



Sunriver

Community Wildfire Protection Plan

2020

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 Sunriver Area to become a more Fire Adapted Community.

Since its creation in 2005, the Sunriver CWPP has been revised two times (2010 and 2015) by a local steering committee with the intention of decreasing the risks of high-intensity wildfire in the Sunriver Area. Due to the sustained investment and maintenance of ladder fuel reduction, some notable trends can be examined by comparing the risk assessments from each iteration of the Sunriver CWPP. Sunriver and neighboring areas have made substantial investments in community preparedness, building standards and fuel reduction, which are reducing the wildfire risk.

The 2020 Sunriver CWPP will assist in the identification and prioritization of wildfire risk on all lands, including surrounding public lands. The Sunriver 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 Sunriver 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 Sunriver’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 Sunriver 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 Sunriver CWPP is multi-jurisdictional and addresses all lands and all ownerships within the boundaries of the plan area. Sunriver is located in the center of Deschutes County. The eastern edge is bound by highway 97 which abuts the East-West CWPP. The southern border follows South Century Drive joining with the Upper Deschutes River CWPP. The western border abuts both the Upper Deschutes River and the East West CWPP and follows the Deschutes River and portions of the Deschutes National Forest Rd 41. The Northern border is combination of the Deschutes River and a lava flow where it abuts the Greater Bend CWPP.

The community of Sunriver, Oregon is located in central Oregon, on the east side of the Cascade Mountains, 15 miles south of Bend in Deschutes County. Developed in 1968 as a residential and resort community, Sunriver is now home to approximately 1,200 full time property owners, with a population upwards of 20,000 property owners and visitors per day during peak recreation periods.

Sunriver is known for its outstanding recreational opportunities and scenic beauty with year round recreation activities available. Within the Sunriver CWPP area there is a significant amount of public land with developed and dispersed recreation sites, which also provide valuable recreation opportunities to both property owners and visitors. In the summer months when the wildfire risk is highest, Deschutes County estimates an additional population of several thousand people enjoying the rivers, designated and dispersed campgrounds and using transportation corridors within the Sunriver CWPP area. This creates an increased seasonal challenge for those agencies responsible for fire suppression and evacuation. Sunriver Owners Association has made substantial financial investments in fuels reduction through the Sunriver Ladder Fuels Reduction Plan.

Sunriver is governed by the Sunriver Owners Association, which is a not-for-profit corporation that maintains all common areas and provides local government for the community in accordance with the provisions of the legal documents, which can be found at www.sunriverowners.org. The association also provides services such as: collection of assessments, environmental services, providing financial statements and collection reports, acting as a general clearing house for problem solving, communication with property owners, providing recreation programs and facilities, maintenance of commonly owned properties including roads and pathways, and serving in an advisory capacity. The Sunriver Owners Association implements and enforces compliance of the Sunriver Ladder Fuel Reduction Plan on private properties within Sunriver.

The Sunriver Service District was formed in 2002 through an agreement between SROA and Deschutes County. The SSD is a public service district authorized under Oregon Revised Statute to oversee both the Sunriver Fire and Police Departments with a seven-person managing board. The district maintains an all-hazard emergency operations plan, and holds an annual emergency operations center drill that involves all major Sunriver stakeholders.

For the purposes of this plan, the area considered wildland urban interface (WUI) and the CWPP planning area are coincident. The Sunriver CWPP boundary is approximately 18 square miles or 11,403 acres.

The CWPP planning area boundary lies within the larger area of the eastern Cascade slopes and foothills. Wickiup Reservoir is a notable landmark to the west of the boundary and is within the East-West CWPP area. The Deschutes River flows south to north along and through portions 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 4,200 feet.

The climate in Sunriver 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 Sunriver 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 Sunriver 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 Sunriver Community Wildfire Protection Plan (CWPP) was originally completed and signed in March, 2005. Subsequent revisions were approved in 2010 and 2015. As directed by this CWPP, fuels reduction activities have been completed on public and private lands. Recent wildland fires have also impacted the landscape. Combined, these events have changed the priorities outlined in the three previous documents.

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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Purpose

Originally created in March 2005, the Sunriver CWPP has been revised twice (2010 and 2015). This 2020 comprehensive revision maintains the original purpose and outlines the updated priorities, strategies and action plans for fuels reduction treatments in the Sunriver 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 Sunriver 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 Sunriver 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 Sunriver'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.

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 2020 Sunriver CWPP will assist the Sunriver Fire Department, the Sunriver Owners Association, local, state and federal governments in the identification of lands at risk from high-intensity wildland fire. The Sunriver 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 Sunriver CWPP Steering Committee reconvened in March 2020 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 the Sunriver Fire Department, the Oregon Department of Forestry (ODF), Sunriver Police, the United States Forest Service (USFS), Deschutes County, Sunriver Owners Association 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.

Representatives from the Sunriver Owners Association, which represents the Community at Risk, participated on the Steering Committee. The Steering Committee also included the Sunriver Service District. The Steering Committee encouraged a collaborative environment for the stakeholders to accomplish the 2020 revision of the Sunriver CWPP.

Step four: Establish a community base map.

The Steering Committee reviewed the previous maps and boundaries from the 2015 CWPP. The group approved the 2020 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 Sunriver CWPP was available for public comment prior to the final signing and approval of the plan. The Sunriver CWPP was mutually approved by the Sunriver Fire Department, the ODF, the Sunriver Owners Association and the Deschutes County Board of Commissioners 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 Sunriver CWPP

Since its creation in 2005, the Sunriver CWPP has been revised two times in 2010 and 2015 with the intention of decreasing the risks of high-intensity wildfire in the Sunriver area. The last revision of the

Sunriver CWPP was finalized in 2015. Since that time 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.

In keeping with the strategy of the original Sunriver CWPP, the Steering Committee reconvened in early 2020 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 2005); and Deschutes County Resolution 2004-093.

The Sunriver CWPP Steering Committee includes representatives from Sunriver Fire Department, ODF, USFS, Sunriver Police, Sunriver Owners Association, and Deschutes County along with members of the Sunriver 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 Sunriver 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

The community of Sunriver, Oregon is located in central Oregon, on the east side of the Cascade Mountains, 15 miles south of Bend in Deschutes County. Developed in 1968 as a residential and resort community, Sunriver is now home to approximately 1,500 full time property owners, with a population upwards of 20,000 property owners and visitors per day during peak recreation periods.

Sunriver is known for its outstanding recreational opportunities and scenic beauty with year-round recreation activities available. Within the Sunriver CWPP area there is a significant amount of public land with developed and dispersed recreation sites, which also provide valuable recreation opportunities to both property owners and visitors. In the summer months when the wildfire risk is highest, Deschutes County estimates several thousand additional people enjoying the rivers, designated and dispersed campgrounds and using transportation corridors within the Sunriver CWPP area. This creates an increased seasonal challenge for those agencies responsible for fire suppression and evacuation.

Historically, much of the Sunriver CWPP area was dominated by mature ponderosa pine stands that effectively supplied the wood products industry here during the 1920s. Soon after logging, many of these stands naturally regenerated to lodgepole pine with today's forests dominated by thick, overstocked stands of lodgepole pine with interspersed ponderosa pines.

Compared to ponderosa pine, lodgepole pine is a relatively short-lived species that historically lived and died by high intensity and active crown fires. It is therefore less desirable from a wildland fire standpoint because of the risk these stands pose to the communities within them. Much of the understory consists of bitterbrush, manzanita, rabbitbrush, red currant and areas of native bunchgrass. Without management intervention, these stands become more and more overcrowded. An overcrowded stand creates a higher fire risk for the landscape and makes the trees more susceptible to beetle death and disease.

At its inception, Sunriver maintained a restrictive forestry management policy, initially preferring the untouched forested environment. Community regulations initially restricted tree and brush removal in most circumstances and wood shake roofing was typical, if not required, on structures.

The Awbrey Hall fire in 1990 in nearby Bend destroyed 3,032 acres and 22 homes and began changing minds and policies within the Sunriver community. Soon after, in 1991, SROA and the Sunriver Nature Center & Observatory drafted a Fuels Modification Plan, which would become the basis for the current SROA Ladder Fuels Reduction (LFR) Plan. The LFR plan required the reduction of hazardous fuels from private properties and common areas. Fuels reduction became mandatory for private property owners in 1996. In 1992, the SROA Board of Directors approved a resolution prohibiting wood roofs in Sunriver by requiring all new and replacement roofs to be noncombustible with a Class A fire rating.

The 1996 Skeleton fire, a few miles to the northeast of Sunriver, burned 22,000 acres and 19 homes and further motivated the Sunriver community to action. In 1997, SROA hired staff to oversee private property inspections and fuels reduction compliance as well as manage the hazardous fuels reduction program on common areas.

The Sunriver area presents a unique challenge for the CWPP process. Community businesses and residences have been intentionally developed in or adjacent to forestlands, and as described above, are at risk of wildland fire. Thick stands of trees, landscape arrangement and substantial ground vegetation contribute to the overall wildland fire risk in the Sunriver CWPP area.

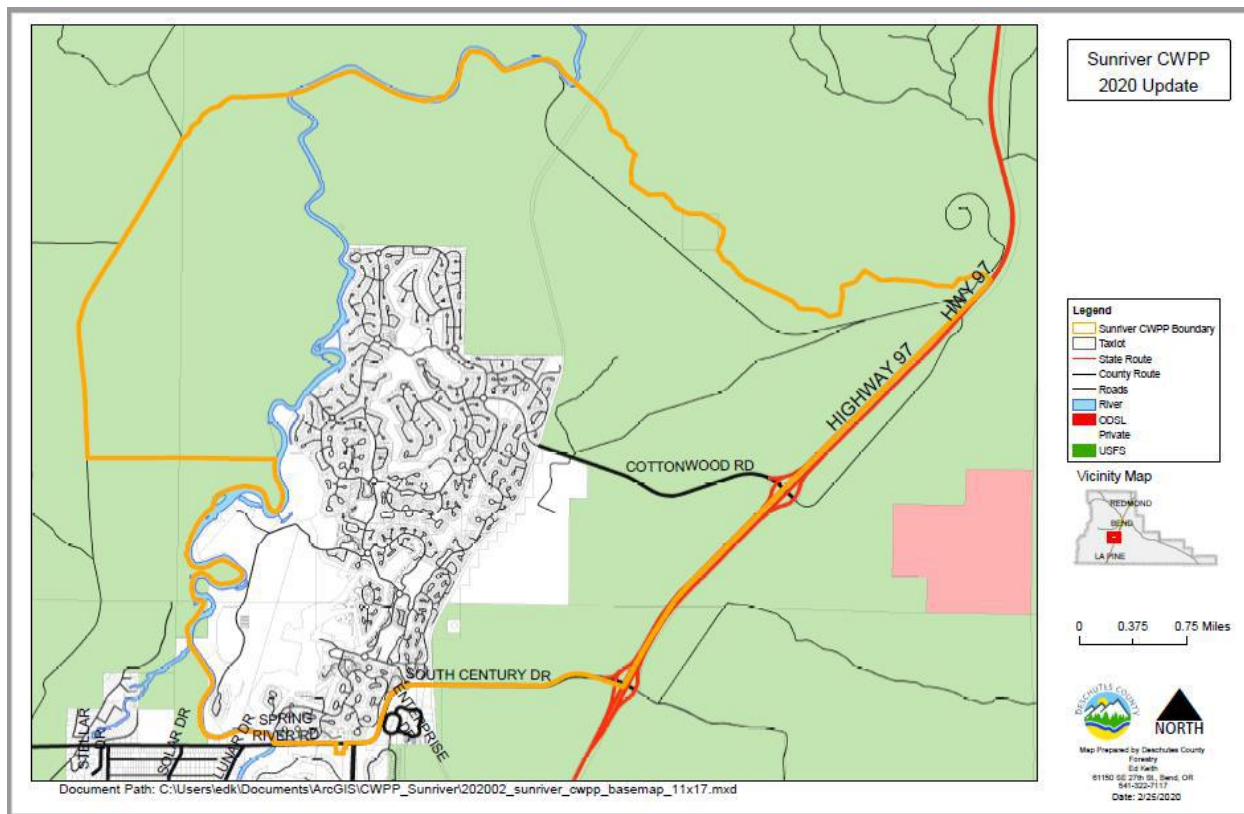
The climate in Sunriver is typical of the east slopes of the Cascade Mountains, with most of the annual precipitation coming as winter snow or fall and spring rains. Summers are dry and prone to frequent thunderstorms. These thunderstorms frequently cause multiple fire ignitions.

Sunriver lies just west of US Highway 97 and the Burlington Northern Santa Fe (BNSF) railroad, both major transportation routes through the state. As Central Oregon grows, more property owners, tourists and commuters use the highway and other roads, particularly during the summer months when fire season reaches its peak. As part of the Central Oregon landscape, transportation routes are included in the consideration of the WUI boundary due to their critical role as travel corridors that link communities together and serve as evacuation routes.

Today, SROA actively collaborates with public land managers, Sunriver Fire Department and private property owners to improve forest health and reduce the risk of fires both inside the Sunriver community and outside the community on public lands.

Community Base Map

The steering committee reviewed the planning area base map and confirmed the boundaries that the Sunriver 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 Sunriver 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 2020 CWPP. The Greater Bend CWPP joins the WUI on the north edge, the Upper Deschutes River Communities CWPP borders the WUI to the south

and southwest, and the East West Deschutes County CWPP borders the plan to the east and 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 Sunriver CWPP boundary is approximately 18 square miles or 11,403 acres.

Fuel Hazards and Ecotypes

The vegetation in the Sunriver Area includes:

- Ponderosa pine
- Lodgepole pine
- Manzanita
- Bitterbrush
- Riparian areas

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.





Manzanita is a shrub that occurs throughout the Sunriver CWPP area but minimally within the community of Sunriver, 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 Sunriver 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 Sunriver wildland-urban interface area has patches of bitterbrush that provide fire-ready ladder fuels for taller tree stands.



A riparian area is defined as the strip of moisture-loving vegetation growing along the edge of a natural water body. The exact boundary of the riparian area is often difficult to determine because it is a zone of transition between the water body and the upland vegetation. The Deschutes River flows along the western edge of the Sunriver WUI boundary creating large riparian areas along the western and northern portions of the planning area. The Sun River and Lake Aspen also have riparian areas in the WUI. Vegetation types in these riparian areas are primarily grasses, forbs and willows. Some of the grass-meadows have young lodgepole pine and ponderosa pine expanding into them which is changing the plant community from meadow to forest. The primary concern from a wildland fire perspective is during the spring and autumn when the vegetation has either cured or green up has not begun.



The majority of fuel types in the Sunriver WUI are currently in a condition that contribute to a substantially elevated risk of wildland fires that are difficult to control. These conditions are capable of producing flame lengths over eight feet with crowning and torching.

Recent Wildfires

Wildfires have significantly impacted the Southern Deschutes County landscape around Sunriver. The table below identifies the large fires greater than 100 acres or deemed significant due to structure loss since 2000. All of these large wildfires have threatened property owners and prompted evacuations within multiple neighborhoods and La Pine State Park.

Fire Name	Fire Size (acres)	Structures Lost	Year Occurred
Bridge Dive	12	2	2019
Burgess Road	3	1	2018
Sheridan	191	0	2016
Burgess Road	168	0	2013
Park Fire	139	0	2005
Davis Lake	21,181	0	2003
Crane Complex	713	0	2001
Pine Forest	120	0	2001

Public & Private Accomplishments

As part of the ongoing wildland fire risk management of the surrounding public and private forestlands, the USFS, the BLM, ODF, SROA, 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 USFS and the BLM 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.

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 under burning. 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 spread to tree crowns, requiring costly suppression efforts and causing large losses on the landscape as well as in and around communities.

The U.S. Forest Service has several projects within the Sunriver CWPP boundary that have been completed or are nearing completion since the 2015 update. These projects include East Tumbull, Sunriver HFRA, and the Oz Research Project. Acres accomplished in each project area are summarized by treatment type in the table below. Activities are largely complete in both the East Tumbull and Oz project areas. In East Tumbull, 491 acres of thinning and 352 acres of pile burning has been completed since 2015. The final project, Sunriver HFRA, is continuing implementation to the east of Sunriver. Thirty-eight acres of thinning and pile burning and 336 acres of mowing have been completed since 2015.

Sunriver CWPP fuels treatments completed on USFS lands from 2015 through 2019 by treatment type (updated March 2020)				
<i>Project Name</i>	<i>Prescribed Fire</i>	<i>Thinning</i>	<i>Pile Burning</i>	<i>Mowing</i>
East Tumbull	0	491	352	0
Sunriver HFRA	0	38	38	826
Oz	61	0	0	0
<i>Total</i>	61	529	400	826

Future Implementation Plans

Within the Sunriver CWPP footprint, continued mowing and prescribed underburning is planned in the Sunriver HFRA project. Mowing is ongoing and prescribed underburning may begin as early as spring 2020. Additional prescribed underburning in the maintenance portions of the East Tumbull project is also possible in the coming years.

Adjacent Projects

Several projects are in varying stages of implementation and planning around the Sunriver CWPP. While these projects are outside of the CWPP boundary, they provide significant benefits for the community of Sunriver by lowering fire hazard on adjacent federal lands. Adjacent projects include West Bend to the north, Rocket to the east, Kew/Lex to the northwest, Junction to the west, UDR WUI to the southwest, and Maintenance prescribed burning to the southwest.

