

Chapter 10 Wildfire

(Hazard Analysis Score = 58)

Table of Contents

Community Wildfire Protection Plan	10-3
Why are Wildfires a Threat to Beaverton?	10-3
Community Wildfire Issues	10-10
Wildfire Hazard Assessment	10-11
Wildfire Hazard Identification	10-11
Vulnerability Assessment.....	10-12
Risk Analysis.....	10-13
Strategic Planning Areas in Washington County	10-13
Mitigation Plan Goals and Existing Activities.....	10-15
Existing Mitigation Activities.....	10-16
Wildfire Mitigation Action Items	10-23

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Community Wildfire Protection Plan (New 03/2011)

A Community Wildfire Protection Plan is a collaborative process meant to identify and prioritize mitigation projects that will help reduce the risk from wildfire. The CWPP planning process was created as a pre-disaster mitigation tool to assist communities in identifying areas of high fire risk, developing realistic projects that will alleviate those risks, and increasing eligibility for funding opportunities to implement proposed projects and recommendations.

The Washington County Community Wildfire Protection Plan was developed in 2007 by the Washington County Fire Defense Board, the Oregon Department of Forestry, and the Office of Consolidated Emergency Management for Washington County. The Community Wildfire Protection Plan (CWPP) for Washington County, Oregon, is the result of analyses, professional collaboration, and assessments of wildfire risks and other factors focused on reducing wildfire threats to people, structures, infrastructure, and unique ecosystems in Washington County. The plan includes incorporated and unincorporated areas of the county that have a potential for wildfires.

This Chapter was updated using information from the Washington County Community Wildfire Protection Plan.

Why are Wildfires a Threat to Beaverton?

Fires are a natural part of the ecosystem in Oregon, but they present a substantial hazard when they threaten life and property in growing communities. Although wildfires are more common to the arid areas of Eastern Oregon, there is still potential for loss due to wildland-urban interface fires in Beaverton, especially as the City annexes outlying lands. Wildfire is defined as any fire occurring on wildlands that requires suppression response.¹ The wildfire hazard is often characterized by an increased fire risk in the urban interface zone. The interface is area at the urban-rural fringe where homes and other structures are built into a densely forested or natural landscape. If left unchecked, it is likely that fires in these areas will threaten lives and property.

While Beaverton has not been impacted by historic wildfire events to date, wildfire has caused substantial destruction to nearby Oregon communities. In 1990, Bend's Awbrey Hall Fire destroyed 21 homes, causing approximately \$9 million in damage and costing over \$2 million to suppress, and became one of Oregon's most destructive fires in recent history. In 1996, Bend's Skeleton Fire burned over 17,000 acres and

"The heightened awareness of the 2000 fire season attracted an unprecedented commitment from Congress to protect communities, watersheds, and species at risk, and will make fire management a top federal priority for years to come."

The Nature Conservancy Magazine -
May/June 2001

damaged or destroyed 30 homes and structures. In that same year, 218,000 acres were burned, 600 homes were threatened, and 44 homes were lost statewide.²

Table 10.1 lists major fires that occurred in Oregon from 1848 to 2002.

Table 10.1. Historic Fires in Oregon (1848-2002)

Year	Fire	# of acres burned
1848	Nestucca	290,000
1849	Siletz	800,000
1853	Yaquina	482,000
1865	Silverton	988,000
1868	Coos Bay	296,000
1933	Tillamook	240,000
1936	Bandon	143,000
1939	Saddle Mountain	190,000
1945	Wilson River/Salmonberry	180,000
1951	North Fork/Elkhorn	33,000
1966	Oxbow	44,000
1987	Silver	970,000
1992	Lone Pine	31,000
1996	Skelton	17,000
2002	Biscuit	500,000

Source: "Atlas of Oregon," William G. Loy, et al, University of Oregon Books, 1976. Oregon Department of Forestry, "Tillamook Burn to Tillamook State Forest," revised 1993. Department of Forestry, http://www.odf.state.or.us/DIVISIONS/protection/fire_protection/stats/histfire.asp?id=307010
5. Oregon Emergency Management, State Hazard Risk Assessment, 2003.

During the 2000 fire season, more than 7.5 million acres of public and private lands burned in the US, resulting in loss of property, damage to resources, and disruption of community services. Taxpayers spent more than \$1.6 billion to combat 90,000 fires nationwide.³ Many of these fires burned in wildland/urban interface areas and exceeded the fire suppression capabilities of those areas. The magnitude of the year 2000 fires is the result of two primary factors: (1) severe drought, accompanied by a series of storms that produce thousands of lightning strikes and windy conditions; and (2) the effects of wildfire suppression over the past century that has led to buildup of brush and small diameter trees in the nation's forests and rangelands.⁴

Southern Oregon's Biscuit fire burned almost 500,000 acres between July and November of 2002. Fourteen structures were lost including four homes, nine outbuildings, and one lookout, as well as numerous recreation structures. At the fire's peak, some 7,000 firefighters were assigned to the blaze and the cost of the fire fighting effort is estimated at \$153,000,000.⁵

Table 10.2 illustrates the fire suppression costs for state, private, and federal lands protected by the Oregon Department of Forestry between 1985 and 2002.

Table 10.2. History of Fire Suppression Costs 1985-2002

Year	Suppression Costs in \$\$	Year	Suppression Costs in \$\$
1985	3,268,644	1994	21,100,000
1986	5,847,018	1995	4,360,349
1987	32,080,746	1996	5,066,227
1988	13,192,596	1997	1,210,692
1989	6,394,593	1998	2,056,343
1990	8,279,974	1999	5,320,555
1991	5,381,192	2000	5,750,862
1992	17,000,000	2001	33,792,483
1993	4,023,033	2002	60,812,872 (preliminary)

Wildfire Characteristics

The characteristics of fire are important to understand when trying to mitigate its negative effects on humans and structures. In order for fire to exist, the three components of the fire triangle must be present. The triangle consists of fuel, heat, and oxygen.⁶ Most naturally caused fires are initiated by lightning strikes. Human-caused fires, both accidental and deliberate, are produced in many ways, including campfires, chimneys, torches, matches, fireworks, cigarettes, vehicle fires, military ordnance, and smoldering slash piles.⁷ In either instance, natural or human-caused, the ignition is started because the fire triangle exists. Fires occurring in natural ecosystems begin as a point of ignition, burn outward into circles and, if they escalate, spread in the direction toward which the wind is blowing.⁸ Additionally, when burning occurs on uneven terrain, the fire spreads upslope to eventually form itself into broad ellipses.⁹

