

3.6 Wildfire

Multnomah County has escaped the recent large fire occurrences of other western Oregon counties. However, weather, fuels buildup and climatic changes have created conditions conducive for a large fire event (Multnomah County, 2011).

This is especially true in unincorporated areas where residential development is heavily interwoven with forest land, vegetation is essentially continuous, and fire suppression resources are scarce. A relatively small fire in these areas would pose a significant risk to many residents and their homes.

Strong east winds generated in the Columbia River Gorge are a driver of wildfire risk, particularly in October and November, when northwest Oregon is historically at its peak for fire danger (Multnomah County, 2011). High winds during the peak of wildfire season place Troutdale at moderate risk to wildfires.

Landscaping and other vegetation in most parts of urban and suburban communities in the Planning Area are not continuous. Low fuel loads and a break in potential fuel sources reduce the risk to wildfire hazards in these areas. For this reason, communities in Gresham, Fairview and Wood Village have relatively low risk to wildfire.

Climate models predict hotter, drier summers and a decrease in summer precipitation for the Planning Area, which will result in more wildfire events and increased exposure to wildfire smoke.

Level of Risk* to Wildfire Hazards

High

- Unincorporated Multnomah County

Moderate

- Troutdale

Low

- Gresham
- Fairview
- Wood Village

Level of risk is based on the local OEM Hazard Analysis scores determined by each jurisdiction in the Planning Area. See **Appendix C for more information on the methodology and scoring.*

3.6.1 Overview

There is extensive forestland in the Planning Area, both on undeveloped land within the National Forest and on land adjacent to developing areas. All are subject to wildfire. The level of wildfire risk depends on the following factors.

- **Vegetative Fuel Load:** The age of timber stands can be a factor in whether a non-threatening ground fire will spread to the canopy and become a dangerous crown fire. Clearings and fuel breaks will disrupt a slow moving wildfire, enabling successful suppression. Large expanses of fallow fields or non-annual cash crops provide areas of continuous vegetation.
- **Weather:** High temperatures, low humidity and high winds greatly accelerate the spread of a wildland fire and make containment difficult or impossible.
- **Topography:** Steeper slopes exacerbate fire spreading and impede fire suppression efforts.
- **Fire Suppression Resources:** Water resources for fire suppression typically are lower in these areas, which are served by pumped pressure zones. Fire department response times may be longer in these areas because of distance or narrow streets and driveways.
- **Construction and Defensible Space:** Fire-safe construction practices and defensible space practices such as weed abatement can reduce an area's risk to wildfire.

Forestland management practices such as fire exclusion, livestock grazing and timber harvesting have altered natural fire frequency, duration, extent and severity in the Planning Area. As a result, risk to wildfire hazards is increasing in forested lands and in developed areas adjacent to forests.

Agricultural and ranching activities increase the risk of a human-caused wildfire spreading. Large expanses of fallow fields or non-annual cash crops provide areas of continuous vegetation (fuels) that have potential to threaten several homes and farmsteads. Under extreme weather conditions, escaped agricultural fires could threaten individual homes or a town.

Urban and suburban areas tend to have lower risk to wildfire hazards. Paved areas, open spaces and mowed grassy areas typically have low fuel loads. In these environments, most fires are structural. Furthermore, urban and suburban communities tend to have the capacity to provide water for fire suppression and to support fire departments that respond quickly. Thus, the risk of a single structure fire spreading to involve multiple structures is generally quite low.

Types

For the purposes of mitigation planning, we define three types of fires: structure fires, wildland fires, and wildland urban interface (WUI) fires. This chapter focuses on WUI fires, which pose a threat to all jurisdictions in the Planning Area, especially the unincorporated areas.

Structure Fires

Structure fires are fires where structures and contents are the primary fire fuel. Structure fires are most often confined to a single structure or location, although in some cases they may spread to adjacent structures.

Wildland Fires

Wildland fires are fires where vegetation (grass, brush, trees) is the primary fire fuel — few or no structures are involved. The most common suppression strategy is to contain the fire at its boundaries, to stop the spread of the fire, and then to let the fire burn itself out. Fire suppression responsibility is shared by local and state fire agencies.

Wildland Urban Interface (WUI) Fires

The defining characteristics of a WUI fire are structures built in or immediately adjacent to areas with essentially continuous vegetative fuel loads. WUI fires often spread quickly, and structures can become fuel sources. Fire suppression efforts for WUI fires focus on saving lives and on protecting structures to the extent possible.

Table 3.6-1 Wildland Urban Interface in Each Jurisdiction

Jurisdiction	Wildland Urban Interface
Unincorporated Multnomah County	✓
Fairview	✓
Gresham	✓
Troutdale	✓
Wood Village	✓

Sources: Multnomah County, 2011; Oregon Department of Land Conservation and Development (DLCD), 2015; and Natural Hazards Mitigation Plan (NHMP) Steering Committee, 2016.

According to the 2011 Multnomah County Community Wildfire Protection Plan (CWPP), wildfires in Multnomah County are most commonly caused by lightning or human activity, as shown in **Table 3.6-2**.

