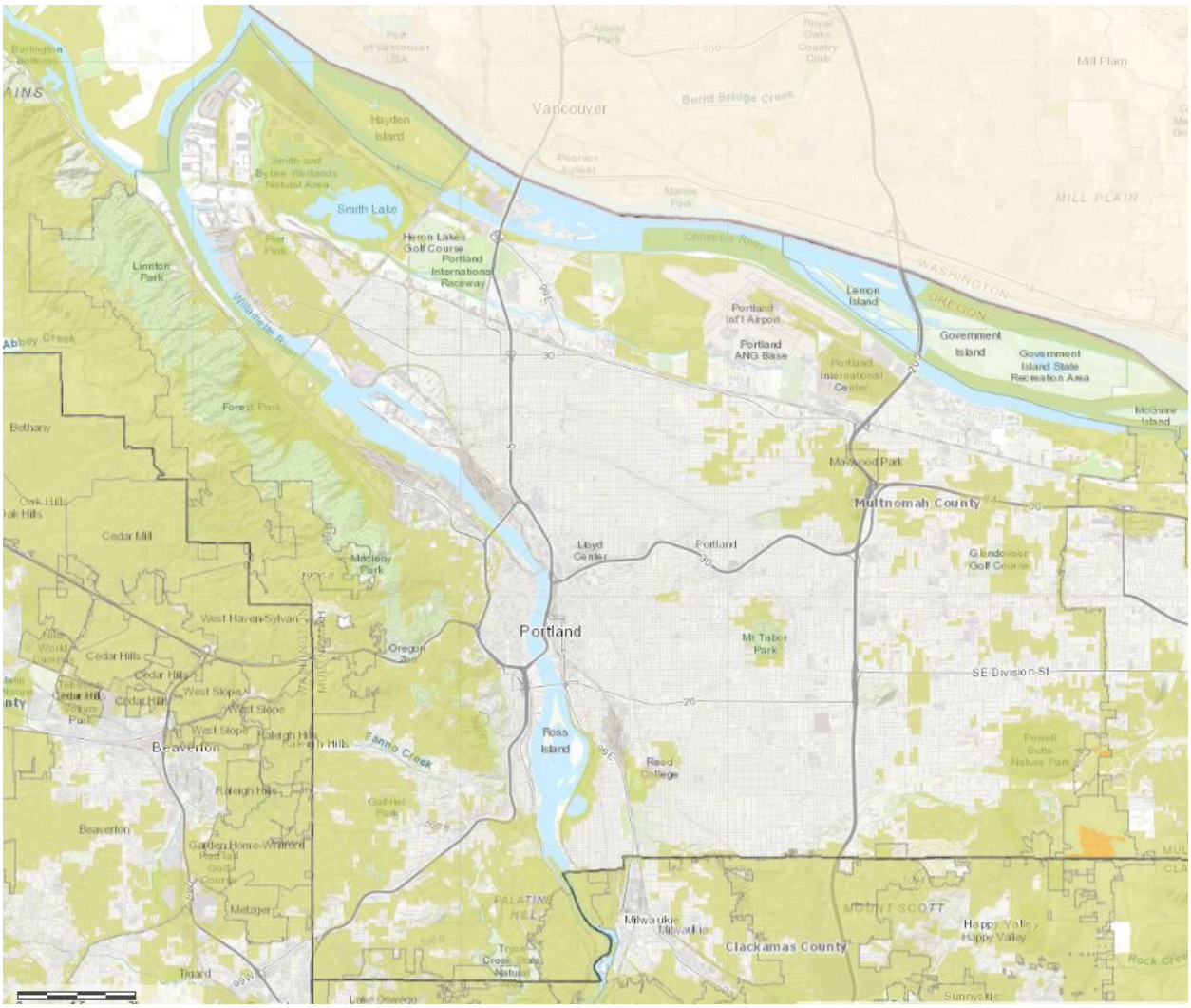


Figure 65 - WUI hazard areas in the City of Portland, with higher risk areas in orange and lower risk areas in green. Map from ODF 2017 Statewide WUI hazard mapping.

Neighborhood Engagement

Portland Fire & Rescue has been working to build community resilience in the city's highest risk areas by supporting Firewise communities and home risk assessments. Firewise communities have been established in:

- Linnton Neighborhood (2020)
- Forest Park Neighborhood - North (2021)
- Forest Park Neighborhood - South (2021)
- Thurman Bridge Neighborhood (2021)
- Forest Heights Neighborhood (2022)
- Collins View Neighborhood (2022)
- Arlington Heights Neighborhood (2023)

The Forest Park Wildfire Risk Reduction Project began with Portland Parks & Recreation, Portland Fire & Rescue, and the Forest Park Conservancy. The City has acquired grant funds from FEMA to perform vegetation management in the Linnton area and to conduct outreach to additional neighborhoods with guidance and tools for property-level fire risk reduction.

Interactive Version of this Map – (Wildfire Potential Impacts/Overall Potential Impact)

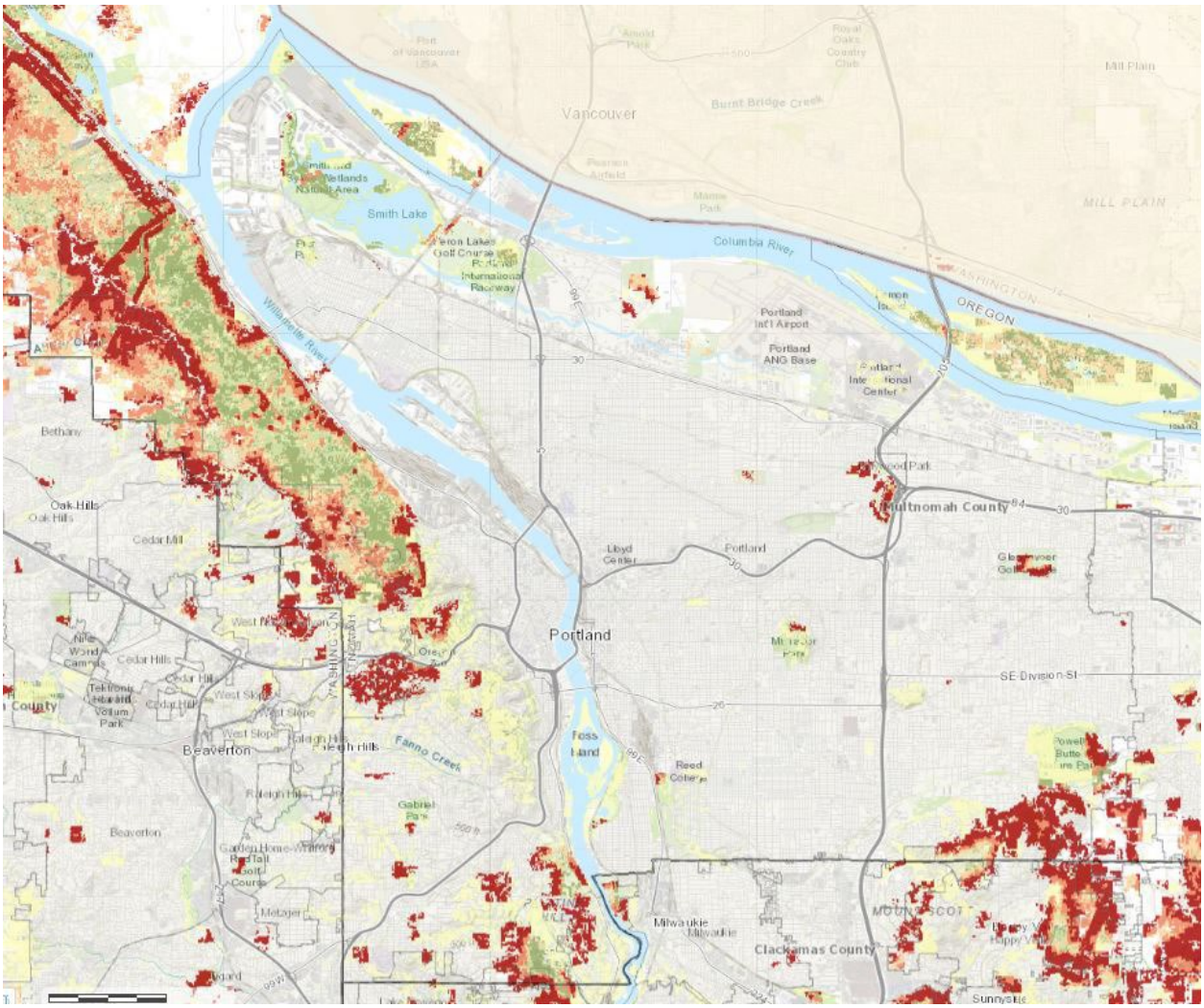


Figure 66 - Areas of potential wildfire impact in Portland, with the highest risk areas shown in dark red. Map from PNW-QWRA.

Fire Prevention

In the summer of 2021, the city approved protocols to remove unsanctioned campsites from high-risk wildfire areas in city parks and natural areas, including areas such as Forest Park, Tryon Creek State Natural Area, Linnton Park, Marquam Nature Park, Oaks Bottom, and Powell Butte Natural Area.[76] The protocols include education and outreach to unsheltered residents of

[76] Portland City Council Approves New Protocol for Removing Campers From Wildfire Hazard Zones, Willamette Week, Sophie Peel, July 31, 2021.

wildfire risk. Enforcement of camping and open burning restrictions continues to require coordination.

Bull Run Watershed

The Bull Run Watershed covers 102 square miles in Multnomah and Clackamas Counties, and provides a catchment for drinking water for nearly 1 million people. The natural area is restricted to the public, and severe fire could lead to long-term impacts on drinking water infrastructure by increasing erosion of sediment into reservoirs. Efforts for protecting the watershed are focused on fire prevention, detection, and suppression. Firefighting in the watershed is coordinated through a Fire Management Plan that coordinates the U.S. Forest Service and PWB for managing a fire protection program, with additional consultation with the Oregon Department of Forestry.

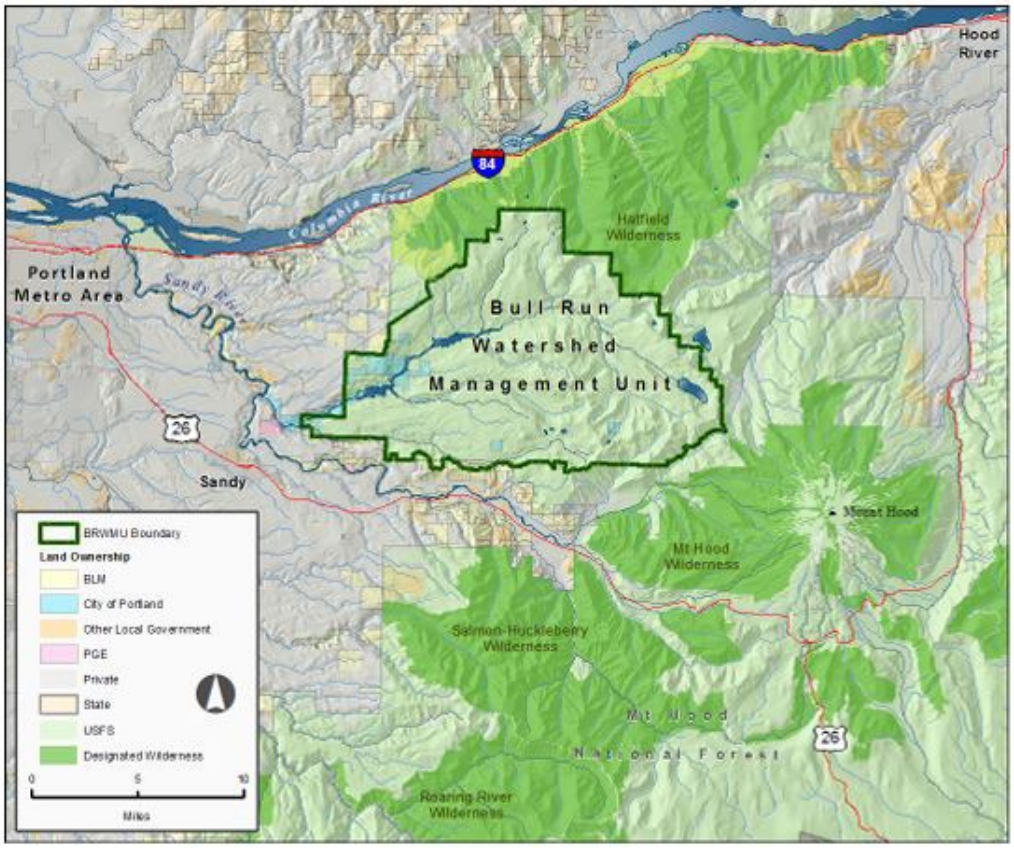


Figure 67 - Map of the Bull Run Watershed and adjacent land ownership.

Risk from fire inside the watershed is reduced by its restricted access, but human-caused or lightning-caused fire are still of concern, as is a fire moving from the Mount Hood National Forest driven by east winds into the watershed. Because of the cyclical nature of large wildfires in this area and the increased risk caused by climate change impacts, the PWB is developing efforts to increase the resiliency of the water system by identifying backup water sources and building a filtration plant that will allow water to continue to be used even if contaminated with

ash, silt, debris or other contaminants.[77] PWB is also focused on the protection of infrastructure and the safety of employees during any large, uncontrolled fire event in the watershed.

Planning and Building Policies

Policy and Code Amendments in 2021 were recommended to adjust environmental zone regulations to allow tree removal and branch pruning immediately adjacent to structures and to allow the facilitation of building fire breaks. Work continues to best meet multiple goals for environmental protection and wildfire risk reduction in high-risk areas. Potential updates to building codes and the implementation of land use planning initiatives coming from Senate Bill 762 are also being monitored.

Wildfire Response Capacity

Alerting those living or recreating in areas without cell phone service is a concern, and evacuation of high-risk areas is complicated by long driveways or areas with only one way in and one way out. Residents with mobility limitations may face evacuation difficulties.

Building capacity for wildland firefighting is a priority, through continued training and the potential for new grants that could pay for hand crews/wildland firefighting personnel, as used in Clackamas County.

[77] Wildfire: Not All Forests Are Created The Same, Portland Water Bureau, October 22, 2020

City of Portland Wildfire Mitigation Strategies

Action No.	Topic	Mitigation Action	Lead Agency	Supporting Partners
1	Organizational Coordination	Seek grant funding to support fuels reduction and creation of defensible space around homes. Identify grant resource strategies to apply for and manage HMGP, BRIC, SHSP grants and funds obligated through Senate Bill 762. Use multi-jurisdictional approaches to build coalitions and pool resources.	Portland Fire & Rescue Public Education	Portland Parks & Recreation, Metro, Forest Park Conservancy, East and West Multnomah Soil & Water Conservation Districts
2	Organizational Coordination	Re-invigorate Neighborhood Emergency Teams (NETs) with concrete projects such as a neighborhood wildland interface disaster planning program, outreach, and participation in community Firewise fuel mitigation volunteer events.	Portland Fire & Rescue Public Education	Portland Bureau of Emergency Management, Portland Parks & Recreation, Forest Park Conservancy
3	Organizational Collaboration	Partner with local businesses/non-profits to build wildfire mitigation capacity.	Portland Fire & Rescue Public Education	Local Chambers of Commerce, Local Businesses, Oregon Department of Forestry, Keep Oregon Green, Oregon Association of Nurseries, Oregon State Fire Marshal, Forest Park Conservancy, East & West Multnomah Soil & Water Conservation Districts
4	Organizational Collaboration	Target a broader audience by engaging non-traditional partners such as organizations with sustainability programs and the insurance and real estate industries.	Portland Fire & Rescue Public Education	Green Business Council, Metro, Portland Building Association, Oregon Association of Nurseries, Portland Bureau of Planning & Sustainability
5	Organizational Collaboration	Coordinate meetings with all Firewise communities in the Portland Metro area.	Portland Fire & Rescue Public Education	Portland Parks & Recreation, Oregon State Fire Marshal
6	Organizational Collaboration	Provide presentations to organizations that meet regularly and have high visibility in the community: Neighborhood Associations, Granges, Rotaries, Sierra Club, BARK, Garden Clubs, Audubon Society, World Forestry Center, etc.	Portland Fire & Rescue Public Education	Oregon State Fire Marshal Risk Reduction, Forest Park Conservancy, Oregon Department of Forestry, East & West Multnomah Soil & Water Conservation Districts

Action No.	Topic	Mitigation Action	Lead Agency	Supporting Partners
7	Data and Risk Assessment	Refer to International Wildland-Urban Interface Code for definition of WUI standards and associated WUI map, created by Metro, to update and amend City policies, regulations, and codes to strengthen requirements for fire-resistant building materials, and enable the establishment of defensible space around homes and businesses while continuing to protect the natural resources within wildfire hazard zone areas.	Portland Fire & Rescue Public Education	Portland Bureau of Development Services, Portland Parks & Recreation, Portland Bureau of Planning & Sustainability, Portland GIS, Portland Bureau of Environmental Services, Oregon Department of Forestry, Oregon State Fire Marshal
8	Data and Risk Assessment	Work with local fire agencies to develop more detailed risk assessments using local and community-derived data.	Portland Fire & Rescue	Regional Disaster Preparedness Organization (RDPO) Fire-EMS Work Group, Multnomah County Fire Defense Board, Oregon Department of Forestry, OSFM, Multnomah County Emergency Management, Portland Bureau of Emergency Management, Multnomah County GIS, Multnomah County Land Use
9	Data and Risk Assessment	Map all roads, bridges and driveways in the local Communities at Risk and prioritize homes that have dead-ends, and cannot support emergency service vehicles (grade, length, vegetation, turnarounds) for defensible space and fuels reduction projects.	Portland Fire & Rescue	RDPO Fire-EMS Work Group, Multnomah County Fire Defense Board, Oregon Department of Forestry, OSFM, Multnomah County Emergency Management, Portland Bureau of Emergency Management, Multnomah County GIS, Multnomah County Land Use, PBOT, Multnomah County Roads, ODOT
10	Data and Risk Assessment	Develop a series of recommendations for tracking vulnerability data (including houseless populations) throughout the county and revise the Wildfire Hazard Analysis and the Wildland Urban Interface to reflect the new information.	Portland Fire & Rescue Special Ops	RDPO Fire-EMS Work Group, Multnomah County Fire Defense Board, Oregon Department of Forestry, OSFM, Multnomah County Emergency Management, Portland Bureau of Emergency Management, Multnomah County GIS
11	Community Engagement and Resilience Building	Work directly with communities targeted for fuels reduction treatments to gain support for projects prior to implementation.	Portland Fire & Rescue Public Education	Oregon Department of Forestry, Community Outreach Groups, Firewise Programs, Portland Parks & Recreation, Forest Park Conservancy

Action No.	Topic	Mitigation Action	Lead Agency	Supporting Partners
12	Community Engagement and Resilience Building	Conduct community meetings in areas of the city located in wildfire hazard zones to educate communities on defensible space and measures that can be taken to reduce structural ignitability, and work towards becoming Firewise Communities.	Portland Fire & Rescue Public Education	Oregon Department of Forestry, Oregon State Fire Marshal's Office Fire Risk Reduction, Portland Parks & Recreation, Metro, Portland Bureau of Environmental Services, Homeless Urban Camping Impact Reduction Program, Rapid Response, Forest Park Conservancy, West Multnomah Soil & Water Conservation District, Neighborhood Emergency Teams, Portland Office of Neighborhood Involvement
13	Community Engagement and Resilience Building	Educate landowners in the Wildland Urban Interface about reducing wildfire hazards, and encourage them to participate in the Firewise Program.	Portland Fire & Rescue Public Education	Oregon State Fire Marshal Risk Reduction, Portland Parks & Recreation, Forest Park Conservancy, East & West Multnomah County Soil and Water Conservation Districts
14	Community Engagement and Resilience Building	Establish an information network, developing community risk reduction classes to educate homeowners on ways to reduce the risk of wildfires and learning about fire-resistant plants, and signing-up volunteers sign-up for fuel mitigation events in established Firewise Communities	Portland Fire & Rescue Public Education	Portland Parks & Recreation, Forest Park Conservancy, Portland Bureau of Emergency Management, East & West Multnomah Soil & Water Conservation Districts, Explore Washington Park, Oregon State Fire Marshal, Oregon State University Extension Service
15	Community Engagement and Resilience Building	Implement a model Firewise and ecologically sound landscaping project at Portland's Fire and Rescue Station 27 in Forest Park. Scope and seek funding for a project to explore and demonstrate defensible space, planting and landscaping options for fire-resistive native groundcover, shrubs and mature trees to achieve goals for wildfire protection and watershed health. Design and install one or more demonstration areas to showcase wildfire resistant plantings.	Portland Fire & Rescue	Portland Parks & Recreation, Portland Bureau of Environmental Services, Forest Park Conservancy, Oregon State University Extension, Oregon Department of Forestry, Community Involvement Organizations, West Multnomah Soil & Water Conservation District
16	Community Engagement and Resilience Building	Develop and distribute Wildland Urban Interface information to Communities at Risk located in wildfire hazard zones.	Portland Fire & Rescue Public Education	Homeowners & Neighborhood Associations, Multnomah County Community Association, Oregon Department of Forestry, Oregon State Fire Marshal, Portland Parks & Recreation, Forest Park Conservancy, East & West Multnomah Soil & Water Conservation Districts, Portland Bureau of Environmental Services

