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# Preliminary Assessment Cascade Crest Fuel Break

**Clackamas River Ranger District, Mt. Hood National Forest  
Clackamas and Marion Counties, Oregon**

The project is located in T.7S., R.8E.; T.8S., R.8E.; T.7S., R.8½ E.; T.9S., R.8E.;  
Willamette Meridian.

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Dead trees along road 4220



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## 1.0 SUMMARY

Over the past decade, Central Oregon and the Inland West have experienced large wildfires that have put many assets at risk, including people’s lives and homes, sensitive or protected fish and wildlife habitat, culturally and Tribally significant resources, critical infrastructure, soil productivity, aesthetics, clean air and other valued components of forests and communities. In recent years, federal land management agencies have been focusing efforts to minimize the potential impacts of large scale wildfires.

Currently, an ongoing beetle infestation in the Olallie Butte area results in large volumes of dead and down material, creating a significant build-up of hazardous fuels. There is the potential for lightning or human caused fires to grow large threatening both federal and Tribal assets. Of particular concern for the Confederated Tribes of Warm Springs is the proximity of these hazardous fuels to Tribal lands.

The Tribal Council of the Confederated Tribes of the Warm Springs Reservation of Oregon requested that the Forest Service enter into a stewardship agreement to facilitate implementation of a shaded fuel break in this area. This would be a collaborative project between the Confederated Tribes of Warm Springs and the Forest Service. The project

would create a shaded fuel break by cutting some trees and brush and cleaning up fuels on the ground along roads 4220 and 4230 to aid in the safe suppression of large scale wildfires. Section 2.3 has greater detail on the proposed action.

The Tribes made their request under the authorities of the Tribal Forest Protection Act that was passed by Congress in 2004 (Public Law 108-278). The text may be viewed at <http://www.fs.fed.us/spf/tribalrelations/Policy/public%20law%20108-278.pdf> . Regional Forester Linda Goodman accepted their proposal on April 19, 2007.

In the event of a wildfire, a shaded fuel break along these roads would create a situation of reduced flame length and fire intensity that would allow the area to be more easily and safely defended by firefighters. As a result, fewer acres would be burned and there would be reduced risk to Tribal resources. Section 4.1 has more detail about the current fire hazard situation and about fire fighting tactics.

In addition to the primary goal discussed above, there are additional benefits and opportunities associated with this project. Road 4220 (south of the 4690 junction) is a primitive road and is the only access to the Olallie Lake area: a heavily used recreation area. There would be benefits to public safety in the event of a wildfire requiring evacuation of the Olallie area. Reducing wildfire size would result in reduced impacts to the Late-Successional Reserve and species dependant on late-successional habitats, and reduced impacts to scenery in the Olallie Lake Scenic Area. There is also the opportunity to remove and utilize the woody material as timber, firewood or biomass.

Stewardship contracts, service contracts, agreements, or timber sales, may be the management tools used to create the shaded fuel break. Methods used to create the shaded fuel break could include harvest, non-commercial thinning, and piling and burning. Currently, the stands in the fuel break include dead and dying lodgepole pine stands, mature mixed conifer stands and young plantations.

Many Forest Plan standards and guidelines were devised to address traditional timber sale activities. Exceptions to these standards and guidelines will be needed where appropriate for this fuel break to be effective.

## 2.0 INTRODUCTION

### 2.1 Document Structure

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The Forest Service has prepared this document in compliance with the National Environmental Policy Act (NEPA) and other relevant Federal and State laws and regulations. This document discloses the direct, indirect, and cumulative environmental impacts that would result from the proposed action and alternatives. The document is organized into the following parts:

- *Summary*

- *Introduction:* This section includes the purpose of and need for the project, and the agency's proposal for achieving that purpose and need. This discussion also includes design criteria and Best Management Practices. This section also details how the Forest Service informed the public of the proposal and how the public responded.
- *Alternatives:* This section provides a description of alternative methods for achieving the stated purpose. These alternatives were developed based on issues raised by the public and other agencies. Finally, this section provides a comparison of the environmental consequences associated with each alternative.
- *Environmental Consequences:* This section describes the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by resource. Within each section, the existing situation is described first, followed by the effects of the alternatives. The No-action Alternative provides a baseline for evaluation and comparison of the other alternatives.

Additional documentation, including more detailed analyses of project-area resources, may be found in the project planning record located at the Estacada Ranger Station in Estacada, Oregon.

## 2.2 Purpose and Need for Action \_\_\_\_\_

### 2.2.1 The purpose of this project is to aid in the suppression of large scale wildfires.

This action is needed because there is increasing fire hazard and risk caused by dead and dying trees, by dense vegetation and the accumulation of fuels on the ground. The action responds to the request of the Tribal Council of the Confederated Tribes of the Warm Springs Reservation of Oregon under the authorities of the Tribal Forest Protection Act. There is a concern for firefighter safety.

If no action is taken, a large scale wildfire could impact Tribal archaeological sites, first foods, medicinal plants and other resources. If no action is taken, a large scale wildfire would put firefighters at risk, more time and forces would be needed to establish effective fire lines, and the fire would grow larger.

One goal is to reduce fuels in the fuel break so that if a fire were to burn through, flame lengths would be 4 feet or less to permit direct attack or burn out operations by firefighters. Currently, fire models indicate that flame lengths would be up to approximately 100 feet.

Wildfire suppression is extraordinarily expensive. It is more cost effective to reduce fuels and establish control lines in advance.

### 2.2.2 **Management Direction** – The proposed action has been designed to meet the goals and objectives of the documents listed below. This assessment is tiered to the Environmental Impact Statements and the listed plans are incorporated by reference.

- The Mt. Hood National Forest Land and Resource Management Plan as amended (USDA 1990b) (referred to as the **Forest Plan**). The Forest Plan contains standards and guidelines applicable to this project. Consistency is addressed in each resource section 4.0.
- The Mt. Hood National Forest Land and Resource Management Plan Final Environmental Impact Statement (USDA 1990a). This document discusses environmental effects for Forest-wide programs (including the timber sale program) and sets the stage for project level analysis.
- The Forest Plan was amended by the Record of Decision and Standards and Guidelines for Management of Habitat for Late-Successional and Old-Growth Forest Related Species Within the Range of the Northern Spotted Owl. (USDA, USDI 1994b) (hereafter referred to as the **Northwest Forest Plan** or NFP). The NFP contains standards and guidelines for Matrix, Riparian Reserves and Late-Successional Reserves. Consistency is addressed in each resource section (s. 4.0).
- The Northwest Forest Plan Final Supplemental Environmental Impact Statement (USDA, USDI 1994a). This document discusses environmental effects for Region-wide programs (including the timber sale program) and sets the stage for project level analysis.
- The Forest Plan was amended by the 2005 Record of Decision for Preventing and Managing Invasive Plants (USDA 2005). Consistency is addressed in section 4.9.
- The Forest Plan was amended by the 2001 Record of Decision and Standards and Guidelines for Amendments to the Survey and Manage, Protection Buffer, and other Mitigation Measures Standards and Guidelines. (USDA, USDI 2001).
- The Forest Plan was amended by the 2004 Record of Decision to Remove or Modify the Survey and Manage Mitigation Measure Standards and Guidelines. Many species were removed from the requirements of the Survey and Manage Standards and Guidelines and placed on sensitive species lists. Effects to sensitive species are addressed in s. 4.3.9, 4.5.1 & 4.7.
- The Forest Plan was amended by the 2007 Record of Decision To Remove the Survey and Manage Mitigation Measure Standards and Guidelines from Forest Service Land and Resource Management Plans within the Range of the Northern Spotted Owl. (USDA 2007). A court case set aside parts of the 2004 Record of Decision and reinstated the 2001 Record of Decision. The 2007 Record of Decision was developed to resolve this court case but no ruling has yet been made in this matter.

2.2.3 **Maps** – In addition to the vicinity map below, the appendix contains close-up maps showing the proposed actions, land allocations and other details. These maps are in color. If you have a paper copy with black and white maps, color versions of the maps are available at the forest web site or can be sent in the mail if requested.

#### 2.2.4 Land Allocations

The project has many overlapping land allocations. Some areas have two or three land allocations on the same ground.

Allocation	Approximate Acres
Late-Successional Reserves	316
Riparian Reserves	114
A1 – Wild and Scenic Rivers	15
A4 – scenic area	226
A5 – unroaded recreation	23
A9 – key site riparian	17
A10- developed recreation	10
B3 – roaded recreation	41
B11 – summer range	173
C1 – timber emphasis	358

#### 2.2.5 Watershed Analysis – The project is covered by the Upper Clackamas Watershed Analysis (1995).

This project is consistent with the recommendations of the watershed analysis (page 62-63).

#### 2.2.6 Riparian Reserves –

This project has adopted the concepts for riparian reserve delineation described in the watershed analysis. The site-potential tree height for this project is 180 feet. While streams, rivers, ponds, wetlands and certain unstable landforms were shown on maps in the watershed analysis, they were conceptual based on data available at the time and were not field verified. During project level planning, maps are refined based on field inspections. For example, field inspections often show that some streams shown on the watershed analysis maps are not there while other unmapped streams are discovered. Intermittent streams usually have the most changes. There is also newer information about fish presence and absence. The project areas are examined by a geologist to determine the presence or absence of landslide prone landforms. The Cascade Crest project does not have a problem with landslide prone landforms. All of this field-verified information is then used to create a more accurate riparian reserve map. This new map is not considered a change to the recommendations put forward in the watershed analysis or the Northwest Forest Plan but simply a more accurate refinement of the intent of those documents.

2.2.7 **LSR Assessment** – Approximately 316 acres of the fuel break are in late-successional reserves. The North Willamette LSR Assessment (USDA 1998b) covers this area. Section 4.4 contains more detail about the project’s consistency with the LSR Assessment and the Northwest Forest Plan. The LSR Assessment addressed the need for action in this area on page 5-8. Ten years ago it was apparent that there was a fire hazard situation developing as stand health declined. Since the LSR Assessment was written, lodgepole pine mortality has increased dramatically and the urgency to act to protect the LSR from intense fire is even greater now. The Regional Office LSR working group has reviewed this project.

2.2.8 **Roads Analysis** – A Forest-wide Roads Analysis was completed in 2003. Section 4.12 discusses roads for this project and how they relate to the Forest-wide analysis. This project would not build any new roads.

2.2.9 **DESIRED FUTURE CONDITION**

The desired future conditions from the **Mt. Hood Forest Plan** (as amended) that are relevant to this proposal are summarized below.

Health	Forest stands have low levels of disease, damaging insect populations and storm damage. Four-92, FW-382; and Four-292, C1-22.
Scenery	Forest visitors experience a wide diversity of visually appealing scenery. Management activities are visible in certain low-use areas while high-use special areas have a natural appearing landscape. Four-7.
Recreation	Outdoor recreation opportunities are available in a variety of settings. Developed recreation sites are available as well as dispersed recreation opportunities in roaded and unroaded settings. Four-7.
Riparian & Aquatic	Riparian reserves contain the level of vegetative and structural diversity associated with mature and late-successional stand conditions. They supply coarse woody debris sufficient to sustain physical complexity and stability. They provide connectivity within and between watersheds. The riparian reserve connections provide unobstructed routes to areas critical to fulfilling life history requirements of aquatic and riparian-dependent species. NFP p. B-11. In Riparian Reserves the goal of wildfire suppression is to limit the size of all fires. NFP p. C-18.
Late-successional Reserves	Late-successional reserves contain sufficient late-successional and old-growth forest ecosystems to meet the habitat needs for species such as the northern spotted owl. NFP p. C-11. In Late-Successional Reserves the goal of wildfire suppression is to limit the size of all fires. Until a fire management plan is completed for Late-Successional Reserves, suppress wildfire to avoid loss of habitat in order to maintain future management options. NFP p. C-18.
Snags & Down Logs	Snags, down logs, and recruitment trees are well distributed across the landscape in sufficient quantity and quality to support species dependent upon these habitats. NFP page C-40.

Deer & Elk	The forest contains a mix of habitats including forage, thermal cover and optimal cover. Four-72, FW-202 to 207.
Landscape Health	Landscapes are healthy and productive and provide a mix of forest and non-forest habitats to support diverse populations of desired plant and animal species. Watersheds provide long-term sustained production of high quality water for fish and for on-Forest and off-Forest water users. The project is not within a wildland-urban interface. Where natural fire regimes and current conditions indicate that stand replacement fires are likely, it is desired that stand replacement fires be small in size. Four-25.
Invasive Plants	Healthy native plant communities remain diverse and resilient, and damaged ecosystems are being restored. High quality habitat is provided for native organisms. Invasive plants do not jeopardize the ability of the National Forests to provide goods and services communities expect. The need for invasive plant treatment is reduced due to the effectiveness and habitual nature of preventative actions, and the success of restoration efforts. Appendix 1-1, ROD for Preventing and Managing Invasive Plants.
Timber Harvest Levels	Provide forest products consistent with the Northwest Forest Plan goal of maintaining the stability of local and regional economies now and in the future. Timber outputs come primarily from the Timber Emphasis (C-1) portion of the Matrix lands, with lesser amounts coming from the "B" land allocations of the Matrix. Minor amounts of timber may also come from Riparian Reserves or Late-successional Reserves where harvesting would be used as a tool to enhance resources and move the landscape toward the desired future conditions. Four-86 & Four-289 & NFP ROD pages 2 & 3.

## 2.3 Proposed Action

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This action is proposed by the Forest Service in response to the request of the Tribal Council of the Confederated Tribes of the Warm Springs Reservation of Oregon under the authorities of the Tribal Forest Protection Act. The intent is to use stewardship contracts or stewardship agreements to meet the purpose and need.

### 2.3.1 Cascade Crest Fuel Break

A continuous shaded fuel break approximately 500 feet wide would be created adjacent to roads 4230 and 4220. Approximately 852 acres would be treated. These roads are a critical element to the success of the fuel break and are generally in the middle of the fuel break except in some areas where the fuel break is shifted somewhat to one side due to topographic and resource issues. The fuel break would be wider in three places to provide safe areas for suppression crews.



### 2.3.1.1 **Basic Fuel Break Prescription**

The following measures are designed to achieve the objective of 4-foot flame lengths.

Live trees would be retained at a spacing of approximately 20 feet between the outside edge of the crown. The largest live trees would be retained except in lodgepole pine areas described below. This would equate to approximately 40-50 trees per acre in mature forests and 50-80 trees per acre where trees are smaller. All other trees not needed to make up this leave tree spacing and all snags would be felled. Prune trees to 50% of height or 16 feet whichever is less. Cut shrubs that contribute to ladder fuels. The removal of biomass would be encouraged where feasible. Biomass or fuel that is not removed would be piled and burned. Cleanup and slash piling would kept current with operations so that increased fire hazard does not occur with untreated slash and debris.

Many lodgepole pine stands in this area are dead, dying or may soon die from an ongoing mountain pine beetle infestation. These lodgepole pine trees average 10 inches in diameter. In some of these stands there is an understory of other tree species including mountain hemlock and Douglas-fir that are not susceptible to attack by mountain pine beetle. In these areas, the largest trees of species other than lodgepole pine would be retained where available. Live lodgepole pine would only be retained if they are the only species available.

There are areas where most of the lodgepole are dead and where there are insufficient other species to meet the spacing guidelines above. These areas are often quite dense with naturally occurring seedlings or saplings. They would be retained at the spacing listed above.

### 2.3.1.2 **Riparian**

Apply the basic fuel break prescription in riparian reserves except as described below. These riparian adjustments have the objective of minimizing effects to riparian resources while still providing an effective overall fuel break.

Four stream courses would have a 50-foot wide buffer on either side of streams. These are the headwaters of Clackamas River up to Big Spring, Lemiti Creek, South Fork Lemiti Creek and Olallie Creek. These buffers would be wider where appropriate to include adjacent wet areas and meadows. The buffer would have no treatment except within 100 feet of road 4220 or campgrounds where snags would be felled. Adjacent to the no treatment buffers, extending out 50 feet, treatments would be done by hand with no ground-based equipment. Equipment would be allowed on roads.

