



# Greater La Pine Community Wildfire Protection Plan

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## Declaration of Agreement

The Healthy Forests Restoration Act requires that the applicable local government, the local fire department, and the state entity responsible for forest management agree to the Community Wildfire Protection Plan. The undersigned have reviewed this plan and agree to the completed document.

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Jim Gustafson, Fire Chief  
La Pine Rural Fire Protection District

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Date

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Robert Young, District Forester  
Oregon Department of Forestry

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Date

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Mike Daly, Chair  
Deschutes County Board of Commissioners

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Date

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Dennis Luke, Budget Officer  
Deschutes County Board of Commissioners

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Date

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Fred Huft, Representative  
Greater La Pine CWPP Steering Committee

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Date

## Acknowledgements

Assembled within the true spirit of collaboration, the following people are acknowledged for their participation and commitment resulting in the creation of the Greater La Pine Community Wildfire Protection Plan.

Glen Ardt	Oregon Department of Fish & Wildlife
Bill Armstrong	Resident
Tom Bradler	Resident
Albert Bauer	Resident
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Darrell and Lanell Bennett	Residents
Tom Cary	Resident
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Phil Cruz	Deschutes National Forest
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Todd Hansen	Olympic Resource Management
Fred and Irene Huft	Residents
Ed Keith	Oregon Department of Forestry
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Lee Smith	Resident
Sarge Staples	Resident
Joe Stutler	Deschutes County Forester
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Kelly Walker	Sunriver Owners Association
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# Greater La Pine Community Wildfire Protection Plan

## Purpose

The mission of the Greater La Pine Community Wildfire Protection Plan is ***to protect against loss of life, property and natural resources as the result of wildland fire.***

This document outlines the priorities, strategies and action plans for fuels reduction treatments in the wildland urban interface. This CWPP also addresses special areas of concern and makes recommendations for reducing structural vulnerability in communities at risk. It is intended to be a living vehicle for fuels reduction, educational, and other projects to decrease overall risks of loss from wildland fire; updated and revisited at least semi-annually to meet its mission.

Wildland fire is a natural and necessary component of forest ecosystems across the country. Central Oregon is no exception. Historically, wildland fires have shaped the forests and rangelands valued by residents and visitors. Forests and rangelands in the greater La Pine basin however, are now significantly altered due to fire prevention efforts, modern suppression activities and a general lack of large scale fires, resulting in overgrown forests with closed canopies that tend to burn more intensely than in the past. In addition, the recent explosion in population has led to increased residential development into forests, in the wildland urban interface (WUI). To address these issues, members of fire agencies, local businesses and organizations, and individuals have partnered to develop the Greater La Pine Community Wildfire Protection Plan.

Although reducing the risk of wildland fire is the primary motivation behind this plan, managing the forests and rangelands for hazardous fuels reduction and fire resilience is only one part of the larger picture. Residents and visitors desire healthy, fire-resilient forests that provide habitat for wildlife, recreational opportunities, and scenic beauty.

The Greater La Pine Community Wildfire Protection Plan will assist La Pine Rural Fire Protection District and La Pine area residents in the identification of surrounding lands, including federal and state lands, at risk from severe wildland fire. It identifies strategies for reducing wildland fire fuels while improving forest health, supporting local industry and economy and improving fire protection capabilities.

## Collaboration

In 2003, the federal government passed historical bi-partisan legislation: the Healthy Forests Restoration Act (HFRA). This legislation directs federal agencies to collaborate with communities in developing hazardous fuels reduction projects, and in the prioritization of treatment areas as defined by a Community Wildfire Protection Plan (CWPP). It further provides authorities to expedite the NEPA process for fuels reduction projects on federal lands. The act also requires that 50% of funding allocated to HFRA projects be used to protect communities at risk of wildland fire.

For the first time, communities have the opportunity to direct where federal agencies place their fuels reduction efforts. HFRA also allows community groups to apply for federal funding to make communities safer against the threat of wildland fire.

Through the formation of a Steering Committee, community members of La Pine, Oregon came together with representatives from La Pine Rural Fire Protection District, Oregon Department of Forestry, the USDA Forest Service, the USDI Bureau of Land Management, and Deschutes County to develop the Greater La Pine Community Wildfire Protection Plan. The plan was created in accordance with *Preparing a Community Wildfire Protection Plan: A Handbook for Wildland-Urban Interface Communities* (Communities Committee, Society of American Foresters, National Association of Counties, National Association of State Foresters 2005).

## Background information

The unincorporated area of La Pine, Oregon is located approximately 30 miles south of Bend along US Highway 97 and includes the southern portion of Deschutes County. Situated primarily among thick forests of lodgepole and ponderosa pine, an estimated 18,000 residents call the La Pine basin home. In a classic wildland urban interface environment, the La Pine area is also home to abundant wildlife including deer, elk, mountain lion, and many species of birds and fish.

Historically, the La Pine basin was predominately meadow with scattered tracts of lodgepole and ponderosa pine. Following logging in the first half of the 1900's many of these stands naturally regenerated to lodgepole pine. Lodgepole pine is a species that lives and dies 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 of the La Pine basin. Today, with less stand management, logging activity and highly effective wildland fire suppression, the forestland is predominantly dense lodgepole pine with some mixed stands of lodgepole and ponderosa pine. Much of the understory consists of dense bitterbrush and manzanita with some areas of native bunchgrasses. Due to the lack of disturbance, these stands continue to become more and more overcrowded.



The La Pine community has experienced four large fires that have threatened lives, property, wildlife and the landscape in the recent past. In 2001, the Crane Complex Fire burned 713 acres and the Pine Forest Fire charred 120 acres, directly threatening one of the largest residential subdivisions in the area. In 2003, the Davis Lake Fire burned 21,181 acres and threatened homes and property at Wickiup Acres. In August 2005 the Park Fire burned 139 acres and caused the evacuation of 500 people from the La Pine State Park and over 200 residents in nearby subdivisions.

Structural fire protection is afforded across the greater La Pine area by the La Pine Rural Fire Protection District with wildland fire responses met by coordinated efforts between La Pine RFPD, Oregon Department of Forestry, US Forest Service, the Bureau of Land Management and neighboring fire departments in Walker Range, Crescent and Sunriver.

As part of the ongoing wildland fire risk management of the surrounding public and private forestlands, the US Forest Service, the Bureau of Land Management, Oregon Department of Forestry, Deschutes County and private landowners are engaged in several current fuels treatment projects.

## Community Base Maps

The Greater La Pine CWPP relies on the following maps and GIS data:

- Greater La Pine WUI boundary with nine identified communities at risk and land ownership
- Historical fire starts and large fire history
- Fire Regime Condition Class and Oregon Forestland-Urban Interface Fire Protection Act of 1997 (SB 360) ratings
- Crown Fire Potential

## Community Profile

### **Wildland Urban Interface Description**

The Healthy Forests Restoration Act defines wildland urban interface (WUI) as an area within or adjacent to an at risk community that has been identified by a community in its wildfire protection plan or, for areas that do not have such a plan, as an area:

- extending ½ mile from the boundary of an at risk community,
- extending 1½ miles from the boundary of an at risk community when other criteria are met such as a sustained steep slope or a geographic feature that creates an effective firebreak, or is classified as fire condition class 3 land,
- or that is adjacent to an evacuation route.

The La Pine Community has carefully planned and mapped the WUI. The Deschutes County line marks the southern edge of the WUI while the Upper Deschutes River Natural Resources Coalition CWPP marks the boundary to the north. The community of La Pine and seven of the nine identified communities at risk lie in the core of the Greater La Pine WUI boundary. The vast majority of land adjacent to the identified communities is federal land. The Greater La Pine wildland urban interface boundary is approximately 100 square miles. For more detailed information, see the maps in Appendix A.

