



# Greater Bend Community Wildfire Protection Plan 2021

Prepared in cooperation with:



Copies of this plan are available at: <http://www.projectwildfire.org/cwpps/>

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# Executive Summary

## Purpose and Goals

Community Wildfire Protection Plans (CWPPs) are documents that are designed to be developed by a local group of stakeholders who are invested in the wildland fire threat to their area. The group of stakeholders typically consists of a representative from the fire department, the state forest management agency, local governments and especially property owners, in collaboration with federal land managers. Each of these representatives should bring their concerns regarding wildland fire to the discussion and propose solutions to their concerns.

Although reducing the risk of high-intensity wildland fire impacting the community is the primary motivation behind this plan, managing the larger landscape to restore forest health and more resilient conditions and improving fire response by all fire agencies are also discussed and addressed in the action plan. Continued efforts have been made by County, State and Federal land management agencies to reduce the threat of high-intensity wildland fires through education and fuels reduction activities on public lands. In addition, private property owners have responded enthusiastically to the defensible space and preparation guidelines and recommendations to reduce hazardous fuels on their own properties by participating in programs such as Firewise and FireFree. All of these activities allow the Greater Bend Area to become a more Fire Adapted Community. Since its creation in 2006, the Greater Bend CWPP has been revised three times (2011, 2016, 2021) by a local steering committee with the intention of decreasing the risks of high-intensity wildfire in the Greater Bend Area.

The 2021 Greater Bend CWPP will assist in the identification and prioritization of wildfire risk on all lands, including surrounding public lands. The Greater Bend CWPP identifies priorities and strategies for reducing hazardous wildland fuels while improving forest health, reducing structural vulnerability, supporting local industry and economy and improving fire protection capabilities. Addressing these goals in a cooperative, collaborative manner maintains alignment with the goals outlined in the National Cohesive Wildland Fire Management Strategy (Cohesive Strategy) – resilient landscapes, Fire Adapted Communities, and safe and effective wildfire response. For more information on Cohesive Strategy, visit <http://www.forestsandrangelands.gov/>.

The purpose of the Greater Bend CWPP is to:

- Protect lives and property from the negative impacts of wildland fire;
- Instill a sense of responsibility among property owners, visitors, conservation groups and federal, state and local agencies to take preventive actions regarding wildland fire;
- Provide guidance to federal agencies for implementing fuels reduction treatments;
- Prioritize the use of limited funds for the treatment of hazardous fuels;
- Grow and sustain fire-adapted community efforts;
- Increase public understanding of living in a fire-adapted ecosystem;
- Increase the Greater Bend’s ability to prepare for, respond to and recover from wildland fires;
- Restore fire-adapted ecosystems;
- Improve the fire resiliency of the landscape while protecting other social, economic and ecological values.

The Greater Bend CWPP integrates information from a variety of sources to present a

comprehensive picture of risk and possible treatments on the landscape and enables community organizations and their partners to act in a coordinated fashion. A completed plan also allows the adjacent federal land management agencies to make use of the expedited authorities provided by the Healthy Forest Initiative (HFI) and the Healthy Forest Restoration Act (HRFA). In addition, for communities seeking most federal grant funding, a completed CWPP is commonly a requirement. Lastly, developing a CWPP is a powerful tool to help get local property owners and visitors involved in fire protection efforts.

## **Planning Area Description**

The Greater Bend CWPP is multi-jurisdictional and addresses all lands and all ownerships within the boundaries of the plan area. Greater Bend is located in the center of Deschutes County and includes the City of Bend in its entirety in addition to the surrounding rural lands protected by Deschutes County Rural Fire Protection District #2. US Highway 97 and US Highway 20, major transportation routes through the state, intersect the plan area. The Greater Redmond CWPP joins the WUI on the north edge, the Sunriver CWPP borders to the south, the East West Deschutes County CWPP borders the plan to the east and west and the Greater Sisters CWPP borders it to the Northwest.

Bend, Oregon is located east of the Cascades and is the social, economic and recreational hub of Deschutes County. Deschutes County is the fastest growing county in Oregon and currently the Greater Bend Community Wildfire Protection Plan Boundary is home to 115,655 residents. Developed between 3,500 and 4,300 feet in elevations, in a classic wildland urban interface environment, the greater Bend area is also home to abundant wildlife including deer, elk, and many species of birds and fish. Within the planning area there is also a significant amount of public land with developed and dispersed recreation sites, which provide valuable recreation opportunities to both residents and visitors. In the summer months, Deschutes County estimates an additional transient population of up to 20,000 people that occupy these areas creating a seasonal challenge for those agencies responsible for fire suppression and evacuation.

Historically, the Bend area was a mix of forest types including ponderosa pine, some open tracts of western juniper, bitterbrush, sage and open grasslands. Forests in the higher elevations were composed of mixed conifers.

For the purposes of this plan, the area considered wildland urban interface (WUI) and the CWPP planning area are coincident. The Greater Bend CWPP boundary is approximately 364 square miles or 232,675 acres.

The CWPP planning area boundary lies within the larger area of the eastern Cascade slopes and foothills. The Deschutes River is a notable landmark that runs north/south through the center of the planning area. The larger area is dominated by western juniper, sagebrush, and grasses on the high desert as well as transitions from ponderosa pine to mixed conifer and lodgepole pine. The vegetation is adapted to the prevailing dry climate and is highly susceptible to wildland fire with major threats to the area each year. Volcanic cones and buttes dot the landscape across much of the region. Most of the communities in the area lie at an elevation of approximately 3,600 feet. The climate in Greater Bend is typical of the east slopes of the Cascade Mountains, with most of the annual precipitation coming as winter snow or fall and spring rains. Summers are dry and prone to frequent thunderstorms that may be wet or dry. These thunderstorms frequently cause multiple fire ignitions.

Today, with less stand management, logging activity, and highly effective wildland fire

suppression, the forestland is predominantly dense conifer forests consisting primarily of ponderosa and lodgepole pine. Much of the understory consists of dense bitterbrush with some areas of native bunchgrasses. The other main vegetation type is shrubland. Due to the lack of disturbance, vegetation has continued to become more and more overcrowded.

### **Wildland Fire Risk Assessment**

The CWPP steering committee used the Oregon Wildfire Risk Explorer tool that was created in partnership with the Oregon Department of Forestry (ODF) and the Institute for Natural Resources at Oregon State University (OSU) to undertake a wildland fire risk assessment and gauge the relative risk and hazard due to wildland fire for the lands and communities within the planning area. This tool is intended to direct the implementation of wildfire mitigation activities to the highest priority areas and promote cross-boundary coordination. The full risk assessment can be found in Appendix A.

### **Action Plan and Implementation**

The Steering Committee recognizes the Greater Bend CWPP is a living tool that can be used for multiple outcomes. The plan contains recommendations consistent with the three goals of the Cohesive Strategy (safe and effective wildfire response, Fire Adapted Communities and resilient landscapes), as well as prioritized recommendations and preferred treatment methods.

With critical needs assessed and priority areas identified through the risk assessment process, the Steering Committee identified the following recommendations to meet the purposes of the Greater Bend CWPP:

- Reduce hazardous fuels on public lands
- Reduce hazardous fuels on private lands
- Reduce structural vulnerability
- Increase education and awareness of the wildfire threat
- Identify, improve and protect critical transportation routes

## Declaration of Agreement

The Greater Bend Community Wildfire Protection Plan (CWPP) was originally completed and signed in May, 2006. Subsequent revisions were approved in 2011 and 2016. As directed by this CWPP, fuels reduction activities have been completed on public and private lands. Recent wildland fires have also impacted the landscape.

Under the Healthy Forests Restoration Act, the CWPP is approved by the applicable local government, the local fire department, and the state entity responsible for forest management. The plan makes reference to rules and regulations that may be legally binding, however this plan is not legally binding, as it does not create or place mandates or requirements on individual jurisdictions. It is intended to share information and serve as a planning tool for fire and land managers and property owners to assess risks associated with wildland fire and identify strategies and make recommendations for reducing those risks.

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Date

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Sally Russell, Mayor  
City of Bend

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Date

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Gordon Foster, Unit Forester  
Oregon Department of Forestry

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## Acknowledgements

In the true spirit of collaboration, the following people are acknowledged for their participation and commitment resulting in the 2021 Update of the Greater Bend CWPP.

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|--------------------|--|
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| Ben Duda           | Assistant Unit Forester, Oregon Department of Forestry |
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| Sheldon Rhonden    | Bureau of Land Management                              |
| Doug Green         | Bend Fire and Rescue                                   |
| Robert Newey       | US Forest Service                                      |
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| Terrance Highfield | Burlington Northern Santa Fe Railroad                  |
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| Jeff Crawford      | US Forest Service                                      |
| Ken Vaughan        | City of Bend   |
| Brian Rankin       | City of Bend   |
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## Purpose

Originally created in May 2006, the Greater Bend CWPP has been revised three times (2011, 2016 and 2021). This 2021 comprehensive revision maintains the original purpose and outlines the updated priorities, strategies and action plans for fuels reduction treatments in the Greater Bend area wildland-urban interface (WUI). This CWPP also addresses special areas of concern and makes recommendations for reducing structural vulnerability and creating defensible space. It is intended to be a living document for fuels reduction, educational, and other projects to decrease overall risks of loss from wildland fire and should be revisited at least annually to address its purpose, goals and associated outcomes.

Although reducing the risk of high-intensity wildland fire is the primary motivation behind this plan, managing the Greater Bend WUI for hazardous fuels reduction and fire resilience is only a part of the larger picture. Property owners and visitors desire healthy, fire-resilient forests and wildlands that provide habitat for wildlife, recreational opportunities, and scenic beauty. By establishing a more fire adapted community through work on public and private property and a more fire resilient landscape, the local fire response will be more successful.

The purpose of the Greater Bend CWPP is to:

- Protect lives and property from wildland fires;
- Instill a sense of personal responsibility for taking preventive actions regarding wildland fire;
- Increase public understanding of living in a fire-adapted ecosystem;
- Increase the community's ability to prepare for, respond to and recover from wildland fires;
- Restore fire-adapted ecosystems;
- Create and maintain fire adapted communities; and
- Improve the fire resilience of the landscape while protecting other social, economic and ecological values.

Wildland fire is a natural and necessary component of ecosystems across the country. Central Oregon is no exception. Historically, wildland fires have shaped the forests and wildlands valued by property owners and visitors. These landscapes, however, are now significantly altered due to fire prevention efforts, modern suppression activities and a general lack of low intensity fires, resulting in overgrown forests with dense fuels that burn more intensely than in the past. In addition, the recent increase in population has led to a swell in residential development into forested land, adding to the wildland-urban interface.

The 2021 Greater Bend CWPP will assist the City of Bend, Bend Fire and Rescue, Deschutes Rural Fire Dist. No 2, residents of Bend, local, state and federal governments in the identification of lands at risk from high-intensity wildland fire. The Greater Bend CWPP identifies priorities and strategies for reducing hazardous wildland fuels while improving forest health, supporting local industry and economy and improving fire protection capabilities. It also identifies strategies to address special areas of concern such as evacuation routes as well as outlines actions that individuals can take to help protect themselves against the threat of wildland fires.

## Planning Summary

### **CWPP Planning Process**

Eight steps are outlined to help guide Steering Committees through the planning process:

Step one: Convene the decision makers.

The Greater Bend CWPP Steering Committee reconvened in May 2021 to review the work completed within the WUI boundaries on public and private lands and reevaluate the priorities for future fuels reduction treatments. The Steering Committee is comprised of representatives from Bend Fire and Rescue, the Oregon Department of Forestry (ODF), The City of Bend, the United States Forest Service (USFS), Deschutes County and other stakeholders and members of the public.

Step two: Involve state and federal agencies.

The Healthy Forests Restoration Act (HFRA) directed communities to collaborate with local and state government representatives, in consultation with federal agencies and other interested parties in the development of a CWPP. The Steering Committee recognized the importance of this collaboration and involved not only members from the USFS but ODF and Deschutes County representatives as well. Each agency brought a wealth of information about fuels reduction efforts planned and completed along with educational information based on current research across the nation.

Step three: Engage interested parties.

The Steering Committee included representatives from the Communities at Risk, members of local businesses, road districts, homeowner/neighborhood associations, and other organizations and individuals. The Steering Committee encouraged a collaborative environment for the stakeholders to accomplish the 2016 revision of the Greater Bend CWPP. Collaboration and coordination between agencies, community members and landowners is the fundamental goal of the Cohesive Strategy

Step four: Establish a community base map.

The Steering Committee reviewed the previous maps and boundaries from the 2016 CWPP. The group approved the 2021 CWPP boundary.

Step five: Develop a community risk assessment.

The Steering Committee relied on the Oregon Wildfire Risk Explorer tool to create an Advanced Report (Appendix A).

Step six: Establish community hazard reduction priorities and recommendations to reduce structural ignitability.

Based on the report, the Steering Committee produced priorities for fuels reduction treatments on public and private lands. The Steering Committee also made recommendations to reduce structural ignitability based on information in the assessments and local knowledge.

Step seven: Develop an action plan and assessment strategy.

The Steering Committee identified an action plan for key projects; roles and responsibilities for carrying out the purpose of the CWPP; potential funding needs and the evaluation process for the CWPP itself.

Step eight: Finalize the Community Wildfire Protection Plan.

A draft of the Greater Bend CWPP was available for public comment for 30 days prior to the final signing and approval of the plan. Interested parties provided comments during this period. Bend Fire & Rescue, Deschutes County Rural Fire Protection District #2, Oregon Department of Forestry, The City of Bend and the Deschutes County Board of Commissioners, mutually approved the Greater Bend Community Wildfire Protection Plan as demonstrated in the Declaration of Agreement.

### **Policy Background Related to CWPPs**

In 2002, President George W. Bush established the Healthy Forests Initiative (HFI) to improve regulatory processes to ensure more timely decisions, greater efficiency and better results in reducing the risk of high-intensity wildfire. This initiative allowed forest management agencies to expedite the documentation process for the purpose of reducing hazardous fuels on public lands. In 2003, Congress passed historical bi-partisan legislation: The Healthy Forests Restoration Act (HFRA). This legislation directs federal agencies to collaborate with communities in developing a CWPP that includes the identification and prioritization of areas needing hazardous fuels treatment. It further provides authorities to expedite the National Environmental Protection Act (NEPA) process for fuels reduction projects on federal lands. The act also requires that 50% of funding allocated to fuels projects be used in the community-defined wildland-urban interface. Communities now have the opportunity to participate in determining where federal agencies place their fuels reduction efforts. With a CWPP in place, community groups can apply for federal grants to treat hazardous fuels and address special concerns to reduce the risk of catastrophic loss as a result of wildland fire.

Although some of the authorities under HFI and HFRA have been subsequently challenged in federal courts, the original intent and authorities under each remain the same.

In 2009, Congress passed the Federal Land Assistance, Management, and Enhancement (FLAME) Act and called for a National Cohesive Wildland Fire Management Strategy to address wildland fire-related issues across the nation in a collaborative, cohesive manner. The Cohesive Strategy was finalized in 2014 and represents the evolution of national fire policy and states in part.

***To safely and effectively extinguish fire, when needed; use fire where allowable; manage our natural resources; and as a Nation, live with wildland fire.***

The primary, national goals identified as necessary to achieving the vision are:

- **Resilient landscapes:** Landscapes across all jurisdictions are resilient to fire-related disturbances in accordance with management objectives.
- **Fire-Adapted Communities:** Human populations and infrastructure can withstand a wildfire without loss of life and property.
- **Wildfire response:** All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildfire management decisions.

### **History of the Greater Bend CWPP**

Since its creation in 2006, the Greater Bend CWPP has been revised two times in 2011 and 2016 with the intention of decreasing the risks of high-intensity wildfire in the Greater Bend area. The last revision of the Greater Bend CWPP was finalized in 2016. Since that time continued efforts have been made by city, county, state and federal land management agencies to reduce the threat of high-intensity wildland fires through education and fuels reduction activities on public lands. In addition, private property owners have responded enthusiastically to the defensible space and preparation guidelines and recommendations to reduce hazardous fuels on their own properties.

In keeping with the strategy of the original Greater Bend CWPP, the Steering Committee reconvened in 2021 and revisited the planning outline in *Preparing a CWPP: A Handbook for Wildland-Urban Interface Communities* (Communities Committee, Society of American Foresters, National Association of Counties, and National Association of State Foresters 2006); and Deschutes County Resolution 2004-093.

The Greater Bend CWPP Steering Committee includes representatives from Bend Fire and Rescue, The City of Bend, Deschutes Rural Fire Dist. No 2, ODF, USFS, BLM and Deschutes County along with members of the Greater Bend area public.

The importance of collaboration with neighboring CWPPs is recognized by the Steering Committee and is referenced throughout this CWPP as documentation of collaborative efforts to maximize hazardous fuels reduction efforts in the area. The Steering Committee agrees that the Greater Bend CWPP will be a living document, intended to promote fuels reduction, education, and other projects to decrease overall risks of loss from wildland fire; it is intended to be revisited at least annually to address its purpose.

## Planning Area Description

Deschutes County continues to be the fastest growing county in Oregon, according to [Portland State University](#). The combined population of the City of Bend and that portion of Deschutes County within the Greater Bend Community Wildfire Protection Plan Boundary is home to 115,655 residents. The City of Bend anticipates continued growth.

US Highway 97, a major transportation route through the state, runs north to south, through the middle of the city of Bend. US Highway 20 also intersects the city of Bend in the north and east part of town. As central Oregon grows, more residents and tourists crowd the highway and increase congestion, particularly during the summer months when fire season reaches its peak. As part of the central community, transportation routes are included in the consideration of the WUI boundary due to their critical role as roads and travel corridors that link communities together and serve as evacuation routes.

The community is located at 3,500 and 4,300 feet in elevations, in a classic wildland urban interface environment, the greater Bend area is also home to abundant wildlife including deer, elk, and many species of birds and fish. Within the planning area there is also a significant amount of public land with developed and dispersed recreation sites, which provide valuable recreation opportunities to both residents and visitors. In the summer months, Deschutes County is highly impacted by additional transient population of thousands of people that occupy these areas creating a seasonal challenge for those agencies responsible for fire suppression and evacuation.

Historically, the Bend area was a mix of forest types including ponderosa pine, some open tracts of western juniper, bitterbrush, sage and open grasslands. Forests in the higher elevations were composed of mixed conifers. The climate in greater Bend is typical of the east slopes of the Cascade Mountains, with most of the annual precipitation coming as winter snow or fall and spring rains. Summers are dry and prone to frequent thunderstorms with lightning storms producing multiple fire ignitions.

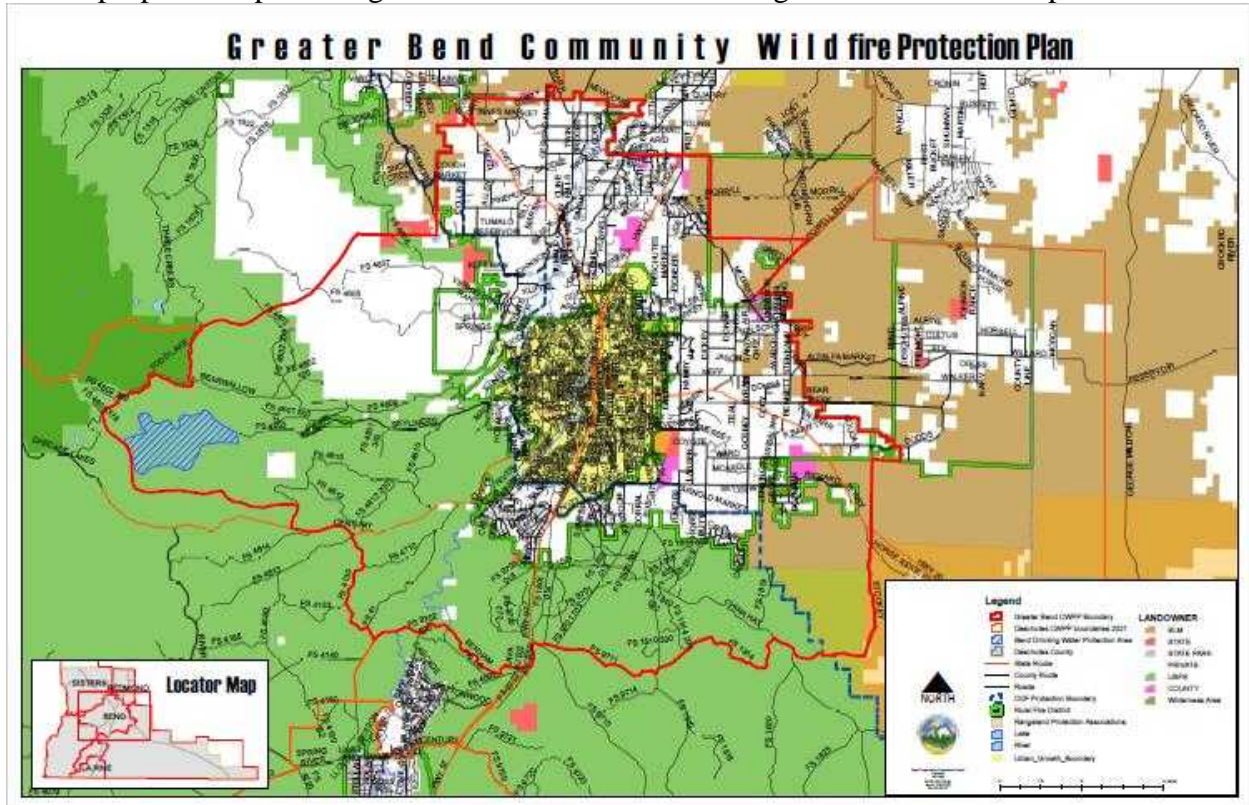
Today, with more development into the wildland urban interface, less stand management, less logging activity and highly effective wildland fire suppression, the greater Bend area is characterized by thicker stands of western juniper on the north and east sides with ponderosa pine, bitterbrush and bunchgrasses to the west and south. In some areas, a variety of noxious weeds are crowding out the native grasses and shrubs. The higher elevations are still a mix of conifers including ponderosa pine.

The community of Bend presents a unique challenge for the wildfire planning process. Although the core urban area is not at significant risk from wildfire due to the amount of development and lack of vegetation, there are areas adjacent to the core of Bend are characterized by large trees and excessive ground vegetation or “ladder fuels” that contribute to its scenic beauty *and* the overall wildland fire risk. Closed canopies are rare inside the city limits. There are significant areas of hazardous wildland fuels intermixed with homes and businesses that in the event of a grass or brush fire could sustain a wildland fire event with catastrophic losses likely. These areas are also susceptible to ember showers from large wildland fire events nearby.



## Community Base Map

The steering committee reviewed the planning area base map and confirmed the boundaries that the Greater Bend CWPP addresses. This area is shown in the base map below and was also used for the purposes of producing the risk assessment in the Oregon Wildfire Risk Explorer.



## Communities at Risk

The Healthy Forest Initiative (HFI) and the Healthy Forests Restoration Act (HFRA) define a “community at risk” from wildland fire as one that:

- is a group of homes and other structures with basic infrastructure and services (such as utilities and collectively maintained transportation routes) in or adjacent to federal land;
- has conditions conducive to large-scale wildland fire; and
- faces a significant threat to human life or property as a result of a wildland fire.

For the purposes of this plan, the lands and associated homes and structures within the planning area boundary of the Greater Bend CWPP constitute the Community at Risk.

## Wildland Urban Interface Definition

The Steering Committee defines the WUI as any developed area where conditions affecting the combustibility of both wildland and built fuels allow for the ignition and spread of wildfire. The Steering Committee reviewed and approved the WUI boundaries of the 2021 CWPP. The Greater Bend CWPP joins the WUI on the north edge, the Sunriver CWPP borders to the south, the East West Deschutes County CWPP borders the plan to the east and west and the Greater Sisters CWPP borders it to the Northwest. For the purposes of this plan, the area considered wildland

urban interface (WUI) and the CWPP planning area identified on the above base map are coincident. The Greater Bend CWPP boundary is approximately 364 square miles or 232,675 acres.

### Fuel Hazards and Ecotypes

The vegetation in the Greater Bend Area includes:

- Ponderosa pine
- Lodgepole
- Mixed Conifer
- Western juniper
- Bitterbrush
- Manzanita
- Sagebrush
- Cheat Grass

Historically, ponderosa pine forests contained more understory grasses and less shrubs than are present today. These plants combined with fallen pine needles, formed fast-burning fuels that led to recurrent widespread burning. Frequent low-intensity ground fires that occurred every 11-15 years characterize the historical fire regime for ponderosa pine. The pattern of low ground fires and stand dynamics resulted in the open park-like conditions that early inhabitants and visitors found in the region. Less stand management, logging activity and highly effective wildland fire suppression, have significantly altered the ponderosa pine forest type. Removal of the older, larger thick-bark pines has dramatically decreased clumpy open forests, replacing them with more evenly spaced and younger “black-bark” forests. Similar to other species of conifer forest types, the suppression of fire has greatly increased the stocking levels (number of trees) and density of trees, creating ladder fuels and putting the stands at risk of attack from insects and disease. These factors have contributed to more intense fires in ponderosa pine forests in recent years.



Mature lodgepole pine stands in central Oregon are characterized by dense, uniform stands, an absence of other species, and a general lack of understory shrubs or forbs (although bitterbrush is often found with mature lodgepole pine). Lodgepole pine forests exhibit a moderate severity fire regime with a fire return interval between 60 and 80 years. Fire in lodgepole pine stands can be low, moderate, or severe over time and often result in full stand replacement. In addition to fire, mountain pine beetles are worth noting as a significant disturbance agent as the two processes are linked.







Mixed conifer (wet and dry) is a complex forest type that varies considerably depending on elevation and site conditions. In the plan area, dry mixed conifer and wet mixed conifer forest types occur, depending on the elevation.

The dry mixed conifer includes Douglas fir, ponderosa pine, lodgepole pine, western larch and true fir. Found at elevations ranging from 3,600 feet to 4,500 feet, it occupies a transitional zone between the higher elevation mixed conifer zone and the true ponderosa pine or lodgepole pine zone.

The wet mixed conifer is found in the higher elevations (4,000 – 7,000 feet) on the west side of the fire plan area. Similar to the dry mixed conifer sites, vegetation consists of Douglas fir, white fir, ponderosa pine, western larch, and lodgepole pine. Spruce can be found in the wetter riparian areas. The historical range of fire intervals in the wet and dry mixed conifer varies considerably; from 35 to 200 years and can be of variable intensity; from low intensity maintenance burns to stand replacement events.

Western juniper occurs mainly in the northern and eastern sections of the Greater Bend WUI. The fire history of western juniper is characterized by fire that occurs approximately every 30 years and is generally limited by the availability of fuels. Western juniper trees have thin bark and fires kill them easily. Western juniper appears to be expanding its range over the previous century.



Manzanita is a shrub that occurs throughout the Greater Bend CWPP area but minimally within the community of Greater Bend, usually mixed with other shrub species such as bitterbrush, rabbitbrush and wax currant. Manzanita is established both through sprouts and seeds that are stimulated by fire. Fires in manzanita are conducive to rapid and extensive fire spread due to both physical and chemical characteristics. Manzanita is particularly susceptible to fire due to its stand density, presence of volatile materials in the leaves, low moisture content of the foliage and persistence of dead branches and stems.

Bitterbrush occurs throughout the Greater Bend CWPP area on all aspects and elevations. Fire severely damages bitterbrush, especially if rain is not received shortly after a burn. Bitterbrush is fire dependent, but not fire resistant. It regenerates mostly from seed after a fire and is often from caches of seeds made by rodents. Bitterbrush will sprout after burning regardless of the severity of the burn and matures relatively quickly. Consequently, the Greater Bend wildland-urban interface area



has patches of bitterbrush that provide fire-ready ladder fuels for taller tree stands.

Cheatgrass provides a flammable link in the brush and forests vegetation types. It cures early in the fire season and ignites readily during dry periods because of its very fine structure that responds readily to changes in the atmospheric moisture, tendency to accumulate litter and invasive nature. Cheatgrass promotes more frequent fires by increasing the biomass and horizontal continuity of fine fuels that persist during the summer lightning season. Its expansion has dramatically changed fire regimes and plant communities over vast areas of western rangelands by creating an environment where fires are easily ignited, spread rapidly, cover large areas, and occur frequently. Fire in these habitats can have severe effects on native species of plants and animals.



Historic fire seasons occurred between July and September, with the middle to end of August being the period of the most extreme fire conditions. Cheatgrass matures by July, while most native species it replaces mature in late August. With Cheatgrass dominant, wildfires tend to occur earlier in the season, when native perennials are more susceptible to injury by burning. These fires are larger and more uniform, with fewer patches of unburned vegetation remaining within burns. Cheatgrass thrives in grounds that have been

disturbed by activities such as recreation or building. There are many areas within the Bend CWPP Boundary that have Cheatgrass invading the landscape, in some cases creating ladder fuel adjacent to homes in the WUI. Cheatgrass is recognized as a noxious weed in Deschutes County. The result of the fuel hazards and forest types in the greater Bend area is an overgrowth of trees and forest floor fuels with an abundance of dead or dying vegetation that contribute to a substantially elevated risk of wildland fires that are difficult to control. These overly dense conditions lead to fire behavior that produces flame lengths over eight feet with crowning and torching that can result in stand replacement severity fires.

Not only, have large stand replacement fires not occurred, but also the more frequent low intensity fires have not been allowed to burn either. This practice of fire exclusion along with insufficient vegetation/fuels reduction has resulted in the buildup of excessive live and dead fuels.

### **Recent Wildfires**

Fires too, have significantly impacted the Greater Bend landscape. The table below recognizes the large fires that have endangered the Greater Bend Area in recent years. All of these larger wildfires have threatened residents, prompted evacuations within multiple neighborhoods, created health concerns due to prolonged heavy smoke inundating the area, and some threatened the City of

Bend’s water supply. Even though Awbrey Hall (1990) and the Skeleton Fire (1996) are out of the scope of this table, they are notable fires in Bend’s history. Combined they resulted in the loss of 44 homes, 15 outbuildings, and \$11 million in damage. These fires also served as the impetus for the community wildfire preparedness activities seen in central Oregon and in the Greater Bend Area.

| <b>Fire Name</b> | <b>Fire Size<br/>(acres)</b> | <b>Year<br/>Occurred</b> |
|------------------|------------------------------|--------------------------|
| 18 Road Fire     | 3,800                        | 2003                     |
| Rooster Rock     | 6,100                        | 2010                     |
| Pole Creek       | 26,795                       | 2012                     |
| Two Bulls        | 6,908                        | 2014                     |
| Cougar Butte     | 150                          | 2017                     |

## Public & Private Accomplishments

As part of the ongoing wildland fire risk management of the surrounding public and private forestlands, the USFS, the BLM, ODF, Deschutes County and private landowners are engaged in hazardous fuels treatment projects across the planning area. Noting these accomplishments informs the risk assessment and action plan found later in this document.

### Federal Lands



Currently, under the combined management of the Central Oregon Fire Management Service (COFMS), the US Forest Service and the Bureau of Land Management are involved in multiple fuels projects in WUI areas that stretch across this planning area to reduce hazardous fuels and the likelihood of high-intensity wildfire. The US Forest Service – Bend Fort Rock District manages approximately 72,409 acres or 35% of the lands in the Bend CWPP area and continues to make great strides to increase forest health and reduce the potential for high-intensity wildland fire.

It is important to note that each project area requires multiple types of fuels reduction activities to achieve the desired result including mechanical shrub mowing, tree thinning, hand piling and pile burning, and underburning. Therefore, multiple entries are required in order to adequately restore forest ecosystem health and reduce hazardous fuels. The ultimate goal for these projects is to reduce the potential for high-intensity fire that can require costly suppression efforts, cause damage to natural and recreational resources, and threaten the community of Bend and surrounding areas.