Along other streams (intermittent) there would be a 10-foot wide buffer. The buffer would have no treatment except within 100 feet of road 4220 or campgrounds where snags would be felled. Adjacent to the no treatment buffers, extending out 25 feet, treatments would be done by hand with no ground-based equipment. Equipment would be allowed on roads.

### 2.3.1.3 Campgrounds

These campground adjustments have the objective of minimizing effects to campers while still providing an effective overall fuel break.

The basic fuel break prescription would be adjusted to provide visual screening between camp sites. Fall snags. Equipment would be allowed only on roads. Remove resulting material and existing debris on the ground for disposal elsewhere. (Includes Triangle Lake Horse Campground and Olallie Meadow Campground. Lower Lake Campground is near the project but not directly affected except along 100 feet of the entrance road.)

### 2.3.1.4 Scenic Area

Within the Olallie Lake Scenic Area (approximately 226 acres), apply the basic fuel break prescription with the following adjustments. These adjustments in the Scenic Area have the objective of minimizing effects to scenery and recreation while still providing an effective overall fuel break.

Leave tree spacing would not be uniform with some trees left in clumps. Some trees would be left unpruned. The width of the fuel break boundary would average the distances shown on the project map but the boundary would be irregular to avoid straight sight lines. Mechanical and hand treatment would occur based on topography. Mechanical treatments would be more common in the northern section of the Scenic Area and hand treatments would be more common in the south. Minimize ground disturbance by using techniques such as over-snow biomass removal and having small landings only within the road prism. Stumps would be cut low. Debris cleanup, piling and burning would be kept current with operations so that only short sections of road 4220 would be visually altered at any one time. If tree marking paint is used on leave trees it would only be used on the portion of the bole not seen from the road. The Pacific Crest Trail would have a 50-foot no-treatment buffer. No equipment would cross the trail.

### 2.3.1.5 Wildlife Adjustments

Adjustments were made for certain wildlife species while still providing an effective overall fuel break.

**Great gray owl:** There is potential nesting habitat for great gray owls in the mature stands directly adjacent to Olallie Meadow, however none have been observed there. Because surveys take multiple years to complete, it is presumed at this time that the owls are present and that the fuel break prescription would be adjusted. Mature stands that have trees 23 inches or greater in diameter within 200 meters of the meadow would have the following treatments: pruning, the removal of down material, and cutting hazardous snags within 100 feet of road 4220 or Olallie Meadow Campground. These adjustments

could be waived if the area is eventually surveyed to protocol and found to be unoccupied.

**Crater lake tightcoil:** This snail is generally found in mid to high elevation habitat adjacent to perennial wet areas. It was found at two locations in the project area. A no-treatment buffer approximately 100 feet wide or greater would be applied in these two areas. The buffer would be tailored to site-specific conditions.

#### 2.3.1.6 Other Adjustments

Adjustments were made to protect the integrity of historic and prehistoric resources while still providing an effective overall fuel break. The site-specific adjustments are described in detail in s. 4.13.

#### 2.3.2 Maintenance

After the fuel break is established, it would be expected that only minor work would be needed such as the felling of trees that have since died. However after approximately 10 to 15 years, regular maintenance is expected. Over time, seedlings and brush would grow up and trees may die or fall into the fuel break. Periodic monitoring would be done to identify when thresholds of concern are reached and action would be taken to maintain the fuel break so that it continues to meet objectives. Some of the work of creating the fuel break and maintaining it over time, may be accomplished by agency firefighting crews when there are no active wildfires. The Forest has a Hotshot crew and an Initial Attack crew (40 people) and two fire engine crews that are fully funded throughout the summer. These crews can accomplish this type of project work and can use the opportunity for on-the-job training and physical conditioning when there are no fire assignments.

#### 2.3.3 Best Management Practices (BMPs) and Design Criteria

These are practices that are part of the proposal. The effects and benefits of these practices are included in the analyses of effects in s. 4. In some cases they are standard practices that are used in all similar projects and in other cases they are specifically tailored to this project based on site-specific factors such as the underlying land allocation and associated standards and guidelines.

##### 1. Seasonal restrictions

- 1.1 **Soils:** No operation of off-road ground-based equipment would be permitted between November 1 and May 31 unless there is at least 18 inches of snow covering the ground. This restriction applies to ground-based equipment including harvesters or equipment used for fuels treatment. This restriction may be waived if soils are dry. *This is a BMP and implements Forest Plan standards and guidelines FW-022 and FW-024.*

- 1.2 **Deer and Elk Summer Range:** No timber felling, yarding, hauling or other noise generating activities would be permitted between April 1 and July 30 in the B11 Deer and Elk Summer Range area. (Between mile posts 3.3 and 6.9 along road 4220)
- 1.3 **Spotted Owls:** No seasonal restrictions are required because all projects are outside the disruption distances specified in the Biological Evaluation.
2. **Erosion:** To reduce erosion, bare soils would be revegetated. Grass seed and fertilizer would be evenly distributed at appropriate rates to ensure successful establishment. Mulch may be used on slopes greater than 20%. Effective ground cover would be installed prior to October 1 of each year. *This is a BMP and implements Forest Plan standard and guideline FW-025.*

**Native plant** materials are the first choice in revegetation of bare soils. Non-native, non-invasive plant species may be used if native plant materials are not available or as an interim measure designed to aid in the re-establishment of native plants. Non-native invasive plant species would not be used. *This implements Forest Plan standard and guideline FW-148 and standard 13 of the Regional Invasive Plants Record of Decision.*

**Grass seed** would preferably be certified by the states of Oregon or Washington or grown under government-supervised contracts to assure noxious weed free status. In certain cases, non-certified seed may be used if it is deemed to be free of Oregon State Class A & B noxious weeds. *This implements Forest Plan standard and guideline FW-148.*

When **straw and mulch** are utilized, it would originate from the state of Oregon or Washington fields, which grow state-certified seed, or grown under government-supervised contracts to assure noxious weed free status, or originate in annual ryegrass fields in the Willamette Valley. In certain cases, straw or hay from non-certified grass seed fields may be used if is deemed to be free of Oregon State Class A & B noxious weeds. *This implements Forest Plan standard and guideline FW-148, and standard 3 of the Regional Invasive Plants Record of Decision.*

3. **Logging Systems** – *These are BMPs and implement Forest Plan standard and guideline FW-022.*

Avoid the use of ground based tractors or skidders on slopes generally greater than 30% and mechanical harvesters on slopes greater than 40% because of the risk of damage to soil and water resources.

4. **Roads** – *These are BMPs.*
  - 4.1 During the wet season, log haul would only be permitted on asphalt and rocked roads when conditions would prevent sediment delivery to streams.

- 4.2 If landings are needed in riparian reserves, they would be located on existing roadways that do not require expansion of the road prism or on existing landings that may require only minimum reconstruction (clearing vegetation, sloping for drainage, or surfacing for erosion control purposes) to be made suitable for use.
- 4.3 The re-opening of old temporary roads is encouraged over the construction of new roads if they are located in areas that would prevent sediment delivery to streams.
5. **Invasive species:** *This implements Executive Order 13112 dated February 3, 1999, and standards and guidelines of the Regional Invasive Plants Record of Decision.*
- All off-road equipment is required to be free of soil, seeds, vegetative matter, or other debris that could contain or hold seeds prior to coming onto National Forest lands. Timber sale contracts and service contracts would include provisions to minimize the introduction and spread of invasive plants. These provisions contain specific requirements for the cleaning of off-road equipment.
  - Gravel or rock used for roads would come from weed free sources.
  - Road blading, brushing and ditch cleaning in areas with high concentrations of invasive plants would be conducted in consultation with invasive plant specialists.
6. **Firewood** would be made available to the public at landings where feasible. *This is an opportunity to contribute to Forest Plan - Forest Management Goal #19, and provide forest products consistent with the NFP goal of maintaining the stability of local and regional economies.*
7. **Monitoring:** *This Implements Forest Plan and NFP monitoring requirements.*

Prior to advertisement, a crosswalk table would be prepared to check the provisions of the Contract and other implementation plans with this document to insure that required elements are properly accounted for.

During implementation, Contract Administrators monitor compliance with the Contract which contains provisions for resource protection including but not limited to: seasonal restrictions, stream protection, erosion prevention, soil protection, road closure and protection of historical sites.

Post project reviews would be conducted to determine if objectives are met.

Monitoring of noxious weeds and invasive plants would be conducted where appropriate to track changes in populations over time and corrective action would be prescribed where needed.

Monitoring is also conducted at the Forest level. For example, water quality is monitored for both temperature and turbidity at several locations across the Forest. Monitoring reports can be found on the Forest's web site at <http://www.fs.fed.us/r6/mthood> under Forest Publications.

## 2.4 Public Involvement

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### 2.4.1 Issues

Many form e-mails were received, generated from one web site that contains incomplete and inaccurate information. However it is clear from these e-mails and letters that many people cherish the Olallie Lake area. "This pristine area is perfect in its current state; just as nature intended it to be." Some people feel that fires are natural and should be allowed to burn. Some feel that if a fuel break is needed it should be somewhere else.

Issue statement: Logging or any activity that impacts the integrity of the resources or scenery in the Olallie Lake area or along the road leading to the Olallie Lake area should not occur. Indicators for this issue include acres treated within the Olallie Lake Scenic Area and effects to scenery.

## 3.0 ALTERNATIVES

This chapter describes and compares the alternatives considered for this project. It includes a description of each alternative considered. This section also presents the alternatives in comparative form, sharply defining the differences between each alternative and providing a clear basis for choice among options by the decision maker and the public. The Proposed Action is described in s. 2.3 and is sometimes referred to as Alternative B.

### 3.1 Alternative A - No Action

Under the No-action Alternative, current management plans would continue to guide management of the area. No fuel break or other associated actions would be implemented to accomplish project goals.

### 3.2 Other Alternatives Considered

Some public comments suggested alternate courses of action. **The highlighted text below is the agency response.**

- 3.2.1 Do only part of the proposed fuel break – Create a fuel break only in the section outside the Olallie Lake Scenic Area (north part only). This would respond to concerns about scenery and the experience of people driving to the destination features of the Scenic Area. Oregon Wild suggested avoiding the Scenic Area and the roadless area that is totally within the Scenic Area. **Approximately ½ the length of the proposed fuel break is inside the Olallie**

Lake Scenic Area. The scenic area has vast areas with dead trees and high wildfire hazard. Some forest visitors do not want scenery or their recreation experience to change, but the insect infestation and previous wildfires have changed both. Some forest visitors do not feel that fire hazard or risk are great enough to warrant the additional changes that would come about with a fuel break. The option of doing only the north half of the proposed fuel break was not fully developed because it would not meet the purpose and need. It would not be responsive to the request of the Tribal Council of the Confederated Tribes of the Warm Springs Reservation of Oregon under the authorities of the Tribal Forest Protection Act. Wildfire hazard would be greater in the area not treated and when wildfires occur, scenery, recreation and other values of the Olallie Lake Scenic Area would be impacted. The safety of firefighters would be compromised and forest visitors would be put at risk. Design features have been incorporated into the proposed action to minimize impact to scenery.

- 3.2.2 Do only part of the proposed fuel break – Create a fuel break in the sections where there is a high level of dead trees. The mature live stands would be retained. This would result in a discontinuous fuel break. This would respond to concern about impacts to late-successional ecosystems and to wildlife species including the northern spotted owl. Oregon Wild suggested a diameter limit of 12 inches. Approximately 36% of the proposed fuel break is mature forest. With this option the fuel break would be broken into six segments. Some people do not want mature forests to be impacted but do not mind treating fuels in plantations or in lodgepole pine stands. Some people do not feel that fire hazard or risk are great enough to warrant the additional changes that would come about with a fuel break. The option of avoiding the mature stands was not fully developed because it would not meet the purpose and need and the resulting fuel break would not be effective. It would not be responsive to the request of the Tribal Council of the Confederated Tribes of the Warm Springs Reservation of Oregon under the authorities of the Tribal Forest Protection Act. Wildfire hazard would be greater in the area not treated and when wildfires occur, mature forests would be impacted across a wide landscape. The safety of firefighters would be compromised and forest visitors would be put at risk. The propose action would retain the largest trees.
- 3.2.3 Change the project from a narrow fuel break to a landscape scale fuel treatment project. This would treat several thousand acres of stands with high fire hazard across the landscape. This option was not fully developed because treating fuels across the landscape would be very expensive and would require roads to be built into unroaded areas to gain access for treatments.
- 3.2.4 Treat plantations only, across the landscape. Plantations would be thinned to a wide spacing and fuels on the ground would be treated. This was suggested by Oregon Wild. This option was not fully developed because it would not meet the purpose and need. It would reduce flame length and damage inside the plantations but it would not be a linear connected fuel break to aid in the suppression of wildfires. It would not be responsive to the request of the Tribal Council of the Confederated Tribes of the Warm Springs Reservation of Oregon under the authorities of the Tribal Forest Protection Act. Wildfire hazard would be greater in the area not treated and when wildfires occur, mature forests

would be impacted across a wide landscape. The safety of firefighters would be compromised and forest visitors would be put at risk.

- 3.2.5 Move fuel break away from road 4220 and align it with reservation boundary with new road in center. This would reduce the visual impact along road 4220: the route to Olallie Lake. The option of avoiding road 4220 was not fully developed because it would be very expensive to build a new road. Resource impacts associated with constructing a new road would be much greater than with the proposed action. Forest visitors would still be at risk in the event a fire burns near road 4220.
- 3.2.6 Move fuel break in some sections to follow roads 4690 and 4690120. Road 4690 is the primary route to Olallie. This option would move the fuel break into some plantations reducing the effect on mature timber. This option was not fully developed because the safety of firefighters would be compromised. While the fuel break would be continuous, portions would not have a road in the center and the drive time for forces to get from one section of the fuel break to the other would take too long. Forest visitors would still be at risk in the event a fire burns near road 4220.
- 3.2.7 Several options were considered that would use an alignment similar to the proposed action but would change other design features.
- Retain some snags and down logs. This option was not fully developed because it would reduce the effectiveness of the fuel break and the safety of firefighters would be compromised. Across the landscape there are abundant snags and down logs to meet the needs of species that need these features.
  - Helicopter removal of biomass. This option was not fully developed because helicopters are very expensive to operate.
  - Reduced riparian treatment. This option was not fully developed because it would reduce the effectiveness of the fuel break and the safety of firefighters would be compromised. Design features have been incorporated into the proposed action to minimize impact to riparian resources.
  - No hand treatments, mechanical treatments would be more cost effective. This option was not fully developed because the proposed action better protects resources in the project area.



### 3.3 Comparison of Alternatives

This section provides a summary of the effects of implementing each alternative and a comparison with the purpose and need. Information in the table is focused on activities and effects where different levels of effects or outputs can be distinguished quantitatively or qualitatively among alternatives.

	No Action (Alt. A)	Proposed Action (Alt. B)
Issue #1 Acres in Olallie Scenic Area	None	226 acres
Issue #1: Affects to scenery	Dead trees and potential for large wildfire would impact scenery.	Some short-term impacts to foreground scenery. Fewer acres impacted by wildfire.
Does it aid in the suppression of a large scale wildfire?	No. Fire fighters would have to withdraw to safe area. Dozers would have to come in to widen fire line. Snags would have to be felled. Fires would get large.	Yes. Fire fighters would be able to work in fuel break safely and could burn out from road without extra preparation. Forces could extend fire lines elsewhere. Fires would be kept smaller.
Does it respond to Tribal request?	No.	Yes.
Does it provide for firefighter safety?	No.	Yes. Fire fighters would be able to work in fuel break safely.
Does it provide for public safety?	No.	Yes. If evacuation is necessary, fire intensity along road 4220 would be low.
Flame length adjacent to road 4220	Up to 100 feet.	4 feet or less.
Approximate Biomass Output (tons)	0	8500 bone dry tons
Cost	No cost now, higher fire fighting costs at the time of a wildfire.	Cost would be partially offset by value of removed biomass. Fire fighting costs would be less at the time of a wildfire.