The Steering Committee utilized the most recent tax information available to identify and name the following nine “communities at risk” within the Greater La Pine WUI for assessment and prioritization.

- **Little Deschutes River** – 7,391 acres with 577 structures including named developments: Summit Acres, Lazy River, Pine Crest Ranchettes, Holmes Acres, Bradcomb, Potters Estates, Cagle Subdivision, La Pine Meadows, Sundown Park, and Wickiup Commercial.
- **Newberry Estates** – 324 acres with 190 structures
- **Ponderosa Pines** – 1,023 acres with 331 structures
- **6<sup>th</sup> & Dorrance Meadow** – 7,549 acres with 934 structures including named developments: Conifer Acres, Lechner Acres, Sand Lilly Estates, Woodland Park Homesites, Safari Acres, Glenwood Acres, Newberry Neighborhood, Timber Haven, Rosland Vacation Plat, Ponderosa Pines East, Deschutes River Acres, Rio Land, Bluewood, CL & D Ranch, Singing Pines, South Park, Pierce Tracts, and Dora’s Acres.
- **Masten Road Area** – 7,211 acres with 132 structures including named developments: Wagon Trail North, Hockman, The South Forty, and Deer Forest Acres.
- **Day Road Corridor** – 5,122 acres with 1,726 structures including named developments: Deschutes River Recreation Sites, Terra De Oro Estates, Parkway Acres, Meadowcrest Acres, Tall Pines, Ammon Estates, Crane Prairie, Pine Meadows Tracts, Bieler Boys Estates, Danielle’s Acres, Los Pinos, Alpine Meadows, Jacobsen’s North Addition, Forest View, CW Reeve Resort, Lynne Acres, Anderson Acres, Jacobsen’s South Addition, Evergreen Park, and Ahern Acres.
- **Huntington South** – 3,492 acres with 173 structures including named developments: Newberry Business Park, Hinkle Road Tracts, La Pine Industrial, Huntington Meadows, Finley Butte and Roan Park.

- **Wickiup Acres** – 33 acres with 26 structures – no fire protection from La Pine RFPD, wildland fire protection only from Oregon Department of Forestry.
- **Section 36** – 629 acres with 5 structures – no fire protection from La Pine RFPD, wildland fire protection only from Oregon Department of Forestry.

## **Fuel Hazards and Ecotypes**

The Greater La Pine area is a mosaic of vegetation types including:

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

**Ponderosa pine** is currently found in meadows and in scattered tracts of lodgepole pine stands. There are relatively few pure stands of ponderosa pine remaining in the La Pine basin.

Historically, ponderosa pine forests contained more understory grasses and 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 occur with a fire return interval of 11-15 years characterize the 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 larger “yellow belly” pines has dramatically decreased clumpy open forests, replacing them with more evenly spaced and smaller “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** in central Oregon is characterized by dense, uniform stands, an absence of other species, and a general lack of understory shrub or herbs (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. The fire cycle in lodgepole pine is 60-80 years and occurs as follows: a stand replacement fire leads to stand regeneration → Dead snags from the fire fall to the forest floor and fuels begin to accumulate → Windstorms blow more trees to the ground → Forest fires burn some of the downed logs and lead to heart rot in the standing trees → The heart rot stresses the stands and makes it vulnerable to attack by the mountain pine beetle → A major outbreak of the mountain pine beetle causes significant mortality and soon the conditions are ripe for another stand replacement fire.

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

**Bitterbrush** occurs throughout the Greater La Pine area on all aspects and elevations. Fire severely damages bitterbrush, especially if rain is not received shortly after a burn. Bitterbrush is fire dependent, but not fire resistant. It regenerates mostly from seed after a fire and is often from caches of seeds made by rodents. Bitterbrush will sprout after burning regardless of the severity of the burn and matures relatively quickly. Consequently, the greater La Pine wildland-urban interface area is rich with 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 Little Deschutes River and Paulina Creek flow through the greater La Pine WUI boundary creating large riparian areas along the middle and northeastern portions of the planning area. Vegetation types in these riparian areas vary from grasses, forbs and willows. The primary concern from a wildland fire perspective is during the spring and autumn when the vegetation has either cured or “greenup” has not begun.

The result of the fuel hazards and forest types in the greater La Pine area is an overgrowth of trees, forest floor fuels and an abundance of dead or dying vegetation that contribute to a substantially elevated risk of wildland fires that are difficult to control. These overly dense conditions lead to fire behavior that produce flame lengths over eight feet with crowning and torching that can result in stand replacement severity fires.

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

## Community Assessment of Risk

The Greater La Pine Community Wildfire Protection Plan utilized three risk assessment methodologies: the Oregon Department of Forestry Assessment of Risk Factors and Fire Regime Condition Class & Oregon Forestland-Wildland Urban Interface Fire Protection Act of 1997 (SB 360) classification ratings. The group also used the National Fire Protection Association (NFPA) 1144 Structural Vulnerability Assessment. These assessments are combined for overall ratings and used separately to identify specific hazards in the communities at risk.

### ODF Assessment of Risk Factors

#### **Risk of Wildfire Occurrence**

The risk of wildfire occurrence refers to the likelihood of a fire occurring based on historical fire occurrence, home density and ignition sources. The risk is high for the entire La Pine area based on historical evidence of fire starts as well as ready ignition sources like abundant dry lightning storms, debris burning, equipment use, juveniles, widespread camping, and arson.

The current condition of the vegetation on the federal and private lands within the greater La Pine WUI poses an extreme risk of catastrophic loss from wildland fire. La Pine is also threatened by the likely possibility of a crown fire sweeping into the community, or by embers falling on the community from an adjacent wildland fire.

#### **Hazard**

The hazard rating describes resistance to control once a fire starts based on weather, topography (including slope, aspect and elevation), vegetation and crown fire potential. As stated earlier, less logging activity and effective wildland fire suppression has led to a forestland of dense lodgepole pine with some mixed stands of lodgepole and ponderosa pine. Much of the understory consists of dense bitterbrush and manzanita with some areas of native bunchgrasses. Due to the lack of disturbance these stands continue to become more and more overcrowded.

A wildland fire could start within the communities or in any of the forested areas adjacent to and/or surrounding the communities. With a fire of any significance, it could be difficult to assemble the resources necessary to adequately address all of the fire and life safety issues that could arise in the early stages of emergency operations. The potential exists for a catastrophic wildland fire for any number of reasons, during any time of year.

#### **Values Protected**

The human and economic values protected in the Greater La Pine planning area range from low to high with an average rating of moderate. These ratings are based on home

density per ten acres and community infrastructure such as power substations, transportation corridors, water and fuel storage, etc.

There are approximately 6,900 homes in the unincorporated area of La Pine, with an appraised value of \$925 million. In addition, there are approximately 29,430 acres of private land with an appraised value of \$185 million. 170 businesses operate in the La Pine area, with an appraised value of \$71 million.

The essential infrastructure 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 roads, water and sewer systems would be minimal because most are underground or otherwise not flammable.

### **Other Community Values**

Of high importance to residents and business owners in La Pine is the value placed on scenic beauty and recreational opportunities that exist on public lands both within and adjacent to the planning area. If a large wildland fire occurs in this area which resulted in area closures or the closure of US Highway 97, the economic loss to businesses could be as much as \$50,000 per day.

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 La Pine area, but to the remainder of Deschutes County and neighboring cities like Bend, Redmond and Sisters. If a large wildland fire occurs in this area, the result will be catastrophic loss to both the developed and dispersed recreational opportunities in the greater La Pine area.

### **Protection capability**

Fire protection capability in the Greater La Pine planning area ranges from low to high with an average ranking of moderate. The ratings are based on fire protection capability and resources to control and suppress wildland and structural fires. The ratings also consider response times and community preparedness.