#### Forest Service

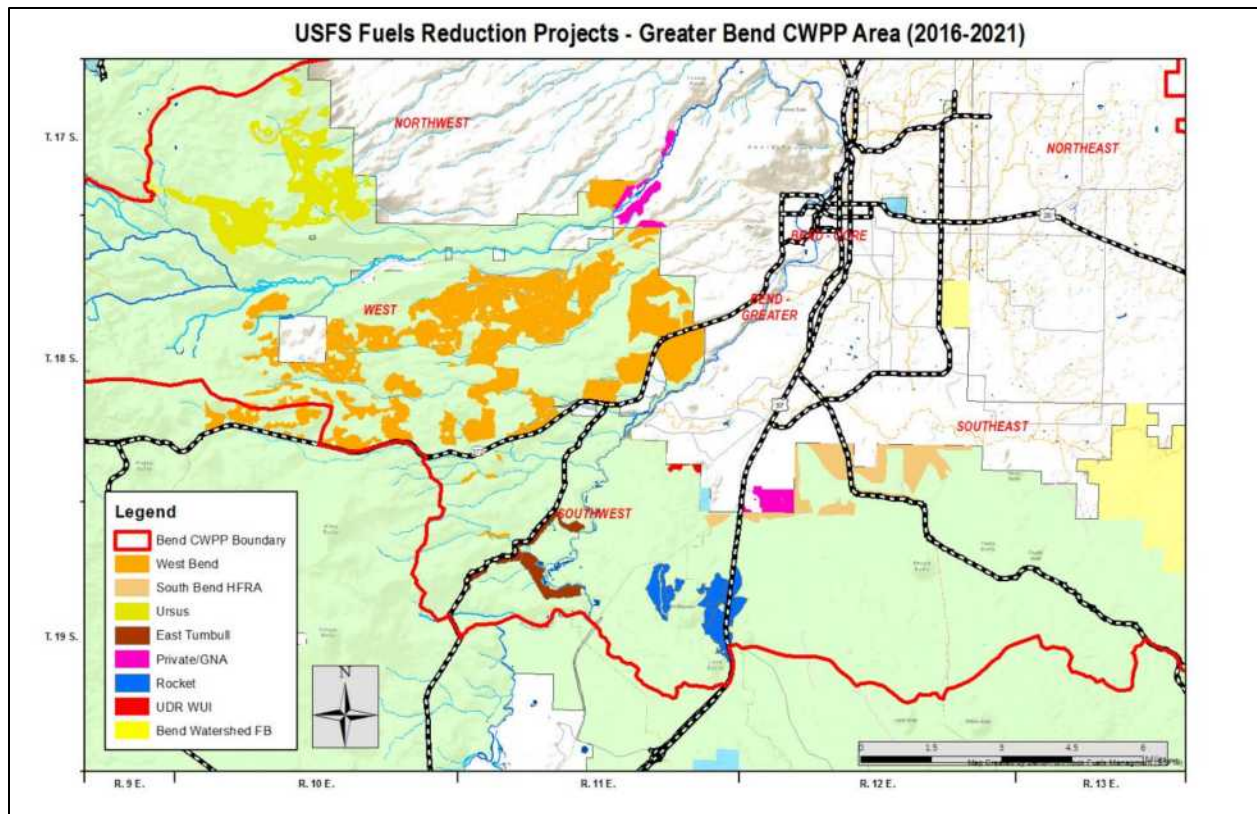
Ongoing projects in the Greater Bend CWPP footprint include the West Bend, South Bend HFRA, East Tumbull, Ursus, Rocket, Upper Deschutes River WUI, Bend Watershed Fuelbreak, and Private/Good Neighbor Authority projects. Acres of completed (and remaining) work in each project area are presented in the table below. Many of these projects are ongoing and have associated prescribed burning that is scheduled to occur over the course of the next several years. These prescribed burns will also include maintenance treatments when necessary to ensure continued treatment effectiveness.

There is one large vegetation management project in the Greater Bend CWPP footprint that is in the planning phase; the Cabin Butte Project. This project is located in the southern area of Bend around what is currently the South Bend HFRA treatment areas. It greatly expands on past treatments in this area; current project implementation is slated to begin in 2022/2023. Three other large vegetation management projects that are adjacent but not within the CWPP boundary are ongoing. These are the Kew, Lex, and Rocket Projects. They are along the southwest and southern boundaries of the CWPP area and have begun implementation of fuels treatments that will have benefits to mitigating fire spread into the Greater Bend CWPP area from the west and southwest.

Table 1. USFS Fuels Reduction Projects within Greater Bend CWPP Boundary (updated May 2021)

| <b>Project Name</b>   | <b>Thinning and Pile Burning</b> |                  | <b>Prescribed Burning</b> | <b>Mowing/Mastication</b> |                  |
|---|----------------------------------|------------------|---------------------------|---------------------------|------------------|
|   | <i>Completed</i>                 | <i>Remaining</i> | <i>Completed*</i>         | <i>Completed</i>          | <i>Remaining</i> |
| <b>West Bend</b>  | 786                              | 10314            | 1956                      | 1568                      | 4577             |
| <b>South Bend HFRA</b>  | 256                              | -                | 1349                      | 236                       | -                |
| <b>East Tumbull</b>   | 524                              | -                | -                         | -                         | -                |
| <b>Ursus</b>  | -                                | 4453             | -                         | -                         | 1103             |
| <b>Rocket</b>   | 284                              | 834              | -                         | 758                       | 68               |
| <b>UDR WUI</b>  | 86                               | -                | -                         | -                         | -                |
| <b>Bend Watershed FB</b>  | -                                | 51               | -                         | -                         | -                |
| <b>Private/GN A</b>   | -                                | -                | 712                       | -                         | -                |
| <b>Total</b>  | <b>1986</b>                      | <b>15652</b>     | <b>4017</b>               | <b>2562</b>               | <b>5752</b>      |
| <p><i>* First-entry prescribed burn treatments remain in West Bend. Maintenance treatments will also occur in the future across multiple project areas as fuels conditions warrant.</i></p> |                                  |                  |                           |                           |                  |





## Bureau of Land Management

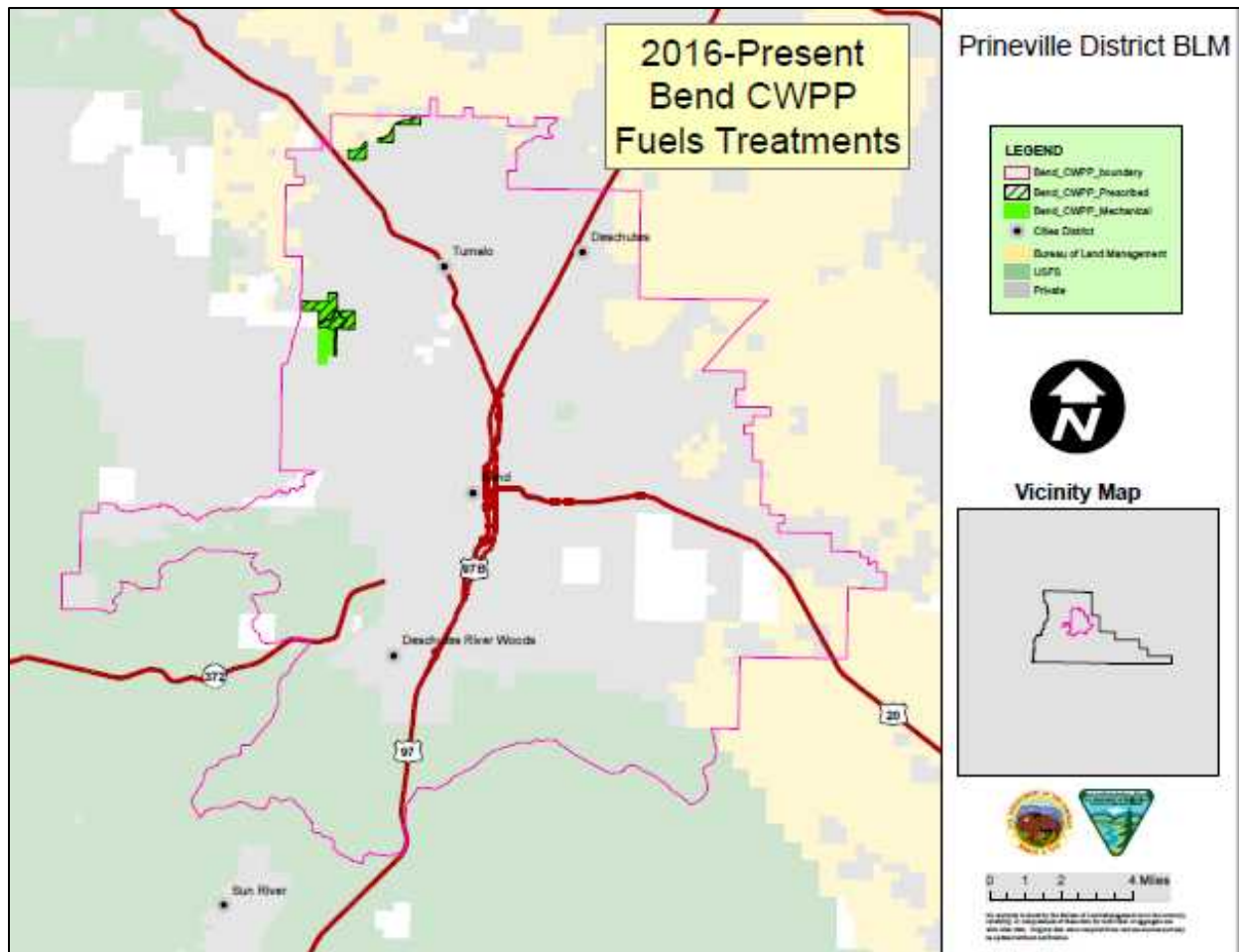
The Prineville District BLM has two primary project areas in the Bend CWPP area. These two projects are the Tumalo Vegetation and Trail Management Project and the Cline Buttes Recreation Area Plan. Between these two areas, the Prineville District BLM has implemented 1,009 acres of mechanical treatments including thinning, hand piling, and mastication. The Prineville District BLM has also completed 753 acres of prescribed burning which includes the burning of the hand piles that were created during the mechanical treatment phase.

In 2016 the Prineville District BLM produced a Determination of NEPA Adequacy (DNA) for the Cline Buttes Recreation Area Plan. This covers 6,506 acres and allows for fuels treatments including the thinning of trees. Thus far, the Prineville District BLM has implemented treatments on 216 acres within the Bend CWPP boundary. This includes the cutting/piling of trees and as well as the burning of those piles.

In 2014 the Prineville District BLM produced the Environmental Assessment for the Tumalo Vegetation and Trail Project. This covers an 800 acre area and allows for the reduction of tree density (thinning of trees). Thus far, 792 acres of treatments have been implemented within the CWPP boundary. This includes the cutting and piling of trees as well the burning of those piles.

### BLM Fuels Treatments - Bend CWPP 2016-2020

| Treatment Year | Mechanical Acres | Prescribed Fire Acres |
|----------------|------------------|-----------------------|
| 2016           | 272              | 0                     |
| 2017           | 265              | 272                   |
| 2018           | 0                | 237                   |
| 2019           | 472              | 28                    |
| 2020           | 0                | 0                     |
| <b>Total</b>   | 1009             | 537                   |



## Oregon Department of Forestry



The Oregon Department of Forestry (ODF) has continued working with a number of private landowners to complete fuels reduction projects in the greater Bend area. These projects have been primarily in the highest priority areas in the CWPP Boundary. These partnerships have yielded 25 projects and 325 acres total in fuels reduction work as well as providing education to multiple other private landowners. A number of these projects have also utilized cross boundary prescribed fire through agreements with the

Deschutes National Forest.

The Oregon Department of Forestry is also working with private landowners in a number of other programs to achieve healthy forest restoration and fire resilient landscapes and communities. ODF Stewardship Foresters are continuously providing technical assistance related to forest health, fire mitigation and fire prevention. In collaboration with the Natural Resource Conservation Service (NRCS), ODF staff assists with the implementation of the Joint Chiefs, Environmental Quality Incentives Program to assist private landowners with bringing their forestland to a healthy and resilient state within the Greater Bend CWPP area. ODF fire program staff and forestry staff also assist with implementation and education of the Oregon Forestland-Urban Interface Act of 1997 (a.k.a. SB360) and also assist in education with regards to defensible space and development of Firewise communities.

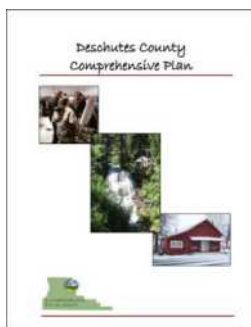
## Deschutes County



Deschutes County has continued to work with communities within the Greater Bend CWPP area preparing residents in the event of wildfire. This includes grant opportunities for fuels reduction assistance and the plans and multiple programs listed below. Within the past 5 years funding sources from FEMA helped to accomplish 241 additional acres within a community east of Bend, with another

87 acres north of Bend adjacent to highway 97 treated utilizing funding from the Oregon Department of Forestry. Other grant opportunities included funding focused on assisting communities in becoming Firewise recognized and achieving goals outlined in their Firewise action plans. These communities included; Woodside Ranch, Awbrey Butte, Tillicum Village, Deschutes River Woods, Wyndemere, Lane Knolls Estates, Sunrise Village, Starwood, Awbrey Park, Boonesborough and Mountain High.

## Deschutes County Comprehensive Plan



The Deschutes County Comprehensive Plan is a statement of issues, goals and policies meant to guide the future of land use in the County that covers a 20-year period from 2011-2030. The Plan is intended to recognize the expectations and rights of property owners and the community as a whole. It also provides a blueprint for land use conservation and development. This is accomplished through goals and policies that tell a cohesive story of where and how development should occur and what places should remain undeveloped. The plan has several natural hazard policies that focus on wildfire:



- Coordinate with stakeholders to support forest management projects that contribute to public safety by treating wildland hazardous fuels particularly in the designated Wildland Urban Interface...
- Protect people, property, infrastructure, the economy and the environment from natural hazards.
- Survey and map wildfire hazard at risk areas
- Support forest management practices that reduce severe wildfire hazard areas
- Support local fire protection districts and departments in providing and improving fire protection services.
- Review and revise County Code as needed to:
  - Address wildfire concerns to and from development, through consideration of site location, building construction and design, landscaping, defensible space, fuel management, access and water availability.
  - Require new subdivisions and destination resorts to achieve Firewise Standards from the beginning of the projects and maintain those standards in perpetuity.

### Natural Hazard Mitigation Plan

A Natural Hazard Mitigation Plan (NHMP) is the representation of the jurisdiction’s commitment to reduce risks from natural hazards, serving as a guide for decision makers as they commit resources to reducing the effects of natural hazards. A local government must have a mitigation plan approved in order to receive pre- and post-disaster mitigation grants. Deschutes County last updated the NHMP in 2016 and an update is underway in 2021. The plan focuses on reducing or alleviating the losses of life, property, and injuries resulting from natural hazards through long and short-term strategies. The plan reduces the risk from natural hazards by identifying resources, information, and strategies for risk reduction. It is also intended to guide and coordinate mitigation activities throughout the county. Wildfire is County's second highest threat (winter storms is ranked first). The plan identifies the projects and efforts overseen by Project Wildfire, Firewise Communities, and Community Wildfire Protection Plans.

### Project Wildfire



Over the last fifteen years, Project Wildfire, in cooperation with the Deschutes County Sheriff’s Office of Emergency Management Program has coordinated evacuation route signage for the Greater Bend Area. Project Wildfire has also helped property owners find grant funding to reduce hazardous fuels on private lands. Providing home assessments for individuals on how vulnerable a structure will be during a wildfire, then offering recommendations that should be taken so the home will have a better chance to survive a wildfire is a free service Project Wildfire offers. As property owners work on proactive planning in preparation for wildfire, they help achieve Project Wildfire’s mission to prevent deaths, injuries, property loss, and environmental damage resulting from wildfires in Deschutes County.

In partnership with Deschutes County and Republic Services, Project Wildfire plans and implements two FireFree events every year in the spring and the fall. The spring days are completely free for property owners to drop off yard debris at landfills and transfer stations throughout Deschutes County. The public has come to expect these FireFree events and there is a high level of participation each year. The events are an easy and cost-effective way for homeowners to create and maintain their defensible space. In 2021 there was 56,046 cubic yards of debris dropped off; this roughly doubled previous years totals.



### Land Use Planning for Wildfire Prepared Communities

The Deschutes County Community Development Department (CDD) has coordinated efforts to establish planned communities with wildfire mitigation as a primary objective. In 2016, County staff facilitated the establishment of the Miller Tree Farm cluster development along the City of Bend's western Urban Growth Boundary. The Tree Farm development incorporates standards from the National Fire Protection Association (NFPA) and Firewise Communities for defensible space, fuel treatments, and construction material guidelines for all new development which occurs onsite. These standards are codified as conditions of approval for the Tree Farm master plan, and ultimately serve as a benchmark for all residential developments which occur in the Wildland Urban Interface moving forward.

Additionally, in 2019 CDD led the adoption of a new zoning district in Deschutes County. The Westside Transect Zone (WTZ) serves as a transitional buffer between the City of Bend's western edge and heavily forested parcels further west. The WTZ is a unique zone in the County and serves as a major piece of compromise legislation between various interests in the region including developers, private property owners, environmental stewardship organizations, and wildfire protection officials. Like the Tree Farm development, the WTZ incorporates National Fire Protection Association (NFPA) and Firewise Communities standards for all new development. All land divisions, which occur in the WTZ, are required to submit Wildfire Mitigation Plans prepared by a professional forester, which outline the specific wildfire risks within the subdivision area, and must include direct strategies for mitigating those risks. Mitigation strategies can include a defensible space program for individual properties, roofing and other fire resistant building material standards, and road access requirements for citizens and firefighting personnel. Measures outlined in individual Wildfire Mitigation Plans are ultimately included as conditions of approval and upheld by designated Homeowners Associations. These plans and designated mitigation actions must be evaluated on a regular basis or at the request of CDD. This ensures that any changes to wildfire risk are adequately captured and factored into new and existing development plans.

### Wildfire Mitigation Advisory Committee and New Development Standards

In 2019, Deschutes County was awarded a \$25,000 technical assistance grant from the Department of Land Conservation and Development (DLCD) to evaluate proposals for increasing wildfire mitigation programs across the County. From 2019 through 2020, the County convened a Wildfire Mitigation Advisory Committee (WMAC) to discuss possible Wildfire Mitigation programs that could be implemented at a regional scale. The WMAC consisted of 12 members representing a variety of interests in Deschutes County, including fire protection officials, developers, and private citizens. In April 2020, the WMAC presented a report to the Deschutes County Board of Commissioners reflecting their findings and recommendations concerning the adoption of new fire

resistant building standards, possible County-wide defensible space programs for residential development, and updates to the adopted Deschutes County Wildfire Hazard Zone. The fire resistant building standards are based on the Oregon Building Codes Division's (BCD) updated Wildfire Hazard Mitigation standards, also known as ORSC - R327.

Based on the findings in the WMAC report, in late 2020 CDD staff hosted a series of open houses to gather public input on new wildfire mitigation programs and proposals. The open house events were done in conjunction with two public surveys to gather additional input. Ultimately, CDD staff found that a majority of citizen respondents were supportive of additional building or defensible space requirements to reduce wildfire risk in Deschutes County. The results of the public outreach effort were presented to the Deschutes County Board of Commissioners in February 2021 along with a timeline for future steps to further evaluate these issues.

### Firewise USA®



Another indication of the commitment of the Greater Bend residents to wildfire preparedness is the recognition of the multiple communities as Firewise USA® sites. The Firewise USA® program is a national recognition program which highlights communities that have chosen to complete and maintain defensible space; ensure adequate access, water and signage; promote ongoing fire prevention education, and build or retro-fit structures with non-combustible building materials such as siding, decks and roofing. Adequate water availability and access are also required. In 2016, the Greater Bend CWPP area was the home of 6 sites, in the past 5 years 12 more sites were added bringing the total number of Firewise Recognized sites within the planning area to 18.

The Firewise USA program recognizes communities that have demonstrated their commitment to wildfire preparedness. Through these steps, communities throughout Bend have effectively lowered Bend's wildfire risk. Partnerships across the Greater Bend area has fostered collaboration between neighbors, increased awareness and their communities' ability to respond to wildfire.

### Deschutes Collaborative Forest Project



In 2009, a group of local agencies and organizations formed a proposal for funding a large, collaborative forest restoration and hazardous fuels reduction project on public lands managed by the Deschutes National Forest. This landscape-level project is known as the Deschutes Collaborative Forest Project (DCFP). Under the federal Collaborative Forest Landscape Restoration Act (CFLRA), the proposal was approved for funding up to \$10 million for ten years. For these first ten years, the Steering Committee and several task-oriented sub-committees provided input and recommendations to the Deschutes National Forest for projects focused on a 257,000 acre landscape near Sisters, Bend and Greater Bend. Now the DCFP collaborates on forest restoration of frequent fire forests across the entire Deschutes National Forest. A five year funding extension has been requested to continue funding on the ground work, and that request has been recommended for funding as it becomes available through the CLFRA. In 2021 \$300,000 in additional funding is expected with more in the following years.

The Deschutes Collaborative Forest Project has a website in place [www.deschutescollaborativeforest.org](http://www.deschutescollaborativeforest.org) along with a social media presence on Facebook to continue the stakeholder dialogue and educational outreach for this important landscape.

### Fire-Adapted Communities



### FIRE ADAPTED COMMUNITIES LEARNING NETWORK

This CWPP is just a piece of the over-arching framework and goal of Fire Adapted Communities. People and nature are increasingly threatened by fire, despite fire’s natural, beneficial role. At the same time, firefighting costs are escalating and diverting money away from proactive land management. The solution is to make natural areas and communities more fire ready so that we can allow fire to play its natural role at a meaningful scale. The Fire Adapted Communities (FAC) initiative and the FAC Learning Network are helping homeowners, communities and land managers in fire-prone areas prepare for inevitable fires -- to “live with fire” safely. A fire-adapted community acknowledges and takes responsibility for its wildfire risk, and implements appropriate actions at all levels. Actions address resident safety, homes, neighborhoods, businesses and infrastructure, forests, parks, open spaces and other community assets. There is no end point in becoming a fire adapted community. Sustaining, growing and adapting strategies, partnerships and capacity through time are key. Visit [www.fireadapted.org](http://www.fireadapted.org) for more information. Working toward being more fire adapted by developing a CWPP addresses one of the three prongs outlined in the larger goal of the National Cohesive Wildland Fire Management Strategy.

### Bend Parks and Recreation



The Bend Park and Recreation District (BPRD) has an active vegetation management program. It includes prescribed fire, various fuel reduction projects and strategic planning when developing district property. The majority of this work is either within, or just outside, the City of Bend Urban Growth Boundary. Annual light fuel reduction focuses on fine fuels in town. Urban fuel reduction projects focus on parks with natural area, frequently directly adjacent to neighborhoods. Larger fuel reduction projects address hazardous fuel loads and forest health to create a fire resilient landscape.

Since 2017 BPRD has partnered with the USFS to conduct prescribed burns in Shevlin Park. The table below shows the acreage burned since 2017. BPRD was able to partner with Project Wildlife, Central Oregon Cohesive Strategy Initiative and USFS to conduct educational prescribed fire tours that were open to the public and media. Further educational efforts included prescribed fire interpretative signs.

### BPRD Prescribed Burning- Bend CWPP 2017-2021

| Treatment Year | Prescribed Fire Acres |
|----------------|-----------------------|
| 2017           | 49                    |
| 2018           | 95                    |
| 2019           | 78                    |
| 2020           | 0                     |
| 2021           | 66                    |
| <b>Total</b>   | <b>288</b>            |

## Community Assessment of Risk

For the 2021 Greater Bend CWPP the Steering Committee used the Advanced Oregon Wildfire Risk Explorer (OWRE) map viewer to organize data based on wildfire risk concepts. This tool provides data, generates maps, charts, graphics, reports, and interpretations. The full report with maps is found in Appendix A. All OWRE advanced reports include information about overall wildfire risk, burn probability, flame length, overall potential impact, hazard to potential structures, fire history, land management, and estimated housing density. Additional layers of interest appear after the layers listed above.

### **Fire Protection Capability**

In considering the overall risk, the ability to provide a fire protection response must be considered. One structural fire district that provides fire response within the planning area. In addition, wildland fire agencies provide fire response for areas of state and federal protection. When local resources are fully engaged, all agencies can request additional resources through the State of Oregon and request federal resources through the Pacific Northwest Coordination Center.

In addition to this high level of coordination, all structural fire departments and wildland agencies in Central Oregon convene each year for a pre-season meeting to discuss the upcoming wildland fire season. Topics addressed at this meeting include predicted wildland fire activity, lessons learned, weather forecasts and how agencies can/will respond to meet the needs of fire events.

### Bend Fire and Rescue

Bend Fire and Rescue is the city of Bend's municipal fire department. With a predominantly career staff and small volunteer support personnel, Bend Fire and Rescue provides first response structural and wildland fire coverage within its 164 square mile service district. Through five stations Bend Fire and Rescue provides Emergency Medical Services, including Advanced Cardiac Life Support transport, within a 1,450 square mile boundary. The department also provides limited Hazardous Materials and River Rescue services. The department has adopted the National Incident Management Systems (NIMS) and all personnel have received training and continue to train in its use. Bend Fire and Rescue employs one Fire Chief, five Deputy Chiefs, four Battalion Chiefs, sixty eight Firefighter/Paramedics and Emergency Medical Technicians (EMTs), six members in the Fire Prevention Division, and three administrative staff members. The Department also employs six part-time EMTs and utilizes volunteers in other programs.

Bend Fire and Rescue commands a Fire Investigation Team (FIT) that provides 24/7 fire investigation across the district, including wildland fires. The benefit of the FIT is not only in the investigation to determine the cause of a fire, but to provide information about the science of fire so the department can focus on a prevention message, campaign and code development to prevent those fires in the future.

Bend Fire and Rescue utilizes a fleet of firefighting and EMS apparatus including six structural engines, six off-road brush engines, three water tenders, one ladder truck, one heavy rescue

vehicle, six ambulances, three command vehicles, and seven fire prevention vehicles.

The department is a party to the Central Oregon Mutual Aid Agreement. In the event of a major fire the department may request assistance from all other fire departments that are signatory to the agreement. In addition to Central Oregon Fire Departments, this includes the US Forest Service, Oregon Department of Forestry, and the BLM. Conversely, when these agencies need assistance and the District has resources available, it assists them. Bend Fire and Rescue is also a party to an Automatic Aid Agreement with Redmond, Cloverdale, Sunriver, Sisters, US Forest Service and ODF. Through a Computer Aided Dispatch (CAD) center, Bend Fire and Rescue responds automatically to certain calls in areas up to five miles beyond the fire district.

In addition to the firefighting resources, Bend Fire and Rescue puts 10% of its workforce towards fire prevention. The fire prevention team is comprised of one Fire Marshal and six Deputy Fire Marshals that provide enforcement of local fire codes and ordinances as well as provide public education across the district.

Local Ordinances provide the department with the control of burning practices. This step alone has contributed positively to the decrease in fire calls and reduced the overall threat of wildfire in the greater Bend area.

Local building codes and fire codes also reduce the catastrophe from wildfires as they allow the department to restrict the use of combustible roofing materials, design new communities with adequate and proper access (ingress/egress) for emergency vehicles as well as adequate water supply and hydrant distribution. Bend Fire and Rescue also manage address sign specifications and road signs. These opportunities give firefighters an expedient route to fires and allow residents to safely evacuate.

All of these enforced code and ordinance provisions help reduce the number and severity of fires in the greater Bend area.

#### Deschutes County Rural Fire Protection District #2 (DCRFPD#2)

The Deschutes County Rural Fire Protection District #2 (District) formed in 1952 consists of approximately 140 square miles of suburban and forested land surrounding the City of Bend (City) and represents approximately 25,000 constituents.

An elected five-member volunteer board of directors and a paid executive director governs the District. The executive director handles the day-to-day operations, fiscal and contract management, and performs administrative and public relation functions of behalf of the District. The actual delivery of fire and emergency medical services to District constituents is provided through an Intergovernmental Agreement (Contract) with the City. The District motto is “Partners in Protection” as all emergency services (fire, EMS, ambulance transport, fire prevention and hazardous materials response) are provided by City of Bend Fire & Rescue.

Under an agreement made in the year 2000 between the City and the fire District, ownership of the existing stations was transferred to the District. The District then remodeled one of the stations and built four brand new ones, as well as a new training center. Then the District replaced the

Tumalo fire station with a new facility in 2019 and will use the old station for storage. The District also built a sixth fire station in 2019 on the south side of Pilot Butte on City owned property. This new facility was strategically located near the center of the City to improve response times. All of the stations are leased back to the City. The current configuration of the stations provides excellent emergency services to the City and District residents. The District has adopted the Oregon Fire Prevention Code, Outdoor Burning Regulations and an ordinance banning sales of all fireworks within the District. The District also manages the “Green Address Sign” project for the District and the City to assist emergency responders. Annually the District provides wildfire fuel reduction grants to assist homeowners to create defensible space. In the year 2000, the District and the City received a National Bronze Smokey award for the creation of the 1997 FireFree public wildfire education program.

### Oregon Department of Forestry

Within the Greater Bend CWPP area, the Central Oregon District of the Oregon Department of Forestry (ODF) protects the private forestland. ODF provides wildland fire response for fires burning on or threatening private forestlands paying a Forest Patrol Assessment. There are some areas within the Greater Bend CWPP Boundary that receive dual protection from ODF and the Bend Fire & Rescue or Deschutes County Rural Fire District #2 because they are located in one or the other of the fire districts and are also classified as private forestland within the ODF district. In areas of dual protection, when a wildland fire occurs, the fire district provides initial response and transfers fire command to ODF personnel upon their arrival.

During fire season, typically June through October, ODF provides ten engines, one five-person hand crew and one dozer; all are available for initial attack response in the Prineville-Sisters unit. Statewide resources are also available to ODF including initial attack hand crews, dozers, water tenders, helicopters, air tankers, and overhead staff positions, depending on statewide needs. During fire season these resources are in high demand and may not always be available. In addition to Oregon Department of Forestry suppression capabilities, ODF cooperates with wildland fire protection agencies in the area including the local fire departments and districts, the US Forest Service, and the Bureau of Land Management.

### COFMS -USDA Forest Service & BLM

The Forest Service provides wildland fire protection on the federal lands within the Greater Bend CWPP area. Together, with the Bureau of Land Management (BLM), they are identified as the Central Oregon Fire Management Service (COFMS). COFMS includes the Deschutes National Forest, the Ochoco National Forest, the Crooked River National Grassland, and the Prineville District of the BLM. These four units are managed cooperatively under combined leadership, with an Interagency Fire Management Officer, two Deputy Fire Management Officers, and a Board of Directors including decision makers from both agencies, with Forest Service District Rangers and BLM Field Managers.

COFMS has a central dispatching facility in partnership with the Oregon Department of Forestry that serves as a Coordination Center for fire and fuels operations, as well as safety and training issues for COFMS. COFMS provides numerous initial attack resources for wildland fire incidents that may occur in the Greater Bend CWPP area. These include ground resources such as engines, initial attack hand crews, water tenders, dozers, Hotshot crews, and prevention units,



as well as aerial resources such as an air attack, helicopters, smoke jumpers, rappellers, and air tankers. During the fire season, COFMS also rosters a Type III Incident Management Team from local resources that can mobilize rapidly to emerging incidents within the COFMS response area. In a typical fire season COFMS resources are in high demand and may not always be available. Anytime an incident grows beyond the capability of the local resources a request may be made to ODF and to the Pacific Northwest Coordination Center for additional wildland fire fighting resources.

## **Areas of special concern**

### Law Enforcement & Evacuations

The City of Bend Police Department and Deschutes County Sheriff provide police services for the Greater Bend area. Both entities have responsibility for ensuring the safe and orderly evacuation of the community in the event of a major emergency. A number of resources have been allocated to accomplish this task including hi/lo sirens on vehicles; emergency notification via radio and television; reverse 9-1-1 capability; Police and Sheriff's Department staff; Bend Fire and Rescue staff and community-wide volunteers. The Countywide Disaster Plan and the Deschutes County Department of Emergency Services address any other issues relative to a major emergency.

The Deschutes Alert System (DAS) can be used to notify the public with important information during an emergency. DAS can notify land-line telephones as well as those who opt in to the system in up to ten different contact paths including: Voice over Internet Protocol (VoIP) telephones, cellular/mobile phones, texts, email and TTY/TDD devices. In the event of an emergency, Deschutes County officials can identify an affected area and, if necessary, send a message that describes the situation and recommend protective actions property owners should take. The DAS system will automatically call out to all land-line and opt-in contact paths within that geographic area and deliver the message. The system can contact multiple paths and repeat if necessary until the recipient confirms they received the message. If an answering machine or voice mail system picks up the call, an emergency message will be recorded. Property owners can register their phone number at: [www.deschutesalerts.org](http://www.deschutesalerts.org)

Oregon State Police assists the law enforcement efforts and cooperates with the Deschutes County Sheriff for protection in the areas near Greater Bend.

In addition to this high level of coordination, all fire departments and agencies in Central Oregon convene each year for a pre-season meeting to discuss the upcoming wildland fire season. Topics addressed at this meeting include predicted wildland fire activity, weather forecasts and how agencies can and will respond to meet the needs of fire events.

The **American Red Cross** offers a gamut of tools to boost community preparedness such as community presentations on emergency preparedness kits. The Red Cross gives presentations to church groups, HOAs, citizen groups, etc. Red Cross plays a vital role in emergency response during large wildfire events. At any time of day or night, trained Red Cross volunteers respond to the scene of structural or wildland fires and provide food, shelter, and emotional support to those affected.