## 4.0 ENVIRONMENTAL CONSEQUENCES

This section summarizes the physical, biological, social and economic environments of the affected area and the potential changes to those environments due to implementation of the alternatives. It also presents the scientific and analytical basis for comparison of alternatives presented in the chart above.

### 4.0.1 Cumulative Effects

A discussion of cumulative effects is included for each resource where appropriate. Cumulative effects are impacts on the environment that result from the incremental impact of the action when added to other past, present and reasonably foreseeable future

actions. If the proposed action would have little or no effect on a given resource, a more detailed cumulative effects analysis is not necessary to make an informed decision. Cumulative effects analysis was guided by the June 2005 Memorandum on cumulative effects from the Council on Environmental Quality.

The land area and the time scale used for cumulative effects analysis varies by resource. The analysis for each affected resource looks at the condition of the resource considering effects from past timber sales, road construction, fires and other disturbances. Past actions are included in the baseline for the cumulative effects analysis and a list of past actions is contained in the analysis file. The analysis includes the effect of roads and permanent openings such as rock quarries and power lines where appropriate. The analysis also includes other recent or planned timber sales that overlap the analysis area where appropriate. The analysis considers the impact of activities on other ownerships where appropriate.

The following is a summary of restoration that has occurred or is planned in the Upper Clackamas 5<sup>th</sup> field watershed:

- 55 miles of roads have already been decommissioned.
- Approximately 2500 acres have been thinned.
- Several side channels have been restored.
- Roads that were damaged by flooding have been repaired.
- Culverts that were impediments to fish passage have been replaced.
- Recent restoration EAs have planned projects that have not yet been implemented:
  - 4.5 miles of decommissioning.
  - 50 miles of roads with ineffective road closures would have new berms installed.
  - Many acres of snag and down wood creation.
  - Many acres of precommercial thinning.
- The Upper Clack Thin would thin an additional 1010 acres in the near future.

The Forest is developing a plan to designate road and trail routes for off-highway vehicles (OHV). It would change OHV access through much of the Forest in order to meet the intent of the Travel Management; Designated Routes and Areas for Motor Vehicle Use; Final Rule that was published on November 9, 2005 (70 FR 216). The OHV plan would designate OHV routes within six proposed OHV areas and designate areas where motorized access to dispersed (undeveloped) camping would be permitted in the Forest. One of the proposed OHV study areas (referred to as Peavine) overlaps the proposed fuel break.

## 4.1 Fire Hazard and Risk

This section elaborates on the purpose and need for this project (s. 2.2). Specifically this section will describe the vegetation and fuels and how they interact with topography and weather to create the current and projected situation of high fire hazard and risk. The resources that would potentially be affected by wildfire are addressed in other sections. As

used here, hazard relates to the quantity and distribution of fuels and how intensely a fire would burn and risk relates to ignition sources and the probability of a fire starting.

#### 4.1.1 **Elaboration of Purpose and Need**

The purpose of this project is to aid in the suppression of large scale wildfires. The section below titled 'Direct and Indirect Effects' discuss fire fighting tactics and contrast the scenarios for action and no action. While it is not possible to predict the exact size a fire might attain with or without a fuel break, it is likely that fires would be kept smaller at less cost and with less risk to resources if a fuel break is in place prior to ignition.

The section below titled 'Existing Situation' describes the increasing fire hazard caused by dead and dying trees, by dense vegetation and the accumulation of fuels on the ground. The risk of ignition from lightning and humans is also high. There is an urgent need for the Forest Service to take action in this high fire hazard and risk area to protect important resources.

The action responds to the request of the Tribal Council of the Confederated Tribes of the Warm Springs Reservation of Oregon under the authorities of the Tribal Forest Protection Act. If no action is taken, a large scale wildfire could impact Tribal archaeological sites, first foods, medicinal plants and other resources. The proposed fuel break is close to the reservation boundary. The tribes have concerns about the risk to resources on the reservation but they also have concerns about resources in the vicinity of the fuel break on the National Forest. The fuel break would occur on, and protect lands that are part of their usual and accustomed lands for hunting and the gathering of medicinal plants and first foods such as roots and huckleberries. The fuel break would also protect spiritual values.

While the proposed action was developed in response to a tribal request, there would be many additional benefits and opportunities:

- There is a concern for firefighter safety. If no action is taken, a large scale wildfire would put firefighters at risk, more time and forces would be needed to establish effective fire lines, and the fire would grow larger. One goal is to reduce fuels in the fuel break so that if a fire were to burn through, flame lengths would be 4 feet or less to permit direct attack or burn out operations by firefighters. Currently, fire models (Crookston et al. 1999) indicate that flame lengths would be up to approximately 100 feet.
- Wildfire suppression is extraordinarily expensive. It is more cost effective to reduce fuels and establish control lines in advance.
- There is a concern about public safety. Road 4220 (south of the 4690 junction) is a primitive road and is the only access to the Olallie Lake area: a heavily used recreation area. The fuel break would reduce fire intensity along road 4220 and

public safety would be enhanced in the event of a wildfire requiring evacuation of the Olallie area.

- There is a concern about the impacts wildfire would have to spotted owls and their habitat. Reducing wildfire size would result in reduced impacts to the Late-Successional Reserve and species dependant on late-successional habitats.
- There is a concern about the impacts wildfire would have to scenery and recreation.
- There is also the opportunity to remove and utilize the woody material as timber, firewood or biomass.

#### 4.1.2 **Existing Situation**

The project area contains a mix of seral stages in both the Mountain Hemlock and Pacific Silver Fir Vegetation Zones. The area of concern for fire hazard and risk stretches from the Olallie Lake area north to Sisi Butte and eastward into the forests of the Warm Springs Reservation. One of the reasons for this concern is the abundance of lodgepole pine stands that are being killed by mountain pine beetle. Mountain pine beetle infestations commonly occur in lodgepole pine stands beginning at age 60 to 80 when the trees are 8 to 12 inches diameter. In addition to the relatively pure lodgepole pine stands, there are many mid-seral stands of Douglas-fir, mountain hemlock, western hemlock with scattered lodgepole pine and other coniferous species. These mid-seral stands became established following large stand replacement fires. Some of the late-seral stands are in isolated patches. Some are isolated because of the way the fires burned and some late-seral stands in the northern portion of the project area are isolated because of the fragmentation caused by logging. The early-seral stands are primarily plantations that were logged in the 1960s to 1980s.

A typical stand of dead lodgepole pine along road 4220.



### 4.1.3 Fire Regime

A natural fire regime is a general classification of the role fire would play across a landscape (Agee 1993, Brown 1995). Coarse scale definitions for natural (historical) fire regimes have been developed by Hardy et al. (2001) and Schmidt et al. (2002) and interpreted for fire and fuels management by Hann and Bunnell (2001). The five natural (historical) fire regimes are classified based on average number of years between fires (fire frequency) combined with the severity (amount of replacement) of the fire on the dominant overstory vegetation.

- I – 0-35 year frequency and low (surface fires most common) to mixed severity (less than 75% of the dominant overstory vegetation replaced);
- II – 0-35 year frequency and high (stand replacement) severity (greater than 75% of the dominant overstory vegetation replaced);
- III – 35-100+ year frequency and mixed severity (less than 75% of the dominant overstory vegetation replaced);
- IV – 35-100+ year frequency and high (stand replacement) severity (greater than 75% of the dominant overstory vegetation replaced);
- V – 200+ year frequency and high (stand replacement) severity.

The project area contains a mix of fire regimes. Lodgepole pine stands are typically fire regime IV. Stand-replacement fires are typical in this regime even when the trees are alive. The project area is experiencing high levels of mortality in the lodgepole pine type causing the fire hazard to be even greater. The remainder of the project area is fire regime V where stand replacement crown fires are expected. Because the two fire regimes are adjacent and intermingled, a fire that begins in one would likely burn through both types.

Fire is the primary disturbance agent for the area with insects and disease playing a secondary role in shaping the vegetation patterns. On August 12, 2001, a passing weather front ignited 21 lightning fires. Several lightning fires were extinguished when they were small. However, there were too many fires for the available firefighting forces and several of the small lightning fires converged into one large stand replacement fire burning on both National Forest land and the Warm Springs Reservation land.

The Olallie Complex of fires was eventually contained at 2,622 acres. The fire burned at various intensities with a large proportion in high intensity. Previous to this fire, there had been no large stand replacement fires in the area since Forest Service administration began in 1907



largely due to fire suppression efforts. An aerial photograph showing this fire is in the appendix.

Evidence points towards the trend of stand conditions ripe for a wildfire:

- Some stands have developed ladder fuel situations (continuous fuels from the ground to the tree canopy where a fire can rapidly spread from the ground to fully consume tree crowns). There has been an in-growth of high densities of shade tolerant small trees and brush species. Some species have limbs down to the ground and some stands have a variety of heights that create a dense vertical structure. Trees in this area are also draped and matted with mosses and lichens that are highly flammable in the dry season. These factors combine to create ladder fuels.
- The mountain pine beetle infestation has grown to epidemic proportions in the last 10 years killing most of the lodgepole pine in the area.
- Spruce budworm infestations have occurred periodically in the area because stands are under stress primarily from high tree densities and drought.
- Dwarf mistletoe has heavily infected the older mountain hemlock.

These circumstances cumulatively create a high fire hazard situation.

The area has high lightning occurrence and high risk of human caused ignition. The Olallie Lake area is called the “lightning belt” of the Cascades because fires caused by lightning strikes are common here. Olallie Lake is one of the most heavily used recreation areas on the Clackamas River Ranger District. Human caused fires have occurred in this area from unattended camp fires, smoking and children playing with fire.

### **Direct and Indirect Effects**

#### **4.1.4 No Action**

Because the project area is located in a “lightning belt,” it is likely that a scenario similar to the 2001 Olallie fire will occur again. Due to the area’s remoteness, it would take several hours from the time of detection before initial attack forces arrive at the scene. Initially the fires would be prioritized based on location, probability of success and safety. Because of the relative lack of roads in the area, forces would walk in and put an initial hand line around the first lightning fire. By afternoon the remaining unmanned lightning fires would begin to burn together and move through the crowns pushed by erratic winds. Spot fires would be started by embers blown ahead of the main fire front.

Fuel modeling (Crookston et al. 1999) and fire behavior predictions indicate that fires would quickly become a crown fire with flame lengths up to 100 feet. Direct attack of a surface fire in areas with heavier fuels or a crowning fire by personnel with hand tools would be ineffective and dangerous. Initial attack forces would be withdrawn to a safe area.



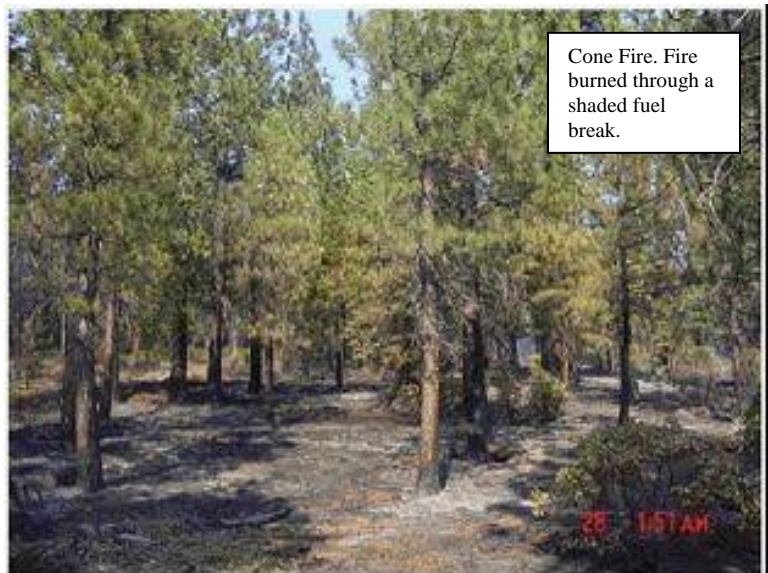
Where appropriate, dozers would be brought in to create an indirect wide fire line. Aircraft may be brought in to assist if available. Snags would be felled and a burn out operation would begin. Depending on the winds the fire could become very large. Other fires in similar conditions to the south on the Deschutes and Willamette NFs, have burned hundreds of thousands of acres. As with the Olallie Fire, it is likely that the fire would cross onto the Warm Springs Reservation and damage tribal resources. The risk to other resources with no action is discussed in their respective sections of this document. A larger fire could potentially threaten the Sisi Lookout Tower.



Cone Fire. An example of high intensity fire.

**4.1.5 Proposed Action**

The purpose of a fuel break is to reinforce an existing defensible location that can be used by firefighters to stop fire spread (Agee 2001). The benefits of a fuel break are achieved when fire suppression activities anchored to the fuel break are successful in limiting the size or perimeter of the fire. The intent of a shaded fuel break is to aid in the suppression of a wildfire. A fuel break would not stop a wildfire by itself. A crown fire on one side can throw embers farther than the 500-foot width of a fuel break starting spot fires on the other side. The intent of a fuel break is to reduce flame lengths along the road so that suppression forces can safely operate. Simplifying forest structure and removing ladder fuels reduces the potential for surface fires to move into tree crowns (Graham 2004). Fuel modeling and fire behavior predictions indicate that fire along the road in a shaded fuel break would remain on the ground and would not become a crown fire. The FVS-FFE model was used in this analysis to evaluate and weigh fuel-treatment scenarios and their effectiveness at keeping fire behavior within acceptable levels to increase



Cone Fire. Fire burned through a shaded fuel break.

safety and protect resources (Crookston et al 1999). It is expected that flame lengths in the completed fuel break would be 4 feet or less in height, which can generally be controlled with hand tools (National Wildfire Coordinating Group, Appendix B, Fire Behavior Handbook). Snag hazards would have already been removed. The road can also be more safely used for evacuation of forest visitors. Shaded fuel breaks have been constructed in many fire prone ecosystems and have proven to be an effective tool (Agee 1993).

The likely wildfire scenario would begin as described under the no action alternative. As lightning fires spread or join together, initial attack forces would fall back to the main roads (4220/4230) along the shaded fuel break and prepare to re-engage using an indirect strategy. Because of the roads, very low levels of fuels and no hazardous snags, the crews would be able to start their suppression activities such as burnout operations or extending fire lines in a safe environment while the fire is relatively small. Fewer suppression resources would be required to hold the fireline along the roads and more resources would be available to work on other flanks, such as those on the Warm Springs Reservation.

While it is not possible to predict the exact size a fire might attain with or without a fuel break, it is likely that fires would be kept smaller with a fuel break in place at less cost and with less risk of crossing onto the Warm Springs Reservation. The impacts and benefits to other resources with the proposed fuel break are discussed in their respective sections of this document.

#### 4.1.6 Response to Public Comments

Section 3.2 discusses the various alternatives suggested. However some commenters question the purpose and need and do not believe the hazard or risk are as great as suggested in this document or they believe the impacts of creating a fuel break would far outweigh the impacts caused by a fire. This section will respond to those concerns. The italicized text is the agency response.