Ongoing prescribed fire activities are planned in the West Bend Project in the Deschutes River Canyon area. Extensive thinning is ongoing in the Rocket project area with thinning and prescribed burning planned in the coming years. The Lex and Kew Projects are in the early stages of implementation. Thinning operations have begun in Lex and can be expected to begin in Kew in 2020. Thinning has begun to the west of Sunriver in the Junction Project area and will be ongoing over the next few years. Work in the UDR WUI project is in the latter stages of implementation and prescribed burning will begin once all associated service work is completed. There are also several Maintenance Prescribed Fire units around the south end of the 41 Road that are planned in 2020 and beyond.

To the southeast of Sunriver, the Klone Project is in the initial planning stage. Thinning and prescribed fire activities are being proposed east of Highway 97 and south of South Century between the highway and the community of Sunriver. Recent prescribed burning in this area occurred as part of the Lavacast Project and plans are being developed to continue to maintain these treatments into the future. Implementation of the Klone Project may begin as early as 2022.

Oregon Department of Forestry

Sunriver Owners Association works closely with the Oregon Department of Forestry (ODF) under the Oregon Defensible Space Law or commonly called Senate Bill 360. SROA developed an alternative plan, a Ladder Fuel Reduction (LFR) plan that meets the standards outlined under this legislation.

Oregon Forestland-Urban Interface Fire Protection Act of 1997

While not utilized as one of the assessment tools for this CWPP, the Steering Committee promotes the standards of the act for private lands, other than Sunriver Owners Association common areas and those properties subject to the Sunriver Ladder Fuels Reduction (LFR) Plan, explained in the previous section.



The Oregon Defensible Space Law, also known as Senate Bill 360, enlists the aid of property owners toward the goal of turning fire-vulnerable urban and suburban properties into less volatile zones where firefighters may more safely and effectively defend structures and properties from wildfires. The law requires property owners in identified forestland-urban interface areas to reduce excess vegetation around structures and along driveways. In some cases, it is also necessary to create fuel breaks along property lines. As of 2019 the Oregon Department of Forestry is required to report in regards to implementation and enforcement status of property notifications and certifications required under the Oregon Defensible Space Law.

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 <https://www.oregon.gov/odf/Fire/Pages/UrbanInterface.aspx>.

Sunriver Ladder Fuels Reduction Plan



Sunriver Owners Association has worked cooperatively with ODF to directly address defensible space standards within Sunriver through a specific Ladder Fuels Reduction Plan that serves as an alternative plan under this legislation.

Sunriver collaborated with ODF to develop a Ladder Fuels Reduction (LFR) Plan that is an authorized and approved alternative plan under the Wildland Urban Interface legislation.

The Sunriver LFR includes requirements for fuels reduction on private lands in Sunriver and SROA-owned common areas. The plan has been reviewed and approved by ODF and the Sunriver Fire Department. ODF has designated the SROA Natural Resources Director and the SROA Natural Resources staff as Accredited Assessors and directors of this program, with the authority to certify Sunriver properties under this legislation. Compliance by property owners with the Sunriver LFR Plan certifies a property under the approved alternative standards and relieves the owner of the fire cost recovery liability. In addition to landowners on private lots, the SROA completes between 120-180 acres of fuel reduction each year on SROA common areas.

Nationally, SROA is recognized for its commitment to fire prevention. SROA received the Bronze Smokey Bear award in 2002 for its ladder fuels reduction programs, fire prevention and protection rules, and community development standards. SROA also maintains an active presence on the Project Wildfire Steering Committee, focusing on the prevention of catastrophic losses resulting from wildfire in Deschutes County. This year, 2020, marks Sunriver's 40th anniversary as a designated Tree City USA, denoting a continuing commitment to forest health and educating the community about the benefits of healthy forests.

Year	Courtesy Letters/Permits	Notice of Deficiency Letters/Permits	Citations Issued
2015	368	34	22
2016	336	46	25
2017	382	40	34
2018	343	72	39
2019	419	106	69

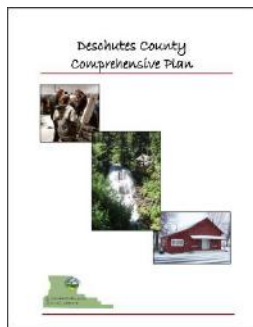
Notes: Data reflect the number of annual comprehensive LFR inspections of Sunriver properties zoned for single-family residential use. Data does not include LFR inspections of other Sunriver properties, such as multi-family residential or commercial properties. A comprehensive LFR inspection is conducted at all Sunriver properties at least once every other year. Properties may be inspected or assessed more frequently depending on the conditions of the property.

Deschutes County



Deschutes County owns only two ¼ acre lots in the Sunriver CWPP area and works with Sunriver Owners Association to maintain them under the Sunriver Ladder Fuels Reduction Program. In 2016, SROA coordinated a fuel reduction project on SROA Common areas with grant assistance from Deschutes County treating approximately 41 acres.

Deschutes County Comprehensive Plan



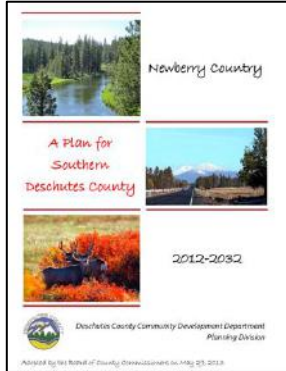
The Deschutes County Comprehensive Plan is a statement of issues, goals and policies meant to guide the future of land use in the County that covers a 20-year period from 2010-2030. The Plan is intended to recognize the expectations and rights of property owners and the community as a whole. It also 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 2015. 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.

Newberry Country: A Plan for Southern Deschutes County



Deschutes County developed an amendment to its Comprehensive Plan in 2012 to formally recognize an area specific plan titled *Newberry Country: A Plan for Southern Deschutes County*. The Plan encompasses the rural areas south of Lava Butte except Sunriver and the City of La Pine, which are governed separately. It addresses the area's unique assets, local values and preferences for growth and development, the environment, natural hazards, transportation and more.

The plan provides a framework for implementing a vision for building a stronger, more resilient rural community in Southern Deschutes County by managing growth to 2032. It recognizes the realities facing rural Deschutes County, while acknowledging what governments can and cannot influence. It is part of the County's Comprehensive Plan, but has more geographically specific goals and policies. It also contains a vision statement conveying the expectations of South County residents for the future, an inventory of existing conditions in the area, and the results of the public involvement process. It was developed with significant public input and calls for collaboration among all sectors; government, businesses, non-profits, and residents to achieve a shared vision. For a copy of the full South Deschutes County plan, visit <http://bit.ly/NewberryCountry>.

Project Wildfire



Over the last ten years, Project Wildfire, in cooperation with the Deschutes County Sheriff's Office of Emergency Management Program has coordinated evacuation route signage for the Sunriver 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, Republic Services and NW Natural Water 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.



Firewise USA®



Another indication of the commitment of the Sunriver Owners Association to wildfire preparedness is the recognition of Sunriver as a Firewise USA® site. 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. Sunriver has been recognized as a Firewise USA® site since 2012.

The Firewise USA program recognizes communities that have demonstrated their commitment to wildfire preparedness. Through these steps, SROA has effectively lowered Sunriver's wildfire risk. SROA has fostered collaboration between neighbors, increased awareness and their communities' ability to respond to wildfire. Sunriver provides a safe and effective location for fire professionals to work and Sunriver property owners and visitors have dramatically decreased their odds of losing their homes and other property to wildfire.

Deschutes Collaborative Forest Project



In 2010, 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 Sunriver. Now the DCFP collaborates on forest restoration of frequent fire forests across the entire Deschutes National Forest.

The Deschutes Collaborative Forest Project has a website in place 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 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.

Community Assessment of Risk

For the 2020 Sunriver 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.

Additional topics that relate to the overall assessment of risk that are not included in the OWRE report include: 1) Protection Capability, 2) Law Enforcement, 3) Community Preparedness, 4) Values Protected, 5) Other Community Values, 6) Structural Vulnerability, and 7) Areas of Special Concern. These topics are described in detail below.

Fire Protection Capability

In considering the overall risk, the ability to provide a fire protection response must be considered. There is 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.

Sunriver Fire Department

The Sunriver Fire Department is an all risk emergency service provider for the community of Sunriver and provides Advanced Life Support Emergency Medical Services for a 300 square mile area including and surrounding Sunriver. Sunriver Fire employs one Fire Chief, one Deputy Chief, and one Office Manager. The Department also employs nine (9) career firefighter/paramedics involved directly in fire operations and up to 18 reserve firefighters also dedicated to fire operations. Three limited duration employees are hired during the summer months to boost staffing. The Department has adopted the National Incident Management Systems (NIMS) Incident Command System and all personnel have received training and continue to train in its use. All personnel receive on-going training in wildland firefighting practices, structural fire protection, and other related topics.

The Department works out of one centrally located fire station and maintains a fleet of two structural fire engines, one ladder truck, two Advanced Life Support (ALS) ambulances, one heavy brush engine, one light brush engine, one water tender and three staff/utility vehicles.

The Department is a party to the Central Oregon Mutual Aid Agreement. In the event of a major structural fire, the Department may request assistance from all other fire departments that are signatory to the agreement. In addition, all Central Oregon fire departments and the wildland fire agencies including the US Forest Service, Oregon Department of Forestry, and the Bureau of Land Management are party to the Central Oregon Cooperative Wildland Fire Agreement. These cooperative agreements allow for interactive coordination in the event of a wildfire that threatens communities in Central Oregon.

Conversely when these agencies need assistance, the Sunriver Fire Department assists them. Anytime an incident grows beyond the capability of the regional resources a request may be made to the State to activate the Statewide Mobilization Plan, whereupon firefighting resources may be requested from across the State.

Sunriver Fire Department, La Pine Rural Fire Protection District and Bend Fire & Rescue also participate in Automatic Aid responding to mutual response zones in certain parts of each district.

Oregon Department of Forestry

Within the Sunriver CWPP area, the private forestland is protected by the Central Oregon District of the Oregon Department of Forestry (ODF). ODF provides wildland fire response for fires burning on or threatening private forestlands paying a Forest Patrol Assessment. There are some areas within the Sunriver CWPP Boundary that receive dual protection from ODF and the Sunriver Fire Department because they are located within the rural fire protection district and are also classified as private forestland within the ODF district

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 Sunriver Fire Department, La Pine Rural Fire District, the US Forest Service, and the Bureau of Land Management.

USDA Forest Service

The Forest Service provides wildland fire protection on the federal lands within the Sunriver 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 Sunriver 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 (gacc.nifc.gov/nwcc) for additional wildland fire fighting resources.

Areas of special concern

Law Enforcement & Evacuations

The Sunriver Police Department has responsibility for ensuring the safe and orderly evacuation of the Sunriver community in the event of a major emergency. A number of resources have been allocated to accomplish this task including sirens and Public Address (PA) systems located throughout the community; emergency notification via the radio, television and www.sunriveremergencyinfo.com; reverse 9-1-1 capability; Sunriver Police Department staff; and Sunriver Citizens Patrol. The Sunriver Police Department cooperates with all law enforcement agencies in Deschutes County as needed with any issues related 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

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

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.

Critical transportation routes

For purposes of the Sunriver 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 Sunriver 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.).

With up to 20,000 property owners and visitors in Sunriver per day during peak summer months and possibly several thousand additional people using recreation sites and the transportation corridors

around Sunriver, critical transportation routes are a prime concern for those agencies responsible for fire suppression and evacuation.

If a large wildland fire occurs in this area which resulted in the closure of US Highway 97, the economic loss to local businesses and central Oregon in general would amount to more than \$3 million each day for areas throughout central Oregon including Sunriver, Bend and Sisters. The medical needs of the local property owners would be significantly impacted with the closure of Highway 97, due to limited local medical services in the Sunriver area.



Working with Deschutes County and Project Wildfire, the Sunriver has 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 exit routes from the community.

A detailed look at specific ingress/egress issues is 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 2020. With new ties the infrastructure will be safer for the communities within the CWPP's it travel 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 hyrails 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

SROA houses a Sunriver specific newspaper, **The Sunriver Scene**. It offers timely and relevant local knowledge on upcoming community events, emergencies & preparedness messages. The Sunriver Scene plays an integral part informing local property owners and visitors. Add plug for Sunriver emergency website

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 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.

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.

As of 2020, there are over 4,100 homes and condominiums, as well as a large resort and multiple businesses in the unincorporated area of Sunriver, with an appraised value in the billions of dollars.

The essential infrastructure in the Sunriver 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 Sunriver is the value placed on scenic beauty and recreational opportunities that exist on private and public lands both within and adjacent to the Sunriver 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 Sunriver area.

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.

As mentioned in the Background Information of this CWPP, Sunriver has developed a progressive approach to decrease the vulnerability of structures to wildland fire. Originally developed with community regulations that restricted tree and brush removal in most circumstances, Sunriver Owners Association quickly modified these plans following major wildland fires in the area. In 1991, Sunriver Owners Association and the Sunriver Nature Center & Observatory drafted a Fuels Modification Plan, which became the basis for the current Ladder Fuels Reduction Plan. The plan detailed the reduction of hazardous fuels from private properties and common areas. Fuels reduction became mandatory for private property owners in 1996.

Wood shake was initially the typical roofing choice found throughout Sunriver. Following large fires and the development of the Fuels Modification Plan, the Sunriver Owners Association Board of Directors approved a resolution in 1992 prohibiting wood roofs in Sunriver by requiring all new and replacement roofs to be noncombustible with a Class A fire rating.

In recent years, the Sunriver Owners Association and many property owners in Sunriver continue to take steps to decrease the vulnerability of structures to wildland fire. Although attitudes and behaviors towards fire continue to improve thanks to the progressive direction of Sunriver Owners Association leadership and 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 high value on the importance of making structures in Sunriver as fire safe as possible.

Action Plan and Implementation

The Steering Committee recognizes the Sunriver 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 Sunriver CWPP.

Safe and Effective Wildfire Response

The Sunriver Fire Department, wildland fire agencies and the Community of Sunriver 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 Sunriver 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

The Sunriver Service District completed construction of a fire training facility in 2018. Although a permanent training structure was not included at this site, live fire training is still accommodated through the use of a variety of portable props. Live fire training evolutions are typically performed with the assistance of Oregon Department of Public Safety Standards and Training instructors. The fire department plans to add a variety of other props over time that will allow a greater degree of flexibility and effectiveness in fire suppression, rescue, driver operator, and hazardous materials training for both department personnel and mutual aid partners.

The Sunriver Service District Board of Directors approved two additional career Firefighter/Paramedic positions that will increase line staff numbers from nine to eleven. These positions are planned to be filled in 2020.

Oregon Department of Forestry is currently in the planning phase of installing smoke detection cameras in Southern Deschutes County. The smoke detection cameras should be installed by the next revision of this plan. These cameras will aid in effective suppression response by the wildland agency resources by allowing for more accurate reporting on smoke size and location. The hope is that local fire lookouts and Central Oregon Interagency Dispatch Center (COIDC) can use multiple perspectives provided by the cameras to effectively communicate smoke locations to resources.

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

The Steering Committee will work with Sunriver Fire Department, Sunriver Police Department, Sunriver Owners Association, 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 Sunriver 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 Steering Committee acknowledged the robust educational campaign and notification system developed by the Sunriver Owners Association and its media partners. With a healthy conduit in place for educational messages to reach property owners and visitors the Steering Committee recommended all the members of the Steering Committee continue to focus on several themes in the next 5 years;

- Increasing the public's knowledge of prescribed fire and its necessity.
- Increasing the public's knowledge of restoration as it relates to wildfire risk and wildlife habitat for Elk and Oregon Spotted Frog.
- Boost the public awareness of wildfire preparedness in the high traffic months when Sunriver has a high number of out of area visitors.

The intention of the Steering Committee is to engage in continued discussions with landowners to facilitate fuels reduction projects on private lands through the approved Sunriver Ladder Fuels Reduction Plan and the implementation of Oregon's Defensible Space Law, 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 is a significant amount of vegetation 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.

The Steering Committee is also charged with the task of working with the Sunriver Fire Department and NW Natural Water to identify and assess the water resources available for fire suppression in Sunriver and the surrounding WUI. The Steering Committee can make recommendations for projects to ensure adequate water resources are available for fire suppression.

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 Sunriver 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 11,403 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, or also known as a broadcast burn, 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. Property owners 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 Sunriver 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 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
- Improved public safety
- 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 Sunriver 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 Sunriver 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 Sunriver 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 Sunriver planning area.

Public lands

Federal lands make up 68% of the Sunriver CWPP area and are managed by the US Forest Service from the Bend – Fort Rock Ranger District.

It is the intent of the Steering Committee that the Sunriver 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 Sunriver CWPP area is directly adjacent to federal lands on all sides except the southern boundary. The maps in Appendix A detail the WUI boundary throughout the Sunriver 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 Sunriver.
- 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 Sunriver.

Private and County-owned lands

Private lands make up 32% of the area in the Sunriver CWPP area. SROA owns and maintains common lands in Sunriver and the balance is comprised of individual private properties, a small portion owned by Sunriver Water LLC and a portion owned by Sunriver Environmental LLC. Deschutes County only owns two ¼ acre lots in this planning area. The Steering Committee recommends that these County owned lands be treated in the same manner as privately owned lands.