#### **La Pine Rural Fire Protection District**

The La Pine RFPD provides first response structural and wildland fire coverage within its 115 square mile service district. The District provides Emergency Medical Services, including Advanced Cardiac Life Support transport, within a 1,000 square mile boundary.

Two communities within the greater La Pine WUI boundary are not protected by the La Pine Rural Fire Protection District: Wickiup Acres and Section 36. Both areas are afforded wildland fire protection by Oregon Department of Forestry.

The District is managed by a five-member elected board of directors. The District consists of 20 career and 14 volunteer positions involved directly in fire and EMS

operations. The District also houses three resident students who participate in the Fire/EMS program at Central Oregon Community College. All firefighting personnel have received training in wildland firefighting practices, structural fire protection and suppression techniques, and other related topics. The District has adopted the National Incident Management Systems (NIMS) Incident Command System and all personnel have received training and continue to train in its use. There are three career personnel and 19 support volunteers not involved in fire and EMS.

The District works out of one centrally located fire station and two satellite stations. It maintains a fleet of three structural fire engines, three Advanced Cardiac Life Support ambulances, three heavy brush engines, one light brush engine, three water tenders and three staff/utility vehicles.

The District is a party to the Central Oregon Mutual Aid Agreement. In the event of a major fire the department may request assistance from all other fire departments that are signatory to the agreement. In addition to Central Oregon Fire Departments, this includes The US Forest Service, Oregon Department of Forestry, and the Bureau of Land Management. Conversely, when these agencies need assistance and the District has resources available, it assists them. The La Pine Rural Fire Protection District and Sunriver Fire Department cooperate in “automatic aid” which includes response zones in certain parts of each district.

#### Oregon Department of Forestry

Within the greater La Pine WUI, 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 greater La Pine WUI that receive dual protection from ODF and the La Pine RFPD because they are located within the rural fire protection district and are also classified as private forestland within the ODF district. In those cases La Pine RFPD provides initial response and transfers fire command to ODF upon their arrival.

Oregon Department of Forestry provides one Type 6 engine in the La Pine area during fire season, typically June through October. Twelve additional engines are available for 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.

#### USDA Forest Service and USDI Bureau of Land Management

The Forest Service and BLM provide wildland fire protection on the federal lands within the greater La Pine area. Together, 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 communications hub for fire and fuels operations, as well as safety and training issues for COFMS. In total, COFMS provides the following resources: 15 engines, 4 initial attack hand crews, 6 prevention units, 2 dozers, 2 water tenders, 1 helicopter with module, 35 smokejumpers, 2 Inter-regional Hotshot crews, 1 air tanker, 1 National Fire Cache, 1 interagency dispatch center and 20 overhead staff positions.

Anytime an incident grows beyond the capability of the local resources a request may be made to the State and to the Pacific Northwest Coordination Center for additional wildland fire fighting resources.

### Law Enforcement

Police services are provided by Deschutes County Sheriff in the La Pine basin. The Sheriff's Department has responsibility for ensuring the safe and orderly evacuation of the community in the event of a major emergency. A number of resources have been allocated to accomplish this task including hi/lo sirens on vehicles; emergency notification via radio and television; reverse 9-1-1 capability; Sheriff's Department staff; La Pine Rural Fire Protection District staff and community-wide volunteers. Any other issues relative to a major emergency are addressed by the Countywide Disaster Plan and the County Department of Emergency Services.

Oregon State Police assists the federal agency law enforcement efforts and cooperates with Deschutes County for protection in the greater La Pine area.

### Community Preparedness

Also under the category of Protection Capabilities, the ODF Assessment of Risk examines a community's level of organization and preparedness to respond in an emergency situation. The assessment looks at whether the area has an organized stakeholder group that looks out for its own area through mitigation efforts, a phone tree, etc. Or, does the area only receive outside efforts such as newsletters, mailings or FireFree information from other groups? In the Greater La Pine WUI, the communities at risk varied from having a high level of organization to not having any. The Steering Committee used local knowledge to determine the level of preparedness. The average value rating for community preparedness was moderate.



The following table is a summary of the nine identified communities, the value ratings and total score for each community in each category. The higher the total score in this assessment, the higher the overall risk.

**Table 1 – ODF Assessment of Risk**

Community	Risk	Hazard	Protection capability	Values protected	Structural vulnerability	Total score	Rank
Newberry Estates	High (40)	Extreme (74)	Moderate (10)	High (40)	Moderate (53.68)	<b>217.68</b>	<b>1</b>
6th & Dorrance	High (35)	Extreme (66.5)	Moderate (10)	High (35)	Moderate (52.33)	<b>198.83</b>	<b>2</b>
Day Road Corridor	High (35)	Extreme (69)	Moderate (10)	High (35)	Moderate (45.00)	<b>194.00</b>	<b>3</b>
Wickiup Acres	High (30)	Extreme (74)	High (19)	Low (2)	High (68.50)	<b>193.50</b>	<b>4</b>
Ponderosa Pines	High (35)	Extreme (69)	Low (8)	Moderate (25)	Moderate (51.52)	<b>188.52</b>	<b>5</b>
Masten Road Area	High (30)	Extreme (71.5)	Moderate (10)	Moderate (22)	Moderate (46.34)	<b>179.84</b>	<b>6</b>
Huntington South	High (30)	Extreme (69)	Moderate (10)	Moderate (22)	Moderate (44.26)	<b>175.26</b>	<b>7</b>
Little Deschutes River	High (30)	Extreme (64)	Moderate (10)	Moderate (22)	Moderate (44.72)	<b>170.72</b>	<b>8</b>
Section 36	High (30)	Extreme (74)	High (19)	Low (2)	Low (26.00)	<b>151.00</b>	<b>9</b>

**Risk:** Describes the likelihood of a fire occurring based on historical fire occurrence and ignition sources.

**Hazard:** Describes resistance to control once a fire starts based on weather, topography and fuel.

**Protection capability:** Describes fire protection capability and resources based on type of protection, response times and community preparedness.

**Values protected:** Describes the human and economic values in the community based on home density per ten acres and community infrastructure such as power substations, transportation corridors, water and fuel storage, etc.

**Structural vulnerability:** Describes the likelihood that structures will be destroyed by wildfire based on roofing and building materials, defensible space, separation of homes, fire department access and street signage.

**Total score:** A sum of all the points from each category surveyed.

**Rank:** An ordered numerical ranking based on the total points.

## Fire Regime Condition Class and Senate Bill 360 ratings

Fire Regime Condition Class considers the type of vegetation and the departure from its natural fire behavior interval.

Five natural (historical) fire regimes are classified based on the average number of years between fires (fire frequency) combined with the severity of the fire on dominant overstory vegetation. Fire regimes I through IV are each represented on the landscape in the greater La Pine planning area. Lodgepole pine for example has a 60-80 year fire interval with the potential for full stand replacement fires. Lodgepole pine therefore falls within Fire Regime IV which describes species with fire return intervals between 35 – 100 years. Ponderosa pine has an 11-15 year natural fire interval with a low potential for stand replacement fires. Therefore, ponderosa pine falls under Fire Regime I which describes species with fire return intervals between 0-35 years.

The following table summarizes Fire Regimes.

**Table 2 – Fire Regimes**

<b>Fire Regime Group</b>	<b>Fire Frequency</b>	<b>Fire Severity</b>	<b>Plant Association Group</b>
<b>I</b>	0 – 35 years	Low severity	Ponderosa pine, manzanita, bitterbrush
<b>II</b>	0 – 35 years	Stand replacement	Western juniper
<b>III</b>	35 – 100+ years	Mixed severity	Mixed conifer dry
<b>IV</b>	35 – 100+ years	Stand replacement	Lodgepole pine
<b>V</b>	> 200 years	Stand replacement	Western hemlock, mixed conifer wet

Condition Class categorizes a departure from the natural fire regime based on ecosystem attributes. In Condition Class 1, the historical ecosystem attributes are largely intact and functioning as defined by the historical natural fire regime. In other words, the stand has not missed a fire cycle. In Condition Class 2, the historical ecosystem attributes have been moderately altered. Generally, at least one fire cycle has been missed. In Condition Class 3, historical ecosystem attributes have been significantly altered. Multiple fire cycles have been missed. The risk of losing key ecosystem components (e.g. native species, large trees, soil) is low for Class 1, moderate for Class 2, and high for Class 3.