##### 4.1.6.1 Fire is natural and wildfires should be allowed to burn.

*The natural fire regime for the project area is one where large stand replacing fires burn and kill most trees. While this may be “natural” it is not the desired condition for this landscape at this time. The landscape is managed for many human values such as scenery, clean air, recreation, safety and huckleberries. It is also managed to provide habitats for rare species. The Mt. Hood Forest Plan as amended by the Northwest Forest Plan requires an appropriate suppression response for all wildfires in this area to protect these values. Fires are sometimes allowed to burn in certain Wilderness areas.*

##### 4.1.6.2 Fuel reduction should occur in the wildland/urban interface and not deep in the forest where no houses are at risk. *The Forest has undertaken hazard reduction in the wildland/urban interface. However, this project was initiated by the request of the Confederated Tribes of Warm Springs under the Tribal Forest Protection Act. It was requested because large scale wildfires are likely to occur in this area, and when they do*



*occur Tribal resources would be damaged. It may seem deep in the forest for folks that come from Portland, but the project is in the “back yard” of Tribal members who live and work there.*

- 4.1.6.3 The proposed fuel break will not stop a wildfire. *The project is not intended to stop a wildfire. It is intended to aid in the suppression of a wildfire. It would be a place where firefighters could safely work. The intent is to create a situation where firefighters could keep a fire smaller than what would occur without a fuel break.*
- 4.1.6.4 100 years of fire suppression has caused the landscape to be outside its natural range of variability and now fires will burn with unnatural intensity. *Fire return intervals in the project area are not outside the range of natural variability. The project area is in fire regime IV which naturally burns with high intensity. Many years of fire suppression have affected the project area. Without fire suppression, the area would likely have fewer acres of mature and mid-seral forests because of stand replacing wildfires and it would likely have more burned areas and more newly established young forests. There are some factors such as dead trees and ladder fuels that may result in fires burning even hotter or get even larger.*
- 4.1.6.5 It is not true that historically all fires burned with low intensity. Large intense stand replacing fires have always been a part of our ecosystems. *In some fire regimes, fires historically burned frequently at low intensity. Due to fire suppression in the last 100 years, some of these stands have grown brush and understory trees that now would burn with great intensity if ignited. Many fuels reduction projects focus on these areas. This project however is not in an area that would naturally have had low intensity fires. For many hundreds of years, large stand-replacing fires burned in this area. It is not our intent to change this landscape to one where low intensity fires burn.*
- 4.1.6.6 Prescribed fire should be used to get fuel levels down to natural levels. *Prescribed fire is one technique used in some areas to reduce fuels. It is not proposed for this project. Prescribed fire in the project area would likely ignite a large stand replacing fire.*
- 4.1.6.7 If you're trying to restore ecosystems there are better ways to do it. *The purpose of the project is not to restore ecosystems. It is intended to aid in the suppression of a wildfire.*
- 4.1.6.8 If your objective is to restore forest health; forest productivity, wildlife, biodiversity, and other resources and values are as much a part of the forest health equation as are the structure of a forest and its tolerance to fire. *The purpose of the project is not to restore forest health. There are forest health issues in the project area, but the fuel break is intended to aid in the suppression of a wildfire. Other resources that may be impacted or benefited by the proposed action are addressed in other parts of this document. Refer to the table of contents.*
- 4.1.6.9 The Olallie Lake area is high elevation and relatively flat. It is unlikely that crown fires would burn in this area. *It is highly likely that crown fires would burn in this area. The recent nearby Olallie Complex Fire is an example of what is likely. It burned forests with*

*similar elevation and topography. It was a crown fire that burned approximately 2500 acres killing virtually every tree.*

- 4.1.6.10 This is an experimental treatment not supported by research. There is not consensus in the scientific community. *Shaded fuel breaks have been used in many areas and have proven to be an effective tool. See references cited in the body of the Fire Hazard and Risk section.*
- 4.1.6.11 It is just as likely that a fire will start when favorable conditions of weather and fuel moisture exist and therefore result in a low intensity fire that would consume fuels across the landscape and accomplish hazard reduction naturally. *If a fire started in the project area when fuels are moist or when winds are not blowing, the fire would be put out by suppression forces when it is quite small. Fires in this area are not allowed to burn. If a fire that started under these conditions was allowed to burn, it would stay small until the fuels dried out at which time it would become a high intensity crown fire. Recently a lightning strike in the area smoldered undetected for 6 weeks until the fuels dried out and embers dropped to the ground creating enough smoke to be detected and subsequently extinguished by suppression crews. The scenario describing low intensity fire that would consume fuels across the landscape and accomplish hazard reduction naturally, would not occur in areas like this in fire regime IV.*
- 4.1.6.12 Logging will increase fire hazard. *This project is not traditional logging. Tree tops, branches and fuels on the ground would be removed. Fuel modeling and previous experience shows that flame lengths would be approximately 4 feet after the creation of the fuel break compared to flame lengths up to 100 feet without it.*
- 4.1.6.13 Thinning will increase temperature, reduce humidity and increase wind speed on the forest floor. Fuels on the ground would then burn with greater intensity. *This project is not a traditional thinning. Tree tops, branches and fuels on the ground would be removed. Fuel modeling and previous experience shows that flame lengths would be approximately 4 feet after the creation of the fuel break compared to flame lengths up to 100 feet without it.*
- 4.1.6.14 It is not proven that thinning lodgepole pine will stop an insect epidemic. *Stopping an insect epidemic is not the purpose of the project. It is likely that insects would continue to kill lodgepole pine across the landscape.*
- 4.1.6.15 Beetles have become a nuisance because of monocultures and fire suppression activities. *The term monoculture usually applies when humans eliminate diversity and plant only one species. Lodgepole pine stands in the project area were not planted, but are naturally occurring stands that seeded in after the last stand-replacement fire. Lodgepole pine naturally becomes susceptible to mountain pine beetle attack when they get to age 80 to 100 regardless of fire suppression activities.*
- 4.1.6.16 It should not be the management objective to impose uniform low intensity fire regime across the landscape. *This is not the objective of the project. The natural fire regime for*

*this area is one where large scale stand-replacement fires burn. The fuel break would have low fire intensity in the actual fuel break but would not change the fire regime across the landscape.*

- 4.1.6.17 Plantations are a fire hazard and should be restored. *Where the fuel break crosses through plantations the fire hazard there would be reduced. The project does not involve treating plantations elsewhere. Treating plantations only, may reduce fire intensity in the plantations but would not result in a continuous fuel break to aid in the suppression of wildfires.*
- 4.1.6.18 Management practices such as logging and road building have changed landscape patterns and resulted in ecosystems without enough old growth. *Logging has removed some old growth in the northern portion of the fuel break adjacent to road 4230. The rest of the project area has little old growth because of past wildfires.*
- 4.1.6.19 There should be a diameter limit to retain all large trees so the area can grow into old growth. Past logging has removed large trees. *There has not been any partial harvest in the project area that removed large trees and left smaller ones. The harvest that has occurred in the northern portion of the project was regeneration harvest that resulted in young plantations. The shaded fuel break would leave the larger trees spaced out. The project does not have a diameter limit. A diameter limit would not space out the trees sufficiently. The objective of the project is not to grow old growth but to aid in the suppression of large wildfires. Without the fuel break, more old growth would likely be burned.*
- 4.1.6.20 Retain the large ponderosa pine that are fire resistant. *There are no ponderosa pine trees in the project area.*
- 4.1.6.21 Fuel reduction should focus on live stands and not post fire salvage. *The project does not propose to do any post fire salvage. The recent Olallie Fire Complex had no salvage.*
- 4.1.6.22 How will the agency fund the regular maintenance that will be needed? *Some of the work of creating the fuel break and maintaining it over time, may be accomplished by agency firefighting crews when there are no active wildfires. The Forest has a Hotshot crew and an Initial Attack crew (40 people) and two fire engine crews that are fully funded throughout the summer. These crews can accomplish this type of project work and can use the opportunity for on-the-job training and physical conditioning when there are no fire assignments.*
- 4.1.6.23 Grass and invasive plants will spread through the area increasing fire hazard. *Contracts would require the cleaning of equipment prior to entering the project area. Erosion control seed would be certified weed free.*
- 4.1.6.24 There is another road leaving Olallie to the south. Consider opening and improving this road as an alternative means of egress. *The road leaving Olallie to the south crosses onto*

*the Warm Springs Reservation. Maintaining this road is not consistent with Tribal objectives.*

4.1.6.25 What plans does the Confederated Tribes of Warm Springs have for their land? *The Confederated Tribes of Warm Springs are concerned about fire hazard. The lodgepole pine on the reservation is being killed by mountain pine beetle. The Tribes' plans have not yet been fully developed.*

#### 4.1.7 Forest Plan goals, standards and guidelines

The Forest Plan contains, at its core, management goals and desired future condition statements that direct how the Mt. Hood National Forest is to be managed (p. Four-1 to Four-44). It also contains a multitude of standards and guidelines that were designed to guide projects to meet management goals and move the landscape toward the desired future condition. These standards and guidelines work as intended when decision makers have the flexibility to determine the size, shape and location of harvest units and can design other implementation details to achieve the Forest Plan's overriding management goals and desired future conditions. Standards and guidelines however were primarily written to address traditional timber sales and they often do not adequately address fuel breaks or high fire hazard situations.

This project arose in response to uncontrollable circumstances: the insect infestation and the resulting high fire hazard. There was also no control over the land allocations that insects would move into. Portions of the project are in areas that would not normally have been targeted for intensive timber management. While the creation of a fuel break would involve some timber removal, the primary goal is to aid in the suppression of large scale wildfires. The Forest Plan directs the suppression of wildfires to protect resources.

A casual reading of standards and guidelines without consideration for the achievement of management goals or desired future conditions might lead one to conclude that a fuel break is not a good idea. However, the appropriate strategy is to weigh the localized impacts of fuel break construction with the landscape-wide benefits of reduced wildfire impacts to determine the achievement of management goals and desired future conditions. Standards and guidelines that were written to shape the development of traditional timber sales may not be applicable especially if they hinder the achievement of key management goals and desired future conditions.

The following section addresses management goals, desired future conditions and standards and guidelines that relate to fire and fuels. Page numbers are from the Forest Plan unless otherwise noted. The bulleted text is from the Forest Plan as amended, and the highlighted text is an explanation of how this project fits with those management goals, desired future conditions and standards and guidelines.

- 4.1.7.1 Provide fire protection, fuels treatment and pest management programs that are responsive to land and resource management goals and objectives. (#22, p. Four-4)

The proposed action would achieve this goal because a fuel break would aid in the suppression of large scale wildfires and would minimize risk to resources.

- 4.1.7.2 Many forest management goals include the direction to “protect, maintain or enhance” resources such as riparian areas, water quality, soil productivity and wildlife habitat. (# 6, 7, 9 and 12, p. Four-2&3)

These resources would be protected because risk of damage from wildfire would be reduced.

- 4.1.7.3 Honor treaty rights and privileges of Native Americans. Protect and preserve Native American ceded rights and privileges to access and use the Forest for traditional religious values. (#2, p. Four-2)

The proposed action responds to the request of the Tribal Council of the Confederated Tribes of the Warm Springs Reservation of Oregon under the authorities of the Tribal Forest Protection Act.

- 4.1.7.4 Provide safe, efficient access for the movement of people. (#17, p. Four-3)

The proposed action would provide for the safety of firefighters and would increase the safety of users of the Olallie area in the event of an evacuation.

- 4.1.7.5 An appropriate suppression response will be made to all wildfires. When fire suppression forces reach the wildfire, they will apply the appropriate fire suppression strategy which allows for the control of the fire with minimum cost plus damage to the resources affected. (p. Four-25)

The proposed action would result in a situation where firefighters would be able to safely suppress a wildfire. Wildfires would be smaller, suppression costs would be reduced and there would be reduced impact to resources.

- 4.1.7.6 In Riparian Reserves the goal of wildfire suppression is to limit the size of all fires. (Northwest Forest Plan Standards and Guidelines p. C-18)

The proposed action would result in smaller wildfires and reduced overall impact to riparian resources.

- 4.1.7.7 In Late-Successional Reserves (LSR) the goal of wildfire suppression is to limit the size of all fires. Until a fire management plan is completed for Late-Successional Reserves, suppress wildfire to avoid loss of habitat in order to maintain future management options. (Northwest Forest Plan Standards and Guidelines p. C-18)

The proposed action includes 316 acres of treatment in the LSR. 54 acres of late-successional stands would be thinned in the LSR to create the shaded fuel break. The proposed action would result in smaller wildfires and reduced overall impact to LSRs and to dependent species. A fire management plan was completed as part of the LSR assessment (chapter 5). It contains recommendations to continue the suppression of wildfire to avoid the loss of habitat.

- 4.1.7.8 Major goals for managing LSRs within the Northwest Forest Plan are to maintain and protect late-successional forest ecosystems from loss due to large scale fire, insect and disease epidemics, and major human impacts. (North Willamette LSR Assessment Fire Management Plan, p. 5-1)

The proposed action is consistent with this recommendation of the LSR Assessment.

- 4.1.7.9 The southern part of the Upper Clackamas LSR (Olallie Lake Scenic Area) and the area directly north, lie in an area called the “Cascade Lightning Belt.” Increasing tree spacing and reducing residual fuel loading will reduce the probability of a stand replacing fire and reduce the impacts should one start. (North Willamette LSR Assessment Fire Management Plan, p. 5-8)

The proposed action is consistent with this recommendation of the LSR Assessment.

- 4.1.7.10 East of the Cascades – Given the increased risk of fire in these areas due to lower moisture conditions and rapid accumulation of fuels in the aftermath of insect outbreaks and drought, additional management activities are allowed in LSRs. (Northwest Forest Plan Standards and Guidelines p. C-12) While risk-reduction efforts should generally be focused on young stands, activities in older stands may be appropriate if: (1) the proposed management activities will clearly result in greater assurance of long-term maintenance of habitat, (2) the activities are clearly needed to reduce risks, and (3) the activities will not prevent the Late-Successional Reserves from playing an effective role in the objectives for which they were established. Such activities in older stands may also be undertaken in Late-Successional Reserves in other provinces if levels of fire risk are particularly high. (Northwest Forest Plan Standards and Guidelines p. C-13)

This project is near the crest of the Cascades but is west of the divide in the Clackamas River Watershed. The project area is very similar in terms of fire hazard to east side stands. The Northwest Forest Plan allows LSRs in other provinces to be managed using East Side standards and guidelines if the levels of fire risk are particularly high.

- 4.1.7.11 Some salvage that does not meet the preceding guidelines will be allowed when salvage is essential to reduce the future risk of fire or insect damage to late-successional forest conditions. (Northwest Forest Plan Standards and Guidelines, LSR, #5, p. C-15)

The proposed action is not a traditional “salvage” timber sale but within much of the fuel break there are many dead trees. These trees would be removed or piled and burned to reduce fire hazard.



- 4.1.7.12 Strategies should recognize the role of fire in ecosystem function and identify those instances where fire suppression or fuels management activities could be damaging to long-term ecosystem functions. (Northwest Forest Plan Standards and Guidelines, Riparian Reserves #FM1, p. C-35)

Fire regimes are near their historic range for the project area. Traditionally, large stand-replacing fires burned every one to two hundred years. One or more large stand-replacing fires are expected to occur in the near future. Given the resources at risk in this area, the strategy of suppression is appropriate.

- 4.1.7.13 It is important to understand that some risk associated with fire and insects is acceptable because they are natural forces influencing late-successional forest development. Consequently, salvage to reduce such risks should focus only on those areas where there is high risk of large-scale disturbance. (Northwest Forest Plan Standards and Guidelines, Late-Successional Reserves #5, p. C-15)

The proposed action is not a traditional “salvage” timber sale but within much of the fuel break there are many dead trees. There is a high risk of large-scale disturbance.