Lands owned by Burlington Northern Santa Fe (BNSF) Railroad encompass much of eastern boundary of the private lots in Sunriver. The Steering Committee recommends that the lands and easements owned by BNSF comply with the fuel reduction standards for private property outlined below in this CWPP. The Steering Committee acknowledged that the current state of the fuels present on these lands located on the eastern boundary of Sunriver pose a significant fire threat to the residences that border them.

Private lands and SROA Commons

On private lands with structural improvements and SROA common lands in Sunriver, the goal is for each structure and property to meet the specific standards as identified in the Sunriver Ladder Fuels Reduction Plan.

The Sunriver Ladder Fuels Reduction Plan has been accepted as an alternative plan to Oregon's Defensible Space Law and has been approved by Oregon Department of Forestry and the Sunriver Fire Department.

Generally, it outlines the following standards and requirements on private lands with and without structures that are the responsibility of the landowner:

- The entire property, including areas within 30 feet of any structure (up to the property line) shall be subject to fuels reduction standards.
- All bitterbrush, noxious weeds, dead vegetation, and other flammable shrubs within 15 feet of a structure shall be removed.
- Bitterbrush and manzanita shall be cleared three feet beyond the drip line of tree branches.
- Live branches of pine trees and other flammable trees shall be removed up to a minimum of six feet and a maximum of eight feet from grade. For trees less than 20 feet tall, only the lower 1/3 of branches shall be removed.
- Trees branches of pines and other flammable trees shall be removed to create a minimum of 15 feet of clearance between chimneys and the branches.
- Roofs, gutters, and areas under decks shall be maintained free of accumulated pine needles and other debris.
- Dry grass shall be maintained to an average height of less than four inches, during the fire season (June-November) with the exception of scattered bunchgrasses.
- Firewood shall be stored a minimum of 20 feet from the structure, or at the property line, during fire season (June – November).

Additional specifications for tree cutting and retention are available in the Sunriver Ladder Fuels Reduction (LFR) Plan which can be found at www.sunriverowners.org.

As another facet of the LFR plan, Sunriver property owners are encouraged to participate in a roadside pickup of yard debris in April and October. This road pickup is coordinated by SROA's Natural Resources Department and implemented by SROA Public Works. This provides a cost-effective and efficient method for property owners to dispose of yard debris created by the maintenance of their defensible space.

Property owners can also help comply with the LFR plan by taking advantage of FireFree and Firewise suggestions to 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. These education programs promote a variety of fire safe actions to help prevent the spread of fire to protect individual homes and neighborhoods. Information about these programs can be found at www.firefree.org and www.firewise.org.

SROA Natural Resources Department is responsible for the maintenance of common areas within Sunriver. The SROA Ladder Fuels Reduction Plan currently maintains a six-year cycle of treatment to reduce hazardous fuels and outlines specific treatments for specific vegetation. Generally, the standards for commons include:

- All bitterbrush and manzanita shall be removed within 15 feet of structures. In open areas an average of 30% coverage shall be maintained of all shrubs following removal of bitterbrush and manzanita to three feet beyond the drip line of tree branches.
- Live tree branches shall be removed to a minimum height of six feet and a maximum of eight feet from grade. For trees less than 20 feet tall, only the lower 1/3 of branches shall be removed.
- The trees in Sunriver will be thinned to six to eight foot spacing between trunks.
- All ponderosa pines shall be retained unless confirmed diseased, a hazard or in an overcrowded condition.

Additional specifications for tree cutting and retention are available in the Sunriver Ladder Fuels Reduction Plan, which can be found at www.sunriverowners.org.

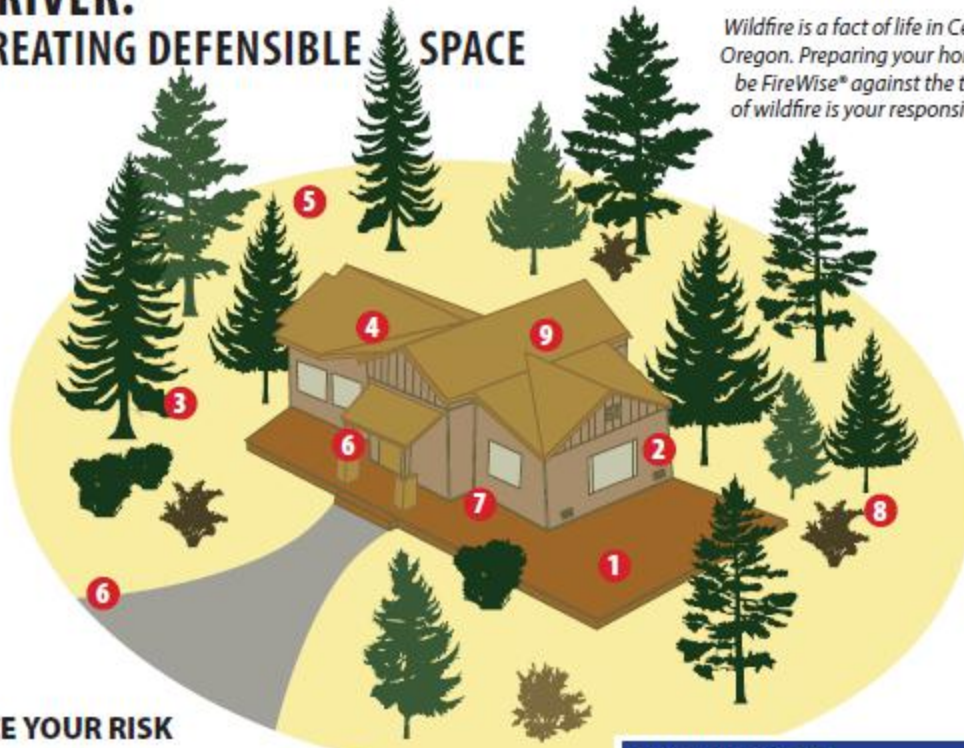
Recommendations to Reduce Structural Vulnerability including Ingress/Egress

There are approximately 5,025 structures spread across this CWPP boundary. The table that follows below summarizes recommendations to reduce structural vulnerability. The list is compiled with tips and suggestions from the FireFree and Firewise programs, which promote property owner responsibility for reducing fire hazards on their property. More information about these programs can be found at www.firefree.org and www.firewise.org.

Primary Hazards	Sunriver CWPP Recommended Actions	☑
Defensible space – hazardous vegetation	Continue with LFR Compliance, FireFree, Firewise.	
Structural composition – 25 homes still have wood shake roofing	Continue education efforts to change roofing to Class A Fire Resistant roof. Comply with LFR, FireFree, Firewise.	>97% have Class A roofing
Road widths 20-24 feet	Maintain height and width clearance through LFR and Oregon Defensible Space Law for roads less than adequate for emergency response and egress.	
Poor fire service access in some areas	Maintain height and width clearance through LFR and Oregon Defensible Space Law for safe turnarounds.	
Unknown evacuation routes	Sign and maintain routes. Educate visitors of the evacuation plan for Sunriver.	

SUNRIVER: CREATING DEFENSIBLE SPACE

Wildfire is a fact of life in Central Oregon. Preparing your home to be FireWise® against the threat of wildfire is your responsibility.



REDUCE YOUR RISK

- 1 Practice good outdoor house-keeping. When not in use, do not leave cushions on patio furniture. Door mats and brooms left outside are also fuel sources.
- 2 Foundation, soffit and attic vents should be screened with metal mesh no larger than 1/8 inch to prevent sparks from entering.
- 3 Remove low hanging branches to reduce ladder fuels. Prune branches to at least 15 feet from the chimney; 5 feet from the roof or wall.
- 4 Keep needles and leaves from collecting on the roof and gutters.

- 5 Move wood piles to your farthest property line. Do not store wood on or under decks or next to the house.
- 6 Make sure your address is visible and in a contrasting color to increase visibility by emergency responders.
- 7 Remove flammable fuels from around the outside walls of your home (mulch, grass, leaves, pine needles, etc.). These materials may also pile up from the wind under decks, near doorways and must be regularly removed.

TERMINOLOGY

DEFENSIBLE SPACE: Is a fire resistant area surrounding your home where potential fuels are reduced and/or spaced apart to slow the spread of wildfire.

FUELS: Any combustible materials of your home, trees and vegetation.

LADDER FUELS: Anything flammable that can create a "ladder" to ignite other materials.

FIRE RESISTANT PLANTS: Those that do not readily ignite from a fire or ignition source.

- 8 Space out plantings to create breaks and slow the spread of fire.
- 9 Your chimney is required to have a spark arrestor.

DEFENSIBLE FACTS

- Most homes are lost as a result of ember showers that deposit "fire brands" on vulnerable areas such as roof valleys, gutters, woodpiles and decks. Embers can smolder and ignite pine needles, leaves and even outdoor furniture cushions.
- Trees and shrubs CAN be part of a fire-resistant landscape as long as they are maintained. Defensible space does not mean clear cutting or a moonscape devoid of vegetation.
- Due to its flammable nature – juniper, bitterbrush and manzanita should not be within 15 feet of any structure or within three feet of tree branch drip lines.



FireWise is a nationwide program providing education and guidelines to communities across the U.S. on how to harden their home and property against wildfire. One size does not fit all and communities are encouraged to tailor the FireWise program and principles to their own community's specific needs.

Education and Awareness of the Wildfire Threat

As stated in the purpose of the Sunriver 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 Sunriver CWPP. The rapid influx of new property owners is just one reason the Steering Committee places a high value on the education of Sunriver 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 Sunriver area. The Sunriver Fire Department, 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. The Steering Committee for the Sunriver CWPP is committed to maintaining and enhancing these partnerships.

The Steering Committee also recommends support for projects that enhance a community's ability to communicate necessary information in the event of a wildfire. The Steering Committee will support and participate in any way necessary with Sunriver's Fire and Police Departments to practice emergency drills that comply with the current and/or future emergency plan for Sunriver.

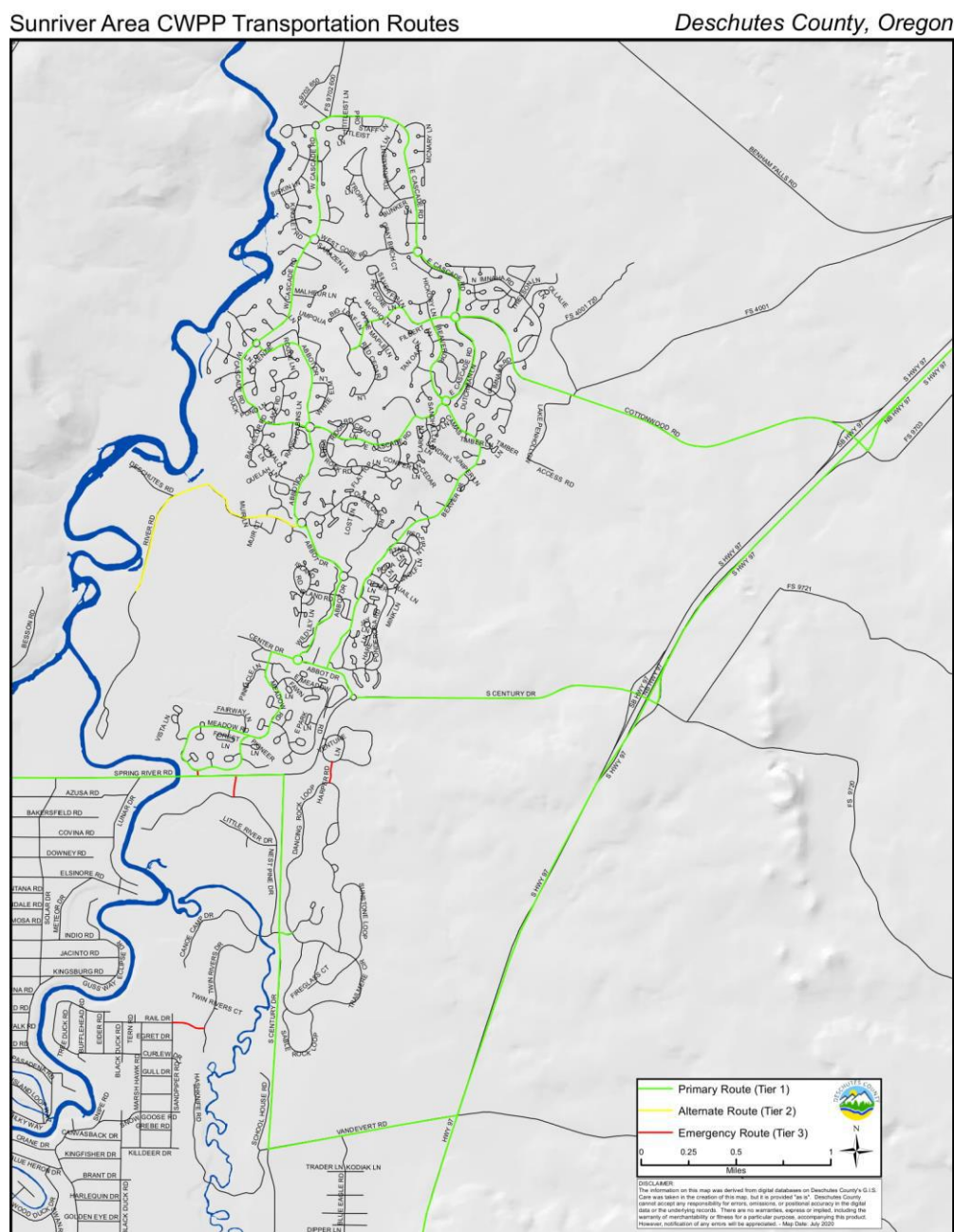
Property owners are strongly encouraged to learn more about how they can reduce the hazards on their own property. Local property owners are encouraged to contact SROA and their local fire department for information. Property owners may also find additional information on how they can reduce hazards and protect themselves at www.firefree.org and 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 Sunriver 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 Sheriff's office in cooperation with other first responders has begun to develop a map that identifies existing critical transportation routes in the Sunriver CWPP area and throughout the County. The map below illustrates these routes as of 2020. 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 Sunriver community to minimize closures of roads that could be considered critical transportation routes.



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

Evaluation and Monitoring

The Steering Committee faced a complex task in the comprehensive revision of the Sunriver 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 Sunriver Fire, 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 Steering Committee shall include: a member of the Sunriver Owners Association Board of Directors; Sunriver Owners Association staff; the Program Director from Project Wildfire; a Chief Officer from Sunriver Fire Department; a representative from Oregon Department of Forestry (ODF); a representative from Central Oregon Fire Management Service (COFMS), and Deschutes County along with members of the Sunriver area public.

The Steering Committee agrees that the Sunriver 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 Sunriver CWPP will be revisited at least annually to address its Purpose.

Sunriver Owners Association and the Sunriver Fire Department will work with Project Wildfire to convene the Steering Committee as often as the Steering Committee deems necessary to implement and review the Sunriver 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.

Sunriver Owners Association, the Sunriver Fire Department 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

Sunriver

11,403 Acres: (18 Sq. Miles)



Generated: February 25, 2020

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

INTRODUCTION

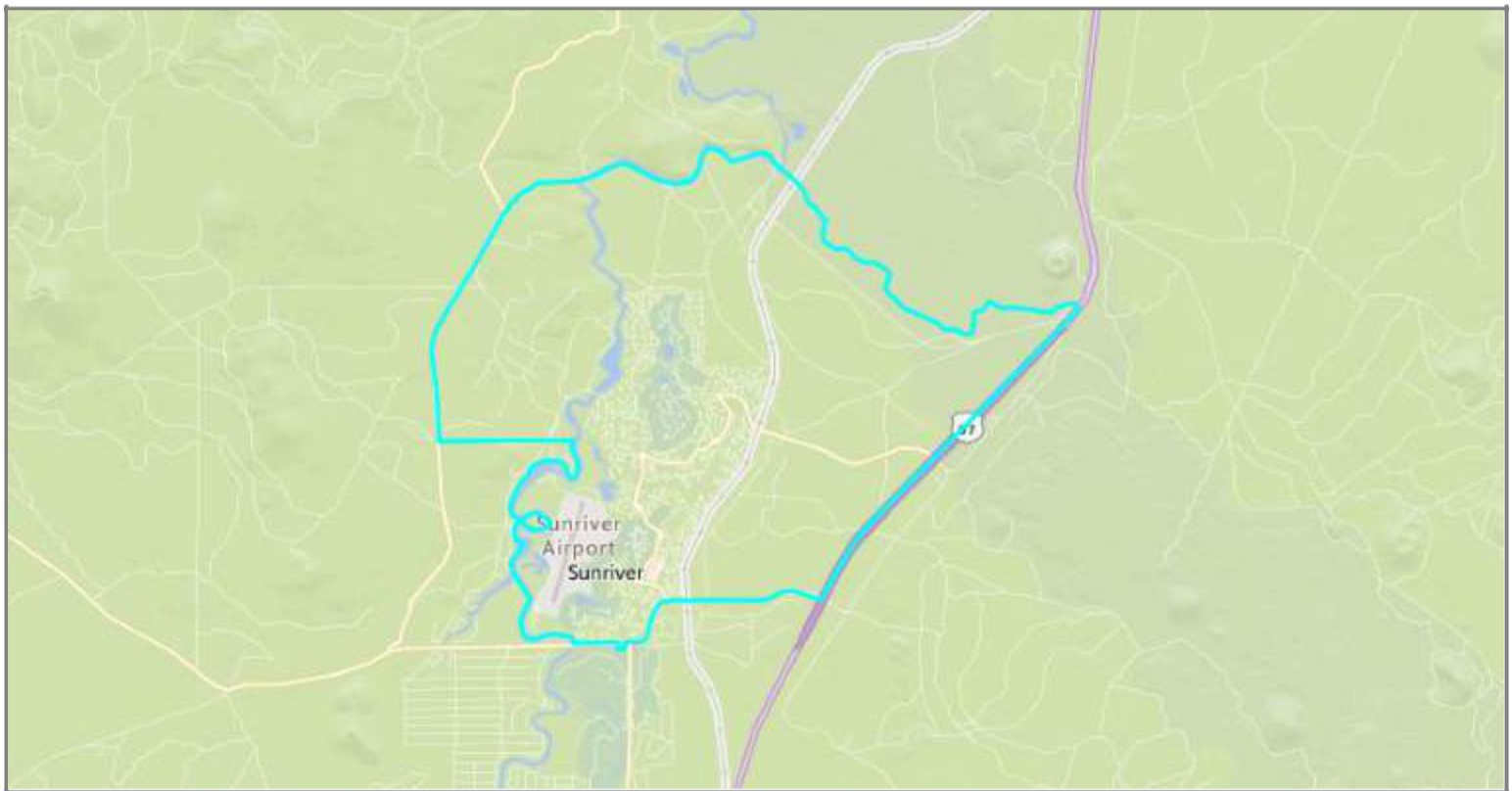
This report summarizes wildfire risk in **Sunriver** from the [Advanced Oregon Wildfire Risk Explorer map viewer](#) (OWRE). **Wildfire** risk combines the likelihood of a fire occurring with the exposure and susceptibility of valued resources and assets on the landscape.