Lightning-Caused Fires

Lightning-caused fires in Multnomah County occur less frequently than compared to southern and eastern Oregon. Recent 10-year averages from the Oregon Department of Forestry (ODF) show lightning as the cause of one to two fires yearly on private land. However, in some years, lightning has ignited a few fires from one storm event in Multnomah County. These multiple fire events sometimes cause a shortage of resources, and contingency move-ups from other parts of the state become necessary (Multnomah County, 2011).

Human-Caused Fires

Human-caused fires are responsible for the majority of fires in Multnomah County. The North Cascade District of ODF lists discarded cigarettes as the number one cause of fires on forest lands in Multnomah County. The second leading cause of fires in the North Cascade District is debris burning in residential areas. Equipment use is identified as the third leading cause of fires, and refers to sparks generated from lawnmowers, chainsaws and other equipment (Multnomah County, 2011).

Table 3.6-2 Wildfire Ignitions on Oregon Department of Forestry* Protected Lands in Multnomah County, 1960-2011

Cause	Percentage
Lightning	5%
Human-Caused: Total	95%
Debris Burning - Logging	5%
Juveniles	7%
Railroad	7%
Recreation	7%
Arson	11%
Equipment Use – Non-Logging	14%
Debris Burning – Non Logging	18%
Human-Caused Miscellaneous	26%

* Fire data is only for ODF protected lands in Multnomah County. During the CWFP process, the need to address inconsistent reporting was identified.

Source: Multnomah County, 2011

Location and Extent

Communities at Risk

The CWPP process is designed to identify and prioritize areas for wildfire prevention and response efforts, referred to as Communities at Risk. The CWPP recognizes the Communities at Risk identified by the ODF. These Communities at Risk have a combination of five risk variables:

1. **Hazard:** vegetation, topography and climate
2. **Risk:** historical fire occurrence and ignition sources
3. **Values:** community values, watersheds, critical facilities and infrastructure
4. **Protection Capabilities:** Fire district response time
5. **Structural Vulnerability:** wildland urban interface

ODF Communities At Risk within Multnomah County include:

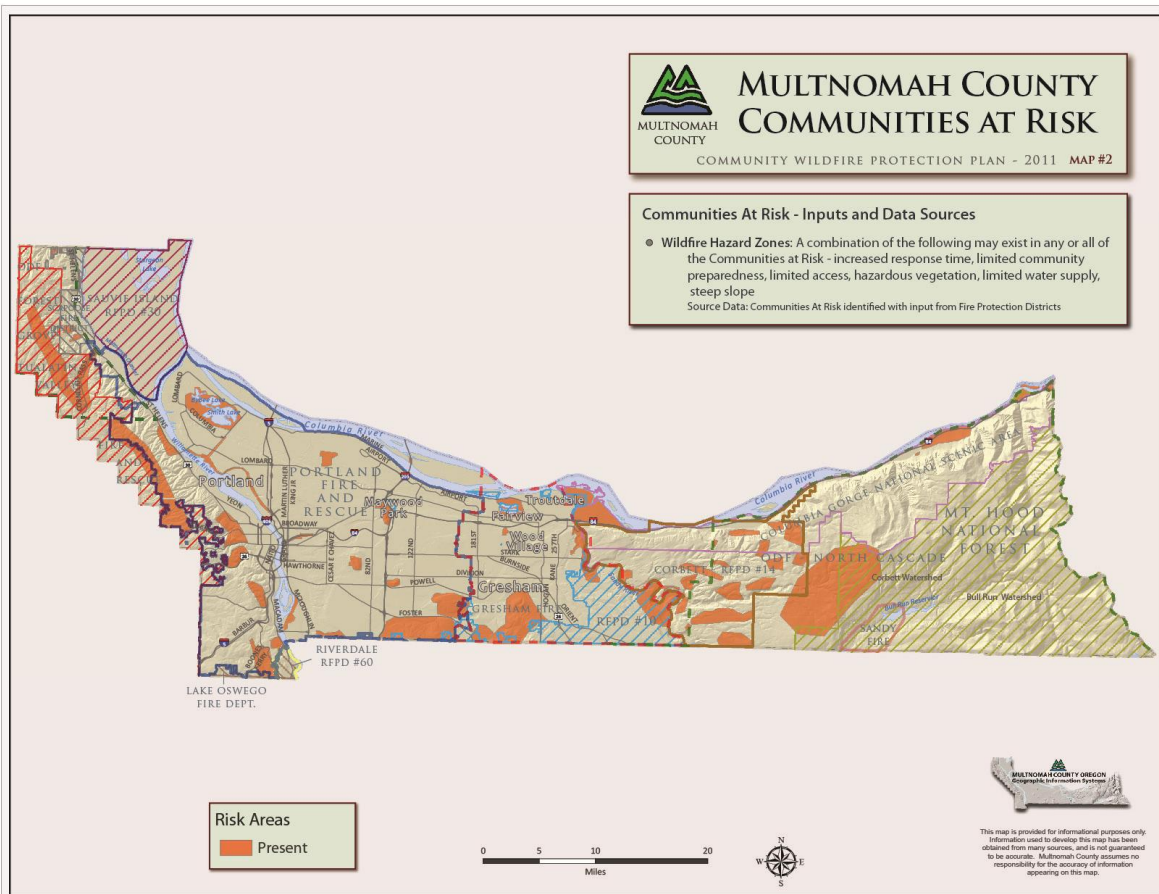
- Fairview
- Gresham
- Lake Oswego
- Maywood Park
- Multnomah County Fire District #10
- Portland
- Riverdale Rural Fire Protection District
- Sauvie Island Rural Fire Protection District
- Scappoose Rural Fire Protection District
- Troutdale
- Tualatin Valley Fire and Rescue
- Unincorporated Multnomah County
- Wood Village