Effects of fire on ecosystem resources can represent damages, benefits, or some combination of both, depending largely on the characteristics of the fire site, the severity of the fire, the time period of valuation, and the values placed on the resources affected by the fire.¹⁰ The ecosystems of most forests depend upon fire to maintain various functions. The use of fire for beneficial purposes is considered, where appropriate, in terms of reducing fuel loads, disposing of slash, preparing seedbeds, thinning overstocked stands, increasing forage plant production, improving wildlife habitats, changing hydrologic processes,

“With more Oregonians than ever living in forests that have grown thicker than ever through decades of strict fire suppression, even modest fires can quickly consume lives, homes, and the millions of dollars it costs to fight them.”

The Oregonian,
Feb. 26, 2001

and improving aesthetic environments.¹¹ However, despite its beneficial values to ecosystems, fire has been suppressed for years because of its perceived effects on timber harvest and threat to human life. In addition, new development continues to push its way into what is termed as the “wildland-urban interface.”

The Interface

There are three categories of interface fire:¹²

- The classic wildland-urban interface exists where well-defined urban and suburban development presses up against open expanses of wildland areas;
- The mixed wildland-urban interface is characterized by isolated homes, subdivisions, and small communities situated predominantly in wildland settings; and
- The occluded wildland-urban interface exists where islands of wildland vegetation occur inside a largely urbanized area.¹³

The occluded wildland-urban interface is the most probable interface fire that would occur in Beaverton.

Unlike most other natural hazards, the wildland-interface is not designated by geography alone. Certain conditions must be present for significant interface fires to occur. The most common are hot, dry, and windy weather; the inability of fire protection forces to contain or suppress the fire; the occurrence of multiple fires that overwhelm committed resources; and a large fuel load (dense vegetation).¹⁴ Once a fire has started, several conditions influence its behavior, including fuel, topography, weather, drought, and development. These combined conditions are the key elements that add to increased wildfire risk. The severity of the wildfire is ultimately affected by the severity of these conditions. For example, if a steep slope (topography) is combined with extremely low humidity, high winds, and highly flammable vegetation, then a high-intensity wildfire may develop.

Since the 1970s, Oregon's growing population has expanded further and further into traditional resource lands such as forestland. The “interface” between urban and suburban areas and the resource lands created by this expansion has produced a significant increase in threats to life and property from fires, and has pushed existing fire protection systems beyond original or current design or capability.¹⁵ Property owners in the interface are often unaware of the problems and threats they face. Therefore, many owners have done very little to manage or offset fire hazards or risks on their own property. Furthermore, human activities increase the incidence of fire ignition and potential damage.

Fuel¹⁶

Fuel is the material that feeds a fire, and is a key factor in wildfire behavior. Fuel is classified by volume and by type. Volume is described in terms of “fuel loading,” or the amount of available vegetative fuel. The type of fuel refers to the species of trees, shrubs, and grass that are present. Oregon, as a western state with prevalent conifer, brush, and

rangeland fuel types, is subject to more frequent wildfires than other regions of the nation.

An important element in understanding the danger of wildfire is the availability of diverse fuels in the landscape, such as natural vegetation, manmade structures, and combustible materials. A house surrounded by brushy growth rather than cleared space allows for greater continuity of fuel and increases the fire’s ability to spread. After decades of fire suppression, “dog-hair” thickets have accumulated. These enable high intensity fires to flare and spread rapidly. Structures that are made of combustible material such as shake roofs and wood siding are especially susceptible to fire. Untrimmed bushes near these structures often serve as “ladder fuels” – enabling a slow moving ground fire to climb onto rooftops and into the crowns of trees. A crown fire is significantly more difficult to suppress than a ground fire, and are much more threatening to structures in the interface. Wildfire at the upper end of the wildfire intensity spectrum is likely to spread into the tops of the tallest trees in violent and discontinuous surges.¹⁷ Fire that occurs at this severe end of the spectrum responds to its own convective winds, spreading rapidly as sparks from exploding trees ignite other fires many meters away.¹⁸

Because of the many different possible “fuels” found in the interface landscape, firefighters have a difficult time predicting how fires will react or spread.

Vegetation and Climate (New 03/2011)¹⁹

Vegetation in Washington County is a mix of forestland, riparian, and agricultural ecosystems. An evaluation of satellite imagery of the region provides some insight to the composition of the vegetation of the area. The full extent of the County was evaluated for cover type by the USDA Forest Service in 2001 as determined from Landsat 7 ETM+ imagery in tabular format. Douglas-fir/western hemlock/western red cedar forest is currently the most represented cover type in Washington County at 44% of the total land base followed by agriculture at 33% and urban at 12%.

Table 10.3. (New 03/2011) **Vegetative Cover Types in Washington County**

Cover	Acres	%
Agriculture	155,320	33%
Douglas-fir/White Oak Forest	2,572	1%
Douglas-fir/W. Hemlock/W. Red Cedar Forest	206,609	44%
Grass-shrub-sapling or regenerating young forest	15,387	3%
Hawthorn-Willow Shrubland	259	0%
Mixed Conifer/Mixed Deciduous Forest	29,612	6%
Open Water	1,361	0%
Urban	53,770	12%
Total	464,890	100%

Topography²⁰

Topography influences the movement of air, thereby directing a fire's course. For example, if the percentage of uphill slope doubles, the rate of spread in wildfire will likely double. Gulches and canyons can funnel air and act as chimneys, which intensify fire behavior and cause the fire to spread faster. Solar heating of dry, south-facing slopes produces upslope drafts that can complicate fire behavior. Unfortunately, hillsides with hazardous topographic characteristics are also desirable residential areas in many communities. This underscores the need for wildfire hazard mitigation and increased education and outreach to homeowners living in interface areas.

Weather²¹

Weather patterns combined with certain geographic locations can create a favorable climate for wildfire activity. Areas where annual precipitation is less than 30 inches per year are extremely fire susceptible.²² High-risk areas in Oregon share a hot, dry season in late summer and early fall when high temperatures and low humidity favor fire activity. Predominant wind directions may guide a fire's path. In addition, many high intensity fires produce their own wind, which aids in the spread of fire.