Action No.	Topic	Mitigation Action	Lead Agency	Supporting Partners
17	Community Engagement and Resilience Building	Promote the use of 211 telephone information system and signing-up for PublicAlerts.org to inform residents about what actions to take during wildfires and other emergencies.	Portland Fire & Rescue Public Education	Oregon Department of Forestry, Multnomah County Emergency Management, Portland Bureau of Emergency Management, Oregon State Fire Marshal
18	Community Engagement and Resilience Building	Utilize active community organizations' social media networks to engage residents including electronic newsletters and links on websites.	Portland Fire & Rescue Public Education	Oregon Department of Forestry, Oregon State Fire Marshal, Portland Parks & Recreation, Forest Park Conservancy, Portland Bureau of Emergency Management, East & West Multnomah Soil & Water Conservation Districts
19	Community Engagement and Resilience Building	Empower community leaders to remain engaged and continue to motivate the community through partnership with local fire departments and Firewise/USA program.	Portland Fire & Rescue Public Education	Home Owners and Neighborhood Associations, Elected Officials
20	Community Engagement and Resilience Building	Encourage Communities at Risk located in wildfire hazard zones to become certified Firewise Communities.	Portland Fire & Rescue Public Education	Oregon Department of Forestry, Oregon State Fire Marshal Risk Reduction
21	Community Engagement and Resilience Building	Use active websites with changing banners and coordinated Twitter messaging (and other appropriate social media) to get people's attention.	Portland Fire & Rescue Public Education	Portland Parks & Recreation, Portland Bureau of Environmental Services, Portland Bureau of Emergency Management
22	Community Engagement and Resilience Building	Use QR codes to reach people who use those information mediums to encourage PublicAlerts.org signups and learn about wildfire risks, and post codes in parks and natural areas.	Portland Fire & Rescue Public Education	Portland Parks & Recreation, Portland Bureau of Environmental Services, Portland Bureau of Emergency Management
23	Community Engagement and Resilience Building	Develop a listing of outreach events that organizations and active citizen groups in Communities at Risk may be planning to identify outreach partnership opportunities.	Portland Fire & Rescue Public Education	Oregon Department of Forestry, Grange Halls, Farmers Markets, Churches, Fire District Open Houses, Neighborhood Associations, Local Businesses, Audubon Society, Forest Park Conservancy, Portland Parks & Recreation, World Forestry Center, Tryon Creek State Park
24	Community Engagement and Resilience Building	Provide presentations to organizations that meet regularly and have high visibility in the community: Neighborhood Associations, Granges, Rotaries, Sierra Club, BARK, Garden Clubs, Audubon Society, World Forestry Center, etc.	Portland Fire & Rescue Public Education	Oregon State Fire Marshal Risk Reduction, Forest Park Conservancy, Oregon Department of Forestry, East & West Multnomah Soil & Water Conservation Districts
25	Structural Ignitability	Develop a local wildfire prevention campaign to promote defensible space and reduce structural ignitability within the Home Ignition Zone.	Portland Fire & Rescue Public Education	Oregon Department of Forestry, Portland Parks & Recreation, Forest Park Conservancy, East and West Multnomah Soil & Water Conservation Districts

Action No.	Topic	Mitigation Action	Lead Agency	Supporting Partners
26	Structural Ignitability	Identify strategies to support under-represented populations (elderly, low income, disabled, BIPOC communities) with fuel mitigation to create defensible space around homes.	Portland Fire & Rescue Public Education	Multnomah County Fire Defense Board, Multnomah County Land Use
27	Structural Ignitability	Coordinate fuel mitigation/management projects with established Firewise Communities and available resources	Portland Fire & Rescue Public Education	Portland Parks & Recreation, Forest Park Conservancy, Portland Bureau of Environmental Services, East & West Multnomah Soil & Water Conservation Districts, Oregon State Fire Marshal
28	Structural Ignitability	Become more familiar with the International Wildland Urban Interface Code and determine whether or not adoption would be beneficial and appropriate in Multnomah County.	Portland Fire & Rescue	Oregon Department of Forestry, Oregon State Fire Marshal, Oregon State University
29	Structural Ignitability	Develop a program to offer no-cost wildland/urban interface evaluations for both new development and existing homeowners.	Portland Fire & Rescue Public Education	Multnomah County Fire Defense Board, Multnomah County Land Use, Multnomah County Transportation, Oregon Department of Forestry
30	Structural Ignitability	Maintain and expand home assessment programs, with increased collaboration between Fire Districts.	Portland Fire & Rescue Public Education	Multnomah County Fire Defense Board, Oregon Department of Forestry, Oregon State Fire Marshal
31	Structural Ignitability	Provide assessments for commercial/industrial buildings and encourage creation of defensible space through fuel mitigation and hardening of structures.	Portland Fire & Rescue Public Education	Portland Bureau of Development Services
32	Structural Ignitability	Empower homeowners that live in a wildfire hazard zone to participate in educational sessions through the Firewise program, or other provided seminars, to learn how to effectively harden their homes, and create defensible space around their homes.	Portland Fire & Rescue Public Education	Oregon State Fire Marshal, Oregon Department of Forestry, Oregon State University Extension Service, National Fire Protection Association
33	Structural Ignitability	Develop strategies for property inspections for ignition risk at times of initial home occupation in a wildfire hazard zone.	Portland Fire & Rescue Public Education	Multnomah County Realty Organizations
34	Structural Ignitability	Obtain structural ignitability intelligence by conducting wildland-urban interface home assessments and data collection (including GIS points) for homes in wildfire hazard zones.	Portland Fire & Rescue Public Education	Portland Fire & Rescue Special Ops, Oregon Department of Forestry

Action No.	Topic	Mitigation Action	Lead Agency	Supporting Partners
35	Structural Ignitability	Develop more fire-resilient landscaping standards, such as recommending fire-resistant plants instead of like-for-like replacements. Use Firewise resources and the International Wildland-Urban Interface code to guide City codes and standards.	Portland Fire & Rescue Public Education	Portland Parks Bureau, Portland Bureau of Environmental Services, Portland Bureau of Development Services, Portland Bureau of Planning & Sustainability
36	Land and Vegetation Management	Provide hazardous fuels assessment and mitigation training to City Natural Resources management and staff.	Portland Fire & Rescue Public Education	Portland Parks & Recreation
37	Land and Vegetation Management	Coordinate between agencies/jurisdictions to maximize effectiveness of vegetation management projects.	Portland Fire & Rescue Public Education	Portland Parks & Recreation, Portland Bureau of Environmental Services, Portland Water Bureau, East & West Multnomah Soil & Water Conservation Districts, Forest Park Conservancy
38	Land and Vegetation Management	Partner with managers of forested areas to reduce invasive vegetation and ladder fuels in natural area boundaries that abut communities located in a wildfire hazard zone.	Portland Fire & Rescue Public Education	Portland Parks & Recreation, Metro, Private Landowners, Forest Park Conservancy, West Multnomah Soil & Water Conservation District, Portland Bureau of Environmental Services
39	Land and Vegetation Management	Support property owners in replacing invasive species on their properties with native, fire-resistant plants.	Portland Fire & Rescue Public Education	Portland Bureau of Planning and Sustainability, East & West Multnomah Soil and Water Conservation Districts, Forest Park Conservancy, Portland Bureau of Environmental Services
40	Land and Vegetation Management	Create incentives for and address barriers to encourage fuel reduction and defensible space, including updates for related city policies.	Portland Fire & Rescue Public Education	Portland Parks & Recreation, Forest Park Conservancy, East & West Multnomah Soil & Water Conservation Districts, Portland Bureau of Environmental Services, Portland Bureau of Planning & Sustainability
41	Land and Vegetation Management	Develop a program for Parks Bureau staff about wildfire fuels assessment, how to create defensible space, and initial wildfire response training and safety.	Portland Fire & Rescue Public Education	Oregon Department of Forestry, Metro, Portland Parks & Recreation, Portland Bureau of Emergency Management, Oregon State University Extension Service, Oregon State Fire Marshal Risk Reduction, Multnomah County Fire Defense Board, Multnomah County Emergency Management
42	Wildfire Prevention	Seek opportunities for wood chipper program grants that may include contract services for fuel reduction or removal. Use as an essential part of the education and awareness of the risk of wildfires occurring in wildfire hazard zones.	Portland Fire & Rescue Public Education	Portland Parks & Recreation, Forest Park Conservancy, Portland Bureau of Environmental Services, East & West Multnomah Soil & Water Conservation Districts, Oregon State Fire Marshal

Action No.	Topic	Mitigation Action	Lead Agency	Supporting Partners
43	Wildfire Prevention	Develop full analysis of where fire prevention codes and environmental regulations are complimentary or contradictory.	Portland Fire & Rescue Public Education	Portland Bureau of Development Services, Portland Bureau of Planning and Sustainability, Portland Parks & Recreation
44	Wildfire Prevention	Develop fire management plans for recreational/open areas - when to limit access or close parks due to fire risk or active fires.	Portland Fire & Rescue	Portland Parks & Recreation, Portland Bureau of Emergency Management, Metro
45	Wildfire Prevention	Identify opportunities for community debris disposal collection sites that recycle or compost vegetative material	Portland Fire & Rescue Public Education	Oregon Department of Forestry, Metro, Oregon State Fire Marshal Risk Reduction,
46	Wildfire Prevention	Work with Park Rangers, State Park Managers and Oregon Department of Transportation to patrol wildfire hazard zones areas to reduce unsanctioned camping.	Portland Fire & Rescue Public Education	Portland Parks & Recreation Park Rangers, State Park Managers, Oregon Department of Transportation, Metro
47	Wildfire Prevention	Increase public awareness of wildfire hazards by posting information on existing placards in recreational areas, such as Smoky Bear fire danger dials, fire danger infographic signs, etc.	Portland Fire & Rescue Public Education	US Forest Service, Oregon Department of Forestry, Portland Parks & Recreation, Portland Bureau of Environmental Services, Metro, Forest Park Conservancy
48	Wildfire Prevention	Establish an agreed upon fire danger rating system and develop agency protocols. Consider adopting the "National Fire Danger Rating System" (NFDRS) and install signs at key points in the City. Partner with the Oregon Department of Forestry to align with "Industrial Fire Protection Levels" (IFPL) throughout wildfire season, and related fire danger levels for public use. Install Smoky Bear Fire Danger signage (Peacock signs) around forested areas in City to raise awareness.	Portland Fire & Rescue Public Education	Oregon Department of Forestry, Portland Parks & Recreation, Portland Risk Management, Portland Bureau of Emergency Management, Portland Bureau of Transportation, Oregon Department of Transportation
49	Wildfire Prevention	Review and potentially refine City contract specifications for machinery operations during wildfire season and during 'Red Flag' weather conditions.	Portland Fire & Rescue Public Education	Portland Parks & Recreation, Portland Bureau of Environmental Services, Portland Bureau of Development Services
50	Wildfire Prevention	Develop preparation plans for managing post-storm debris before wildfire season begins.	Portland Fire & Rescue Public Education	Portland Parks & Recreation, Metro, Portland Bureau of Transportation, Oregon Department of Transportation, Portland Bureau of Environmental Services, Portland Water Bureau, East & West Multnomah Soil and Water Conservation Districts, Forest Park Conservancy, Portland Bureau of Emergency Management, Regional Disaster Prevention Organization Debris Removal Subcommittee

Action No.	Topic	Mitigation Action	Lead Agency	Supporting Partners
51	Wildfire Prevention	Work with landowners in highly visible wildfire risk areas to provide temporary and permanent signage.	Portland Fire & Rescue Public Education	Oregon Department of Forestry, Portland Parks & Recreation, Forest Park Conservancy, Portland Bureau of Transportation
52	Wildfire Prevention	Conduct fire inspections in sanctioned houseless communities to identify fire prevention opportunities	Portland Fire & Rescue Public Education	Portland Bureau of Development Services
53	Wildfire Prevention	Engage unhoused community members residing within wildfire hazard zones about fire use dangers, and provide accessible materials with specific guidance.	Portland Fire & Rescue Public Education	Portland Parks & Recreation, Homeless Outreach Service Organizations
54	Operational Coordination and Capacity	Use controlled burns in Portland Parks and Recreation properties and Metro locations serviced by Portland Fire as a training tool for potential wildland response.	Portland Fire & Rescue Ops/Special Ops	Portland Parks & Recreation, Metro, U.S. Forest Service, Oregon Department of Forestry
55	Operational Coordination and Capacity	Conduct a wildland firefighter training assessment of Portland Fire & Rescue and make recommendations for enhancing wildfire training standards.	Portland Fire & Rescue Special Ops	RDPO Fire-EMS Work Group
56	Operational Coordination and Capacity	Develop operational procedures for the potential loss of cell towers in wildfire emergencies in Skyline Ridge area, specified Tualatin Mountains locations, Rocky Butte, and Powell Butte	Portland Fire & Rescue	Oregon Department of Forestry, Tualatin Valley Fire & Rescue, Portland Bureau of Emergency Management
57	Operational Coordination and Capacity	Inventory existing water resources and identify alternative water sources to support potential wildfire fighting efforts. Provide signage for these sources and update computer-aided dispatch.	Portland Fire & Rescue	Burlington Water District, Tualatin Valley Fire & Rescue, Clackamas County Fire District 1, Scappoose Fire, Lake Oswego Fire,.Gresham Fire, Portland Parks & Recreation, Metro
58	Operational Coordination and Capacity	Implement rural road addressing (including length of driveways) and other signage for emergency response.	Portland Fire & Rescue Public Education	Portland Bureau of Transportation, Multnomah County Roads, Oregon Department of Transportation
59	Operational Coordination and Capacity	Enhance programs supporting citizens located in areas with limited cellphone access to ensure emergency notifications reach everyone located in wildfire hazard zones.	Portland Fire & Rescue Public Education	Multnomah County Fire Defense Board, Multnomah County Emergency Management, Oregon State Fire Marshal, Oregon Department of Forestry, Portland Bureau of Emergency Management, Bureau of Emergency Communication (BOEC), Regional Disaster Prevention Organization Alert & Warning Work Group
60	Operational Coordination and Capacity	Coordinate with power companies to identify potential additional placements of fire detection cameras in rural forested areas.	Portland Fire & Rescue Special Ops	Portland Bureau of Emergency Communications, Portland Parks & Recreation, Portland General Electric, Pano 360

Action No.	Topic	Mitigation Action	Lead Agency	Supporting Partners
61	Operational Coordination and Capacity	Identify the standard to which basic wildland firefighters will be trained. Work with partners to train all incident personnel for basic wildland firefighting and the Incident Command System (e.g. firefighters).	Portland Fire & Rescue Special Ops	RDPO Fire-EMS Work Group, Multnomah County Fire Defense Board, OSFM, Oregon Department of Forestry, US Forest Service
62	Operational Coordination and Capacity	Create a program to hire and train a local hand crew and utilize them for off-season vegetation management of ladder fuel mitigation, and defensible space projects.	Portland Fire & Rescue Special Ops	RDPO Fire-EMS Work Group, Multnomah County Fire Defense Board, OSFM, Oregon Department of Forestry, US Forest Service, Portland Parks & Recreation, Portland Bureau of Environmental Services, Clackamas County Fire District 1
63	Operational Coordination and Capacity	Identify and address any shortages in wildland training and qualifications in line leadership positions such as Operations Section Chief, Division Group Supervisor (DIVS) and Task Force Leader (TFLD)	Portland Fire & Rescue Special Ops	RDPO, Multnomah County Fire Defense Board, OSFM, Oregon Department of Forestry, US Forest Service
64	Operational Coordination and Capacity	Revisit mutual aid agreements to ensure they are current and applicable.	Portland Fire & Rescue Emergency Ops	Signatory mutual aid agencies
65	Operational Coordination and Capacity	Review and update the Forested and Wildland Interface Areas Fire Protection Plan	Portland Fire & Rescue Special Ops	Portland Bureau of Emergency Management
66	Operational Coordination and Capacity	Improve emergency radio communication between City first responders and Portland Parks & Recreation City Nature staff.	Portland Fire & Rescue	Portland Parks & Recreation, Portland Bureau of Emergency Communications, Portland Bureau of Emergency Management
67	Structural Ignitability	Maintain defensible space around Portland Bureau of Environmental Services critical infrastructure.	Portland Bureau of Environmental Services	Portland Fire & Rescue
68	Land and Vegetation Management	Incorporate climate forecasting, adaptive management and functional assessments when revising site-specific management plans.	Portland Bureau of Environmental Services	
69	Wildfire Prevention	Clarify timing of prohibited activities in mapped high-risk wildfire areas managed by Bureau of Environmental Services and determine how to effectively message risk to the public. Align signage strategy with that used by Parks Bureau at trailheads.	Portland Bureau of Environmental Services	Portland Parks & Recreation, Portland Fire & Rescue
70	Wildfire Prevention	Continue development of in-house enforcement mechanisms for prohibited activities creating wildfire risk in Bureau of Environmental Services managed natural areas.	Portland Bureau of Environmental Services	Homelessness and Urban Camping Impact Reduction Program

Action No.	Topic	Mitigation Action	Lead Agency	Supporting Partners
71	Organizational Collaboration	Maintain communication with the Public Utility Commission to determine how statewide utility management policy can be aligned with city planning and environmental management goals.	Portland Bureau of Planning & Sustainability	Public Utility Commission, PGE, PacifiCorp
72	Data and Risk Assessment	Identify tools from state wildfire risk reduction initiatives that can be used to refine local planning hazard mapping.	Portland Bureau of Planning & Sustainability	Oregon Department of Forestry, Oregon Department of Land Conservation and Development
73	Structural Ignitability	Review planning and zoning codes to clarify and identify opportunities to address vegetative fuel management around structures.	Portland Bureau of Planning & Sustainability	Portland Fire & Rescue, Portland Bureau of Emergency Management
74	Land and Vegetation Management	Consider additional updates to City Plant list with more robust identification of fire-resistant plantings, and identify tree species resilient to drought and hotter summers to replace dying trees.	Portland Bureau of Planning & Sustainability	
75	Data and Risk Assessment	Inventory and map evacuation routes in Portland Parks & Recreation parks and natural areas, including emergency vehicle access routes, and share with emergency responders and other jurisdictions.	Portland Parks & Recreation	Portland Fire & Rescue, Portland Bureau of Emergency Management
76	Data and Risk Assessment	Better define Wildland Urban Interface areas and map them to identify locations for seasonal use restrictions on Portland Parks & Recreation managed natural areas.	Portland Parks & Recreation	Portland Fire & Rescue
77	Community Engagement and Resilience Building	Develop a listing of outreach events of organizations and active citizen groups to identify opportunities for partner outreach.	Portland Parks & Recreation	Portland Office of Neighborhood Involvement
78	Land and Vegetation Management	Train Portland Parks & Recreation staff who work in natural areas in fire science and how to perform hazardous fuels assessments at Parks-managed natural areas in order to target fuel reduction efforts.	Portland Parks & Recreation	Portland Fire & Rescue
79	Land and Vegetation Management	Obtain funding for long-term vegetation management in key locations.	Portland Parks & Recreation	Portland Bureau of Emergency Management
80	Land and Vegetation Management	Support the Protect The Best program to stop the spread of invasive species in natural areas.	Portland Parks & Recreation	
81	Land and Vegetation Management	Consider wildfire risk when assessing and developing ecological prescriptions for management of large, publically owned natural areas. Include wildfire risk in new management plans and updates to existing plans.	Portland Parks & Recreation	Portland Fire & Rescue

Action No.	Topic	Mitigation Action	Lead Agency	Supporting Partners
82	Land and Vegetation Management	Develop a comprehensive vegetation management treatment program for Portland Parks & Recreation properties, considering mechanical removal and other strategies.	Portland Parks & Recreation	
83	Land and Vegetation Management	Coordinate with Portland Parks & Recreation's existing Ecologically Sustainable Landscapes Initiative to plant wildfire-resistant vegetation.	Portland Parks & Recreation	Portland Fire & Rescue
84	Wildfire Prevention	Increase Park Ranger staff and clarify rules for enforcement of open fire bans and other park policies.	Portland Parks & Recreation	Portland Fire & Rescue
85	Operational Coordination and Capacity	Develop a Communications Plan for new wildfire ignitions that coordinates communications between Portland Parks & Recreation staff who work in natural areas and first responders.	Portland Parks & Recreation	Portland Fire & Rescue
86	Operational Coordination and Capacity	Train Portland Parks staff who work in natural areas on policies and safety procedures when discovering a fire.	Portland Parks & Recreation	Portland Fire & Rescue
87	Structural Ignitability	Evaluate and create defensible space of at-risk Water Bureau infrastructure in high-risk fire zones throughout the city	Portland Water Bureau	Portland Fire & Rescue
88	Structural Ignitability	Use Firewise defensible space principles around buildings and infrastructure in the Bull Run Watershed Closure Area	Portland Water Bureau	Portland Fire & Rescue
89	Structural Ignitability	Incorporate new construction best practices when designing or renovating buildings in the Bull Run Watershed Closure Area	Portland Water Bureau	
90	Land and Vegetation Management	Create defensible space in mapped high-risk wildfire Bureau properties through fuel mitigation in heavily camped areas.	Portland Water Bureau	
91	Wildfire Prevention	Evaluate the feasibility of undergrounding power lines in the Bull Run Watershed Closure Area	Portland Water Bureau	PGE
92	Wildfire Prevention	Create fire risk signage for Water Bureau managed natural areas, and develop a sign maintenance staffing plan.	Portland Water Bureau	
93	Operational Coordination and Capacity	Install Pano AI Camera at Powell Butte in SE Portland for early fire detection, seeking potential funding support from Pano or other partners.	Portland Water Bureau	PGE, Pano 360, Portland Fire & Rescue, Portland Bureau of Emergency Communications
94	Operational Coordination and Capacity	Create wildfire evacuation route signage within the Bull Run Watershed Closure Area.	Portland Water Bureau	Portland Fire & Rescue, Portland Bureau of Emergency Management, Portland Police Bureau, Multnomah County Sheriff's Office

Communities at Risk

Location	Priority	Defensible Space	Access	Water	Public Lands	Private Lands	Camping Uses	Protection Capability	Burning	Preparedness	Communications	Steep Slopes	Description
Elrod Road (Port of Portland)	High	●		●									This area is the location of the Port's infrastructure. There is some commercial development to the south. The site is fenced, so unsanctioned homeless campers are not an issue, but there are electrical lines that could ignite the trees, brush and grass.
Forest Heights	High	●	●	●	●	●	●	●		●	●	●	Forest Heights is a community of about 1,800 homes. It is located on the western edge of Forest Park and has a great deal of managed forest land surrounding it and many natural areas winding throughout the community. There are also large common areas that need to be maintained to reduce wildfire hazards. There are steep, winding, narrow roads, with limited options for evacuation routes. Many homes have cedar shake roofs. A limited number of areas in the community have sprinkler systems in the natural areas to create a water firebreak in case of a wildfire. These are activated by the neighbors connecting sprinkler standpipes to the hydrants near by. Sprinkler connecting kits are provided by Portland Fire & Rescue - and staged for use before wildfire season each year.
Forest Park - Skyline Road	High	●	●	●	●	●	●	●		●	●	●	Forest Park is the largest natural area in Portland, at over 5,000 acres. Large concentrations of native and non-native vegetation have the potential to burn and transfer fire to nearby homes and businesses. The park is heavily used by unsanctioned homeless campers and recreators. Addressing is needed here.
Government Island (Port of Portland)	High		●	●	●		●	●					Government Island is unique because it lies under the I-205/I-5 bridge and is controlled by State Parks. The island can only be accessed by boat and many recreators use this area and frequently have campfires and light fireworks. A wildfire here could potentially close the I-205/I-5 bridge.