The CWPP also recognizes local service boundaries for fire protection. This reduces redundancy and organizes communities into more functional units (Multnomah County, 2011). These include three Incorporated Fire Districts and six Rural Protection Districts:

- Portland Fire & Rescue
- Gresham Fire (*provides services to City of Gresham residents and contracts with Fairview, Troutdale, Wood Village and parts of unincorporated Multnomah County*)
- Scappoose RFPD
- Corbett RFPD #14
- Tualatin Valley Fire & Rescue
- Sauvie Island RFPD # 30
- RFPD #10 (Gresham Fire)
- RFPD # 1 (Portland Fire & Rescue)
- RFPD # 60 (Lake Oswego Fire)
- Unprotected Areas

Communities At Risk are mapped in **Figure 3.6-1**, including those identified by ODF and the additional nine fire protection service areas mentioned above.

Figure 3.6-1 Communities at Risk



Source: Multnomah County, 2011

3.6.2 History

From 1960 to June 2016, there have been 164 fires in Multnomah County burning a total of 1,609 acres. Of the major fires to impact Oregon, zero occurred within Multnomah County. Significant wildfires that have impacted the Planning Area are listed in **Table 3.6-3**.

Table 3.6-3 Significant Historic Wildfires

Date	Location	Description
1889	Multnomah County	Balch Creek Canyon Fire. Started in northwest Portland and burned west , over Portland's West Hills toward the Cascade Mountains. Covered 9,000 acres.
1902	Multnomah and Clackamas Counties	170,000 acres burned.
Aug. 1933	Tillamook, Washington, and Yamhill Counties	Burned for 14 days. Covered 240,000 acres.
Aug. 1939	Multnomah and Washington Counties	In Dutch Creek Canyon near Scappoose, just west of Forest Park. Fire spread rapidly. 20-mph winds. 200 firefighters deployed. 1,500 people deployed by NW Forest Protective Association. 14,000 acres of timberland lost.
1940	Multnomah County	The Bonny Slope Fire. Began in southern portion of Forest Park and burned through the West Hills, more than 1,000 acres.
Aug. 1951	Portland	Burma Road Fire. Started in Forest Park. Fire consumed more than 100 acres in one evening. Flames reached 50-ft. high. 3,000 acres burned. 500 firefighters fought the blaze.
1960	Gresham	Wildfire on Grant Butte.
Sep. 1971	Columbia River Gorge	Sky Hook Fire. 1,831 acres burned.
Oct. 1991	Columbia River Gorge	Falls Fire. Threatened Multnomah Falls Lodge. Closed Hwy 30 and the Columbia Gorge Scenic Hwy. Residents evacuated. No injuries or deaths. 975 acres burned.
Aug. 2001 and 2002	Portland	2001 fire on Willamette Bluff near the University of Portland. Five-alarm fire fought by firefighters and citizens. Burned 38 acres. Burned again in 2002, covering 10 acres.
Aug. 2002 Sept. 2003	Portland	Powell Butte. Three relatively small fires. Burned 54.75 acres.
Sep. 2003	Columbia River Gorge	Cascade Locks Fire. Started in Cascade Locks. Strong east winds drove the fire more than a mile. Burned more than 300 acres on each side of I-84. Residents evacuated; two residential buildings burned and other buildings threatened.
2003	Columbia River Gorge	Herman Creek Fire. Burned more than 500 acres. Jumped I-84 five times. Destroyed three homes.
Sep. 2005	Vista House in Columbia River Gorge	Vista House Fire. Started 0.5 miles from Vista House. Burned 10 acres.