Drought

Recent concerns about the effects of climate change, particularly drought, are contributing to concerns about wildfire vulnerability. The term *drought* is applied to a period in which an unusual scarcity of rain causes a serious hydrological imbalance. Unusually dry winters, or significantly less rainfall than normal, can lead to relatively drier conditions, and leave reservoirs and water tables lower. Drought leads to problems with irrigation, and may contribute to additional fires, or additional difficulties in fighting fires. However, most fuel types (not including grasses) require two or three years of drought before the fuel becomes dangerously dry. Drought contributes to the frequency and intensity of fires. A February 2001 Oregonian article reported: "Favorable weather last year helped the Northwest emerge largely unscathed from a fire season that scorched other parts of the West. But the forests remain thick with timber and with homes. And this winter has brought the Northwest far less snow and rain than usual, which could give a greater foothold to the flames that are sure to come."²³ And surely flames came to the state during the 2002 fire season.

Development

Growth and development in forested areas is increasing the number of human-caused structures in the interface in Oregon. Wildfire has an effect on development, yet development can also influence wildfire. While wildfires have always been a historic part of the ecosystem in Oregon, homes in the interface often lead to human ignition of fire. The combined increase in human development and activity in the interface, with the high content of fuels from years of fire suppression, can create a lethal combination.

Homeowners often prefer lots that are private and have scenic views nestled in vegetation. A private setting may be far from public roads, or hidden behind a narrow, curving driveway. These conditions, however, make evacuation and firefighting difficult. The scenic views found along mountain ridges can also mean areas of dangerous topography. Natural vegetation contributes to scenic beauty, but it may also provide a ready trail of fuel leading a fire directly to the combustible fuels of the home itself.²⁴

Ignition Sources (New 03/2011)²⁵

Oregon Department of Forestry

Within the Oregon Department of Forestry, Forest Grove District, nearly all of the fires are mancaused and the majority of the ignitions are from debris burning. To assist with reducing these types of fires, Washington County imposes a burn ban during ODF's closed fire season each summer. This has helped considerably in reducing fire starts not just within the Forest Grove District, but also in local fire agency boundaries.

Cause	Acres Burned	%	Number of Ignitions	%
Arson	22	4%	34	7%
Campfire	20	4%	11	2%
Children	41	8%	106	21%
Debris Burning	58	11%	144	28%
Equipment	110	20%	73	14%
Field Burning	6	1%	34	7%
Land Clearing	18	3%	37	7%
Lightning	2	0%	18	4%
Smoking	264	49%	50	10%
Total	540	100%	507	100%

Oregon Department of Forestry database of wildfire ignitions includes ignition and extent data from 1961 through 2005 for fires within their jurisdiction.

Oregon State Fire Marshal's Office

The State Fire Marshal's Office has maintained an extensive wildfire database for the period of 1960 – 2005 throughout the State. According to this database, smoking caused the largest number of acres burned; however, there were significantly more ignitions due to debris burning.

Table 10.5. (New 03/2011) Summary of Ignitions in Washington County from the State Fire Marshal's database.				
Cause	Acres Burned	%	Number of Ignitions	%
Arson	7	1%	13	2%
Debris Burning	215	33%	177	28%
Equipment Use	53	8%	119	19%
Juveniles	5	1%	34	5%
Lightning	12	2%	33	5%
Miscellaneous	53	8%	76	12%
Railroad	23	4%	12	2%
Recreationists	35	5%	61	10%
Smoking	252	38%	108	17%
Total	654	100%	633	100%

Community Wildfire Issues

Characteristics of Growth and Development in the Interface

People living in or near wildland settings in Beaverton are vulnerable to the threat of wildfire. While there is currently very little wildland interface within the City of Beaverton's jurisdiction, some of the City's annexable land to the southwest and northeast possess some of the characteristics that define the interface zone. As Beaverton continues to grow, the wildland interface will become an increased concern for the City. The vegetation in these interface areas consists of an assortment of grasses, shrubs, and deciduous and coniferous trees. Steep slopes may also be a consideration in determining wildfire prone areas in future annexation. The development of homes and other structures is encroaching into wildland and natural areas and is expanding the wildland-urban interface. Interface neighborhoods are characterized by a diverse mixture of varying housing structures, development patterns, ornamental and natural vegetation, and natural fuels.

In the event of a wildfire, vegetation, structures, and other flammables can merge into unwieldy and unpredictable events. Factors germane to the fighting of such fires include access, firebreaks, proximity of water sources, distance from fire stations, and available firefighting personnel and equipment. Reviewing past wildland/urban interface fires shows that many structures are destroyed or damaged by wildfire for one or more of the following reasons:²⁶

- Combustible roofing material;
- Wood construction;
- Structures with no defensible space;
- Fire department with poor access to structures;
- Subdivisions located in heavy natural fuel types;
- Structures located on steep slopes covered with flammable vegetation;

- Limited water supply; and
- Winds over 30 miles per hour.

Road Access

Of particular concern to firefighters are developments with narrow roadways and few routes of egress, or routes with very limited accessibility. Many new subdivisions are constructed with cul-de-sacs, which contribute to the problem of road access. Most cul-de-sacs do not allow rear access to homes, which can be a significant problem for firefighters and emergency services in defending the structure and ensuring the safety of its inhabitants.

Water Supply

Water supply is a critical factor in the ability to fight wildland fires. Developments lacking an adequate water supply and hydrant taps create extra challenges for firefighting personnel. Another water supply issue is that of small diameter pipe water systems, which are inadequate to provide sustained fire-fighting flows.

Wildfire Hazard Assessment

Wildfire Hazard Identification

Hazard identification is the first phase of a hazard assessment, and is the process of estimating the geographic extent of the hazard, its intensity, and its probability of occurrence.²⁷ This process usually results in a hazard map. Hazard maps can provide detailed information in a clear format to the public and to policy and land use decisions makers.