## 4.2 Recreation and Scenery

- 4.2.1 **Introduction** - The proposed fuel break crosses areas that are used for various types of recreation. The project area is seen by forest visitors on their way to recreational destinations, and viewing scenery is an important recreational activity. Generally, the northern portion receives more roaded recreation and hunting, while the southern portion is the access to the Olallie Lake Scenic Area – a relatively primitive area where camping and hiking are the primary uses. The Olallie Lake Scenic Area receives approximately 30,000 visitors each year, mostly in the summer months. Most visitors to the Olallie area travel there via road 46 to road 4690 to road 4220. (Road 4220 is sometimes referred to as the Skyline Road.) They would enter the proposed fuel break at the junction of roads 4690 and 4220 and would follow the fuel break south to near Head Lake. It is also possible to get to the Olallie area via road 42 to road 4220 where a visitor would enter the fuel break at the junction of road 4220 and 4230. Either route would take travelers through a landscape that has been intensively managed for timber production with a checkerboard pattern of clear cuts and plantations of various ages. When travelers get to the area of the fuel break on their way to Olallie, they find that the road gradually becomes more primitive and the landscape they move through transitions to one with fewer and fewer human caused visual alternations. However they also encounter dead and dying trees, mainly lodgepole pine killed by mountain pine beetles. The vast majority of the travelers on road 4220 are on their way to destination features such as the Olallie Lake Resort, Paul Dennis Campground, Peninsula Campground, Camp Ten Campground, the trail heads of the Pacific Crest Trail, or any of the various lakes. These features are past the end of the proposed fuel break, therefore the primary potential impact to forest visitors would be visual alteration along their drive or traffic interruptions during implementation. The Olallie Lake Resort (on

National Forest System land, operated under special use authorization) and the adjacent Guard Station were constructed in the 1930s.

The following proposed actions have the potential to affect recreation and scenery:

- Cutting trees would create stumps and would open up stands so that visitors could see farther into the forest. Depending on the configuration of leave trees and pruning, visitors may see unnatural patterns or lines.
- Heavy equipment and pile burning could damage leave trees.
- Heavy equipment and pile burning could create bare soil.
- Burning would create smoke.
- Loading and removing wood products may cause traffic conflicts.
- During implementation and before final cleanup, slash would be visible.

## 4.2.2 Existing Situation

4.2.2.1 **Olallie Lake Scenic Area** – The Olallie Lake Scenic Area was established administratively through local land management planning, not by Congressional designation. The boundary of the Scenic Area was expanded to the north with the Forest Plan and the establishment of the A4 land allocation. The proposed fuel break crosses the current Scenic Area boundary at its northern boundary near road 4690. Approximately 226 acres of the fuel break would be in the Scenic Area. The sign on road 4220 welcoming visitors to the Scenic Area is actually one mile farther south, near Olallie Meadow. Many forest visitors do not consider that they have “arrived” until they get to Olallie Lake, approximately 5 miles from the Scenic Area boundary.

The scenery in the area and the quality of the recreational experience has been affected by past management activities and catastrophic events:

- Approximately 125 acres of plantations occur in the Scenic Area from harvest that occurred in the 1980s. None of these plantations can be seen from road 4220.
- A powerline corridor managed by Portland General Electric crosses the Scenic Area (approximately 400 feet wide).
- As visitors approach the Olallie area, they drive through a landscape of dead and dying trees.
- Most of the trees surrounding the Olallie Lake Resort have died, and many have already been cut because they posed a risk to the cabins and forest visitors.
- All of the campgrounds have been affected by the on-going mountain pine beetle infestation. The dead lodgepole pine trees in the campgrounds have been felled or will soon be felled because they are hazardous to campers. This action results in a campground that is more open with less screening between campsites and reduced shade.
- Visitors to the Peninsula Campground get a close-up view of the Olallie Fire Complex that burned right up to the shore line of Olallie Lake and Monon Lake. The fire burned very hot in this area and all vegetation was killed. Over 2500 acres were burned.



- Part of Peninsula Campground was burned by a human caused fire. Children ignited lichens that created a fire that spread through tree crowns. It was extinguished after burning only a few acres. The burned trees have since been felled because they were considered hazardous.

Ingress and egress to the Scenic Area for recreation and administration requires the use of Road 4220. In the event of a wildfire, it is also the only route in for fire suppression forces and the only way out if emergency evacuation of the public is required. Fire hazard is increasing due to dying trees and the accumulation of fuels; and the risk of fire ignition from lightning and careless humans is high.

- 4.2.2.2 **Campgrounds** – Of the 7 campgrounds in the Scenic Area, only three are close to the fuel break: Triangle Lake Horse Camp, Olallie Meadows Campground, and Lower Lake Campground. Triangle Lake Horse Camp is within the proposed treatment area, and a modified treatment prescription would be applied to vegetation in the campground. Lower Lake Campground is just outside the area. The Forest has plans to decommission Olallie Meadows Campground because most of the trees there are dead or dying.
- 4.2.2.3 **Trails** - The Pacific Crest National Scenic Trail is adjacent to the proposed fuel break. There would be a 50-foot buffer between the fuel break and the trail. Approximately 2.8 miles of the trail parallel the proposed fuel break within a distance of as close as 50 feet to as far as 1000 feet between Triangle Lake Horse Camp and Head Lake. The fuel break would be close enough to be seen from the trail along approximately 1 mile in three sections. Other trails in the area include the Lodgepole Trail (trail 706) that goes from Triangle Lake to Lower Lake, and the Russ Lake Trail (trail 716) that connects Olallie Meadows Campground to the Pacific Crest Trail. The Lodgepole Trail is outside the proposed treatment area. Only the western terminus of the Russ Lake Trail is in the proposed treatment area.
- 4.2.2.4 **Clackamas River** - The Clackamas River is a Congressionally designated Wild and Scenic River with both recreational and scenic segments. The outstandingly remarkable values identified in the River's management plan are Botany/Ecology, Fish, Wildlife, Recreation and Cultural Resources. These resources are addressed in detail elsewhere in this document (see table of contents). Scenery was not found to be an outstandingly remarkable value. The river is also a state scenic waterway. The river corridor has a land allocation (A1).
- Approximately 15 acres of the proposed fuel break are in the scenic river segment near its headwaters. The river at this point is one to two feet wide, and there are no fish in this section. To visitors on their way to the Olallie area, the river appears like any other small stream. The 15 acres of the proposed fuel break that are in the river corridor are entirely within Olallie Lake Scenic Area.
- 4.2.2.5 **Unroaded Recreation/Wilderness** - An unroaded recreation land allocation (A5) occurs within the proposed fuel break east of Sisi Butte (not in the Olallie Lake Scenic Area).

This area is bounded on its east side by road 4220 and on its south side by road 4220120 which is a gated road to the Sisi Butte lookout tower. This area is not an “inventoried” roadless area. The forest there is almost entirely lodgepole pine that has very high mortality. There are no trails or constructed recreation features. Recreation use, primarily hunting, is very low. The fuel break would include approximately 23 acres of the A5 allocation in an area that has been previously thinned.

Pending legislation in the 110<sup>th</sup> Congress would designate new wilderness encompassing most of this unroaded recreation area. The fuel break proposal was adjusted for approximately 0.6 mile of its length to exclude the proposed wilderness. The current Wilderness bill language does not require a buffer between the Wilderness and management actions.

- 4.2.2.6 **Inventoried Roadless Area** – An inventoried roadless area overlaps a portion of the Olallie Lake Scenic Area. Its north boundary is the power line and its east boundary is road 4220. The fuel break was adjusted to be only 100 feet wide in this area. The current Roadless Rule allows generally small diameter timber to be cut, sold or removed to reduce uncharacteristic wildfire effects. The proposed action would not build any roads.
- 4.2.2.7 **Dispersed Recreation** - The primary use of the northern portion of the project area is dispersed camping and hunting. These users are typically not traveling to the Olallie area. Fire rings are present at old landings and road junctions.
- 4.2.2.8 **Roaded Recreation** - The fuel break overlaps approximately 1.5 miles (41 acres) of a roaded recreation land allocation (B3), west of road 4220 near the junction with road 4690. Since this area now overlaps a Late-successional Reserve the Forest no longer encourages motorized recreation there.

The Forest is developing a plan to designate road and trail routes for off-highway vehicles (OHV). It would change OHV access through much of the Forest in order to meet the intent of the Travel Management; Designated Routes and Areas for Motor Vehicle Use; Final Rule that was published on November 9, 2005 (70 FR 216). The OHV plan would designate OHV routes within six proposed OHV areas and designate areas where motorized access to dispersed (undeveloped) camping would be permitted in the Forest. One of the proposed OHV study areas (referred to as Peavine) overlaps the proposed fuel break. Road 4230, along the northern portion of the fuel break would be the southernmost OHV route. There is no road or trail construction proposed for OHV access in the immediate vicinity of the proposed fuel break. The nearest new trail proposed under this proposal is just north of Road 42, four and a half miles north of the proposed fuel break. Currently, none the proposed fuel break gets very much OHV use.

4.2.2.9 **Visual Quality Objectives**

<b>Area</b>	<b>Viewer Position</b>	<b>Visual Quality Objective * (Foreground)</b>
Clackamas River	River bank	Retention
Campgrounds	Campgrounds	Partial Retention
Pacific Crest Trail	Trail	Retention
A4 – scenic area		Retention
A5 – unroaded recreation	Trails, rec areas, water bodies (there are none of these)	Retention
B3 – roaded recreation	Open roads	Partial Retention
Inventoried roadless area	Road 4220	Retention
Streams	Stream bank	Partial Retention
All other areas	Local open roads	Modification

\* From Forest Plan

4.2.2.10 **Recreation Opportunity Spectrum**

The project area crosses land with various recreational objectives. The Recreation Opportunity Spectrum (ROS) is a framework to inventory, plan, and manage recreational opportunities. The ROS objectives for the project area are Semi-Primitive Non-Motorized in the unroaded land allocation and inventoried roadless area, Semi-Primitive Motorized in the Scenic Area and Roaded Natural elsewhere.

The proposed fuel break would not change access, remoteness, the level of development of facilities or the number or type of social encounters. The project’s primary effect on ROS would be scenic quality and the degree of naturalness encountered by visitors.

4.2.3 **Cumulative Effects**

There are no other foreseeable projects planned in the vicinity of the fuel break that would impact scenery or recreation. The Forest is developing a plan to designate road and trail routes for off-highway vehicles (OHV). One of the proposed OHV areas overlaps the proposed fuel break along road 4230. The effects of this plan are addressed below under roaded recreation. Plantations from past timber harvest occur on 277 acres of the proposed fuel break. Visual effects from recent wildfires and the potential for future wildfires are included in the baseline discussion of existing condition above and the sections below on direct and indirect effects. The section on fire hazard and risk (s. 4.1), discusses historic fire regimes and the effects fire suppression has had on the landscape.

#### 4.2.4 Direct Effects

With no action, the fuel break would not be constructed. Snags and other hazard trees along roads 4230 and 4220 and in campgrounds would be felled as part of routine road and campground maintenance to provide for visitor safety.

The proposed action would result in some changes to scenery and recreation. Project design elements such as leaving live trees, cutting stumps low and having complete cleanup of slash and debris would result in an open looking park-like stand. Clumpy leave tree spacing, leaving some trees unpruned and an undulating edge would help mitigate the change to visual dominance elements (line, form, color, and texture) that would result from the proposed action.

Since the project is occurring along open roads, people traveling these roads would be able to view project implementation. Visitors may see equipment operating, fresh stumps, debris on the ground, unburned slash piles and some exposed soil. Eventually they would see the black area where slash piles were burned. Where wood products are removed a loader logging system would result in minimal ground disturbance because logs would be picked up and moved to the road side. Some visitors may find this process visually offensive, particularly if they are not aware of the objectives of the project. Reduction in form, line, color and texture contrast would likely take more than one year. As time goes by, the fresh stumps would turn grey and bare soil and the black of burn piles would eventually become less evident.

Once the project is completed, a period of adjustment would occur as people get accustomed to the new look and feel of this area. Since the fuel break would be maintained, the altered landscape and visual contrast in the area would continue indefinitely. Future maintenance would likely involve the removal of small trees and brush and would not result in as much visual impact as would occur during the initial installation of the fuel break.

While many design features have been included to minimize effects to scenery it is likely that a fuel break directly adjacent to primary viewer positions would not meet visual quality objectives in the short term where the foreground visual quality objective is Retention or Partial Retention. The fuel break would likely be evident to forest visitors as they travel to Olallie Lake, hike along the Pacific Crest Trail or camp in campgrounds. Fuel break areas may be less likely to be photographed or be used for picnicking and other casual day-use activities. As time goes by, the fuel break would become less evident and visitors may become accustomed to the change. Even with no action, visitors would need to adjust to changes caused by the insect infestation and the effect that dead and fallen trees have on scenery and recreation.

In Triangle Lake campground, removal of vegetation for fuel break construction would reduce visual screening between campsites. Overhead shade would also be reduced. The overall result would be a more open-feeling and warmer campground.

#### 4.2.5 Indirect Effects

With no action, the likely wildfire scenario would be similar to what happened with the recent nearby Olallie Lake fire complex. When a wildfire starts, the fire and firefighting tactics would likely result in effects to scenery. Tactics would likely include an increased use of dozers. Because of the urgency to contain the fire, firefighters would not be able to take as much time and care to avoid impacts to scenery. Stumps would not be flush cut and debris would be pushed by dozers. When burnout operations begin, there would be more scorch to the residual trees and many more trees would eventually die compared to the fuel break where flame lengths would only be 4 feet. There is a higher probability that fires would get larger than it would if a fuel break were in place.

There is a concern about public safety in the event of a fire requiring evacuation of the Olallie area. Road 4220 (south of the 4690 junction) is a primitive road and is the only access to the Olallie Lake area. If the fire were burning adjacent to road 4220 with current conditions, the heat would be too intense to allow vehicles to pass. The fuel break would reduce fire intensity along road 4220 and public safety would be enhanced because vehicles could drive by with the lower levels of heat.

With no action, a wildfire directly adjacent to primary viewer positions would result in higher levels of visual and recreational impact than would occur with the fuel break in place. As with the recent nearby Olallie Lake fire complex, a wildfire burning with no fuel break would be a crown fire that would kill virtually every tree. The landscape would be black and stark for many years. In the area of the fuel break, flame lengths would be approximately 4 feet and visual impacts directly adjacent to primary viewer positions would be less because the fire would be less likely to burn through the crowns. Some trees that are not resistant to fire, such as hemlock and lodgepole pine, may be killed even with 4-foot flame lengths.

With no action, wildfires are likely to get larger than with the fuel break, and a larger fire would result in greater impacts to scenery across the landscape and greater impacts to facilities such as campgrounds and the Olallie Lake Resort. It would take several decades for the visual effects of a wildfire to become less evident.

#### 4.2.6 Other Area Specific Effects

4.2.6.1 **Olallie Lake Scenic Area** – Design features are adjusted in the Scenic Area to minimize effects to scenery while still providing an effective overall fuel break.

- Leave tree spacing would be irregular with some trees left in clumps.
- Some trees would be left unpruned.
- The width of the fuel break boundary would average the distances shown on the project map but the boundary would be irregular to avoid straight sight lines.
- Mechanical and hand treatment would occur based on topography. Mechanical treatments would be more common in the northern section of the Scenic Area and hand treatments would be more common in the south.

- Ground disturbance would be minimized by using techniques such as over-snow biomass removal and having small landings only within the road prism.
- Stumps would be cut low.
- Debris cleanup, piling and burning would be kept current with operations so that only short sections of road 4220 would be visually affected by this part of the action at any one time.
- If tree marking paint is used on leave trees it would only be used on the portion of the bole not seen from the road.

See description of direct and indirect effects. Creating the fuel break would result in changes that would be noticed by people driving on road 4220 to the scenic area. With no action, the dead trees along the road would create a hazard and would be felled as part of routine maintenance to provide for visitor safety. With no action, wildfires are likely to get larger than with the fuel break, and a larger fire would result in greater visual impacts to the Olallie Lake Scenic Area.

4.2.6.2 **Campgrounds** – Design features are adjusted in Triangle Lake Horse Camp and Olallie Meadows Campground to minimize effects to the recreational experience while still providing an effective overall fuel break.