### Critical transportation routes

For purposes of the Greater Bend CWPP, the Steering Committee defines Critical Transportation



Routes as:

all routes necessary for the support of routine flow of commerce to and/or through the Greater Bend area,

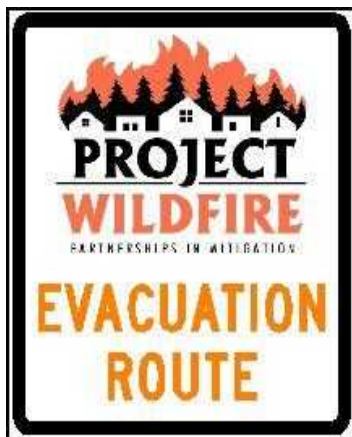
all routes that could be used for potential evacuation of property owners and visitors from a wildland fire threat to public safety,

routes needed for emergency ingress and egress to a wildland fire incident, not including unimproved or “two-track” roads,

in addition, all routes needed to protect and support critical infrastructure (power substations, communication transmission lines, water and fuel storage, public service facilities, recreation facilities, etc.).

With up to 20,000 visitors in Bend per day during peak summer months and an additional 20,000 people using recreation sites and the transportation corridors around Bend, critical transportation routes are a prime concern for those agencies responsible for fire suppression and evacuation.

As noted in previous plans, the Steering Committee is concerned with the lack of maintained roads leading in and out of the high risk areas in the WUI. Should an evacuation be necessary, the Steering Committee expressed great concern over the quality of the evacuation routes. Many of the egress routes are dirt roads that contribute to substantial dust and debris clouds as vehicles attempt to use them. During the summer months, after a few cars travel the road, the dust is so dense that it is not safe for vehicles to continue using the road until the dust settles. Lack of maintenance has led to deteriorated road surfaces with large potholes, ruts and washboards that slow evacuation efforts and cause some vehicles to break down, further complicating a mass departure from the area. The current condition of some of the evacuation routes is a life safety issue.



Working with Deschutes County and Project Wildfire, several neighborhoods within the Communities at Risk have taken advantage of a signage program to increase visibility of evacuation route signs along roads. The signs are made from high intensity reflective material and indicate proper exit routes from these neighborhoods.

The Steering Committee underscored the need to continue to identify, develop and protect critical transportation routes as part of this planning process. Ingress/egress issues are included under Recommendations to Reduce Structural Vulnerability. This issue is also highlighted under Action Plan and Implementation.

### Burlington Northern Santa Fe (BNSF)

Burlington Northern Santa Fe (BNSF) Owns and operates railroad tracks that bisect the CWPP area running North and South. These tracks have been of concern for wildfire in this and other CWPP areas. BNSF recognizes this concern and has taken steps to help mitigate the potential risk. Currently, BNSF has a multi-million dollar project planned between Bend and Chemult replacing 70k railroad ties. This work is planned to take place starting in May of 2021. With new ties the

infrastructure will be safer for the communities within the CWPP's it travels through. While railroad ties are not fire proof a new tie isn't deteriorated or cracked and is harder to catch fire. BNSF also has firefighting resources available on an as needed basis. These resources include, a 500 gallon water tank on a freightliner truck equipped with hydrants for being driven up and down the track, 15k gallon water tank on a train car with a deck gun and pump, a fire train in Wishram, Washington equipped with 45k gallons of water with 3 deck guns, 3 pumps, and tie sprayers on the caboose. BNSF employees assigned in this area are wildland fire trained every year with the class focused on supporting local fire efforts and communication between resources.

### Community Preparedness

A [business resiliency study](#) conducted by FEMA in 2012 presents statistics for small businesses that have been impacted by a natural disaster such as a large wildfire. All of the statistics apply to those businesses that did not have a business continuity plan or an emergency plan:

- 43% of companies never reopened.

- 51% of companies closed within 2 years.

- 80% of companies that do not recover from a disaster within one month are likely to go out of business.

- 75% of companies without a business continuity plan fail within three years of a disaster. Companies that aren't able to resume operations within ten days (of a disaster hit) are not likely to survive.

- Of those businesses that experience a disaster and have no emergency plans, 43% never reopen; of those that do reopen, only 29% are still operating two years later.

A large wildfire can have lingering effects that last for months to years and the largest impacts lasting for at least a month. With much of the local economy tied to small local businesses that depend on the local surrounding forest environment, the consequences of a wildfire that closed major recreation and tourism opportunities would be catastrophic. Business resiliency of the local small businesses is a critical piece in creating a more fire-adapted community. Based on a statewide [economic impact study](#) of the spending losses to the travel and tourism industry due to wildfires in 2017, Deschutes County lost an estimated \$16 million. Specific action items for business owners are located in the Action Plan.

The essential infrastructure in the Greater Bend CWPP area includes utilities, roads, water and sewer systems and has an approximate replacement value of \$275,000 per mile for electrical transmission lines; \$150,000 per mile of electrical distribution lines; and \$2 million per electrical sub-station. Loss to water and sewer systems would be minimal because most are underground or otherwise not flammable.

Also of high importance to property owners and business owners in Greater Bend is the value placed on scenic beauty and recreational opportunities that exist on private and public lands both within and adjacent to the Greater Bend CWPP area.

The loss of recreational use by visitors to the area as a result of scenic quality, specifically large "burn over" areas, will have an unknown economic impact not only to the area but to the remainder of Deschutes County and neighboring cities like Bend and Redmond. If a large wildland fire

occurs in this area, the result will be a catastrophic loss to both the developed and dispersed recreational opportunities in the Greater Bend area.

### Bend drinking water protection area

The Greater Bend CWPP Steering Committee included the Bridge Creek Watershed in the WUI boundary. Approximately half of Bend's drinking water comes from this area. The watershed was established in 1926 in cooperation with the Deschutes National Forest and a subsequent 1991 Memorandum of Understanding, which describes protection measures in place for the watershed. Annual inspections of the watershed are conducted with the Department of Environmental Quality and the Deschutes National Forest. A wildland fire occurring in or near this watershed could severely affect water quality in the Bridge Creek watershed. The Steering Committee recommends treatment for hazardous fuels as identified in this plan to prevent catastrophic damage from wildfires to the watershed.

### Structural Vulnerability

Structural vulnerability refers to the defensible space and building materials used on structures. It also includes the type and amount of fire department access such as the numbers of roads in and out, road widths and signage.

In recent years, many neighborhoods in the greater Bend area have taken steps to decrease the vulnerability of structures to wildland fire. Although attitudes and behaviors towards fire are changing thanks to educational programs like FireFree and Firewise, the population growth and continued development into the wildland-urban interface present fresh challenges each year. The Steering Committee puts a high value on the importance of making structures and neighborhoods in the Greater Bend area as fire-safe as possible by reducing structural vulnerability through home hardening and creation of defensible space. Recommendations to reduce structural vulnerability can be found in the prioritized recommendation section.

### Recent Legislation

During the 2021 state legislative session, a number of bills were introduced related to wildfire mitigation. On June 26, 2021, Senate Bill (SB) 762 was passed by the Oregon legislature, which has significant impacts on wildfire mitigation efforts across all jurisdictions in Oregon including Deschutes County.

While details are still unknown, SB 762 contains a broad range of regulatory and non-regulatory approaches to address wildfire risk. The bill focuses on the following areas:

- Plans for public electricity utilities to reduce risks associated with wildfire
- Statewide mapping of wildfire risks
- Defensible space standards for new and existing development
- Building code guidelines to reduce risks associated with wildfire
- Programs to support local communities in detecting, preparing for, communicating, or mitigating the environmental and public health impacts of wildfire smoke
- Emergency response and disaster recovery associated with wildfire events
- Programs to reduce wildfire risk through the restoration of landscape resiliency and the reduction of hazardous fuel on public or private forestlands and rangelands and in communities near homes and critical infrastructure

- The creation of an Oregon Conservation Corps Program to reduce wildfire risk to communities and critical infrastructure and to help to create fire-adapted communities
- Requirements for Counties to ensure all lands have a baseline level of fire protection
- Creation of a Wildfire Programs Advisory Council

The steering committee will continue to monitor the impacts of SB762 and update the Greater Bend CWPP as necessary.

## Action Plan and Implementation

The Steering Committee recognizes the Greater Bend CWPP is a living tool that can be used for multiple outcomes. What follows is an overview of recommendations consistent with each of the three Cohesive Strategy goals, as well as prioritized recommendations and preferred treatment methods for the Greater Bend CWPP.

### **Safe and Effective Wildfire Response**

Bend Fire and Rescue, wildland fire agencies and the Community of Greater Bend are charged to identify and assess opportunities to improve coordinated wildfire response including an assessment of the water resources available for fire suppression in the Greater Bend CWPP area. The Steering Committee will make recommendations for projects to ensure adequate water resources are available for fire suppression. The benefits of looped lines, fire hydrants, redundant power supplies, protected wells, reservoirs and the surrounding landscape should be considered.

In addition, the Steering Committee will assist in conducting further assessments to determine the evacuation needs and identify potential projects developing new routes and/or improving existing routes.

### **Improving Fire Protection Capabilities**

Oregon Department of Forestry is currently in the planning phase of installing smoke detection cameras in Deschutes County. Recently Bear Wallow has had a camera installed with remainder of cameras to be installed by the next revision of this plan. These cameras are monitored though fire season and aid in effective suppression response by the wildland agency resources by allowing for more accurate reporting on smoke size and location. Bend Fire and Rescue have also reduced response times and improved resource availability by adding an additional fire station within the planning area.

The Steering Committee will continue to encourage federal land managers to work with Bend residents to minimize closures of roads that can be used as alternate evacuation routes.

The Steering Committee will work with Bend Fire and Rescue, Bend Police Department, Bend residents Deschutes County, and Oregon Department of Transportation to identify and map existing transportation and evacuation routes.

### **Fire Adapted Communities**

The Steering Committee is charged with the task of engaging community members to review the risk assessment including the overall fire risk in this CWPP (Appendix A) and identify projects that will increase the potential for property owners to survive a high-intensity wildland fire within the Greater Bend area. Property owners can utilize the information in this document as a resource to improve the fire resistance of their homes on an individual basis.

The intention of the Steering Committee is to engage in continued discussions with landowners to facilitate fuels reduction projects on private lands utilizing the data in Appendix A. These actions can be accomplished through educational activities or grants for specific projects on private lands.

### Specific Action Items

If there are hazardous fuels present, all landowners are urged to mitigate their fuels to

create a fire resilient and healthy landscape.

Given the historical and recent fire occurrence, the crown fire potential is high. Property owners are urged to create and maintain defensible space, reduce ladder fuels and thin where necessary.

Ensuring the access and evacuation routes are clear of vegetation will ensure access for emergency personnel during large wildfires and/or other emergency incidents.

Property owners should develop evacuation kits for their families in case of a large wildfire.

The Steering Committee will encourage and assist community groups in seeking funding for fuels reduction, educational, and other projects to decrease overall risks of loss from wildland fire.

One important piece of a Fire Adapted Community is preparing for the recovery process after a wildland fire occurs. There are many resources for property owners who are recovering from a wildland fire that can impact their small business and home. Building community and business resiliency is the key to being fully adapted to fire. Post-fire recovery resources can be found in Appendix C of this document.

### **Restoring Resilient Landscapes**

The intention of the Steering Committee is to engage in continued discussions with the Greater Bend community and adjacent landowners to implement the CWPP and accomplish hazardous fuels reduction projects in the most expeditious manner possible.

The Steering Committee recognizes the effectiveness and value of maximizing treatment efforts in areas that are adjacent to federal or other private projects and recommends that future projects consider these benefits when selecting areas for treatment.

There are 232,675 acres in the planning area. Significant fuels reduction projects continue to improve the overall health and fire resiliency of the landscape. Achieving a resilient healthy landscape, however, requires multiple entries on treatment sites, over a period of years. For example, thinning and mowing may occur over a 12-24-month project period. The under-burning component of the project may not occur for 3-5 years while the land recovers from the thinning and mowing and produces an adequate shrub content to support prescribed fire.

Therefore, the Steering Committee recognizes that although significant fuels reduction work has been completed, the need continues on the landscape as a whole. The Steering Committee supports the ongoing planning and treatment process on public lands, especially an increase in the use of prescribed fire. There are multiple prescribed fire techniques that land managers may use to best suit the area they are working within. The ultimate goal is to restore low-intensity fire to the local ecosystem, which has been historically dependent on fire for its health.

Treating ground fuels is a critical component of any effort designed to reduce fire threats, and it has added ecological benefits, such as recycling nutrients. Once an area, or unit, has been thinned and the slash has been treated, the site can be broadcast burned. Fire practitioners prepare the area by constructing firelines and/or use natural breaks such as roads or existing trails for containment lines for the prescribed burn. Where site objectives dictate that standing dead trees and large

downed woody material need to be protected, they can be either hand-lined or otherwise excluded from the burn block. Extra protection measures may not be necessary for many cultural or archaeological sites: treating these areas with prescribed fire has the advantage of protecting them from emergency suppression activities during a wildfire. Generally, the target flame length is under four feet, although some sites require a hotter burn to achieve the resource objectives.

Historically, large-scale broadcast burning has occurred in the spring. As the demands to boost prescribed fire use increase, utilizing as many burn windows, or days when the weather conditions are favorable, will be a critical piece in achieving restoration goals. Burning outside of the historical time frame, however, is more challenging to use prescribed fire and will depend on the availability and preparedness of appropriate resources and weather.

Burn operations usually begin by mid-morning following the break-up of the nighttime temperature inversion and the establishment of the daytime wind pattern. Completion of ignition should be targeted early enough to ensure adequate smoke dispersal prior to the onset of cooler nighttime temperatures.

Extensive public notification is an essential element of the prescribed burn program. The public can contact the Deschutes National Forest if they have health concerns that are exacerbated by smoke so that they can be notified prior to a prescribed burn. The Deschutes National Forest uses social media; especially [Twitter](#), their handle is @DesNatlForest. In addition @CentralORFire and a comprehensive website, [Central Oregon Fire, www.centraloregonfire.org](#), is used to notify local property owners of prescribed burns. The website includes news about upcoming prescribed fires, interactive maps of planned fires, information on air quality and what property owners can do to protect themselves from smoke impacts. Residents can also sign up for text alerts by sending the text “COFIRE” to 888777.

Once thinning, slash treatment, and first under-burning has been completed, the treated area constitutes an effective fuel-break for the next several years. Follow-up thinning and maintenance burns must be scheduled as necessary to ensure the treated areas remain free of the risk of catastrophic wildfire. Adequate access must be assured, not only to conduct needed follow-up treatments but also to permit the rapid response of fire suppression forces.

For the Greater Bend CWPP area, it is not a question of if a wildfire will occur, but when, where, and how much damage will result. Experience with wildfires burning in previously treated areas demonstrates the following:

- Improved public and firefighter safety
- Improved access for firefighters and apparatus
- Increased efficiency when locating and constructing firelines
- Easier detection and suppression of spot fires
- Decreased mop-up time and effort
- Reduced fire intensity, torching, and mortality
- Reduction of loss
- Reduction of smoke emissions

## **Prioritized Recommendations and Preferred Treatment Methods**

With critical needs assessed and priority areas identified through the risk assessment process, the Steering Committee identified the following hazard reduction recommendations to meet the purposes listed on page one of the Greater Bend CWPP:

- Reduce hazardous fuels on public lands
- Reduce hazardous fuels on private lands
- Reduce structural vulnerability including Ingress/Egress
- Increase education and awareness of the wildfire threat
- Identify, improve and protect critical transportation routes

### **Hazardous fuels reduction**

The overall standard of the Greater Bend CWPP is to decrease the risk of high-intensity wildland fire behavior by reducing and maintaining fuel loads to that which can produce flame lengths of less than four feet. This enables a safe and effective initial attack. The overall goal is to reduce the potential for crown fires and provide for a healthy, fire resilient landscape that supports the social, economic and ecological values of Greater Bend area property owners and visitors. The Steering Committee recognizes the effectiveness and value of maximizing treatment efforts in areas that are adjacent to federal or private projects and recommends that future projects consider these benefits when selecting areas for treatment. The following specific standards are recommended for treatments on public and private lands within the Greater Bend planning area.

#### Public lands

Federal lands make up 47% of the Greater Bend CWPP area and are managed by the US Forest Service from the Bend (38%) – Fort Rock Ranger District and the Bureau of Land Management (9%) – Prineville Ranger District.

It is the intent of the Steering Committee that the Greater Bend WUI boundary is subject to expedited measures for hazardous fuels treatment and allocation of funds to protect it as stipulated by the Healthy Forests Restoration Act (HFRA).

The Greater Bend CWPP area is directly adjacent to federal lands in segments on all sides of the boundary. The maps in Appendix A detail the WUI boundary throughout the Greater Bend CWPP area calling for protection specifically by reducing wildland fuel hazards on public lands.

The overall standard for public lands under this CWPP is to decrease the risk of high intensity wildland fire behavior by reducing and maintaining fuel loads to a level that will produce flame lengths of less than four feet in the areas within the WUI boundary. The areas where the fuel reduction projects are implemented will create a buffer or fire break that will begin at the edge of private lands (except where other land management practices prohibit it such as riparian or wetland areas) and extend onto the federal lands to the designated WUI boundary. This enables safe and effective initial attack. This standard can be achieved by the federal land management agency through a variety of treatment methodologies such as thinning, prescribed burning and mechanical treatments. Specific treatments should address fuels issues on a landscape scale rather than acre



by acre.

Federal land managers are strongly encouraged to work toward the overall standard by reducing fuel loads to a level that will produce flame lengths of less than four feet:

- On all areas within the identified WUI boundary beginning with the first ¼ mile buffer around private lands, especially those identified in the risk assessment as very high or high risk. Treatments should begin here and increase in ¼ mile increments until the WUI boundary is reached.
- Within 300 feet of any critical transportation route from Greater Bend.
- Although the treatments should focus on very high and high risk areas, maintenance of previously treated lands is also a top priority where treatment is critical to maintain fuel conditions that result in flame lengths of four feet or less within the CWPP area. Treatment and maintenance of previously treated lands before treatment begins again in other places is an important component of keeping communities safe.

In general, the dominant strategy in all areas should be thinning from below, in an effort to restore large tree, open park-like ponderosa pine dominated forests. In exclusively lodgepole pine and mixed conifer stands where site conditions are favorable to ponderosa pine, intensive thinning should occur with a reforestation strategy to restore a proper ratio, as determined by the agency, of lodgepole or mixed conifer to ponderosa pine. Excessive dead/down fuels should be removed followed by understory maintenance.

The Steering Committee also encourages federal land managers to work with local landowners to minimize road closures that could be used as alternate evacuation routes from Communities at Risk.

#### Private and County-owned lands

Private lands make up 51% of the acreage in the planning area. The County and City each owns less than 1% of the land in this planning area. The Steering Committee recommends that City and County-owned lands be treated in the same manner as privately-owned lands. The Steering Committee recommends continued partnerships with private timberland owners that encourages the same priorities as listed above for public lands within the WUI area.

#### Private land with *or* without structural improvements

On private lands within the Greater Bend CWPP WUI boundary with structural improvements or those that are vacant, the goal is for each property to meet the Oregon Urban Interface Fire Protection Act for its individual classification rating. This statute outlines standards and requirements for defensible space on private property that has fire protection from Oregon Department of Forestry.

Not all property in the Greater Bend WUI is provided wildland fire protection by ODF. During the reclassification process in 2009 however, Deschutes County elected to classify every parcel of

private land regardless of its protection status by ODF.

A detailed description of the standards is available from the Oregon Department of Forestry in the handbook for the Oregon Forestland – Urban Interface Fire Protection Act of 1997. This information is also available at [Oregon Wildland Urban Interface Act](#).

The Default Standards under the Oregon Forestland – Urban Interface Fire Protection Act of 1997 are:

- Establish a primary fuel break of 30-100 feet around structures;
- Create fuel breaks around driveways longer than 150 feet;
- Remove tree branches within 10 feet of chimneys;
- Remove any dead vegetation that overhangs a roof;
- Remove flammable materials from under decks and stairways;
- Move firewood 30 feet away from structures;

Property owners can also create and/or maintain defensible space, a fire-resistant buffer that allows for effective first-response firefighting and a significantly reduced risk of the spread of fire by participating in programs like FireFree and Firewise, which promote a variety of fire safe actions to help prevent the spread of fire, to protect individual homes and neighborhoods.

Property owners that live within the city limits of Bend do have to comply with local building codes and fire codes to reduce the catastrophe from wildfires. These codes allow for the City and Bend Fire and Rescue to restrict the use of combustible roofing materials, design new communities with adequate and proper access (ingress/egress) for emergency vehicles as well as adequate water supply and hydrant distribution; address sign specifications and road signs are also managed by Bend Fire and Rescue. There are also ordinances in effect that allow for the enforcement of vegetation abatement. All of these enforced code and ordinance provisions help reduce the number and severity of fires in the greater Bend area.

## Recommendations to Reduce Structural Vulnerability including Ingress/Egress

There are approximately 46,262 structures spread across this CWPP boundary. The graphic and two tables that follow below summarize recommendations to reduce structural vulnerability. The lists are compiled with tips and suggestions from the FireFree and Firewise programs, which promote homeowner responsibility for reducing fire hazards on their property. More information about these programs can be found at [www.firefree.org](http://www.firefree.org) and [www.firewise.org](http://www.firewise.org).



### **Home Safety Checklist for Home Ignition Zones:**

#### **Immediate Zone: 0-5**

- Clean roofs, gutters and the area within 5' of the residence of all dead leaves, needles, flammable debris and vegetation
- Move any flammable material away from wall exteriors mulch, flammable plants, leaves and needles, firewood piles anything that can burn. Remove anything stored underneath decks or porches.

#### **Intermediate Zone: 5-30**

- Thin out dense groups of trees.
- Remove vegetation under trees and prune trees up to six to ten feet from the ground.

#### **Extended Zone: 30- 100**

- Dispose of heavy accumulations of ground debris.
- Remove dead plants and trees.
- Remove small trees growing between or under mature trees.

|                          | <b><u>What are ten steps I can do to prepare my defensible space?</u></b> |
|--------------------------|---|
| <input type="checkbox"/> | Define your defensible space – at least 30 feet                           |
| <input type="checkbox"/> | Reduce flammable brush around your home and under nearby trees.           |
| <input type="checkbox"/> | Prune or remove trees.  |
| <input type="checkbox"/> | Keep grass and weeds cut low.   |
| <input type="checkbox"/> | Clear wood piles and building materials away from your home.              |
| <input type="checkbox"/> | Keep your yard and roof clean.  |
| <input type="checkbox"/> | Keep address signs visible  |
| <input type="checkbox"/> | Choose fire resistant building materials and lawn furniture.              |
| <input type="checkbox"/> | Recycle yard debris – avoid burning.                                      |
| <input type="checkbox"/> | Be prepared to respond to wildfire.                                       |

|                          | <b><u>What additional steps can I take to reduce risks to my home and neighborhood?</u></b>  |
|--------------------------|--|
| <input type="checkbox"/> | Remove all branches and limbs that overhang roofs.   |
| <input type="checkbox"/> | Remove leaves & needles from gutters, roofs and decks.   |
| <input type="checkbox"/> | Remove dead plants and brush.  |
| <input type="checkbox"/> | Keep decks free of flammable lawn furniture, toys, doormats, etc   |
| <input type="checkbox"/> | Screen vents and areas under decks with 1/8” metal mesh or fire-resistant siding.  |
| <input type="checkbox"/> | Trim vegetation along driveways a minimum distance of 14’ wide x 14’ high for fire trucks.   |
| <input type="checkbox"/> | Choose fire resistant plants. Visit <a href="http://www.extension.oregonstate.edu/deschutes">www.extension.oregonstate.edu/deschutes</a> to view <i>Fire-Resistant Plants for the Home Landscape</i> . |
| <input type="checkbox"/> | Increase Homeowner education and actions with programs such as FireFree, Firewise, Urban Interface Fire Protection Act.  |
| <input type="checkbox"/> | Re-apply for Firewise USA® recognition annually, if applicable   |
| <input type="checkbox"/> | If you are interested in a free home assessment call Bend Fire and Rescue or Oregon Department of Forestry   |
| <input type="checkbox"/> | If burning debris outside Bend City Limits – call the Burn Line at Bend Fire and Rescue at 541-322-6335 to see if burning is allowed. Do not burn building materials                                   |

## **Education and Awareness of the Wildfire Threat**

As stated in the purpose of the Greater Bend CWPP, four outcomes related to education and awareness for this planning effort are to:

- Instill a sense of personal responsibility for taking preventative actions regarding wildland fire,
- Increase public understanding of living in a fire-adapted ecosystem,
- Increase the community's ability to prepare for, respond to and recover from wildland fires, and
- Increase the community's ability to recover from wildland fires.

With these goals in mind, education and outreach are top priorities for the Greater Bend CWPP. The rapid influx of new property owners is just one reason the Steering Committee places a high value on the education of Greater Bend area property owners. Many new property owners and visitors are unfamiliar with wildland fire and have limited experience with issues like defensible space. Property owners and visitors will continue to benefit from clear examples of what a fire resilient forest and community look like as well as easy access to resources that help them take action.

There are several opportunities to enhance educational efforts in the Greater Bend area. Bend Fire and Rescue, the USFS, BLM, ODF, the Central Oregon Fire Prevention Cooperative and Project Wildfire all provide wildland fire preparedness programs through a variety of individual and collaborative efforts. Realty and insurance agencies are identified as partners to help educate and raise awareness for members of the community that may be new to the area. The Steering Committee for the Greater Bend CWPP is committed to maintaining and enhancing these partnerships.

Property owners are strongly encouraged to learn more about how they can reduce the hazards on their own property. Property owners may also find additional information on how they can reduce hazards and protect themselves at [www.firefree.org](http://www.firefree.org) and [www.firewise.org](http://www.firewise.org).

## **Identify, Improve and Protect Critical Transportation Routes**

As noted in the Community Assessment of Risk, the Steering Committee defined Critical Transportation Routes as:

all routes necessary for the support of routine flow of commerce to and/or through the Greater Bend area,

all routes that could be used for potential evacuation of property owners and visitors from a wildland fire threat to public safety,

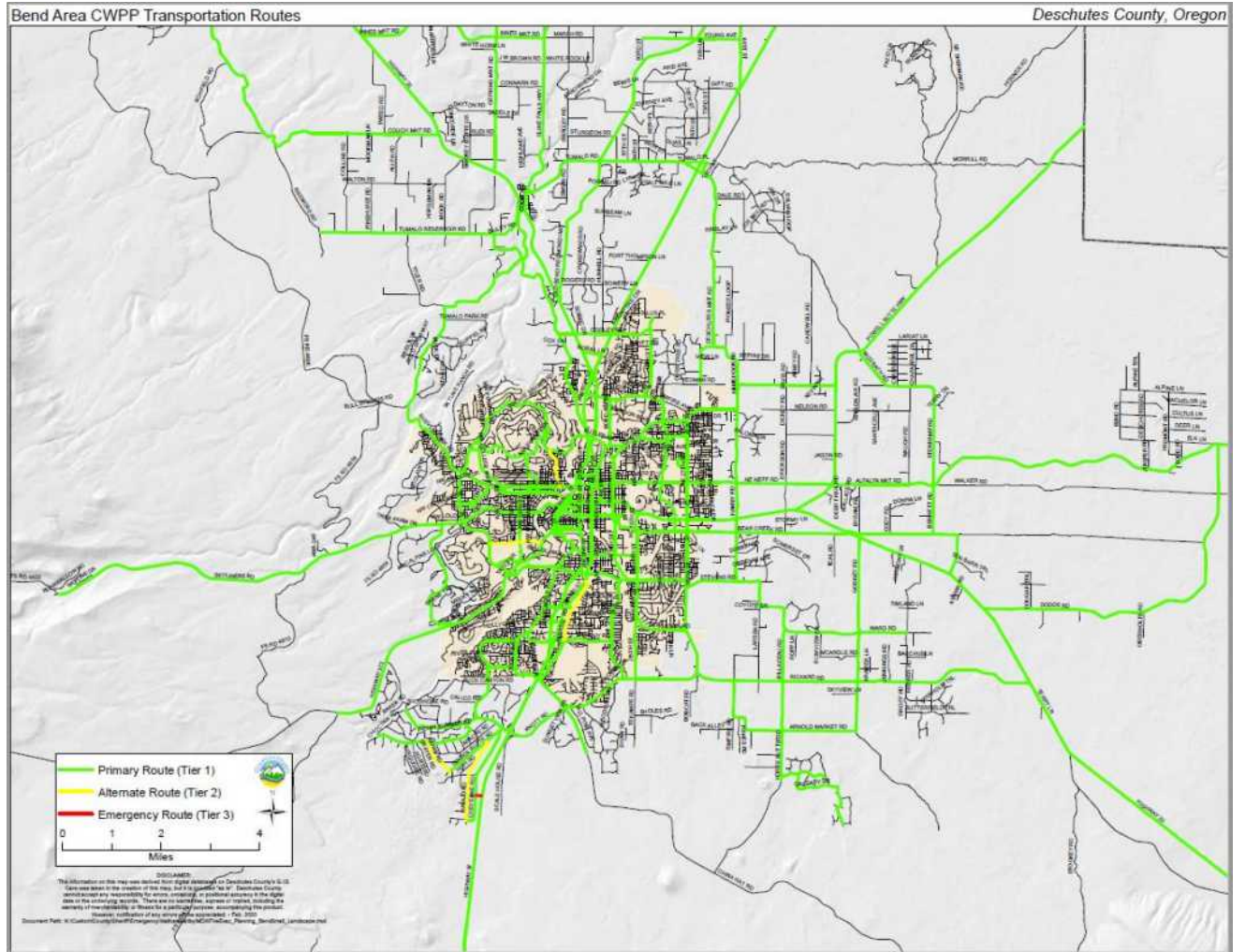
routes needed for emergency ingress and egress to a wildland fire incident, not including unimproved or "two-track" roads,

and, all routes needed to protect and support critical infrastructure (power substations, communication transmission lines, water and fuel storage, public service facilities, recreation facilities, etc.).

The steering committee recognized the need to translate the definition above into a map that

identifies these routes. The Deschutes County Sherriff's office in cooperation with other first responders has begun to develop a map that identifies existing critical transportation routes in the Greater Bend CWPP area and throughout the County. The map below illustrates these routes as of 2021. The Steering Committee will assist in conducting further assessments to determine the evacuation needs and identify potential projects developing new routes and/or improving existing routes. The Steering Committee will continue to encourage federal land managers to work with the Greater Bend community to minimize closures of roads that could be considered critical transportation routes.





The figure above shows critical transportation routes identified in the Greater Bend CWPP area



## Evaluation and Monitoring

The Steering Committee faced a complex task in the comprehensive revision of the Greater Bend Community Wildfire Protection Plan. Implementing and sustaining the efforts outlined in the Action Plan will require a significant time and financial commitment. Building a collaborative and cooperative environment with Bend Fire and Rescue, Deschutes County RFPD #2, community-based organizations, local government and the public land management agencies has been the first step in reducing the risk of loss from wildland fire. The Steering Committee pledges to maintain this cooperation with the public over the long-term with the commitment of all the parties involved.

At a minimum, the Greater Bend CWPP Steering Committee shall include: representatives from Bend Fire & Rescue; Deschutes County Rural Fire Protection District #2; Oregon Department of Forestry (ODF); the City of Bend; Bureau of Land Management (BLM) and the US Forest Service (USFS); the Deschutes County Forester; and the Program Director from Project Wildfire, along with members of the public.

The Steering Committee agrees that the Greater Bend Community Wildfire Protection Plan will be a living document, intended to promote fuels reduction, educational, and other projects to decrease overall risks of loss from wildland fire. The Greater Bend CWPP will be revisited at least annually to address its purpose.

Bend Fire and Rescue will work with Project Wildfire to convene the Steering Committee as often as the Steering Committee deems necessary to implement and review the Greater Bend Community Wildfire Protection Plan. Topics for discussion can include:

- Identification and assessment of new or treated risks.
- Evaluation and tracking of progress toward goals.
- Updating of maps.
- Adoption of new and/or revised priorities.
- Identification of specific projects.
- Discussions of grant opportunities and determination of projects eligible for funding.
- Writing of grants.
- Identification of appropriate projects to address additional items as outlined in the Action Plan for Structural Vulnerability, Education and Critical Transportation Routes.
- Coordination of additional items, projects and assessments.

Bend Fire and Rescue and Project Wildfire will ensure that the evaluation and monitoring activities listed above are addressed by the Steering Committee each year. As members of the Steering Committee change, Project Wildfire will ensure that it maintains a balanced representation of agency and public members, with a continued focus on inviting interested parties to participate in the review and planning process.