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.

Sunriver in Oregon



Sunriver Reference Map



REPORT CONTENTS

2	Guidelines	10	Burn Probability	22	Probability of >4ft Flames
3	Concepts	12	Fire Intensity - Flame Lengths	23	Probability of >8ft Flames
4	Land Ownership & Management	14	Overall Impact	24	Potential Impact to People and Property
5	Fire History - Fire Ignitions	16	Hazard to Potential Structures	25	Potential Impact to Infrastructure
6	Fire History - Fire Perimeters	18	Existing Vegetation Type	26	Potential Impact to Wildlife
7	Housing Density - Where People Live	20	Risk To Assets	27	Potential Impact to Forest Vegetation
8	Overall Wildfire Risk	21	Risk To People and Property	30	Fuel Model Groups



Oregon Wildfire Risk Explorer- Advanced Report

Sunriver

11,403 Acres: (18 Sq. Miles)



Generated: February 25, 2020

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 <http://oe.oregonexplorer.info/rural/CommunitiesReporter/>
- Wildland Urban Interface Toolkit - https://www.usfa.fema.gov/wui_toolkit/wui_planning.html
- Wildland Urban Interface Wildfire Mitigation Desk Reference Guide - <https://www.nwcg.gov/sites/default/files/publications/pms051.pdf>
- Oregon Spatial Data Library - <http://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. 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.



Oregon Wildfire Risk Explorer- Advanced Report

Sunriver

11,403 Acres: (18 Sq. Miles)



Generated: February 25, 2020

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



Oregon Wildfire Risk Explorer- Advanced Report

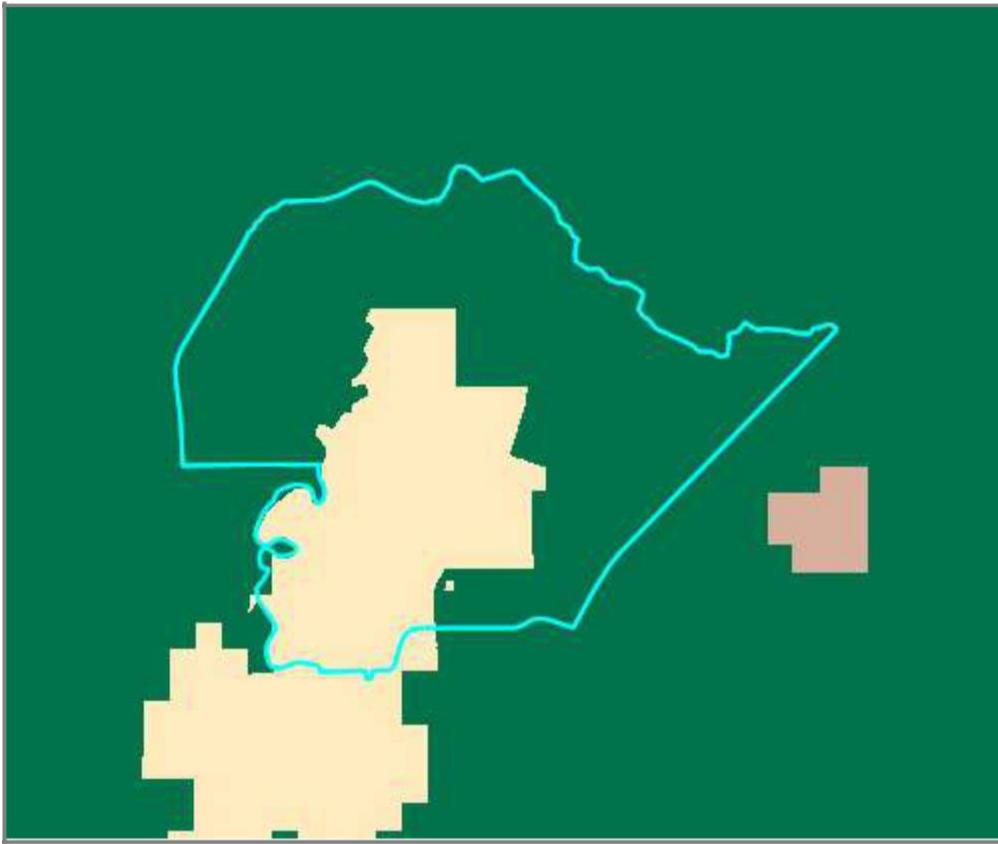
Sunriver

11,403 Acres: (18 Sq. Miles)



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LAND OWNERSHIP AND MANAGEMENT

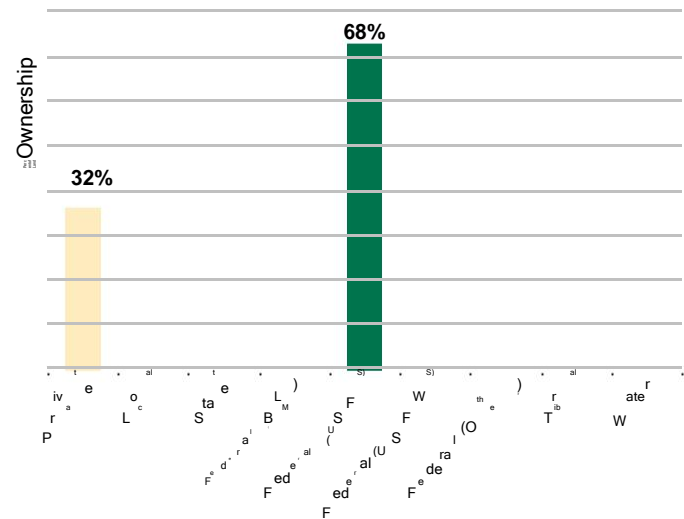


Knowing the land ownership and management in an area is important for hazard planning and awareness when wildfires occur. Oregon has a complete and coordinated wildfire management system between local, private, tribal, state, and federal agencies. These entities participate to fight fire in local areas 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.

Sunriver

	Major Landowner/Manager	Acres
	Private	3,688
	Local	0
	State	0
	Bureau of Land Management (BLM)	0
	US Forest Service (USFS)	7,716
	US Fish & Wildlife (USFWS)	0
	Other Federal	0
	Tribal	0
	Water	0



Source: Bureau of Land Management, 2015

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



Oregon Wildfire Risk Explorer- Advanced Report

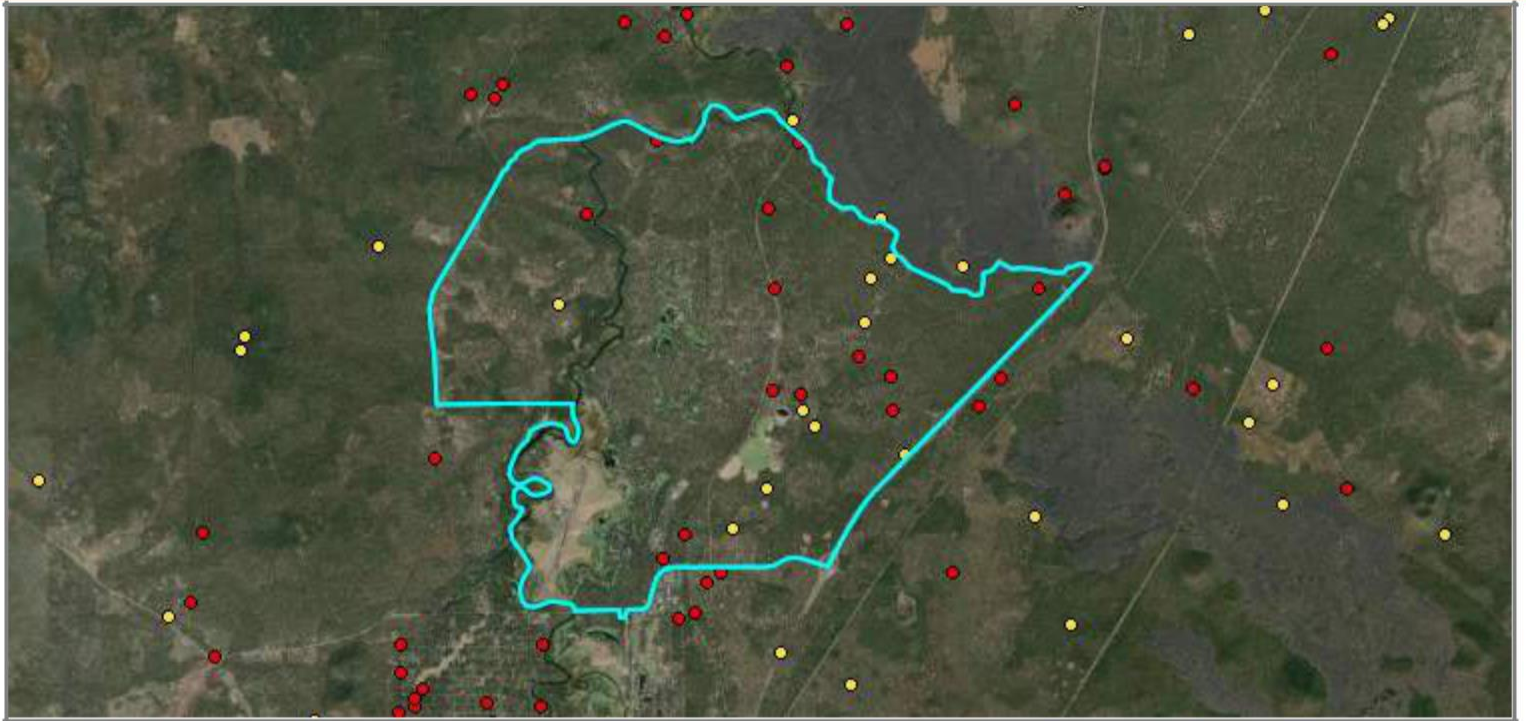
Sunriver

11,403 Acres: (18 Sq. Miles)

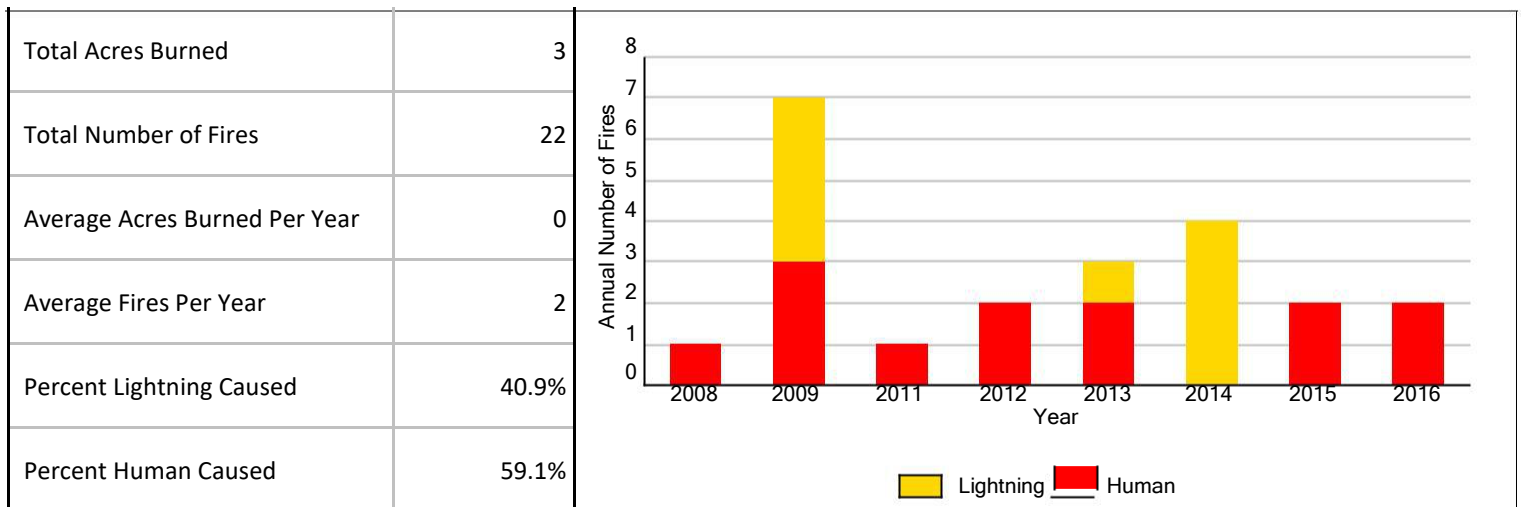


Generated: February 25, 2020

FIRE HISTORY - FIRE IGNITIONS



Sunriver fire starts between 2008-2017



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, 2017



Oregon Wildfire Risk Explorer- Advanced Report

Sunriver

11,403 Acres: (18 Sq. Miles)





















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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.

 2000	 2009
 2001	 2010
 2002	 2011
 2003	 2012
 2004	 2013
 2005	 2014
 2006	 2015
 2007	 2016
 2008	 2017



Wildfires in Sunriver

No large fire perimeters in this area of interest.

Source: Geomac <https://www.geomac.gov/>

For more information about previous large wildfires, see: National Interagency Fire Center https://www.nifc.gov/fireInfo/fireInfo_main.html



Oregon Wildfire Risk Explorer- Advanced Report

Sunriver

11,403 Acres: (18 Sq. Miles)



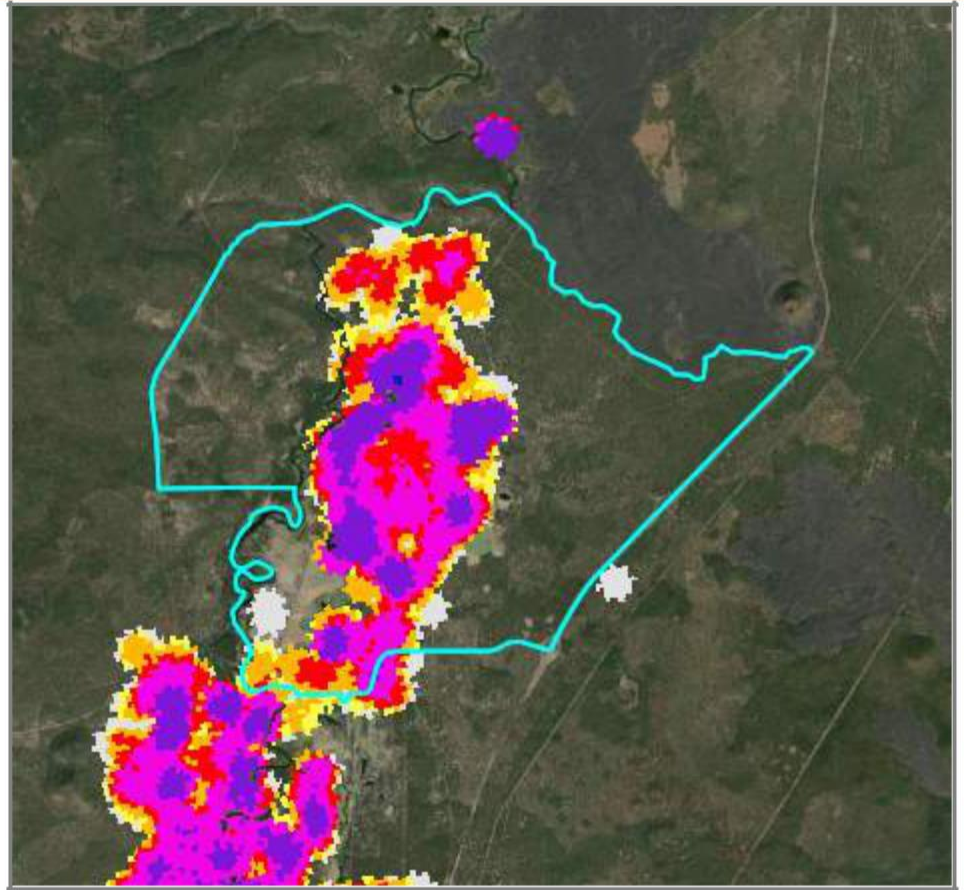
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HOUSING DENSITY - WHERE PEOPLE LIVE








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.