Location	Priority	Defensible Space	Access	Water	Public Lands	Private Lands	Camping Uses	Protection Capability	Burning	Preparedness	Communications	Steep Slopes	Description
Johnson Creek Watershed	High	●	●	●		●	●		●	●		●	This area includes a number of homes that are in need of defensible space. Many roads are steep and narrow dead ends. It is heavily used by for unsanctioned homeless camping that has caused numerous vegetation fires due to warming and cooking fires.
Kelly Butte	High	●	●	●		●	●		●	●		●	Kelly Butte has a high concentration of fuels and structures at the base of the hill. There is a natural area that is not very well maintained. The water supply and pressure is poor here and access is limited. BOEC transmitters are located here, making it a high priority for protection. In addition, unsanctioned campers are a source of campfires.
Linnton	High	●	●	●	●	●	●	●		●	●	●	This community is at particularly high risk because it is adjacent to Highway 30, fuel tank farms and the Railroad, which transport hazardous and flammable materials. The area is within Forest Park, so there is ample vegetation to fuel a wildfire, and many recreators providing potential ignition sources. Access is limited due to steep slopes and narrow driveways. Addressing is needed here. Water pressure is a limiting factor as elevation increases.
Mount Tabor	Medium	●				●	●	●		●		●	Mount Tabor is a very urban area, with homes surrounding the base. It is comprised of healthy, mature forest, but there is an area on the southern end that has an issue with blackberries. Portland Water Bureau has reservoirs here, making it a priority for protection.
Oaks Bottom	High		●	●	●	●		●		●		●	There are many homes located at the top of the steep Oaks Bottom canyon. Access is limited here and there is heavy vegetation. The area is used by many recreators and unsanctioned homeless campers that have caused numerous vegetation fires due to warming and cooking fires. Portland Fire & Rescue and Portland Parks & Recreation have used prescribed fire here to reduce wildfire hazards. Community outreach has been conducted here.

Location	Priority	Defensible Space	Access	Water	Public Lands	Private Lands	Camping Uses	Protection Capability	Burning	Preparedness	Communications	Steep Slopes	Description
Pittock Mansion Area	Medium	●	●		●	●		●		●		●	There are a lot of homes in this area intermixed with heavy vegetation. Pittock Mansion is a historical structure and many recreators use this area. There are many natural areas that would benefit from fuels reduction work.
Portland Zoo and Hoyt Arboretum	Medium	●	●	●	●	●		●		●		●	Although the zoo grounds are well maintained, the areas adjacent to Highway 26 and up the slope to the zoo are heavy with flammable brush. Frequent car fires occur here on the side of Highway 26 that could easily ignite the hillside leading up to the zoo. Evacuation would be challenging with the windy roads, large numbers of recreators, and animals at the zoo. Wider paving is needed.
Powell Butte	High	●	●	●		●	●		●	●		●	There are heavy fuels adjacent to homes on steep slopes on Powell Butte. There is an ongoing challenge with unsanctioned homeless camping that has caused numerous vegetation fires due to warming and cooking fires along the Springwater Corridor. Although there is a hydrant at the top of the butte, it is not sufficient for fighting wildland fire. The area is also heavily used by recreators, and there is a caretaker that lives on top. Access is poor due to steep, narrow roads. Prescribed burns have been used here for oak restoration. This area is the future site of a Portland Water Bureau Reservoir.
Rocky Butte	High	●	●	●		●	●	●		●		●	There are about 50-60 homes on Rocky Butte. This community includes homes on very steep slopes and some that are perched on stilts. Ignitions from the freeway, unsanctioned homeless camping and recreators is a potential hazard here. There is a tunnel at the base of the slope that limits access and ODOT owns primary access road, which is in need of more regular maintenance. There is very low water pressure at the top of the Butte. The Homeowner's Association is very active here and provides an opportunity for community outreach.

Location	Priority	Defensible Space	Access	Water	Public Lands	Private Lands	Camping Uses	Protection Capability	Burning	Preparedness	Communications	Steep Slopes	Description
Smith & Bybee Lakes	Low				●		●						This area is comprised of commercial and industrial land. There is good defensible space around these structures. The City Park here is used by many unsanctioned homeless campers, so it is essential that the city continue to maintain these areas to reduce potential wildfire ignitions.
Springwater & Flavel	Medium	●				●				●		●	There is a recreational corridor amidst this very urban area that presents some unique wildfire hazards. Blackberries can be found 10 feet thick near homes. It is a major bicycle thoroughfare and is used by many unsanctioned homeless campers that have caused numerous vegetation fires due to warming and cooking fires.
Sullivan's Gulch	Low		●		●		●	●					There is a railroad here that has had a number of ignitions. There needs to be more rigorous vegetation management in the right of way. There are many unsanctioned homeless campers living along this area that have caused numerous vegetation fires due to warming and cooking fires.
SW Portland Cemetery	Low	●				●	●			●			The cemetery has a great deal of fuels that need better maintenance.
Terwilliger Curves	Medium	●	●	●	●	●	●	●		●		●	The Terwilliger Curves area has very poor access, with narrow, windy, steep one-way roads. Water is also limited here. The forest is mature, but defensible space around homes is needed.
Thurman Bridge	High	●	●		●	●	●	●	●	●	●	●	This community is at particularly high risk because it is above NW St. Helens Rd, which is an industrial area. The neighborhood is surrounded by the southern end of Forest Park, so there is ample vegetation to fuel a wildfire, and many recreators providing potential ignition sources. Access is limited due to steep slopes and limited evacuation routes. There are also a number of unsanctioned homeless campers that use warming and cooking fires.

Location	Priority	Defensible Space	Access	Water	Public Lands	Private Lands	Camping Uses	Protection Capability	Burning	Preparedness	Communications	Steep Slopes	Description
Tryon Creek	Medium	●	●			●				●		●	There are many residential areas surrounding the State Park. The park has an older stand of mature trees, but defensible space around homes is needed. Access is limited from the surrounding neighborhoods for evacuation route options. It is visited by many recreators, which presents some outreach opportunities.
Willamette Bluffs Escarpment	High	●	●	●		●				●	●	●	The Willamette Bluff Escarpment is located adjacent to the University of Portland and has extremely steep slopes covered with blackberries. Multiple homes are exposed to a fire moving upslope in this area. Access is good, but fighting fire on this steep escarpment is extremely challenging and a five-alarm wildfire almost engulfed these homes on August 8th, 2001. In addition, unsanctioned homeless campers live on the hillside and have caused vegetation fires from warming and cooking fires.

Priority Fuel Mitigation Location	Project Details
Arlington Heights Neighborhood	Defensible space projects identified through Firewise program activities
Collins View Neighborhood	Defensible space projects identified through Firewise program activities
Forest Heights Neighborhood	Defensible space projects identified through Firewise program activities
Forest Park Neighborhood – North and South	Defensible space projects identified through Firewise program activities
Linnton Neighborhood	Defensible space projects identified through Firewise program activities
Thurman Bridge Neighborhood	Defensible space projects identified through Firewise program activities
City of Portland	Defensible space in areas with high levels of unsanctioned or sanctioned camping. (Specific locations to be determined)

Priority Fuel Mitigation Location	Project Details
City of Portland Infrastructure	Defensible space projects around structures and equipment in high risk areas
Johnson Creek	Ongoing fuel reduction and invasive species removal needs
Kelly Butte	Ongoing fuel reduction, ecosystem restoration, and invasive species removal needs
Mount Scott	Ongoing fuel reduction, ecosystem restoration, and invasive species removal needs
Mount Tabor	Ongoing fuel reduction, ecosystem restoration, and invasive species removal needs
Oaks Bottom	Ongoing fuel reduction, ecosystem restoration, and invasive species removal needs
Powell Butte	Ongoing fuel reduction and invasive species removal needs
Rocky Butte	Ongoing fuel reduction, ecosystem restoration, and invasive species removal needs
Willamette Bluff	Ongoing fuel reduction and invasive species removal needs

5.3.6 Sauvie Island Fire

Sauvie Island Fire District is a rural fire protection district created in the 1980s. It provides protection to the entirety of Sauvie Island, covering 24,000 acres between the Multnomah Channel and the Columbia River in the northwestern edge of Multnomah County and southern Columbia County. The northern third of the island is mostly made up by the Sauvie Island Wildlife Area owned by the Oregon Department of Fish and Wildlife.

Interactive Version of This Map

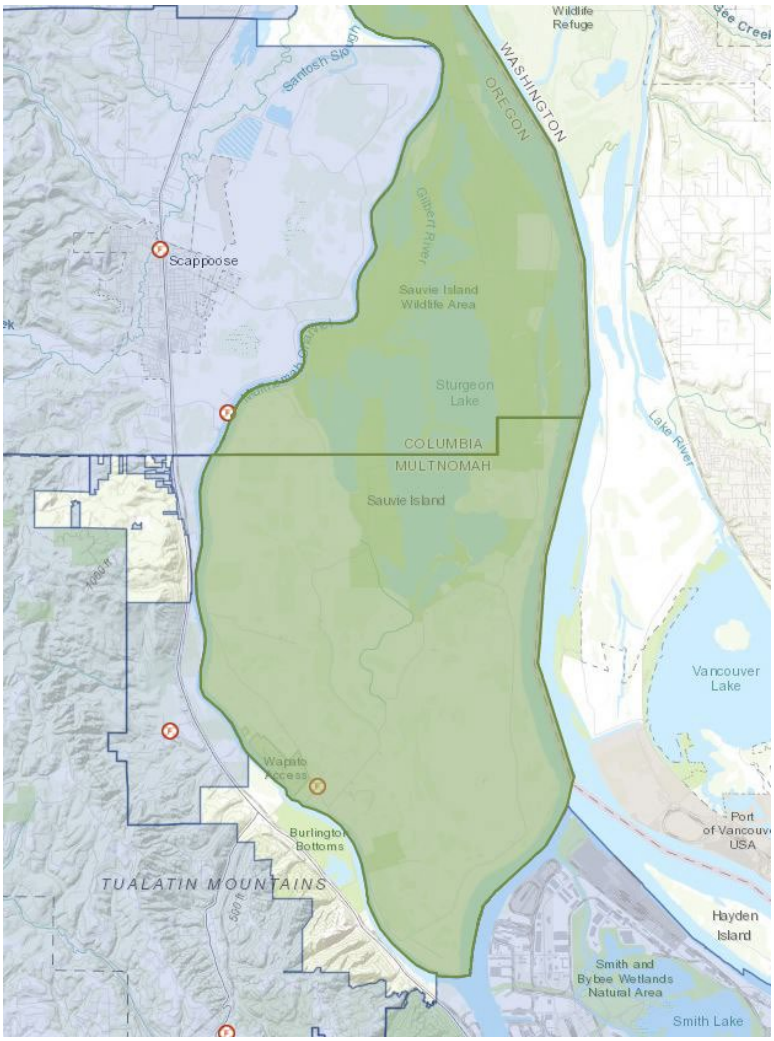


Figure 68 - Map showing Sauvie Island Fire service boundaries and fire station. Map from Oregon State Fire Marshal.

Sauvie Island is an unincorporated part of Multnomah County with approximately 2,850 residents.

Wildfire risks for Sauvie Island come in variable grassy or wooded areas, from agricultural fuels, and potential fires in the Wildlife Area. The island is primarily in agricultural use and also has popular summer beaches.

Sauvie Island Fire responds to about 140-150 calls a year, with about 65% of those calls for emergency medical services, with the remainder being for fires, motor vehicle collision rescues, and miscellaneous assistance calls. Sauvie Island has a main station, two sub-stations with equipment, and a total of three engines, two tenders, and three brush units. There are currently 27 volunteers who support operations. Response capacity has been improved by the acquisition of vehicles and other equipment from other local departments. The department responded to six brush fires, five grass fires, one vegetation fire and one forest fire in 2021.

Vulnerability from wildfire is heightened by the limited number of evacuation routes on the island and the large number of visitors, especially during the summer. Summertime visitors may increase the risk of fire ignition in wooded areas near beaches, be less likely to receive evacuation warnings, and be less able to successfully navigate evacuation routes.

Sauvie Island has a strong community support network for emergency preparedness through the Sauvie Island Community Association and the Sauvie Island Grange. Wildfire risk assessments for residents are arranged through Portland Fire & Rescue (PF&R), and conducted by Sauvie Island Fire, PF&R, or Scappoose Fire.

Interactive Version of Map 1 (left) – Planning and Cadastral/Oregon WUI Hazard Rating

Interactive Version of Map 2 (right) – Wildfire Potential Impacts/Overall Potential Impact

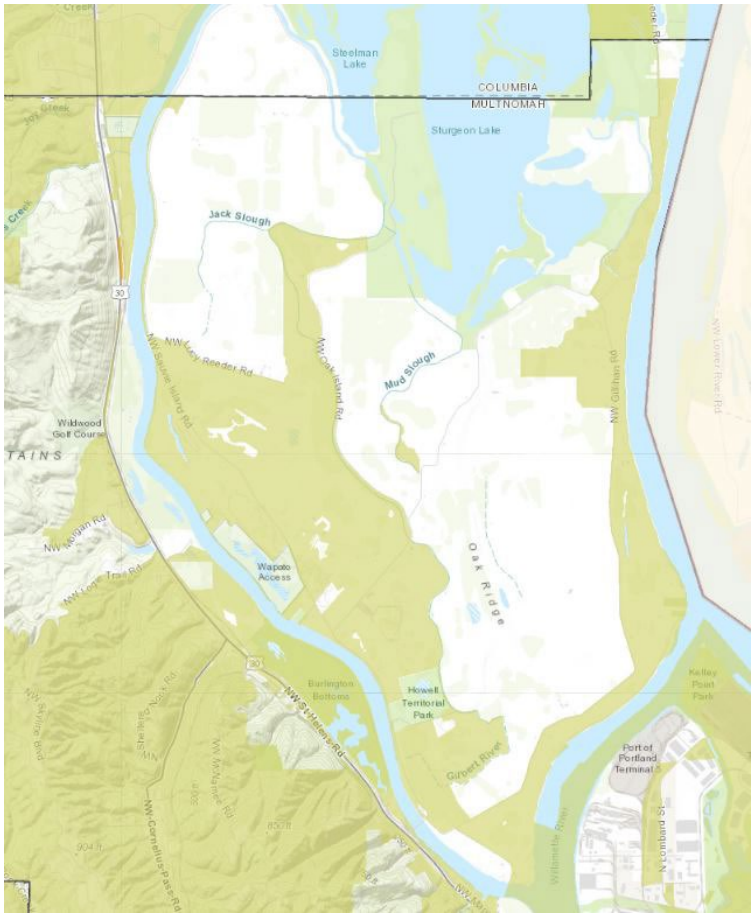


Figure 70 - Map showing WUI hazard areas in green, in the Multnomah County portion of Sauvie Island. Map from Oregon Department of Forestry WUI Hazard Map.

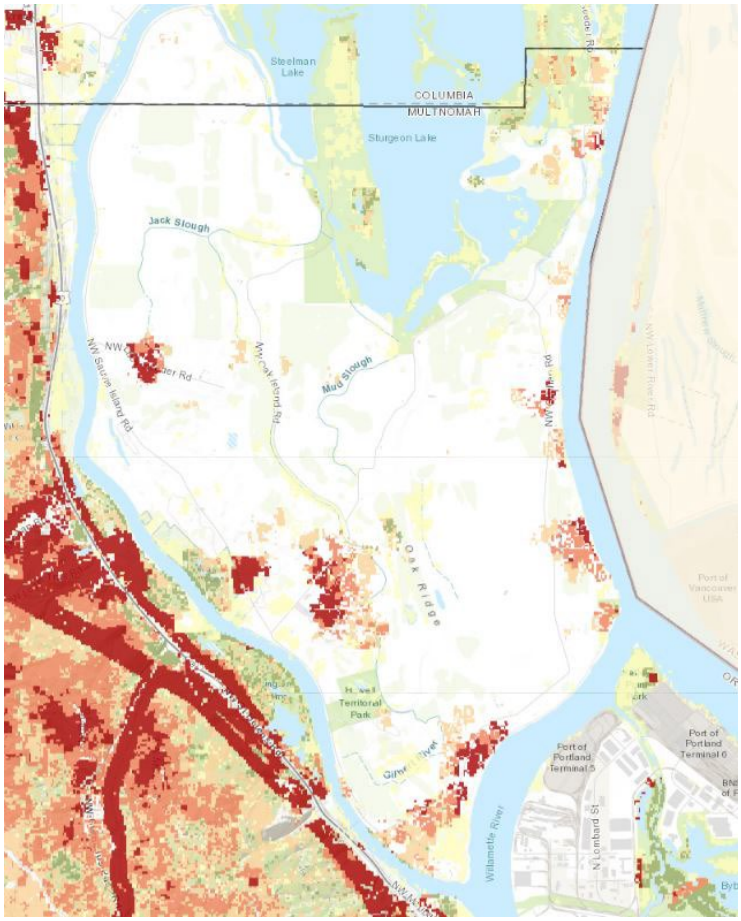


Figure 69 - Map showing overall potential impact from wildfire in the Multnomah County portion of Sauvie Island. Areas in red have the most potential impact from wildfire. Map from PNW-QWRA.

Sauvie Island Fire Mitigation Strategies

Action No.	Topic	Mitigation Action	Supporting Partners
1	Structural Ignitability	Support defensible space projects identified through home assessments.	Portland Fire & Rescue, Scappoose Fire, Oregon Department of Forestry, Oregon State Fire Marshal
2	Operational Coordination and Capacity	Develop an evacuation plan that identifies specific routes to move people off the island, considering limited access routes and summer visitor's unfamiliarity with local roads.	Multnomah County Sheriff's Office, Multnomah County Emergency Management
3	Operational Coordination and Capacity	Assess alerting procedures, especially for periods with high-volumes of visitors during periods of high wildfire risk.	Multnomah County Emergency Management

Communities at Risk

As in the 2011 version of this plan, the entirety of Sauvie Island is considered to be a single Community at Risk. The nature of development on the island is such that there are not clearly defined neighborhoods with unique risk characteristics.

Priority Fuel Mitigation Location	Project Details
All Sauvie Island wildfire risk areas	Defensible space projects identified through the home assessment program.

5.3.7 Scappoose Rural Fire Protection District

Scappoose Rural Fire Protection District provides emergency protection services across 52 square miles and serves about 12,000 people. Scappoose Fire's service area is primarily in Columbia County, but extends into the northern limit of Multnomah County, including the unincorporated communities of Holbrook, Chapman, and Warren, and an area of floating homes along the Multnomah Channel. There were 17 vegetation fires responded to in 2020 across the entirety of Scappoose Fire's service area.

The department has 20 firefighting staff, two administrative and three chiefs. Scappoose RFPD has one station in Multnomah County, located in Holbrook, which has wildfire response equipment but is not staffed. Overall the District has three brush engines and a fire boat.