# Oregon Wildfire Risk Explorer- Advanced Report

## Greater Bend

232,675 Acres: (364 Sq. Miles)



Generated: June 9, 2021

Weather and vegetation conditions vary daily and seasonally. For current conditions and local fire restrictions, contact your local fire district or visit: [www.keeporegongreen.org/current-conditions](http://www.keeporegongreen.org/current-conditions)

## INTRODUCTION

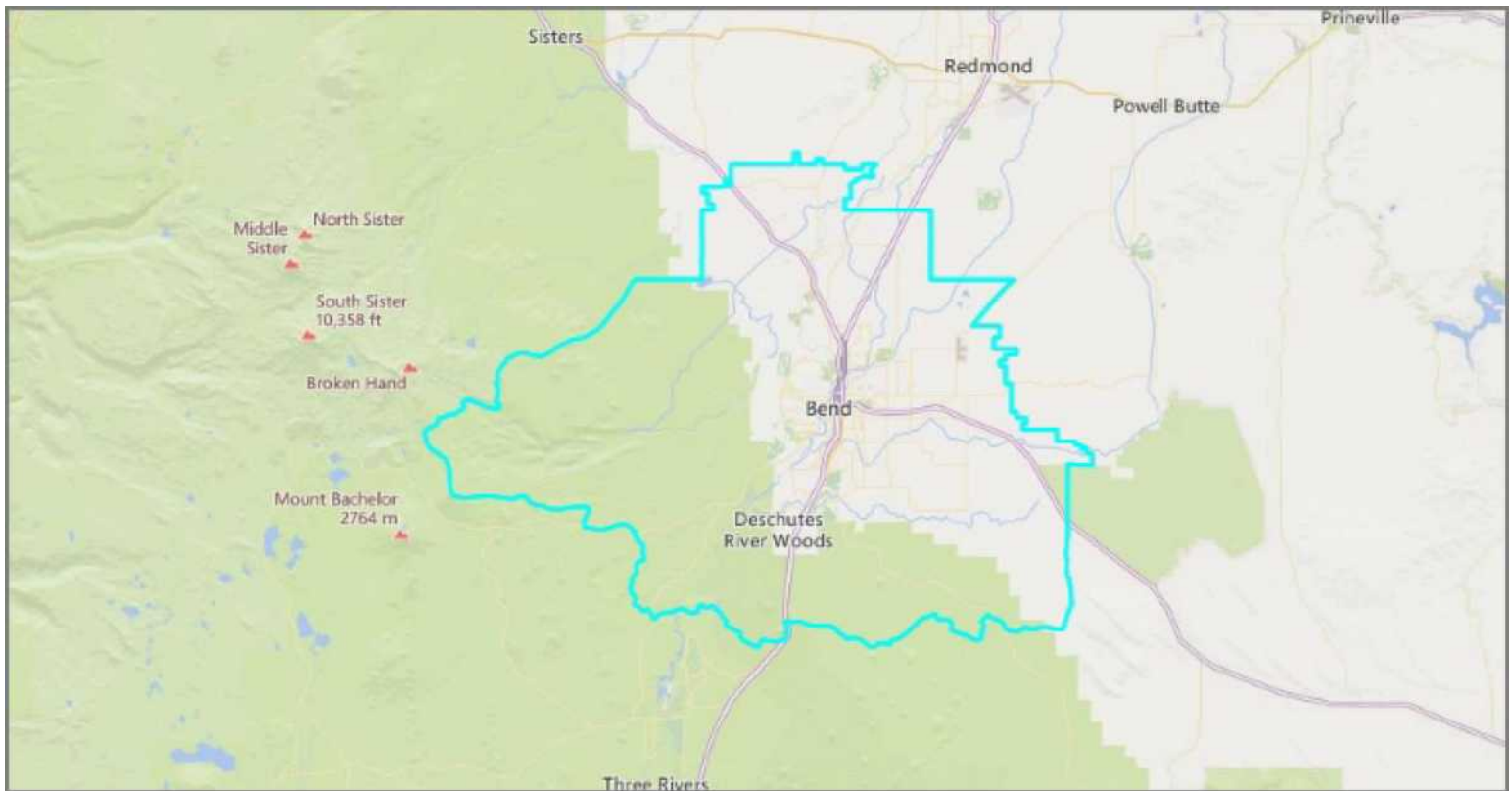
This report summarizes wildfire risk in **Greater Bend** from the [Advanced Oregon Wildfire Risk Explorer map viewer](#) (OWRE). Wildfire risk combines the likelihood of a fire occurring with the exposure and susceptibility of valued resources and assets on the landscape.

Nearly all areas in Oregon experience some level of wildfire risk. Conditions vary widely with local topography, fuels, and local weather, especially local winds. In all areas, under warm, dry, windy, and drought conditions, expect higher likelihood of fire starts, higher fire intensities, more ember activity, a wildfire more difficult to control, and more severe impacts.

Greater Bend in Oregon



Greater Bend Reference Map



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# Oregon Wildfire Risk Explorer- Advanced Report

**Greater Bend**

232,675 Acres: (364 Sq. Miles)



Generated: June 9, 2021

## GUIDELINES

The OWRE Advanced Report provides wildfire risk information for a customized area of interest to support Community Wildfire Protection Plans (CWPPs), Natural Hazard Mitigation Plans (NHMPs), and fuels reduction and restoration treatments in wildfire-prone areas in Oregon. Here are some things you need to know about this information:

The Advanced OWRE map viewer provides **wildfire risk assessment** data primarily from the 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, produced by the US Forest Service with a coalition of local fire managers, planners, and natural resource specialists in both Washington and Oregon. The assessment uses the most current data (incorporating 2017 fires) and state-of-the-art fire modeling techniques, and is the most up-to-date wildfire risk assessment for Oregon. The assessment characterizes risk of large wildfires (>250 acres). Data also comes from the 2013 West Wide Wildfire Risk Assessment, Oregon Department of Forestry (ODF), and other sources.

Wildfire risk is modeled at a landscape scale. The data does not show access for emergency response, home construction materials, characteristics of home ignition zones, or NFPA Firewise USA® principles. For CWPP and NHMP updates you may want to **consider two scales**:



- first, use data from the OWRE to characterize and understand the fire environment and fire history in your area broadly at a landscape scale, focusing on watersheds or counties;
- then, overlay local knowledge, focusing on communities, fire protection capabilities, local planning areas, and defensible space concepts for neighborhoods and homes.

The OWRE Advanced Report will provide the landscape context of the current fire environment and fire history upon which you can build your local plans toward resilience by preparing and mitigating the larger landscape wildfire risk.

The OWRE Advanced Map Viewer and Report will not replace local knowledge of communities you may consider high risk. Continue to use local Fire Department and ODF knowledge to generate CWPP concern areas. OWRE will produce broad scale maps for your CWPP area as a whole, but maps and data will contain some inaccuracies, which are most prevalent at fine scales.

Recommended additional information sources for wildfire planning:

- Oregon Department of Forestry CWPP list - <https://www.oregon.gov/ODF/Fire/Pages/CWPP.aspx>
- Oregon Explorer Communities Reporter - demographic and other data for counties and communities <https://oe.oregonexplorer.info/rural/CommunitiesReporter/>
- Wildland Urban Interface Toolkit - [https://www.usfa.fema.gov/wui\\_toolkit/wui\\_planning.html](https://www.usfa.fema.gov/wui_toolkit/wui_planning.html)
- Wildland Urban Interface Wildfire Mitigation Desk Reference Guide - <https://www.nwccg.gov/sites/default/files/publications/pms051.pdf>
- Oregon Spatial Data Library - <https://spatialdata.oregonexplorer.info/geoportal/>
- NFPA Firewise USA® - teaching people how to adapt to living with wildfire and encouraging neighbors to work together and take action to prevent losses. - <https://www.nfpa.org/Public-Education/By-topic/Wildfire/Firewise-USA>
- Headwaters Economics - Full Community Costs of Wildfire - <https://headwaterseconomics.org/wildfire/homes-risk/full-community-costs-of-wildfire/>

This Advanced Wildfire Risk Report was generated from the Advanced Oregon Wildfire Risk Explorer map viewer at: [tools.oregonexplorer.info/OE\\_HtmlViewer/index.html?viewer=wildfireplanning](https://tools.oregonexplorer.info/OE_HtmlViewer/index.html?viewer=wildfireplanning). This site is intended for wildfire professionals and planners. For a basic summary of wildfire risk geared toward a public audience, visit the basic OWRE map viewer: [tools.oregonexplorer.info/OE\\_HtmlViewer/index.html?viewer=wildfire](https://tools.oregonexplorer.info/OE_HtmlViewer/index.html?viewer=wildfire).



# Oregon Wildfire Risk Explorer- Advanced Report

**Greater Bend**

232,675 Acres: (364 Sq. Miles)



Generated: June 9, 2021

## WILDFIRE RISK ASSESSMENT CONCEPTS & DATA

The Advanced Oregon Wildfire Risk Explorer (OWRE) map viewer organizes data into folders based on wildfire risk concepts. All OWRE advanced reports will include information about Overall wildfire risk, Burn probability, Flame length, Overall potential impact, Hazard to potential structures, Fire history, Land management, and Estimated housing density. Users can select additional data layers of interest, which will appear after the layers listed above.

### Wildfire Risk

Overall wildfire risk takes into account both the likelihood of a wildfire and the exposure and susceptibility of mapped valued resources and assets combined. The dataset considers (1) the likelihood of wildfire >250 acres (likelihood of burning), (2) the susceptibility of resources and assets to wildfire of different intensities, and (3) the likelihood of those intensities. Blank areas either have no currently mapped assets or resources and/or are considered a non-burnable fuel in terms of wildfire. Note that agricultural lands are considered non-burnable in this map, even though fires can occur in these areas and may spread into more typically considered burnable areas such as forested lands. Data layers include: Overall wildfire risk, Wildfire risk to assets, and Wildfire risk to people and property.

### Wildfire Threat

Wildfire threat shows the likelihood of a large wildfire, the average intensity and the likelihood of higher intensities, conveyed by flame length. Data layers include: Burn probability, Average flame length, Probability of exceeding 4' flames, and Probability of exceeding 8' flames. Additional data layers that show wildfire threat are found under the Fire History and Active Fires folder, where historical fire starts and historical fire perimeters are located.



### Wildfire Potential Impacts

Wildfire potential impacts shows the actual exposure of mapped resources and assets. The data layers do not incorporate the likelihood of burning, they only show the consequence of wildfire if it were to occur. Data layers include: Overall potential impact, Potential impact to people and property, Potential impact to infrastructure, Potential impact to timber resources, Potential impact to wildlife, and Potential impact to forest vegetation. The layers (Potential impact to timber resources, wildlife, and forest vegetation) may be useful when targeting fuels treatment. These layers are influencing the "Benefit" areas in the Overall wildfire risk map - they show areas where there is ecological opportunity to restore historical or desired conditions and/or potentially reduce the risk of catastrophic wildfire with managed fire use or other management. The Potential impact to forest vegetation optional report element is coupled with historical fire regime information to give basic context when comparing historical and current conditions.

### Hazard to Potential Structures

Hazard to potential structures depicts the hazard to hypothetical structures in any area if a wildfire were to occur. This differs from Potential Impacts, as those estimates consider only where people and property currently exist. In contrast, this layer maps hazard to hypothetical structures across all directly exposed (burnable), and indirectly exposed (within 150 meters of burnable fuel) areas in Oregon. As with the Potential Impacts layers, the data layer does not take into account wildfire probability, it only shows exposure and susceptibility.

### Fire Model Inputs and Fuelscape

These layers are the fuels and topography used to run the fire model in the 2018 Pacific Northwest Quantitative Wildfire Risk Assessment. Data layers include: Fuel models, Fuel model groups, Forest canopy base height, Forest canopy height, Forest canopy cover, Forest canopy bulk density, Slope, Elevation and Aspect. Fuel models and groups characterize local surface vegetation composition relative to carrying fire more precisely than a basic land cover or vegetation maps. Fuel models indicate the type of potential wildfire based on the fuels that will ignite and spread fire. Canopy data layers characterize vegetation structure for fire modeling: base height, cover, and bulk density estimates can show where there may be propensity for ladder fuels (ground vegetation and trees that reach up to tree branches and upper forest canopy), and where contiguous forest canopies have potential for canopy fire. Note that not all of these layers are available to select for use in the OWRE advanced reports, but all of them are available for download and they are described in the metadata. Also note that weather, the third part of the three major elements that determine wildfire occurrence and intensity, is not included in this data distribution - please see the full report to understand the weather parameters used in the assessment.

For more detailed information, please see the full 2018 PNW Quantitative Wildfire Risk Assessment report:

[oe.oregonexplorer.info/externalcontent/wildfire/reports/20170428\\_PNW\\_Quantitative\\_Wildfire\\_Risk\\_Assessment\\_Report.pdf](http://oe.oregonexplorer.info/externalcontent/wildfire/reports/20170428_PNW_Quantitative_Wildfire_Risk_Assessment_Report.pdf)



# Oregon Wildfire Risk Explorer- Advanced Report

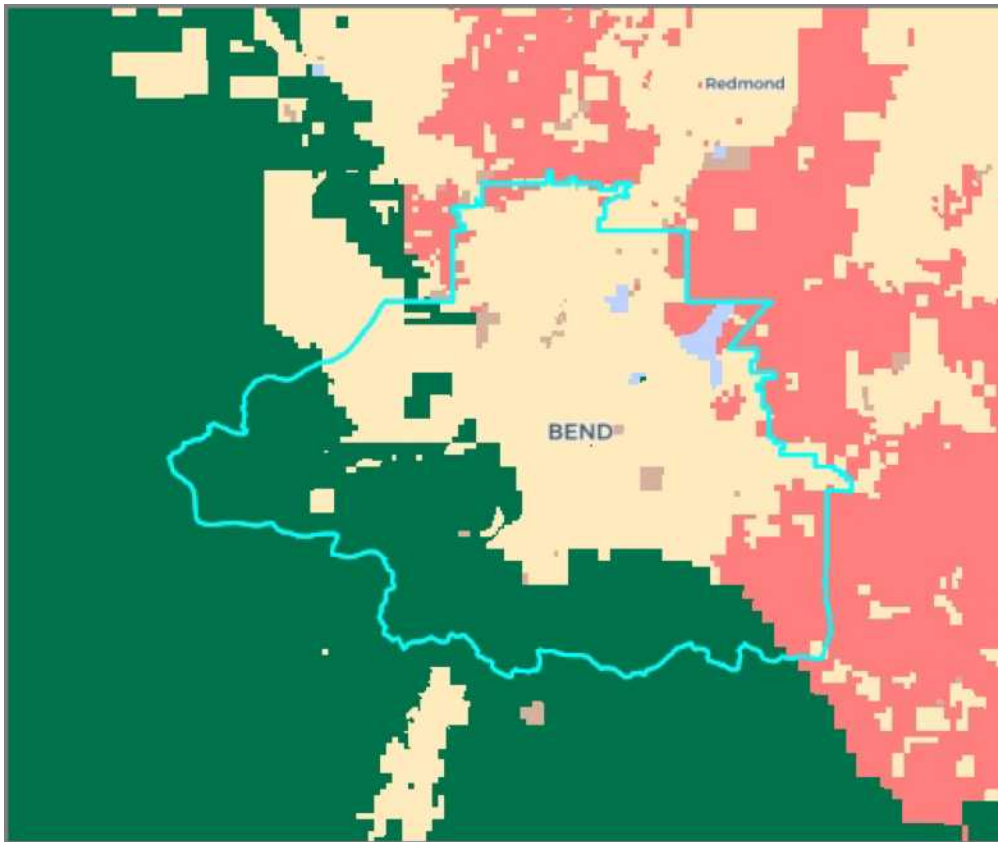
## Greater Bend

232,675 Acres: (364 Sq. Miles)



Generated: June 9, 2021

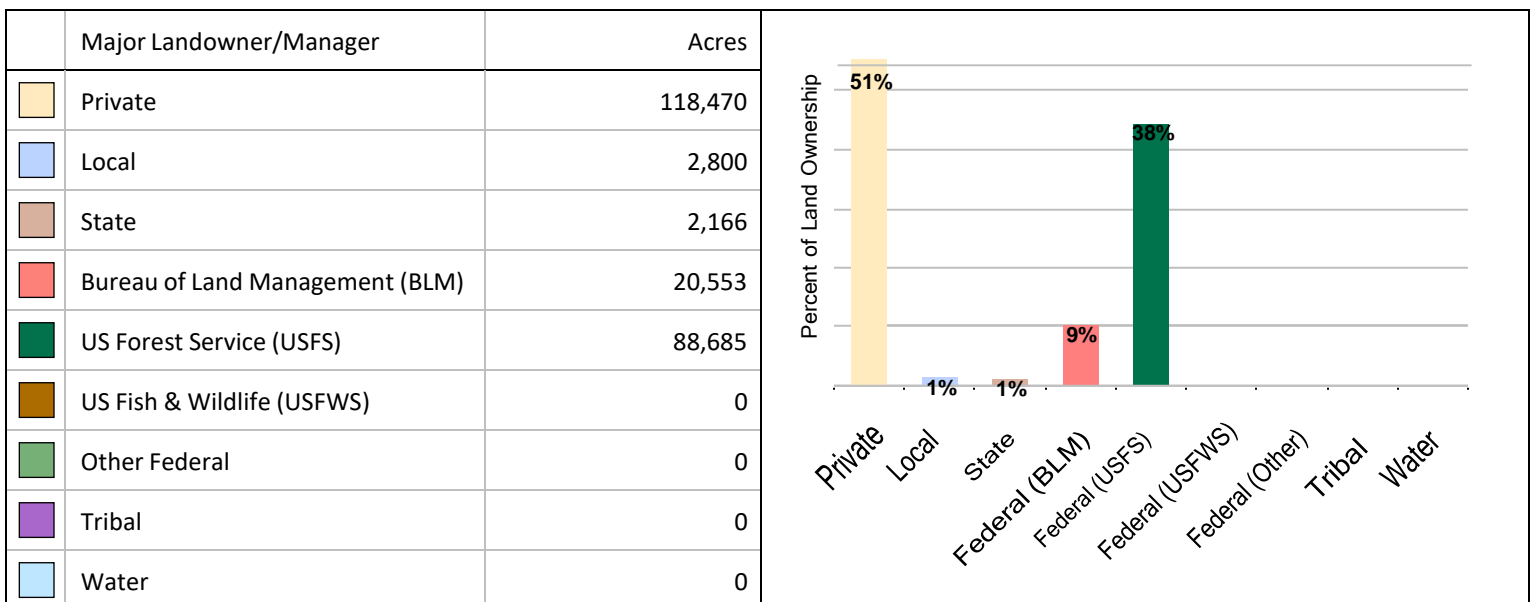
### LAND OWNERSHIP AND MANAGEMENT



Knowing the land ownership and management in an area is important for hazard planning and awareness when wildfires occur. Oregon has a complete and coordinated wildfire management system between local, private, tribal, state, and federal agencies. These entities participate to fight fire in local areas and throughout the state according to their jurisdictions and protection responsibilities. Different land owners and managers have a variety of highly valued resources and assets to protect. Agencies differ in land use and overall management, including fire management.

The map, table and charts below show the breakdown of ownership types in your area.

Greater Bend



Source: Bureau of Land Management, 2015

\* Values may add up to over 100% due to rounding precision





# Oregon Wildfire Risk Explorer- Advanced Report

**Greater Bend**  
232,675 Acres: (364 Sq. Miles)



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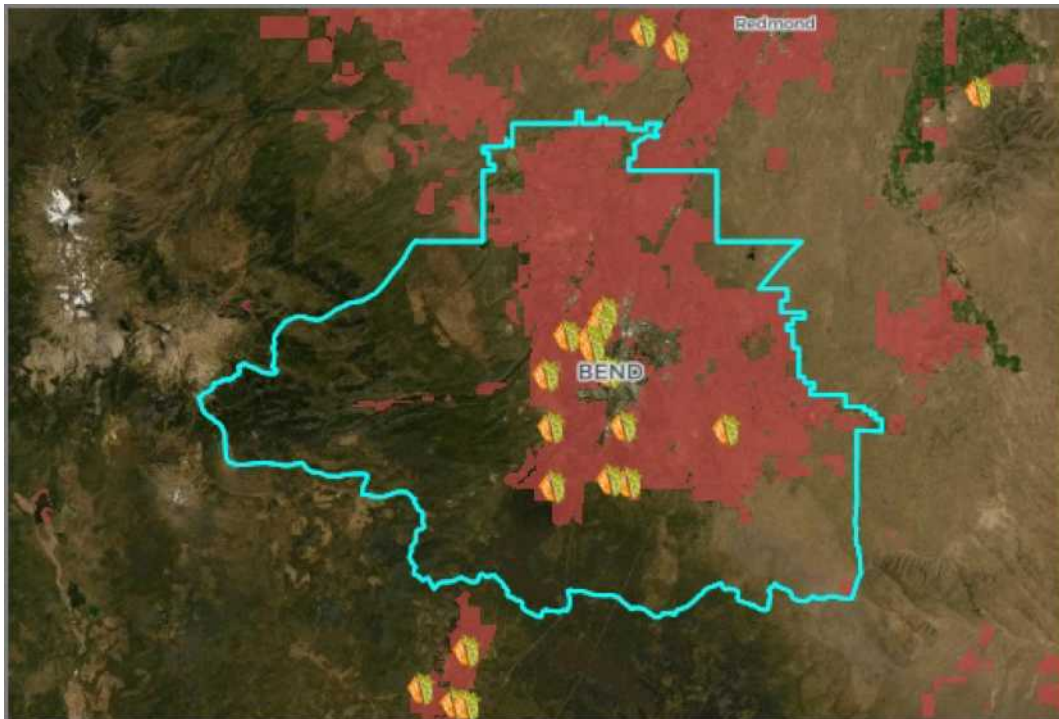
## OREGON WUI COMMUNITY HAZARD RATINGS

Counting locally identified communities and neighborhoods, there are up to 6.9 million acres of Wildland Urban Interface (WUI) areas in Oregon. These areas were identified using a base WUI dataset from Radeloff, V.C., et. al, 2017 (published by USFS RDA), which incorporated 2010 census and 2011 land cover data. Locally mapped communities from Community Wildfire Protection Plans (CWPPs) from 2008 through 2013 were associated with the WUI geography. Department of Land Conservation & Development 2017 Oregon Land Use Zoning was also included for recent residential and developed or developing rural growth since the 2010 census. A cross-check was also made with the “100 Communities at Risk” report from the QWRA. Note that this WUI acreage contrasts with the 2.4 million acres from the West Wide Risk Assessment (Where People Live/Wildland Development Areas). The source Radeloff et. al WUI data used census block housing counts and land cover as opposed to WWRA Landscan night lights and housing densities. Acreage is larger in this Oregon WUI due to some rural areas having built environments along roads that spline two or more large census blocks, and we erred on the side of inclusion to add those entire areas to the dataset and not disrupt the original WUI geography. Also very small rural town centers that can potentially be encompassed by catastrophic wildfire, are kept whole in the Oregon WUI dataset.

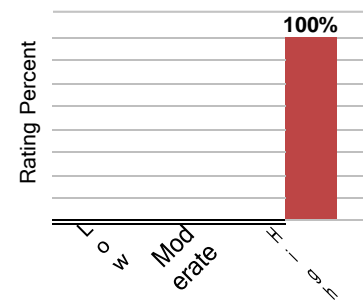
Burn Probability from the QWRA was used to assign a wildfire hazard rating to the built environment and homes in these areas. Hazard levels are based on modeled vegetation, not on building construction materials or ingress/egress issues. For a comprehensive analysis of wildfire risk and understanding of the potential threat of wildfire to your community, view the WUI combined with local fire starts and information in your Community Wildfire Protection Plan. A Community Wildfire Protection Plan (CWPP) is the product of collaboration between local communities and agencies interested in reducing wildfire risk and addressing response in a comprehensive plan. It also allows counties to prioritize and mitigate high risk areas, enhance safety and better protect themselves and their forested landscapes from wildfire.

Even in areas where risk is high, defensible space and Firewise USA® principles can be incredibly useful in minimizing the risk to homes in the Wildland Urban Interface.

Greater Bend



WUI Hazard Area Acres in Greater Bend



|  | Rating        | Acres  |
|--|---------------|--------|
|  | Low           | 0      |
|  | Moderate      | 0      |
|  | High          | 88,901 |
|  | Firewise Site |        |



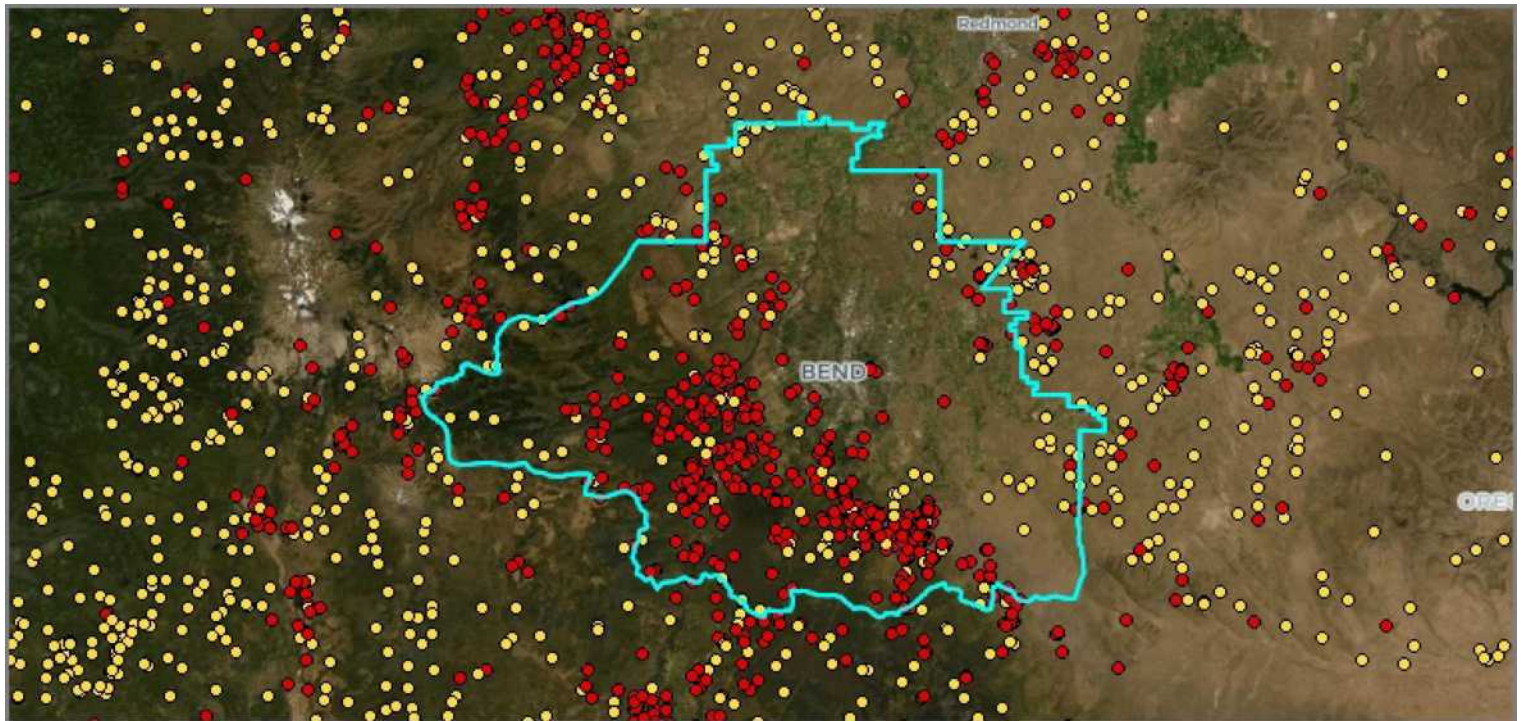
# Oregon Wildfire Risk Explorer- Advanced Report

**Greater Bend**  
232,675 Acres: (364 Sq. Miles)

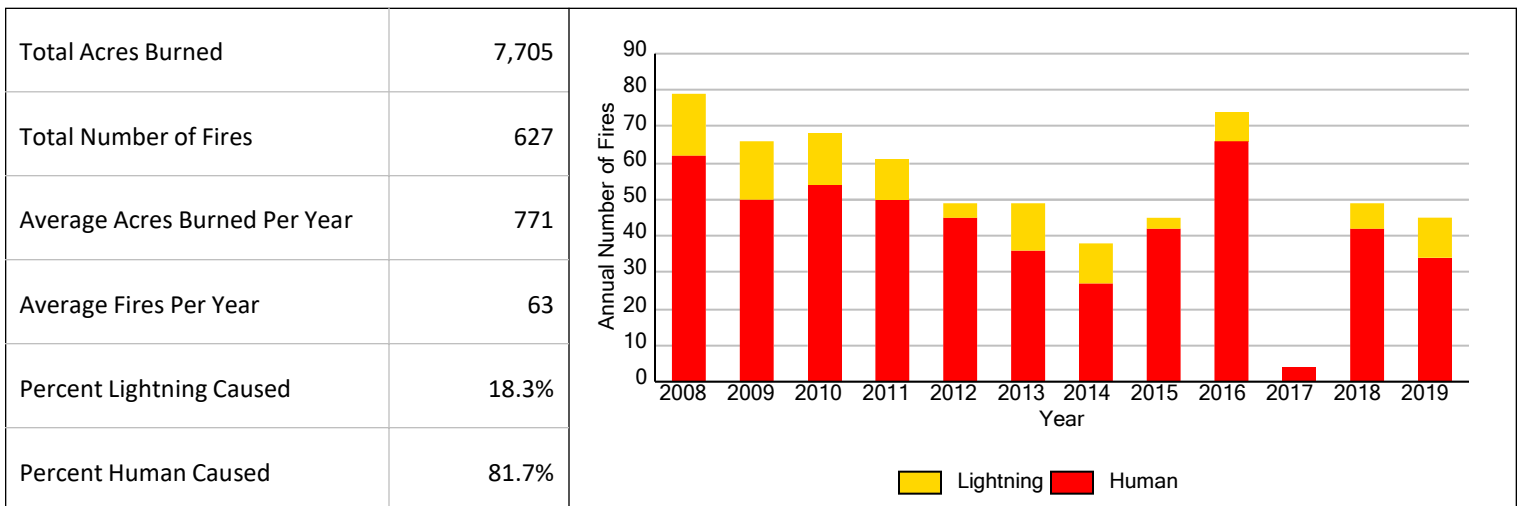


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## FIRE HISTORY - FIRE IGNITIONS



Greater Bend fire starts between 2008-2019



Knowing where and why fires start is the first step in awareness, prevention, and mitigation. Viewing local fire starts in conjunction with burn probability (provided later in this report) provides a comprehensive view of local fire history and potential.

Statewide, 71% of fires recorded by ODF are human-caused, and many of these fires are near populated areas. Lightning caused fires make up only 29% of fire starts, but tend to burn more acres as they are often located in remote areas.

The map, table and charts on this page show the cumulative number fire starts in your area.

Source: Short, K. and Oregon Department of Forestry, 2019





# Oregon Wildfire Risk Explorer- Advanced Report

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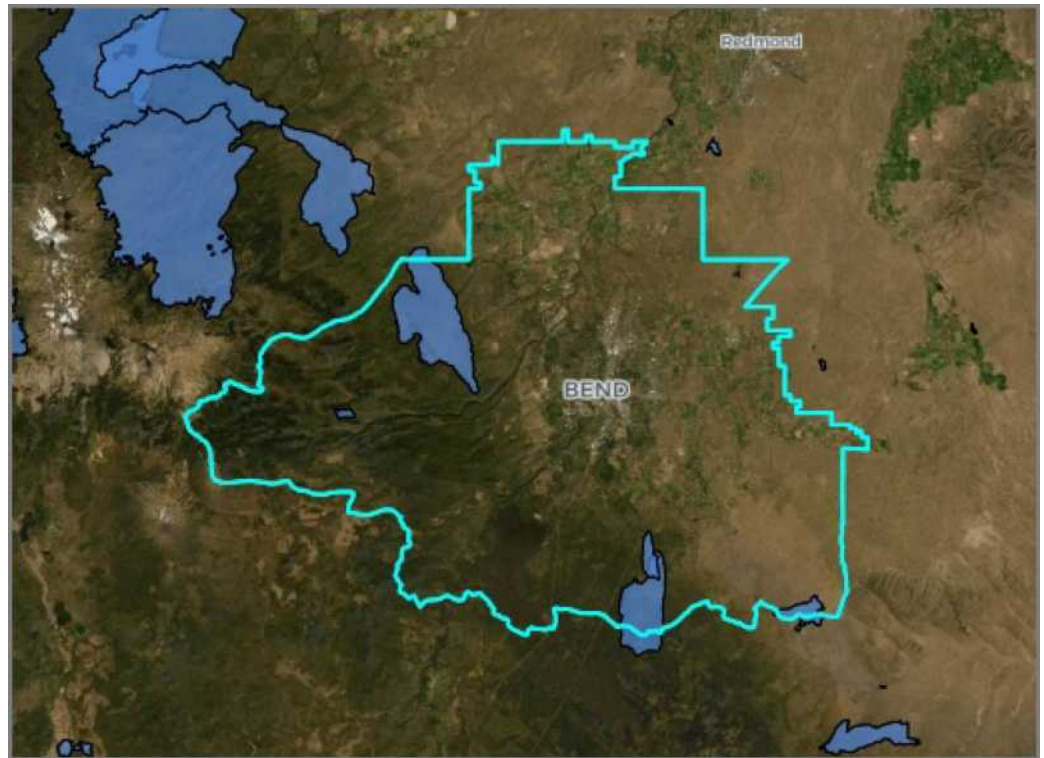


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## FIRE HISTORY - FIRE PERIMETERS

Although most wildfires in Oregon are human-caused and suppressed quickly while small, Oregon has experienced many large wildfires. The map and table below show the footprints of fires that have occurred in your area since 2000.