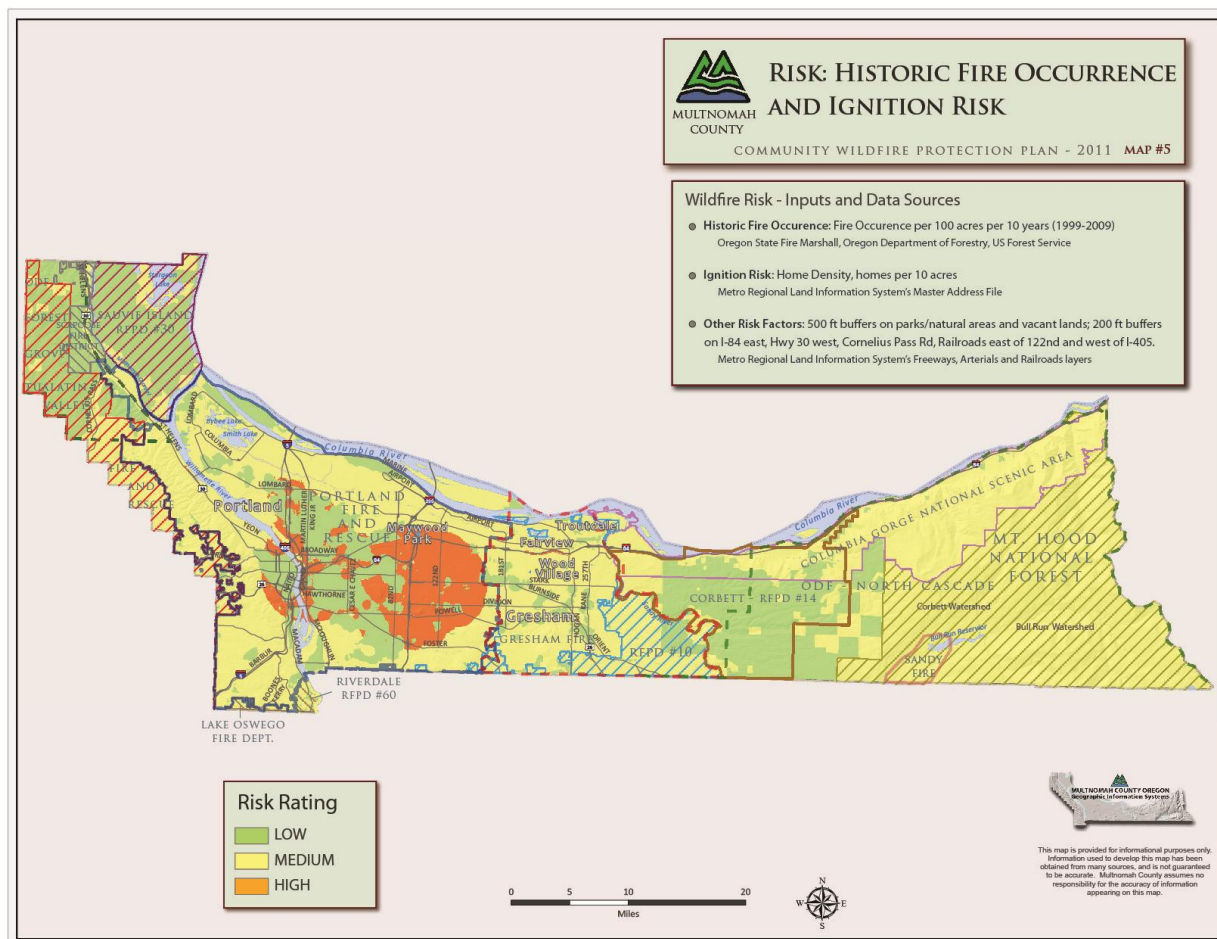
Source: Brian Ballou, 2002; Oregon State, no date; Multnomah County, 2011; DLCD 2015; and unknown sources.

3.6.3 Probability

To indicate future fire occurrence, a composite map using historic fire events and potential ignition sources was developed for the CWPP. Notable data limitations were identified, such as inconsistency in data reporting, areas with high density and low fuel loads that scored high because of density, and the inability to include large historic fires data (Multnomah County, 2011). There was an effort to eliminate inconsistencies through weighting techniques, but “glaring inconsistencies” remain including the following (Multnomah County, 2011):

- Some urban areas scored higher because parks were in close proximity to developed areas and fire departments had a higher capacity for reporting fires.
- “Wildland fire” may be defined differently by urban and rural fire departments.
- Corbett shows low risk due to low urban density and limited ability to report fires, leading to an undercount of fires reported.

Figure 3.6-2 Risk: Historic Fire Occurrence and Ignition Risk



Source: Multnomah County, 2011

Climate Change

In 2011, the National Research Council (NRC) estimated that for each 1.8 degree Fahrenheit rise in global temperature, the number of acres burned in the western United States could increase by 200% to 400% (National Geographic, 2015). One-fourth of the Earth's vegetated surface is seeing longer fire seasons, according to the U.S. Forest Service. These fire weather changes coupled with ignition sources and available fuel could markedly impact global ecosystems, societies, economies and climate (National Geographic, 2015).

According to the Multnomah County and City of Portland Climate Change Preparation Strategy and the Oregon Natural Hazards Mitigation Plan (NHMP), climate models project hotter, drier summers and a decline in mean summer precipitation for Oregon. Coupled with projected decreases in mountain snowpack due to warmer winter temperatures, Multnomah County is expected to be affected by an increased incidence of drought and wildfire. One example is based on a study conducted by the NRC that linked climate change to an increased exposure to wildfire smoke. See section **3.6.4 Vulnerability** for more information about public health risks to wildfire smoke.

Decades of forest management, fire suppression and climate change have significantly altered forest composition and structure.

The result is an increase in the wildfire hazard as forest vegetation has accumulated to create a more closed, tighter forest environment that tends to burn more intensely than in the past.

Rising temperatures and changes to precipitation patterns result in drought conditions, making forests more susceptible to ignitions.