Interactive Version of This Map

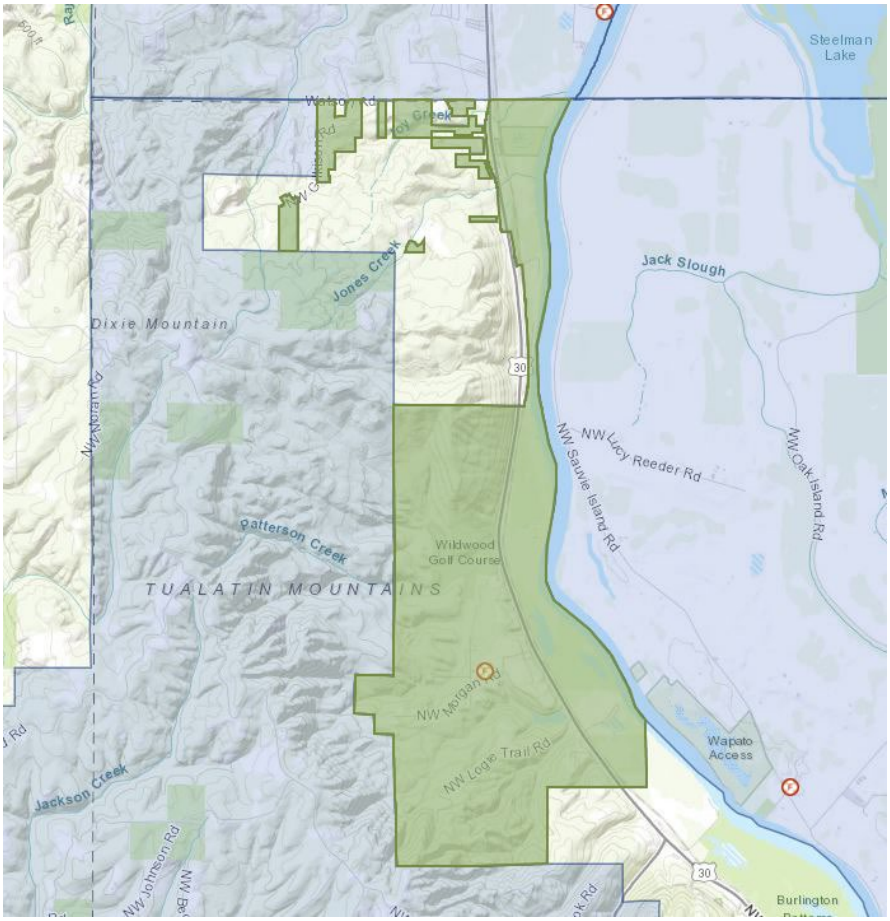


Figure 71 - Map showing Scappoose Fire service area in Multnomah County and location of fire station in Holbrook. Map from the Oregon State Fire Marshal.

Issues for Scappoose Fire in Multnomah County include fire detection in mountainous service areas and coordination with neighboring departments where fire service boundaries are isolated. Evacuation coordination in this area, with low population density and limited ingress and egress routes in isolated neighborhoods is an additional need. There is also a sizable area, with few structures, that is structurally unprotected but where Scappoose Fire provides first response.

Creating defensible space around homes and building community preparedness in isolated areas are key strategies for reducing risk.

Interactive Version of Map 1 (left) – Planning and Cadastral/Oregon WUI Hazard Rating

Interactive Version of Map 2 (right) – Wildfire Potential Impacts/Overall Potential Impact

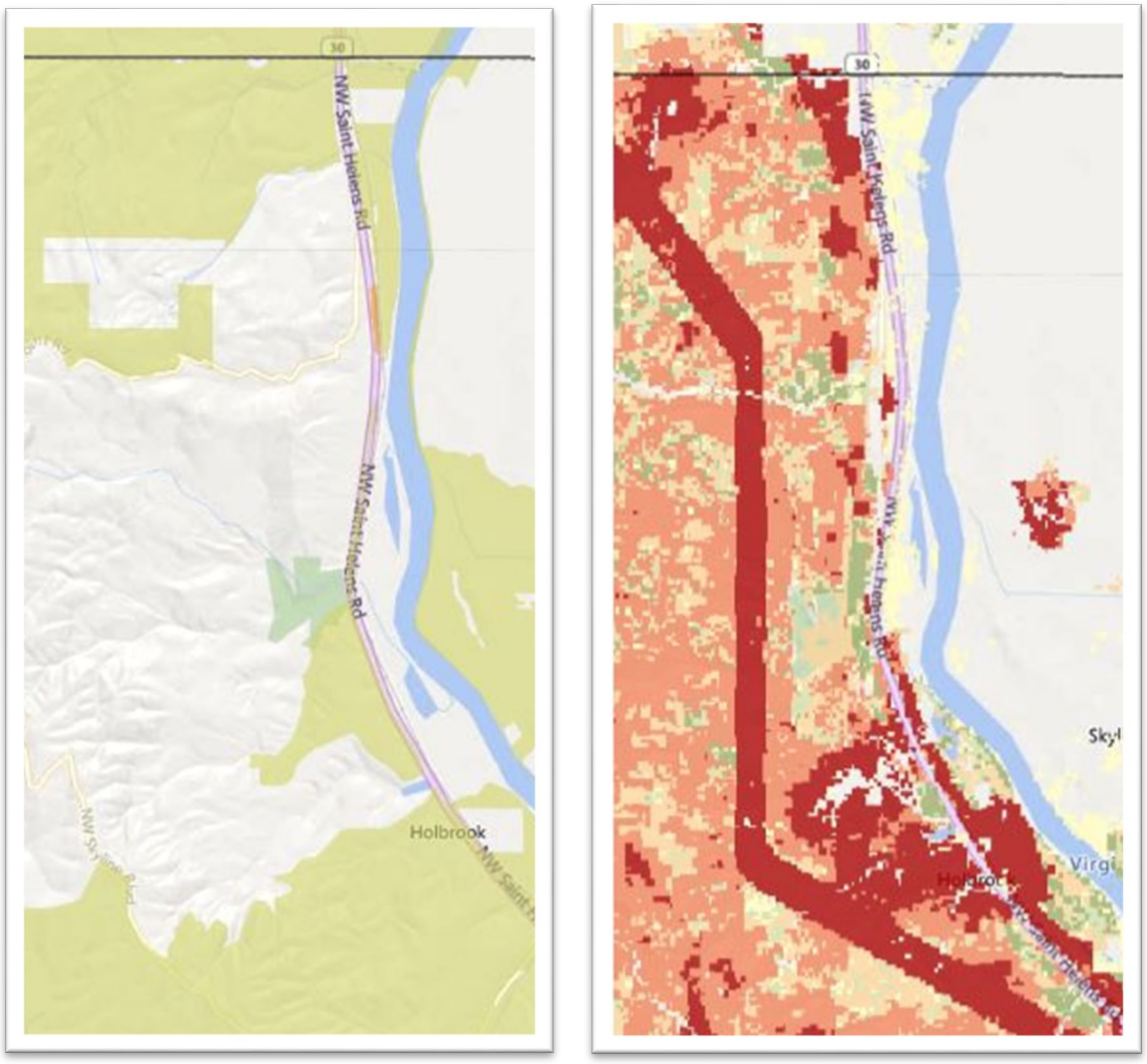


Figure 72 - Maps of Scappoose Fire protection areas in Multnomah County, showing WUI Hazard in green (left) and potential impacts, with the most severe in dark red (right).

The unincorporated community of Holbrook is the most populated risk area, with about 50 homes and high impact from wildfire. Development along Highway 30 and NW Gilkison Road at the northern border with Columbia County also carries high potential vulnerability.

Scappoose Fire Mitigation Strategies

Action No.	Action Category	Mitigation Strategy	Supporting Partners
1	Data and Risk Assessment	Build GIS layers from online mapping resources that be can integrated into district fire plans.	
2	Community Engagement and Resilience Building	Support the development of a Firewise Community in Holbrook.	Oregon State Fire Marshal, Multnomah County Emergency Management
3	Structural Ignitability	Designate staff time to continue defensible space assessments in the Holbrook community and support defensible space grants.	Oregon State Fire Marshal, Multnomah County Emergency Management
4	Land and Vegetation Management	Thin trees on key arterial routes to maintain evacuation routes.	Multnomah County Transportation
5	Wildfire Prevention	Install and maintain a wildfire risk (peacock) sign at Logie Trail Road near Rainbow Lake.	Oregon Department of Forestry, Oregon State Fire Marshal
6	Operational Capacity and Coordination	Identify training opportunities for Incident Command System positions that coordinate resources – liaison, public information, command and general staff, aviation support.	Multnomah County Land Use
7	Operational Capacity and Coordination	Enhance coordination with local and regional partners to plan for and resource share unmanned aviation planning and equipment.	FEMA, Oregon State Fire Marshal
8	Operational Capacity and Coordination	Shore up mutual aid agreements and communication with neighboring districts to clarify response planning in areas where Scappoose Fire would be the first on-scene for a wildfire.	Regional Disaster Preparedness Organization
9	Operational Capacity and Coordination	Improve access to wildland areas by partnering with local park organizations to deploy fire locks at park gates.	Portland Fire & Response, Tualatin Valley Fire & Rescue, Sauvie Island Fire
10	Operational Capacity and Coordination	Assess where district boundaries or response communication protocols can be re-evaluated to lower response times by area districts.	Regional and Local Park Agencies
11	Operational Capacity and Coordination	Identify training opportunities for Incident Command System positions that coordinate resources – liaison, public information, command and general staff, aviation support.	Multnomah County Board of Commissioners, Portland Fire and Rescue, Tualatin Valley Fire and Rescue

Communities at Risk

Location	Priority	Defensible Space	Access	Water	Public Lands	Private Lands	Camping Uses	Protection Capability	Burning	Preparedness	Communications	Steep Slopes	Description
Gilkenson Road	Medium	●	●	●	●	●	●	●		●		●	Gilkenson Road has about 28 residences. Access is limited and some homes are isolated. The area has heavy fuels on very steep slopes and intensive forest management activities occur around and within the community.
Holbrook	High	●	●	●	●	●	●	●		●		●	Holbrook is an unincorporated community with about 50 residences. The community is in the southern portion of Scappoose Fire's service area and has extended response times from the main station. Access is severely limited,
Logie Trail Road	High	●	●	●	●	●	●	●		●		●	This area is a high priority for prevention efforts because it is difficult to access, there are heavy fuels and steep slopes and

Priority Fuel Mitigation Location	Project Details
Logie Trail Road	Tree thinning to maintain safe evacuation route
Rocky Point Road	Tree thinning to maintain safe evacuation route
Morgan Road	Tree thinning to maintain safe evacuation route
Holbrook	Defensible space projects identified through home assessment

5.3.8 Tualatin Valley Fire and Rescue

Tualatin Valley Fire and Rescue (TVF&R) is Oregon's largest fire district by size, covering a 390-square-mile response area and serving almost 550,000 people. The vast majority of the service area is in Washington County, but there is a sizable service area in Multnomah County in areas on the west slope of Forest Park/West Hills and north through the Tualatin Mountains all the way to Multnomah County's border with Columbia County. TVF&R has 28 total fire stations, but just one is located in Multnomah County-Station 72 in the Skyline neighborhood.

Interactive Version of This Map

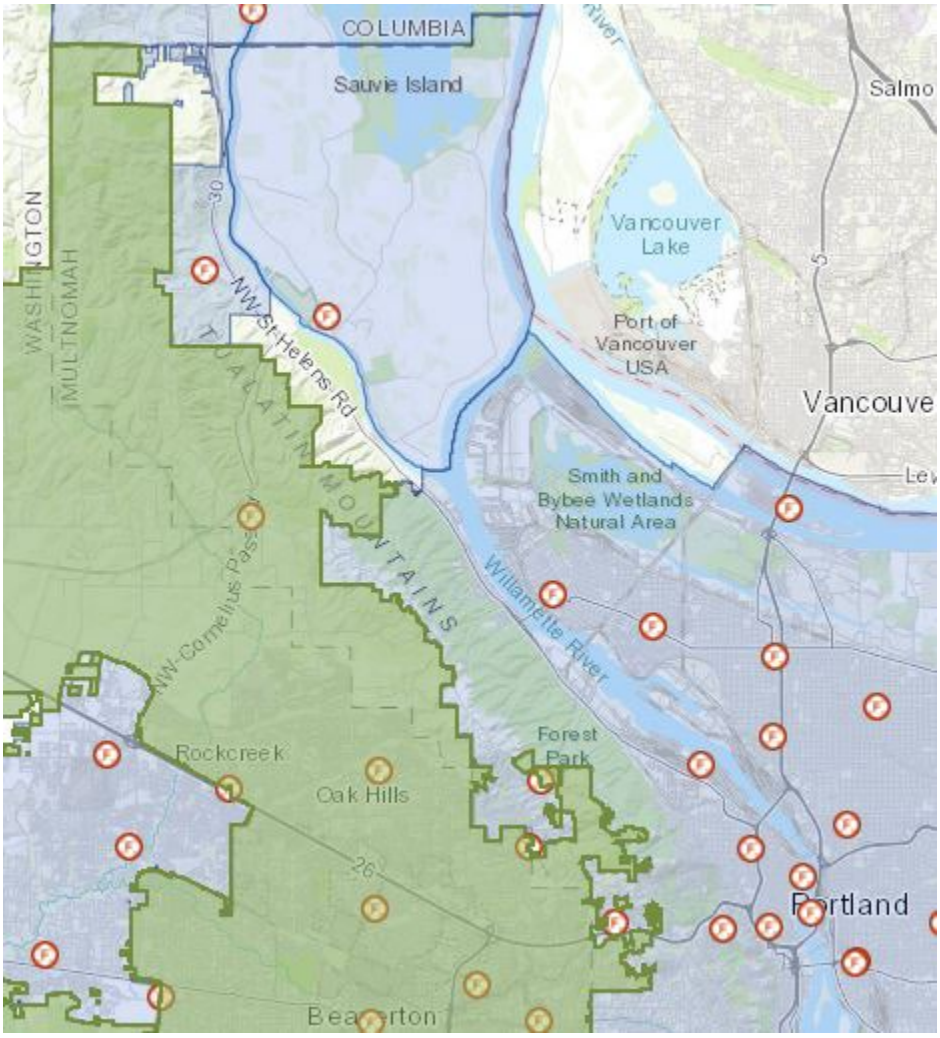


Figure 73 - Fire service area of Tualatin Valley Fire and Rescue, shown in green. The Multnomah County boundary is shown as the dashed line. Of the three stations shown at the southeastern boundary of the district, two are located in Portland (Forest Heights and Sylvan stations) and one is TVF&R Station 60, located in Washington County. Map from Oregon State Fire Marshal.

TVF&R's mitigation efforts in Multnomah County have focused on building resilience among its rural residents in high-risk wildfire areas. The department has held monthly trainings during fire season, along with public webinars and has developed personal presentations for homeowners' associations in the district.

Interactive Version of Map 1 (left) – (Planning and Cadastral/Oregon WUI Hazard Rating)

Interactive Version of Map 2 (right) – (Wildfire Potential Impacts/Overall Potential Impact)

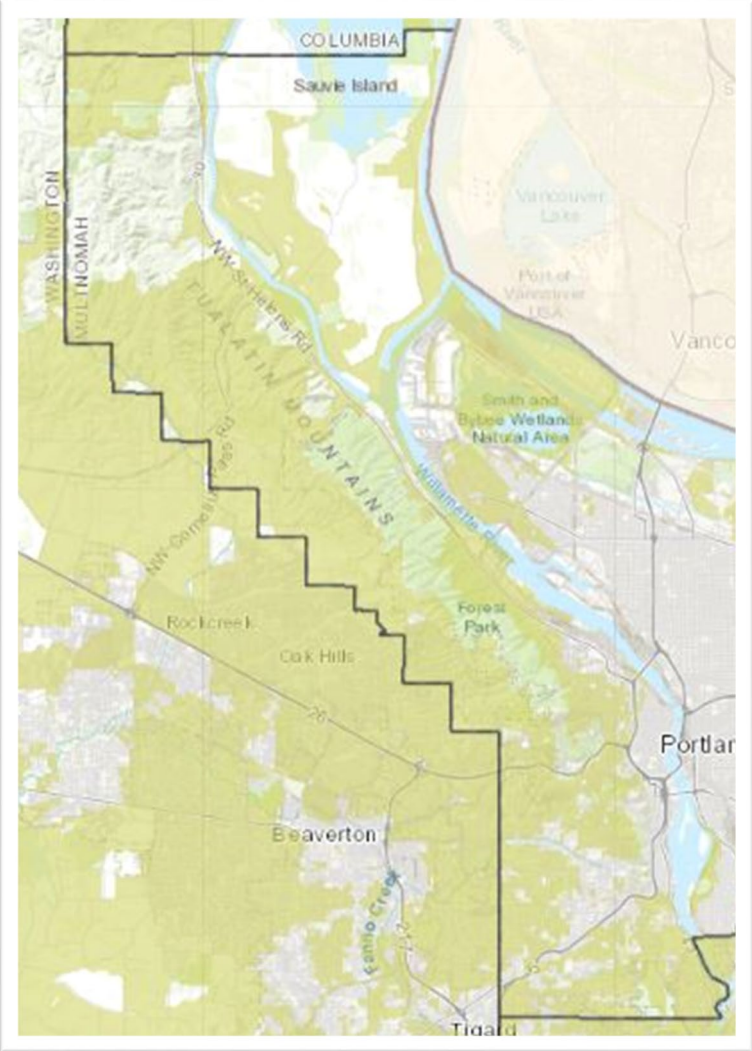


Figure 74 - WUI areas shown in green in the TVF&R service areas of Multnomah County. Map from statewide ODF WUI Hazard mapping.

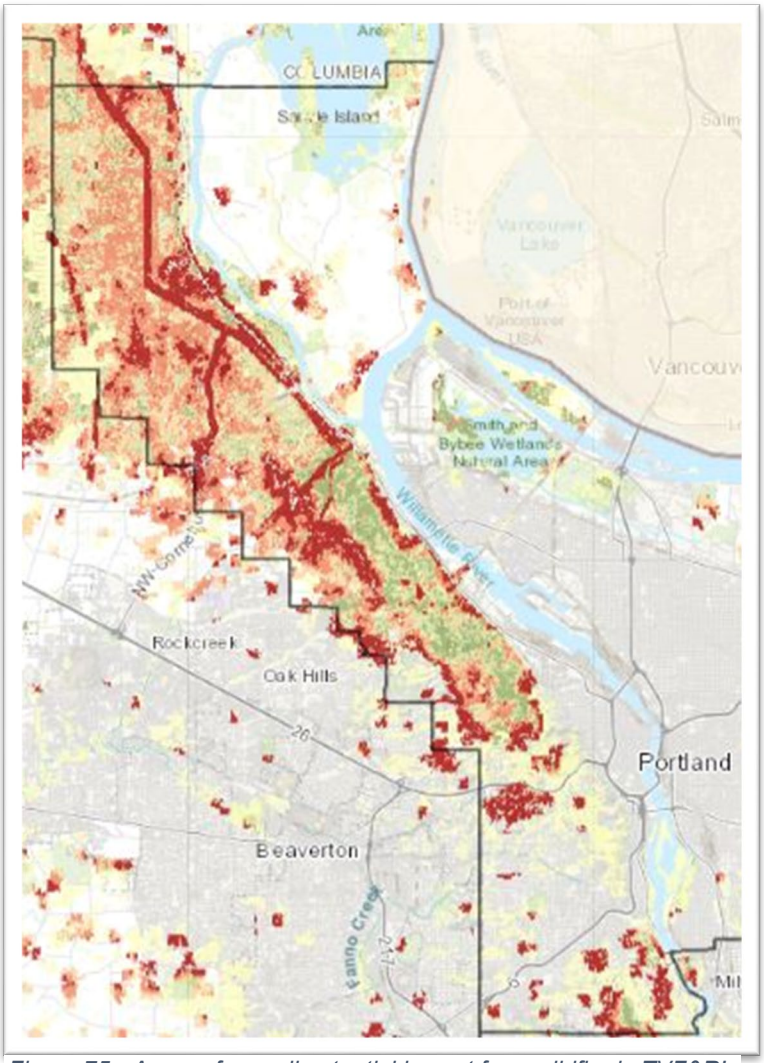


Figure 75 - Areas of overall potential impact from wildfire in TVF&R's service area in Multnomah County. Areas vulnerable to the highest impact are shown in dark red. Map from PNW-QWRA.

Most of TVF&R's fire protection boundaries in Multnomah County are part of the mapped WUI. Areas with the highest potential impact from wildfire are located on the west slopes of the

Tualatin Mountains, especially along major road corridors including NW Skyline Blvd., NW Cornelius Pass Road, and NW Germantown Road.

Property assessments have been used to promote reduction of risk in home ignition zones. Residential resilience has been promoted through videos and handouts, with encouragement of wildfire preparation and self-sufficiency among residents in advance of future fires.

The service areas in Forest Park create similar problems with alerting those in the park to fire risk and locating where people are in the park during emergencies.

A 702-acre structurally unprotected area near the Skyline neighborhood described in the 2011 CWPP has been incorporated into TVF&R's service boundary.

Tualatin Valley Fire & Rescue Mitigation Strategies

Action No.	Action Category	Mitigation Actions	Supporting Partners
1	Organizational Collaboration	Partner with other fire departments, public agencies, news sources, and community organizations to raise awareness around wildfire safety, preparedness and evacuation.	Portland Fire & Rescue, Scappoose Fire, Multnomah County Emergency Management, Portland Bureau of Emergency Management, Oregon State Fire Marshal, Oregon Department of Forestry
2	Community Engagement and Resilience Building	Continue periodic public trainings, webinars, and presentations to reduce wildfire ignition risk and increase home resilience.	Multnomah County Emergency Management, Oregon State Fire Marshal, Oregon Department of Forestry
3	Community Engagement and Resilience Building	Continue to provide social media, educational information and handouts that encourage residents' ability to be self-sufficient in managing risk on their properties.	Multnomah County Emergency Management

Communities at Risk

Location	Priority	Defensible Space	Access	Water	Public Lands	Private Lands	Camping Uses	Protection Capability	Burning	Preparedness	Communications	Steep Slopes	Description
Cornelius Pass Road	High	●	●	●	●	●	●	●	●	●	●	●	Cornelius Pass is located just west of Skyline Road, and has similar wildfire hazards and potential response issues. Cornelius Pass has poor addressing, steep driveways, and heavy fuels. Like Skyline, there is limited communication in this area, water supply is scarce, and it is located more than 10 minutes away from the nearest fire station. This road is used by recreationists as well as commuters, so it is characterized by relatively heavy traffic for this otherwise rural area.
Skyline Ridge	High	●	●	●	●	●	●	●	●	●	●	●	Skyline is a particularly vulnerable community homes because it is located along a ridgetop that has very steep slopes, poor access, and heavy fuels. This is a heavily traveled road that provides access to forested areas used for recreation, intensive forest management activities occur around and within this community, which increases potential ignition sources and fuels. Due to its location, response time are greater than 10 minutes, and response efforts will prove difficult as the roads are steep, driveways are narrow and are not well marked, and there are no known alternative water sources for the ridgeline. The terrain also inhibits radio communications.