(New 12/2010) Washington County has not experienced a significant wildfire event in the last 47 years; however, this does not indicate that the County is at low risk. The fire suppression agencies in Washington County respond to several wildland fires each year, but few of those fires grow to a significant size. Combining the ignition data from ODF and the State Fire Marshal's Office shows that there were 1,194 total ignitions resulting in 1,140 acres burned in Washington County between the years 1960-2005. According to national statistics, only 2% of all wildland fires escape initial attack. However, that 2% accounts for the majority of fire suppression expenditures and threatens lives, properties, and natural resources. Many of the fire professionals in Washington County believe it is not "if" there will be a large fire in this area; it is "when."²⁸

Wildfire hazard areas are commonly identified in regions of the wildland/urban interface. Ranges of the wildfire hazard are further determined by the ease of fire ignition due to natural or human conditions and the difficulty of fire suppression. The wildfire hazard is also magnified by several factors related to fire suppression/control, such as the surrounding fuel load, weather, topography, and property characteristics. Generally, hazard identification rating systems are based on weighted factors of fuels, weather, and topography. Indicators

of least dangerous to most dangerous illustrate each category. For example:

Roads and Signage

Steep; narrow; poorly signed	3
One or two of the above	2
Meets all requirements	1

Water Supply

None, except domestic	3
Hydrant, tank, or pool over 500 feet away	2
Hydrant, tank, or pool within 500 feet	1

Location of the Structure

Top of steep slope with brush/grass below	3
Mid-slope with clearance	2
Level with lawn, or watered groundcover	1

In order to determine the “base hazard factor” of specific wildfire hazard sites and interface regions, several factors must be taken into account. Categories used to assess the base hazard factor include:

- Topographic location, characteristics, and fuels;
- Site/building construction and design;
- Site/region fuel profile (landscaping);
- Defensible space;
- Accessibility;
- Fire protection response; and
- Water availability.

The use of Geographic Information System (GIS) technology in recent years has been a great asset to fire hazard assessment, allowing further integration of fuels, weather, and topography data for such ends as fire behavior prediction, watershed evaluation, mitigation strategies, and hazard mapping. As stated in the wildfire characteristics section of this chapter, the interface is not geographic in nature, but is associated with certain characteristics such as slope and vegetation. Based on these characteristics there are potential interface areas in Beaverton’s current annexable lands. Data at the time of publication was not comprehensive enough to make a determination on which lots were at risk. As development occurs to the northeast and the southwest, the issue of wildfire will need to be addressed.

Vulnerability Assessment

Vulnerability assessment is the second phase of a hazard assessment. It combines the information generated through hazard identification with an inventory of the existing development exposed to wildfire.

Vulnerability assessments assist in predicting how different types of property and population groups will be affected by a hazard.²⁹ Data that

includes the location of interface areas in the City can be used to assess the population and total value of property at risk from wildfire.

While a quantitative vulnerability assessment (an assessment that describes number of lives or amount of property exposed to the hazard) has not yet been conducted for Beaverton wildfire events, there are many qualitative factors (issues relating to what is in danger within a community) that point to potential vulnerability. There are many pockets of forested land scattered throughout the City. Whether lying in undeveloped areas or alongside heavily developed commercial or residential properties, these lands pose a significant wildland/urban interface fire threat. Although the City has no history of fires rising to the level of major emergency or disaster, the potential will increase as development near these hazard areas becomes more concentrated.

Risk Analysis

Risk analysis is the third, and most advanced phase of a hazard assessment. It builds upon hazard identification and vulnerability assessments.

Key factors included in assessing wildfire risk include ignition sources, building materials and design, community design, structural density, slope, vegetative fuel, fire occurrence, and weather, as well as occurrences of drought. At the time of publication of this plan, data was insufficient to conduct a risk analysis and the software needed to conduct this type of analysis was not available.

The National Wildland/Urban Fire Protection Program has developed a Wildland/Urban Fire Hazard Assessment Methodology tool for communities to assess their risk to wildfire. For more information on wildfire hazard assessment refer to www.Firewise.org.

Strategic Planning Areas in Washington County (New 03/2011)³⁰

Washington County's Community Wildfire Protection Plan divides Washington County into subregions which they felt not only had similar fuel conditions, but also would require similar initial attack techniques. These subregions are referred to as 'Strategic Planning Areas' or SPAs. Typically, SPA boundaries lie along local fire district boundaries. The names of identified SPAs in Washington County are:

- Banks
- Cochran
- Cornelius
- Forest Grove
- Gaston
- Hillsboro
- Scoggins
- Tualatin Valley
- Tupper Ranch
- Washington

Tualatin Valley Strategic Planning Area

The Tualatin Valley Strategic Planning Area (SPA), lies on the east side of Washington County and is bordered on the east by Clackamas and Multnomah Counties, and on the southeast by Yamhill County. The Tualatin Valley SPA includes the cities of Beaverton, Durham, Sherwood, Tigard, and Tualatin and the communities of Aloha, Garden Home, Reedville, Six Corners, and Metzger.

Overall, the Tualatin Valley SPA is a high-density urban area with some agriculture and occluded woodlands. The terrain is mostly flat to rolling with prominent highlands in the north, central and southern part of the SPA. The land ownership is primarily private with a small amount owned by city and county government, utilities, Tualatin Hills Park and Rec, and Metro Parks. Many of the occluded woodlands abut structures and subdivisions.

Fire Potential

The wildfire potential in the Tualatin Valley SPA is relatively low. The occluded woodlands, parks and open space have a heavy accumulation of “wildland” fuels. These woodland areas intermingle in places with extensive urban residential and industrial development. Due to the presence of many watchful eyes, and rapid response of firefighting equipment, a wildfire in the occluded woodlands or parks would be quickly detected and extinguished under normal conditions. However, due to the nature of the fuels in these areas, and under extreme fire conditions with high winds, a large number of homes and lives adjacent to the fuels could be at risk.

Ingress-Egress

Primary ingress-egress routes in the Tualatin Valley SPA includes State Route 8 (Tualatin Valley Highway), State Route 10 (Beaverton Hillsdale Highway/Farmington Road), State Route 210 (Scholls Ferry Road), Tualatin-Sherwood Road, and Highway 26 (Sunset Highway) which run east and west. State Route 99W runs through the south central part of the SPA and State Route 217 runs through the central part of the SPA. Interstate 5 runs through the far southeast corner of the SPA. There are many other access routes; all are paved, two-lane roads usually congested at various times during the day.