- The leave tree spacing would be altered in the areas between camp sites to reduce the effect to visual screening between sites.
- Equipment would operate only on roads.
- Slash and debris on the ground would be removed from the campground for disposal elsewhere.
- Snags would be removed because they are a fire hazard and a safety hazard to campers.

See description of direct and indirect effects. Creating the fuel break would result in changes that would be noticed by campers. With no action, standing dead trees would still be felled as part of routine campground maintenance to provide for visitor safety. With no action, wildfires are likely to get larger than with the fuel break, and a larger fire would result in greater impacts to these campgrounds and others in the Olallie Lake Scenic Area.

4.2.6.3 **Trails** – Design features are adjusted along the Pacific Crest Trail to minimize effects to scenery while still providing an effective overall fuel break.

- The Pacific Crest Trail would have a 50-foot no-treatment buffer. No equipment would cross the trail.
- Other trails in the area include trail 706 that goes from Triangle Lake to Lower Lake, and trail 716 that connects from Olallie Meadows Campground to the Pacific Crest Trail. The trail tread would be protected because no equipment would cross these trails.

Only a small portion of these trails touch the fuel break. The trails go through a wider landscape where insects are killing trees. With or without a fuel break, trail maintenance costs would increase and scenery would be impacted.

See description of direct and indirect effects. Creating the fuel break would result in changes that would be noticed by hikers and horseback riders. With no action, wildfires are likely to get larger than with the fuel break, and a larger, more intense fire would result in greater impacts to hikers and horseback riders. Rather than viewing a mosaic pattern of burned and unburned landscapes, trail users would be more likely to see larger areas burned more intensely. Large severe burns would be more likely to affect soil chemistry. As the loss of the organic component of the soil increases (this component acts as a binding agent), maintaining the trail tread becomes more difficult. For most visitors, using a trail in a severely burned landscape would be a less desirable recreation experience. The experience would be generally hotter and dustier.

4.2.6.4 **Clackamas River** – Since the Wild and Scenic River segment is totally within the Olallie Scenic Area, the design features that were discussed in that section apply here as well. The area directly adjacent to the river would also have design features that were adjusted for riparian areas to minimize effects to riparian and aquatic resources while still providing an effective overall fuel break.

- There would be a 50-foot wide buffer on either side of the channel. The buffer would be wider to include adjacent wet areas and meadows. The buffer would have no treatment except within 100 feet of road 4220 where snags would be felled.
- Adjacent to the no treatment buffer, extending out 50 feet, treatments would be done by hand with no ground-based equipment. Equipment would be allowed on roads.

The project design would protect the river's outstandingly remarkable values. With no action, wildfires are likely to get larger than with the fuel break, and a larger fire would result in greater impacts to the river.

4.2.6.5 **Unroaded Recreation/Wilderness** - Design features are adjusted in and near the unroaded area east of Sisi Butte to minimize effects to recreation and wilderness values while still providing an effective overall fuel break. The pending Wilderness bill language does not require a buffer between the Wilderness and management actions.

- The fuel break boundary was adjusted for approximately 0.6 mile of its length to exclude the proposed wilderness even though most of the trees there are dead.
- The 23 acres of the fuel break that are in the A5 allocation but not in the Wilderness proposal have already been thinned. Treatment there would consist of snag removal and treatment of debris on the ground.

See description of direct and indirect effects. The area receives very little recreation use; primarily hunting. Creating the fuel break would result in changes that would be noticed by visitors driving by on road 4220. Most of this unroaded area contains dead and dying

lodgepole pine. With no action, wildfires are likely to get larger than with the fuel break, and a larger fire would result in greater impacts to the area and could potentially threaten the Sisi Lookout Tower.

4.2.6.6 **Inventoried Roadless Area** – Since the inventoried roadless area (south of the power line and west road 4220) is totally within the Olallie Scenic Area, the design features that were discussed in that section apply here as well. Design features are further adjusted in the inventoried roadless area to minimize effects to roadless values while still providing an effective overall fuel break. Approximately 28 acres of the fuel break are in the Inventoried Roadless Area.

- The fuel break was adjusted to be only 100 feet wide in this area.
- The creation of the fuel break would cut sell and remove generally small diameter trees to reduce uncharacteristic wildfire effects.
- Snags would be cut where they pose a hazard to road 4220.
- The proposed action would not include any road construction.

See description of direct and indirect effects. There are no trails, and minimal dispersed recreation occurs in this narrow strip along road 4220. Creating the fuel break would result in changes to visual dominance elements that would be noticed by visitors driving to Olallie Lake.

The Roadless Rule (section 294.13) allows generally small diameter timber to be cut, sold, or removed in inventoried roadless areas where it maintains one or more of the roadless area characteristics as defined in § 294.11 and maintains or restores the characteristics of ecosystem composition and structure, such as to reduce uncharacteristic wildfire effects, within the range of variability that would be expected to occur under natural disturbance regimes of the current climatic period (Paragraph (b)(1)). Paragraph (b)(2) allows timber cutting, sale, or removal in inventoried roadless areas when incidental to implementation of a management activity not otherwise prohibited by this rule. Examples of these activities include, but are not limited to removal of hazard trees adjacent to classified roads for public health and safety reasons.

The Roadless Rule (section 294.11) defines roadless area characteristics. Resources or features that are often present in and characterize inventoried roadless areas, including: (1) High quality or undisturbed soil, water, and air; (2) Sources of public drinking water; (3) Diversity of plant and animal communities; (4) Habitat for threatened, endangered, proposed, candidate, and sensitive species and for those species dependent on large, undisturbed areas of land; (5) Primitive, semi-primitive non-motorized and semi-primitive motorized classes of dispersed recreation; (6) Reference landscapes; (7) Natural appearing landscapes with high scenic quality; (8) Traditional cultural properties and sacred sites; and (9) Other locally identified unique characteristics.

With no action, wildfires are likely to get larger than with the fuel break, and a larger fire would result in greater impacts to most of these listed characteristics. In the event of a wildfire, the fuel break would help protect one or more of these characteristics.



- 4.2.6.7 **Dispersed Recreation** – Design features of the basic fuel break prescription with the adjustments described above would minimize effects to dispersed recreation while still providing an effective overall fuel break.

See description of direct and indirect effects. Creating the fuel break would result in changes that would be noticed by people participating in dispersed recreation. With no action, wildfires are likely to get larger than with the fuel break, and a larger fire would result in greater impacts to the recreational experience. Larger, more intensely burned areas would be less likely to be photographed, and less likely to be used for picnicking and other casual day-use activities.

- 4.2.6.8 **Roaded Recreation** - Design features of the basic fuel break prescription with the adjustments described above would minimize effects to roaded recreation while still providing an effective overall fuel break.

The Forest is developing a plan to designate roads and trails for off-highway vehicles (OHV). One of the proposed OHV areas overlaps the proposed fuel break. Road 4230, along the northern portion of the fuel break would be the southernmost OHV route. Currently, none the proposed fuel break gets very much OHV use. If this proposed OHV area remains in the final plan, the environmental impact statement for that plan will address the effects. The more open character of the fuel break could encourage OHV riders to leave the road and cause additional soil impacts. These impacts are elaborated elsewhere in this document. Roaded recreation could lead to increased risk of fire ignition. Because of reduced fuel loads, the proposed fuel break may reduce the initial intensity of a fire ignited adjacent to the road resulting in quicker control and fewer acres burned.

#### 4.2.7 **Forest Plan Goals, Standards and Guidelines**

Standards and guidelines were designed to guide projects to meet management goals and move the landscape toward the desired future condition. Standards and guidelines however were primarily written to address traditional timber sales and they often do not adequately address fuel breaks or high fire hazard situations.

The following section addresses management goals and standards and guidelines that relate to scenery and recreation. Page numbers and standard and guideline numbers are from the Forest Plan unless otherwise noted.

Forest Plan Goal 16 - Manage Forest recreational access to protect natural resources, provide for public safety, and minimize conflicts among the various users of the Forest.  
Page Four-3

Forest Plan Goal 33 - Provide Forest visitors with visually appealing scenery. Manage all Forest lands to attain the highest possible visual quality commensurate with other resource values. Page Four-4.

4.2.7.1

<b>Visual Quality Objectives</b>	
	<i>In the short term, the fuel break would not likely meet these objectives. As time goes by, the fuel break would become less evident and visitors may become accustomed to the change. With no action, wildfires are likely to get larger than with the fuel break, and a larger fire would result in greater impacts to scenery across the landscape. See discussion of exemptions in s. 4.2.7.3.</i>
FW-556	The prescribed VQO should be achieved within one year after completion of any project activities.
FW-552	The visual quality objectives prescribed in management direction represent the minimum level that shall be achieved in long term visual resource management.
FW-553	Management Areas VQOs shall be prescribed as summarized in table Four-22.
FW-554	Visual quality objectives for “designated viewsheds” shall be prescribed as listed in table Four-23.
A4-014	All management activities within the Management Area shall meet visual quality objectives of Retention in the foreground, and partial retention in the middleground and background distance zones, as seen from open roads, high recreational use areas, and water bodies within A4 boundaries.
A10-009	Management activities within the Management Area shall achieve a visual quality objective of partial retention as viewed from within A10 boundaries.
B3-013	All management activities within the Management Area shall meet the visual quality objectives of partial retention as seen from open roads, high recreational use areas, and water bodies (i.e. streams, lakes and reservoirs).
B7-013	Management activities shall achieve a visual quality objective of at least foreground partial retention and middleground modification as viewed from the stream and stream bank.
B11-008	All management activities shall achieve a visual quality objective of modification as viewed from open roads.
C1-007	Management activities shall achieve a visual quality objective of modification as viewed from open roads.
FW-584	Trail visual quality objectives shall be prescribed for near foreground (i.e. the first 660 feet each side of the trail, unless screened by topography), far foreground (i.e. the second 660 feet) and middleground based on trail sensitivity level as displayed in table four-24.
FW-585	Sensitivity Level I trails shall have prescribed VQOs of Retention, Partial Retention and Modification in near foreground, far foreground and middle ground distance zones, respectively.
FW-568	Landings shall be hidden from viewer positions in landscapes where Retention VQOs are prescribed.

<b>Visual Quality Objectives</b>	
FW-571	Tree stumps shall be cut so as to not dominate over natural form, line, color, and texture in foreground zones of landscapes where retention and partial retention VQOs are prescribed.
FW-581	Wood residue treatment, and other fire and fuel management activities shall be designed to achieve prescribed VQOs.
FW-583	Maintenance of natural-appearing quantities and character of down woody debris shall be emphasized.
FW-582	Exceptions to organic matter (e.g. down woody debris) management direction may occur within Retention and Partial Retention near-foreground areas (i.e. 200 feet) of designated viewsheds as necessary to achieve visual quality objectives.

4.2.7.2 The proposed fuel break is consistent with the following standards and guidelines.

- A1-001 All management activities in the river corridors shall protect and/or enhance the identified outstandingly remarkable values. (Wild and Scenic River - Botany/Ecology, Fish, Wildlife, Recreation, Cultural Resources)
- A1-004 Management activities shall be consistent with prescribed Recreation Opportunity Spectrum class. (Wild and Scenic River, semi-primitive motorized)
- A4-001 All management activities shall meet the prescribed Recreation Opportunity Spectrum class criteria as displayed in table four-28. (Scenic Area, semi-primitive motorized)
- A4-020 Nonregulated timber harvest activities necessary to achieve Special Interest Area objectives may be allowed, provided no permanent roads are constructed, and the prescribed ROS class is maintained. (Scenic Area)
- A5-001 All management activities shall meet the semi-primitive non-motorized Recreation Opportunity Spectrum class. (Unroaded Recreation Area)
- B3-001 All management activities shall meet roaded natural Recreation Opportunity Spectrum class, or less developed settings.
- FW-451 Activities with the potential to adversely impact trails...and/or dispersed recreation sites shall include measures to minimize impacts and provide for protection and/or restoration.....
- FW-452 Designated trails.....impacted and/or adversely affected by management activities, shall be rehabilitated, restored, and/or relocated.

#### 4.2.7.3 Exceptions

An exception to Forest Plan standard and guideline FW-556 is proposed.

The visual quality objective standards and guidelines are important because it is a Forest goal to attain the highest possible visual quality commensurate with other resource values. However it is often not possible to achieve the VQO during or shortly after project implementation. It may take some time for example for grass seed to grow or slash to be crushed by snow. Even for projects that may take a few years to complete, the language of FW-556 allows flexibility in achieving the prescribed VQO. This guideline's flexibility is crucial here because it would likely take more than one year for the fuel break to become less evident and for visitors to become gradually accustomed to the change.

Even with no action, visitors would need to adjust to changes caused by the insect infestation and the effect that dead and fallen trees have on scenery and recreation. With no action, wildfires are likely to get larger than with the fuel break, and a larger fire would result in greater impacts to scenery across the landscape and greater impacts to facilities such as campgrounds and the Olallie Lake Resort. It would take several decades for the visual effects of a wildfire to become less evident.

#### 4.2.8 Response to Public Comments

Section 3.2 discusses the various alternatives suggested. However some commenters question the purpose and need and do not believe the hazard or risk are as great as suggested in this document or they believe the impacts of creating a fuel break would far outweigh the impacts caused by a fire. This section will respond to those concerns.

The following is a discussion of an e-mail campaign sponsored by Oregon Wild. Form e-mails were available to be sent from Oregon Wild's web site. Several hundred emails were received by Gary Larsen. The Oregon Wild web site did not mention that the proposed project is a fuel break, or that one of the objectives was to reduce the impact of wildfire on the Olallie area or that part of the scenic area was recently burned. The following is the content of the Oregon Wild web notice. The highlighted text represents the agency response.

### Stop the plan to log in the Olallie Lakes basin

(The proposed fuel break is not in the Olallie Lake basin, it is in the Clackamas River watershed.)



*Mt. Jefferson rises above the calm surface of Olallie Lake*  
 (The proposed fuel break is not in the area shown in this photo)  
*photo by William Sullivan*

If you've been there you know and if you haven't, the above picture says it all. (For those who have never been there, the photo does not show the dead trees that contribute to the fire hazard situation or the recent wildfire that burned nearby.) Olallie Lake is an Oregon treasure, but this family camping area at the base of Mount Jefferson is at risk. (The project is 8 miles from the base of Mount Jefferson.) Right now, the Forest Service has plans to log 900 acres in the Olallie Lakes region. (The fuel break is not a traditional logging project. Approximately 226 acres of the fuel break would be in the Olallie Lake Scenic Area.)

The Olallie Lakes Scenic Area contains dozens of alpine lakes perfect for swimming, fishing and paddling around in a rowboat. Families coming to enjoy their favorite camping spot don't want to see miles and miles of tree stumps when they drive in. (Stumps would be cut low and would not be visually evident. The fuel break would not be seen from any of the heavily used lakes.)

To take action, use the form below to e-mail the Forest Service and tell them you want your campgrounds and trails to be beautiful and natural, not logged over. Tell them not to log the Olallie Lakes Scenic Area!

### **Background:**

In addition to being a scenic area, the world-renowned Pacific Crest Trail passes by several of the lakes. The logging would actually cut trees along several miles of this famous trail! And if that wasn't enough, part of the logging project cuts into a designated roadless area; federally protected land. Oregonians want wildlands protected, not turned into stump fields! (Stumps would be cut low and would not be visually evident. The fuel break would

only be seen along approximately 1 mile of the Pacific Crest Trail. The current Roadless Rule allows small diameter trees to be cut and removed to reduce uncharacteristic wildfire effects. The proposed action would not build any roads.)

*Following are two versions of the e-mails sent to Gary Larsen:*

Dear Mr. Larsen

The Olallie Lakes Scenic Area is truly a special place. The alpine lakes, hiking trails, campgrounds and breathtaking views of Mount Jefferson make it a prime destination for Oregonians looking to get away to a truly wild and scenic area. However, this amazing scenery would be greatly harmed by the proposed plan to log 900 acres in and around the Olallie Lakes area.