Priority Fuel Mitigation Location	Notes
Cornelius Pass Road	Defensible space projects and landscape scale work to reduce starter and heavy fuels, reduce invasive species, and maintain evacuation routes
Skyline Ridge	Defensible space projects and landscape scale work to reduce starter and heavy fuels, reduce invasive species, and maintain evacuation routes
Firewise Communities	Defensible space projects identified through home assessments and Firewise programs.

5.3.9 Multnomah County

Multnomah County government does not have a fire service and therefore does not identify Communities at Risk. Multnomah County plays an important role in convening stakeholders, as one of the few jurisdictional partners in this plan with constituency across the entire county.

The departments and divisions from Multnomah County that participated in the development of this plan are listed here.

- **Multnomah County Emergency Management (MCEM)** - Served as project manager for this planning process and will continue to support centralized plan maintenance and organization. MCEM also supports alerting, evacuation planning, and other needs in unincorporated areas, as well as post-disaster sheltering across the entire county.
- **Multnomah County Department of County Services (DCS)**
    - **County Land Use –** Performs development review under zoning and land use codes to ensure compliance for new construction in unincorporated Multnomah County. Multnomah County Land Use is monitoring land use planning implementation requirements or optional policies that will be developed at the state level under Senate Bill 762.
    - **County Transportation –** Maintains roads and bridges in locations across the county, making the division a key partner in evacuation planning and fire prevention in right-of-ways.
- **Multnomah County Sustainability –** The Office of Sustainability has long recognized the increased risk of wildfire as a major local vulnerability due to climate change. The 2015 joint Climate Action Plan between the county and the City of Portland included actions recognizing the importance of implementing CWPP actions, monitoring building codes for opportunities to reduce structural ignition risk, and improving the quality of vegetated corridors and buffers.
- **Multnomah County Sheriff's Office (MCSO)** – Serves as the primary evacuation and search response organization for wildfire events in unincorporated areas and in the Cities of Fairview, Troutdale, and Wood Village.

Wildfire mitigation strategies for Multnomah County in this plan focus on Multnomah County's role as a convener for countywide coordination, training and exercises, and enhancing stakeholder participation. Other strategies reflect the county's role in supporting evacuation planning and sheltering during wildfire disasters.

Multnomah County Mitigation Strategies

Action No.	Mitigation Topic	Mitigation Action	Lead Agency	Supporting Partners
1	Organizational Collaboration	Build relationships with additional wildfire stakeholders across fire district boundaries and identify strategies for integrating them into future mitigation and preparedness planning efforts. Some potential groups could be from the insurance industry, watershed councils, and community-based organizations.	Multnomah County Emergency Management	Oregon State Fire Marshal
2	Organizational Collaboration	Assess resource and funding support needed for Multnomah County Emergency Management to maintain a central position for organization of ongoing countywide wildfire mitigation efforts, including convening meetings, maintaining group member lists, and mitigation grant planning.	Multnomah County Emergency Management	Oregon Emergency Management, Oregon State Fire Marshal
3	Organizational Collaboration	Align countywide CWPP priorities, when possible, with planning priorities in connected wildfire risk areas that cross county lines and fire districts and emergency management agencies in neighboring counties.	Multnomah County Emergency Management	Cascade Locks Fire Clackamas Fire, Lake Oswego Fire, Portland Fire & Rescue, Sauvie Island Fire, Sandy Fire, Scappoose Rural Fire Protection District, Tualatin Valley Fire & Rescue, Clackamas County, Columbia County, Hood River County, Washington County
4	Organizational Collaboration	Support regional wildland firefighting equipment grants and other potential projects available through RDPO UASI funding.	Multnomah County Emergency Management	Regional Disaster Preparedness Organization, Portland Emergency Management, Gresham Emergency Management
5	Organizational Collaboration	Determine if Multnomah County should become a participating county in the Oregon State University Extension Service to coordinate additional wildfire mitigation expertise and program support.	Multnomah County Emergency Management	Oregon State University
6	Organizational Collaboration	Build wildfire specific components in the upcoming update to the Multnomah County Recovery Plan.	Multnomah County Emergency Management	Regional Disaster Preparedness Organization
7	Data & Risk Assessment	Identify grants to support GIS projects to develop Story Maps and other engaging, accessible and broad-ranging public wildfire risk materials.	Multnomah County Emergency Management	Multnomah County GIS, Multnomah County Communications, Oregon Emergency Management, Oregon State Fire Marshal

Action No.	Mitigation Topic	Mitigation Action	Lead Agency	Supporting Partners
8	Data & Risk Assessment	Explore platforms for developing and maintaining a countywide mapping application showing active and planned fuel treatment project locations.	Multnomah County Emergency Management	Multnomah County IT, Oregon Department of Forestry, Oregon State Fire Marshal, All County Fire Districts, Land Management Agencies and Organizations
9	Community Engagement & Resilience Building	Gather survey information from unhoused residents about unmet needs and community wildfire risk awareness.	Multnomah County Emergency Management	Joint Office of Homeless Services (JOHS), JOHS Outreach Contractors
10	Community Engagement & Resilience Building	Provide simple, graphic-based materials for homeless service contractors to distribute to unhoused communities before each wildfire season. Materials could address wildfire risk reduction, evacuation messaging, and how to limit wildfire smoke vulnerability.	Multnomah County Emergency Management	Joint Office of Homeless Services, JOHS Outreach Contractors, Multnomah County Communications
11	Community Engagement & Resilience Building	Explore ways to foster countywide Firewise Community coordination for sharing of information, best practices, and mutual support. Determine if there are ways for existing Firewise Communities to provide support to new groups with an interest in neighborhood-based resilience.	Multnomah County Emergency Management	Existing Firewise Communities and their local Fire Districts, Oregon State Fire Marshal, National Fire Protection Association
12	Land and Vegetation Management	Support the development of grants or other opportunities that could facilitate the shared use of air curtain burners by fire districts and resource management agencies across the county or region, to safely dispose of vegetative debris.	Multnomah County Emergency Management	US Forest Service, Regional Disaster Preparedness Organization, Oregon State Fire Marshal, Oregon Department of Forestry
13	Wildfire Prevention	Assess the feasibility of grants for providing fire prevention and suppression equipment - such as flameless stoves and fire buckets - to unsheltered communities in unincorporated vegetated areas.	Multnomah County Emergency Management	Joint Office of Homeless Services
14	Operational Coordination and Capacity	Convene forums for residents in the structurally unprotected areas in eastern and western Multnomah County to explore alternatives for establishing structural fire district protection.	Multnomah County Emergency Management	Cascade Locks Fire, Corbett Fire, Portland Fire & Rescue, Scappoose Fire, Tualatin Valley Fire & Rescue, Multnomah County Fire Defense Board, Oregon State Fire Marshal

Action No.	Mitigation Topic	Mitigation Action	Lead Agency	Supporting Partners
15	Operational Coordination and Capacity	Create an Alert and Warning Annex to the Multnomah County Emergency Operations Plan that prioritizes communicating wildfire risk to underserved communities.	Multnomah County Emergency Management	Joint Office of Homeless Services, Department of County Human Services, Multnomah County Sheriff's Office, Gresham Fire, Corbett Fire, Sauvie Island Fire, Scappoose Fire, Tualatin Valley Fire & Rescue, Cascade Locks Fire
16	Operational Coordination and Capacity	Continue to organize annual exercises to test operational wildfire coordination, alternating scenarios between the east and west sides of the county.	Multnomah County Emergency Management	Multnomah County Sheriff's Office, Gresham Fire, Corbett Fire, Sauvie Island Fire, Scappoose Fire, Tualatin Valley Fire & Rescue, Cascade Locks Fire, Portland Fire & Rescue, Oregon Department of Forestry, US Forest Service, Oregon State Parks, Metro Parks and Natural Areas, Portland Water Bureau
17	Structural Ignitability	Determine a method to review defensible space around new development and maintain evaluation and permitting of established fuel breaks,	Multnomah County Land Use	Gresham Fire, Corbett Fire, Sauvie Island Fire, Scappoose Fire, Tualatin Valley Fire & Rescue, Cascade Locks Fire
18	Structural Ignitability	Coordinate with fire districts to review and update zoning codes. Consider expanding wildfire codes into non-resource zones, and align programs with Senate Bill 762 land use programs.	Multnomah County Land Use	Gresham Fire, Corbett Fire, Sauvie Island Fire, Scappoose Fire, Tualatin Valley Fire & Rescue, Cascade Locks Fire
19	Structural Ignitability	Maintain engagement with fire districts to ensure planning codes meet wildfire safety needs.	Multnomah County Land Use	Gresham Fire, Corbett Fire, Sauvie Island Fire, Scappoose Fire, Tualatin Valley Fire & Rescue, Cascade Locks Fire
20	Operational Coordination and Capacity	Support fire districts in the development of fire response best practices for rural addressing .	Multnomah County Land Use	Multnomah County Emergency Management, Gresham Fire, Corbett Fire, Sauvie Island Fire, Scappoose Fire, Tualatin Valley Fire & Rescue, Cascade Locks Fire
21	Operational Coordination and Capacity	Determine evacuation zones in unincorporated areas that can streamline determination and communication of evacuation levels.	Multnomah County Sheriff's Office	Multnomah County Emergency Management, Gresham Fire, Corbett Fire, Sauvie Island Fire, Scappoose Fire, Tualatin Valley Fire & Rescue, Cascade Locks Fire

Priority Fuel Mitigation Location	Notes
Areas Without Structural Protection (unincorporated East and West Multnomah County)	Support defensible space projects initiated by residents in these areas

Chapter 6 – Wildfire Smoke

6.1 Introduction to Wildfire Smoke

Wildfire smoke contains a mix of gasses and fine particles from burning trees, buildings and other materials into the air we breathe. Wildfires emit a variety of pollutants: particulate matter, black carbon, nitrogen dioxide, carbon monoxide, volatile organic compounds, polycyclic aromatic hydrocarbons and metals.[78] Wildfire smoke particles can be inhaled and absorbed into peoples' lungs and bloodstream, and effects can be felt immediately. The most common health effects from smoke exposure include: coughing, trouble breathing, wheezing, asthma attacks, stinging eyes, scratchy throat, runny nose, irritated sinuses, headaches, tiredness, chest pain and elevated heart rate. Changes in sleep patterns, appetite and mental health effects have also been documented. The severity of these effects can vary based on a person's age, health and lifestyle. Smoke can blow into our communities from fires burning across the Pacific Northwest. Even smoke from distant wildfires can be extremely hazardous to health.

Figure 76 - Thick smoke settles over Portland on September 9, 2020

[78] Wildfire Smoke Trends and the Air Quality, Oregon Department of Environmental Quality, 2022

6.1.1 Particulate Matter

Particulate matter (PM) is a general term for a mixture of solid and liquid droplets suspended in the air. PM can come from many sources and is always in the air we breathe. It can be present in many sizes and shapes, and is categorized based on size. Larger particles usually do not enter the lungs but can still irritate the eyes, nose, and throat. Particles that are less than 10 micrometers in diameter can pass through the nose and throat and enter the lungs.[79]

Fine, inhalable particulate matter (PM2.5) is the air pollutant of greatest concern to public health from wildfire smoke because it can travel deep into the lungs and may even enter the bloodstream.

- U.S. EPA

Particles less than 2.5 micrometers are referred to as fine particulate matter, or PM2.5, and represent approximately 90% of the pollutants emitted from wildfire smoke. PM2.5 can affect the lungs and heart, and can cause serious health effects. There is growing scientific evidence that links a heightened risk of cardiovascular and respiratory effects as a result of wildfire smoke exposure, particularly as the intensity of the smoke increases.

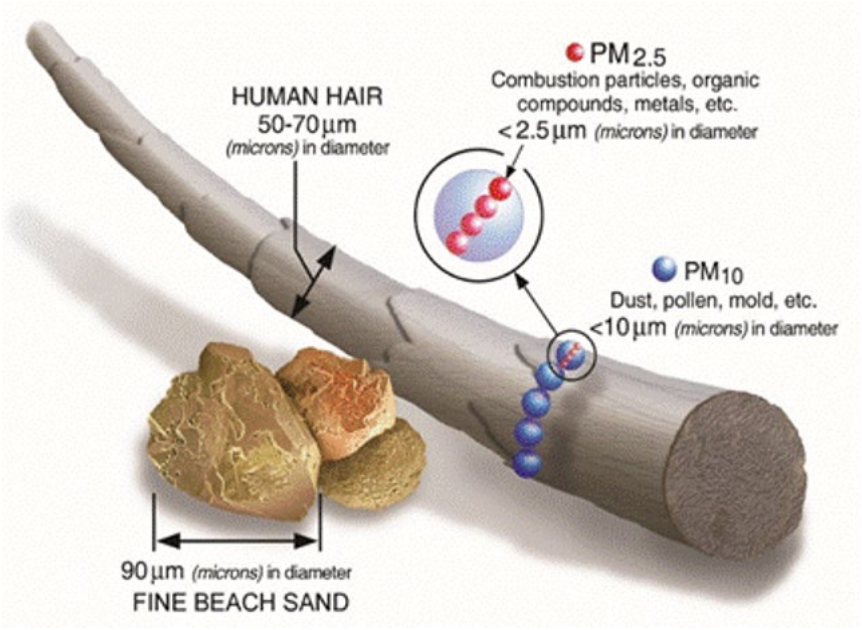


Figure 77 - EPA's illustration of fine, inhalable particulate matter (PM2.5), the air pollutant of greatest concern to public health from wildfire smoke, as they can enter the lungs and bloodstream.

[79] Why Wildfire Smoke is a Health Concern, U.S. Environmental Protection Agency, 2023

6.1.2 Air Quality Index

The Air Quality Index (AQI) is the Environmental Protection Agency's (EPA's) tool for reporting air quality. AQI measurements are used to determine if the air is healthy to breathe. The index measures six major air pollutants regulated by the EPA through the Clean Air Act: 1) ground level ozone, 2) particle pollution, 3) carbon monoxide, 4) sulfur dioxide, 5) nitrogen dioxide and 6) lead. The AQI includes a scale from 0 to 500 that is divided into six levels of concern ranging from healthy to unhealthy to hazardous, with each identified by a color. The index lists health effects that can be experienced within a few hours or days after exposure to each level of concern.

Daily AQI Color	Levels of Concern	Values of Index	Description of Air Quality
Green	Good	0 to 50	Air quality is satisfactory, and air pollution poses little or no risk.
Yellow	Moderate	51 to 100	Air quality is acceptable. However, there may be a risk for some people, particularly those who are unusually sensitive to air pollution.
Orange	Unhealthy for Sensitive Groups	101 to 150	Members of sensitive groups may experience health effects. The general public is less likely to be affected.
Red	Unhealthy	151 to 200	Some members of the general public may experience health effects; members of sensitive groups may experience more serious health effects.
Purple	Very Unhealthy	201 to 300	Health alert: The risk of health effects is increased for everyone.
Maroon	Hazardous	301 and higher	Health warning of emergency conditions: everyone is more likely to be affected.

Figure 78 - Air Quality Index with levels of concern and descriptions of air quality, from www.airnow.gov

On a typical day, the AQI in Multnomah County is in the 0 to 50 (green) range, posing little or no risk. Throughout the year, air quality conditions can change based on natural- and human-caused conditions, such as wildfire smoke or emissions from wood-burning stoves and fireplaces.

The Oregon Department of Environmental Quality (DEQ) has been monitoring air quality year-round since 1985. Prior to 2015, AQI values in the Portland area had zero days that measured above 100 PM due to wildfire smoke with air quality considered unhealthy for sensitive populations or worse. Since 2015, air quality in the county has reached unhealthy levels multiple times due to smoke from fires burning across the Pacific Northwest, including Canada.[80]

[80] Wildfire Smoke Trends Report, Oregon Department of Environmental Quality. 2022.

6.2 Process and Partners

6.2.1 Wildfire Smoke Subcommittee

Between April 2021 and April 2023, thirty partners from community organizations and county and city departments served on the CWPP Wildfire Smoke Subcommittee. Members represented sustainability, public health, environmental health, public information, facilities, occupational safety, diversity and equity, human services, people with disabilities, people experiencing homelessness, affordable housing, environmental quality and water services. The group met four times in 2021 to provided direction on goals, data, risk, actions and priorities for the new section of the CWPP. They also developed a community survey that was administered in the Fall of 2021, with themes from the survey explored in the next subsection. In 2022, MCEM conducted one-on-one meetings with partners, began drafting the plan and refined actions in the Mitigation Strategy. The draft section was reviewed by partners in 2023, finalized and added to the main CWPP.

Organizations that participated in this process:

- Home Forward
- Joint Office of Homeless Services
- Lewis and Clark College
- Multnomah County Communications Office
- Multnomah County Department of County Assets, Facilities
- Multnomah County Department of Human Resources
- Multnomah County Emergency Management
- Multnomah County Health Department, Aging and Disability
- Multnomah County Health Department, Public Health
- Multnomah County Health Department, Public Health, Environmental Health
- Multnomah County Office of Sustainability
- Multnomah County Risk Management
- Oregon Department of Environmental Quality
- Portland Bureau of Emergency Management
- Portland Occupational Safety and Well-Being
- Portland State University
- Portland Water Bureau

6.2.2 Surveys: Understanding Public Preparedness

Following the intense fire season in 2020, two separate public surveys were designed and implemented in 2021 to learn about the community's level of preparedness. The first survey was developed by Oregon Health Authority (OHA) and the University of Oregon (UO) and was conducted across the state. The second survey was developed by the Multnomah County CWPP Smoke Subcommittee for county residents. Both surveys were available in English and Spanish. The county survey was also available in Vietnamese, Somali, Russian, and Chinese

(Simplified and Traditional). The OHA/OU surveys intentionally focused on collecting data on race, ethnicity, language and disabilities. Although the sample size for the County surveys was smaller than anticipated (48), in many instances trends among County responses were similar to those from across the State

The table below provides an overview of each survey approach. Table 2 lists key findings, and identifies similarities, difference and takeaways among survey groups. Survey themes informed the mitigation actions defined in Section 6.2.2.

2021 Survey Approaches

	Statewide survey	Countywide survey
Purpose	To learn from Oregonians • How they responded to wildfire smoke • Their communication needs	To learn from County residents their • Awareness of health risks • Level of concern • Preparedness efforts • Barriers to preparing for future events
Total responses	1,200	48
Languages (# of responses)	English (971), Spanish (229)	English (33), Spanish (3), Vietnamese (0), Chinese - Traditional (3) and Simplified (9), Somali (0) and Russian (0)
Method	Online	Online
Outreach	Separate online outreach campaigns to English-speaking and Spanish-speaking communities Spanish respondents received a $10 gift card Equally targeted urban and rural communities	Social media, Multnomah County Emergency Management newsletter and website, County Health Department's Community Partnerships and Capacity Building network and the Subcommittee member networks
Limitations and Considerations	Online only Intentional oversampling of rural and Hispanic/Latinx populations	Online only Small sample size Unintentional under-representation from non-English groups

Key Findings from State and County public surveys conducted in 2021

Survey Categories	Statewide Survey	Countywide Survey
Symptom awareness	Not asked	**Most** Know about the respiratory risks associated with wildfire smoke Chest pain and fast heartbeat were less commonly known

Survey Categories	Statewide Survey	Countywide Survey
Concerns	**Most** Most common concern was health of vulnerable people Next common concern was own health	**Most** Concerned about health risks if a wildfire smoke event lasts 3 days or longer.
Preventative actions taken during 2020 Labor Day Fires	**Hispanic/Latinx or Having Disability** More likely to have felt prepared **English-Language Respondents** More likely to have felt unprepared **Most** Attributed being prepared to having • Previous experiences with smoke • A community plan • Emergency supplies Made changes to outdoor activities Did not take preventative actions indoors **Lower-income** Less likely to have avoided going outdoors	**Most** Stayed indoors and closed doors and windows Changed activities because of smoky air **Half** Used an air purifier **English-Language Respondents** Checked air quality online before going outside
Information	**Most** Relied on own observations or the internet for air quality information, but this was not equally true across all demographics Want more information about • Air and smoke forecasts • How to stay safe indoors and outdoors • How to use PPE **Non-White and Hispanic/Latinx** More likely to go to friends and family for information	**Most** Most commonly go to social media for information on weather related disasters • Second most common is local and national news **English-Language Respondents** Also check the Multnomah County website

Survey Categories	Statewide Survey	Countywide Survey
Preparedness for future smoke events	Not asked	**Most** Able to stay home if air quality was hazardous Able to leave home on short notice and without assistance • Themes why leaving home would be difficult: Transportation, pets, not having a place to go, employment Would use a stand-alone or room-sized air cleaner **Non-English Language Respondents** More likely to feel “not prepared” or “little prepared” More likely to leave home for basic needs such as groceries, water and medication More likely to go to a cleaner air shelter/cooling center **English-Language Respondents** More likely to feel “prepared” to “very prepared” More likely to leave home for work Less likely to go to a clean air/cooling space
Barriers	**Many** Lack access to adequate household protections Want information about what to do during a smoke event Lack clean air spaces in community	**Themes** Lack financial resources Not knowing which filtration supplies to purchase Not knowing how to retrofit or use air filtration supplies and equipment.