Infrastructure

Most residents within city limits and in unincorporated areas of the SPA have access to a municipal water system. Those without service from a municipal systems typically rely on personal or multiple home well systems.

Above ground public transmission lines crisscross the SPA. Most transmission lines travel along roads and highways. Power and phone service throughout the SPA is located both above and below ground.

The Pacific and Western Railroad operates several rail lines passing through the Tualatin Valley SPA. Trains on these lines travel through

Sherwood, Tualatin, and Beaverton on their way to the Stimson-Forestex Mill northwest of Gaston.

Fire Protection

Tualatin Valley Fire and Rescue provides fire and rescue services to the Tualatin Valley SPA as well as areas outside the county. Mutual aid agreements supplement that service when needed.

Risk Assessment

Wildfire risk in the urban portions of the Tualatin Valley SPA is low due to the lack of wildland fuels in the cities. However, scattered throughout the SPA, are pockets of occluded wildland fuels, wooded highlands, parks and open space areas with high wildland fire potential. These areas include the Bull Mountain, Cooper Mountain and Parrett Mountain areas and parks as well as open space and developed waterways maintained by Metro Parks, the Tualatin Hills Park and Recreation District, and city park departments. In many of these areas, housing developments and industry abut wooded stream channels and large woodlots creating high wildland fire risk under extreme fire conditions. Due to the high density of people living next to these areas; there is a potential for high loss of life and property under extreme wildfire conditions.

Mitigation Activities

As with all Strategic Planning Areas, identifying the risk is the first step in prevention. Educating the people residing in developed areas adjacent to urban parks and wooded stream courses on the existing wildfire potential would be a high priority. Areas of risk need to be identified and a defensible space developed around structures and along access routes to lessen the potential threat. Home and business owners in those areas should be required to prune landscape plants and maintain a green zone around their structures. Wildland fuel owners need to be contacted, educated, encouraged, and assisted in reducing wildland fuels adjacent to their neighbors.

Mitigation Plan Goals and Existing Activities

The mitigation plan goals and action items are derived from a review of city, county, regional, state and national natural hazards mitigation plans and planning literature, guidance from the Beaverton Natural Hazards Mitigation Steering Committee, and interviews with both Beaverton and Washington County stakeholders. Goals for this mitigation plan address four categories:

1. Protect Human Life, Commerce, Property and Natural Systems
2. Improve Partnerships for Communication and Coordination
3. Enhance Emergency Services
4. Ensure Implementation of Mitigation Activities

Existing Mitigation Activities

Existing mitigation activities include current mitigation programs and activities that are being implemented by city, county, regional, state, or federal agencies and organizations.

Local Programs

Tualatin Valley Fire and Rescue (TVFR)

Tualatin Valley Fire and Rescue fire fighting crews are actively working on public education and homeowner responsibility by visiting neighborhoods and explaining hazards to citizens. They hand deliver informative brochures and encourage citizens to clearly mark their address on the roadway to ensure more rapid and accurate response to calls and better access. The District has identified urban/wildland interface areas using criteria outlined by the Department of Forestry. The District crews hope to conduct community meetings in the future to further reach out to their constituents and personally inform them of wildfire hazard mitigation strategies.

Regional Programs

Building Codes

City, county, state, and local jurisdictions work together to establish and ultimately implement building codes. These codes apply to new development, dwellings and structures, retrofitting, and siting. The process begins with the establishment of the code at the state level, and is then implemented locally. For example, once the State of Oregon establishes a building code, the City of Beaverton implements the code for its residents. Some fire mitigation standards covered by codes are: Locating in a fire protection district or ensuring fire protection through contract;

- Identification of water supply;
- Provision of adequate road access;
- Establishing fire breaks;
- Meeting slope requirements;
- Using fire retardant roofs; and
- Installing spark arresters on chimneys.

For more information on forestland zones consult the Oregon Department of Land Conservation and Development; Statewide Goal 4 – Forestlands and Oregon Administrative Rules 660-006.

State Programs

Oregon Revised Statute 215.730:

ORS 215.730, Additional Criteria for Forestland Dwellings, provides criteria for approving dwellings located on lands zoned for forest and mixed agriculture/forest use. Under its provisions, county governments must require, as a condition of approval, that single-family dwellings on lands zoned as forestland meet the following requirements:

1. Dwelling has a fire retardant roof;
2. Dwelling will not be sited on a slope of greater than 40 percent;
3. Evidence is provided that the domestic water supply is from a source authorized by the Water Resources Department and not from a Class II stream as designated by the State Board of Forestry;
4. Dwelling is located upon a parcel within a fire protection district or is provided with residential fire protection by contract;
5. If dwelling is not within a fire protection district, the applicant provides evidence that the applicant has asked to be included in the nearest such district;
6. If dwelling has a chimney or chimneys, each chimney has a spark arrester; and
7. Dwelling owner provides and maintains a primary fuel-free break and secondary break areas on land surrounding the dwelling that is owned or controlled by the owner.

If a governing body determines that meeting the fourth requirement is impractical, local officials can approve an alternative means for protecting the dwelling from fire hazards.

Oregon Revised Statute 477.015-061

Provisions in ORS 477.015-061, Urban Interface Fire Protection, were established through efforts of the Oregon Department of

Forestry, the Office of the State Fire Marshal, fire service agencies from across the state, and the Commissioners of Deschutes, Jefferson, and Jackson Counties. It is innovative legislation designed to address the expanding interface wildfire problem within Oregon Department of Forestry Fire Protection Districts. Full implementation of the statute will occur on or after January 1, 2002. The statute does the following:

1. Directs the State Forester to establish a system of classifying forestland-urban interface areas;
2. Defines forestland-urban interface areas;
3. Provides education to property owners about fire hazards in forestland-urban interface areas. Allows for a forestland-urban interface county committee to establish classification standards;
4. Requires maps identifying classified areas to be made public;
5. Requires public hearings and mailings to affected property owners on proposed classifications;
6. Allows property owners appeal rights;
7. Directs the Board of Forestry to promulgate rules that set minimum acceptable standards to minimize and mitigate fire hazards within forestland-urban interface areas; and

8. Creates a certification system for property owners meeting acceptable standards. Establishes a \$100,000 liability limit for cost of suppressing fires, if certification requirements are not met.