 Perimeter



### Wildfires in Greater Bend

| Wildfire Name        | Year | Acres Burned |
|----------------------|------|--------------|
| 0215 COUGAR BUTTE NW | 2017 | 150          |
| Two Bulls            | 2014 | 6,906        |
| Woodside Ranch       | 2007 | 595          |
| Cave                 | 2005 | 853          |
| 18 Road              | 2003 | 3,811        |

Source: National Interagency Fire Center: <https://www.nifc.gov/>

For more information about previous large wildfires, see: National Interagency Fire Center [https://www.nifc.gov/fireInfo/fireInfo\\_main.html](https://www.nifc.gov/fireInfo/fireInfo_main.html)



# Oregon Wildfire Risk Explorer- Advanced Report

**Greater Bend**  
232,675 Acres: (364 Sq. Miles)



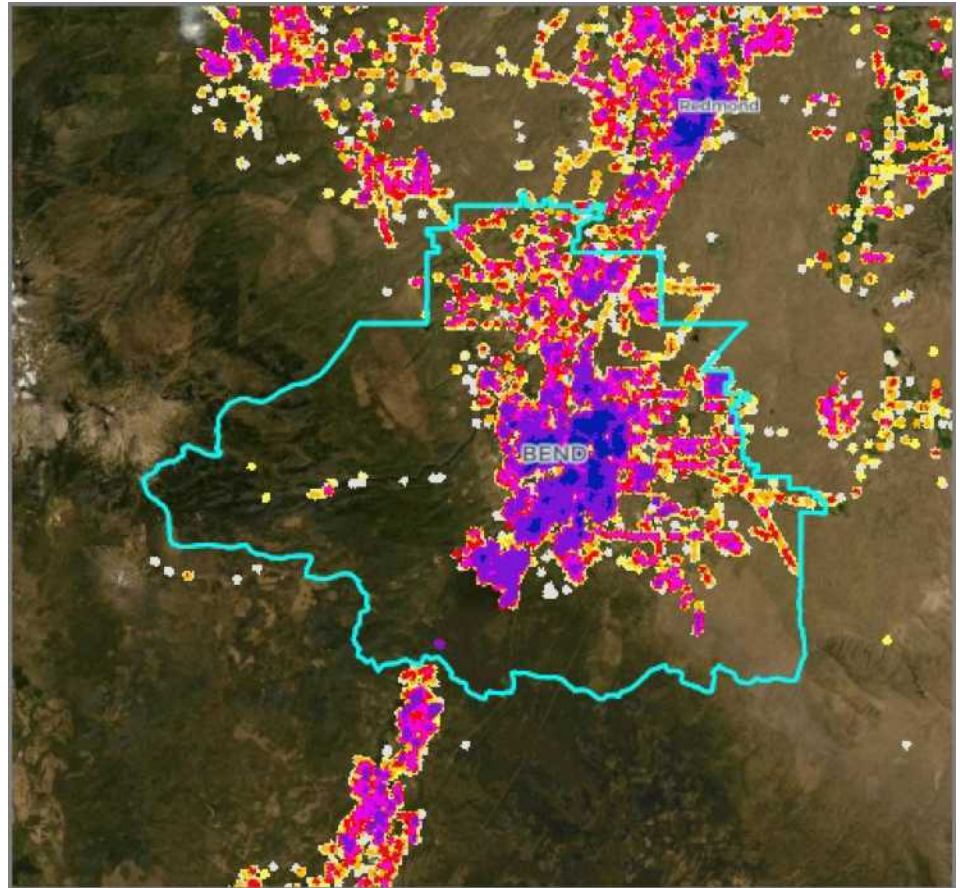
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## HOUSING DENSITY - WHERE PEOPLE LIVE

Areas where people live are a primary concern when assessing wildfire risk. Especially critical is the Wildland Urban Interface (WUI) - areas where houses and other development meet or mix with undeveloped natural areas, with a close proximity of houses and infrastructure to flammable wildland vegetation.

In the U.S., the number of homes in the WUI increased by 13.4 million since 1990. This expansion of the WUI poses particular challenges for wildfire management, creating more structures and populations at risk in environments where firefighting is often difficult. In Oregon, nearly 2.4 million acres are considered WUI areas, about 3.8% of the state. Of the nearly 1.7 million homes in Oregon, over 603,000, or 36%, are in the WUI.

The map and table on this page shows the location and density of where people live in your area.



### Greater Bend housing density

| Category                         | Acres  | %* |
|----------------------------------|--------|----|
| <1 house per 40 acres            | 6,738  | 3  |
| 1 per 40 acres to 1 per 20 acres | 6,119  | 3  |
| 1 per 20 acres to 1 per 10 acres | 10,268 | 4  |
| 1 per 10 acres to 1 per 5 acres  | 11,279 | 5  |
| 1 per 5 acres to 1 per 2 acres   | 14,446 | 6  |
| 1 per 2 acres to 3 per acres     | 16,743 | 7  |
| > 3 per acres                    | 4,264  | 2  |

Source: 2013 West Wide Wildfire Risk Assessment, ODF

\* Values may add up to over 100% due to rounding precision





# Oregon Wildfire Risk Explorer- Advanced Report

## Greater Bend

232,675 Acres: (364 Sq. Miles)



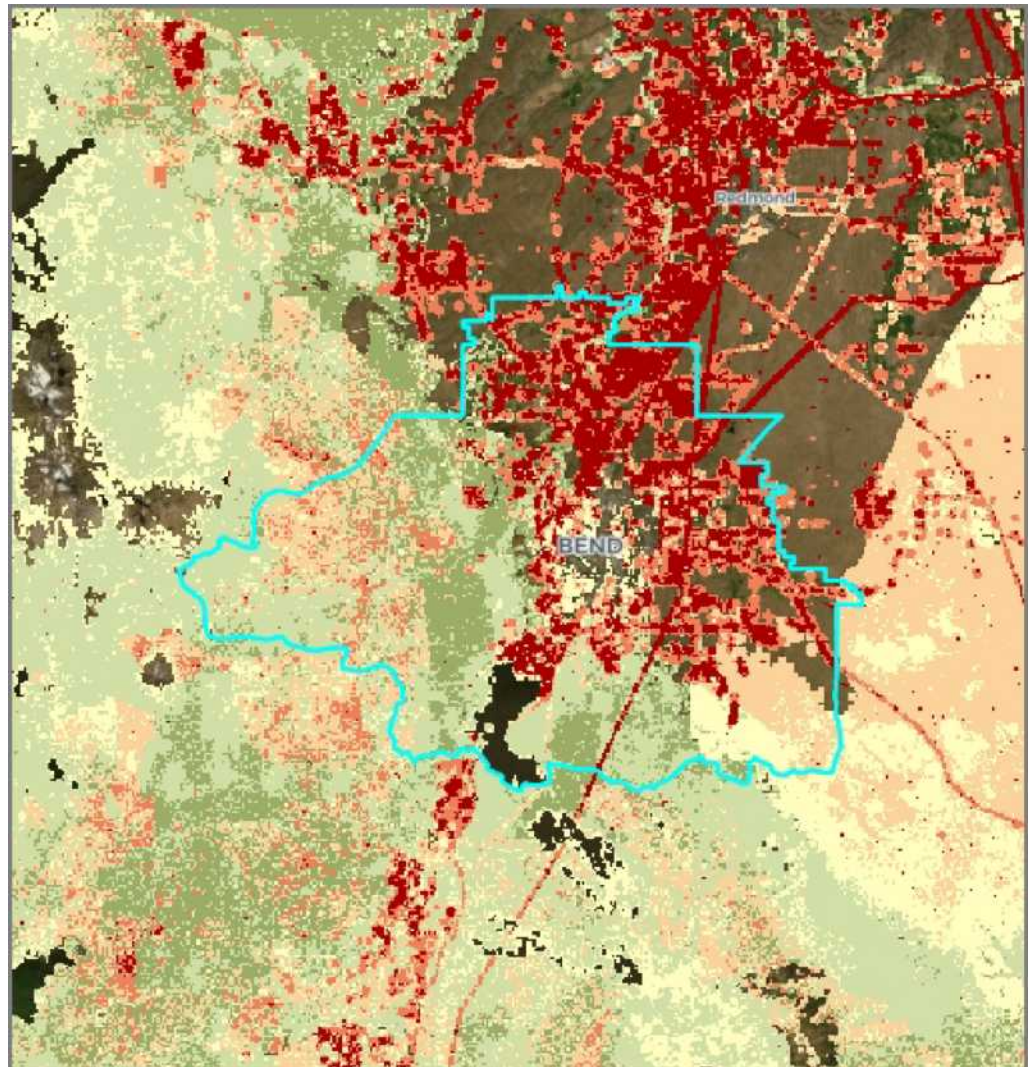
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### OVERALL WILDFIRE RISK

Overall wildfire risk combines both the likelihood of a wildfire and the expected impacts of a wildfire on highly valued resources and assets. (See other sections for more information on Burn probability and Overall potential impact.) Overall wildfire risk also reflects the susceptibility of resources and assets to wildfire of different intensities, and the likelihood of those intensities.

Mapped resources and assets include critical infrastructure, developed recreation, housing unit density, seed orchards, sawmills, historic structures, timber, municipal watersheds, vegetation condition, and terrestrial and aquatic wildlife habitat.

The data values in the overall wildfire risk map and chart reflect a range of impacts from a very high negative value, where wildfire is detrimental to one or more resources or assets, to positive, where wildfire has an overall benefit (e.g., forest health or wildlife habitat).



#### Overall wildfire risk: Legend

|  |              |  |
|--|--------------|--|
|  | Very High    | Wildfire risk is very highly negative (top 5% of values).  |
|  | High         | Wildfire risk is highly negative (80th to 95th percentile).  |
|  | Moderate     | Wildfire risk is moderately negative (50th to 80th percentile).  |
|  | Low          | Wildfire risk is slightly negative(29th to 50th percentile).   |
|  | Low Benefit  | Wildfire is slightly beneficial (14.5 to 29th percentile).   |
|  | Benefit      | Wildfire is beneficial overall (0-14.5th percentile).  |
|  | Non-burnable | There are no highly valued resources or assets mapped in the area, or it is considered non-burnable (urban, agriculture, etc). |



# Oregon Wildfire Risk Explorer- Advanced Report

**Greater Bend**  
232,675 Acres: (364 Sq. Miles)



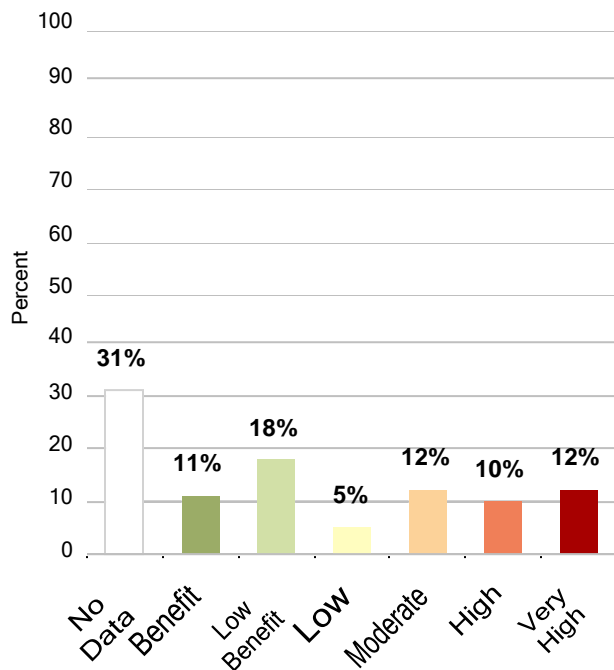
Generated: June 9, 2021

This page contains additional information about overall wildfire risk, including a table of classes by ownership to determine the distribution of categories across ownerships, and a chart of overall percentages of classes across the area. The inset box displays sub-watershed summaries for landscape-scale prioritization.

## Overall wildfire risk in Greater Bend: estimated acres by ownership

| Category    | Total   | Private | Local | State | BLM    | USFS   | USFWS | Other Fed | Tribal |
|-------------|---------|---------|-------|-------|--------|--------|-------|-----------|--------|
| Very High   | 28,976  | 25,454  | 556   | 286   | 1,710  | 970    | 0     | 0         | 0      |
| High        | 22,795  | 17,195  | 336   | 237   | 1,441  | 3,586  | 0     | 0         | 0      |
| Moderate    | 28,031  | 8,442   | 16    | 135   | 6,598  | 12,840 | 0     | 0         | 0      |
| Low         | 12,294  | 2,361   | 2     | 60    | 1,732  | 8,139  | 0     | 0         | 0      |
| Low Benefit | 42,253  | 6,951   | 2     | 282   | 47     | 34,971 | 0     | 0         | 0      |
| Benefit     | 25,482  | 7,815   | 1     | 79    | 14     | 17,573 | 0     | 0         | 0      |
| No Data     | 72,847  | 50,239  | 1,888 | 1,095 | 9,009  | 10,616 | 0     | 0         | 0      |
| Total Area  | 232,678 | 118,457 | 2,801 | 2,174 | 20,551 | 88,695 | 0     | 0         | 0      |

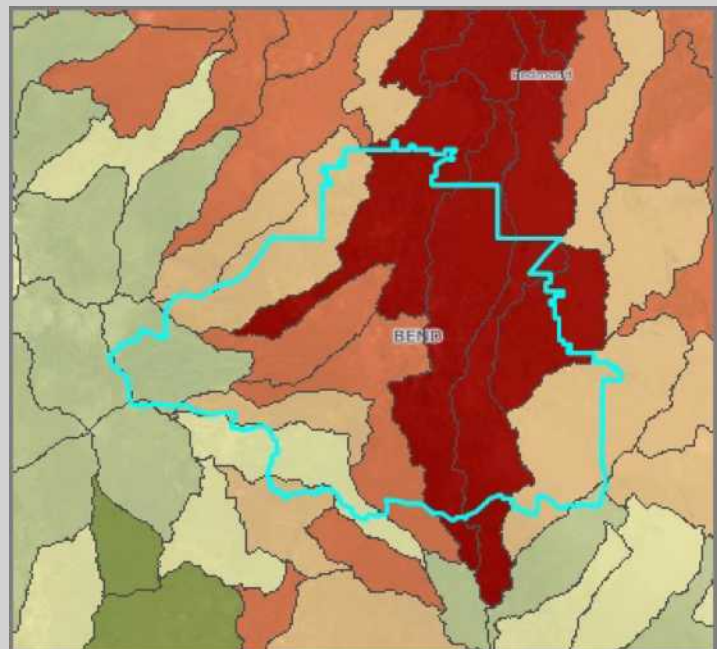
## Overall wildfire risk in Greater Bend \*



Source: 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, US Forest Service

\* Values may add up to over 100% due to rounding precision

**Overall wildfire risk in Greater Bend: sub-watershed summary map.** Overall wildfire risk is summarized at the sub-watershed (6th field Hydrologic Unit Code, HUC12) level. Watershed summaries enable you to view the landscape context and identify and compare sub-watersheds for prioritization.







# Oregon Wildfire Risk Explorer- Advanced Report

**Greater Bend**  
232,675 Acres: (364 Sq. Miles)

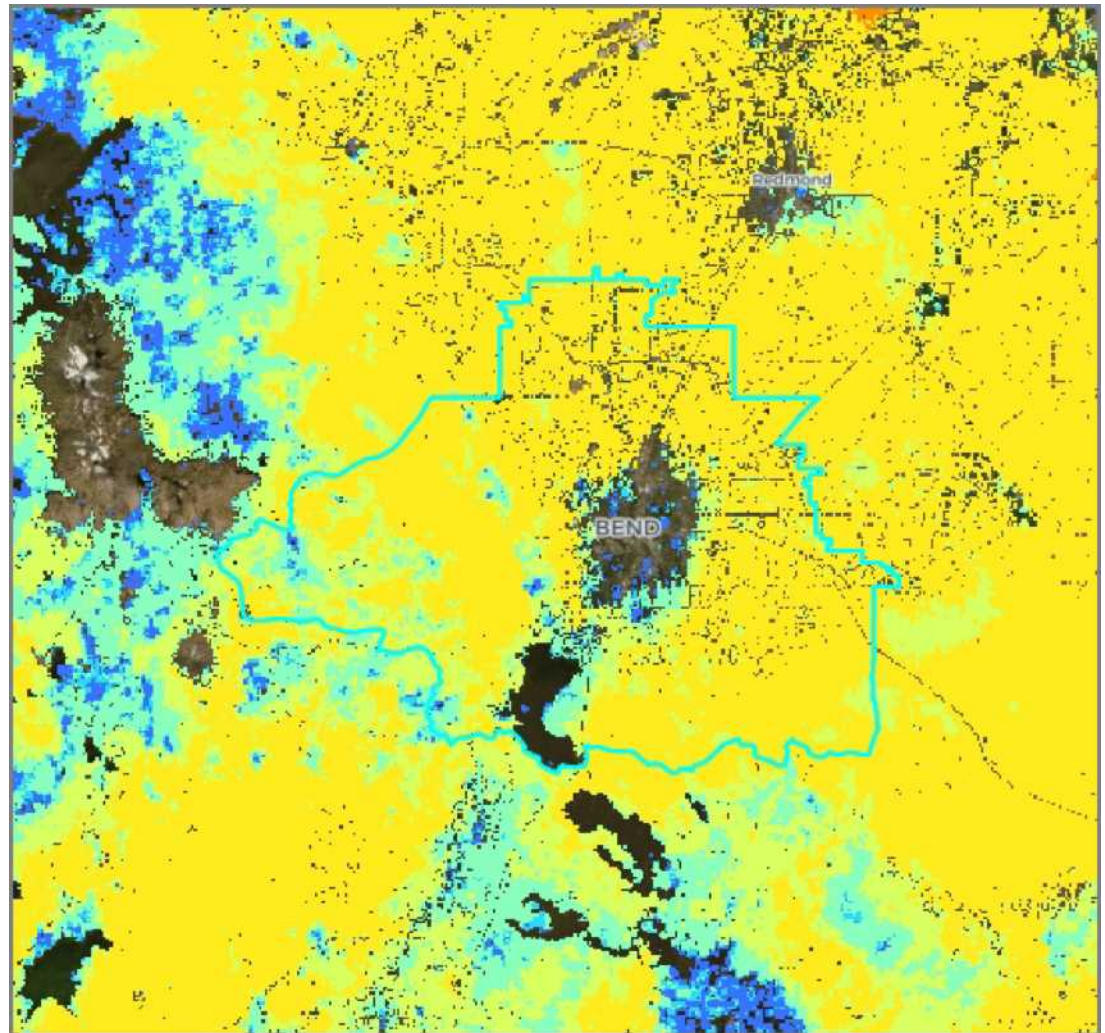


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## BURN PROBABILITY

Burn probability shows the annual likelihood of a wildfire greater than 250 acres in size occurring, considering weather, topography, fire history, and fuels (vegetation). This estimate includes fire history from 1992 through recently disturbed fuels from large Oregon wildfires in notable years 2013, 2014, 2015, and 2017.

Only large wildfires over 250 acres in size are included because they are the most influential on the landscape and they can be simulated using computer software. Most fire occurrences are less than 250 acres (see fire history section). Although these smaller fires have a low impact on the broader landscape, they can have significant local impacts, especially in areas with human activity and infrastructure.



| Burn probability          |  |
|---------------------------|--|
| Very High                 | Greater than 1 in 50 chance of a wildfire >250 acres in a single year (>96th percentile).                        |
| High-Very High<br>High    | Between 1 in 500 and 1 in 50 chance of a wildfire >250 acres in a single year (29th to 96th percentile).         |
| Moderate-High<br>Moderate | Between 1 in 5,000 and 1 in 500 chance of a wildfire >250 acres in a single year (11th to 29th percentile).      |
| Low-Moderate<br>Low       | Less than approximately 1 in 5,000 chance of a wildfire >250 acres in a single year (up to the 11th percentile). |
| Non-burnable              | This area contains non-burnable fuel types such as water, urban, agriculture, barren rock, etc.                  |



# Oregon Wildfire Risk Explorer- Advanced Report

## Greater Bend

232,675 Acres: (364 Sq. Miles)



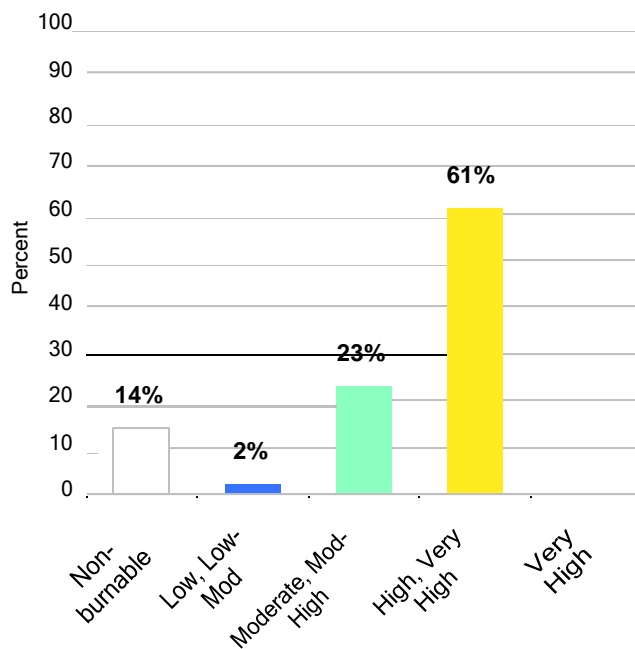
Generated: June 9, 2021

This page contains additional information about burn probability, including a table of classes by ownership to determine the distribution of categories across ownerships, and a chart of overall percentages of classes across the area. The inset box displays sub-watershed summaries for landscape-scale prioritization.

### Burn probability in Greater Bend: estimated acres by ownership

| Category           | Total   | Private | Local | State | BLM    | USFS   | USFWS | Other Fed | Tribal |
|--------------------|---------|---------|-------|-------|--------|--------|-------|-----------|--------|
| Very High          | 0       | 0       | 0     | 0     | 0      | 0      | 0     | 0         | 0      |
| High, Very High    | 143,004 | 75,251  | 2,329 | 1,257 | 18,454 | 45,713 | 0     | 0         | 0      |
| Moderate, Mod-High | 53,069  | 16,184  | 189   | 560   | 1,572  | 34,564 | 0     | 0         | 0      |
| Low, Low-Mod       | 4,222   | 2,651   | 0     | 90    | 0      | 1,481  | 0     | 0         | 0      |
| Non-Burnable       | 32,384  | 24,371  | 283   | 268   | 526    | 6,936  | 0     | 0         | 0      |
| Total Area.        | 232,679 | 118,457 | 2,801 | 2,175 | 20,552 | 88,694 | 0     | 0         | 0      |

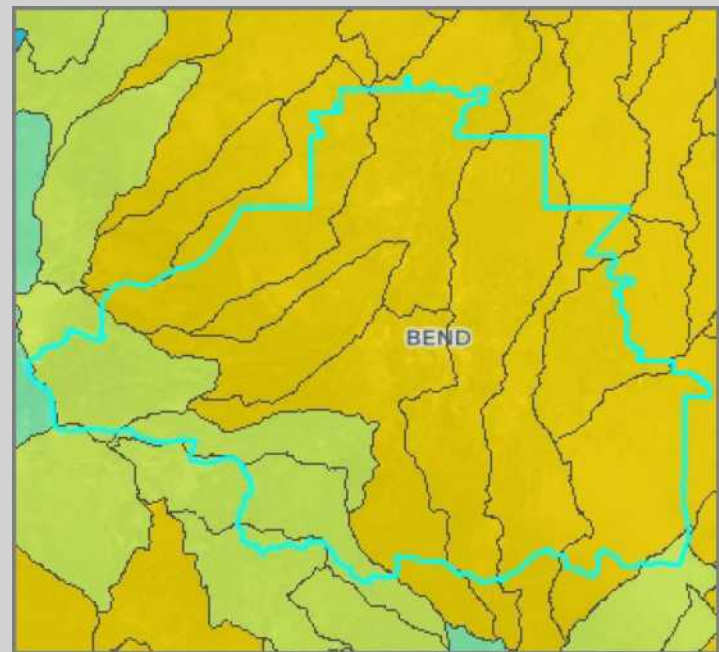
### Burn probability in Greater Bend \*



Source: 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, US Forest Service

\* Values may add up to over 100% due to rounding precision

**Burn probability in Greater Bend: sub-watershed summary map.** Burn probability is summarized at the subwatershed (6th field Hydrologic Unit Code, HUC12) level. Watershed summaries enable you to view the landscape context and identify and compare sub-watersheds for prioritization.







# Oregon Wildfire Risk Explorer- Advanced Report

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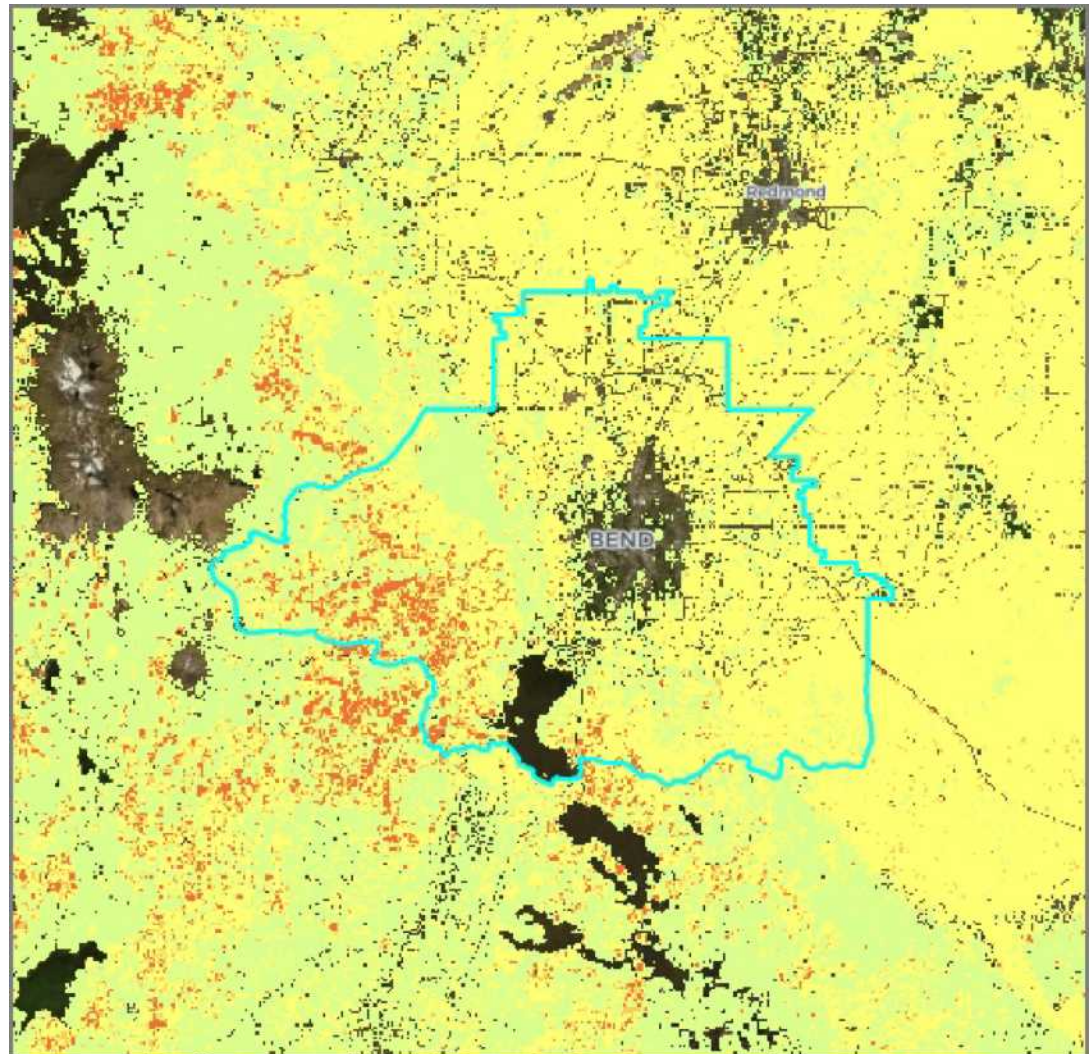
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


## FIRE INTENSITY - FLAME LENGTHS

Flame length is an indication of fire intensity, which is a primary factor to consider for gauging potential impacts to values at risk and for firefighter safety. It can also guide mitigation work to reduce the potential for catastrophic fires by reducing fire intensity and flame length.

Under normal weather conditions average flame lengths within your area are shown, and the associated table describes the expected fire behavior in each average flame length category.

Conditions vary widely with local topography, fuels, and local weather, especially local winds. In all areas, under warm, dry, windy, and drought conditions, expect higher likelihood of fire starts, higher fire intensities, more ember activity, a wildfire more difficult to control, and more severe impacts.



| Average fire intensity - flame lengths under normal weather conditions                           |  |
|--|--|
|  > 11 foot    | Fires may exhibit greater than 11-foot average flames with major fire movement, tree crowning, longer-range spotting and ember travel. |
|  8-11 foot    | Fires may exhibit 8-11 foot average flames with tree torching and increased ember travel.  |
|  4-8 foot     | Fires may exhibit 4-8 foot average flames, and embers may travel moderate distances.   |
|  4 foot       | Fires may exhibit 4 foot average flames.   |
|  Non-burnable | This area contains non-burnable fuel types such as water, urban, agriculture, barren rock, etc.  |



# Oregon Wildfire Risk Explorer- Advanced Report

## Greater Bend

232,675 Acres: (364 Sq. Miles)



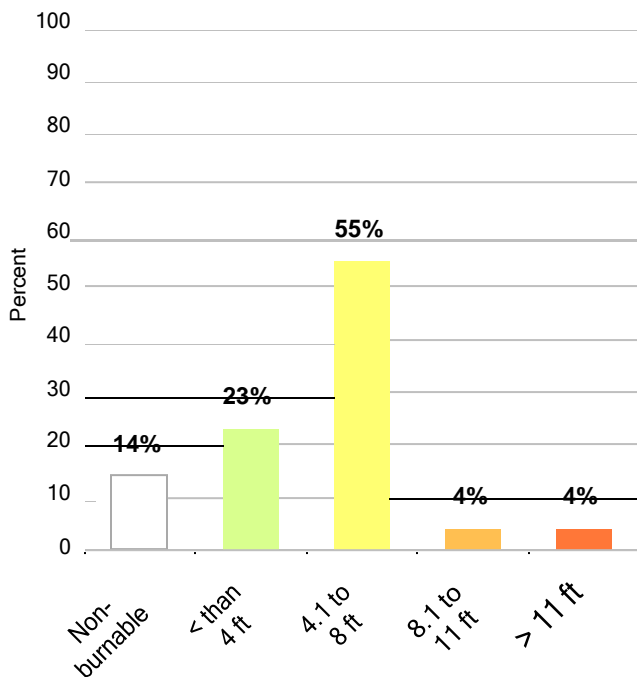
Generated: June 9, 2021

This page contains additional information about fire intensity, including a table of classes by ownership to determine the distribution of categories across ownerships, and a chart of overall percentages of classes across the area. The inset box displays sub-watershed summaries for landscape-scale prioritization.