— Multnomah County CWPP, 2011

3.6.4 Vulnerability

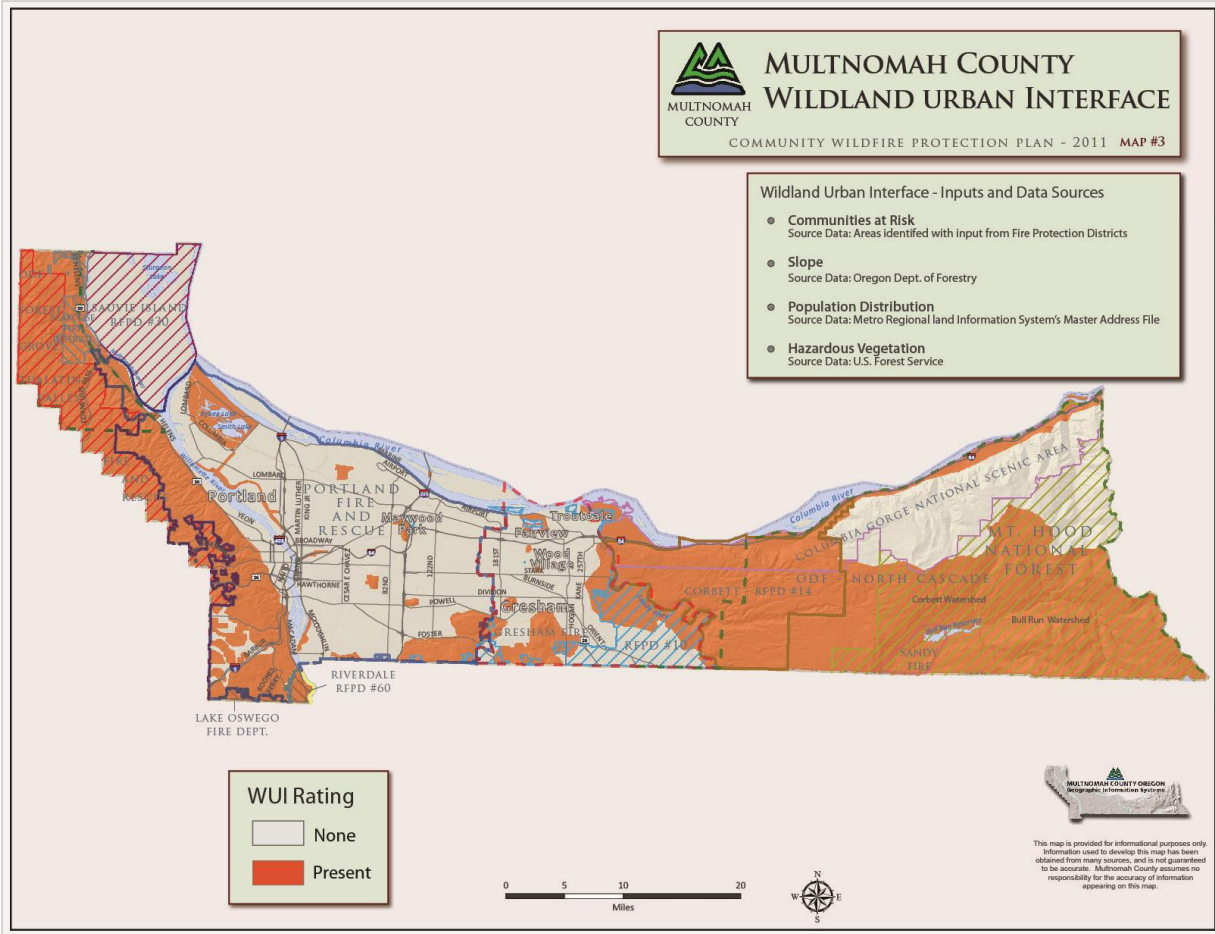
Wildland Urban Interface (WUI)

Because wildfire prevention and fuels treatments will be managed differently in urban communities than in communities adjacent to heavily forested landscapes, the CWPP Risk Assessment Subcommittee developed a WUI relevant to surrounding land use (Multnomah County, 2011).

- In urban areas, the WUI extends approximately two blocks from the 500-foot vegetation buffer. Structures inside this buffer are either (1) most vulnerable to being damaged by wildfire, or (2) positioned to spread fire from their property to adjacent forests.
- In more heavily forested timber or agricultural areas with adjacent communities or infrastructure, the WUI extends to 1.5 miles beyond structures, or to ridge tops, when appropriate.

These WUI areas are shown in **Figure 3.6-3**.

Figure 3.6-3 Multnomah County Wildland Urban Interface



Source: Multnomah County, 2011

According to the CWPP, although each fire agency in Multnomah County is considered a Community at Risk, wildfire hazards vary within fire district boundaries, as most districts/departments encompass a variety of communities that have very different development patterns, vegetation types and protection capability. Local fire agency personnel identified 57 areas that were at particular high risk to wildfire and are considered Local Communities at Risk (**Table 3.6-5**). It is recommended that fire agencies target these areas for site-specific wildfire planning and project implementation. Although each Local Community at Risk has unique wildfire hazards and potential impediments to emergency response, the following issues are common to the majority of high-risk strategic planning areas.