478.120 Inclusion of forestland in district. The authority to include forestland within a rural fire protection district pursuant to ORS 478.010 (2)(c) applies to forestland within the exterior boundaries of an existing district and to forestland on which structures subject to damage by fire have been added after July 20, 1973.

478.140 Procedure for adding land to district by consent of owner. Any owner consenting to add the forestland of the owner to the district under ORS 478.010 (2)(c) shall do so on forms supplied by the Department of Revenue. The owner shall file the original with the district. The district shall forward a copy to the assessor of each county in which the land is located, within 20 days of receipt.

478.910 Adoption of fire prevention code. A district board may, in accordance with ORS 198.510 to 198.600, adopt a fire prevention code.

478.920 Scope of fire prevention code. The fire prevention code may provide reasonable regulations relating to:

- (1) Prevention and suppression of fires.
- (2) Mobile fire apparatus means of approach to buildings and structures.
- (3) Providing fire-fighting water supplies and fire detection and suppression apparatus adequate for the protection of buildings and structures.
- (4) Storage and use of combustibles and explosives.
- (5) Construction, maintenance and regulation of fire escapes.
- (6) Means and adequacy of exit in case of fires and the regulation and maintenance of fire and life safety features in factories, asylums, hospitals, churches, schools, halls, theaters, amphitheaters, all buildings, except private residences, which are occupied for sleeping purposes, and all other places where large numbers of persons work, live, or congregate from time to time for any purpose.
- (7) Requiring the issuance of permits by the fire chief of the district before burning trash or waste materials.
- (8) Providing for the inspection of premises by officers designated by the board of directors, and requiring the removal of fire hazards found on premises at such inspections.

478.927 Building permit review for fire prevention code. A district adopting a fire prevention code shall provide plan review at the agency of the city or county responsible for the issuance of building permits for the orderly administration of that portion of the fire prevention code that requires approval prior to the issuance of building

Senate Bill 360

Senate Bill 360, passed in 1997, is state legislation put in place to address the growing wildland/urban interface problem. The bill has three purposes:

1. To provide an interface fire protection system in Oregon to minimize cost and risk and maximize effectiveness and efficiency;
2. To promote and encourage property owners' efforts to minimize and mitigate fire hazards and risks; and
3. To promote and encourage involvement of all levels of government and the private sector in interface solutions.³¹

The bill has a five-year implementation plan that includes public education and outreach, and the development of rules, standards, and guidelines that address landowner and agency responsibilities. The success of Senate Bill 360 depends upon cooperation among local and regional fire departments, fire prevention cooperatives, and the Oregon Department of Forestry, which means interagency collaboration is vital for successful implementation of the bill. This cooperation is important in all aspects of wildland firefighting. Resources and funding are often limited, and no single agency has enough resources to tackle a tough fire season alone. The introductory language of Senate Bill 360 states: "The fire protection needs of the interface must be satisfied if we are to meet the basic policy of the protection of human life, natural resources, and personal property. This protection must be provided in an efficient and effective manner, and in a cooperative partnership approach between property owners, local citizens, government leaders, and fire protection agencies."

Oregon Department of Forestry

ODF is involved with local fire chiefs and local fire departments to provide training. Local firefighters can get a range of experience from exposure to wildland firefighting. Local firefighters can also obtain their red card (wildland fire training documentation), and attend extensive workshops combining elements of structural and wildland firefighting, defending homes, and operations experience.³²

ODF has been involved with emergency managers to provide support during non-fire events and for years, ODF has worked with industrial partners (big timber companies) to share equipment in the case of extremely large fires.³³

Federal Programs

The proposed role of the federal land managing agencies, such as the U.S. Forest Service and the Bureau of Land Management, in the wildland/urban interface is diverse. Their roles include: reducing fuel hazards on the lands they administer; cooperating in prevention and education programs; providing technical and financial assistance; and developing agreements, partnerships, and relationships with property owners, local protection agencies, states, and other stakeholders in wildland/urban interface areas. These relationships focus on activities

before a fire occurs, which render structures and communities safer and better able to survive a fire occurrence.³⁴

Federal Emergency Management Agency Programs

The Federal Emergency Management Agency (FEMA) is directly responsible for providing fire suppression assistance grants and, in certain cases, major disaster assistance and hazard mitigation grants in response to fires. The role of FEMA in the wildland/urban interface is to encourage comprehensive disaster preparedness plans and programs, increase the capability of state and local governments, and provide for a greater understanding of FEMA's programs at the federal, state, and local levels.³⁵

Fire Suppression Assistance Grants

Fire Suppression Assistance Grants may be provided to a state with an approved hazard mitigation plan for the suppression of a forest or grassland fire that threatens to become a major disaster on public or private lands. These grants are provided to protect life and improved property, and encourage the development and implementation of viable multi-hazard mitigation measures, and provide training to clarify FEMA's programs. The grant may include funds for equipment, supplies, and personnel. A

States must have an approved hazard mitigation plan in place to receive either a Fire Suppression Assistance Grant or a Hazard Mitigation Grant.

Fire Suppression Assistance Grant is the form of assistance most often provided by FEMA to a state for a fire. The grants are cost-shared with states. Once the federal grant money is provided to the State, it is then passed along to local jurisdictions. This money would ultimately be passed along to the City of Beaverton to be applied to projects. FEMA's US Fire Administration (USFA) provides public education materials addressing wildland/urban interface issues, and the USFA's National Fire Academy provides training programs.³⁶

Hazard Mitigation Grant Program

Following a major disaster declaration, the FEMA Hazard Mitigation Grant Program provides funding for long-term hazard mitigation projects and activities to reduce the possibility of damages from all future fire hazards and to reduce the costs to the nation for responding to and recovering from the disaster.

National Wildland/Urban Interface Fire Protection Program

Federal agencies can use the National Wildland/Urban Interface Fire Protection Program to focus on wildland/urban interface fire protection issues and actions. The Western Governors' Association (WGA) can act as a catalyst to involve state agencies, as well as local and private stakeholders, with the objective of developing an implementation plan to achieve a uniform, integrated national approach to hazard and risk assessment and fire prevention and protection in the wildland/urban interface. The program helps states develop viable and comprehensive wildland fire mitigation plans and performance-based partnerships.