Lodgepole pine in the La Pine basin is considered in Condition Class 1 because it is currently within its historical and natural fire interval. It nonetheless poses a significant threat to communities due to its overgrowth and potential for large, stand replacement fires. For this reason, the steering committee also considered crown fire potential. This takes into account areas of high hazard such as lodgepole pine stands that may be in condition class 1, but still pose a significant risk to communities.

The following table summarizes Condition Class.

**Table 3 – Condition Class**

Condition Class	Attributes
<b>Condition Class 1</b>	<ul style="list-style-type: none"> <li>▪ Fire regimes are within or near an historical range.</li> <li>▪ The risk of losing key ecosystem components is low.</li> <li>▪ Fire frequencies have departed from historical frequencies (either increased or decreased) by no more than one return interval.</li> <li>▪ Vegetation attributes are in tact and functioning within an historical range.</li> </ul>
<b>Condition Class 2</b>	<ul style="list-style-type: none"> <li>▪ Fire regimes have been moderately altered from their historical range.</li> <li>▪ The risk of losing key ecosystem components has increased to moderate.</li> <li>▪ Fire frequencies have departed (either increased or decreased) from historical frequencies by more than one return interval. This change results in moderate changes to one or more of the following: fire size, frequency, intensity, severity or landscape patterns.</li> <li>▪ Vegetation attributes have been moderately altered from their historic ranges.</li> </ul>
<b>Condition Class 3</b>	<ul style="list-style-type: none"> <li>▪ Fire regimes have been significantly altered from their historical range.</li> <li>▪ The risk of losing key ecosystem components is high.</li> <li>▪ Fire frequencies have departed (either increased or decreased) by multiple return intervals. This change results in dramatic changes to one or more of the following: fire size, frequency, intensity, severity, or landscape patterns.</li> <li>▪ Vegetation attributes have been significantly altered from their historic ranges.</li> </ul>

The Steering Committee considered available GIS data that shows the amount of Condition Class 2 and 3 lands in the Greater La Pine WUI. The nine communities at risk were ranked and given a corresponding score based on the amount of Condition Class 2 and 3 lands in each community, with 1 representing the highest amount of Condition Class 2 and 3 lands. Therefore, the lower the ranking from this exercise, the higher the risk of catastrophic wildland fire. The summary of the scores in each area is shown in Table 4.

SB 360 ratings refer to the classification of risk under the Oregon Forestland – Urban Interface Fire Protection Act of 1997 based on the amount and type of vegetation on private property. Classifications in the Greater La Pine planning area include “high”, “extreme”, and “high density extreme”.

The Steering Committee combined the SB 360 classification map and the Fire Regime Condition Class map to reveal where “extreme” and “high density extreme” lands overlap with Condition Class 2 and 3 vegetation. The Steering Committee then ranked and gave a corresponding score to the nine communities at risk based on the amount of Condition Class 2 and 3 vegetation found on the “extreme” and “high density extreme” lands, with 1 referring to the highest amount of Condition Class 2 and 3 vegetation on “high density extreme” lands. Table 4 shows the summary of this exercise.

Table 4 also shows the combined scores for both exercises above in each of the nine communities. The lower the combined score for each community, the higher the risk.

**Table 4 – Fire Regime Condition Class & Senate Bill 360 Classifications**

	<b>Fire Regime Condition Class</b>	<b>Senate Bill 360</b>		
<b>Community</b>	<b>Score</b>	<b>Score</b>	<b>Total score</b>	<b>Rank</b>
<b>Newberry Estates</b>	1	4	5	1
<b>Ponderosa Pines</b>	4	1	5	1
<b>Masten Road Area</b>	5	1	6	2
<b>6<sup>th</sup> &amp; Dorrance</b>	3	3	6	2
<b>Day Road Corridor</b>	2	6	8	3
<b>Wickiup Acres</b>	8	2	10	4
<b>Huntington South</b>	6	6	12	5
<b>Little Deschutes River</b>	7	6	13	6
<b>Section 36</b>	8	5	13	6

## Neighborhood Structural Vulnerability

The steering committee agreed to utilize the NFPA 1144 structural vulnerability assessment. It evaluates survivability of structures in the event of a wildland fire. Local fire professionals and neighborhood leaders conducted the assessment in each of the nine communities at risk. The assessment is based on factors such as roofing and building materials, defensible space and distance between structures, and fire department access.

Table 5 is a summary of the NFPA 1144 Structural Vulnerability exercise. The higher the total score for each community, the higher the risk.

**Table 5 – NFPA 1144 Structural Vulnerability**

<b>Community</b>	<b>Total score</b>	<b>Rank</b>
<b>Wickiup Acres</b>	68.50	<b>1</b>
<b>Newberry Estates</b>	53.68	<b>2</b>
<b>6th &amp; Dorrance</b>	52.33	<b>3</b>
<b>Ponderosa Pines</b>	51.52	<b>4</b>
<b>Masten Road Area</b>	46.34	<b>5</b>
<b>Day Road Corridor</b>	45.00	<b>6</b>
<b>Little Deschutes River</b>	44.72	<b>7</b>
<b>Huntington South</b>	44.26	<b>8</b>
<b>Section 36</b>	26.00	<b>9</b>

The Steering Committee agreed to combine the three risk assessments and the following table summarizes all three risk assessments and assigns an overall rank for each of the nine communities. The lower the total score of all three assessments, the higher the risk.

**Table 6 – Summary of the three risk assessments**

<b>Community</b>	<b>ODF Assessment of Risk Factors</b>	<b>Fire Regime Condition Class &amp; Senate Bill 360</b>	<b>NFPA 1144 Structural Vulnerability</b>	<b>Total score</b>	<b>Overall rank</b>
<b>Newberry Estates</b>	1	1	2	4	1
<b>6th &amp; Dorrance</b>	2	2	3	7	2
<b>Wickiup Acres</b>	4	4	1	9	3
<b>Ponderosa Pines</b>	5	1	4	10	4
<b>Day Road Corridor</b>	3	3	6	12	5
<b>Masten Road Area</b>	6	2	5	13	6
<b>Huntington South</b>	7	5	8	20	7
<b>Little Deschutes River</b>	8	6	7	21	8
<b>Section 36</b>	9	6	9	24	9

## Areas of special concern

### Evacuation routes

Also of high importance to the residents and business owners in greater La Pine is the condition of the roads and the lack of evacuation routes in the area. The Steering Committee is concerned with the lack of maintained roads leading in and out of the high risk areas in the WUI boundary. Should an evacuation be necessary, as in the recent evacuation of over 700 people during the Park Fire, the Steering Committee expressed great concern over the quality of the evacuation routes. Many of the egress routes in the La Pine area are dirt roads that contribute to substantial dust and debris clouds as vehicles attempt to use them. During the summer months, after a few cars travel the road, the dust is so dense that it is not safe for vehicles to continue using the road until the dust settles. Lack of maintenance has led to deteriorated road surfaces with large potholes, ruts and washboards that slow evacuation efforts and cause some vehicles to break down, further complicating a mass departure from the area. The current condition of the evacuation routes is a life safety issue.