This pristine area is perfect in its current state; just as nature intended it to be. I urge the Forest Service to preserve what we love about Olallie Lakes and keep the chainsaws and bulldozers away.

Dear Mr. Larsen

The Olallie Lakes area is one of Oregon's great treasures, with its alpine lakes, hiking trails, campgrounds and great views of Mount Jefferson. This is a place for Oregonians to enjoy camping and hiking, not a place for a new logging project. People visit the lakes along the crest of the Cascades to see forests in their natural state, not to see stump fields.

The forests around Olallie Lakes should be protected from chainsaws and bulldozers. Not only would the views be negatively impacted, but the Pacific Crest National Scenic Trail would have logging right near the trail for several miles, and right over the trail in some places.

Please cancel the plans to log in the Olallie Lakes Scenic Area, and instead manage this area in its natural scenic condition.

Sections 4.2.2.1 and 4.2.6.1 discuss the situation surrounding the Olallie Lake Scenic Area.

## 4.3 Fisheries and Water Quality

### 4.3.1 Existing Condition

The Cascade Crest Fuel Break is located within the headwaters of the Upper Clackamas River. The project area includes acreage within the Upper Clackamas (Headwaters Segment), Olallie Creek, Lemiti Creek, and South Fork Lemiti Creek drainages. (Olallie Creek does not flow into Olallie Lake. The fuel break's southern end is near Olallie Lake but does not cross into the Olallie Lake drainage which is part of the Deschutes River Basin.) The total area of the four drainages associated with the project is approximately 24,616 acres. The streams within the project area are characterized as spring-fed systems,

originating in meadows, with low flows during the dry season. All of these streams have areas of subsurface flow during the late summer months.

The Upper Clackamas fifth field watershed includes the headwaters of the mainstem Clackamas River and all its tributaries downstream to the confluence of the Collawash River. The watershed comprises 100,380 acres on the west slope of the Cascade Range. Approximately 94,800 acres of the watershed is within the Mt. Hood National Forest, 5,600 acres lie within the Confederated Tribes of the Warm Springs Reservation of Oregon, and approximately 150 acres at Austin Hot Springs are privately owned.

The Upper Clackamas River supports populations of Lower Columbia River (LCR) steelhead (*Oncorhynchus mykiss*), Upper Willamette River (UWR) chinook salmon (*Oncorhynchus tshawytscha*), and Lower Columbia River (LCR) coho salmon (*Oncorhynchus kisutch*). These species and their designated critical habitat are listed as Threatened and are protected under the Endangered Species Act (ESA).

There are no species listed under the ESA in the vicinity of the proposed project. The nearest occurrence of listed fish habitat (LFH), which is defined as any stream reach potentially occupied by ESA protected fish species, is over 3.5 miles downstream of the project area in the mainstem Clackamas River. Fish species that occur in the stream reaches within the project area include resident cutthroat trout, sculpin, and non-resident brook trout that have recruited into streams from the stocking of high lakes in the area.

The Cascade Crest Project proposes treatment on approximately 852 acres of dead and dying lodgepole pine stands, mature mixed conifer stands, and young plantations. Treatments would occur within approximately 316 acres of late-successional reserves and 114 acres of riparian reserves.

### **Direct and Indirect Effects**

For this proposal, the following treatment actions have the potential to affect water quality and aquatic species or their habitats: burning, mechanical tree felling, yarding, and log or wood biomass hauling. These actions are of concern because they could affect stream temperature, levels of sediment in streams, and future in-channel large wood recruitment within the project area.

#### **4.3.2 Alternative A (No Action)**

With no action there would be no direct effects to water quality or fisheries resources. There would be no ground disturbance or increase in surface erosion or sedimentation. There would be no immediate change in streamside canopy cover and stream temperatures would remain unchanged. Although there are many dead and dying trees along the stream courses, they do provide some degree of shading from solar radiation. Unless a catastrophic wildfire occurs, water temperatures within and downstream of the project area would remain in their present state with no action.

With no action dead trees would fall reducing stocking levels over time. There is an increasing fire hazard risk due to the dying trees and ground fuel accumulation. As trees die, there would be an understory response from increased light from the opened canopy and natural regeneration would occur. This process would provide a long-term down wood component to streams, riparian areas, and the forest floor.

In the event of a catastrophic wildfire across the project area, there would be a significant loss of stream shading and ground cover. Stream water temperatures would increase along with an increased amount of sediment reaching streams from surface erosion. Future in-stream large wood recruitment would also be reduced by the wildfire burning trees in the riparian area.

## **Alternative B**

- 4.3.3 **Sediment from treatment activities** – The treatment proposed to implement the fuel break is a ground disturbing activity that has the potential to cause a temporary reduction in water quality by allowing sediment to enter stream channels from surface erosion or run-off. Mechanical tree felling and ground-based yarding methods can disturb the protective soil litter cover, and may result in minor sediment movement at the site level. Ground-based equipment does cause some direct soil displacement which would be mitigated through project design criteria (such as no-treatment stream buffers, hand treatments within riparian areas, and over-snow biomass removal). Most of the sediment produced from treatments would only travel short distances before being trapped by duff, woody materials, and other obstructions. If ground-based yarding is done with at least 16 inches of snow on the ground, there would be no surface soil disturbance and no potential for sediment movement. In any case, the probability of overland surface runoff on uncompacted soil surfaces is low for the soils in the project area.

Project design criteria would incorporate no-treatment protection buffers 50 ft. wide along perennial streams. These buffers would be wider where appropriate to include adjacent wet areas and meadows. The buffers would have no treatment except within 100 feet of road 4220 or campgrounds where snags would be felled. Adjacent to the no-treatment buffers, extending out 50 feet, treatments would be done by hand with no ground-based equipment. The hand treatment adjacent to the no-treatment buffers would minimize ground disturbance and reduce the potential of any surface erosion resulting from ground disturbance.

Along all intermittent streams within the project area, a 10 ft. wide no-treatment buffer would be established. The buffers would have no treatment except within 100 feet of road 4220 or campgrounds where snags would be felled. Adjacent to the no treatment buffers, extending out 50 feet, treatments would be done by hand with no ground based equipment.

The no-treatment buffers would act as a barrier to sediment being transported into stream channels by surface erosion or run-off and would minimize the risk of any channel or water quality impacts. Hand treatments adjacent to the no-treatment buffers would



minimize any surface erosion resulting from ground disturbance. The buffers on either side of the stream would likely retain any displaced and eroded soil before it is transported to the stream channel. These buffer widths would allow soil infiltration between the unit and any water source. Surface roughness, vegetation, and duff in untreated buffers would filter most sediment coming off of any exposed soil surfaces before reaching perennial streams. Even if some soil movement occurred, the vegetated buffer strips along perennial or intermittent channel would act as an effective barrier. The probability that measurable amounts of fine sediment would enter any stream within the project area as a direct result of the proposed treatment activity is low.

- 4.3.4 **Sediment from log or biomass transport** – Log hauling or haul of biomass materials along aggregate surfaced roads has the potential to introduce sediment in small quantities to streams. Traffic breaks down surfacing material resulting in finer surface gradation and increased sediment transport from the road surface. Any fine sediment created by hauling traffic would more than likely be washed from the road surface in the first precipitation event that is sufficient to cause runoff from the road surface. Any input of sediment is expected to be minimal as the roads where there is a potential for surface runoff are asphalt or durable crushed rock. Road use on asphalt and rock surfaces, however would be restricted to periods when road related runoff is not present and as such, little sediment is expected to leave the road bed while haul is occurring.

Crossings at streams where LFH occurs along the haul route are asphalt surfaced, and therefore the probability of sediments reaching the stream channels at these crossings is extremely rare. Any sediment that leaves the road surface due to run-off is expected to disperse over land or be stored within the smaller tributary streams along the haul route. If any sediment is transported downstream it would be during the beginning of the rainy season and would be diluted by a sufficient volume of water where it would be indistinguishable from background instream turbidity levels. It is very unlikely that any measurable amount of sediment produced during log haul would be transported to stream channels where listed fish species occur.

If any sediment did enter stream courses from hauling activities, it would be in very small amounts and for a short-term duration. No adverse effect to fish or their habitat, and water quality is expected to occur from log hauling activities.

- 4.3.5 **Water Temperature** - No-treatment stream buffers were developed to reduce the potential for adverse impacts to stream temperature as the result of the proposed treatments, and to meet guidelines in the Northwest Forest Plan Temperature TMDL Implementation Strategy (2005). The 50-foot no-treatment stream protection buffers along perennial streams are designed to meet stream temperature goals by avoiding treatment in the primary shade zone and retaining shade producing vegetation. The primary shade zone consists of vegetation that intercepts solar radiation between 1000 and 1400 hours, which is critical for providing stream shade and maintaining stream temperature.

The upper sections of some of the streams that flow within the project boundaries originate in meadows where the vegetation is made up of sedges and shrubs that provide very little shade to the stream course. In these areas riparian vegetation does not play as critical role in providing the stream shading component in the primary shade zone.

The no-treatment buffers along perennial streams would insure that the majority of existing shade producing vegetation would remain and there would be no measurable increase in solar radiation. Although there are many dead and dying trees along the streams, they do provide some degree of shading from solar radiation. The streams in the project area run subsurface during the dry season in some sections where treatment would occur. Thus, water temperature would not likely be a measurably impacted from loss of vegetation outside of a 50-foot no-treatment buffer along perennial streams.

Stream temperatures are not expected to exceed the tolerance limits of resident or anadromous fish species or other aquatic organisms. Since many of the streams that flow within proposed units are relatively small, and provide very little flow or subsurface flow during the hottest time of the year, the designated stream protection buffers along perennial streams would preserve enough of the existing canopy cover to maintain existing stream temperatures.

No-treatment protection buffers applied to intermittent streams within the project area would not retain direct overhead shading. However, these streams only carry water during wet times of the year (winter and spring) when temperatures are cooler. Since these channels have no surface flow during the summer time when elevated stream temperatures are of concern no significant increase in stream temperature is expected downstream. Current stream temperatures in all streams within and downstream of the project area are expected to maintain the existing temperature regimes.

#### 4.3.6 **Comparison of Alternatives**

Unless a catastrophic wildfire occurs in the project area, the potential effects to water quality and fisheries for Alternative A would be less than that of Alternative B. Since there would be no ground disturbance from any treatment activity, there would be no potential for any increase in surface erosion or sedimentation. If ground-based logging activities proposed for Alternative B are conducted over sufficient snow cover, there would be no potential for any increase in surface erosion or sedimentation.

With the no-action alternative, dead trees would fall reducing stocking levels over time. There would be a response from understory vegetation due to increased light hitting the forest floor from the opened canopy and natural regeneration would occur. This process would provide a long-term down wood component to streams, riparian areas, and the forest floor.

In the event of a catastrophic wildfire, there would be a real potential for measurable increases in stream temperature and sedimentation due to the loss of stream shading and

soil ground cover. Future recruitment of large wood would also be affected if the trees in the riparian area are burned. While it is not possible to predict the exact size a fire might attain with or without a fuel break, it is likely that fires would be kept smaller with a fuel break in place resulting in reduced overall impact on fish and water quality.

The action alternative would reduce ground and ladder fuels in the treatment area, which would aid in the suppression of large scale wildfires. The treatments would create a situation of reduced flame length and fire intensity allowing safe areas for crews to work in. The proposed treatments would immediately reduce stocking levels and maintain this reduced level over time as periodic maintenance would occur. There would be reduced potential for long-term down wood recruitment outside of no-treatment buffers.

#### 4.3.7 **Cumulative Effects**

The Aggregate Recovery Percentage (ARP) index is often used to estimate the potential for adverse cumulative effects related to past, present and foreseeable future timber harvest activities and other actions that reduce tree cover such as road construction or fire. ARP evaluates the risk of increased peak flows from rain-on-snow events within the transient snow zone. Since the proposed project area lies above 4200 feet in elevation, it is not in the transient snow zone and the proposed project would have no effect to peak flows. The portions of the watershed on the Warm Springs Reservation are also above 4200 feet and would not contribute cumulatively to peak flows.

There are other potential cumulative effects to sediment or stream temperature. Sediment can result from surface erosion during rainfall events or snow melt from areas where soil has been disturbed during treatment activities prior to vegetation being re-established or from wildfire. Stream temperature increases can result from the loss of stream shading following land treatment activities or wildfire.

Cumulative effects from sediment are not expected to occur because ground-based skidding activities would only be conducted when soil conditions are favorable, or when there is adequate snow to prevent any soil disturbance. In the event of any soil disturbance, erosion control measures and stream buffers would minimize the amount of sediment entering streams. Cumulative effects on water temperature are not expected because stream buffers on perennial streams would protect primary stream shading.

Past activities that have occurred within the Upper Clackamas River fifth-field watershed include timber harvest, pre-commercial thinning, and various restoration projects that have focused on improving fish passage, stream function, decreasing road densities, and restoring off-channel habitat and floodplain connectivity. Over the past several years' project activities have thinned approximately 2,500 acres, decommissioned 55 miles of roads, replaced culverts that were passage barriers to Threatened and Endangered fish species, restored important side channel habitat, and repaired roads that were damaged by floods.

Recent restoration EAs have planned projects that have not yet been implemented. These projects include: 4.5 miles of road decommissioning, 50 miles of road closures with berms, instream large wood and side channel projects, wildlife snag creation and down wood projects, pre-commercial thinning and commercial thinning.

Benefits from the implementation of restorative projects include long-term improvements to water quality, fish habitat and riparian areas, restored fish passage, a decrease in drainage network, re-established floodplain connectivity, restoration of hydrologic function, a reduction in sediment delivery to streams and the reduction of wildfire related risk.

The fuel break project and these restoration and thinning projects would be implemented over multiple years in a number of different drainages. The recovery from short-term effects from one project may be complete by the time another project in the same watershed is implemented. Effects from the proposed projects are expected to be of a short-term duration and undetectable at the watershed scale.

There would be no detrimental cumulative effects to aquatic resources or water quality with the implementation of the Cascade Crest Project.

#### 4.3.8 Forest Plan Goals, Standards and Guidelines

##### **Mt. Hood Forest Plan References**

Forestwide Riparian Standards and Guidelines - FW-80 to FW-136, page Four-59

Forestwide Water Standards and Guidelines - FW-54 to FW-79, page Four-53

Forestwide Fisheries Standards and Guidelines - FW-137 to FW-147, page Four-64

General Riparian Standards and Guidelines - B7-28 to B7-39, page Four-257

Mt. Hood FEIS pages IV-22, IV-47, IV-155 to IV-167

**Northwest Forest Plan** - Riparian Reserve Standards and Guidelines – pages C-31 to 38

##### 4.3.8.1 **Forest Management Goals –**

Protect, maintain or enhance the characteristics of floodplain, wetland and riparian plant communities. Maintain or increase aquatic and terrestrial habitat complexity and diversity within the riparian zone. Assure long term provision for riparian associated wildlife and plant species within the full spectrum of riparian zones across the Forest. (#6 Four-2)

Protect, maintain or enhance the character and quality of water. Provide long term sustained production of water. Provide a favorable condition of water flow from the Forest for both on-Forest and off-Forest water users. (#7 Four-2)

Maintain or increase fish habitat capability and assure long term sustained production of fish. (#8 Four-3)

*In the long term, a fuel break would protect riparian areas, water quality and fish across a broad landscape because it would result in smaller wildfires. The current conditions for*

*riparian areas, water quality, and fish habitat capability would be maintained at the watershed scale.*

#### 4.3.8.2 **Aquatic Conservation Strategy**

This project is designed to maintain aquatic resources over the long term at both the project scale and fifth-field watershed scale, by reducing the potential size of stand replacement fires. Details on conditions for the project area and fifth-field watersheds are described in the biological evaluation. There would be some localized or short-term affects to riparian and aquatic resources to achieve the overall objective, which would result in greater protection to the streams and riparian areas within the fuel break, as well as the streams and riparian areas outside the fuel break.