US Forest Service

The US Forest Service (USFS) is involved in a fuel-loading program implemented to assess fuels and reduce hazardous buildup on US forestlands. The USFS is a cooperating agency and, while it does not have jurisdiction in Beaverton city limits, it still has an interest in preventing fires in the interface, as fires often burn up the hills and into the higher elevation US forestlands.³⁷ This will especially be an important issue as Beaverton annexes land in the wildland-urban interface in the future.

Other Mitigation Programs and Activities

Some areas of the country are facing wildland/urban issues collaboratively. These are model programs that include local solutions. One example of this is in Ashland, Oregon. Because of the highly flammable slopes above Ashland, homeowners in the wildland urban interface face a high risk of encountering a wildland fire. The City has partnered with local organizations to help coordinate mitigation strategies with homeowners in high-risk areas. Currently, more than 40 acres have been treated in the interface above Ashland.³⁸ Treatment has included thinning of tree stands, removing of highly flammable noxious weeds (i.e. Scotch broom), and the creation of fuel breaks along ridge tops most susceptible to wildland fire. The City has contributed approximately \$500,000 dollars towards cost shares with homeowners to help reduce fuels near their homes.³⁹ In California, the Los Angeles County Fire Department has retrofitted more than 100 fire engines with fire retardant foam capability, and Orange County is evaluating a pilot insurance grading and rating schedule specific to the wildland/urban interface. Both are examples of successful programs that demonstrate the value of pre-suppression and prevention efforts when combined with property owner support to mitigate hazards within the wildland/urban interface.⁴⁰

Prescribed Burning

The health and condition of a forest will determine the magnitude of a wildfire. If fuels – slash, dry or dead vegetation, fallen limbs and branches – are allowed to accumulate over long periods of time without being methodically cleared, fire can move more quickly and destroy everything in its path. The results are more catastrophic than if the fuels are periodically eliminated. Prescribed burning is the most efficient method to get rid of these fuels. In 1998, 3,000 prescribed fires were used to burn approximately 163,000 acres statewide.⁴¹

“New data from National Forest Service fire ecologists shows that for every dollar spent on prescribed burning, forest thinning and the training of fire-management personnel, seven dollars worth of savings are realized in the costs of having to extinguish big fires. When that ratio is placed in the context of an average \$1 billion spent annually over the past decade on fire suppression, the implications of foresighted fire management are profound.”

The Nature Conservancy Magazine –
May/June 2001

Firewise

Firewise is a program developed within the National Wildland/Urban Interface Fire Protection

For more information on the Firewise program, contact:

The Wildland/Urban Interface Fire Program
c/o The National Fire Protection Association
1 Batterymarch Park, Quincy, MA 02269 -
<http://www.firewise.org>

Program, and it is the primary federal program addressing interface fire. It is administered through the National Wildfire Coordinating Group whose extensive list of participants includes a wide range of federal agencies. The program is intended to empower planners and decision makers at the local level. Through conferences and information dissemination, Firewise increases support for interface wildfire mitigation by educating professionals and the general public about hazard evaluation and policy implementation techniques. Firewise offers online wildfire protection information and checklists, as well as listings of other publications, videos, and conferences. The interactive home page allows users to ask fire protection experts questions, and to register for new information as it becomes available.

For information on FireFree, contact:

SAFECO Plaza T-8,
Seattle, WA 98185, (206) 545-6188
<http://www.FireFree.org>

FireFree Program

FireFree is a unique private/public program for interface wildfire mitigation involving partnerships between an insurance company and local government agencies. It is an example of an effective non-regulatory approach to hazard mitigation. Originating in Bend, the program was developed in response to the city's "Skeleton Fire" of 1996, which burned over 17,000 acres and damaged or destroyed 30 homes and structures.⁴² Bend sought to create a new kind of public education initiative that emphasized local involvement. SAFECO Insurance Corporation was a willing collaborator in this effort. Bend's pilot program included:

- A short video production featuring local citizens as actors, made available at local video stores, libraries, and fire stations;
- Two city-wide yard debris removal events;
- A 30-minute program on a model FireFree home, aired on a local cable television station; and
- Distribution of brochures, featuring a property owner's evaluation checklist and a listing of fire-resistant indigenous plants.

The success of the program helped to secure \$300,000 in Federal Emergency Management Agency (FEMA) “Project Impact” matching funds. By fostering local community involvement, FireFree also has the potential for building support for sound interface wildfire policy

Wildfire Mitigation Action Items (Revised 03/2011)

The wildfire mitigation action items provide direction on specific activities that organizations and residents in Beaverton can undertake to reduce risk and prevent loss from wildfire events. There are three long-term wildfire action items described below. Each action item is followed by ideas for implementation, which can be used by the steering committee and local decision makers in pursuing strategies for implementation.

LT-WF#1 Encourage the creation and adoption of wildland interface maps to build development requirements that assist wildfire mitigation.

- **Completed** – Maps were developed as part of the development of Washington County Community Wildfire Protection Plan.

Plan Goals Addressed: Develop and implement activities to protect human life, commerce, property, and natural systems from natural hazards; Improve Partnerships for Communication and Coordination

LT-WF#2: Develop and implement, or enhance existing outreach and education programs aimed at mitigating wildfire hazards and reducing or preventing the exposure of citizens, public agencies, private property owners, and businesses to natural hazards.

Possible Actions **Outreach**

- Visit urban interface neighborhoods and conduct site assessments, education and outreach activities;
- Conduct specific community-based demonstration projects of fire prevention and mitigation in the urban interface;
- Establish neighborhood “drive-through” activities that pinpoint site-specific mitigation activities. Fire crews can give property owners personal suggestions and assistance; and
- Perform public outreach and information activities at Beaverton fire stations by creating “Wildfire Awareness Week” activities. Fire stations can hold open houses and allow the public to visit, see the equipment, and discuss wildfire mitigation with the station crews.

Education

- Encourage communities in the wildland/urban interface to develop public awareness programs and land use development policies that ensure specific recommendations for wildfire mitigation policies, programs, and community-based activities will be implemented; and
- Develop a “preventative approach” campaign by educating the public on hazardous human activities that must be regulated and controlled because of the danger of starting fires, including enforcement of existing “no burn” policy.