Two of the communities at risk have populated areas with only one way in and one way out. In the Little Deschutes River Corridor, the Lazy River South neighborhood has only one road for ingress and egress, and it is over a bridge, which presents additional risks in the event of an evacuation. The Deer Road neighborhood in the 6<sup>th</sup> & Dorrance Meadow community also only has one way in and out. These will be of high priority for evaluation and project determination by the Steering Committee following the completion of this plan.

### Vacant lots

Within the Greater La Pine Community Wildfire Protection Plan boundary, over 50% of the private lands are vacant lots. Many of those are owned by “absentee owners”. In general, vacant lots owned by absentee owners present a specific threat to neighborhoods in that owners have no connections to the neighborhoods and in most cases do not recognize their responsibility to contribute to the safety of the entire neighborhood by reducing the hazardous vegetation on their properties. The risk of destructive wildland fires is thereby greater inside these neighborhoods due to the lack of owner attention on vacant lots.

Deschutes County is the property owner for approximately 300 acres of half-acre or larger lots. The Oregon Forestland-Urban Interface Fire Protection Act of 1997 (also known as Senate Bill 360) only addresses vacant lots that are classified as “High Density Extreme” with a recommended standard of a 20-foot fuel break around each vacant lot. Only a small percentage of the plan area is classified as “High Density Extreme” yet there are thousands of acres in the plan area that pose a significant threat to neighboring lands. The Oregon Department of Forestry along with Deschutes County and the La Pine Fire District are currently working on solutions to this issue, including a proposed county ordinance that addresses all vacant lots.

## Prioritized Hazard Reduction Recommendations and Preferred Treatment Methods

The Steering Committee agreed that the Greater La Pine Community Wildfire Protection Plan is a tool that can be used for many outcomes. The following is an outline of the priorities and preferred treatments under the Greater La Pine Community Wildfire Protection Plan.

### **Federal and State owned lands**

Federal lands make up a majority of the Greater La Pine CWPP and each of the nine neighborhoods is adjacent to public land managed by either the Forest Service or the Bureau of Land Management. State owned lands represent only a small percentage of the lands within the plan area. The state also bears fire protection responsibility for the La Pine State Park which borders the Greater La Pine WUI boundary. Although it is outside the greater La Pine WUI, the Steering Committee expresses great concern over the significant threat to adjacent neighborhoods and recommends that it be recognized as a priority area for fuels treatment. It is the intent of the Steering Committee that the Greater La Pine WUI be subject to expedited measures for hazardous fuels treatment and allocation of funds to protect the communities and neighborhoods as stipulated by the Healthy Forests Restoration Act.

The included maps show the WUI boundary throughout the Greater La Pine CWPP and the individual neighborhoods calling for protection specifically by reducing wildland fuel hazards on public lands.

The standard of the Greater La Pine CWPP is to decrease the risk of uncharacteristic wildland fire behavior by reducing fuel loads to that which can produce flame lengths of less than four feet in the areas within the ¼ mile buffer of each community at risk. This enables safe and effective initial attack. This standard will be achieved by the federal and state landowners through a variety of treatment methodologies such as prescribed burning and mechanical treatments.

Based on the combined risk assessments shown in Table 6, the priorities of the Greater La Pine Community Wildfire Protection Plan with regard to federal and state owned lands within the WUI are as follows:

1) Condition class 2 and 3 lands and all areas where crown fire potential is rated extreme:

A) Within ¼ mile of each community at risk portions of the WUI utilizing the following priorities:

- Newberry Estates, 6<sup>th</sup> and Dorrance and Wickiup Acres
- Ponderosa Pines, Day Road, and Masten Road.
- Little Deschutes Corridor, Huntington South and Section 36



- B) Within 300 feet of any evacuation route from each community at risk. Specific treatment should address fuels issues on a landscape scale rather than acre by acre.
- 2) Condition class 2 and 3 lands and all areas where crown fire potential is rated extreme, beyond ¼ mile of each prioritized community at risk, in ¼ mile increments until the WUI boundary is reached.

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 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 to ponderosa pine. In exclusively lodgepole pine stands where site conditions are not favorable to ponderosa pine, thinning should occur to provide a minimum of 20' X 20' spacing, and excessive dead/down fuels should be removed followed by understory maintenance.

### **Industrial and non-industrial private timberlands**

The Steering Committee recommends continued partnerships with private timberland owners that encourage the following standard and treatments.

The standard of the Greater La Pine CWPP is to decrease the risk of uncharacteristic wildland fire behavior by reducing fuel loads to that which can produce flame lengths of less than four feet in the areas within the ¼ mile buffer of each identified neighborhood. This enables safe and effective initial attack. This standard will be achieved by the industrial and non-industrial timberland owners through a variety of treatment methodologies such as prescribed burning and mechanical treatments.

Based on the combined risk assessments shown in Table 6, the priorities of the Greater La Pine Community Wildfire Protection Plan with regard to industrial and non-industrial timberlands within the WUI are as follows:

- 1) Condition class 2 and 3 lands and all areas where crown fire potential is rated extreme:
- A) Within ¼ mile of each community at risk portions of the WUI utilizing the following priorities:
- Newberry Estates, 6<sup>th</sup> and Dorrance and Wickiup Acres
  - Ponderosa Pines, Day Road, and Masten Road.
  - Little Deschutes Corridor, Huntington South and Section 36
- B) Within 300 feet of any evacuation route from each community at risk. Specific treatment should address fuels issues on a landscape scale rather than acre by acre.

2) Condition class 2 and 3 lands and all areas where crown fire potential is rated extreme, beyond ¼ mile of each prioritized community at risk, in ¼ mile increments until the WUI boundary is reached.

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 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 landowner, of lodgepole to ponderosa pine. In exclusively lodgepole pine stands where site conditions are not favorable to ponderosa pine, thinning should occur to provide a minimum of 20' X 20' spacing, and excessive dead/down fuels should be removed followed by understory maintenance.

### **Private and County owned lands**

The standard of the Greater La Pine CWPP is to decrease the risk of uncharacteristic wildland fire behavior by reducing fuel loads to that which can produce flame lengths of less than four feet in the areas within the ¼ mile buffer of each community at risk. This enables safe and effective initial attack. This standard will be achieved by the private landowners through a variety of treatment methodologies such as prescribed burning and mechanical treatments.

On private lands within the Greater La Pine CWPP WUI boundary with structural improvements, the goal is for each structure to meet the defensible space requirements identified in the Oregon Forestland – Urban Interface Fire Protection Act of 1997, also known as Senate Bill 360.

Priority areas for completion based on Table 6:

- Newberry Estates, 6<sup>th</sup> and Dorrance and Wickiup Acres
- Ponderosa Pines, Day Road, and Masten Road.
- Little Deschutes Corridor, Huntington South and Section 36

On private and County owned lands that are vacant lots, the goal is for each lot to have an established and maintained 20-foot fuel break along property lines and the sides of every road, or adhere to any subsequent county ordinance that addresses vacant lots.

Priority areas for completion based on Table 6:

- Newberry Estates, 6<sup>th</sup> and Dorrance and Wickiup Acres
- Ponderosa Pines, Day Road, and Masten Road.
- Little Deschutes Corridor, Huntington South and Section 36

## Recommendations to Reduce Structural Vulnerability

### **Structural Vulnerability**

In recent years, many neighborhoods in the greater La Pine area have been taking steps to decrease the vulnerability of structures to wildland fire. It is a goal of this CWPP that all structures within the plan area are as fire safe as possible; and that all neighborhoods and structures survivable in the event of a wildland fire.

The Structural Vulnerability risk assessment identified the communities at greatest risk based on the NFPA 1144 survey. Utilizing that information, the Steering Committee prioritized the nine communities at risk of loss due to wildland fire. The prioritized list for recommended action is located in Table 5.

The following table identifies the main hazards for structures and communities at risk in Greater La Pine. For each hazard or risk listed, an action is recommended to address the threat or decrease the risk. The communities are listed in priority order from Table 5.