Sunriver housing density

Category	Acres	%*
 <1 house per 40 acres	329	3
 1 per 40 acres to 1 per 20 acres	299	3
 1 per 20 acres to 1 per 10 acres	698	6
 1 per 10 acres to 1 per 5 acres	821	7
 1 per 5 acres to 1 per 2 acres	1,092	10
 1 per 2 acres to 3 per acres	793	7
 > 3 per acres	4	< 1

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

Sunriver

11,403 Acres: (18 Sq. Miles)



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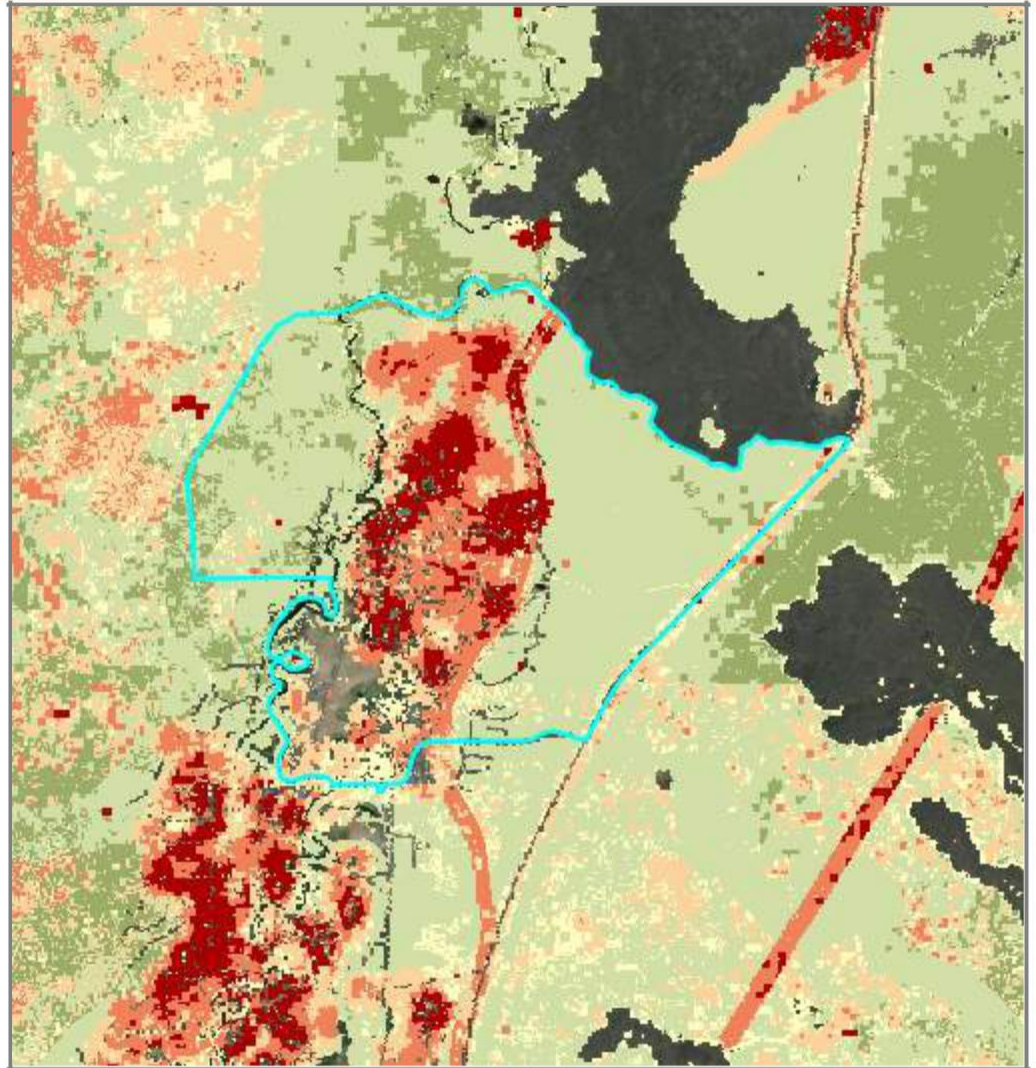
February 25, 2020

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

Sunriver

11,403 Acres: (18 Sq. Miles)



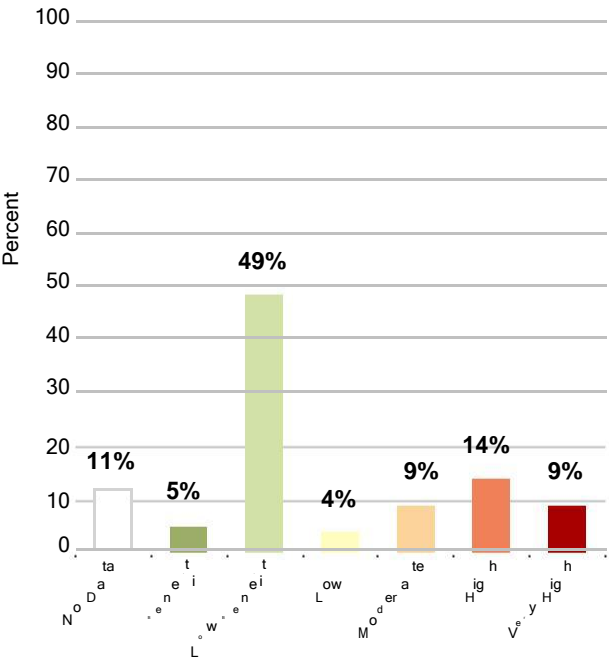
Generated: February 25, 2020

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 Sunriver: estimated acres by ownership

Category	Total	Private	Local	State	BLM	USFS	USFWS	Other Fed	Tribal
Very High	988	715	0	0	0	273	0	0	0
High	1,563	887	0	0	0	676	0	0	0
Moderate	1,047	565	0	0	0	482	0	0	0
Low	503	255	0	0	0	248	0	0	0
Low Benefit	5,552	354	0	0	0	5,198	0	0	0
Benefit	537	12	0	0	0	525	0	0	0
No Data	1,214	898	0	0	0	316	0	0	0
Total Area	11,404	3,686	0	0	0	7,718	0	0	0

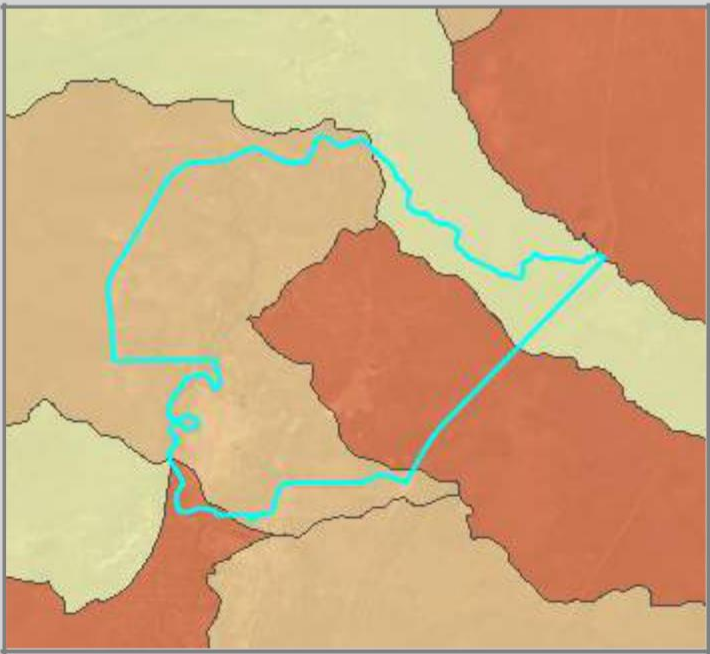
Overall wildfire risk in Sunriver *



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 Sunriver: 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

Sunriver

11,403 Acres: (18 Sq. Miles)



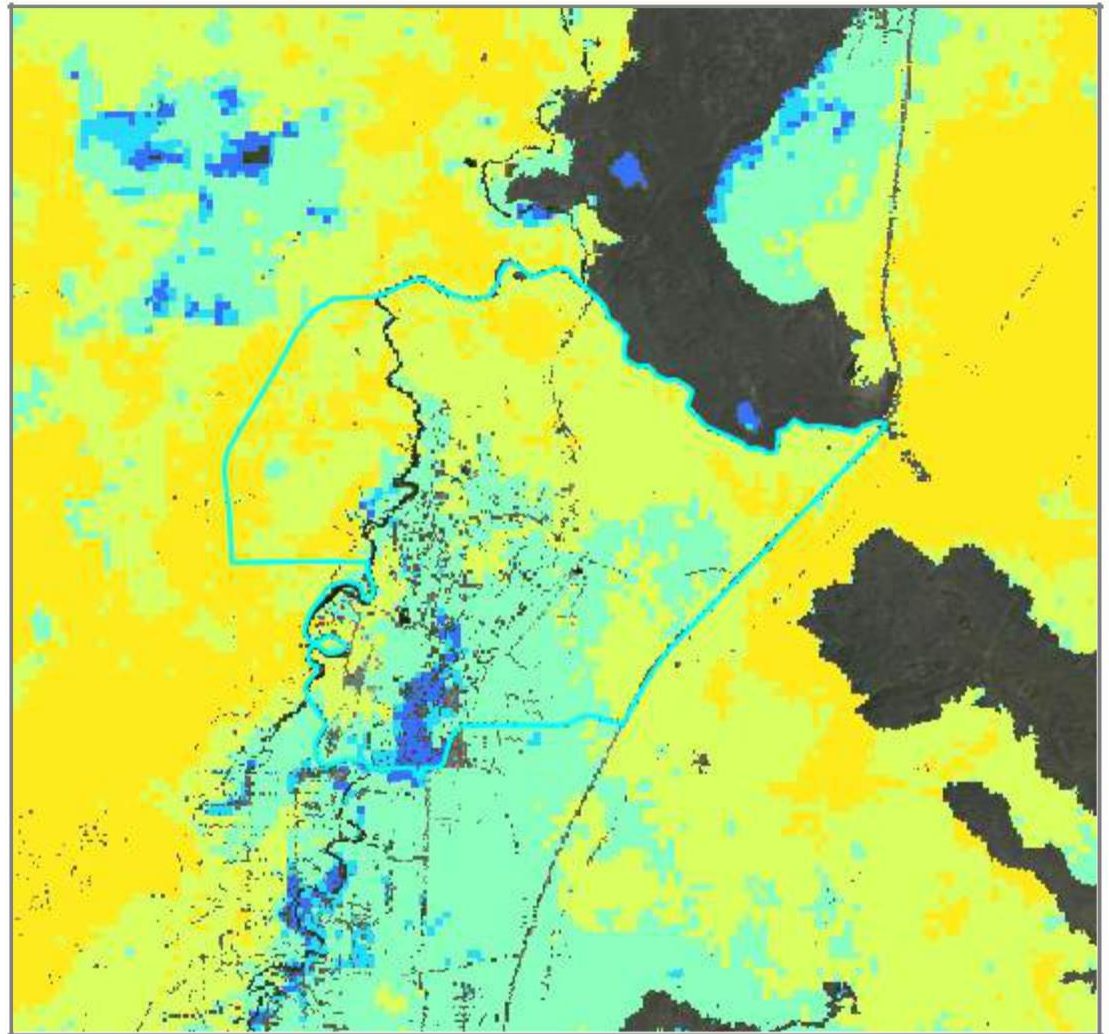
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February 25, 2020






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	Between 1 in 500 and 1 in 50 chance of a wildfire >250 acres in a single year (29th to 96th percentile).
 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	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

Sunriver

11,403 Acres: (18 Sq. Miles)



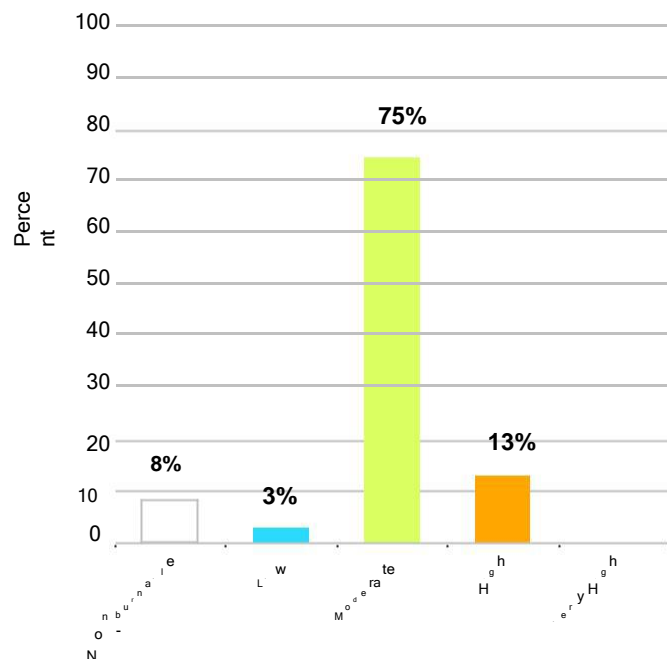
Generated: February 25, 2020

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 Sunriver: 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	1,512	20	0	0	0	1,492	0	0	0
Moderate	8,593	2,706	0	0	0	5,887	0	0	0
Low	336	312	0	0	0	24	0	0	0
Non-Burnable	963	648	0	0	0	315	0	0	0
Total Area	11,404	3,686	0	0	0	7,718	0	0	0

Burn probability in Sunriver *

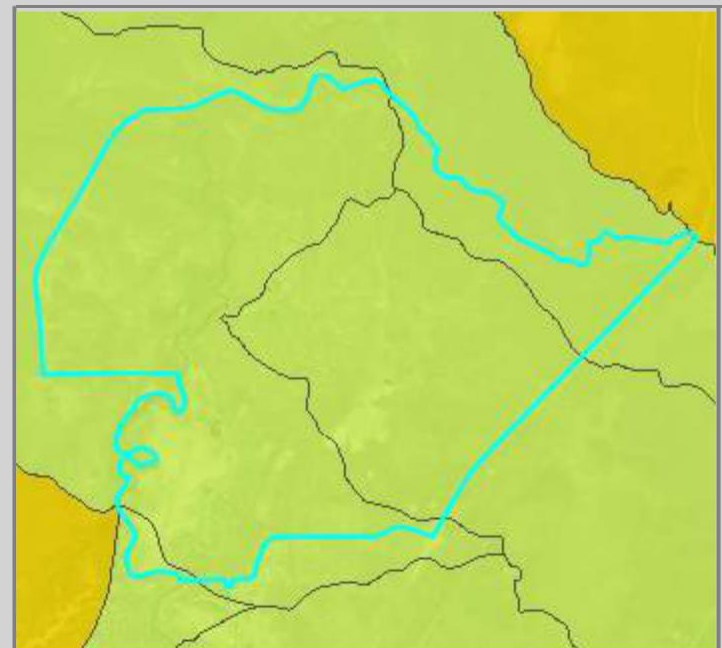


Source: 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, US Forest Service

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

Burn probability in Sunriver: 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

Sunriver

11,403 Acres: (18 Sq. Miles)



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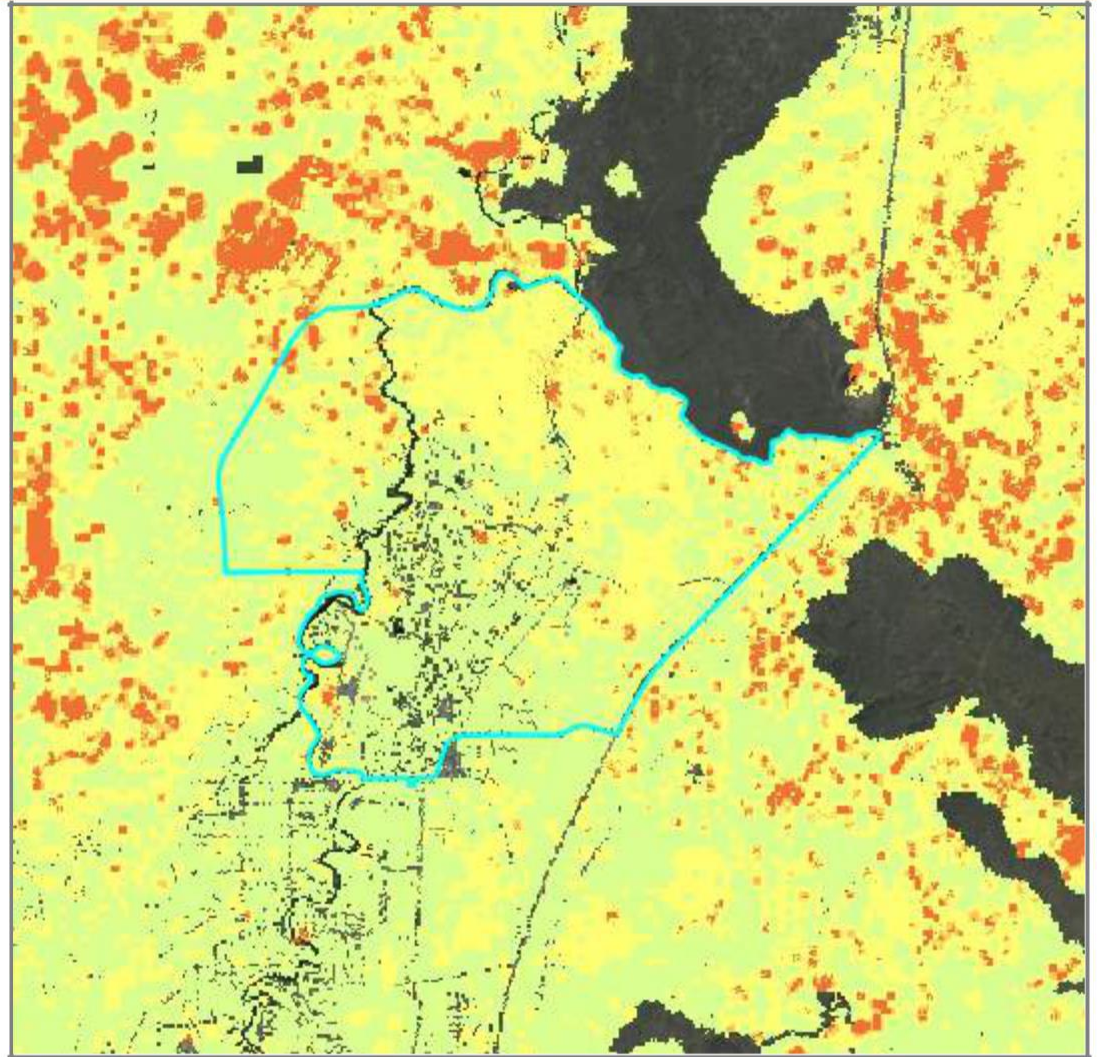
February 25, 2020