### Greater Bend average fire intensity - flame lengths estimated acres by ownership

| Category     | Total   | Private | Local | State | BLM    | USFS   | USFWS | Other Fed | Tribal |
|--------------|---------|---------|-------|-------|--------|--------|-------|-----------|--------|
| > 11 ft      | 9,808   | 1,132   | 0     | 15    | 25     | 8,636  | 0     | 0         | 0      |
| 8 - 11 ft    | 8,405   | 2,805   | 50    | 31    | 286    | 5,233  | 0     | 0         | 0      |
| 4 - 8 ft     | 128,265 | 64,907  | 2,106 | 1,315 | 18,203 | 41,734 | 0     | 0         | 0      |
| > 0 - 4 ft   | 53,818  | 25,242  | 362   | 546   | 1,512  | 26,156 | 0     | 0         | 0      |
| Non-burnable | 32,384  | 24,371  | 283   | 268   | 526    | 6,936  | 0     | 0         | 0      |
| Total Area   | 232,680 | 118,457 | 2,801 | 2,175 | 20,552 | 88,695 | 0     | 0         | 0      |

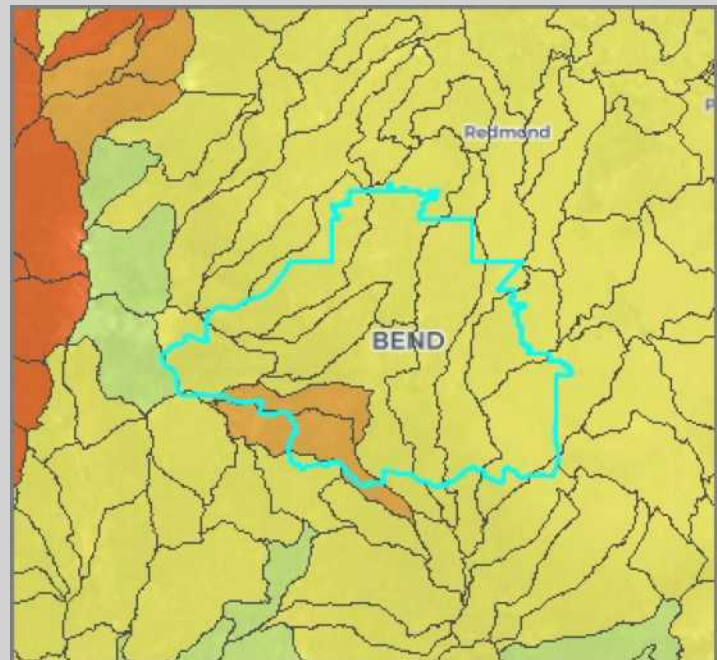
### Fire intensity - flame length in Greater Bend \*



Source: 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, US Forest Service

\* Values may add up to over 100% due to rounding precision

**Fire intensity in Greater Bend: sub-watershed summary map.** Fire intensity is summarized at the subwatershed (6th field Hydrologic Unit Code, HUC12) level. Watershed summaries enable you to view the landscape context and identify and compare sub-watersheds for prioritization.







# Oregon Wildfire Risk Explorer- Advanced Report

## Greater Bend

232,675 Acres: (364 Sq. Miles)



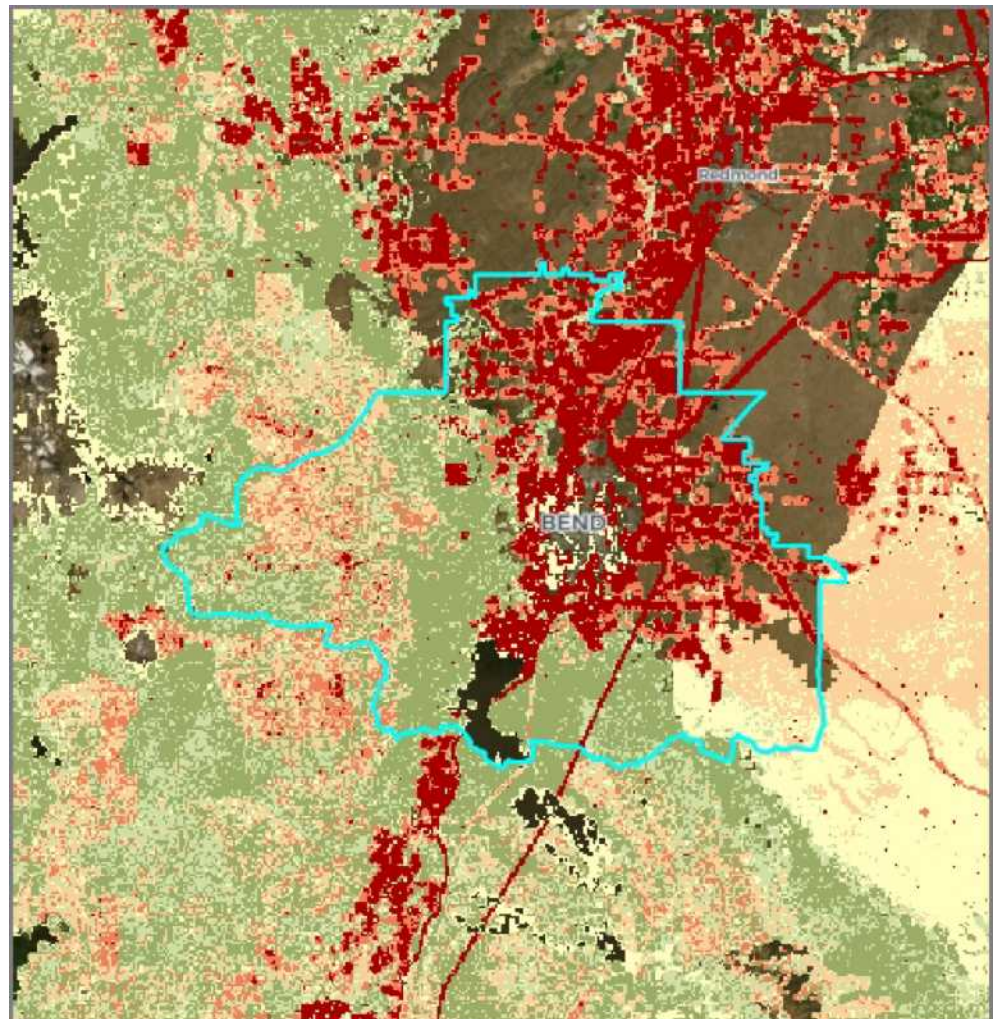
Generated: June 9, 2021

### OVERALL POTENTIAL IMPACT

Overall potential impact represents the exposure or consequence of wildfire on all mapped highly valued assets and resources combined, including critical infrastructure, developed recreation, housing density, seed orchards, sawmills, historic structures, timber, municipal watersheds, vegetation condition, and selected terrestrial and aquatic wildlife habitat.

The Potential Impact data layers characterize exposure and susceptibility only, and do not include the likelihood of an area burning. This differentiates the Potential Impact layers from Wildfire Risk layers, which account for the burn probability in the risk rating.

The data values reflect a range of impacts from a very high negative consequence, where wildfire is detrimental (e.g., high exposure to structures, infrastructure, or sensitive habitat), to a positive impact of wildfire, where wildfire will produce an overall benefit (e.g., improving forest health or wildlife habitat).



| Overall potential impact (if a wildfire were to occur) |  |
|--|--|
| Very High  | Overall potential impact is very highly negative (top 5% of values).   |
| High   | Overall potential impact is highly negative (80-95th percentile).  |
| Moderate   | Overall potential impact is moderately negative (50-80th percentile).  |
| Low  | Overall potential impact is slightly negative (30-50th percentile).  |
| Low Benefit  | Overall potential impact is slightly beneficial at low flame lengths (15-30th percentile).                                 |
| Benefit  | Overall potential impact is slightly beneficial, with a cumulative positive impact of fire (0-15th percentile).            |
| No Data (blank)  | There are no highly valued resources or assets mapped in the area or it is non-burnable (urban, agriculture, barren, etc). |



# Oregon Wildfire Risk Explorer- Advanced Report

## Greater Bend

232,675 Acres: (364 Sq. Miles)



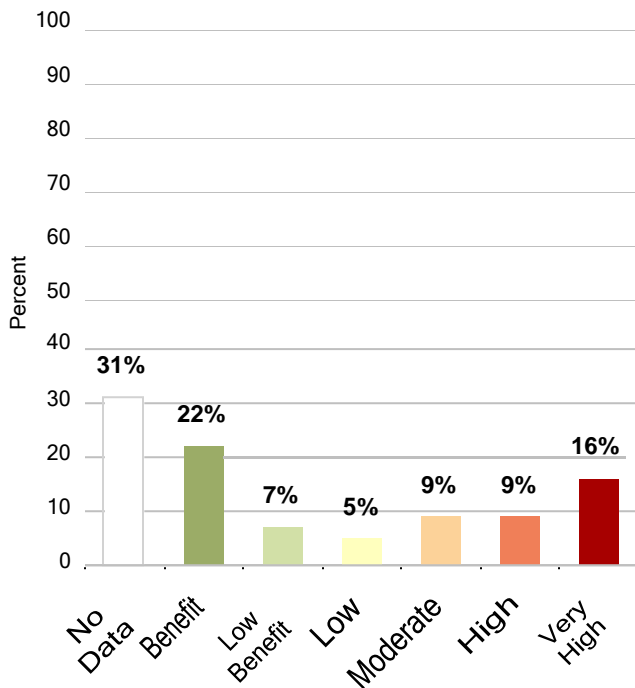
Generated: June 9, 2021

This page contains additional information about overall potential impact, including a table of classes by ownership to determine the distribution of categories across ownerships, and a chart of overall percentages of classes across the area. The inset box displays sub-watershed summaries for landscape-scale prioritization.

### Greater Bend overall potential impact estimated acres by ownership

| Category    | Total   | Private | Local | State | BLM    | USFS   | USFWS | Other Fed | Tribal |
|-------------|---------|---------|-------|-------|--------|--------|-------|-----------|--------|
| Very High   | 37,165  | 32,131  | 643   | 406   | 1,983  | 2,002  | 0     | 0         | 0      |
| High        | 20,071  | 12,557  | 260   | 171   | 1,176  | 5,907  | 0     | 0         | 0      |
| Moderate    | 22,013  | 6,088   | 5     | 74    | 5,714  | 10,132 | 0     | 0         | 0      |
| Low         | 11,905  | 2,611   | 2     | 66    | 2,521  | 6,705  | 0     | 0         | 0      |
| Low Benefit | 16,976  | 4,299   | 1     | 271   | 142    | 12,263 | 0     | 0         | 0      |
| Benefit     | 51,704  | 10,531  | 2     | 93    | 8      | 41,070 | 0     | 0         | 0      |
| No Data     | 72,847  | 50,239  | 1,888 | 1,095 | 9,009  | 10,616 | 0     | 0         | 0      |
| Total Area  | 232,681 | 118,456 | 2,801 | 2,176 | 20,553 | 88,695 | 0     | 0         | 0      |

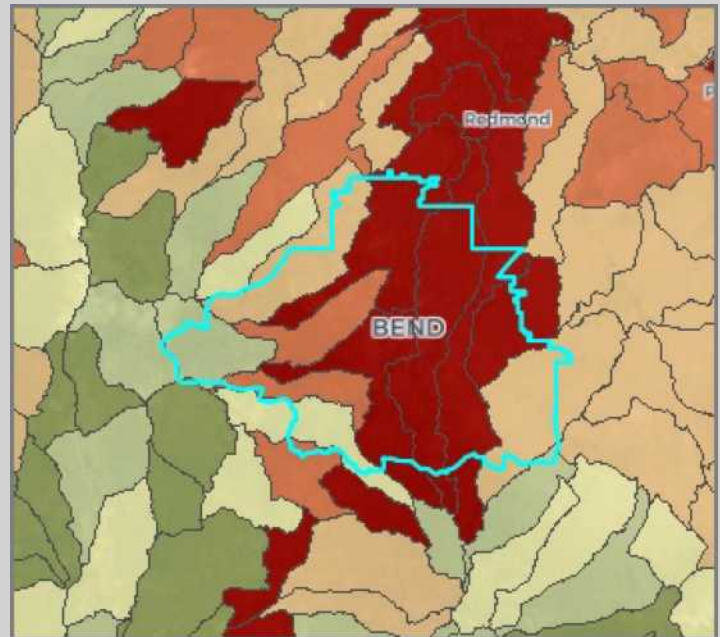
### Overall potential impact in Greater Bend \*



Source: 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, US Forest Service

\* Values may add up to over 100% due to rounding precision

**Overall potential impact in Greater Bend: sub-watershed summary map.** Overall potential impact is summarized at the sub-watershed (6th field Hydrologic Unit Code, HUC12) level. Watershed summaries enable you to view the landscape context and identify and compare sub-watersheds for prioritization.





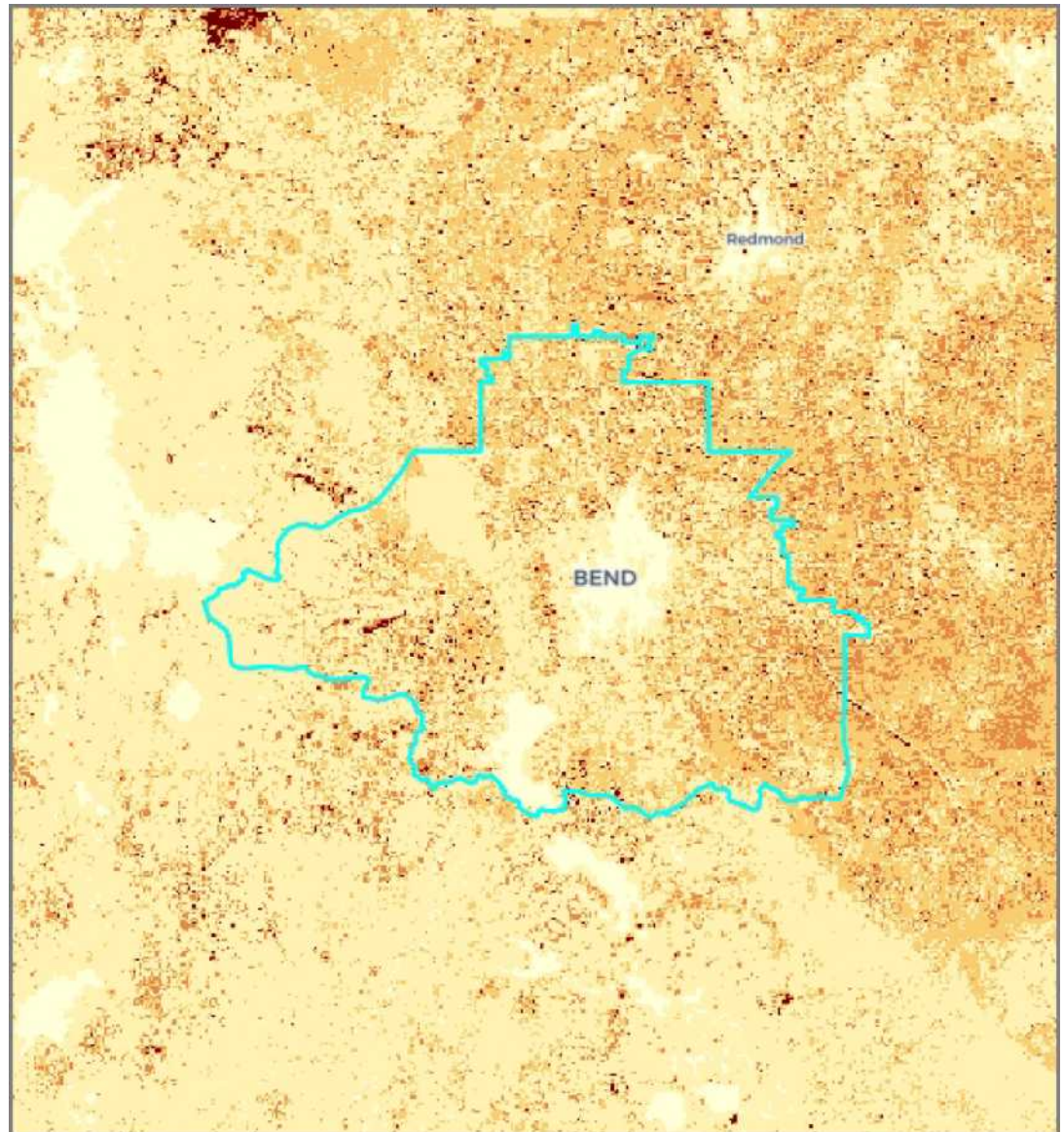


## HAZARD TO POTENTIAL STRUCTURES

Hazard to potential structures depicts the hazard to a hypothetical structure (not necessarily an existing structure) if a wildfire were to occur. Hazard to potential structures differs from overall estimates of wildfire impact or risk, as those estimates only consider where existing structures are currently located.

Community planners can use this information when planning development outside of existing developed, urban or WUI areas. This data provides model-based consideration of wildfire hazard when developing Fire Adapted Communities in Oregon.

As with the other data layers, this layer characterizes the fire environment only and does not consider other important factors in determining structural fire risk such as building construction materials and vegetation within close proximity of a structure.



| Hazard to potential structures |  |
|--------------------------------|--|
| Very High                      | Potential hazard is very high (top 5 percent).           |
| High                           | Potential hazard is high (80th to 95th percentile).      |
| Moderate                       | Potential hazard is moderate (50th to 80th percentile).  |
| Low                            | Potential hazard is low (up to the 50th percentile).     |
| Non-Burnable                   | Fuel in the area is largely non-burnable or very sparse. |



# Oregon Wildfire Risk Explorer- Advanced Report

## Greater Bend

232,675 Acres: (364 Sq. Miles)



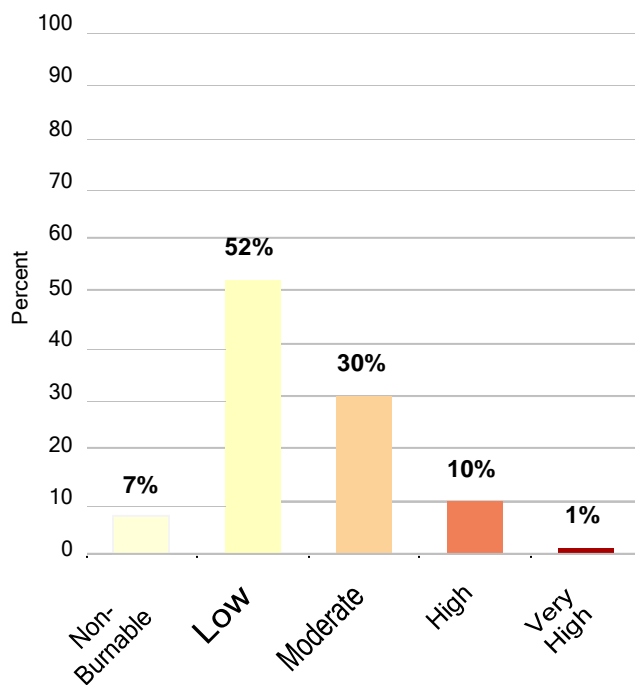
Generated: June 9, 2021

This page contains additional information about hazard to potential structures, including a table of classes by ownership to determine the distribution of categories across ownerships, and a chart of overall percentages of classes across the area. The inset box displays sub-watershed summaries for landscape-scale prioritization.

### Hazard to potential structures in Greater Bend: estimated acres by ownership

| Category     | Total   | Private | Local | State | BLM    | USFS   | USFWS | Other Fed | Tribal |
|--------------|---------|---------|-------|-------|--------|--------|-------|-----------|--------|
| Very High    | 2,769   | 1,225   | 29    | 12    | 192    | 1,311  | 0     | 0         | 0      |
| High         | 23,721  | 12,321  | 249   | 188   | 4,286  | 6,677  | 0     | 0         | 0      |
| Moderate     | 69,288  | 34,262  | 1,195 | 643   | 10,436 | 22,752 | 0     | 0         | 0      |
| Low          | 121,279 | 60,188  | 1,244 | 1,242 | 5,634  | 52,971 | 0     | 0         | 0      |
| Non-Burnable | 15,621  | 10,460  | 83    | 90    | 3      | 4,985  | 0     | 0         | 0      |
| Total Area   | 232,678 | 118,456 | 2,800 | 2,175 | 20,551 | 88,696 | 0     | 0         | 0      |

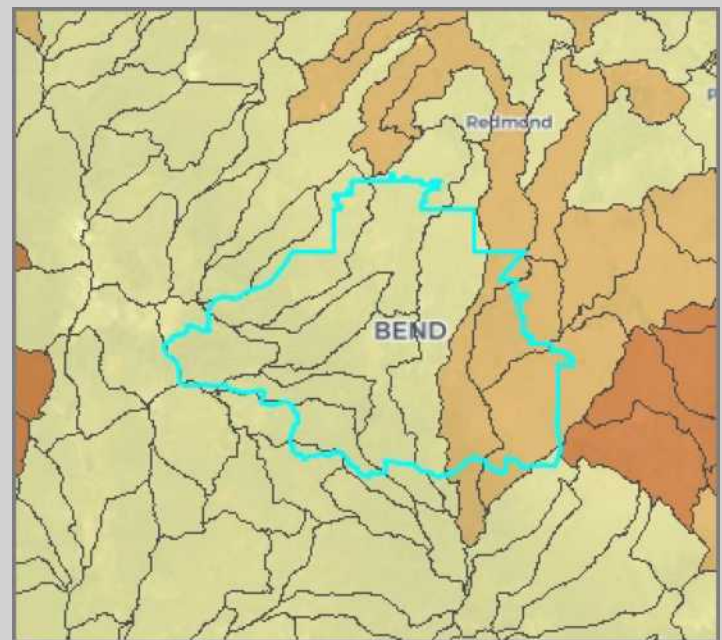
### Hazard to potential structures in Greater Bend \*



Source: 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, US Forest Service

\* Values may add up to over 100% due to rounding precision

**Hazard to potential structures in Greater Bend: sub-watershed summary map.** Hazard to potential structures is summarized at the subwatershed (6th field Hydrologic Unit Code, HUC12) level. Watershed summaries enable you to view the landscape context and identify and compare sub-watersheds for prioritization.







# Oregon Wildfire Risk Explorer- Advanced Report

## Greater Bend

232,675 Acres: (364 Sq. Miles)



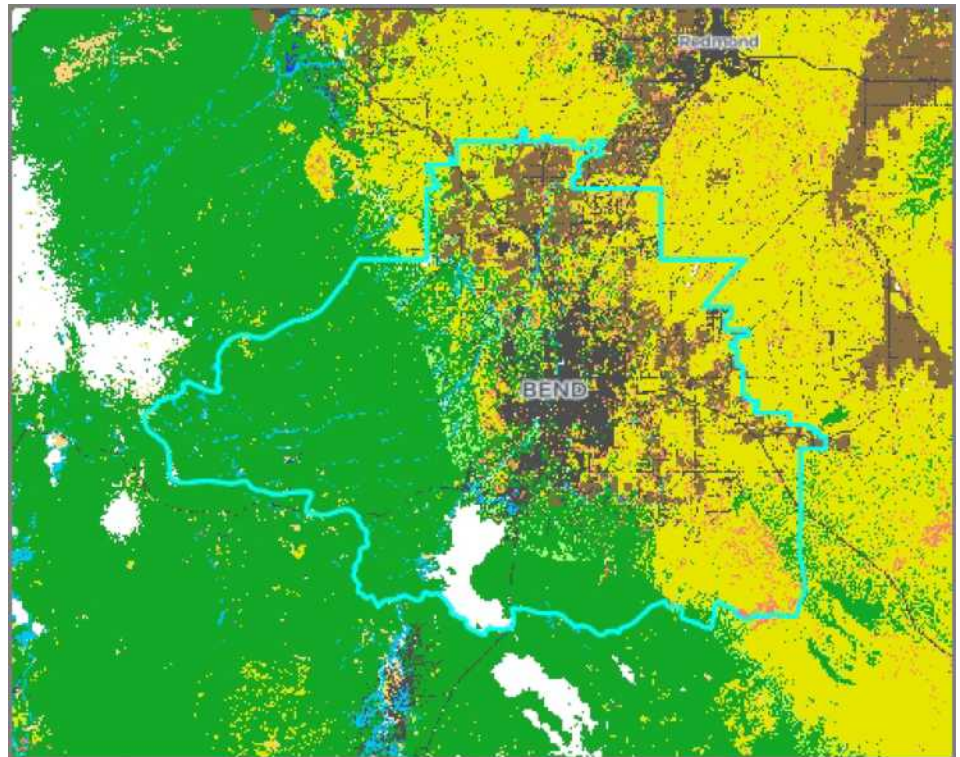
Generated: June 9, 2021

### EXISTING VEGETATION TYPE

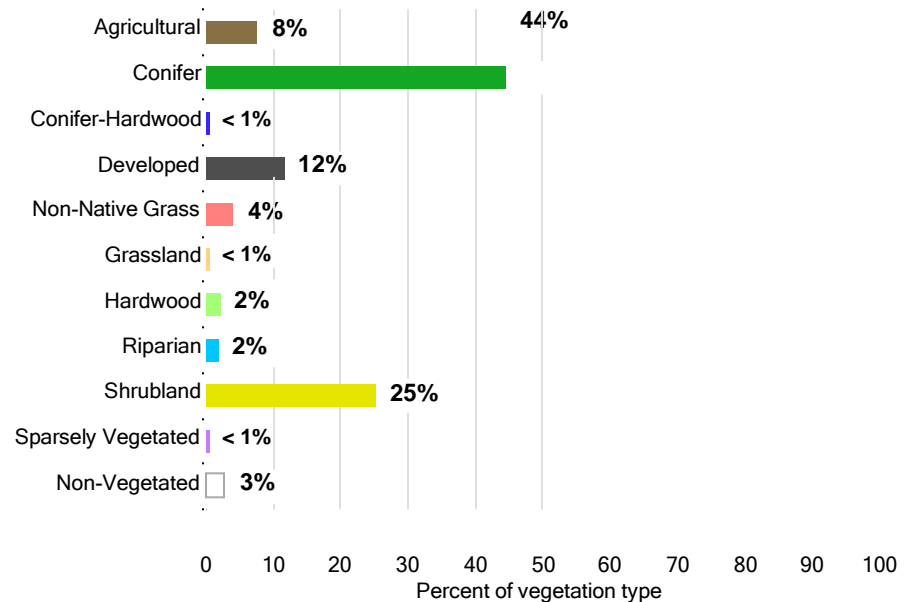
Vegetation is an important influence on potential wildfire behavior. The dominant vegetation type helps us understand the corresponding historical fire regime, a designation of fire frequency and severity. Fire frequency, or burn probability, suggests how often wildfire occurs (see Burn probability data layer). Fire severity tells us how much impact wildfires are likely to have on the vegetation and other elements of an ecosystem (see Potential impact to forest vegetation data layer). The living and dead vegetation below forest canopies (shrubs, grasses, leaf litter, dead tree snags, etc.) also strongly influence fire behavior and impacts in a location (see Fuel models).

Higher frequency fire areas generally have lower severities. Vegetation is continually or often thinned by fire and the remaining vegetation and other ecosystem elements can be considered adaptive or resilient to fire. Examples include Ponderosa pine forests and oak woodlands.

Lower frequency fire regimes experience less fire, but generally have higher severities, with vegetation and other ecosystem elements which can be considered sensitive. Examples include coastal forests, subalpine forests and many stream headwaters and riparian areas.



Vegetation Types in Greater Bend





# Oregon Wildfire Risk Explorer- Advanced Report

## Greater Bend

232,675 Acres: (364 Sq. Miles)



Generated: June 9, 2021

### Greater Bend vegetation type

| Category                            | Description        | Acres   | %*  |
|-------------------------------------|--------------------|---------|-----|
| Non-vegetated or recently disturbed | Non-vegetated      | 6,648   | 3   |
| Agricultural                        | Agricultural       | 17,559  | 8   |
| Conifer                             | Conifer            | 103,466 | 44  |
| Conifer-Hardwood                    | Conifer-Hardwood   | 91      | < 1 |
| Developed                           | Developed          | 27,001  | 12  |
| Exotic Herbaceous                   | Non-Native Grass   | 9,106   | 4   |
| Grassland                           | Grassland          | 1,057   | < 1 |
| Hardwood                            | Hardwood           | 4,838   | 2   |
| Riparian                            | Riparian           | 4,262   | 2   |
| Shrubland                           | Shrubland          | 58,647  | 25  |
| Sparsely Vegetated                  | Sparsely Vegetated | 2       | < 1 |

Existing Vegetation Type Data Dictionary <https://www.landfire.gov/evt.php>

Source: LANDFIRE <https://www.landfire.gov>

Resource:

US Forest Service Fire Regime Table

[https://www.fs.fed.us/database/feis/fire\\_regime\\_table/fire\\_regime\\_table.html#PacificNorthwest](https://www.fs.fed.us/database/feis/fire_regime_table/fire_regime_table.html#PacificNorthwest)

\* Values may add up to over 100% due to rounding precision



# Oregon Wildfire Risk Explorer- Advanced Report

**Greater Bend**  
232,675 Acres: (364 Sq. Miles)



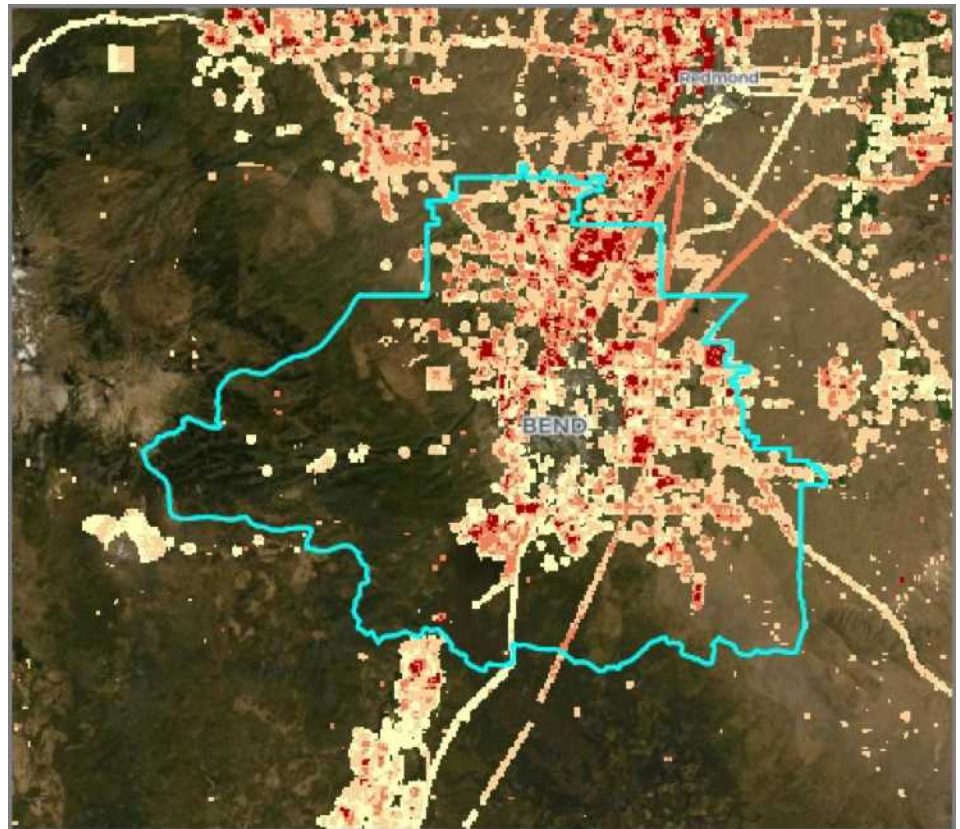
Generated: June 9, 2021

## WILDFIRE RISK TO ASSETS

Wildfire risk combines both the likelihood of a wildfire (or Burn probability) and the expected effects of a wildfire on highly valued resources and assets. See the description of Overall wildfire risk for more details.

Wildfire risk to assets maps wildfire risk only in places with the following assets: critical infrastructure, developed recreation, housing unit density, seed orchards, sawmills, and historic structures. Note that these resources and assets were mapped at a broad scale across all of Oregon and Washington, and maps contain errors and omissions, especially at fine scales.

The values in the maps and charts reflect a range of negative impacts from low to very high. Positive benefits of wildfire are not mapped in this layer, assuming that any impact of wildfire to human development is negative.