**Table 7 – Structural Vulnerability Hazards & Recommendations**

Priority	Community	Primary Hazards	Recommended Actions
1	Wickiup Acres	Defensible space – hazardous vegetation	FireFree, Fire Wise, SB 360 compliance
		Structural composition	FireFree, Fire Wise, SB 360 compliance
		Insufficient water supply	Develop water supply
		Poor condition of roads	Identify, upgrade and maintain
2	Newberry Estates	Defensible space – hazardous vegetation	FireFree, Fire Wise, SB 360 compliance
		Structural composition	FireFree, Fire Wise, SB 360 compliance
		No water supply	Develop water supply
		Insufficient evacuation routes	Establish route(s), sign and maintain
		Poor condition of interior roads	Identify, upgrade and maintain
3	6 <sup>th</sup> and Dorrance	Defensible space – hazardous vegetation	FireFree, Fire Wise, SB 360 compliance
		Structural composition	FireFree, Fire Wise, SB 360 compliance
		Some high structural density	FireFree, Fire Wise, SB 360 compliance
		No water supply	Develop water supply
		Insufficient evacuation routes	Establish route(s), sign and maintain
4	Ponderosa Pines	Poor condition of interior roads	Identify, upgrade and maintain
		Defensible space – hazardous vegetation	FireFree, Fire Wise, SB 360 compliance
		Structural composition	FireFree, Fire Wise, SB 360 compliance
		High structural density	FireFree, Fire Wise, SB 360 compliance
		Insufficient water system	Upgrade to support structural fire flow
5	Masten Road	Insufficient evacuation routes	Establish route(s), sign and maintain
		Poor condition of interior roads	Identify, upgrade and maintain
		Defensible space – hazardous vegetation	FireFree, Fire Wise, SB 360 compliance
		Structural composition	FireFree, Fire Wise, SB 360 compliance
		High structural density	FireFree, Fire Wise, SB 360 compliance
6	Day Road Corridor	No water supply	Develop water supply
		Insufficient evacuation routes	Establish route(s), sign and maintain
		Poor condition of interior roads	Identify, upgrade and maintain
		Defensible space – hazardous vegetation	FireFree, Fire Wise, SB 360 compliance
		Structural composition	FireFree, Fire Wise, SB 360 compliance
7	Little Deschutes River	Some high structural density	FireFree, Fire Wise, SB 360 compliance
		No water supply	Develop water supply
		Insufficient evacuation routes	Establish route(s), sign and maintain
		Poor condition of interior roads	Identify, upgrade and maintain
		Defensible space – hazardous vegetation	FireFree, Fire Wise, SB 360 compliance
8	Huntington South	Structural composition	FireFree, Fire Wise, SB 360 compliance
		No water supply	Develop water supply
		Insufficient evacuation routes	Establish route(s), sign and maintain
		Poor condition of interior roads	Identify, upgrade and maintain
		Defensible space – hazardous vegetation	FireFree, Fire Wise, SB 360 compliance
9	Section 36	Defensible space – hazardous vegetation	FireFree, Fire Wise, SB 360 compliance
		Structural composition	FireFree, Fire Wise, SB 360 compliance
		No water supply	Develop water supply
		Insufficient evacuation routes	Establish route(s), sign and maintain
		Poor condition of roads	Identify, upgrade and maintain

## Education

Education and outreach are primary goals for the Greater La Pine CWPP. There are ongoing efforts in greater La Pine to educate and inform residents about two main subjects: living in a fire adapted environment and increasing personal responsibility for creating defensible space.

The rapid influx of new residents is just one reason the Steering Committee places high value on the education of La Pine area residents and landowners. Many new residents are unfamiliar with wildland fire and have limited experience with issues like defensible space. Residents 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.

The La Pine Rural Fire Protection District maintains active membership in the Central Oregon Fire Prevention Cooperative, the Central Oregon FireFree Program and routinely partners with Project Wildfire for educational efforts in each area. The Steering Committee for the Greater La Pine CWPP is committed to maintaining and enhancing these partnerships.

Some neighborhoods in the greater La Pine area are well organized through homeowners associations and other organized groups. These groups provide valuable ongoing education to their populations about the risks of catastrophic wildland fire and ways to reduce those risks. The Steering Committee supports these groups and encourages the formation of them in the greater La Pine area to address the educational needs of current and incoming residents about living in a fire adapted environment and increasing personal responsibility for creating defensible space.

Local residents are encouraged to contact the La Pine Rural Protection Fire District for information. Residents may also find additional information on how they can reduce hazards and protect themselves from loss due to wildland fires at [www.firefree.org](http://www.firefree.org) and [www.firewise.org](http://www.firewise.org).

## Action Plan and Implementation

The Steering Committee will make copies of the Greater La Pine CWPP available to all adjacent landowners including the Deschutes National Forest, the Bureau of Land Management, Oregon Department of Forestry, industrial and non-industrial timberland owners. The intention of the Steering Committee is to engage in continued discussions with the greater La Pine community and adjacent landowners to implement the CWPP and projects that address the outlined priorities in the Greater La Pine planning area in the most expeditious manner possible.

Regarding Structural Vulnerability, the Steering Committee is charged with the task of engaging community members to review the Structural Vulnerability Assessment in this CWPP and identify projects that will strengthen the potential for the neighborhoods to survive a catastrophic wildland fire within the Greater La Pine WUI.

In addition, 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.

## Evaluation and Monitoring

The Steering Committee faced a complex task in the development of the Greater La Pine Community Wildfire Protection Plan. Implementing and sustaining these efforts will require a significant commitment. Building a collaborative and cooperative environment between the La Pine Rural Fire Protection District, community-based organizations, local government and the public land management agencies has been the first step in reducing the risk of wildland fire. The Steering Committee pledges to maintain this cooperation with the public over the long-term with the commitment of all the partners involved.

The La Pine Rural Fire Protection District will work with Project Wildfire to convene the Steering Committee yearly as follows, or as often as the Steering Committee deems necessary to accomplish agreed upon tasks:

### **January**

- Identify specific fuels treatment projects.
- Discuss grant opportunities and determine which communities at risk will seek funding for identified projects.
- Review grant opportunities, write grants.

### **Spring**

- Identify appropriate projects to decrease structural vulnerability, address issues with evacuation routes, condition of roads and water supply.
- Identify appropriate projects to address educational needs.

### **Fall**

- Evaluate and track progress toward goals (field trips to project areas), and update maps.
- Identify and assess new or treated risks.
- Adopt new and/or revised priorities, with specific projects.

At a minimum, the Steering Committee shall include: the La Pine RFPD Fire Chief; a representative from ODF; representatives from the US Forest Service, the BLM, Central Oregon Fire Management Service and Deschutes County along with members of the greater La Pine public.

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## Glossary of Terms

### A

**Aerial Fuels:** All live and dead vegetation in the forest canopy or above surface fuels, including tree branches, twigs and cones, snags, moss, and high brush.

**Agency:** Any federal, state, or county government organization participating with jurisdictional responsibilities.

**Anchor Point:** An advantageous location, usually a barrier to fire spread, from which to start building a fire line. An anchor point is used to reduce the chance of firefighters being flanked by fire.

**Aspect:** Direction toward which a slope faces.

### B

**Backfire:** A fire set along the inner edge of a fire line to consume the fuel in the path of a wildfire and/or change the direction of force of the fire's convection column.

**Blow-up:** A sudden increase in fire intensity or rate of spread strong enough to prevent direct control or to upset control plans. Blow-ups are often accompanied by violent convection and may have other characteristics of a fire storm. (See Flare-up.)

**Brush:** A collective term that refers to stands of vegetation dominated by shrubby, woody plants, or low growing trees, usually of a type undesirable for livestock or timber management.