Coordinating Organization: City of Beaverton

Internal Partners: Emergency Management, Mayor’s Office - Neighborhood Program, Community Development Department

External Partners: School Districts, Oregon Emergency Management (OEM), Oregon Department of Forestry (ODF), Firewise, FireFree, Washington County

Timeline: On-going

Plan Goals Addressed: Improve Partnerships for Communication and Coordination; Protect Human Life, Commerce, Property and Natural Systems

LT-WF#3: Increase communication, coordination, and collaboration between wildland/urban interface property owners, city and county planners, and fire prevention crews and officials to address inherent risks in wildland/urban interface areas, available prevention/protection measures, and federal mitigation assistance programs.

Possible Actions

- Encourage zoning and planning entities to work closely with landowners and/or developers in mapped wildland/urban interface areas to identify and mitigate conditions that aggravate wildland/urban interface wildfire hazards, including:
- Limited access for emergency equipment due to width and grade of roadways;
- Inadequate water supplies and the spacing, consistency, and species of vegetation around structures;
- Inadequate fuel breaks, or lack of defensible space;
- Highly flammable construction materials;
- Building lots and subdivisions that are not in compliance with state and local land use and fire protection regulations; and
- Inadequate entry/escape routes.
- Inadequate water pressure for fire suppression.

- Require all new homes and major remodels involving roofs or additions that are located in the interface to have fire resistant roofs.
- Provide education and training to the public to assess if their homes meet fire safety performance standards.
- Encourage the public to evaluate access routes to homes for fire-fighting vehicles and to develop passable routes if they do not exist.
- Review development and building codes to ensure adequate requirements for sprinkler systems, setbacks, etc in identified wildland interface areas.

Coordinating Organization: City of Beaverton
Internal Partners: Emergency Management, Community Development Department
External Partners: Washington County, Oregon Department of Forestry (ODF), Office of the State Fire Marshal, Tualatin Valley Fire and Rescue District
Timeline: Future Plan Cycle
Plan Goals Addressed: Improve Partnerships for Communication and Coordination, Protect Human Life, Commerce, Property and Natural Systems; Enhance Emergency Services

Wildfire Resource Directory

(Revised 03/2011) – See Appendix G: Consolidated Resource Directory.

Wildfire Endnotes

¹ Colorado State Forest Service, (July 2001), <http://205.169.13.227/depts/emmgmt/wildfireproblem.htm>.

² *Planning for Natural Hazards: The Oregon Technical Resource Guide*, (July 2000), Department of Land Conservation and Development, Ch. 7.

³ Wilkinson, Todd. "Prometheus Unbound," (May/June 2001), Nature Conservancy.

⁴ National Interagency Fire Center, *National Register of Urban Wildland Interface Communities Within the Vicinity of Federal Lands that are at High Risk from Wildfire*. (May 2001) <http://www.nifc.gov/fireplan/fedreg.html>.

⁵ United States Forest Service (April 2003)
<http://www.biscuitfire.com/facts.htm>

⁶ DeBano, Leonard; Neary, Daniel; Ffolliott, Peter, *Fire's Effects on Ecosystems*, 1998, pg. 21

⁷ Ibid 22

⁸ Ibid 22

⁹ Ibid 49

¹⁰ Ibid. pg. 304

¹¹ Ibid

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- ¹² *Planning for Natural Hazards: The Oregon Technical Resource Guide*, (July 2000), Department of Land Conservation and Development, Ch. 7.
- ¹³ Any Wildland-Urban Interface Issues Beaverton deals with would fall into this category.
- ¹⁴ Robert Olson Associates, *Metro Regional Hazard Mitigation Policy and Planning Guide*, (June 1999), Metro.
- ¹⁵ Introductory language in Senate Bill 360, (July 2001), ODF website, <http://www.odf.state.or.us/fireprot/sb360.html>.
- ¹⁶ *Planning for Natural Hazards: The Oregon Technical Resource Guide*, (July 2000), Department of Land Conservation and Development, Ch. 7.
- ¹⁷ DeBano, Leonard; Neary, Daniel; Ffolliott, Peter, *Fire's Effects on Ecosystems*, 1998, pg. 59.
- ¹⁸ Ibid
- ¹⁹ Washington County, OR, *Community Wildfire Protection Plan*, August 6, 2007
- ²⁰ *Planning for Natural Hazards: The Oregon Technical Resource Guide*, (July 2000), Department of Land Conservation and Development, Ch. 7.
- ²¹ Ibid.
- ²² Ibid.
- ²³ The Oregonian, Feb. 25, 2001.
- ²⁴ *Planning for Natural Hazards: The Oregon Technical Resource Guide*, (July 2000), Department of Land Conservation and Development, Ch. 7.
- ²⁵ Washington County, OR, *Community Wildfire Protection Plan*, August 6, 2007
- ²⁶ Colorado State Forest Service, (July 2001), <http://205.169.13.227/depts/emmgmt/wildfireproblem.htm>.
- ²⁷ Burby, R. (Ed.) *Cooperating with Nature: Confronting Natural Hazards with Land Use Planning for Sustainable Communities*. Washington D.C., (1998) Joseph Henry Press.
- ²⁸ Washington County, OR, *Community Wildfire Protection Plan*, August 6, 2007
- ²⁹ Burby, R. (Ed.) *Cooperating with Nature: Confronting Natural Hazards with Land Use Planning for Sustainable Communities*. Washington D.C., (1998) Joseph Henry Press.
- ³⁰ Washington County, OR, *Community Wildfire Protection Plan*, August 6, 2007
- ³¹ Oregon Department of Forestry, (1999) Oregon Forests Report.
- ³² Personal Interview. Jim Wolf, Oregon Department of Forestry, February 28, 2001.
- ³³ Ibid.
- ³⁴ Federal Wildland Fire Policy, (July 2001), <http://www.fs.fed.us/land/wdfire7c.htm>.
- ³⁵ Ibid.
- ³⁶ Ibid.
- ³⁷ Personal Interview. M.J. Harvey, United States Forest Service, March 1, 2001.
- ³⁸ Personal Interview, Bill Fleeger, Regional Ecosystem Applied Learning (REAL) Corps, June 30, 2003.
- ³⁹ Ibid.
- ⁴⁰ Personal Interview. M.J. Harvey, United States Forest Service, March 1, 2001.
- ⁴¹ Ibid.
- ⁴² <http://www.firewise.org/communities/ffoverview.pdf/> (Accessed 6/26/03)