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

Sunriver

11,403 Acres: (18 Sq. Miles)



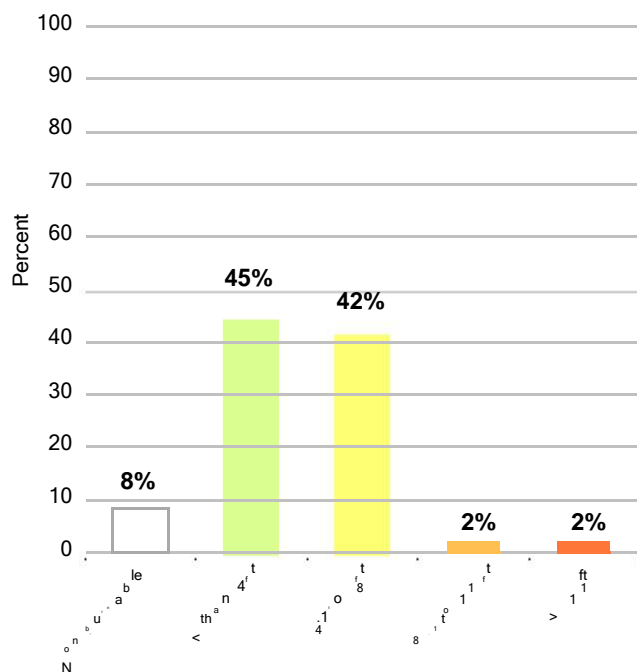
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This page contains additional information about fire intensity, including a table of classes by ownership to determine the distribution of categories across ownerships, and a chart of overall percentages of classes across the area. The inset box displays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

Sunriver average fire intensity - flame lengths estimated acres by ownership

Category	Total	Private	Local	State	BLM	USFS	USFWS	Other Fed	Tribal
> 11 ft	236	29	0	0	0	207	0	0	0
8 - 11 ft	281	13	0	0	0	268	0	0	0
4 - 8 ft	4,782	659	0	0	0	4,123	0	0	0
> 0 - 4 ft	5,140	2,336	0	0	0	2,804	0	0	0
Non-burnable	963	648	0	0	0	315	0	0	0
Total Area	11,402	3,685	0	0	0	7,717	0	0	0

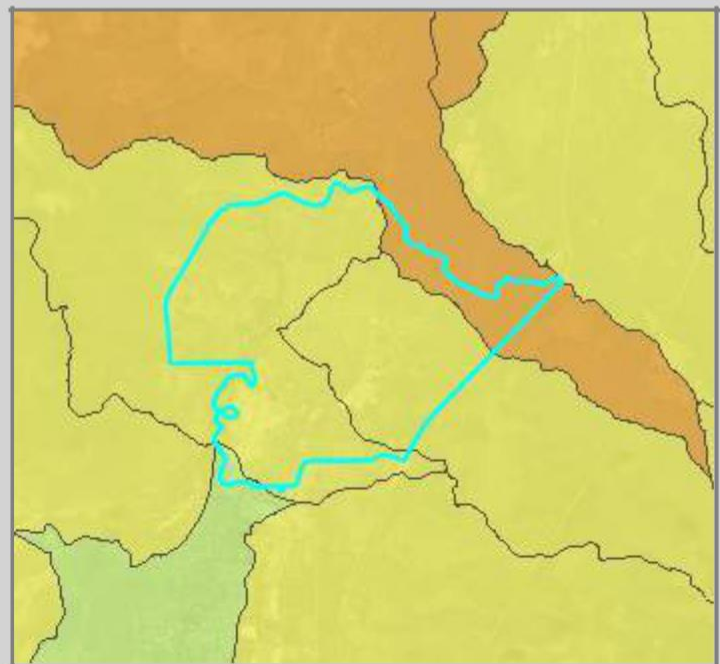
Fire intensity - flame length in Sunriver *



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 Sunriver: 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

Sunriver

11,403 Acres: (18 Sq. Miles)



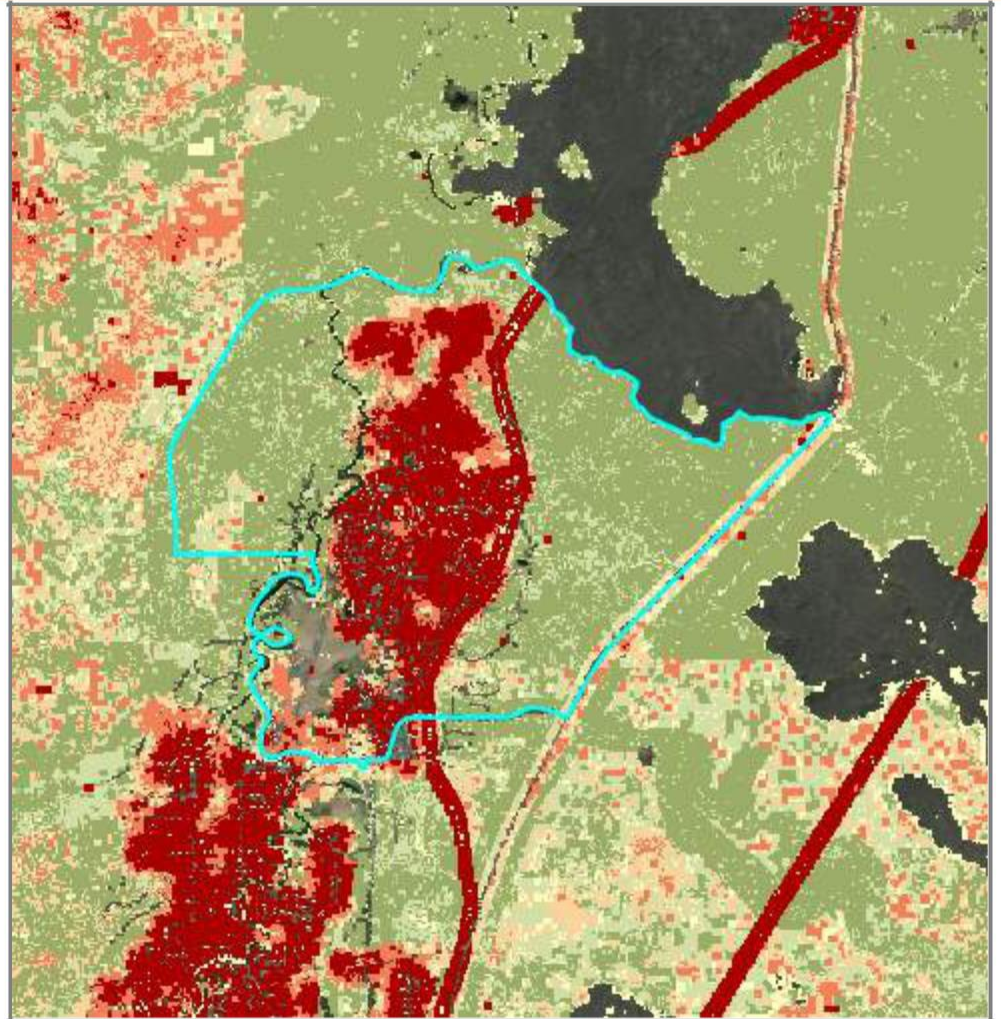
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OVERALL POTENTIAL IMPACT

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

Sunriver

11,403 Acres: (18 Sq. Miles)



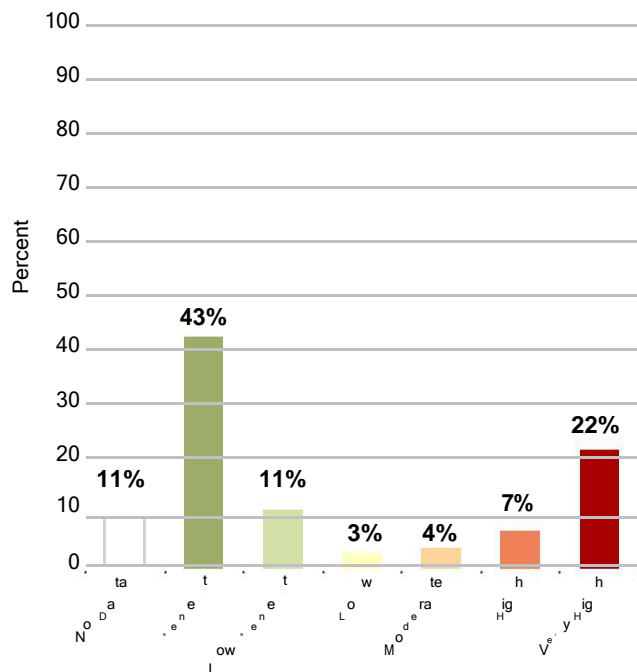
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This page contains additional information about overall potential impact, including a table of classes by ownership to determine the distribution of categories across ownerships, and a chart of overall percentages of classes across the area. The inset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

Sunriver overall potential impact estimated acres by ownership

Category	Total	Private	Local	State	BLM	USFS	USFWS	Other Fed	Tribal
Very High	2,503	1,752	0	0	0	751	0	0	0
High	790	410	0	0	0	380	0	0	0
Moderate	481	122	0	0	0	359	0	0	0
Low	292	123	0	0	0	169	0	0	0
Low Benefit	1,258	84	0	0	0	1,174	0	0	0
Benefit	4,867	297	0	0	0	4,570	0	0	0
No Data	1,214	898	0	0	0	316	0	0	0
Total Area	11,405	3,686	0	0	0	7,719	0	0	0

Overall potential impact in Sunriver *

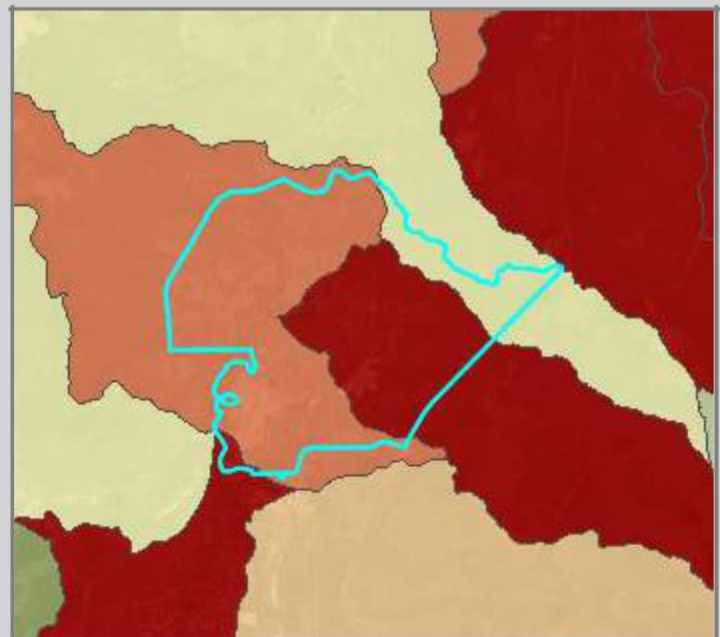


Source: 2018 Pacific Northwest Quantitative Wildfire Risk Assessment, US Forest Service

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

Overall potential impact in Sunriver: 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.





Oregon Wildfire Risk Explorer- Advanced Report

Sunriver

11,403 Acres: (18 Sq. Miles)



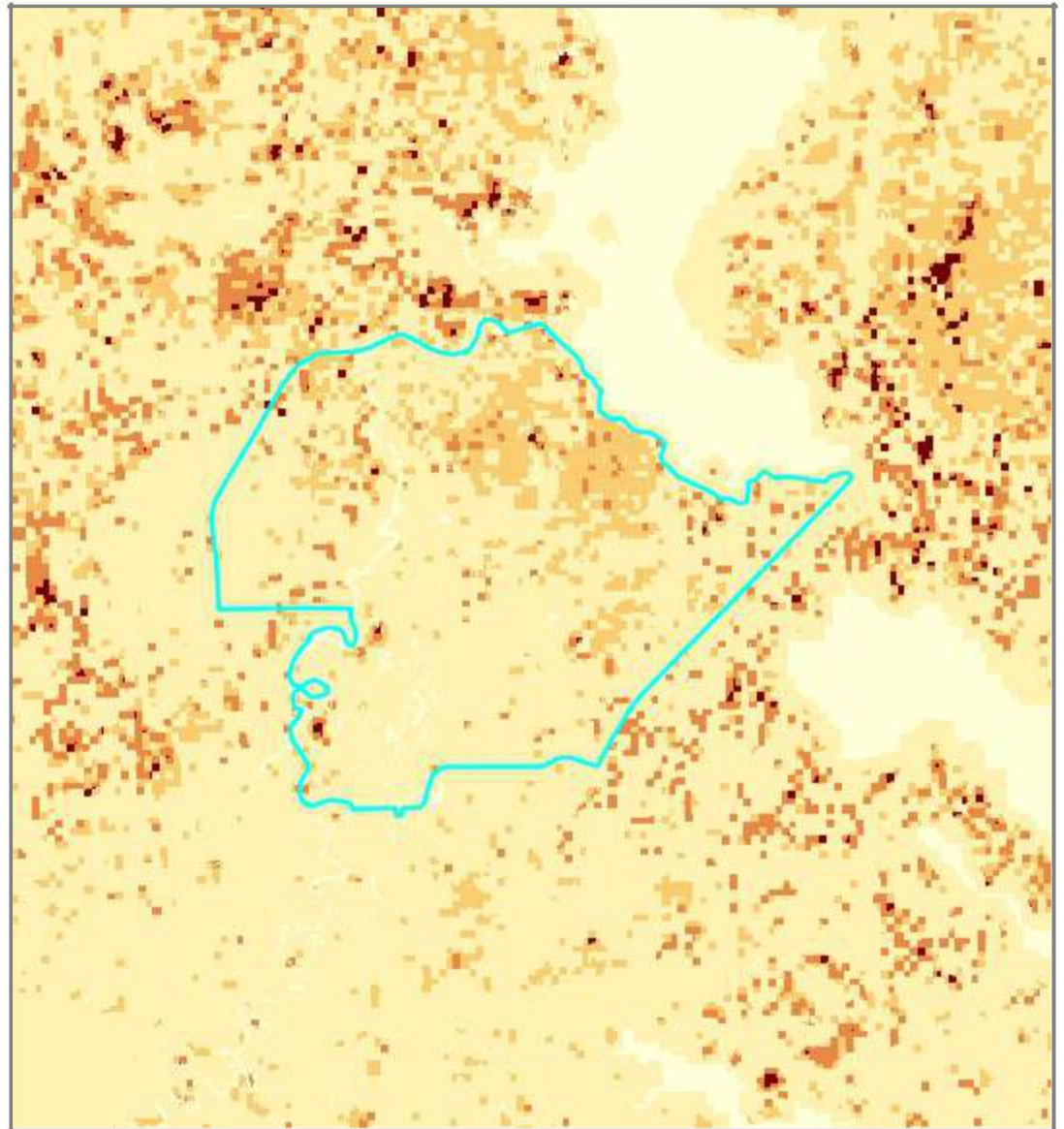
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HAZARD TO POTENTIAL STRUCTURES

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

Sunriver

11,403 Acres: (18 Sq. Miles)