**Brush Fire:** A fire burning in vegetation that is predominantly shrubs, brush and scrub growth.

**Buffer Zones:** An area of reduced vegetation that separates wild lands from vulnerable residential or business developments. This barrier is similar to a greenbelt in that it is usually used for another purpose such as agriculture, recreation areas, parks, or golf courses.

**Burn Out:** Setting fire inside a control line to widen it or consume fuel between the edge of the fire and the control line.

**Burning Ban:** A declared ban on open air burning within a specified area, usually due to sustained high fire danger.

**Burning Conditions:** The state of the combined factors of the environment that affect fire behavior in a specified fuel type.

**Burning Period:** That part of each 24-hour period when fires spread most rapidly, typically from 10:00 a.m. to sundown.

### C

**Closure:** Legal restriction, but not necessarily elimination of specified activities such as smoking, camping, or entry that might cause fires in a given area.

**Contain a fire:** A fuel break around the fire has been completed. This break may include natural barriers or manually and/or mechanically constructed line.

**Control a fire:** The complete extinguishment of a fire, including spot fires. Fire line has been strengthened so that flare-ups from within the perimeter of the fire will not break through this line.

**Control Line:** All built or natural fire barriers and treated fire edge used to control a fire.

**Creeping Fire:** Fire burning with a low flame and spreading slowly.

**Crown:** That portion of a tree or shrub which is either the needles or leaves. Tree needles generally stay green and remain on the tree, leaves are generally deciduous and fall from the tree in autumn.

**Crown Fire (Crowning):** The movement of fire through the crowns of trees or shrubs more or less independently of the surface fire.

**Curing:** Drying and browning of herbaceous vegetation or slash.

## D

**Dead Fuels:** Fuels with no living tissue in which moisture content is governed almost entirely by atmospheric moisture (relative humidity and precipitation), dry-bulb temperature, and solar radiation.

**Debris Burning:** A fire spreading from any fire originally set for the purpose of clearing land or for rubbish, garbage, range, stubble, or meadow burning.

**Defensible Space:** An area either natural or manmade where material capable of causing a fire to spread has been treated, cleared, reduced, or changed to act as a barrier between an advancing wildland fire and the loss to life, property, or resources. In practice, "defensible space" is defined as an area a minimum of 30 feet around a structure that is cleared of flammable brush or vegetation.

**Drought Index:** A number representing net effect of evaporation, transpiration, and precipitation in producing cumulative moisture depletion in deep duff or upper soil layers.

**Dry Lightning Storm:** Thunderstorm in which negligible precipitation reaches the ground. Also called a dry storm.

**Duff:** The layer of decomposing organic materials lying below the litter layer of freshly fallen twigs, needles, and leaves and immediately above the mineral soil.

## E

**Environmental Assessment (EA):** EA's were authorized by the National Environmental Policy Act (NEPA) of 1969. They are concise, analytical documents prepared with public participation that determine if an Environmental Impact Statement (EIS) is needed for a particular project or action. If an EA determines an EIS is not needed, the EA becomes the document allowing agency compliance with NEPA requirements.

**Environmental Impact Statement (EIS):** EIS's were authorized by the National Environmental Policy Act (NEPA) of 1969. Prepared with public participation, they assist decision makers by providing information, analysis and an array of action alternatives, allowing managers to see the probable effects of decisions on the environment. Generally, EIS's are written for large-scale actions or geographical areas.

**Extreme Fire Behavior:** "Extreme" implies a level of fire behavior characteristics that ordinarily precludes methods of direct control action. One or more of the following is usually involved: high rate of spread, prolific crowning and/or spotting, presence of fire whirls, strong convection column. Predictability is difficult because such fires often exercise some degree of influence on their environment and behave erratically, sometimes dangerously.

## F

**Fine (Light) Fuels:** Fast-drying fuels, generally with a comparatively high surface area-to-volume ratio, which is less than 1/4-inch in diameter and has a time lag of one hour or less. These fuels readily ignite and are rapidly consumed by fire when dry.

**Fire Behavior:** The manner in which a fire reacts to the influences of fuel, weather and topography.

**Fire Behavior Forecast:** Prediction of probable fire behavior usually prepared by a Fire Behavior Officer, in support of fire suppression or prescribed burning operations.

**Fire Break/Fuel Break:** A natural or constructed barrier used to stop or check fires that may occur, or to provide a control line from which to work. In either case, sufficient vegetation (fuel) is removed or absent from the area.

**Fire Front:** The part of a fire within which continuous flaming combustion is taking place. Unless otherwise specified the fire front is assumed to be the leading edge of the fire perimeter. In ground fires, the fire front may be mainly smoldering combustion.

**Fire Intensity:** A general term relating to the heat energy released by a fire.

**Fire Line:** A linear fire barrier that is scraped or dug to mineral soil.

**Fire Load:** The number and size of fires historically experienced on a specified unit over a specified period (usually one day) at a specified index of fire danger.

**Fire Management Plan (FMP):** A strategic plan that defines a program to manage wildland and prescribed fires and documents the Fire Management Program in the approved land use plan. The plan is supplemented by operational plans such as preparedness plans, preplanned dispatch plans, prescribed fire plans, and prevention plans.

**Fire Perimeter:** The entire outer edge or boundary of a fire.

**Fire Season:** 1) Period(s) of the year during which wildland fires are likely to occur, spread, and affect resource values sufficient to warrant organized fire management activities. 2) A legally enacted time during which burning activities are regulated by state or local authority.

**Fire Weather:** Weather conditions that influence fire ignition, behavior and suppression.

**Fire Weather Watch:** A term used by fire weather forecasters to notify using agencies, usually 24 to 72 hours ahead of the event, that current and developing meteorological conditions may evolve into dangerous fire weather.

**Firefighting Resources:** All people and major items of equipment that can or potentially could be assigned to fires.

**Flame Height:** The average maximum vertical extension of flames at the leading edge of the fire front. Occasional flashes that rise above the general level of flames are not considered. This distance is less than the flame length if flames are tilted due to wind or slope.

**Flame Length:** The distance between the flame tip and the midpoint of the flame depth at the base of the flame (generally the ground surface); an indicator of fire intensity.

**Flaming Front:** The zone of a moving fire where the combustion is primarily flaming. Behind this flaming zone combustion is primarily glowing. Light fuels typically have a shallow flaming front, whereas heavy fuels have a deeper front. Also called fire front.

**Flanks of a Fire:** The parts of a fire's perimeter that are roughly parallel to the main direction of spread.

**Flare-up:** Any sudden acceleration of fire spread or intensification of a fire. Unlike a blow-up, a flare-up lasts a relatively short time and does not radically change control plans.

**Flash Fuels:** Fuels such as grass, leaves, draped pine needles, fern, tree moss and some kinds of slash, that ignite readily and are consumed rapidly when dry. Also called fine fuels.

**Forbs:** A plant with a soft, rather than permanent woody stem, that is not a grass or grass-like plant.

**Fuel:** Combustible material. Includes, vegetation, such as grass, leaves, ground litter, plants, shrubs and trees, which feed a fire. (See Surface Fuels.)

**Fuel Bed:** An array of fuels usually constructed with specific loading, depth and particle size to meet experimental requirements; also, commonly used to describe the fuel composition in natural settings.

**Fuel Break/Fire Break:** A natural or constructed barrier used to stop or check fires that may occur, or to provide a control line from which to work. In either case, sufficient vegetation (fuel) is removed or absent from the area.

**Fuel Loading:** The amount of fuel present expressed quantitatively in terms of weight of fuel per unit area.

**Fuel Reduction:** Manipulation, including combustion, or removal of fuels to reduce the likelihood of ignition and/or to lessen potential damage and resistance to control.