6.3 Wildfire Smoke Risk Assessment

6.3.1 Wildfire Smoke History

The Oregon Department of Environmental Quality (DEQ) has been monitoring air quality year-round since 1985. Prior to 2015, the AQI ratings in the Portland area had zero days that measured unhealthy for sensitive populations or worse from wildfire smoke. Since then air quality in the County has reached those levels due to smoke from local or regional fires in 2015, 2017, 2018, 2020 and 2022.[81]

- **2022 Nakia Fire**

Figure 79 - Smoke from the Nakia Fire burning in Washington State drifts into Oregon

Fueled by strong winds and unseasonably hot temperatures, a human-caused wildfire in southwest Washington burned 1,918 acres in October 2022. Officials named this the "number-one priority fire in the nation" because of the potential risk to life safety and the resources needed to put it out.[82] Smoke blew into communities across Oregon.

Air quality during the Nakia Fire reached an unhealthy rating in North Portland extending along the I-5 area. Air quality in East Portland registered unhealthy for sensitive groups. As shown in Figure 3, air quality in the Pacific Northwest was among of the worst in the country on October 18th, 2022.

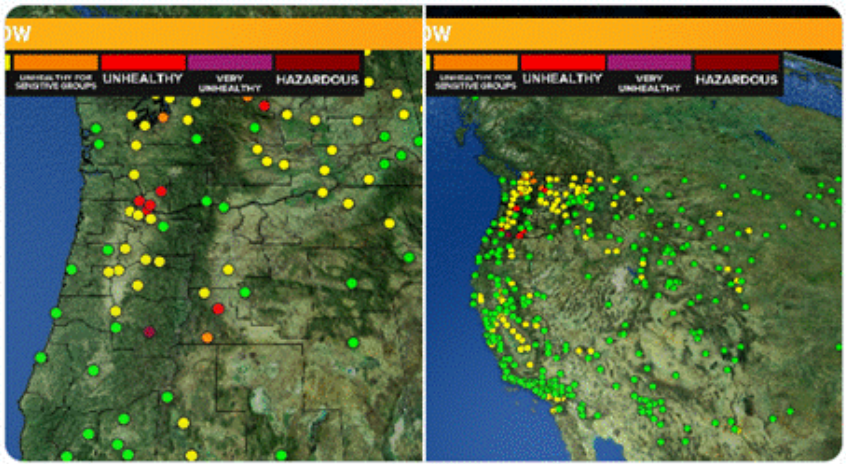


Figure 80 - Maps displaying AQI measurements on October 18, 2022, during the Nakia Fire, reported by KGW8 news.

[81] Wildfire Smoke Trends and the Air Quality Index, Oregon Department of Environmental Quality, 2022.
[82] Nakia Creek Fire (OR) is Now 'No. 1 Priority Fire in Nation' as Firefighters Ramp Up Efforts, Wait for Rain, *Wildland Firefighter*, 2022.

- **2020 Labor Day Fires**

In September 2020, a combination of hot and dry conditions ignited multiple wildfires across the region. Due to extremely high winds, wildfires multiplied throughout Oregon and Washington. Multnomah County was spared the flames, but not the toxic smoke.

Figure 81 - Smoke looming over downtown Portland in 2020 during the Labor Day Fires during which Multnomah County experienced the most hazardous air quality in the world

DEQ issued an air quality warning for the Portland Metro area due to wildfire smoke exposure. Hazardous conditions reached an AQI of 509 (Maroon, Hazardous - everyone is more likely to be affected). Portland experienced the most hazardous air quality in the world for a period of time and the worst ever recorded in the area. In Multnomah County the number of people reporting asthma-like symptoms jumped 88% over the average on smoke-free days. People reporting those symptoms accounted for 10% of all emergency department and urgent care visits." [83]

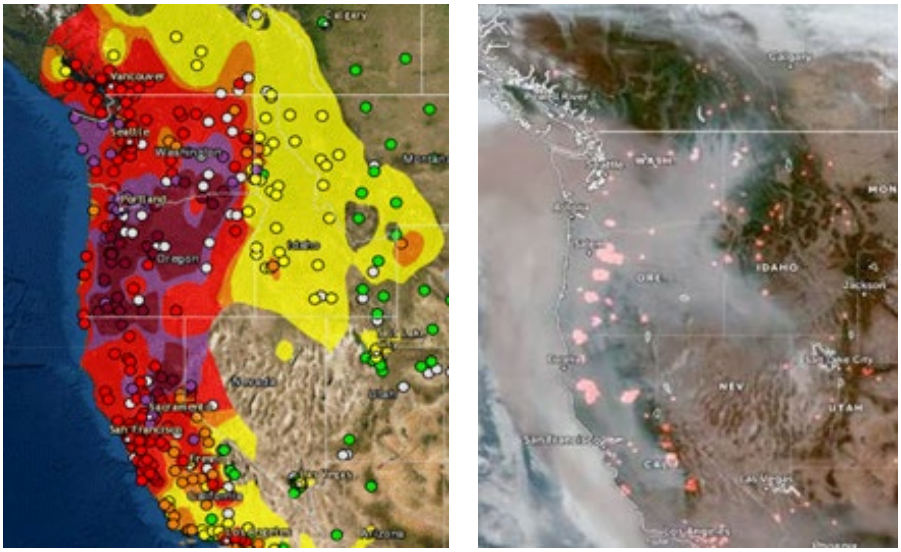


Figure 82 - A satellite image and snapshot from air quality monitors, on September 12, 2020, depict the air quality conditions along the West Coast of the United States

Preliminary data shows exposure to PM2.5 during the 2020 wildfire season was associated with increased risk of COVID-19 cases and deaths. One study published in *Science Advances* analyzed data from 92 counties in California, Washington and Oregon that were affected by the 2020 wildfires. "18 of 19 counties in Oregon reported an increase of COVID cases on days they were subject to wildfire smoke and higher PM2.5 values ."[84]

[83] Hazardous air is causing a jump in emergency department visits in Multnomah County, Multnomah County, 2020
[84] Excess of COVID-19 cases and deaths due to fine particulate matter exposure during the 2020 wildfires in the United States, *Science Advances*, Zhou, X., K. Josey, L. Kamareddine, M.C. Caine, T. Liu, L.J. Mickley, M. Cooper, and F. Dominici. August 13, 2021.

- **2018 Smoke Events**

In August 2018, east winds pushed heavy smoke and persistent haze into Northwest Oregon from wildfires burning in British Columbia, Washington and Eastern Oregon. Air quality plummeted. DEQ issued an air quality advisory for the Willamette Valley, including the Portland area[85], leading to media describing Portland as having "the dubious distinction of worst air quality for a major city on the planet"[86]

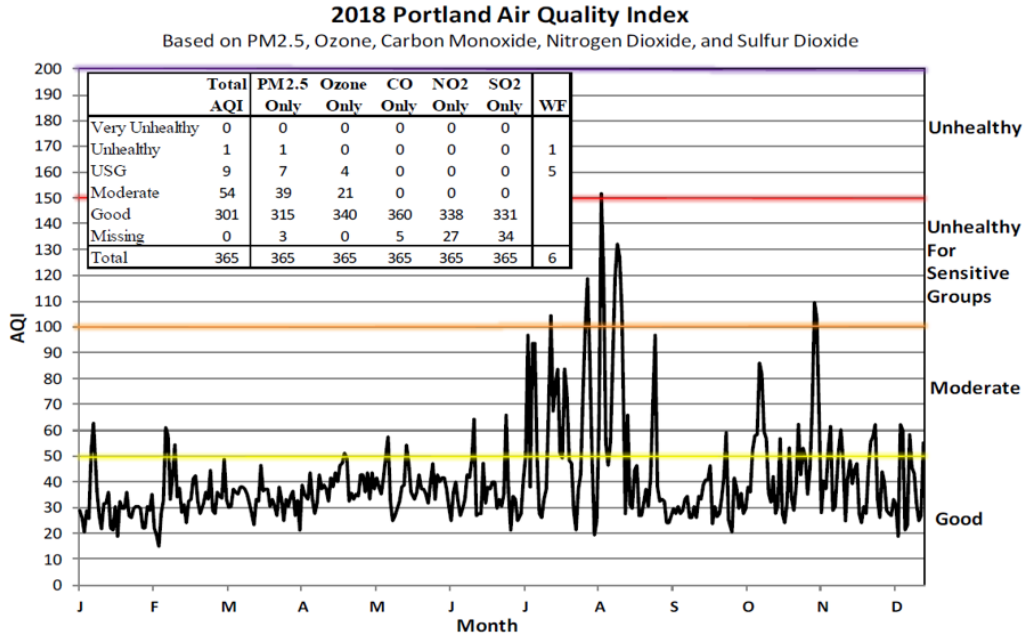


Figure 83 - In August 2018, DEQ reported air quality measurements reaching unhealthy levels from wildfires burning across the Pacific Northwest, as illustrated by this chart in the Oregon Air Quality Annual Report: 2018.

- **2017 Eagle Creek Fire**

Smoke from the Eagle Creek Fire blanketing the City of Troutdale in 2017

Smoke from wildfires in British Columbia drifted into the northern Willamette Valley in August 2017. Then, over Labor Day weekend, a human-caused fire ignited in the Columbia River Gorge. The fire grew quickly over the next few days and winds blew ash and smoke into communities across the Portland Metro Region.

The Eagle Creek Fire alone was responsible for moderate to very unhealthy air quality in early September. Particulate matter from distant fires coupled with the local Eagle Creek fire degraded the air for months. For 61 days, from August through

[85] Northwest Annual Fire Report, 2018, Northwest Interagency Coordination Center. 2018. Northwest Annual Fire Report 2018.
[86] Portland weather 2018: Record breaking heat, wildfire smoke, one massive snowstorm made news, *Oregon Live*. Grant Butler, December 30, 2018

September, approximately one of three days had moderate or worse air quality in the Willamette Valley.[87]

- **2015 Smoke Events[88]**

After two hot and dry months, an extended period of lightning strikes in early August 2015 ignited fifteen major fires in Oregon and Washington. Mid to late August winds transported smoke to Eugene, Portland, and Seattle.

This event led to the worst two-week air quality period across the Pacific Northwest during the 2015 wildfire season. For the first time in recorded history, wildfire smoke degraded air quality to AQI measurements of unhealthy for sensitive populations or worse.

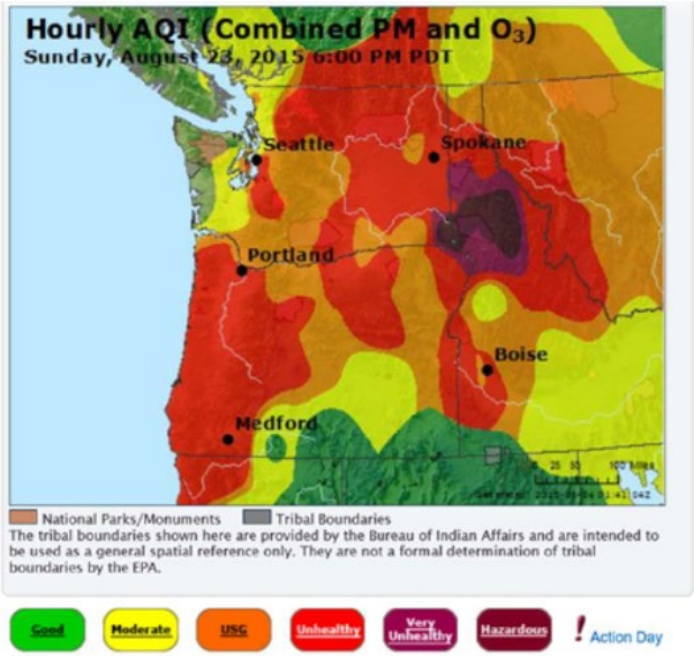


Figure 84 - EPA's AQI map for August 23, 2015 shows widespread degraded air quality conditions across most of the Pacific Northwest

6.3.2 Wildfire Smoke Location and Extent

All of Multnomah County is subject to wildfire smoke. Wind direction and other atmospheric effects are the main drivers in determining when and where wildfire smoke will spread. Risks from wildfire smoke are driven less by geographic factors, and more by exposure, lifestage, and certain situations experienced by populations[89].

Wildfire smoke plumes are getting taller and can spread father. Research indicates that larger fires in the western United States can generate taller plumes of smoke that can expand more easily and transport a greater volume of PM2.5 across wider distances. This long-range transport of hazardous air can pose health hazards to larger numbers of people, going from a more localized issue to a regional or continental problem.[90]

[87] 2017 Pacific Northwest Fire Narrative, USDA Forest Service and DOI Bureau of Land Management, 2017
[88] Air Quality Summary Report for the 2015 Pacific Northwest Fire Year, USDA Forest Service, 2016
[89] Which Populations Experience Greater Risk of Adverse Health Effects Resulting From Wildfire Smoke Exposure?, US Environmental Protection Agency. 2023
[90] Wildfire plumes in the Western US are reaching greater heights and injective more aerosols aloft as wildfire activity intensifies, *Scientific Reports*, Wilmot, T.Y., Mallia, D.V., Hallar, A.G. *et al.* July 20, 2022

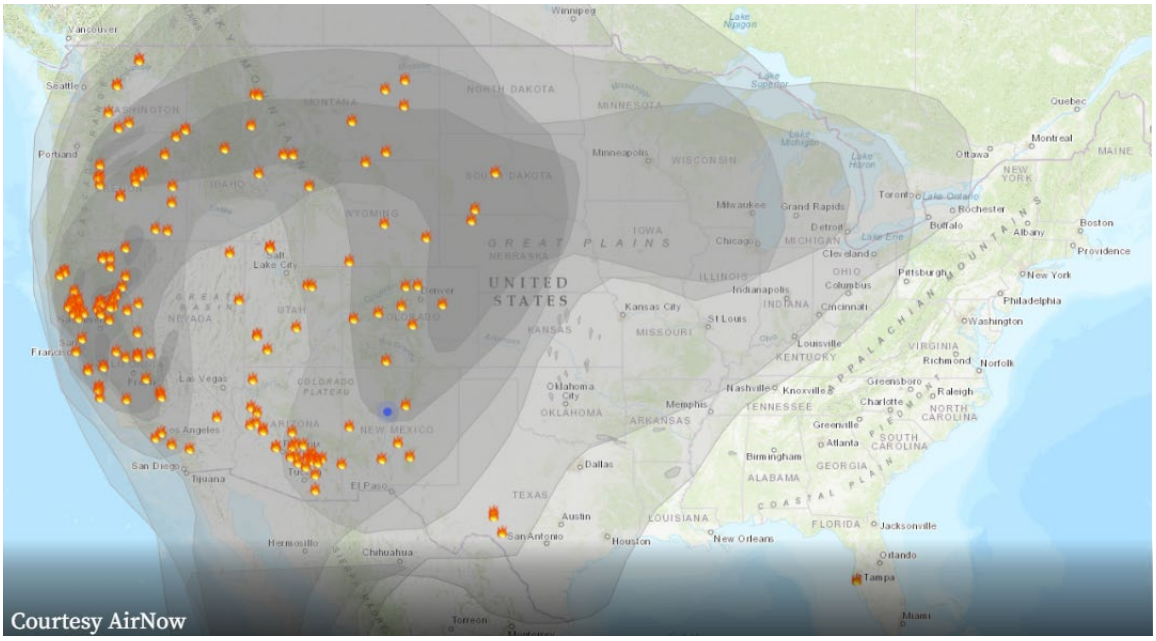


Figure 85 - Wildfires burning in the western U.S. in August 2020, and the resulting smoke plume shaded in gray, from AirNow.gov.

For example, during the local Eagle Creek Fire in 2017, AQI measurements in the county peaked at 157 (unhealthy/red). Those readings were much lower than air quality measurements reached in 2020 when smoke drifted into the county from fires burning across the Pacific Northwest. That year, AQI values in Multnomah County broke 500 (hazardous/maroon) and residents were exposed to the most hazardous air quality in the world.

While smoke can blanket the county with toxic particulate matter, not everyone is impacted equally. Section **6.3.4 on Wildfire Smoke Vulnerability** describes different health outcomes associated with length of exposure and how some populations are more sensitive to fine particulate matter found in smoky air.

6.3.3 Wildfire Smoke Probability

Multnomah County is susceptible to smoke from wildfires across the Pacific Northwest and has a greater likelihood of exposure to smoke than to wildfire. As the fire season is getting longer and smoke plumes are traveling further, the county is experiencing unhealthy air quality more frequently.

Between 1985 and 2014, Oregon DEQ measured zero days in the county with an AQI value that is unhealthy for sensitive populations or worse from wildfire smoke. From 2015 to 2021 the county experienced 23 days of unhealthy or worse air, an average of 3.3 days per year. All of the very unhealthy and hazardous days occurred in 2020.[91]

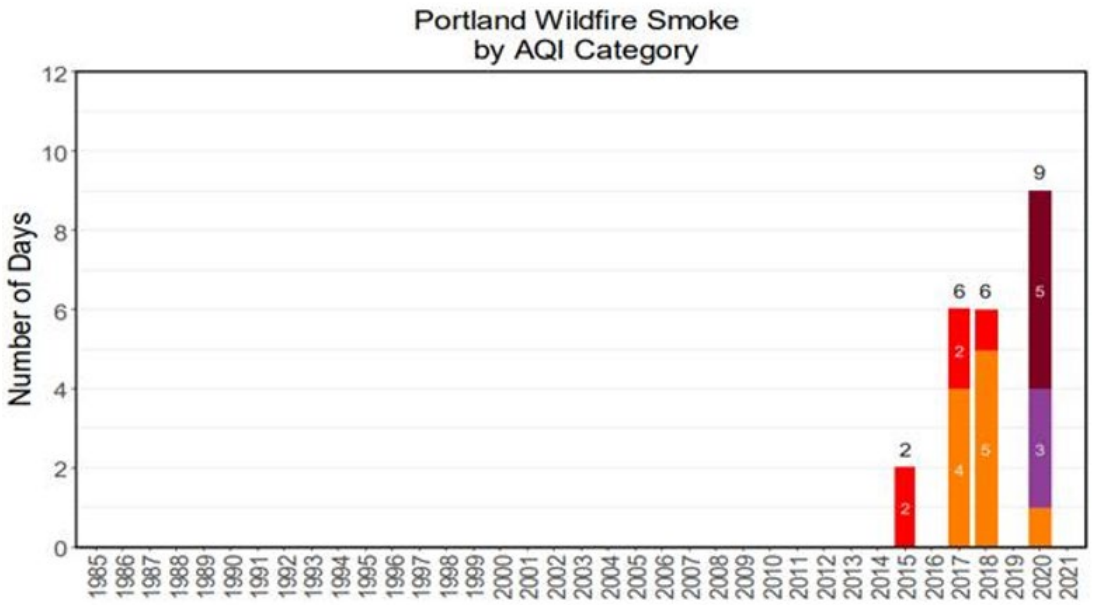


Figure 86 - *After 30 years with zero poor air quality measurements, Portland experienced five unhealthy, three very unhealthy, and five hazardous days from wildfire smoke between 2015 and 2021. Reported by the Oregon DEQ in the 2022 the Wildfire Smoke Trends Report.*

A longer fire season coupled with taller and wider reaching smoke plumes are resulting in more days per year with unhealthy AQI values or greater. If these trends continue, Oregon can expect to see an increase in the number of days with unhealthy air. This will include areas which have not typically seen significant smoke impacts, including the Willamette Valley and the Portland Metro area.

6.3.4 Wildfire Smoke Vulnerability

When smoke levels are high, even healthy people may have symptoms or health problems.[92] However, some people are at greater risk. The US Environmental Protection Agency has noted the ways that length of exposure to wildfire smoke and the sensitivity of specific lifestages and populations can lead to different health outcomes.[93]

[91] Wildfire Smoke Trends and the Air Quality Index, Oregon Department of Environmental Quality, May 2023
[92] Wildfire Smoke and Your Health, Oregon Health Authority.

[93] Health Effects Attributed to Wildfire Smoke, US Environmental Protection Agency. 2022

Length of exposure

Short-term exposure over a few days can result in:

- Irritation of the eyes and respiratory tract
- Respiratory symptoms
  - Coughing
  - Phlegm
  - Wheezing
  - Difficulty breathing
- Respiratory effects
  - Bronchitis
  - Reduced lung function
  - Increased risk of asthma exacerbation and aggravation of other lung diseases
  - Increased risk of emergency room visits and hospital admissions
- Cardiovascular effects
  - Heart failure
  - Heart attack
  - Stroke
  - Increased risk of emergency room visits and hospital admissions
  - Increased risk of premature death

Information on continuous exposures over multiple days or a few weeks is only available from studies of wildland fire fighters. Those studies indicated that continuous occupational wildland fire smoke exposure may have a cumulative effect on lung function.[94]

Populations with greater health risks

The EPA identifies certain lifestages, health conditions and situations that can lead to greater risk of complications from smoke exposure. The AQI refers to these groups as “sensitive populations”. These include:

- asthma and other respiratory diseases
- pre-existing heart disease
- childhood
- pregnancy
- older adulthood
- economic hardship
- working outdoors

The CWPP Smoke Subcommittee added *not having shelter* to the list of sensitive populations. Like outdoor workers, people without shelter may experience prolonged exposure to high

There's a lot of inequity in the way people encounter smoke. Vulnerable groups are often least able to control their own smoke exposure, underscoring the importance of community-level interventions

- Center for Wildfire Smoke Research and Practice, University of Oregon

[94] Which Populations Experience Greater Risks of Adverse Health Effects Resulting From Wildfire Smoke Exposure, US Environmental Protection Agency. 2022.

concentrations of unhealthy air during smoke events.