### Wildfire Risk to Assets in Greater Bend

| Category  | Description  | Acres   | %* |
|-----------|--|---------|----|
| Very High | Wildfire risk is very highly negative to all combined mapped assets (top 5%).                        | 4,598   | 2  |
| High      | Wildfire risk is highly negative (80-95th percentile).   | 14,926  | 6  |
| Moderate  | Wildfire risk is moderately negative (50-80th percentile).   | 25,980  | 11 |
| Low       | Wildfire risk is slightly negative (0-50th percentile).  | 6,210   | 3  |
| No Data   | There are no highly valued resources or assets mapped in the area, or it is considered non-burnable. | 180,965 | 78 |

Source: 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, US Forest Service

\* Values may add up to over 100% due to rounding precision





# Oregon Wildfire Risk Explorer- Advanced Report

**Greater Bend**  
232,675 Acres: (364 Sq. Miles)



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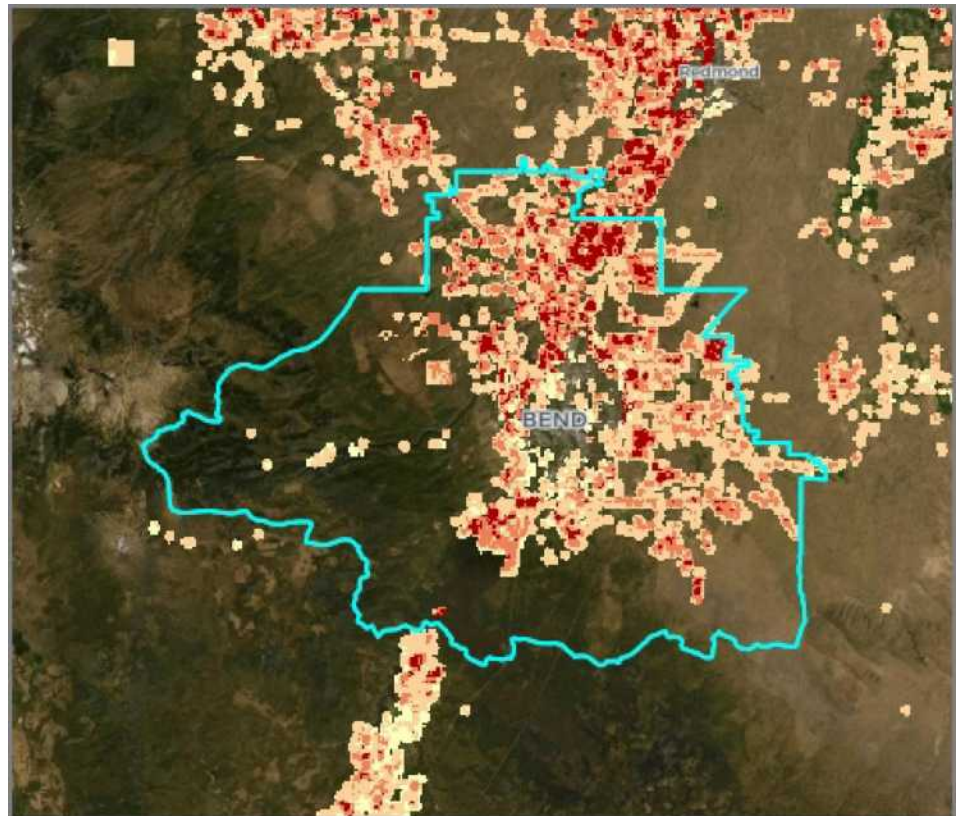
## WILDFIRE RISK TO PEOPLE AND PROPERTY

Wildfire risk combines both the likelihood of a wildfire (or burn probability) and the expected effects of a wildfire on highly valued resources and assets. See the description of overall wildfire risk for more details.

Wildfire risk to people and property includes only housing unit density as mapped in the Where people live layer and US Forest Service private inholdings.

Note that these resources and assets were mapped at a broad scale across all of Oregon and Washington, and maps contain errors and omissions, especially at fine scales.

The values in the maps and charts reflect a range of negative impacts from low to very high. Positive benefits of wildfire are not mapped in this layer, assuming that any impacts of wildfire to human development is a negative impact.



### Wildfire Risk to People and Property in Greater Bend

| Category  | Description  | Acres   | %*  |
|-----------|--|---------|-----|
| Very High | Wildfire risk is very highly negative to people and property (top 5%).                               | 5,982   | 3   |
| High      | Wildfire risk is highly negative (80-95th percentile).   | 17,087  | 7   |
| Moderate  | Wildfire risk is moderately negative (50-80 percentile).   | 24,122  | 10  |
| Low       | Wildfire risk is slightly negative (0-50 percentile).  | 1,559   | < 1 |
| No Data   | There are no highly valued resources or assets mapped in the area, or it is considered non-burnable. | 183,928 | 79  |

Source: 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, US Forest Service

\* Values may add up to over 100% due to rounding precision



# Oregon Wildfire Risk Explorer- Advanced Report

## Greater Bend

232,675 Acres: (364 Sq. Miles)



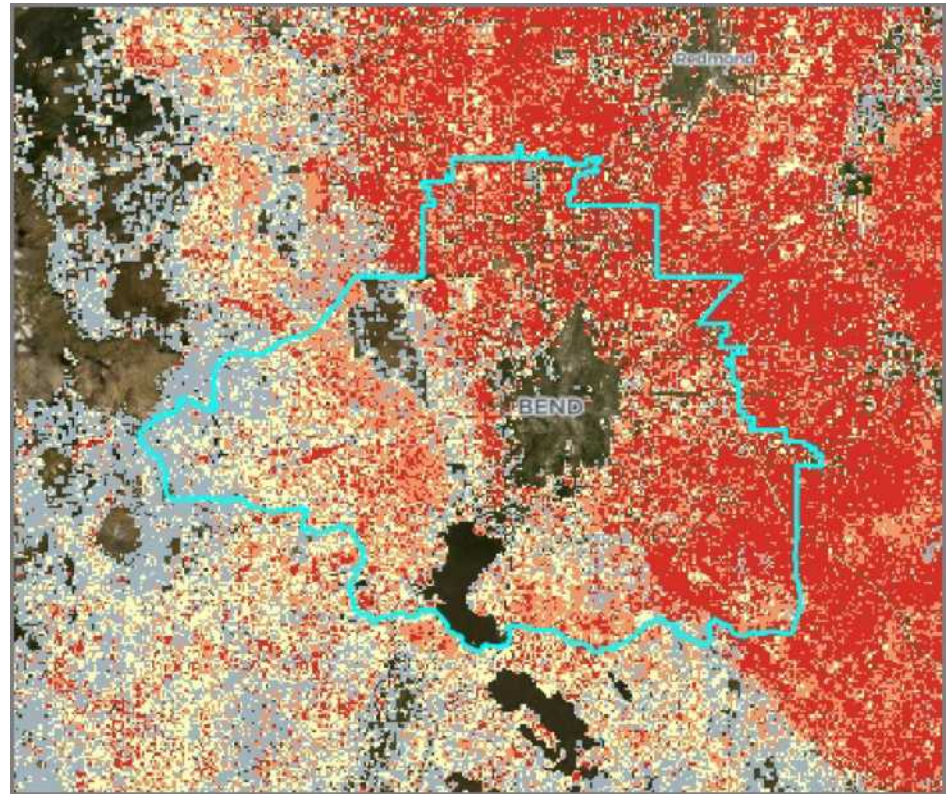
Generated: June 9, 2021

### PROBABILITY OF EXCEEDING 4 FOOT FLAME LENGTHS

Flame length is an indication of fire intensity, which is a primary factor to consider for firefighter safety and for gauging potential impacts to values at risk. Fires with greater flame lengths are more intense and difficult to control. At higher flame lengths, firefighters cannot directly approach. As flame lengths increase, tree torching and spotting is expected and ember travel is increased.

Fires with greater than 4' flames are too intense for firefighters to work at the front of the flame using hand tools, and heavier equipment such as bulldozers may be necessary.

Using this layer to help target locations of higher flame length potential, a local assessment might reveal opportunity to reduce fire intensity as a goal of fuels treatment projects by using managed fire and/or other active management activities. Values are expressed as a percent likelihood. These probabilities do not take into account the likelihood of burning (see Burn probability).



#### Greater Bend probability of exceeding flames

| Category | Description   | Acres  | %* |
|----------|---|--------|----|
| 75-100%  | If a fire occurs, there is a very high (>75%) chance that flame lengths will be greater than 4'.  | 65,695 | 28 |
| 50-75%   | If a fire occurs, there is a high (50-75%) chance that flame lengths will be greater than 4'.     | 55,238 | 24 |
| 25-50%   | If a fire occurs, there is a moderate (25-50%) chance that flame lengths will be greater than 4'. | 38,579 | 17 |
| 0-25%    | If a fire occurs, there is a low (<25%) chance that flame lengths will be greater than 4'.        | 34,528 | 15 |
| 0%       | This area contains non-burnable fuel types such as water, urban, agriculture, barren rock, etc.   | 38,639 | 17 |

Source: 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, US Forest Service

\* Values may add up to over 100% due to rounding precision





# Oregon Wildfire Risk Explorer- Advanced Report

## Greater Bend

232,675 Acres: (364 Sq. Miles)



Generated: June 9, 2021

### PROBABILITY OF EXCEEDING 8 FOOT FLAME LENGTHS

Flame length is an indication of fire intensity, which is a primary factor to consider for firefighter safety and for gauging potential impacts to values at risk. Fires with greater flame lengths are very intense and are expected to be highly difficult to control -- too intense for firefighters to work at the front of the flame, and they can severely impact values at risk. Tree torching and spotting is expected and ember travel is increased.

Fires with >8' flame lengths may be very difficult to control with little ability to work at the front of the flame, and greater risk of torching, crowning and spotting.

Using this layer to help target locations of higher flame length potential, a local assessment might reveal opportunity to reduce fire intensity as a goal of fuels treatment projects by using managed fire and/or other active management activities.

Values are expressed as a percent likelihood. These probabilities do not take into account the likelihood of an area burning.



#### Greater Bend probability of exceeding 8' flames

| Category | Description  | Acres   | %*  |
|----------|--|---------|-----|
| 75-100%  | If a fire occurs, there is a very high (>75%) chance that flame lengths will be greater than 8'.               | 358     | < 1 |
| 50-75%   | If a fire occurs, there is a high (50-75%) chance that flame lengths will be greater than 8'.                  | 4,491   | 2   |
| 25-50%   | If a fire occurs, there is a moderate (25-50%) chance that flame lengths will be greater than 8'.              | 8,903   | 4   |
| 0-25%    | If a fire occurs, there is a low (<25%) chance that flame lengths will be greater than 8'.                     | 145,535 | 63  |
| 0%       | This area contains non-burnable fuel types such as water, urban, agriculture, barren rock, glacial areas, etc. | 73,393  | 32  |

Source: 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, US Forest Service

\* Values may add up to over 100% due to rounding precision





# Oregon Wildfire Risk Explorer- Advanced Report

**Greater Bend**  
232,675 Acres: (364 Sq. Miles)



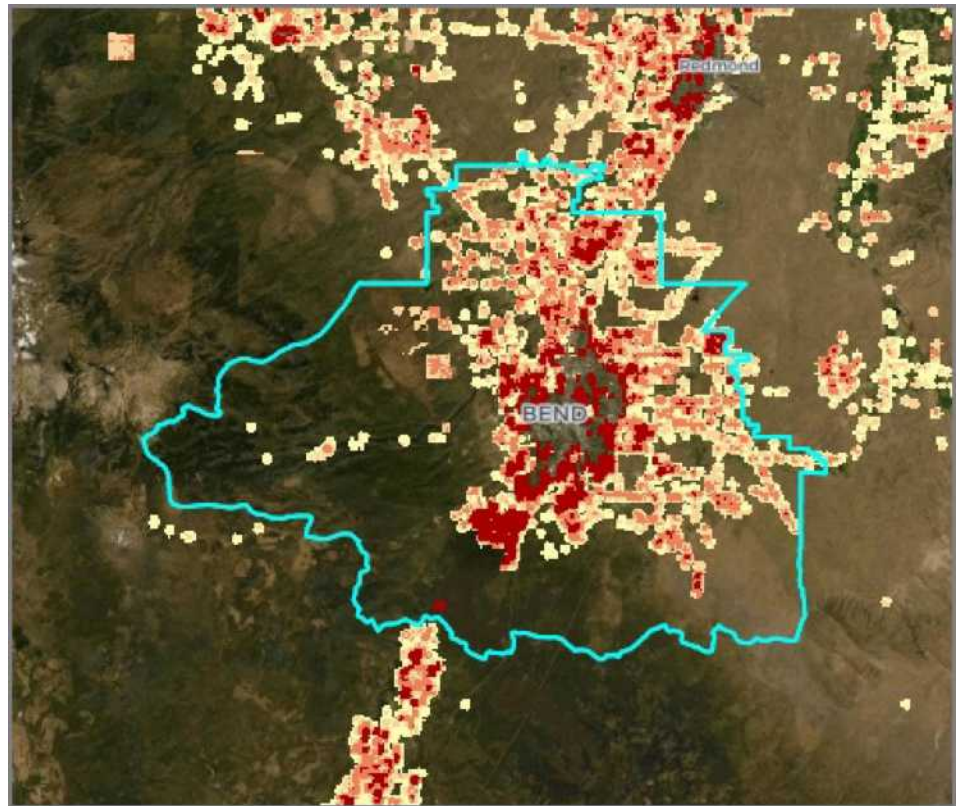
Generated: June 9, 2021

## POTENTIAL IMPACT TO PEOPLE AND PROPERTY

Potential impact to people and property represents the exposure or consequence of wildfire on mapped highly valued assets including housing unit density and USFS private inholdings.

The Potential Impact data layers characterize exposure and susceptibility only, and do not include the likelihood of an area burning. This differentiates the Potential Impact layers from Wildfire Risk layers, which account for the burn probability in the risk rating.

The data values reflect a range of impacts from very high to low negative consequences. Positive benefits of wildfire are not mapped in this layer, assuming that any impact of wildfire to human development is negative.



### Greater Bend potential impact to people and property, if a wildfire were to occur.

| Category  | Description  | Acres   | %* |
|-----------|--|---------|----|
| Very High | Potential impact is very highly negative to people and property (top 5%).  | 8,873   | 4  |
| High      | Potential impact is highly negative (80-95th percentile).  | 16,477  | 7  |
| Moderate  | Potential impact is moderately negative (50-80th percentile).  | 14,926  | 6  |
| Low       | Potential impact is slightly negative (0-50th percentile).   | 8,475   | 4  |
| No Data   | There is no people and property mapped in the area or it is considered non-burnable (urban, agriculture, barren, etc). | 183,928 | 79 |

Source: 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, US Forest Service

\* Values may add up to over 100% due to rounding precision



# Oregon Wildfire Risk Explorer- Advanced Report

**Greater Bend**  
232,675 Acres: (364 Sq. Miles)



Generated: June 9, 2021

## POTENTIAL IMPACT TO INFRASTRUCTURE

Potential impact to infrastructure represents the exposure or consequence of wildfire on mapped highly valued assets including critical infrastructure, developed recreation, housing unit density, seed orchards, sawmills, and historic structures.

The Potential Impact data layers characterize exposure and susceptibility only, and do not include the likelihood of an area burning. This differentiates the Potential Impact layers from Wildfire Risk layers, which account for the burn probability in the risk rating.

The resulting values reflect a range of impacts from a very high to low negative consequences. Positive benefits of wildfire are not mapped in this layer, assuming that any impact of wildfire to infrastructure is negative.



### Greater Bend potential impact to infrastructure, if a wildfire were to occur.

| Category  | Description   | Acres   | %*  |
|-----------|---|---------|-----|
| Very High | Potential impact is very highly negative (top 5%).  | 388     | < 1 |
| High      | Potential impact is highly negative (80-95th percentile).   | 1,541   | < 1 |
| Moderate  | Potential impact is moderately negative (50-80th percentile).   | 1,872   | < 1 |
| Low       | Potential impact is slightly negative (0-50th percentile).  | 3,276   | 1   |
| No Data   | There is no infrastructure mapped in the area or it is considered non-burnable (urban, agriculture, barren, etc). | 225,602 | 97  |

Source: 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, US Forest Service

\* Values may add up to over 100% due to rounding precision





# Oregon Wildfire Risk Explorer- Advanced Report

**Greater Bend**  
232,675 Acres: (364 Sq. Miles)



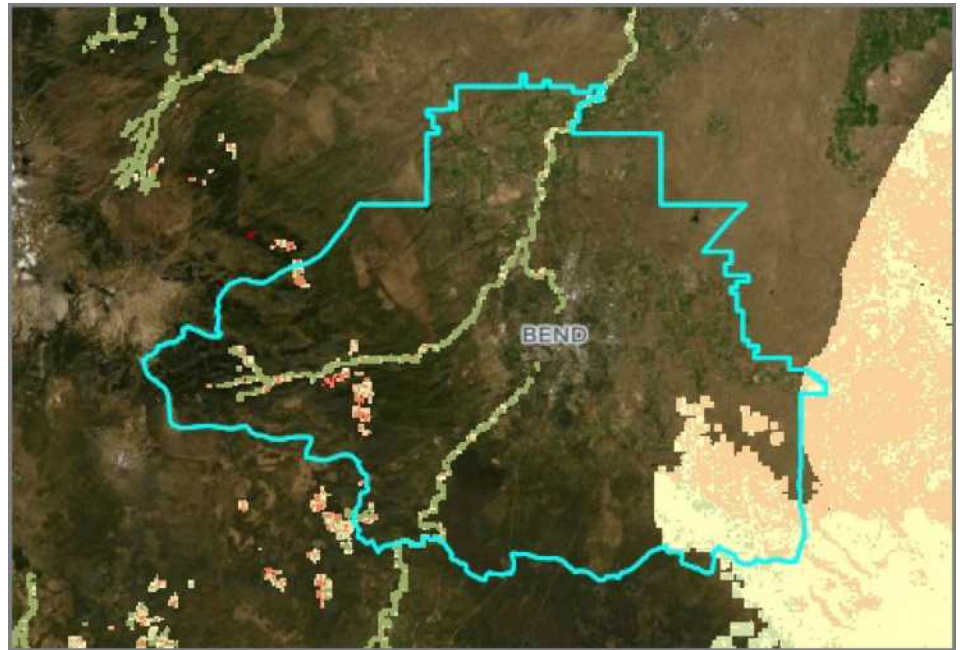
Generated: June 9, 2021

## POTENTIAL IMPACT TO WILDLIFE

Potential impact to wildlife represents the exposure or consequence of wildfire on mapped wildlife habitat for the following species: northern spotted owl, marbled murrelet, sage grouse, chinook salmon, coho salmon, steelhead trout, bull trout, redband trout, coastal cutthroat, and Lahontan cutthroat trout.

The Potential Impact data layers characterize exposure and susceptibility only, and do not include the likelihood of an area burning. This differentiates the Potential Impact layers from Wildfire Risk layers, which account for the burn probability in the risk rating.

The data values reflect a range of impacts from a very high negative consequences, where wildfire is detrimental (for example, sensitive habitat with fire-intolerant species), to a positive impacts of wildfire, where wildfire will produce an overall benefit (for example, improving wildlife habitat for fire-dependent species).



**Greater Bend potential impact to wildlife habitat, if a wildfire were to occur.**

| Category    | Description  | Acres   | %*  |
|-------------|--|---------|-----|
| Very High   | Potential impact is very highly negative (top 5%).   | 41      | < 1 |
| High        | Potential impact is highly negative (80-95th percentile).  | 531     | < 1 |
| Moderate    | Potential impact is moderately negative (50-80th percentile).  | 8,447   | 4   |
| Low         | Potential impact is slightly negative (17-50th percentile).  | 8,845   | 4   |
| Low Benefit | Potential impact is slightly beneficial to wildlife at low flame lengths (8-17th percentile).                        | 1,578   | < 1 |
| Benefit     | Potential impact is beneficial, with a cumulative positive impact on wildlife habitat (0-8th percentile).            | 3,683   | 2   |
| No Data     | There is no wildlife habitat mapped in the area, or it is considered non-burnable (urban, agriculture, barren, etc). | 209,554 | 90  |

Source: 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, US Forest Service

\* Values may add up to over 100% due to rounding precision



# Oregon Wildfire Risk Explorer- Advanced Report

## Greater Bend

232,675 Acres: (364 Sq. Miles)



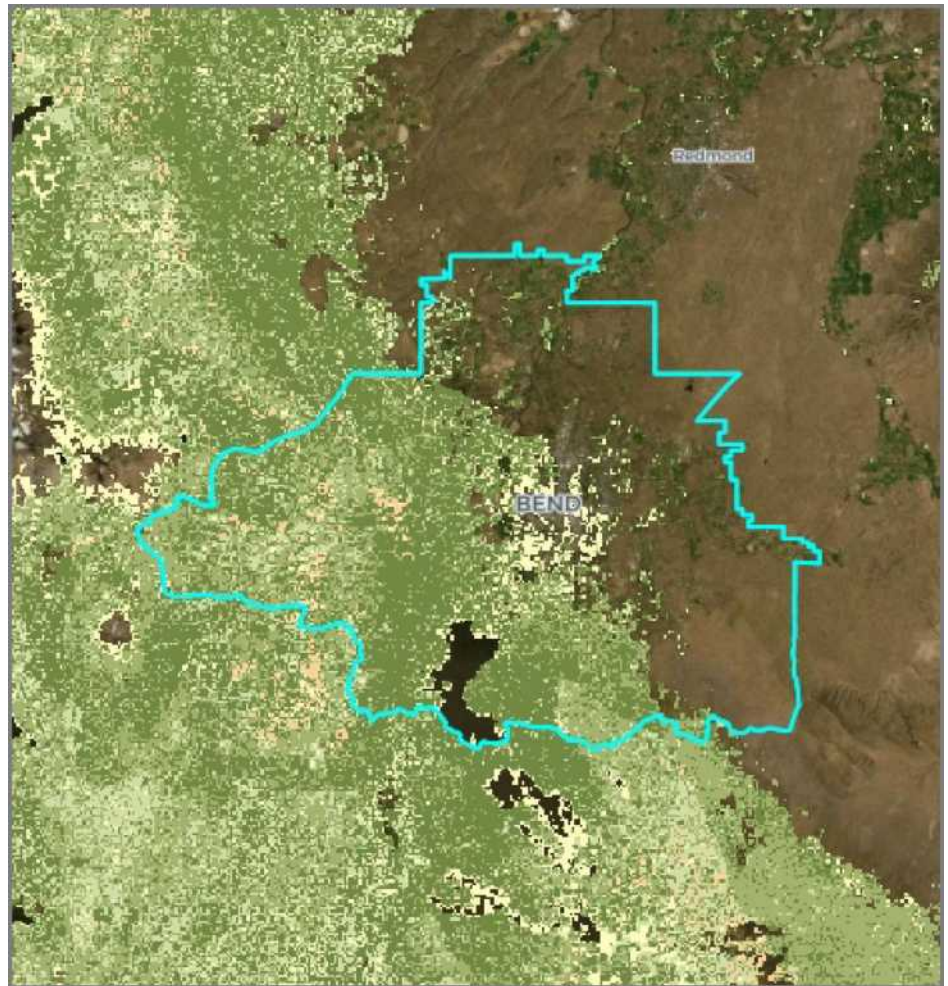
Generated: June 9, 2021

## POTENTIAL IMPACT TO FOREST VEGETATION

Potential impact to forest vegetation represents the exposure or consequence of wildfire on mapped forest vegetation. This layer provides information about departure of current vegetation condition relative to historical vegetation and reference conditions, and considers the natural role of fire to specific fire regime groups.

The Potential Impact data layers characterize exposure and susceptibility only, and do not include the likelihood of an area burning. This differentiates the Potential Impact layers from Wildfire Risk layers, which account for the burn probability in the risk rating.

The data values reflect a range of impacts from a very high negative rating, where wildfire will move the landscape further from historical or desired conditions, to positive, where wildfire will bring the landscape closer to historical or desired conditions. Note that wildfire impacts on rangeland and grassland vegetation were not simulated due to a lack of spatial data and adequate characterization of wildfire impacts on vegetation outside of forested communities.





# Oregon Wildfire Risk Explorer- Advanced Report

## Greater Bend

232,675 Acres: (364 Sq. Miles)



Generated: June 9, 2021

### Greater Bend potential impact to forest vegetation, if a wildfire were to occur.

| Category    | Description  | Acres   | %* |
|-------------|--|---------|----|
| Very High   | Potential impact is very highly negative (top 3%). Fire has a highly detrimental effect on the landscape, moving the landscape further from historical/desired conditions. | 53,965  | 23 |
| High        | Potential impact is highly negative (87-97th percentile). Fire has a detrimental effect on the landscape, moving the landscape further from historical/desired conditions. | 32,176  | 14 |
| Moderate    | Potential impact is moderately negative (52-87th percentile). Fire will move the landscape further from historical/desired conditions.                                     | 7,854   | 3  |
| Low         | Potential impact is slightly negative (19-52th percentile). Fire will move the landscape further from historical/desired conditions.                                       | 2,936   | 1  |
| Low Benefit | Potential impact is slightly beneficial to forest vegetation at low flame lengths, potentially producing a "fuel treatment" effect (0.6-19th percentile).                  | 2,366   | 1  |
| Benefit     | Potential impact is beneficial, with a cumulative positive impact on forest vegetation (0-0.6th percentile). There is potential for fire to bring the landscape closer to  | 0       | 0  |
| No Data     | There is no vegetation mapped in the area, or it is considered non-burnable (urban, agriculture, barren, etc).   | 133,382 | 57 |

Source: 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, US Forest Service

\* Values may add up to over 100% due to rounding precision



# Oregon Wildfire Risk Explorer- Advanced Report

**Greater Bend**

232,675 Acres: (364 Sq. Miles)



Generated: June 9, 2021

## FIRE REGIME GROUPS

A fire regime is a description of the general characteristics of a fire area, including frequency, intensity, size, pattern, season, and severity of effects of wildfire in an ecosystem over an extended period of time, dependent on topography, weather, vegetation, and fire history. How intensely a fire burns determines the effects and severity. Overall impacts of fires will depend on the historical fire regime and the influence of changes to that regime through changes in forest structure, composition, and processes.

Existing vegetation has departed from historical conditions in some areas, which affects the current fire environment. This departure depicts relative degrees of alterations of key ecosystem components such as species composition, structural stage, stand age, canopy closure, and fuel loadings. The potential impact to forest vegetation layer (and other potential impact layers) shows the areas where wildfire will move the landscape further from historical conditions, and where there are opportunities to use managed fire, active management, or other fuel treatments to bring the landscape closer to historical conditions.

Historically, higher fire frequency areas have lower fire severities. Vegetation in these areas is considered adaptive or resilient to fire due to this frequency. Examples include Ponderosa pine forests and dry mixed conifer forests. Lower frequency fire regime areas generally have higher severities, with vegetation and ecosystem elements usually considered sensitive due to their lack of exposure to fire. Examples include coastal forests, subalpine forests, alpine meadows, and many stream headwaters and riparian areas (see Existing vegetation).

Fire frequency suggests how often wildfire occurs (see Burn probability and Fire history data layers). Fire severity tells us how much impact wildfires are likely to have on the vegetation and other elements of an ecosystem (see Potential Impact data layers). The living and dead vegetation below forest canopies (shrubs, grasses, leaf litter, dead tree snags, etc.) also influences fire behavior (intensity and spread) and severity (impacts or effects). See Fuel models and Flame length data layers).

The national classification of fire regime groups commonly used includes five groups of fire frequency and severity pairs: I - frequent fire (0-35 years), low severity; II - frequent fire (0-35 years), stand replacement severity; III - 35-100+ years, mixed severity; IV - 35-100+ years, stand replacement severity; and V - 200+ years, stand replacement severity. Oregon has all of these historical fire regimes.

Maps of fire regime groups from LANDFIRE can be found here:  
[https://www.landfire.gov/geoareasmaps/2012/CONUS\\_FRG\\_c12.pdf](https://www.landfire.gov/geoareasmaps/2012/CONUS_FRG_c12.pdf).

Find more information about fire regime groups here: <https://www.landfire.gov/frg.php>.

Fire Regime table for major vegetation areas (in the Pacific Northwest):  
[https://www.fs.fed.us/database/feis/fire\\_regime\\_table/fire\\_regime\\_table.html#PacificNorthwest](https://www.fs.fed.us/database/feis/fire_regime_table/fire_regime_table.html#PacificNorthwest)





# Oregon Wildfire Risk Explorer- Advanced Report

**Greater Bend**  
232,675 Acres: (364 Sq. Miles)



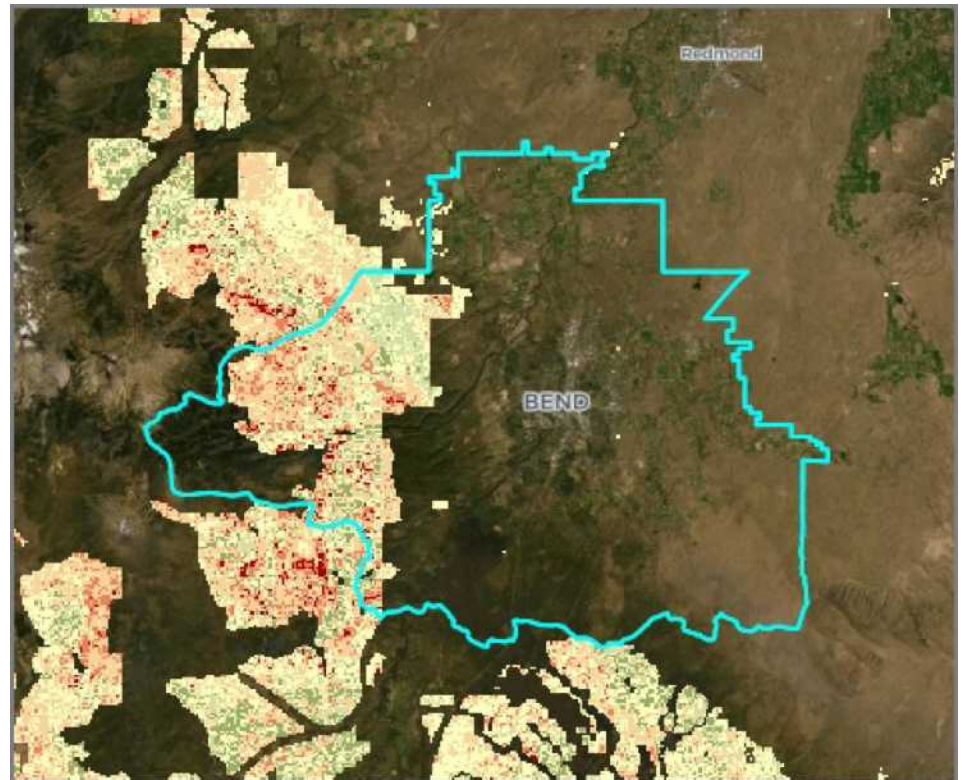
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## POTENTIAL IMPACT TO TIMBER RESOURCES

Potential impact to timber resources represents the exposure or consequence of wildfire on mapped highly valued timber on US Forest Service, Tribal, private lands, BLM, and state-managed lands.

The Potential Impact data layers characterize exposure and susceptibility only, and do not include the likelihood of an area burning. This differentiates the potential impact layers from Wildfire Risk layers, which account for the burn probability in the risk rating.

The data values reflect a range of impacts from a very high negative rating, where wildfire is detrimental (for example early seral stage and/or sensitive forests), to positive, where wildfire may produce an overall benefit (for example, understory thinning treatment for fire-adapted species).



### Greater Bend potential impact to timber resources, if a wildfire were to occur.

| Category    | Description   | Acres   | %*  |
|-------------|---|---------|-----|
| Very High   | Potential impact is very highly negative (top 5%).  | 868     | < 1 |
| High        | Potential impact is highly negative (80-95th percentile).   | 4,720   | 2   |
| Moderate    | Potential impact is moderately negative (50-80th percentile).   | 12,505  | 5   |
| Low         | Potential impact is slightly negative (19-50th percentile).   | 9,846   | 4   |
| Low Benefit | Potential impact is slightly beneficial to timber resources at low flame lengths (9-19th percentile).                 | 6,082   | 3   |
| Benefit     | Potential impact is beneficial, with a cumulative positive impact on timber resources (0-9th percentile).             | 2,318   | < 1 |
| No Data     | There are no timber resources mapped in the area, or it is considered non-burnable (urban, agriculture, barren, etc). | 196,338 | 84  |

Source: 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, US Forest Service

\* Values may add up to over 100% due to rounding precision



# Oregon Wildfire Risk Explorer- Advanced Report

**Greater Bend**  
232,675 Acres: (364 Sq. Miles)

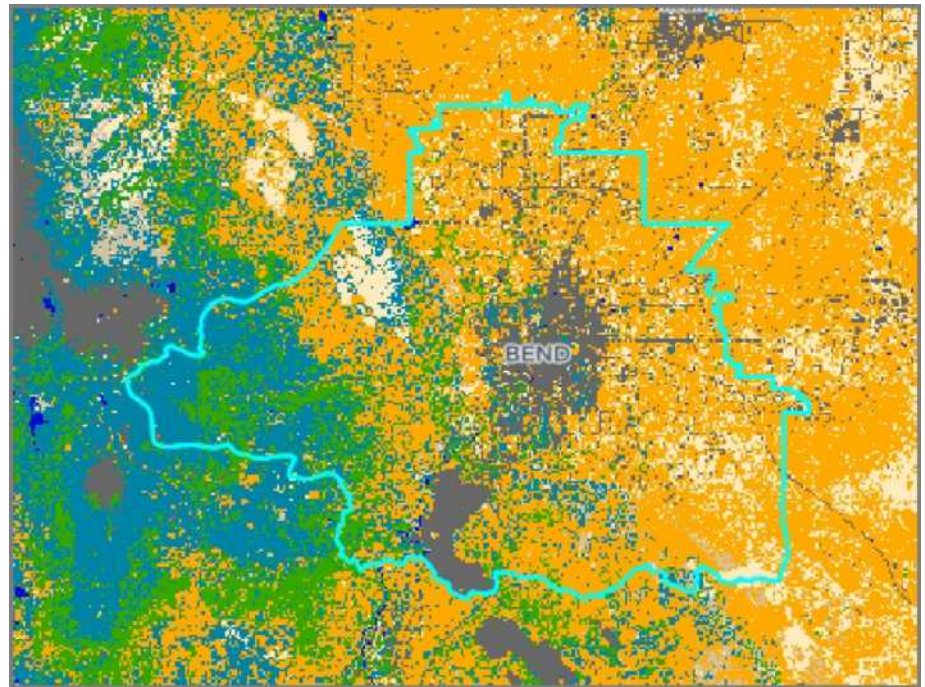


Generated: June 9, 2021

## FUEL MODEL GROUPS

Fuel models describe the fire-carrying materials that make up surface fuels, such as grasses, shrubs and litter (see next page). Fuel models are developed from climate characteristics, existing vegetation type, cover, height, and other vegetation characteristics, and help us understand the fuels igniting and carrying fire. These fuel models can be grouped into broad categories of burnable fuels based on descriptions of live and dead vegetation that represent distinct fuel types, size classes, and load distributions (amounts), shown in the map and chart below.