**Fuel Type:** An identifiable association of fuel elements of a distinctive plant species, form, size, arrangement, or other characteristics that will cause a predictable rate of fire spread or difficulty of control under specified weather conditions.

## G

**Geographic Area:** A political boundary designated by the wildland fire protection agencies, where these agencies work together in the coordination and effective utilization

**Ground Fuel:** All combustible materials below the surface litter, including duff, tree or shrub roots, punchy wood, peat, and sawdust, which normally support a glowing combustion without flame.

## H

**Hand Line:** A fireline built with hand tools.

**Hazard Reduction:** Any treatment of a hazard that reduces the threat of ignition and fire intensity or rate of spread.

**Head of a Fire:** The side of the fire having the fastest rate of spread.

**Heavy Fuels:** Fuels of large diameter such as snags, logs, large limb wood, that ignite and are consumed more slowly than flash fuels.

**Hotspot:** A particular active part of a fire.

## I

**Incident Commander:** Individual responsible for the management of all incident operations at the incident site.

**Initial Attack:** The actions taken by the first resources to arrive at a wildfire to protect lives and property, and prevent further extension of the fire.

## K

**Knock Down:** To reduce the flame or heat on the more vigorously burning parts of a fire edge.

## L

**Ladder Fuels:** Fuels which provide vertical continuity between strata, thereby allowing fire to carry from surface fuels into the crowns of trees or shrubs with relative ease. They help initiate and assure the continuation of crowning.

**Large Fire:** 1) For statistical purposes, a fire burning more than a specified area of land e.g., 300 acres.  
2) A fire burning with a size and intensity such that its behavior is determined by interaction between its own convection column and weather conditions above the surface.

**Light (Fine) Fuels:** Fast-drying fuels, generally with comparatively high surface area-to-volume ratios, which is less than 1/4-inch in diameter and have a time lag of one hour or less. These fuels readily ignite and are rapidly consumed by fire when dry.

**Lightning Activity Level (LAL):** A number, on a scale of 1 to 6, which reflects frequency and character of cloud-to-ground lightning. The scale is exponential, based on powers of 2 (i.e., LAL 3 indicates twice the lightning of LAL 2).

**Litter:** Top layer of the forest, scrubland, or grassland floor, directly above the fermentation layer, composed of loose debris of dead sticks, branches, twigs, and recently fallen leaves or needles, little altered in structure by decomposition.

**Live Fuels:** Living plants, such as trees, grasses, and shrubs, in which the seasonal moisture content cycle is controlled largely by internal physiological mechanisms, rather than by external weather influences.

## M

**Mineral Soil:** Soil layers below the predominantly organic horizons; soil with little combustible material.

**Mop-up:** To make a fire safe or reduce residual smoke after the fire has been controlled by extinguishing or removing burning material along or near the control line, felling snags, or moving logs so they won't roll downhill.

## N

**National Environmental Policy Act (NEPA):** NEPA is the basic national law for protection of the environment, passed by Congress in 1969. It sets policy and procedures for environmental protection, and authorizes Environmental Impact Statements and Environmental Assessments to be used as analytical tools to help federal managers make decisions.

**Normal Fire Season:** 1) A season when weather, fire danger, and number and distribution of fires are about average. 2) Period of the year that normally comprises the fire season.

## P

**Peak Fire Season:** That period of the fire season during which fires are expected to ignite most readily, to burn with greater than average intensity, and to create damages at an unacceptable level.

**Preparedness:** Condition or degree of being ready to cope with a potential fire situation

**Prescribed Fire:** Any fire ignited by management actions under certain, predetermined conditions to meet specific objectives related to hazardous fuels or habitat improvement. A written, approved prescribed fire plan must exist, and NEPA requirements must be met, prior to ignition.

**Prescription:** Measurable criteria that define conditions under which a prescribed fire may be ignited, guide selection of appropriate management responses, and indicate other required actions. Prescription criteria may include safety, economic, public health, environmental, geographic, administrative, social, or legal considerations.

**Prevention:** Activities directed at reducing the incidence of fires, including public education, law enforcement, personal contact, and reduction of fuel hazards.

**Project Fire:** A fire of such size or complexity that a large organization and prolonged activity is required to suppress it.

## R

**Rate of Spread:** The relative activity of a fire in extending its horizontal dimensions. It is expressed as a rate of increase of the total perimeter of the fire, as rate of forward spread of the fire front, or as rate of increase in area, depending on the intended use of the information. Usually it is expressed in chains or acres per hour for a specific period in the fire's history.

**Re-burn:** The burning of an area that has been previously burned but that contains flammable fuel that ignites when burning conditions are more favorable; an area that has re-burned.

**Red Flag Warning:** Term used by fire weather forecasters to alert forecast users to an ongoing or imminent critical fire weather pattern.

**Rehabilitation:** The activities necessary to repair damage or disturbance caused by wildland fires or the fire suppression activity.

**Resource Management Plan (RMP):** A document prepared by field office staff with public participation and approved by field office managers that provides general guidance and direction for land management activities at a field office. The RMP identifies the need for fire in a particular area and for a specific benefit.

**Retardant:** A substance or chemical agent which reduced the flammability of combustibles.

**Run (of a fire):** The rapid advance of the head of a fire with a marked change in fire line intensity and rate of spread from that noted before and after the advance.

## S

**Slash:** Debris left after logging, pruning, thinning or brush cutting; includes logs, chips, bark, branches, stumps and broken understory trees or brush.

**Smoke Management:** Application of fire intensities and meteorological processes to minimize degradation of air quality during prescribed fires.

**Smoldering Fire:** A fire burning without flame and barely spreading.

**Snag:** A standing dead tree or part of a dead tree from which at least the smaller branches have fallen.

**Spark Arrester:** A device installed in a chimney, flue, or exhaust pipe to stop the emission of sparks and burning fragments.

**Spot Fire:** A fire ignited outside the perimeter of the main fire by flying sparks or embers.

**Spotting:** Behavior of a fire producing sparks or embers that are carried by the wind and start new fires beyond the zone of direct ignition by the main fire.

**Structure Fire:** Fire originating in and burning any part or all of any building, shelter, or other structure.

**Suppressant:** An agent, such as water or foam, used to extinguish the flaming and glowing phases of combustion when direction applied to burning fuels.

**Suppression:** All the work of extinguishing or containing a fire, beginning with its discovery.

**Surface Fuels:** Loose surface litter on the soil surface, normally consisting of fallen leaves or needles, twigs, bark, cones, and small branches that have not yet decayed enough to lose their identity; also grasses, forbs, low and medium shrubs, tree seedlings, heavier branch wood, downed logs, and stumps interspersed with or partially replacing the litter.

## T

**Tactics:** Deploying and directing resources on an incident to accomplish the objectives designated by strategy.

**Test Fire:** A small fire ignited within the planned burn unit to determine the characteristic of the prescribed fire, such as fire behavior, detection performance and control measures.

**Torching:** The ignition and flare-up of a tree or small group of trees, usually from bottom to top.

## U

**Uncontrolled Fire:** Any fire which threatens to destroy life, property, or natural resources, and

**Under burn:** A fire that consumes surface fuels but not trees or shrubs. (See Surface Fuels.)

**Unprotected Lands:** Improved and unimproved lands where no formal structural and/or wildland response is planned in the event of fire. These lands are not claimed by wildland or structural fire agencies and by default, County Government is responsible for fire protection.

## V

**Volunteer Fire Department (VFD):** A fire department of which some or all members are unpaid.

## W

**Wet Line:** A line of water or water and chemical retardant, sprayed along the ground, that serves as a temporary control line from which to ignite or stop a low-intensity fire. **Wildland Fire:** Any non-structure fire, other than prescribed fire, that occurs in the wildland.

**Wildland Urban Interface:** The line, area or zone where structures and other human development meet or intermingle with undeveloped wildland or vegetative fuels.