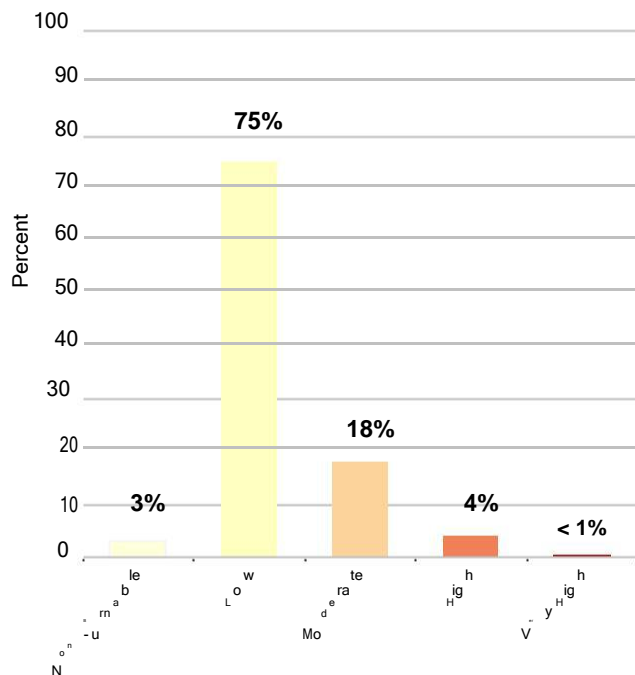
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This page contains additional information about hazard to potential structures, including a table of classes by ownership to determine the distribution of categories across ownerships, and a chart of overall percentages of classes across the area.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

Hazard to potential structures in Sunriver: estimated acres by ownership

Category	Total	Private	Local	State	BLM	USFS	USFWS	Other Fed	Tribal
Very High	28	7	0	0	0	21	0	0	0
High	463	62	0	0	0	401	0	0	0
Moderate	2,052	225	0	0	0	1,827	0	0	0
Low	8,556	3,227	0	0	0	5,329	0	0	0
Non-Burnable	304	165	0	0	0	139	0	0	0
Total Area	11,403	3,686	0	0	0	7,717	0	0	0

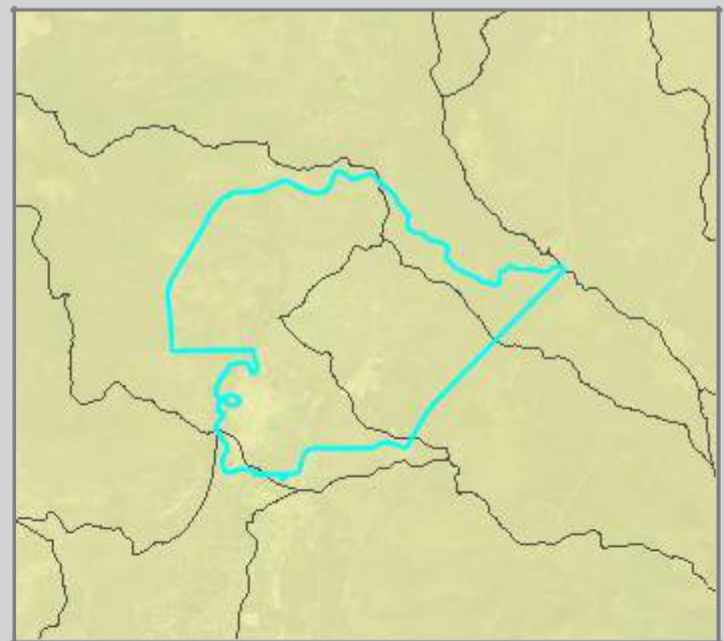
Hazard to potential structures in Sunriver *



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 Sunriver: 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

Sunriver

11,403 Acres: (18 Sq. Miles)



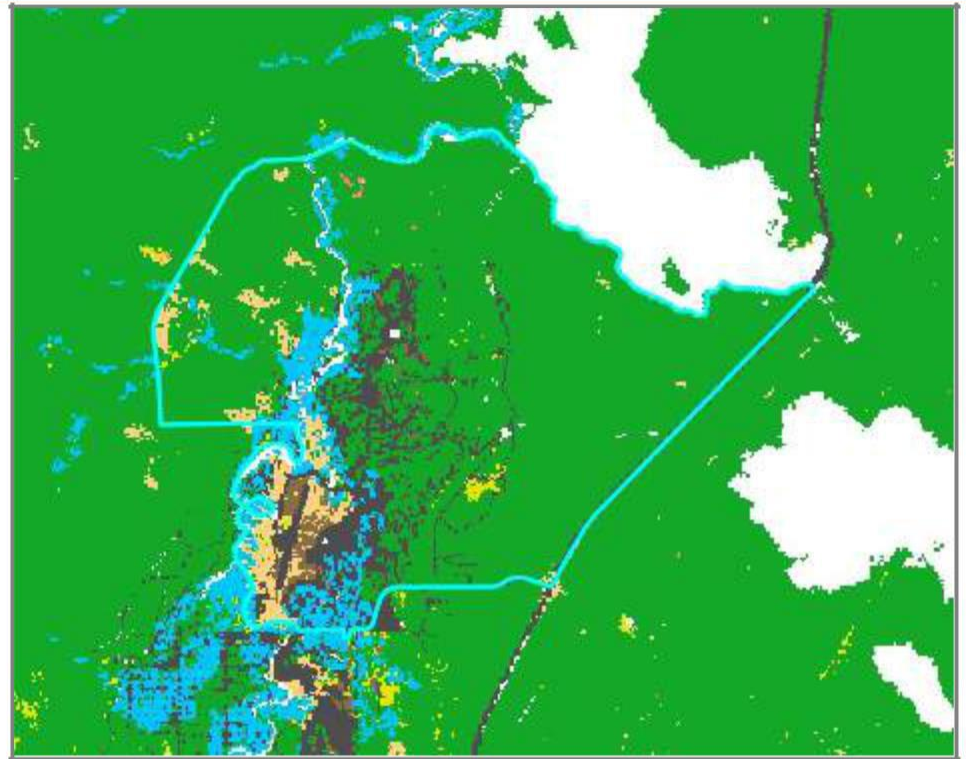
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EXISTING VEGETATION TYPE

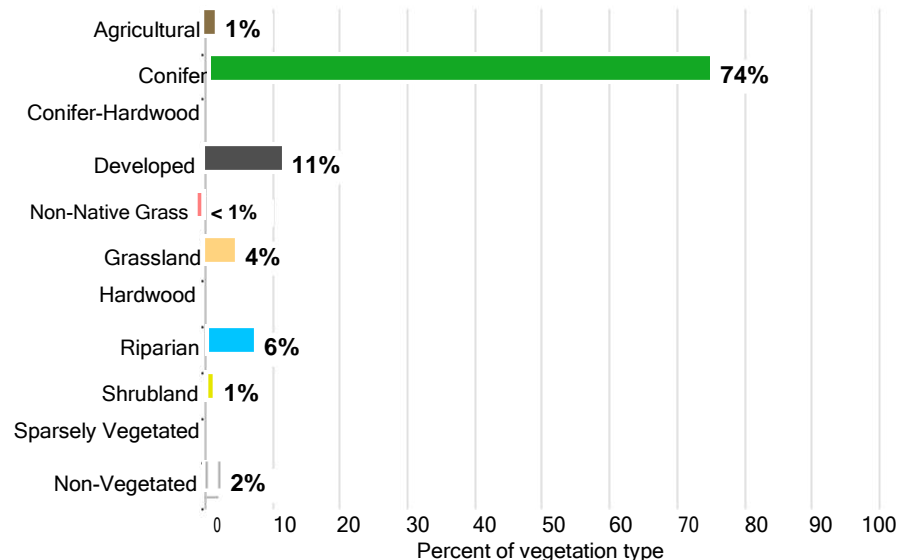
Vegetation is an important influence on potential wildfire behavior. The dominant vegetation type helps us understand the corresponding historical fire regime, a designation of fire frequency and severity. Fire frequency, or burn probability, suggests how often wildfire occurs (see Burn probability data 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 Sunriver





Oregon Wildfire Risk Explorer- Advanced Report












Sunriver

11,403 Acres: (18 Sq. Miles)



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Sunriver vegetation type

Category	Description	Acres	%*
 Non-vegetated or recently disturbed	Non-vegetated	217	2
 Agricultural	Agricultural	163	1
 Conifer	Conifer	8,434	74
 Conifer-Hardwood	Conifer-Hardwood	0	0
 Developed	Developed	1,279	11
 Exotic Herbaceous	Non-Native Grass	10	< 1
 Grassland	Grassland	489	4
 Hardwood	Hardwood	0	0
 Riparian	Riparian	740	6
 Shrubland	Shrubland	71	< 1
 Sparsely Vegetated	Sparsely Vegetated	0	0

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

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



Oregon Wildfire Risk Explorer- Advanced Report

Sunriver

11,403 Acres: (18 Sq. Miles)



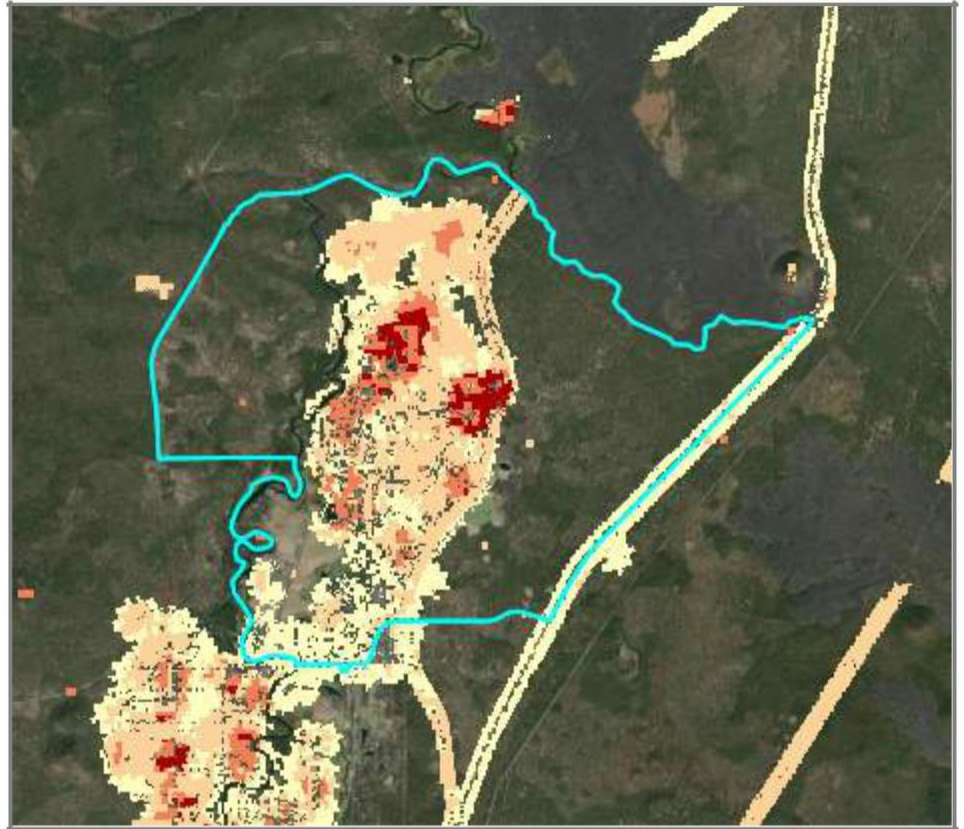
Generated: February 25, 2020

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 Sunriver

Category	Description	Acres	%*
 Very High	Wildfire risk is very highly negative to all combined mapped assets (top 5%).	215	2
 High	Wildfire risk is highly negative (80-95th percentile).	437	4
 Moderate	Wildfire risk is moderately negative (50-80th percentile).	1,798	16
 Low	Wildfire risk is slightly negative (0-50th percentile).	1,391	12
 No Data	There are no highly valued resources or assets mapped in the area, or it is considered non-burnable.	7,564	66

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

Sunriver

11,403 Acres: (18 Sq. Miles)



Generated: February 25, 2020

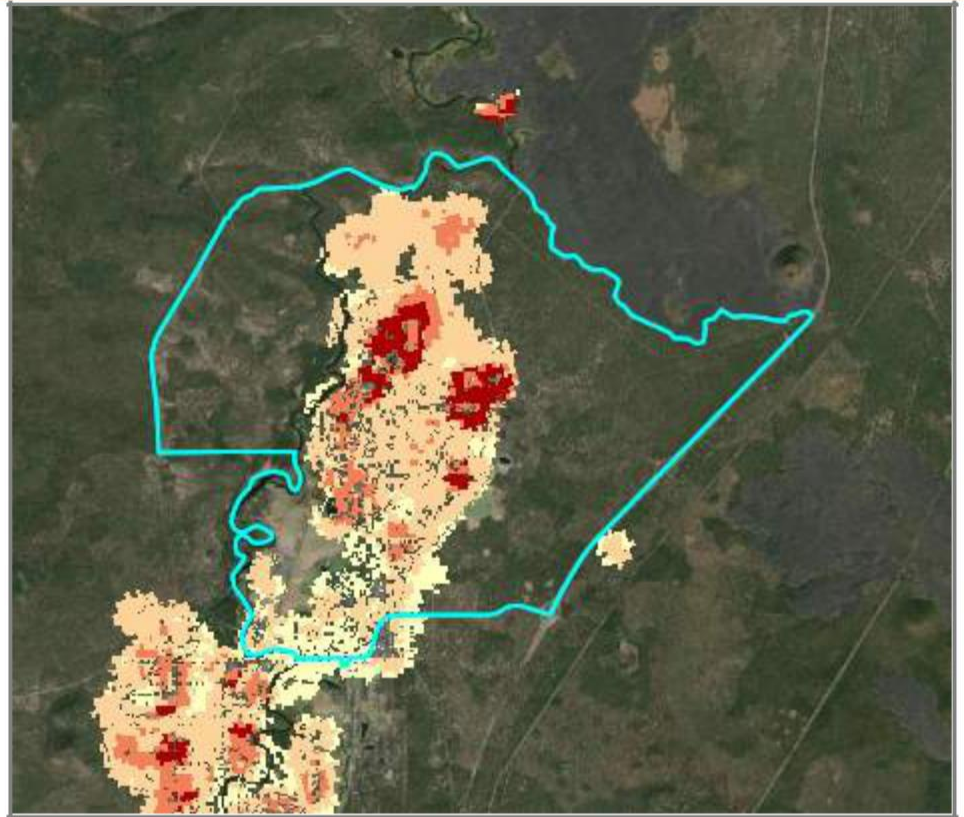
WILDFIRE RISK TO PEOPLE AND PROPERTY

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 Sunriver

Category	Description	Acres	%*
 Very High	Wildfire risk is very highly negative to people and property (top 5%).	311	3
 High	Wildfire risk is highly negative (80-95th percentile).	443	4
 Moderate	Wildfire risk is moderately negative (50-80 percentile).	2,201	19
 Low	Wildfire risk is slightly negative (0-50 percentile).	542	5
 No Data	There are no highly valued resources or assets mapped in the area, or it is considered non-burnable.	7,907	69

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

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11,403 Acres: (18 Sq. Miles)



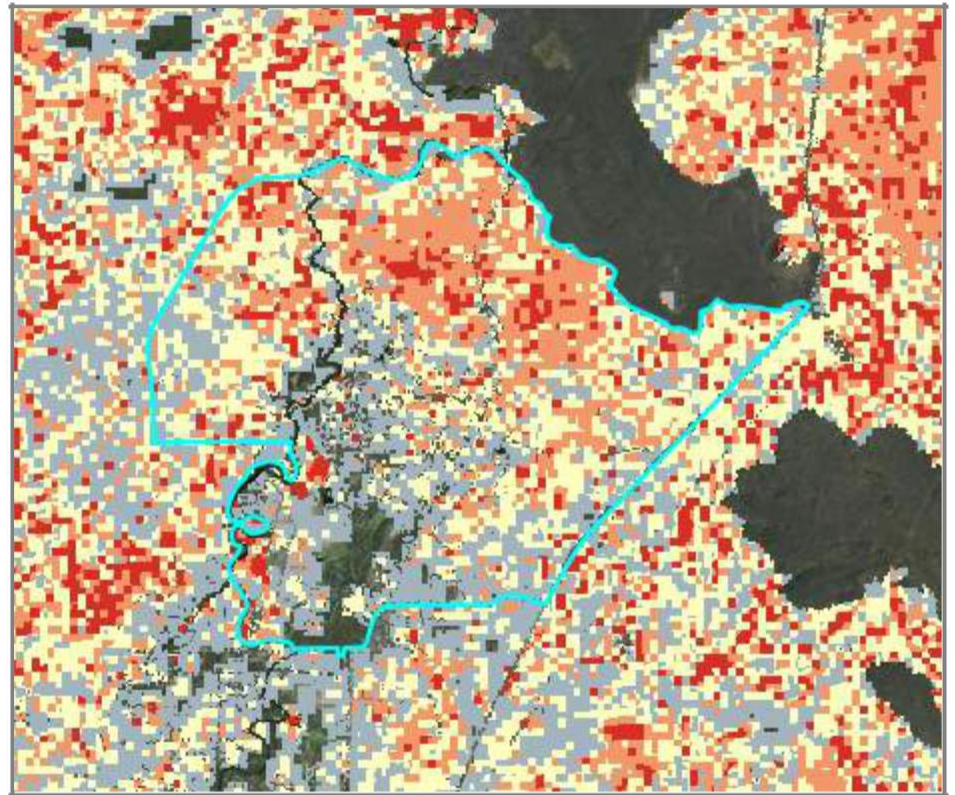
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PROBABILITY OF EXCEEDING 4 FOOT FLAME LENGTHS






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).