Listed below are the rationale and potential health effects for each population at greater risk, each as described by the EPA. Demographic information and statistics for each group is then described under *In Multnomah County*. This includes information about disparate impact among specific populations.

Asthma and other respiratory diseases

Rationale: Underlying respiratory diseases result in compromised health status that can result in the triggering of severe respiratory responses by environmental irritants, such as wildfire smoke.

Potential health effects: Breathing difficulties (e.g., coughing, wheezing, and chest tightness) and exacerbations of chronic lung diseases (e.g., asthma and COPD), leading to increased medication usage, emergency department visits, and hospital admissions.

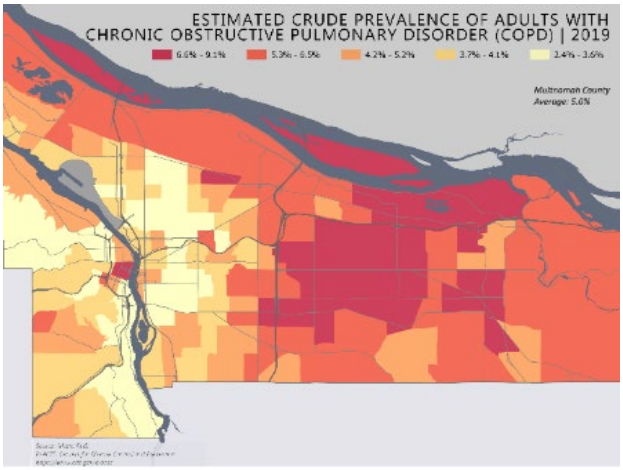


Figure 88 - Estimated number of adults in Multnomah County who report having COPD, based on 2019 CDC PLACES data.

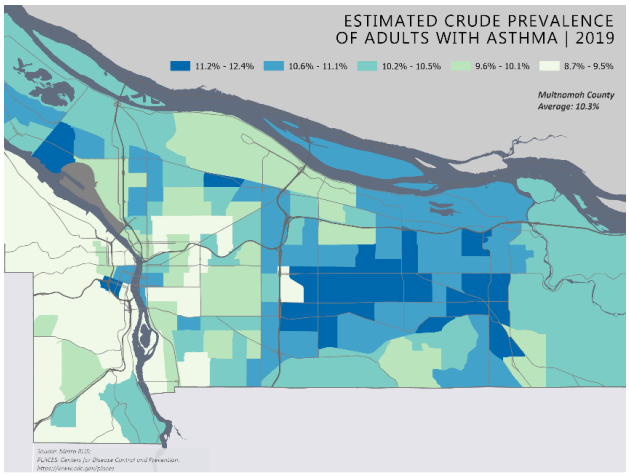


Figure 87 - Estimated number of adults in Multnomah County who report an asthma diagnosis, based on 2019 CDC PLACES data.

In Multnomah County: One in 10 adults report an asthma diagnosis, making it one of the most prevalent chronic illnesses in the county.[95] As shown in Figure 8, Parts of East County, pockets of North Portland, and an area in Southwest Portland around Interstate 405 have a higher prevalence of adults with asthma.

Nationwide, asthma disproportionately affects people of color. More specifically, Black, Hispanic and American Indian/Alaska Native people have the highest rates of asthma, and deaths and hospitalizations caused by asthma. [96]

[95] The Board of Commissioners briefed on the Public Health review of health risks posed by gas stoves, Multnomah County, November 10, 2022

[96] Asthma Disparities in America, Asthma and Allergy Foundation of America. 2023

Pre-existing heart disease

Rationale: Underlying circulatory diseases result in compromised health status that can result in the triggering of severe cardiovascular events by environmental irritants, such as wildfire smoke.
Potential health effects: Triggering of ischemic events, such as angina pectoris, heart attacks, and stroke; worsening of heart failure; or abnormal heart rhythms could lead to emergency department visits, hospital admissions, and even death.

In Multnomah County: Cancer and heart disease are the leading causes of death for Multnomah County residents.[97] Cardiovascular disease is diagnosed at higher rates in Black and African communities. In 2018, Black residents in Multnomah County died of heart disease at a rate more than 25% higher than white residents.[98]

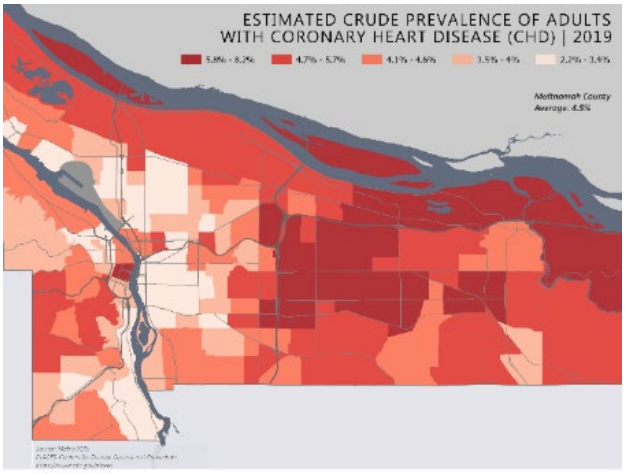


Figure 89 - Estimated number of adults in Multnomah County who report having heart disease, based on 2019 CDC PLACES data.

Childhood

Rationale: Children's lungs are still developing, and there is a greater likelihood of increased exposure to wildfire smoke resulting from more time spent outdoors, engagement in more vigorous activity, and inhalation of more air per pound of body weight compared to adults.

Potential health effects: Coughing, wheezing, difficulty breathing, chest tightness, decreased lung function in all children. In children with asthma, worsening of asthma symptoms or heightened risk of asthma attacks may occur.

In Multnomah County: Children make up 18% of residents.[99] In recent years, the share of children in the county has been decreasing. Between 2010 and 2021, the 0 to 4 age group declined the most, dropping by 18.8%.[100]

Pregnancy

Rationale: Pregnancy-related physiologic changes (e.g., increased breathing rates) may increase vulnerability to environmental exposures, such as wildfire smoke. In addition, during critical development periods, the fetus may experience increased vulnerability to these exposures.
Potential health effects: Limited evidence shows air pollution-related effects on pregnant people and the developing fetus, including low birth weight and preterm birth.

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[97] Heart Disease, Multnomah County. 2023.
[98] County mirrors nation in leading causes of death, and its glaring disparities, Multnomah County, November 14, 2018. s
[99] US Census. 2022
[100] Our Changing Population: Multnomah County, Oregon, USA Facts

In Multnomah County: The rate of Black infant mortality in Multnomah County is higher than any other race, and more than twice as high as non-Latinx white infants. Additionally, black infants in the county are born with a low birthweight at a rate of 75% higher and are born prematurely at a rate of 47% higher than non-Latinx white babies.[101] Despite a nationwide decline in low birth weight and infant mortality, racial disparities have persisted.[102]

Older adulthood

Rationale: Higher prevalence of pre-existing lung and heart disease and decline of physiologic process, such as defense mechanisms.
Potential health effects: Exacerbation of heart and lung diseases can lead to emergency department visits, hospital admissions, and even death.

In Multnomah County[103]: Older adults are among the fastest-growing populations in the county, and represent 18% of the county's population. One in every five older adults in the county identifies as a person of color (20%). People of Color are disproportionately represented among those 60+ living in poverty, particularly Black and Latino older adults.

[101] Healthy Birth Initiative supports healthier pregnancies and births for Black families, Providence Health and Services, December 16, 2020
[102] Infant Mortality and African Americans, US Department of Health and Human Services Office of Minority Health
[103] 2021-2025 Area Plan Year 1 Update ,Multnomah County Aging, Disability and Veterans Services Division. 2022

Economic hardship

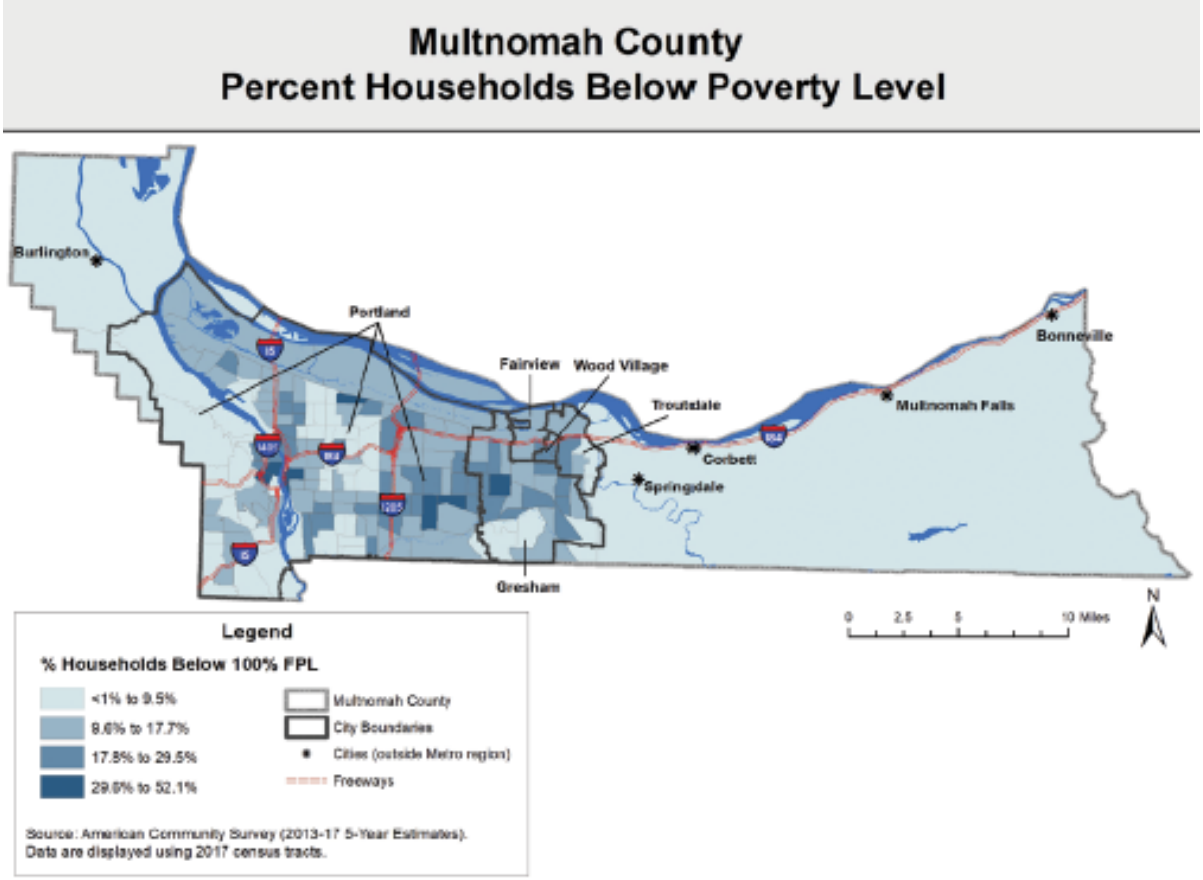

Figure 90 - Percent households below the federal poverty level, from the 2019 Poverty in Multnomah County Report.

Rationale: Less access to health care, could lead to higher likelihood of untreated or insufficient treatment of underlying health conditions (e.g., asthma, diabetes), and greater exposure to wildfire smoke resulting from less access to measures to reduce exposure (e.g., air conditioning).

Potential health effects: Greater exposure to wildfire smoke resulting from less access to measures to reduce exposure, along with higher likelihood of untreated or insufficiently treated health conditions could lead to increased risks of experiencing the health effects described above.

In Multnomah County[104]:

34% of households are unable to meet their basic needs. The highest poverty areas in the county are east of Interstate 205, Gresham, Northeast Portland, and near downtown. Poverty

[104] Poverty in Multnomah County Report, Multnomah County, 2019

rates for African Americans, Native Americans, and Latinxs are more than twice the rate as white residents.

Working outdoors or lacking shelter

Rationale: Extended periods of time exposed to high concentrations of wildfire smoke.
Potential health effects: Greater exposure to wildfire smoke can lead to increased risks of experiencing the range of health effects described above.

In Multnomah County: Industries with outdoor workers who could experience heightened exposure to high concentrations of wildfire smoke include agricultural workers, landscapers, utility workers, construction workers, and park personnel.[105] Additionally, people working outdoors in airport, marine, transportation, utility, public safety, emergency services and public transit sectors may have greater exposure to high concentrations of wildfire smoke in the county.

An estimated 3,057 people are experiencing unsheltered homelessness in Multnomah County This includes people living outside, in vehicles, in tents, and in other places not meant for human habitation. Between 2019 and 2022 the share BIPOC communities experiencing unsheltered homeless rose (from 36% to 38%), while the share of Non-Hispanic White people dropped (from 59% to 52.8%). The largest increase in share is among the Black or African American community. Females represent 60% of all unsheltered people in the county. Families with at least one adult and one child under 18 years old represent 15% of the unsheltered population. 22.5% reported having a chronic health condition.[106]

[105] Outdoor Workers Exposed to Wildfire Smoke, Centers for Disease Control. 2021.
[106] 2022 Point in Time County, Joint Office of Homeless Services. 2022 Point-in-Time Count.

6.4 Wildfire Smoke Mitigation

6.4.1 Recommended Household, Workplace, and Community-Level Mitigation Strategies

The *Wildfire Smoke Guide for Public Health Officials, 2021*, identifies strategies to reduce exposure and risks to wildfire smoke. The best thing to do is to limit exposure to smoke. Staying indoors when the air quality is at unhealthy levels is usually the best way to seek refuge from wildfire smoke. These priority risk reduction strategies can be implemented at the household, workplace and community level, along with information on how to access resources locally.

- Stay indoors
- Limit physical activity
- Reduce indoor air pollution sources
- Use air conditioners and air filters or cleaners
- Provide cleaner air spaces
- Use respiratory protection

6.4.2 Organizational Mitigation Actions

Mitigation priorities and actions identified in this plan are based on recommendations from the:

- EPA's *Wildfire Smoke Guide for Public Health Officials, Revision 2019,*
- Multnomah County's *Wildfire Threat and Smoke Intrusion Incident After Action Report* (2020)
- Regional Disaster Preparedness Organization's *Extreme Heat and Wildfire Smoke: Reducing Risks to Public Health in the Portland Region Report* (2021)
- Public surveys described in **6.2.2 Surveys: Understanding Public Preparedness**
- CWPP Smoke Subcommittee's wildfire smoke mitigation action workshops
- Interviews with stakeholders in 2021 and 2022.

Six overarching priorities for action items emerged during the planning process and were confirmed by the CWPP Smoke Subcommittee.

1. Preparedness- Actions taken before a wildfire smoke incident to help reduce impacts of smoke.
2. Community partnership- Actions that involve engaging with and getting feedback from the community or organizations that serve the community.
3. Community outreach- Actions in which information or resources are provided to the community.
4. Caring for the most vulnerable- Actions that specifically help to mitigate impacts of wildfire smoke on the populations with the highest risk of health effects.

5. Safety/Shelters- Actions specifically related to emergency shelter spaces and life safety resources and procedures.
6. Collaboration and coordination- Actions involving multiple agencies or organizations working together and leveraging existing efforts to increase efficiency and resilience.

The mitigation actions are listed in two tables below. The first table has seventeen actions with an identified lead agency or agencies. Each action includes a description, lead, partners and identifies which mitigation priorities are addressed by that strategy. A lead is one or more organization most likely to coordinate that action, and the actions are grouped by lead agencies. Supporting partners are listed alphabetically – those organizations are a selection of partners that may have roles in the implementation of actions. Ultimately, implementation will be driven by the lead agency, and the list of supporting partners may add or subtract partners as projects are developed.

The second table lists actions that were identified as priorities by the Wildfire Smoke subcommittee, but do not yet have leads identified. These actions are considered to of equal importance, and are maintained in to ensure they remain available for future work planning, where a coordinating agency can be eventually identified.

For actions in both tables, it is important to note that these actions are not regulatory requirements, but a representation of a roadmap for reducing wildfire smoke risk over time. Changes in priorities, resources and research may alter these actions over time, and new partnerships may develop that will change the approach or coordination point for actions. Future planning efforts will continue to track actions for progress or to note how they may shift roles, responsibilities or goals over time. A description of specific steps to ensure these actions will continue to be monitored and improved is located in Chapter 4 – Plan Implementation and Maintenance.

Action No.	Mitigation Action	Lead Agency	Supporting Partners	Priorities					
				Preparedness	Community Partnership	Outreach	Care for Most Vulnerable	Safety & Shelter	Collaboration & Coordination
1	Update Multnomah County's Wildfire Smoke Standard Operating Procedure (SOP) annually to align with new and updated plans, policies, procedures, rules, and/or lessons learned. Specifically ensure procedures related to populations with greater health risks to wildfire smoke (as identified in Subsection 6.3.4) are reviewed and updated as appropriate. Coordinate with all County departments and partners on Wildfire Smoke SOP roles and responsibilities to ensure the updated SOP is actionable.	Multnomah County Emergency Management	Partners listed in the Wildfire Smoke SOP Partners that serve populations at highest risk identified in this chapter. Wildfire Smoke Subcommittee members	●			●	●	●
2	Identify permanent warehouse locations for the storage of smoke mitigation and safety supplies for county functions and the community.	Multnomah County Emergency Management	Multnomah County Department of County Assets, Facilities Portland Bureau of Emergency Management	●				●	●
3	Add wildfire smoke to Multnomah County's annual summer preparedness coordination meeting to ensure local situational awareness, coordination and preparedness with countywide, regional, state and federal partners.	Multnomah County Emergency Management	Partners listed in the Wildfire Smoke SOP	●					●
4	Add wildfire smoke topics to the agenda for wildfire operational coordination calls.	Multnomah County Emergency Management	Partners listed in the Wildfire Smoke SOP					●	●
5	Host operational coordination calls for events when smoke is the only wildfire-related county impact.	Multnomah County Emergency Management	Partners listed in the Wildfire Smoke SOP					●	●

Action No.	Mitigation Action	Lead Agency	Supporting Partners	Priorities					
				Preparedness	Community Partnership	Outreach	Care for Most Vulnerable	Safety & Shelter	Collaboration & Coordination
6	Add Multnomah County's *Wildfire Smoke Exposure Control and Protection* training to the training program for non-county shelter personnel before their first shift of the year.	Multnomah County Emergency Management	Portland Bureau of Emergency Management Multnomah County Department of Human Services	●	●			●	
7	Engage partners who serve populations most sensitive to wildfire smoke in the annual review and update of the Wildfire Smoke Section of the CWPP.	Multnomah County Emergency Management	Partners listed in the Wildfire Smoke SOP Public, private, and community groups that serve and represent populations most sensitive to wildfire smoke WF Smoke Subcommittee members	●	●	●	●	●	●
8	Develop a countywide operational Wildfire Smoke Plan. Align the new plan with existing county smoke plans and SOPs.	Multnomah County Emergency Management	Multnomah County Department of Assets, Facilities Multnomah County Department of County Human Resources Multnomah County Department of County Management, Risk Management Multnomah County cities	●			●	●	●

Action No.	Mitigation Action	Lead Agency	Supporting Partners	Priorities					
				Preparedness	Community Partnership	Outreach	Care for Most Vulnerable	Safety & Shelter	Collaboration & Coordination
9	Review current capabilities and coordination processes for transportation assistance to/from cleaner air spaces. Identify unmet needs and opportunities to increase efficiency. Identify funding sources, vehicles, drivers, and other logistical needs to further address unmet transportation needs and enhance transportation coordination.	Multnomah County Emergency Management	211 Info Multnomah County Department of County Assets, Fleet Multnomah County Department of Human Services Portland Bureau of Emergency Management Portland Office of Management and Finance, Division of Asset Management, City Fleet TriMet			●	●	●	●
10	Synthesize available best practice literature on wildfire smoke mitigation and preparedness and update annually for partners. Post information on the county's smoke and wildfire websites.	Multnomah County Health Department, Environmental Health	Multnomah County Communications Office Multnomah County Office of Sustainability	●		●	●	●	

Action No.	Mitigation Action	Lead Agency	Supporting Partners	Priorities					
				Preparedness	Community Partnership	Outreach	Care for Most Vulnerable	Safety & Shelter	Collaboration & Coordination
11	Use the Action 10 synthesis to inform an outreach campaign on protective measures for various housing types. Target outreach to populations most sensitive to wildfire smoke (as identified in Subsection 6.3.4), and in the language of that community. Review survey findings (as identified in Subsection 6.2.2) when developing outreach strategies.	Multnomah County Health Department, Environmental Health with Multnomah County Communications Office	Affordable housing organizations Gresham Communications Office Multnomah County Department of Human Services Portland Bureau of Emergency Management Portland Housing Bureau Portland Office of Community and Civic Life	●	●	●	●	●	
12	Continue to build on existing public engagement campaigns that align with local, regional and national readiness initiatives such as *Smoke Ready Week,* to encourage the community to better prepare for the health risks associated with wildfire smoke. Utilize survey findings (as identified in Subsection 6.2.2) to inform public engagement strategies.	Multnomah County Health Department, Environmental Health with Multnomah County Communications Office	Gresham Communications Office Multnomah County Emergency Management Northwest Air Quality Communicators Group Portland Bureau of Emergency Management Portland Office of Community and Civic Life	●		●		●	