- Structural Ignitability
- Access Limitations
- Protection Capability
- Water Supply

Table 3.6-5 Local Communities at Risk to Wildfire in Multnomah County

Portland Fire & Rescue Bureau	<ul style="list-style-type: none"> • Skyline Ridge • Mount Tabor • Kelly Butte • Powell Butte • Johnson Creek Watershed • Oaks Bottom • Springwater & Flavel • Sullivan's Gulch • Willamette Bluffs Escarpment • Forest Heights 	<ul style="list-style-type: none"> • Smith/Bybee Lake • Forest Park • Linnton • NW Portland (Pittock Mansion area) • Tryon Creek • Terwilliger Curves • Oregon Zoo & Hoyt Arboretum • Riverdale • Bull Run Watershed
Port of Portland Fire	<ul style="list-style-type: none"> • Elrod Road 	<ul style="list-style-type: none"> • Government Island (Unprotected)
Gresham Fire Department	<ul style="list-style-type: none"> • Walters Hill/Gresham Butte • Ritchie Road • Oxbow Park • Lower Sandy River Bend 	<ul style="list-style-type: none"> • 1000 Acres (a.k.a. Sandy River Delta) • Blue Lake • Wisteria Lane • Wistful Vista
Scappoose Fire District	<ul style="list-style-type: none"> • Holbrook Road • Logie Trail Road 	<ul style="list-style-type: none"> • Gilkenson Road
Rural Fire Protection District # 14 (Corbett Fire)	<ul style="list-style-type: none"> • Trout Creek Road • Tout Creek Camp • Aims Road • Mannthay Road • Deverell Road • Gordon Creek • North Oxbow • Camp Angeles • Corbett Watershed • Brower/Palmer Mill 	<ul style="list-style-type: none"> • Ricker/O Regan Roads • Howard Road • Alder Meadows • Maffet Road • Red Elder • Haines/Thompson Mill • Columbia Historic Hwy • Latourell/Alex Barr • Bridal Veil Lakes
Tualatin Valley Fire & Rescue	<ul style="list-style-type: none"> • Skyline Ridge • Cornelius Pass 	
Unprotected Areas	<ul style="list-style-type: none"> • Warrendale-Dodson • Bonneville • Small portion of Forest Park 	<ul style="list-style-type: none"> • Ainsworth • Eagle Creek • Government Island
Sauvie Island	<ul style="list-style-type: none"> • Entire Island 	