Fuels and other elements of the fuelscape in the risk assessment were extensively reviewed and refined by local expert consultation, and the fuelscape was updated to account for wildfires that occurred through 2017.



**Greater Bend fuel model groups** (see next page for descriptions of codes)

| Category           | Description  | Acres   | %*  |
|--------------------|--|---------|-----|
| Grass              | Fuel models 101-104, (GR1; GR2; GR3; GR4)                          | 26,322  | 11  |
| Grass/Shrub        | Fuel models 121-123, (GS1; GS2; GS3)                               | 110,616 | 48  |
| Non-burnable-other | Fuel Models 91-93,99, (NB1; NB2; NB3; NB9)                         | 29,597  | 13  |
| Non-burnable-water | Fuel Models 98, (NB8)  | 713     | < 1 |
| Slash-blowdown     | Fuel Models 202, (SB2)   | 0       | 0   |
| Shrub              | Fuel Models 141-147, (SH1; SH2; SH3; SH4; SH5; SH6; SH7)           | 3,950   | 2   |
| Timber Litter      | Fuel Models 181-189, (TL1; TL2; TL3; TL4; TL5; TL6; TL7; TL8; TL9) | 39,852  | 17  |
| Timber-Understory  | Fuel Models 161-163, 165, (TU1; TU2; TU3; TU5)                     | 21,630  | 9   |

Source: 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, US Forest Service

\* Values may add up to over 100% due to rounding precision



# Oregon Wildfire Risk Explorer- Advanced Report

**Greater Bend**

232,675 Acres: (364 Sq. Miles)



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## Table of Fuel Model Groups

40 Scott and Burgan Fire Behavior Fuel Models Description and Data Dictionary <https://www.landfire.gov/fbfm40.php>  
<https://www.landfire.gov/DataDictionary/f40.pdf>

| Group  | Description  |
|--|--|
| Grass<br><br>Fuel models<br>101-104, (GR1;<br>GR2; GR3;<br>GR4)                      | GR1: Short, sparse dry climate grass is short, naturally or heavy grazing, predicted rate of fire spread and flame length low<br>GR2: Low load, dry climate grass primarily grass with some small amounts of fine, dead fuel, any shrubs do not affect fire behavior<br>GR3: Low load, very coarse, humid climate grass continuous, coarse humid climate grass, any shrubs do not affect fire behavior<br>GR4: Moderate load, dry climate grass, continuous, dry climate grass, fuelbed depth about 2 feet   |
| Grass/Shrub<br><br>Fuel models<br>121-123, (GS1;<br>GS2; GS3)                        | GS1: Low load, dry climate grass-shrub shrub about 1 foot high, grass load low, spread rate moderate and flame length low<br>GS2: Moderate load, dry climate grass-shrub, shrubs are 1-3 feet high, grass load moderate, spread rate high, and flame length is moderate<br>GS3: Moderate load, humid climate grass-shrub, moderate grass/shrub load, grass/shrub depth is less than 2 feet, spread rate is high and flame length is moderate   |
| Non-Burnable-Other   | Fuel Models 91-93, 99, (NB1; NB2; NB3; NB9)<br>NB1: Urban<br>NB2: Snow/Ice<br>NB3: Agriculture<br>NB9: Barren  |
| Non-burnable-Water   | Fuel Model 98, (NB8): Water  |
| Slash-blowdown   | Fuel Model 202, (SB2):<br>Moderate load activity fuel or low load blowdown, 7-12 t/ac, 0-3 inch diameter class, depth about 1 foot, blowdown scattered with many still standing, spread rate and flame low   |
| Shrub Group<br><br>Fuel Models<br>141-147, (SH1;<br>SH2; SH3; SH4;<br>SH5; SH6; SH7) | SH1: Low load dry climate shrub, woody shrubs and shrub litter, fuelbed depth about 1 foot, may be some grass, spread rate and flame low<br>SH2: Moderate load dry climate shrub, woody shrubs and shrub litter, fuelbed depth about 1 foot, no grass, spread rate and flame low<br>SH3: Moderate load, humid climate shrub, woody shrubs and shrub litter, possible pine overstory, fuelbed depth 2-3 feet, spread rate and flame low<br>SH4: Low load, humid climate timber shrub, woody shrubs and shrub litter, low to moderate load, possible pine overstory, fuelbed depth about 3 feet, spread rate high and flame moderate<br>SH5: High load, humid climate grass-shrub combined, heavy load with depth greater than 2 feet, spread rate and flame very high<br>SH6: Low load, humid climate shrub, woody shrubs and shrub litter, dense shrubs, little or no herbaceous fuel, depth about 2 feet, spread rate and flame high<br>SH7: Very high load, dry climate shrub, woody shrubs and shrub litter, very heavy shrub load, depth 4-6 feet, spread rate somewhat lower than SH6 and flame very high |





# Oregon Wildfire Risk Explorer- Advanced Report

**Greater Bend**

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|  |  |
|--|--|
| Timber Litter Group  | TL1: Low load compact conifer litter, compact forest litter, light to moderate load, 1-2 inches deep, may represent a recent burn, spread rate and flame low<br>TL2: Low load broadleaf litter, broadleaf, hardwood litter, spread rate and flame low  |
| Fuel Models 181-189, (TL1; TL2; TL3; TL4; TL5; TL6; TL7; TL8; TL9) | TL3: Moderate load conifer litter, moderate load conifer litter, light load of coarse fuels, spread rate and flame low<br>TL4: Small downed logs moderate load of fine litter and coarse fuels, small diameter downed logs, spread rate and flame low<br>TL5: High load conifer litter, light slash or dead fuel, spread rate and flame low<br>TL6: Moderate load broadleaf litter, spread rate and flame moderate<br>TL8: Large downed logs, heavy load forest litter, larger diameter downed logs, spread rate and flame low<br>TL8: Long needle litter, moderate load long needle pine litter, may have small amounts of herbaceous fuel, spread rate moderate and flame low<br>TL9: Very high load broadleaf litter, may be heavy needle drape, spread rate and flame moderate |
| Timber-Understory Group  | TU1: Low load dry climate timber grass shrub, low load of grass and/or shrub with litter, spread rate and flame low<br>TU2: Moderate load, humid climate timber-shrub, moderate litter load with some shrub, spread rate moderate and flame low<br>TU3: Moderate load, humid climate timber grass shrub, moderate forest litter with some grass and shrub, spread rate high and flame moderate   |
| Fuel Models 161-163, 165, (TU1; TU2; TU3; TU5)                     | TU5: Very high load, dry climate shrub, heavy forest litter with shrub or small tree understory, spread rate and flame moderate  |

This report was generated from the Advanced Oregon Wildfire Risk Explorer map viewer: [tools.oregonexplorer.info/OE\\_HtmlViewer/index.html?viewer=wildfireplanning](https://tools.oregonexplorer.info/OE_HtmlViewer/index.html?viewer=wildfireplanning). For more information on wildfire risk in a specific location, you can generate a Homeowner’s report from the Oregon Wildfire Risk Explorer map viewer.

### How to Cite:

Accessed from the Oregon Wildfire Risk Explorer on June 09, 2021  
URL: [https://tools.oregonexplorer.info/OE\\_HtmlViewer/index.html?viewer=wildfireplanning](https://tools.oregonexplorer.info/OE_HtmlViewer/index.html?viewer=wildfireplanning)  
Primary data Source: USDA Forest Service Pacific Northwest Quantitative Wildfire Risk Assessment (2018)

The Oregon Wildfire Risk Explorer site, tools and reports are the result of a collaboration among the following organizations and others:



*Wildfire risk data is primarily from the USDA Forest Service 2018 Pacific Northwest Quantitative Wildfire Risk Assessment with some components from the 2013 West Wide Wildfire Risk Assessment. The information is being provided as is and without warranty of any kind either express, implied or statutory. The user assumes the entire responsibility and liability related to their use of this information. By accessing this website and/or data contained within, you hereby release the Oregon Department of Forestry, Oregon State University, and all data providers from liability. This institution is an equal opportunity provider. This publication was made possible through grants from the USDA Forest Service.*

## **Appendix B**

### **Glossary of Terms**

- **Cohesive Strategy:** In 2009, Congress passed the Federal Land Assistance, Management, and Enhancement (FLAME) Act and called for a National Cohesive Wildland Fire Management Strategy, also known commonly as the Cohesive Strategy, to address wildland fire related issues across the nation in a collaborative, cohesive manner. The Cohesive Strategy was finalized in 2014 and represents the evolution of national fire policy: To safely and effectively extinguish fire, when needed; use fire where allowable; manage our natural resources; and as a Nation, live with wildland fire. The primary, national goals identified as necessary to achieving the vision are: **Resilient landscapes:** Landscapes across all jurisdictions are resilient to fire-related disturbances in accordance with management objectives. **Fire-adapted communities:** Human populations and infrastructure can withstand a wildfire without loss of life and property. **Wildfire response:** All jurisdictions participate in making and implementing safe, effective, efficient risk-based wildfire management decisions.
  
- **Crown Fires:** A fire that advances from top to top of trees or shrubs more or less independent of a surface fire. Crown fires are sometimes classed as running or dependent to distinguish the degree of independence from the surface fire.
  
- **Defensible Space:** Defensible Space, in the context of fire control, is the natural and landscaped area around a structure that has been maintained and designed to reduce wildfire danger by using vegetation that is fire resistant.
  
- **Deschutes Collaborative Forest Project:** In 2010, a collaborative group of local agencies and organizations formed a proposal for funding a large, collaborative forest restoration and hazardous fuels reduction project on public lands managed by the Deschutes National Forest. This landscape level project is known as the Deschutes Collaborative Forest Project (DCFP).
  
- **Dispersed Campgrounds & Recreational Sites:** Campsites or recreational sites members of the public use that are outside of a designated campground or developed recreation site. These sites do not have trash removal or facilities such as tables and fire pits. For more information on how to use dispersed recreational sites visit: <http://www.fs.usda.gov/>
  
- **Fire Adapted Community:** One of the tenets of the Cohesive Strategy. A Fire Adapted is one that acknowledges and takes responsibility for its wildfire risk, and implements appropriate actions at all levels. Deschutes County is a pilot community for the Fire Adapted Communities Learning Network. For more information visit:



<http://www.facnetwork.org>

- **Fire Break:** A gap in vegetation or other combustible materials that acts as a barrier to slow or stop the progress of a wildfire.
- **Fire Prone Area:** A geographic area that can support a wildfire due to weather and vegetation.
- **Fire Resiliency:** A landscape or geographic location that is able to withstand wildfire without suffering catastrophic effects, such as loss of life, home loss or damage and/or environmental damage.
- **Fire Return Interval:** The time between fires in a defined area or landscape.
- **Fire Suppression Costs:** The financial figure that is incurred during any operations by fire fighting agencies to suppress (or put out), a wildland fire.
- **FireFree:** A local program in Central Oregon that uses ten steps to educate property owners on how to defend their home from wildfire. FireFree also provides two annual events where homeowners can dispose of debris created from wildfire preparedness activities.
- **Firewise USA®:** A national program that provides a process that empowers neighbors to work together in reducing their wildfire risk. The National Fire Protection Association sponsors the Firewise USA® program.
- **Hazardous Fuel Reduction:** Reducing vegetation that could accelerate a wildland fire.
- **Hazardous Fuels:** Any fuel or vegetation that will sustain or accelerate a wildland fire.
- **High Intensity:** Fire intensity represents that energy releases during various phases of the fire. High intensity fires are damaging to certain vegetation and ecosystems that are not adapted to them. Much of the lower elevation forests in Central Oregon are adapted to lower intensities.
- **Overstory:** Also called the canopy. Made up of the tallest trees that stand over the rest of the plants in the landscape.
- **Pacific Northwest Coordination Center:** The Northwest Interagency Coordination Center (NWCC) is the Geographic Area Coordination Center for the Northwest Region, which includes the States of Oregon and Washington. Located

in Portland, OR, the NWCC serves as the focal point for interagency resource coordination, logistics support, aviation support and predictive services for all state and federal agencies involved in wildland fire management and suppression in the region. Cooperating agencies include the: Bureau of Land Management, US Forest Service, Oregon Dept of Forestry, US Fish and Wildlife Service, Bureau of Indian Affairs, Washington Dept. of Natural Resources and the National Park Service.

- **Resilient Landscapes:** A landscape that is able to recover quickly or repel disturbances that may be a departure from normal circumstances.
- **Silvicultural Treatments:** A planned series of treatment that aide in achieving the goals set forth by a diverse set of values. Silviculture is the practice of controlling the establishment, growth, composition, health and quality of forests to meet diverse needs and values.
- **Stand Dynamics:** The underlying physical and biological forces that shape and change a particular area or forest stand.
- **Structural Ignitability:** Also known as Structural Vulnerability; which refers to the probability of a home igniting during a large wildfire.
- **Structural Vulnerability Factors:** Factors that can increase or decrease a home's probability of igniting during a large wildfire. Examples include: roof composition, roof cleanliness, vent covers, deck composition & cleanliness, etc.
- **Thick Bark Pine:** a local species is Ponderosa Pines. Their thick bark makes them a fire resistant species. The lower elevation forests that were/are dominated by Ponderosa Pines are adapted to low intensity fire that would burn through as often as every ten years.
- **Tree Crowns:** See overstory. Also known as the tree canopy.
- **Understory:** The layer of vegetation beneath the main canopy of a forest.
- **Wildfire Preparedness:** Changing behaviors and/or processes to reduce the impact a wildfire may have on the population.
- **Wildland Fire:** Any non-structural fire that occurs in vegetation or natural fuels. An unplanned, unwanted wildland fire including unauthorized human-caused fires, escaped wildland fire use events, escaped prescribed fire projects, and all other wildland fires where the objective is to put the fire out.

- **Wildland Fuels:** Vegetation that is located in an area in which development is essentially non-existent, except for roads, railroads, powerlines, and similar transportation facilities. Structures, if any, are widely scattered.
- **Wildland Urban Interface (WUI):** The line, area, or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels. Describes an area within or adjacent to private and public property where mitigation actions can prevent damage or loss from wildfire. Much of Deschutes County is considered Wildland Urban Interface.

## **Appendix C**

### **Post Fire Recovery**

#### **During the Fire Contacts**

Deschutes County 911 Non-Emergency Line (541) 693-6911  
American Red Cross (Central and Eastern Oregon Chapter) (541) 382-2142

#### **Web links for Fire and Evacuation Information:**

- Central Oregon Fire Information [Central Oregon Fire Info](#)
- Deschutes County Emergency Blog [Deschutes County Emergency Info](#)
- Central Oregon Interagency Twitter Feed [twitter.com/CentralORFire](https://twitter.com/CentralORFire)
- Deschutes County Sheriff’s Twitter Feed [twitter.com/DeschutesSO](https://twitter.com/DeschutesSO)
- Evacuation Guide [Ready, Set, Go](#)
- Emergency Notifications [Deschutes County Alerts](#)

#### **Post-Fire Recovery Community Issues to Consider**

Following a wildfire, communities may be facing a host of issues. The complexities involved in mid and long-term strategies for economic, environmental and social recovery may be daunting. Learning from the experiences of others is helpful. Considering relevant questions like:

- How soon can or should schools reopen?
- Can debris removal efforts be expedited? If so, what is the cost and who will pay for it?
- Does the impact warrant inviting the Oregon DOJ Charitable Activities Section regulators to send a team to ensure crooks and scam artists don’t take advantage of vulnerable residents?
- Are emergency grants available to restore basic public services?
- What system(s) can be used to equitably and efficiently distribute the donations that a community receives following a catastrophic fire?
- What resources are available for small businesses attempting to reestablish? Do new programs need to be created?
- How will tourism be affected?

#### **Deschutes County Long-Term Recovery Efforts**

The Deschutes County Sheriff’s Office Emergency Management Team, working with residents and community stakeholders, is developing a Disaster Recovery Framework. The Framework is part of a suite of plans that address various elements of emergency management. It aims to establish guidelines for how the Deschutes County Community will work together to restore, rebuild, and reshape the

physical, social, economic and natural environment in the months and years following a disaster or emergency.

## **After the Fire Resources for Affected Residents**

**Fire Management Assistance (FMAG)** is available to States, local and tribal governments, for the mitigation, management, and control of fires on publicly or privately owned forests or grasslands, which threaten such destruction as would constitute a major disaster. The Fire Management Assistance declaration process is initiated when a State submits a request for assistance to the Federal Emergency Management Agency (FEMA) Regional Director at the time a "threat of major disaster" exists. The entire process is accomplished on an expedited basis and a FEMA decision is rendered in a matter of hours.

The Fire Management Assistance Grant Program (FMAGP) provides a 75 percent Federal cost share and the State pays the remaining 25 percent for actual costs. Before a grant can be awarded, a State must demonstrate that total eligible costs for the declared fire meet or exceed either the individual fire cost threshold - which is applies to single fires, or the cumulative fire cost threshold, which recognizes numerous smaller fires burning throughout a State. Eligible firefighting costs may include expenses for field camps; equipment use, repair and replacement; tools, materials and supplies; and mobilization and demobilization activities.

**FEMA Individual Assistance (FEMA IA)** has created a set of tools to help those facilitating their community's recovery. Community Services Programs deliver a variety of services to assist in disaster recovery. Disaster Housing Resources provides links to access information on multiple disaster housing programs and strategies. FEMA Voluntary Agency and Donations Coordination delivers information, support and guidance during disaster recovery. The National Emergency Child Locator Center and National Mass Evacuation Tracking System are both tracking databases that can be activated during disasters and assist in reunifying family members. The National Shelter System is a database that supports the agencies responsible for Mass Care and Emergency Assistance. For information on these tools follow this link to [FEMA's site](#).

**FEMA Public Assistance (FEMA PA)** mission's to provide assistance to State, Tribal and local governments, and certain types of Private Nonprofit organizations so that communities can quickly respond to and recover from major disasters or emergencies declared by the President.

Through the PA Program, FEMA provides supplemental Federal disaster grant assistance for debris removal, emergency protective measures, and the repair, replacement, or restoration of disaster-damaged, publicly owned facilities and the facilities of certain Private Non-Profit (PNP) organizations. The PA Program also encourages protection of these damaged facilities from future events by providing assistance for hazard mitigation measures during the recovery process.



The Federal share of assistance is not less than 75% of the eligible cost for emergency measures and permanent restoration. The grantee (usually the State) determines how the non-Federal share (up to 25%) is split with the sub-grantees (eligible applicants).

**Small Business Disaster Loans** through the [Small Business Administration \(SBA\)](#). SBA provides low-interest disaster loans to businesses of all sizes, private non-profit organizations, homeowners, and renters. SBA disaster loans can be used to repair or replace the following items damaged or destroyed in a declared disaster: real estate, personal property, machinery and equipment, and inventory and business assets.

**Oregon VOAD** ([Voluntary Organizations Active in Disaster](#)) is a group of faith-based, community service organizations with disaster relief roles related to short and long-term recovery from disasters.

Functions include but are not limited to: damage assessment, cleanup, building repair, donations management, child care, clothing, communication, counseling, disaster welfare inquiry, financial assistance, food, human relations, mass care, sheltering, transportation, volunteer staffing, warehousing and bulk distribution. ORVOAD coordinates disaster planning with member agencies to ensure reduction of duplication and an increase in effective delivery of services.

**Natural Resources Conservation Services (NRCS)** may provide funding they are allocated to help with fire recovery efforts for agricultural and private, non-industrial forestland owners. Program and application announcements will be made as funding becomes available. Please check [this site](#) frequently for updates.

**American Red Cross [Casework](#):** Providing Emergency Assistance is trains Red Cross caseworkers how to conduct effective client interviews and provide appropriate assistance to help meet a client's immediate disaster-caused or disaster-aggravated needs.

## Fire Recovery Safety Tips

REMEMBER – use caution and good judgment. Hazards may still exist, even though the fire is controlled.

### ELECTRICAL

#### Electrical Safety Facts

**General:** An important part of the disaster recovery is hazard recognition. Should you come across damaged or fallen power poles or lines, contact your local electrical power authorities. **DO NOT TOUCH THE DOWNED WIRES.** In the cleanup area, be especially careful when cutting trees and operating heavy equipment around power lines. Vegetation and power poles may have lost stability due to fire damage.

If a power line or pole should fall next to you while working in the area, *do not walk – hop out of the area.* (Using this technique, you will be less likely to be a conductor of electricity).

Electricity is always trying to go somewhere. It goes easily through conductors; it does not go easily through non-conductors.

| Conductors                               | Non-Conductors |
|--|----------------|
| Metal                                    | Rubber         |
| Water                                    | Glass          |
| Wet Things                               | Plastic        |
| Things In Water (including animals/pets) |                |

One of the most important fixtures in the conduction of electric current are utility poles. The fire or fire suppression actions may have dislodged or broken some of these poles, causing the wires to sag or break, resulting in extremely hazardous conditions. Do not touch anything at the scene.

Trees can also be dangerous conductors of electricity. When a tree falls or grows into contact with power wires, the electric power diverts and finds a path to the ground through the branches and the trunk. Anyone who comes into contact with these trees is subject to tragic consequences, since electric power can easily jump from the tree to the person.

#### Electrical Safety Tips

- Do not overload circuits; don't operate several large appliances at the same time on the same circuit.
- Do not use extension cords to plug in many items on one outlet.
- Turn off appliances when you finish using them. Provide adequate air circulation around all

appliances to prevent over-heating. Keep appliances clean, repaired and serviced.

- Check wires and plugs regularly. Replace worn or frayed wires. Do not run cords under carpets or across doorways.
- Be careful when replacing fuses or breakers. Keep the area near the circuit box dry and turn the main switch off before changing the fuse/breaker.
- Temporary lines should be removed from service.

#### **Electrical Locations To Avoid**

- Electrical meters and service lines coming into the home or other outbuildings.
- Any power supply line which appears to sag, show bare wire, or have insulation missing.
- Secured power sub-stations or any area identified as high voltage.
- Downed power lines.

#### **Emergency Procedures for an Electrical Fire**

- Call the fire department.
- Shut off power supply at the breaker if possible.

#### **Restoring Electric Power**

If, upon returning to your residence, there is no electrical power, please check to make sure the main breaker is on. If the breakers are on and power is still not present, please call to report the power outage to your local electrical power authorities.

Reporting problems like a down or broken wire will speed up the process of power restoration.

- Stand off to one side of the breaker box when turning on the main breaker. Do not stand directly in front of the box.
- If any smells of hot electrical insulation or sparking occurs, turn of the breaker immediately and call an electrician.
- If electrical lights or appliances appear brighter than normal, turn off main breaker. The service entrance needs to be checked.

#### **To Change A Fuse**

Try to find the cause of the blown fuse, and correct it by disconnecting the defective appliance or appliances causing the overload or short circuit. Shut off the main power switch when you change the fuse.

- Do not replace fuses with a higher amp rating fuse than you removed.
- Turn on the main switch to restore the power.

- If the fuse blows again, leave it alone and contact a certified electrician. Other problems may exist and should be investigated to remove the possibility of an electrical fire.

### **To Reset A Circuit Breaker**

Try to find the cause of the overload or short circuit and correct it by disconnecting the defective appliance or appliances. Turn the switch to “on” to reset and restore power. If breaker trips again leave it alone, and contact a certified electrician. Other problems may exist and should be found to remove the possibility of an electrical fire.

### **Special Information of Fuses & Circuit Breakers**

Fuses and circuit breakers shut off the current whenever too much current tries to flow through a wire because of:

- A short circuit, possibly caused by a bare wire touching the ground;
- Overloading, possibly caused by too many lights or appliances on one circuit; or
- By defective parts in an appliance.

Know where the main circuit or fuse box is located in your house. Be sure you can locate the main switch; it controls all of the power coming into the house and is usually inside the circuit box. In some cases, however, it may be located outside of the house. Fuse or circuit boxes generally are labeled to designate which area of the house the circuits or fuses serve.



# **DRINKING WATER**

## **Restoring Water Systems**

Unless impacted by a fuel spill, the fire should not have affected wells at undamaged homes. If your house was damaged, your water system may potentially have become contaminated with bacteria due to loss of water pressure. In this case it is recommended that the well be disinfected and the water be tested before consumption. To disinfect your water system, pour ½ - 1 cup of chlorine bleach inside the well casing and turn on all faucets until a chlorine scent is noticed. Allow the chlorine solution to remain in the system overnight. The following morning, open all faucets and flush the system until free of chlorine smell.

If you have a public use well or water system, contact the Deschutes County Public Health Department for specifics on testing prior to consumption of any water. The Drinking Water Program administers and enforces drinking water quality standards for approximately 175 public water systems within Deschutes County. More information can be found on their website at <https://www.deschutes.org/health/page/drinking-water>

Oregon implements drinking water protection through a partnership of DEQ (Department of Environmental Quality) and the OHA (Oregon Health Authority). The program provides information about drinking water, and helps Oregonians get involved in protecting drinking water quality. In general, for questions regarding groundwater sources, contact OHA. Contact DEQ for questions about protecting public water supplies using surface water.

For questions about regulations, water quality, treatment plants, and testing, contact OHA who is the primacy agency for the implementation of the federal Safe Drinking Water Act in Oregon.

OHA's webpages provide the most useful info for consumers about drinking water protection:

<https://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/DRINKINGWATER/Pages/index.aspx>

Information specific for private domestic wells is here:

<https://www.oregon.gov/oha/PH/HEALTHYENVIRONMENTS/DRINKINGWATER/SOURCEWATER/DOMESTICWELLSAFETY/Pages/index.aspx>

## **SOLID WASTE**

### **Removing Debris**

Cleanup of your property can expose you to potential health problems from hazardous materials. Wet down any debris to minimize health impacts from breathing dust particles. The use of a two-strap dust particulate mask with nose clip and coveralls will provide the best minimal protection. Leather gloves should be worn to protect your hands from sharp objects while removing debris.

Hazardous materials such as kitchen and bathroom cleaning products, paint, batteries, contaminated fuel and damaged fuel containers must be handled properly. Contact your local County Officials for specific handling restrictions and disposal options.

All hazardous materials should be labeled as to their contents if known!

## **HEATING FUELS**

### **Checking Propane Tanks**

Propane suppliers recommend homeowners contact them for an inspection prior to reusing their system. If the fire burned the tank, pressure relief valve probably opened and released the contents of the tank. Tanks, brass and copper fittings, and lines may be heat-damaged and unsafe. Valves should be turned off and remain closed until the propane suppliers inspect the system.

### **Checking Home Heating Oil Tanks**

Heating oil suppliers recommend homeowners contact them for an inspection prior to reusing their system. The tank may have shifted or fallen from the stand and fuel lines may have kinked or weakened. Heat from the fire may have caused the tank to warp or bulge. Non-vented tanks are more likely to bulge or show signs of stress. The fire may have loosened or damaged fittings and filters. If the tank is intact and heating oil remains in the tank, the heating oil should still be good. If you have questions on the integrity of the tank, fuel lines, tank stand, or the fuel, or need assistance in moving the tank or returning it to service, contact your fuel supplier.

## MISCELLANEOUS SAFETY AWARENESS

### Ash Pits

Holes created by burned trees and stumps create ash pits, which are full of hot ashes. Mark them for your safety, as they can stay hot for many days following the fire, causing serious burns. Warn your family and neighbors, especially children. Tell them to watch for ash pits and to not put hands or feet in these holes—they are hot!

### Evaluation of Trees Damaged by Fire

The following information will assist you in evaluating any trees that have been scorched or burnt by the fire. Identification of the type of tree affected is important and can easily be done. Two basic types of trees exist in this area: deciduous and evergreen. Deciduous trees are broad leaf trees that lose their leaves in the fall.

In this area we have a variety of deciduous tree species. Evergreen trees have needles and in this area we mainly have Ponderosa Pine, Lodgepole Pine and Western Juniper.

First: visually check the tree stability. Any tree weakened by fire may be a hazard. Winds are normally responsible for toppling weakened trees. The wind patterns in your area may have changed as a result of the loss of adjacent tree cover. Seek professional assistance before felling trees near power lines, houses or other improvements.

If the tree looks stable:

- Visually check for burnt, partially burnt or broken branches and tree tops that may fall.
- Check for burns on the tree trunk. If the bark on the trunk of the tree has been burned off or scorched by very high temperatures completely surround the tree's circumference, the tree will not survive. This is because the living portion of the tree (cambium) was destroyed. The bark of the tree provides protection to the tree during fire. Bark thickness varies based upon tree species: check carefully to see if the fire or heat penetrated the bark. Where fire has burnt deep into the tree trunk, the tree should be considered unstable until checked.
- Check for burnt roots by probing the ground with a rod around the base of the tree and out away from the base several feet. The roots are generally six to eight inches below the surface. If you find that the roots have been burned you should consider this tree very unstable; it could easily be toppled by wind.

If the tree is scorched

- A scorched tree is one that has lost part or all of its needles. Leaves will be dry and curled. Needles will be a light red or straw colored. Healthy deciduous trees are resilient and may possibly produce new branches and leaves, as well as sprouts at the base of the tree. Evergreen trees, particularly long-needled trees, may survive when partially scorched. An evergreen tree that has been damaged by fire is subject to bark beetle attack. Please seek



professional assistance concerning measures for protecting evergreen trees from bark beetle attack.

## **Residual Smoke In Fire Interior**

Smoke may be present on the interior of the fire for several days following containment. This occurs as a result of stumps, roots, and other surface materials being exposed to changing temperatures and wind conditions. Smoke volume from these materials may fluctuate depending on weather conditions. This activity should not pose a risk and smoke will continue to dissipate until materials are fully consumed or extinguished by fire crews or weather.

## **Flooding Risk**

With the recent large high intensity wildfires in Oregon certain locations within burned areas, or downhill and downstream of burned areas are much more susceptible to flash flooding and debris flows. Even areas that are not traditionally flood prone are at risk due to changes to the landscape caused by wildfire. Rainfall that would normally be absorbed will run off extremely quickly after a wildfire, as burned soil can be as water repellent as pavement. As a result, much less rainfall is required to produce a flash flood. A good rule of thumb is, if you can look uphill from where you are and see an area burned by wildfire, you are at risk.

### **Preparing for Flooding**

In the event of moderate to heavy rainfall, do not wait for a flash flood warning in order to take steps to protect life and property. Thunderstorms that develop over the burned area may begin to produce flash flooding and debris flows before a warning can be issued. If you are in an area vulnerable to flooding and debris flows, plan in advance and move away from the area. There may be very little time to react once the storms and rain start.

- Have an evacuation/escape route planned that is least likely to be impacted by Flash Flooding or Debris Flows
- Have an Emergency Supply Kit available
- Stay informed before and during any potential event; knowing where to obtain National Weather Service (NWS) Outlooks, Watches and Warnings via the NWS Pendleton Website, Facebook, Twitter, or All Hazards NOAA Weather Radio
- Be alert if any rain develops. Do not wait for a warning to evacuate should heavy rain develop.
- Call 911 if you are caught in a Flash Flood or Debris Flow
- Contact local officials for additional risk information and potential mitigation efforts
- Contact The US Army Corps of Engineers regarding their [Silver Jackets Program](#)