Sunriver probability of exceeding 4' 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'.	830	7
 50-75%	If a fire occurs, there is a high (50-75%) chance that flame lengths will be greater than 4'.	2,677	23
 25-50%	If a fire occurs, there is a moderate (25-50%) chance that flame lengths will be greater than 4'.	3,496	31
 0-25%	If a fire occurs, there is a low (<25%) chance that flame lengths will be greater than 4'.	3,021	26
 0%	This area contains non-burnable fuel types such as water, urban, agriculture, barren rock, etc.	1,380	12

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

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



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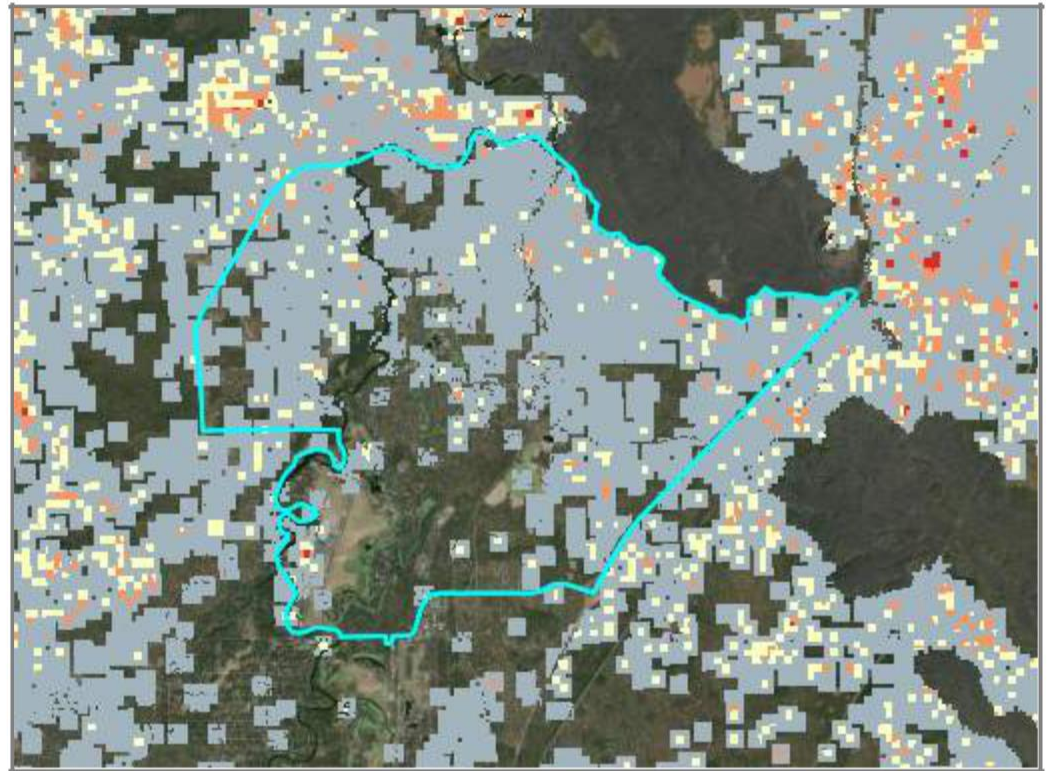
PROBABILITY OF EXCEEDING 8 FOOT FLAME LENGTHS

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.



Sunriver 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'.	2	< 1
 50-75%	If a fire occurs, there is a high (50-75%) chance that flame lengths will be greater than 8'.	105	< 1
 25-50%	If a fire occurs, there is a moderate (25-50%) chance that flame lengths will be greater than 8'.	367	3
 0-25%	If a fire occurs, there is a low (<25%) chance that flame lengths will be greater than 8'.	6,377	56
 0%	This area contains non-burnable fuel types such as water, urban, agriculture, barren rock, glacial areas, etc.	4,554	40

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

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



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Sunriver

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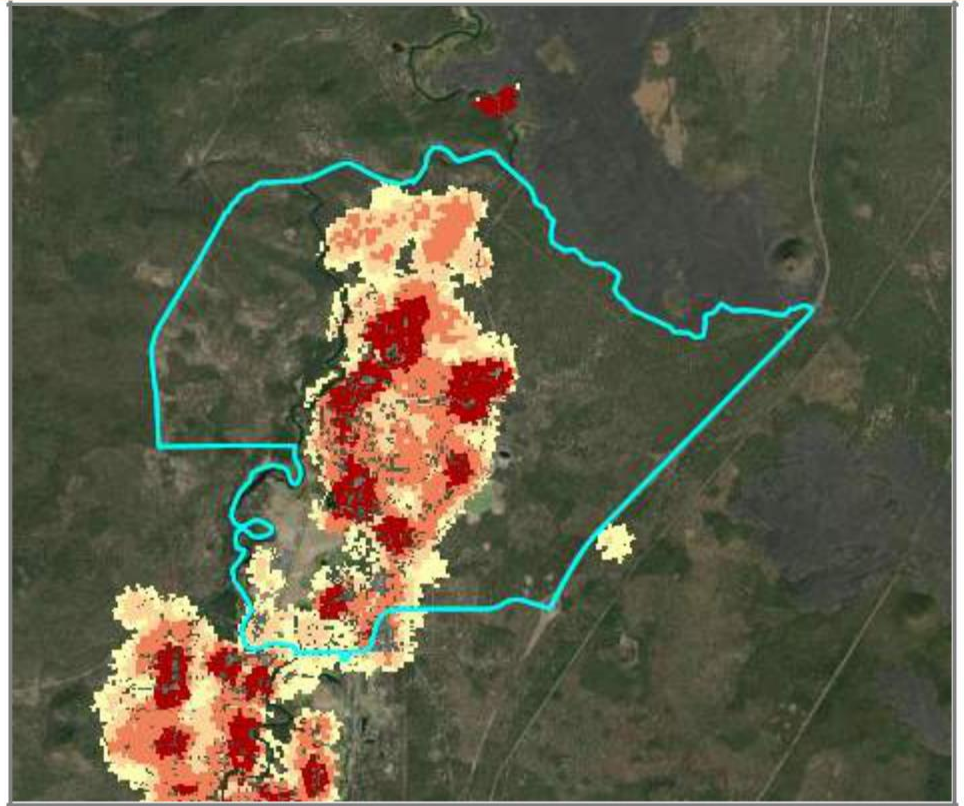
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POTENTIAL IMPACT TO PEOPLE AND PROPERTY

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.



Sunriver 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%).	656	6
High	Potential impact is highly negative (80-95th percentile).	1,126	10
Moderate	Potential impact is moderately negative (50-80th percentile).	1,021	9
Low	Potential impact is slightly negative (0-50th percentile).	695	6
No Data	There is no people and property mapped in the area or it is considered non-burnable (urban, agriculture, barren,etc).	7,907	69

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

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



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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.



Sunriver potential impact to infrastructure, if a wildfire were to occur.

Category	Description	Acres	%*
 Very High	Potential impact is very highly negative (top 5%).	30	< 1
 High	Potential impact is highly negative (80-95th percentile).	21	< 1
 Moderate	Potential impact is moderately negative (50-80th percentile).	408	4
 Low	Potential impact is slightly negative (0-50th percentile).	201	2
 No Data	There is no infrastructure mapped in the area or it is considered non-burnable (urban, agriculture, barren,etc).	10,745	94

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

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



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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).



Sunriver potential impact to wildlife habitat, if a wildfire were to occur.

Category	Description	Acres	%*
 Very High	Potential impact is very highly negative (top 5%).	0	0
 High	Potential impact is highly negative (80-95th percentile).	0	0
 Moderate	Potential impact is moderately negative (50-80th percentile).	8	< 1
 Low	Potential impact is slightly negative (17-50th percentile).	10	< 1
 Low Benefit	Potential impact is slightly beneficial to wildlife at low flame lengths (8-17th percentile).	29	< 1
 Benefit	Potential impact is beneficial, with a cumulative positive impact on wildlife habitat (0-8th percentile).	460	4
 No Data	There is no wildlife habitat mapped in the area, or it is considered non-burnable (urban, agriculture, barren,etc).	10,898	96

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

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



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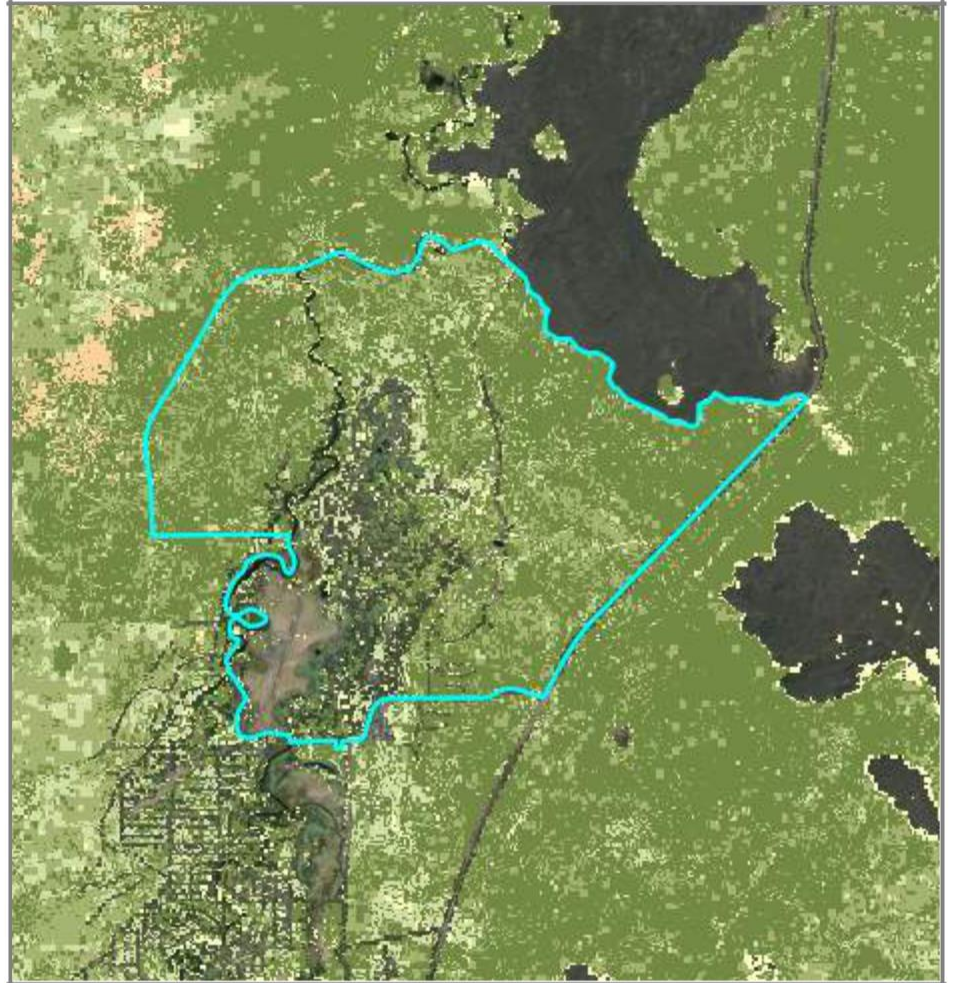
February 25, 2020

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.





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Sunriver 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.	5,862	51
 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.	1,962	17
 Moderate	Potential impact is moderately negative (52-87th percentile). Fire will move the landscape further from historical/desired conditions.	837	7
 Low	Potential impact is slightly negative (19-52th percentile). Fire will move the landscape further from historical/desired conditions.	221	2
 Low Benefit	Potential impact is slightly beneficial to forest vegetation at low flame lengths, potentially producing a "fuel treatment" effect (0.6-19th percentile).	17	< 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).	2,506	22

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

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



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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.

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



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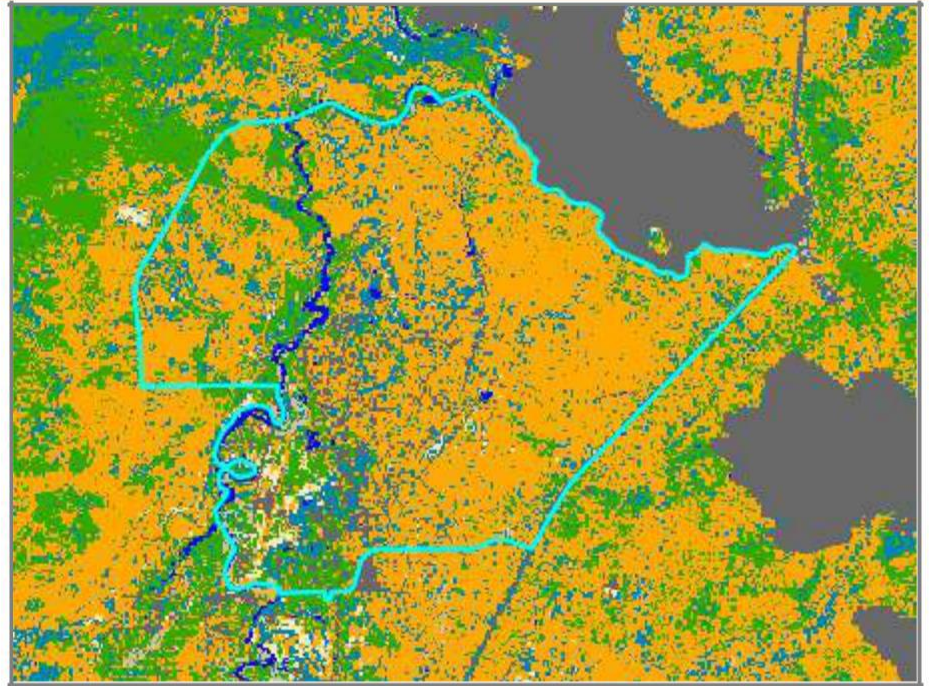


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FUEL MODEL GROUPS

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.



Sunriver fuel model groups (see next page for descriptions of codes)

Category	Description	Acres	%*
 Grass	Fuel models 101-104, (GR1; GR2; GR3; GR4)	156	1
 Grass/Shrub	Fuel models 121-123, (GS1; GS2; GS3)	7,066	62
 Non-burnable-other	Fuel Models 91-93,99, (NB1; NB2; NB3; NB9)	722	6
 Non-burnable-water	Fuel Models 98, (NB8)	236	2
 Slash-blowdown	Fuel Models 202, (SB2)	0	0
 Shrub	Fuel Models 141-147, (SH1; SH2; SH3; SH4; SH5; SH6; SH7)	169	1
 Timber Litter	Fuel Models 181-189, (TL1; TL2; TL3; TL4; TL5; TL6; TL7; TL8; TL9)	1,660	15
 Timber-Understory	Fuel Models 161-163, 165, (TU1; TU2; TU3; TU5)	1,396	12

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

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



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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 Fuel models 101-104, (GR1; GR2; GR3; GR4)	GR1: Short, sparse dry climate grass is short, naturally or heavy grazing, predicted rate of fire spread and flame length low GR2: Low load, dry climate grass primarily grass with some small amounts of fine, dead fuel, any shrubs do not affect fire behavior GR3: Low load, very coarse, humid climate grass continuous, coarse humid climate grass, any shrubs do not affect fire behavior GR4: Moderate load, dry climate grass, continuous, dry climate grass, fuelbed depth about 2 feet
Grass/Shrub Fuel models 121-123, (GS1; GS2; GS3)	GS1: Low load, dry climate grass-shrub shrub about 1 foot high, grass load low, spread rate moderate and flame length low GS2: Moderate load, dry climate grass-shrub, shrubs are 1-3 feet high, grass load moderate, spread rate high, and flame length is moderate 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) NB1: Urban NB2: Snow/Ice NB3: Agriculture NB9: Barren
Non-burnable-Water	Fuel Model 98, (NB8): Water
Slash-blowdown	Fuel Model 202, (SB2): 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 Fuel Models 141-147, (SH1; SH2; SH3; SH4; 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 SH2: Moderate load dry climate shrub, woody shrubs and shrub litter, fuelbed depth about 1 foot, no grass, spread rate and flame low SH3: Moderate load, humid climate shrub, woody shrubs and shrub litter, possible pine overstory, fuelbed depth 2-3 feet, spread rate and flame low 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 SH5: High load, humid climate grass-shrub combined, heavy load with depth greater than 2 feet, spread rate and flame very high 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 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



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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
Fuel Models	TL2: Low load broadleaf litter, broadleaf, hardwood litter, spread rate and flame low
181-189, (TL1;	TL3: Moderate load conifer litter, moderate load conifer litter, light load of coarse fuels, spread rate and flame low
TL2; TL3; TL4;	TL4: Small downed logs moderate load of fine litter and coarse fuels, small diameter downed logs, spread rate and flame low
TL5; TL6; TL7;	TL5: High load conifer litter, light slash or dead fuel, spread rate and flame low
TL8; TL9)	TL6: Moderate load broadleaf litter, spread rate and flame moderate
	TL8: Large downed logs, heavy load forest litter, larger diameter downed logs, spread rate and flame low
	TL8: Long needle litter, moderate load long needle pine litter, may have small amounts of herbaceous fuel, spread rate moderate and flame low
	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
Fuel Models	TU2: Moderate load, humid climate timber-shrub, moderate litter load with some shrub, spread rate moderate and flame low
161-163, 165,	TU3: Moderate load, humid climate timber grass shrub, moderate forest litter with some grass and shrub, spread rate high and flame moderate
(TU1; TU2;	TU5: Very high load, dry climate shrub, heavy forest litter with shrub or small tree understory, spread rate and flame moderate
TU3; TU5)	

This report was generated from the Advanced Oregon Wildfire Risk Explorer map viewer:

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 February 25, 2020

URL: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:



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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 |
| • Deschutes County Sheriff's Twitter Feed | 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 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 off 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 primary 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 repellant 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](#)