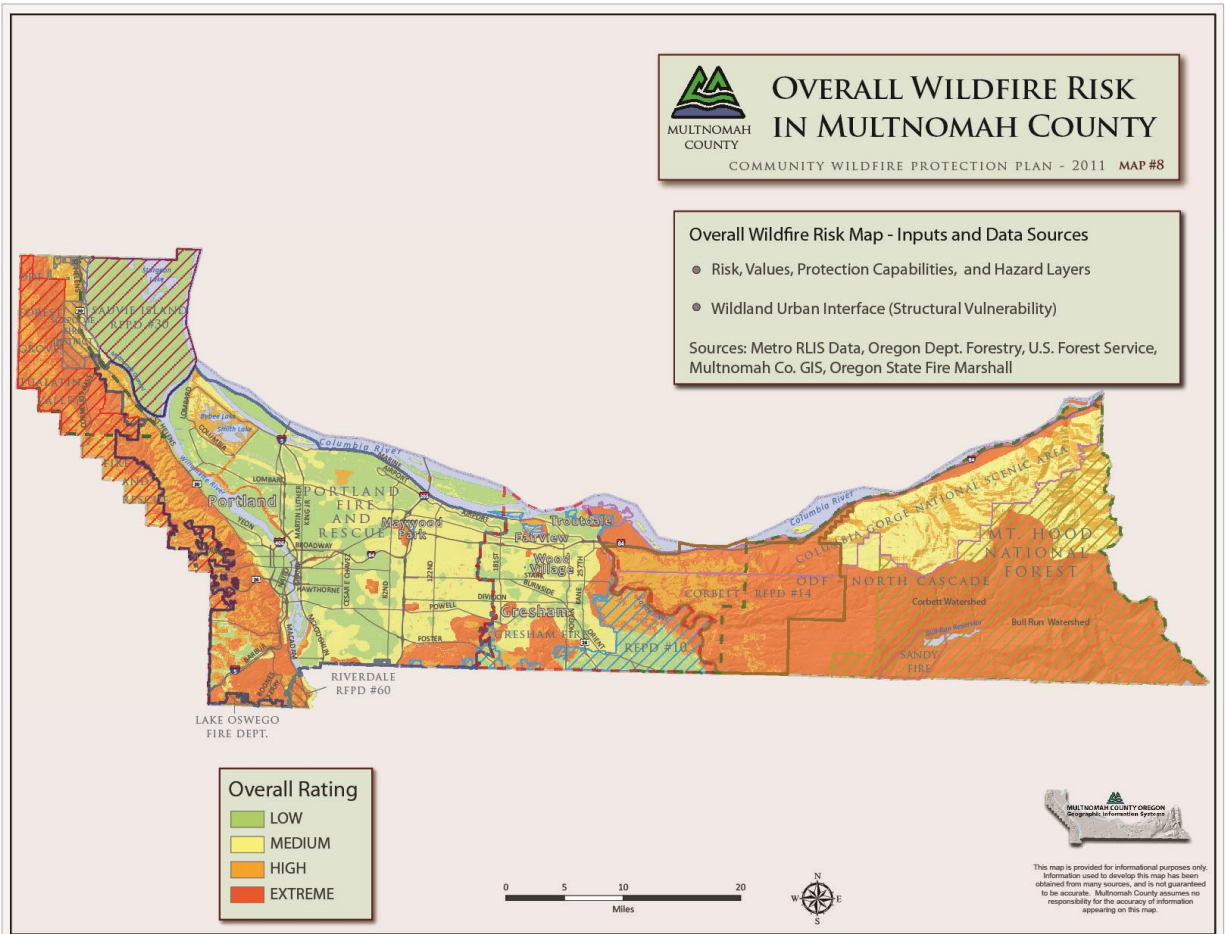
Source: Multnomah County, 2011

A Wildfire Hazard and Risk Assessment developed for the CWPP considered four categories to determine *relative* severity of fire risk (**Table 3.6-6**). The map in **Figure 3.6-4** represents the county's perception of low, moderate, high, and extreme hazard areas, based on these categories. Roughly 200,000 acres are in high and extreme wildfire risk areas (**Table 3.6-7**).

Table 3.6-6 Wildfire Hazard and Risk Assessment Elements

Assessment Categories	Elements
Wildfire Hazard	Fuels (developed from vegetation information), Slope, Aspect, Elevation, Weather
Wildfire Risk	Historic Fire Occurrence (derived from state and federal fire agency databases), and an estimation of Ignition Risk based on expert opinion and home density
Community Values	Life/Property as determined by home density (homes per 10 acres) and community infrastructure
Protection Capability	Fire Response Time (determined from fire district boundaries and district-reported response times) and Community Preparedness
Structural Vulnerability	The Wildland Urban Interface was determined as the area having the highest degree of structural ignitability.

Source: Multnomah County, 2011

Figure 3.6-4 Overall Wildfire Risk in Multnomah County

Source: Multnomah County Community Wildfire Protection Plan, 2011

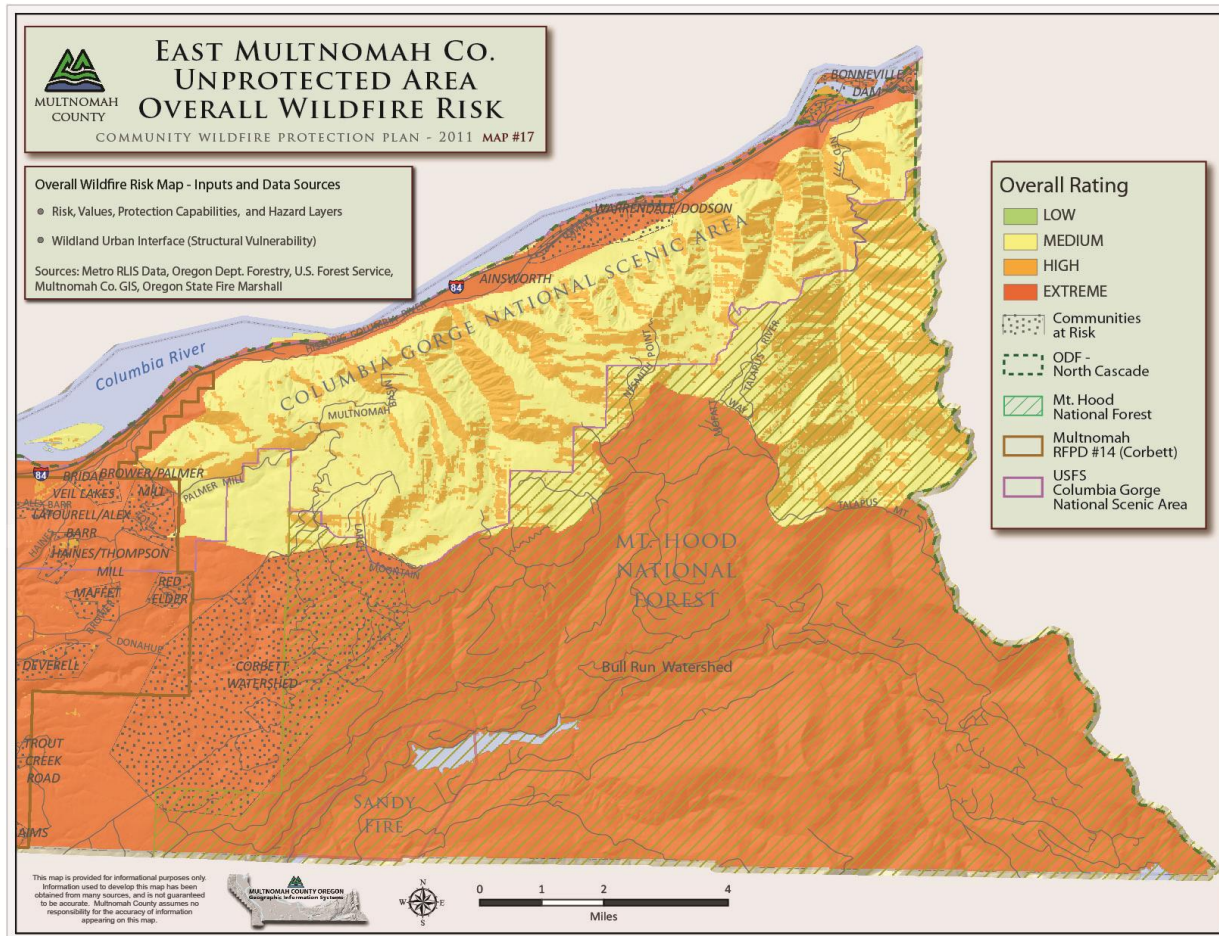
Table 3.6-7 Number Acres in Each Hazard Level in Multnomah County