Action No.	Mitigation Action	Lead Agency	Supporting Partners	Priorities					
				Preparedness	Community Partnership	Outreach	Care for Most Vulnerable	Safety & Shelter	Collaboration & Coordination
13	Collaborate across health agencies before wildfire smoke events, to identify funding sources and purchase air filters and air cleaners to meet best practice thresholds for cleaner air spaces. Coordinate this action through the lead identified in Action 23.	Multnomah County Health Department, Environmental Health	Multnomah County Office of Sustainability	●					●
14	Build off Actions 15 and 24 to develop a distribution plan that targets populations most sensitive to wildfire smoke (as identified in Subsection 6.3.4). Utilize survey findings in (as identified in Subsection 6.2.2) to inform public engagement strategies.	Multnomah County Health Department, Environmental Health	Affordable housing organizations Multnomah County Department of Human Services Portland Bureau of Emergency Management School districts Community Organizations Active in Disasters	●	●	●	●	●	●
15	Define roles and responsibilities regarding the delivery of guidance and thresholds for the cancellation of outdoor events and activities, and work with MCEM to add to the Wildfire Smoke SOP.	Multnomah County Health Department, Public Health, Environmental Health and Health Officer	Multnomah County Emergency Management Portland Bureau of Emergency Management Portland Bureau of Transportation Portland Parks and Recreation Portland Police Bureau	●				●	●

Action No.	Mitigation Action	Lead Agency	Supporting Partners	Priorities					
				Preparedness	Community Partnership	Outreach	Care for Most Vulnerable	Safety & Shelter	Collaboration & Coordination
16	Coordinate with the Emergency Operations Center – Emergency Support Function (ESF) 6 (Mass Care and Shelter) and Emergency Support Function (ESF) 8 (Health and Medical) - to conduct targeted welfare calls to clients during wildfire smoke events.	Multnomah County Department of Human Services Multnomah County Health Department, Public Health and Integrated Clinical Services	Multnomah County Health Department, Environmental Health	●		●	●	●	
17	Purchase air filtration and air cleaner supplies and equipment necessary to meet best air filtration practices for each location designated as a cleaner air space.	Each jurisdiction would identify a lead as applicable	Multnomah County Department of County Assets, Facilities Multnomah County Department of County Management, Risk Management Multnomah County Department of Human Services Multnomah County Emergency Management Portland Bureau of Emergency Management Portland Parks and Recreation	●				●	

Mitigation Actions Without Identified Leads

Action No.	Mitigation Action	Potential Lead or Supporting Partners	Priorities					
			Preparedness	Community Partnership	Outreach	Care for Most Vulnerable	Safety & Shelter	Collaboration & Coordination
18	Establish prioritization criteria for cleaner air spaces. Include the following criteria: 1) ability to implement indoor air filtration best practices, 2) daytime shelter capacity 3) nighttime shelter capacity and 4) other criteria as determined by subject matter experts.	Multnomah County Department of County Assets, Facilities Multnomah County Department of County Management, Risk Management Multnomah County Department of Human Services Multnomah County Emergency Management Multnomah County Health Department, Environmental Health Multnomah County Health Department, Public Health Portland Bureau of Emergency Management Portland Parks and Recreation	●			●	●	
19	Create a county map to illustrate the location, spatial distribution and characteristics of cleaner air spaces as determined in Action 18	211 Info Multnomah County Communications Office Multnomah County Department of Human Services Multnomah County Emergency Management Portland Bureau of Emergency Management Multnomah County, Department of County Assets, IT	●			●	●	

Action No.	Mitigation Action	Potential Lead or Supporting Partners	Priorities					
			Preparedness	Community Partnership	Outreach	Care for Most Vulnerable	Safety & Shelter	Collaboration & Coordination
20	Share the results of the Action 10 synthesis and Action 11 outreach campaign with policy-makers and housing providers.	Affordable housing organizations Multnomah County Health Department, Environmental Health Multnomah County Office of Sustainability Portland Bureau of Emergency Management Portland Housing Bureau	●			●		●
21	Build off the Multnomah County Preparedness Advocates model to develop a train-the-trainer model to create and conduct multi-lingual training and outreach to county populations most sensitive to wildfire smoke (as identified in Subsection 6.3.4). Outreach includes: • critical wildfire smoke health and safety information • preferred filtration supplies • clear instructions on how to filter air at home • how to find a cleaner air space • where to find air and smoke forecasts • how to stay safe indoors • how to stay safe outdoors	Affordable housing organizations Community Based Organizations Gresham Community and Neighborhood Engagement Multnomah County Department of Human Services Multnomah County Health Department, Community Partnerships and Capacity Building Multnomah County Health Department, Environmental Health Neighborhood Associations Neighborhood Emergency Teams Portland Office of Neighborhood Involvement School Districts	●	●	●	●	●	●

Action No.	Mitigation Action	Potential Lead or Supporting Partners	Priorities					
			Preparedness	Community Partnership	Outreach	Care for Most Vulnerable	Safety & Shelter	Collaboration & Coordination
22	Echo OHA and OSHA messaging for people who are likely to be outdoors during wildfire smoke events, including outdoor workers, people who are unsheltered, and others who cannot access a cleaner air space.	Multnomah County and City of Portland Joint office of Homeless Services Multnomah County Health Department, Environmental Health Organizations that serve people who are unsheltered	●			●	●	
23	Identify an entity to lead the coordination of procurement and distribution of air filtration and air cleaning supplies for the community prior to smoke events. Goals include reducing duplication and increasing efficiency and effectiveness of distribution efforts.	Multnomah County Department of Human Services Multnomah County Health Department, Environmental Health Multnomah County Office of Sustainability Portland Office of Emergency Management COAD organizations	●					●
24	Conduct outreach to community organizations on how to access clean air resources 1) before a wildfire smoke event, through the lead agency identified in Action 23, and 2) through an established resource request process during a wildfire smoke event.	Affordable housing organizations Community Organizations Active in Disasters Multnomah County Emergency Management Portland Bureau of Emergency Management Portland Housing Bureau	●	●	●	●		

Action No.	Mitigation Action	Potential Lead or Supporting Partners	Priorities					
			Preparedness	Community Partnership	Outreach	Care for Most Vulnerable	Safety & Shelter	Collaboration & Coordination
25	Work with partners to identify which air filtration and air cleaner supplies and equipment are needed to meet cleaner air best practices for shelters, and add those items to the shelter inventory list.	Multnomah County Department of County Assets, Facilities Multnomah County Department of County Management, Risk Management Multnomah County Department of Human Services Multnomah County Emergency Management Multnomah County Health Department, Environmental Health Portland Bureau of Emergency Management Portland Parks & Recreation	●				●	

ANNEX A – 2011 Multnomah County CWPP Actions

Mitigation actions defined in the 2011 plan are collected here, to provide a reference for plan users to evaluate how priorities have changed over the last 12 years and how advancement in reducing future wildfire risk has progressed.

The actions included in this Annex are the countywide objectives included with each topic chapter in the 2011 plan. The 2011 plan also had action plans for Communities at Risk, but those have not been included here for the sake of brevity.

2011 Multnomah County CWPP Actions

- **Risk Assessment**

Action No.	Action	Lead
1	Improve consistency and relevancy of “wildland” fires ignition data.	Local Fire Agencies, ODF
2	Develop a series of recommendations for tracking structural vulnerability data throughout the County and revise the Wildfire Hazard Analysis and the Wildland Urban Interface to reflect new information.	Local Fire Agencies, ODF
3	Integrate large historical fires into the wildfire hazard analysis.	ODF, USFS, Columbia River National Scenic Area
4	Work with local fire agencies to develop more detailed risk assessments using local and community-derived data	Local Fire Agencies, ODF

- **Fuels Reduction and Biomass Utilization**

Action No.	Action	Lead
1	Develop and maintain an inventory of potential fuels reduction projects in high-risk areas, fuel reduction prescriptions, and a list of prioritized future projects.	Wildfire Technical Committee
2	Work directly with communities targeted for fuels reduction treatments to gain support for the project prior to implementation.	Local Fire Agencies
3	Integrate defensible space practices into Naturescaping programming and other vegetation management programs targeted at homeowners to ensure consistent and complimentary messaging in high-risk areas of the Wildland Urban Interface.	East and West Multnomah Soil and Water Conservation Districts
4	Align fuels reduction efforts with invasive weed management programs.	Wildfire Technical Committee, Four-County

Action No.	Action	Lead
		Cooperative Weed Management Area
5	Develop a "Prescription team" to develop a landscape Desired Future Condition (DFC) and recommendation for achieving the DFC for high priority fuels reduction projects that meet multiple objectives (wildfire, maintaining shrub layer for habitat, etc.).	Wildfire Technical Committee
6	Develop and monitor experimental projects that utilize innovative strategies to achieve ecologically healthy, visually appealing landscapes that are resilient to wildfires.	Wildfire Technical Committee
7	Obtain funding to implement fuels reduction projects.	Wildfire Technical Committee
8	Develop cost sharing opportunities designed to decrease the financial burden on the property owner.	ODF, Multnomah County
9	Develop an emergency communications plan for Metro Parks, Portland and other Cities' Parks, and Portland Water Bureau staff, to ensure that employees can communicate during a wildfire event.	Multnomah County Emergency Management, Portland Fire & Rescue
10	Inventory and map evacuation routes in Metro Parks, Portland and other Cities' Parks, and Natural Areas and communicate this information to adjacent communities and emergency response professionals.	Multnomah County Emergency Management
11	Develop a wildfire fuels assessment and initial response training and safety program for Parks staff.	Portland Fire & Rescue
12	Develop a supply/demand information sheet that aligns potential biomass utilization opportunities for specific types of extracted vegetation.	ODF
13	Utilize strategies that add value to extracted vegetation and enhance economic development (consider timing and timber market prices).	Wildfire Technical Committee

- **Emergency Operations**

Action No.	Action	Lead
1	Identify the standard to which basic wildland firefighters will be trained. Work with partners to train all incident personnel for basic wildland firefighting and the Incident Command System (e.g. firefighters, park technicians, etc.).	Portland Fire & Rescue Training Division
2	Identify and address any shortages in wildland training and qualifications in line leadership positions such as Operations Section Chief, DIVS and TFLD.	Multnomah County Fire Defense Board
3	Examine mutual aid agreements (and/or amend as needed via MOU) for protocol regarding resource sharing and potential cost reimbursement for Extended Attack (after first 12 hours). Consider cooperative fire protection agreements between the Forest Service and local fire departments that do not already exist. Develop and integrate a process for rapid equipment sharing.	Multnomah County Fire Defense Board
4	Provide clear direction for Incident Commanders regarding when and how to ask for additional resources and/or mutual aid from other jurisdictions.	Multnomah County Fire Defense Board
5	Conduct a preseason meeting with neighboring jurisdictions to discuss upcoming wildfire season, staffing levels, communications plan, resources, and other important information including finances, roles and responsibilities.	ODF, Multnomah County Fire Defense Board
6	Conduct annual tri-county (Washington, Clackamas and Multnomah) CWPP meetings.	Multnomah County Emergency Management, Portland Office of Emergency Management, ODF
7	Inventory wildfire fighting equipment (dozers, tenders, radios) in Multnomah County (and mutual aid agencies) and document the procurement process. Once developed, coordinate resource sharing with Clackamas, Washington, Columbia, and Hood River Counties.	Multnomah County Emergency Management
8	Utilize MCEM's cache of field programmable VHF radios and ensure that they have current Mt. Hood National Forest, Columbia River Gorge National Scenic Area, and ODF frequencies.	Multnomah County Emergency Management
9	Develop a wildfire communications plan that considers interoperability and outlines protocol for radio communication during an event. Make sure frequency use agreements that don't exist already	Multnomah County Emergency Management

Action No.	Action	Lead
	are in place Test Communications Plan at different levels to clarify command structure and ensure firefighter safety.	
10	Establish an agreed upon fire danger rating system and develop agency protocols. Consider adopting the "National Fire Danger Rating System" (NFDRS) and install signs at key points in the County. Communicate the daily fire danger rating to all field staff throughout the fire season.	Multnomah County Fire Defense Board
11	Inventory potential staging areas, Incident Command Posts and Incident Bases (fire camp) locations throughout the County and document process and contacts for access. Consider developing an annual mobilization plan with updated contact information.	Multnomah County Emergency Management
12	Work with Metro to develop a wildland training and accreditation program for technical staff. Utilize Metro as a partner in equipment sharing program.	Metro
13	Obtain funding to secure a cache of electronic mapping devices (iPhones, etc) integrated with GPS.	Multnomah County Emergency Management
14	Explore possibility of retrofitting those existing Mobile Command Units that lack the ability to handle large-scale wildfire and ensure agreements are in place to share those resources.	Multnomah County Fire Defense Board
15	Consider pre-positioning Type 3 logistical incident support trailers throughout the county during fire season.	Multnomah County Fire Defense Board

- **Wildfire Prevention and Community Involvement**

Action No.	Action	Lead
1	Develop consistent standards fir defensible space and fire-resistant building materials in Multnomah County.	Multnomah County Fire Defense Board
2	Communicate standards for defensible space and fire-resistant building materials to primary decision makers and stakeholders in Multnomah County.	Local Fire Agencies

Action No.	Action	Lead
3	Encourage the Multnomah County Fire Defense Board to form a Fire Prevention Cooperative or partner with regional Fire Prevention Co-ops to implement the actions outlined in the CWPP.	Multnomah County Fire Defense Board
4	Identify funding opportunities through grant programs and philanthropic organizations.	Wildfire Technical Committee
5	Implement a model Firewise and ecologically sound landscaping project at Portland Fire & Rescue Station 27 in Forest Park.	Portland Fire & Rescue, Wildfire Technical Committee
6	Encourage Communities at Risk to become certified Firewise Communities.	Local Fire Agencies
7	Work with landowners in highly visible wildfire risk areas to provide temporary and permanent signage: State Parks, Metro, City Parks Departments, landowners.	Wildfire Technical Committee
8	Develop a listing of outreach events that organizations and active citizen groups in Communities at Risk may be planning to identify opportunities to partner for outreach efforts.	ODF
9	Provide presentations to organizations that meet regularly and have high visibility in the community: Neighborhood Associations, Granges, Rotaries, Sierra Club, BARK, etc.	Local Fire Agencies
10	Develop and distribute Wildland Urban Interface information to Communities at Risk.	Local Fire Agencies
11	Utilize active community organizations' social media network to engage residents including electronic newsletters and links on websites.	Local Fire Agencies
12	Promote the use of the 211 telephone information system to inform residents about what actions to take during wildfires and other emergencies.	Local Fire Agencies
13	Encourage and empower local fire districts to conduct community meetings by developing "plug and play" community meeting kits.	ODF
14	Partner with local businesses to build capacity.	Local Fire Agencies
15	Target a broader audience by engaging nontraditional partners such as organizations that hold 'living sustainably' programs as well as the insurance and real estate industry.	Local Fire Agencies
16	Empower community leaders to remain engaged and continue to motivate the community.	Local Fire Agencies
17	Consider implementing a Firewise incentive contest to promote wildfire prevention messaging through television, newspaper and radio.	Local Fire Agencies, ODF

Action No.	Action	Lead
18	Develop an effective outreach campaign to inform and educate homeowners about Oregon's Forestland-Urban-Interface Act (SB 360) when it takes effect in Multnomah County	ODF, Local Fire Agencies

- **Structural Ignitability**

Action No.	Action	Lead
1	Modify the current Multnomah County Land Use Planning & RFPD brochure to reflect the minimum state fire code requirements to offer clarity to the applicant.	Multnomah County Land Use Planning
2	Work with Multnomah County's Building Departments to include the local fire agencies to the list of stakeholders that must sign off before issuance of any building permits and approve prior to building permit final acceptance.	Multnomah County Land Use Planning
3	Continue working with Multnomah County to allow alternative building construction and materials to meet access and fire flow requirements.	Multnomah County Land Use Planning
4	Explore an Access Enforcement Program for the local fire agencies that would address heavy fuels or lack of maintenance that when renders access roads unusable, the RFPD can require improvement.	Multnomah County Fire Defense Board
5	Encourage Multnomah County Land Use Planning to meet individually with local fire agencies to establish relationships and articulate expectations.	Multnomah County Land Use, Multnomah County Transportation
6	Obtain structural ignitability data by conducting structural triage assessment (access, water defensible space, building materials) with BPS units for homes in strategic planning areas.	ODF
7	Work with CWPP partners to engage the Columbia Gorge Commission in discussions about risk of wildfire, and the benefits of fire-resistant building materials and defensible space.	Multnomah County Fire Defense Board
8	Implement road addressing and signage for emergency response and include the length of driveway on the signs.	Multnomah County Fire Defense Board

Action No.	Action	Lead
9	Develop a program to offer no-cost Wildland Urban Interface evaluations for both new development and existing homeowners.	Multnomah County Fire Defense Board
10	Explore adoption of the Wildland Interface Code in the WUI to require primary and secondary fuels reduction and fire resistive building materials.	Multnomah County Fire Defense Board
11	Map all roads, bridges and driveways in the Local Communities at Risk and prioritize homes that have dead ends and cannot support emergency service vehicles (grade, length, vegetation, turn-arounds) for defensible space and fuels reduction projects.	Multnomah County Emergency Management, Multnomah County Fire Defense Board
12	Inventory private bridges, determine whether or not they have had an engineer certification and develop a system to track required 5-year engineer inspections.	Local Fire Agencies

ANNEX B – COLLECTED RESOURCES

Resources are grouped in this annex to collect different sources of information used throughout the plan in one location, as well as contact information for plan participants. This Annex will be reviewed annually to update, add, or remove information and fix broken links. Please contact Multnomah County Emergency Management with any suggested additions.

CWPP Participating Entities

- Bonneville Power Administration, Wildfire Mitigation Planning; 800-282-3713
- Cascade Locks Fire and EMS; 541-374-8510
- Corbett Fire District; 503-809-4372
- East Multnomah Soil and Water Conservation District; 503-222-7645
- Gresham Fire; 503-618-2355
- Home Forward; 503-802-8300
- Joint Office of Homeless Services; 503-988-2525
- Lake Oswego Fire Department; 503-635-0275
- Multnomah County Department of County Human Services; 503-988-3691
- Multnomah County Land Use Planning; 503-988-3043
- Multnomah County Office of Emergency Management; 503-679-3275
- Oregon Department of Forestry; 503-945-7200
- Oregon State Fire Marshal, Wildfire in Oregon; 503-378-3473
- Oregon State Parks; 503-986-0707
- PacifiCorp (Pacific Power) – Wildfire Safety; 1-888-221-7070
- Portland Bureau of Emergency Management (PBEM); 503-823-4375
- Portland Bureau of Environmental Services (BES); 503-823-7740
- Portland Fire & Rescue (PF&R); 503-823-3700
- Portland Parks & Recreation (PP&R); 503-823-2525
- Portland Planning & Sustainability (BPS); 503-823-7700
- Portland General Electric (PGE) – Wildfire Outages and PSPS; 503-228-6322
- Portland State University – Institute for Sustainable Solutions; 503-725-9940
- Portland Water Bureau – About the Bull Run Watershed, 503-823-7770
- Sauvie Island Fire Department; 503-621-1242
- Scappoose Rural Fire Protection District; 503-543-5026
- Tualatin Valley Fire & Rescue (TVF&R); 503-649-8577

Wildfire Education

- Fire Behavior Field Reference Guide, National Wildfire Coordinating Group
- Fire Behavior Training Course, National Wildfire Coordinating Group
- Wildland Fire Behavior, National Park Service

Community Resources

- Air Quality, Metro
- Be Smoke Ready, AirNow.gov

- Columbia River Gorge National Scenic Area Fire Management – US Forest Service
- Community Wildfire Defense Grant Program – US Forest Service
- DEQ Wildfire Response, Oregon Department of Environmental Quality
- Insurance Institute for Business and Home Safety – Wildfire Risk Research
- Multnomah County Smoke and Wildfire
- National Fire Protection Association – Firewise USA
- National Fire Protection Association – Preparing homes for wildfire
- Oregon Building Codes Department – Wildfire hazard mitigation
- Oregon Defensible Space – Oregon State Fire Marshal
- Oregon Department of Land Conservation and Development, Wildfire Adapted Communities
- Oregon Public Utility Commission, Wildfire Mitigation
- Oregon State University Extension Service Fire Program
- Oregon Wildfire Risk Explorer, Oregon Department of Forestry and US Forest Service
- Oregon Wildfire Response and Recovery, Oregon Department of Emergency Management
- Wildfire Adaptation Resource Hub, Fire Adapted Communities
- Wildfire Risk to Communities, US Forest Service

Wildfire and Wildfire Smoke History

- Eagle Creek Fire Response Photos, US Forest Service
- Eagle Creek Fire Story & Data, US Forest Service
- The Almeda Fire: A New Wildfire Era, University of Oregon **(PDF)**
- Vintage Oregon, 1940 West Hills Wildfire (Photos) – The Oregonian

Wildfire and Wildfire Smoke Research

- 2010-2020 Regional Climate and Health Monitoring Report
- A "New Normal" for West-Side Fire – US Forest Service Pacific Northwest Research Station Story Map
- AirNow, US Air Quality Index - Wildfires
- Climate Change Impacts and Risk Analysis, US Environmental Protection Agency
- Oregon Climate Assessments, Oregon Climate Change Research Institute
- Oregon State University Extension Service Wildfire Research Materials
- Pacific Northwest Quantitative Wildfire Risk Assessment: Methods and Results
- West-Side Fire and Climate Adaptation Research Initiative – US Forest Service Pacific Northwest Research Station
- Why Wildfire Smoke is a Health Concern, US Environmental Protection Agency
- Wildfire Smoke Trends and the Air Quality Index, Oregon Department of Environmental Quality **(PDF)**

Wildfire and Wildfire Smoke News and Forecasts

- National Weather Service Fire Weather

- **Northwest Interagency Coordination Center**
- **Oregon Department of Forestry Wildfire News Blog**
- **Oregon Smoke Information Blog** **INFORMACIÓN SOBRE EL HUMO DE OREGON**