Hazard Level	Acres
Low	18,285
Moderate	59,169
High	84,344
Extreme	115,177

Source: Multnomah County, 2011

There are approximately 92,864 acres of structurally unprotected lands in Multnomah County. The majority of those unprotected lands, 88,379 acres, are in the eastern part of the county, which includes the Columbia River Gorge National Scenic Area and Mount Hood National Forest. Government Island, located in central Multnomah County, accounts for 1,939 acres (**Figure 3.6-5**); 2,546 acres are in the western part of the county in Forest Park (Multnomah County, 2011).

The Oregon Department of Forestry and the U. S. Forest Service provide wildland fire protection to these areas, but their scope is limited to forest protection, not rescue or structural fire protection. It would take these wildland fire agencies more than 20 minutes to respond to a wildland fire in these areas (Multnomah County, 2011). Local fire agencies providing structural fire protection adjacent to these unprotected areas have developed a list of actions to build capacity and assist in making Communities at Risk more resilient to potential wildfires (Multnomah County, 2011).

Figure 3.6-5 Structurally Unprotected Communities at Risk

Source: Multnomah County, 2011

Structures in the unincorporated areas of the Communities at Risk are predominantly single-family residential or rural buildings, along with four industrial buildings. In the incorporated areas, there are mostly residential buildings and a few buildings with other uses, including industrial buildings.

Wildfire risk in the WUI often is exacerbated by homeowners' reluctance to evacuate quickly. Instead, homeowners often try to protect their homes with whatever fire suppression resources are available. Such efforts generally have very little effectiveness. For example, the water flow from a garden hose is too small to meaningfully impact a single-structure fire once the structure is significantly engulfed by flames, and is too small to have any impact on a WUI fire. Homeowners who delay evacuation in attempts to save their homes may place their lives in jeopardy by delaying evacuation until it may be impossible.

Public Health

High levels of smoke from major fires pose health risks. Breathing in wildfire smoke can cause coughing, stinging eyes, trouble breathing normally, scratchy throat, runny nose, irritated sinuses, wheezing and shortness of breath, chest pain, headaches, tiredness, an asthma attack, and fast heartbeat (Centers for Disease Control and Prevention, 2013). Some individuals — including children, elderly, and individuals with asthma and other respiratory diseases or cardiovascular disease — may be especially vulnerable to

wildfire smoke. A study by the Environmental Protection Agency found medical needs rose during the smokiest days of a peat fire in North Carolina in 2008. Emergency room visits for breathing problems rose by 66 percent. Emergency room visits for heart failure increased 37 percent. People living in poverty were impacted most significantly (National Geographic, 2015).

3.5.5 References

- Ballou, B. (2002). A Short History of Oregon Wildfires, Oregon Department of Forestry, unpublished. Retrieved from <https://services.oregon.gov/ODF/Documents/Fire/UrbanInterface/WildlandUrbanHistory.pdf>
- Centers for Disease Control and Prevention. (2013)
- Forest Stewards Guild. (2015, October). Evaluating the Effectiveness of Wildfire Mitigation Activities in the Wildland-Urban Interface. Retrieved from http://forestguild.org/publications/research/2015/WUI_effectiveness.pdf.
- Multnomah County, & City of Portland. (2014). Climate Change Preparation Strategy: Preparing for Local Impacts in Portland and Multnomah County 2014.
- Multnomah County et al. (2011). Multnomah County Community Wildfire Protection Plan (MCWPP) 2011.
- National Geographic. (2015). Smoke from Wildfires is Killing Hundreds of Thousands of People. Retrieved from http://news.nationalgeographic.com/content/news/en_US2015/10/151029-wildfires-smoke-asthma-indonesia-california-health.html.
- Northwest Interagency Coordination Center 2015 Northwest Fire Statistics to Date. (2015). Retrieved from <http://nwccinfo.blogspot.com/>.
- Oregon Department of Forestry. (No date). Fires List. Retrieved from http://www.odf.state.or.us/DIVISIONS/protection/fire_protection/fires/FIREList.asp.
- Oregon Department of Forestry (ODF). (2006, September). Statewide Forest Assessment.
- ODF. (2012, December 5). West Wide Wildfire Risk Assessment Final Report – Addendum VI County Risk Summaries, Oregon.
- Oregon Department of Land Conservation and Development (DLCD). (2015). 2015 Oregon Natural Hazards Mitigation Plan. Retrieved from <http://www.oregon.gov/LCD/HAZ/pages/nhmp.aspx>.
- Oregon State University. (no date). The Tillamook Burn: Separating Fact from Legend. Retrieved from <http://oregonstate.edu/instruct/geo422/522-Paper%20hoadley.pdf>.
- Weather Outreach and Consulting Services, LLC. (2015). 2015 Washington and Oregon Fire Season Outlook.
- Wildland Fire: A Report of the Subcommittee on Disaster Reduction. (No date). Retrieved from http://www.sdr.gov/docs/185820_Wildfire_FINAL.pdf