Mitigation measures and project design criteria, such as stream protection buffers, operating restrictions on ground based machinery, and no mechanical treatment areas, were developed to reduce impacts and to maintain the function of key watershed indicators that make up elements of the Aquatic Conservation Strategy. These key indicators for water quality, habitat, flow, channel condition, and watershed condition, would be maintained at the project scale and the fifth field watershed scale with the implementation of the proposed action.

#### 4.3.8.3 **Riparian Reserves**

This project is consistent with riparian reserve standards and guidelines. Section 2.2.6 explains refinements made to riparian reserves since the time of the watershed analysis.

The proposed fuel break is not a traditional timber sale. Trees and material on the ground would be removed from riparian reserves but treatments have been adjusted to minimizing effects to riparian resources while still providing an effective overall fuel break. The purpose of this project is to aid in the suppression of large scale wildfires. One of the benefits of the fuel break would be reduced fire size and reduced impacts to riparian reserves.

The following text is from the Northwest Forest Plan beginning on page C-31, and the italicized text is an explanation of how this project fits with management goals, desired future conditions and standards and guidelines.

TM-1. Prohibit timber harvest, including fuelwood cutting, in Riparian Reserves, except as described below.

b. Salvage trees only when watershed analysis determines that present and future coarse woody debris needs are met and other Aquatic Conservation Strategy objectives are not adversely affected. *The project is not a traditional timber salvage operation. The large numbers of dead trees result in a high fire hazard in the project area. Most of the dead*

*and dying trees need to be removed for the fuel break to be effective. Snags would be retained within the 50-foot stream buffers described in s. 2.3.3. At the landscape scale there is an abundance of snags. The Aquatic Conservation Strategy objectives would not be adversely affected.*

c. Apply silvicultural practices for Riparian Reserves to control stocking, reestablish and manage stands, and acquire desired vegetation characteristics needed to attain Aquatic Conservation Strategy objectives. *The project would achieve ACS objective #1 – “Maintain and restore the distribution, diversity, and complexity of watershed and landscape-scale features to ensure protection of the aquatic system to which species, populations and communities are uniquely adapted.” The fuel break involves stocking control and the establishment of desired vegetation and would ultimately help protect riparian areas across a broad landscape.*

### **Fire/Fuels Management**

FM-1. Design fuel treatment and fire suppression strategies, practices, and activities to meet Aquatic Conservation Strategy objectives, and to minimize disturbance of riparian ground cover and vegetation. Strategies should recognize the role of fire in ecosystem function and identify those instances where fire suppression or fuels management activities could be damaging to long-term ecosystem function. *In this area, the role of fire is stand replacement. Conditions have developed that would result in very intense and large fires that could damage aquatic and riparian resources across the landscape. Some vegetation needs to be removed for a fuel break to be effective.*

Other - In Riparian Reserves, the goal of wildfire suppression is to limit the size of all fires. When watershed and/or landscape analysis, or province-level plans are completed and approved, some natural fires may be allowed to burn under prescribed conditions. Rapidly extinguishing smoldering coarse woody debris and duff should be considered to preserve these ecosystem elements. *Creation of a fuel break is the best strategy at this time to limit the size of fires and potential adverse effects to aquatic and riparian resources. A fire management plan was completed as part of the LSR assessment (chapter 5). It contains recommendations to continue the suppression of wildfire to avoid the loss of habitat. There have been no plans completed that recommend allowing natural fires to burn in this area.*

### **General Riparian Area Management**

RA-2 Fell trees in Riparian Reserves when they pose a safety risk. Keep felled trees on-site when needed to meet coarse woody debris objectives. *For a fuel break to be effective, coarse woody debris must be removed.*

## **Watershed and Habitat Restoration**

WR-2. Cooperate with federal, state, local, and tribal agencies, and private landowners to develop watershed-based Coordinated Resource Management Plans or other cooperative agreements to meet Aquatic Conservation Strategy objectives. *The action responds to the request of the Tribal Council of the Confederated Tribes of the Warm Springs Reservation of Oregon under the authorities of the Tribal Forest Protection Act. They made this request in part because of their concern that a large scale wildfire would adversely impact various resources, including fish and riparian areas.*

### **4.3.8.4 Key Watersheds**

The Northwest Forest Plan (page B-19) indicates that roads should be decommissioned in key watersheds and that there should be no net increase in the amount of roads in key watersheds. The Clackamas River has a narrow key watershed designation that does not include the whole watershed. The project would not build any new roads and many miles have already been decommissioned in the key watershed.

### **4.3.8.5 The Clean Water Act and Best Management Practices**

Sections 208 and 319 of the Clean Water Act of 1972, as amended (1977 and 1987), acknowledge land treatment measures as being an effective means of controlling nonpoint sources of water pollution and emphasizes their development. These land treatment measures are known as Best Management Practices (BMPs). BMPs are used to control or prevent nonpoint sources of pollution from resource management activities, and to ensure compliance with the Forest Plan, as amended, the Clean Water Act, as amended, the Oregon Administrative Rules (OAR Chapter 340-41-0004,0028, and 0036), Department of Environmental Quality (DEQ), and the Memorandum of Understanding between the Oregon DEQ and the USDA, Forest Service. General BMPs are described in the document General Best Management Practices, USDA Forest Service, Pacific Northwest Region (11/88). The BMPs are flexible in that they are tailored to account for diverse combinations of physical and biological environmental circumstances. The Forest has documented typical BMPs and assessed their effectiveness (USDA 2004a).

The BMPs recognize the role of fire suppression and fuel management to reduce the effect of wildfire on Forest resources. BMP F-1 has an objective to reduce losses from wildfire and/or subsequent flooding and erosion, by reducing the frequency, intensity and destructiveness of wildfire. Administrative, corrective and preventive measures include:

- a. Fuel break construction.
- b. Vegetation type conversions or manipulation.
- c. Greenbelt establishment to separate urban areas from wildlands.
- d. Fuel reduction units.
- e. Access roads for rapid ingress and egress.
- f. Fire suppression activities.

- g. Fuel utilization and modification programs.
- h. Public information and education programs.

4.3.8.6 **Other Standards and Guidelines - FW-054 to FW-079, FW-080 to FW-136, FW-137 to FW-147, B6-001 to B6-042, B7-001 to B7-070, and A9-020 to A9-021**

The project is consistent with these standards and guidelines unless noted otherwise. Project design criteria would provide protection to fisheries and riparian dependent resources while providing some protection from high intensity wildfire. Adherence to the project design criteria would maintain the existing aquatic complexity within and downstream of the project area. All of the environmental baseline indicators for habitat and watershed condition would be maintained or improved in the long-term by implementation of the project. These indicators include: stream temperature, sediment, pool habitat and quality, large woody debris, stream channel morphology, refugia, road density and riparian areas.

Standards and Guidelines FW-061 through 064 would not be affected by the proposed fuel break because it lies above 4200 feet in elevation and is not in the transient snow zone, therefore the proposed project would have no effect to peak flows. The Upper Clackamas Watershed Analysis (p. 173) shows that none of the subwatersheds (now drainages) that overlap the project have issues with hydrologic recovery. See section 4.3.1.

The following 3 apply to the terrestrial habitat of Class I, II and fish bearing Class III streams (refer to Forest Plan glossary).

- FW-105 At least 95 percent effective ground cover (e.g. adapted trees, shrubs, sedges, and grasses) in a project activity area should be maintained. *See Forest Plan Management Direction – Interpretation #2 which gives advice on the width of riparian management area (not the same as Riparian Reserve). An exception is needed for FW-105 because a portion of the vegetation and logs that cover the ground must be removed for a fuel break to be effective. Adjustments were made to the fuel break prescription (s. 2.3.3) including stream buffers to minimize effects to riparian and aquatic resources while still providing an effective overall fuel break.*
- FW-106 At least 80 percent of riparian management areas shall be maintained with, or restored to, a fully stocked, multi-layered canopy of old growth and/or mature forest. *See Forest Plan Management Direction – Interpretation #2 which gives advice on the width of riparian management area (approximately 50 to 100 feet). The fuel break crosses riparian areas that currently have a mix of mature forest and younger stands that have been affected by wildfire and insect infestations. Where the fuel break intersects streams there would be a reduction of stocking and the removal of smaller trees. Across the landscape, riparian areas would meet this standard.*



FW-107 At least 90 percent of naturally occurring dead and down LWD pieces per acre (i.e. at least 40 cubic feet each) in varying stages of decomposition should be maintained. *An exception is needed for FW-107 because down logs must be removed for a fuel break to be effective. Adjustments were made to the fuel break prescription (s. 2.3.3) including stream buffers to minimize effects to riparian and aquatic resources while still providing an effective overall fuel break.*

The following apply to Class IV streams, seeps, springs and headwaters.

FW 134 Maintenance of noncommercial trees should be encouraged. *An exception is needed for FW-134 because small trees that create ladder fuels must be removed for a fuel break to be effective. Adjustments were made to the fuel break prescription (s. 2.3.3) including stream buffers to minimize effects to riparian and aquatic resources while still providing an effective overall fuel break.*

FW-135 Conifer and hardwood trees necessary for stream bank stability, long term wood input, and diversity of wildlife and plant communities should be maintained. *Trees along streams would be retained to maintain stream bank stability but other trees would be removed farther away. An exception is needed for FW-135 because some trees must be removed for a fuel break to be effective. Adjustments were made to the fuel break prescription (s. 2.3.3) including stream buffers to minimize effects to riparian and aquatic resources while still providing an effective overall fuel break. The largest trees would be retained.*

FW-136 At least 100 percent of naturally occurring large woody material (both quantity and quality) within seeps and springs or lying within or across the channels of Class IV streams should be maintained. *See Forest Plan Management Direction – Interpretation #2 which gives advice on the intent of this standard. An exception is needed for FW-136 because down logs must be removed for a fuel break to be effective. Adjustments were made to the fuel break prescription (s. 2.3.3) including stream buffers to minimize effects to riparian and aquatic resources while still providing an effective overall fuel break.*

The following apply to the Key Site Riparian (A9) land allocation. The A9 allocation includes portions of Lemiti and Slow Creeks. The fuel break intersects the dry upland portion of A9 allocation.

A9-021 Silvicultural techniques, including timber harvest, may occur only to maintain or enhance riparian resource values. *The fuel break would aid in the suppression of wildfire. The no-treatment protection buffers along streams and wetlands would help protect riparian resource values.*

A9-022 Timber salvage activities shall not occur, except to protect or enhance riparian resource values. *The fuel break is not a traditional timber salvage. The removal of dead trees however is necessary for a fuel break to be effective. Adjustments were made to the fuel break prescription (s. 2.3.3) including stream buffers to minimize effects to riparian and aquatic resources while still providing an effective overall fuel break. The fuel break would aid in the suppression of wildfire and would help protect riparian resource values.*

#### 4.3.9 **Aquatic Sensitive, Rare or Uncommon Species**

##### **Columbia Dusksnail** (*Lyogyrus* n. sp. 1)

This species of aquatic mollusk has been found across the Forest during surveys conducted over the past several years (Mt. Hood National Forest, unpublished data). Habitat requirements for this species are fairly specific: cold well oxygenated springs, seeps, and small streams, preferring areas without aquatic macrophytes. Individuals have not been found in larger streams and rivers, or glacial streams.

Surveys for the Columbia dusksnail have been conducted at sites across the Forest for a wide range of projects. This mollusk has been found in many areas across the Forest and is likely to be present in seeps, springs, and smaller streams near and within the proposed project area.

##### **Basalt Juga** (*Juga Oreobasis* n. sp. 2)

These small snails have only been found at two location within the Oregon portion of the Scenic Area: in Canyon Creek just west of the town of Hood River and in several small seeps just above (south) Interstate 84 about half-mile east of The Dalles Dam. Individuals have been found at several locations on the Washington side of the Scenic Area and east of the Scenic Area on both sides of the river. They have never been found in any survey conducted on the Forest, and they are not believed to reside in Forest streams. Their habitat requirements are similar to the Columbia Dusksnail: cold well oxygenated springs, seeps, and small streams.

Standards and Guidelines for rare and uncommon species give the line officer flexibility to survey or not survey after seeking specialists' recommendations to help determine the need for a survey based on site-specific information. In making such determination, the line officer should consider the probability of the species being present on the project site, as well as the probability that the project would cause a significant negative effect on the species habitat or the persistence of the species at the site.

The line officer has decided not to survey for the two rare aquatic mollusks for this project, even though the Columbia dusksnail is known to occur in many streams on the district including those within the proposed project area. Instead of conducting surveys in all adjacent streams, species presence is presumed. Riparian reserve standards and

guidelines and project design criteria are sufficient to provide for the habitat needs of this species. Anticipated effects of implementing the proposed action would not significantly affect habitat or species persistence at each site.

The effects determination for the Columbia Dusksnail and Basalt Juga (if this species is present on Forest) would be “**No Impact**” (NI) for Alternative A, and “**May impact individuals or habitat but will not likely contribute to a trend towards federal listing**” (MIIH) for Alternative B.

## **Endangered Species Act and Magnuson-Stevens Fishery Conservation and Management Act Compliance**

### 4.3.10 **Designated Critical Habitat**

Critical habitat for twelve ESUs of West Coast salmon and steelhead listed under the Endangered Species Act of 1973 was designated on September 2, 2005. Critical habitat includes the stream channels within the designated stream reaches, and includes a lateral extent as defined by the ordinary high-water line or bankfull elevation. Within these areas, the primary constituent elements essential for the conservation of these ESUs are those sites and habitat components that support one or more life stages, including: freshwater spawning sites, freshwater rearing sites, freshwater migration corridors, estuarine areas, near-shore marine areas, and off-shore marine areas that support growth and maturation.

Primary constituent elements listed below, refer to freshwater habitat components. Nothing proposed in any alternative would have any affect on estuarine or marine habitat components, thus they are not discussed.

1. Freshwater spawning sites with water quantity and quality conditions and substrate supporting spawning, incubation and larval development.
2. Freshwater rearing sites with:
  - a. Water quantity and floodplain connectivity to form and maintain physical habitat conditions and support juvenile growth and mobility;
  - b. Water quality and forage supporting juvenile development; and
  - c. Natural cover such as shade, submerged and overhanging large wood, log jams and beaver dams, aquatic vegetation, large rocks and boulders, side channels, and undercut banks.
3. Freshwater migration corridors free of obstruction and excessive predation with water quantity and quality conditions, and natural cover, such as submerged and overhanging large wood, aquatic vegetation, large rocks and boulders, side channels, and undercut banks supporting juvenile and adult mobility and survival.

Designated critical habitat for Upper Willamette River chinook and Lower Columbia River steelhead occurs over 3.5 miles downstream of the proposed project area in the mainstem Clackamas River. As of this time, critical habitat for LCR coho has yet to be designated but will likely correspond with the critical habitat designation for UWR chinook since they utilize the same habitat within the Clackamas River Basin.

The analysis of effects has determined there is no probability that the proposed project would have any effect on any designated critical habitat because of the distance of the project area to any occurrence of ESA listed species or habitat. There would be no measurable short-term or long-term effect to any habitat or baseline habitat indicators where ESA listed fish species occur. Therefore, an effects determination of **No Effect (NE)** is warranted for designated critical habitat that occurs downstream of the project area.

#### 4.3.11 **Essential Fish Habitat**

Essential Fish Habitat (EFH) established under the Magnuson-Stevens Fishery Conservation and Management Act (MSA) includes those waters and substrate necessary to ensure the production needed to support a long-term sustainable fishery (i.e., properly functioning habitat conditions necessary for the long-term survival of the species through the full range of environmental variation). EFH includes all streams, lakes, ponds, wetlands, and other water bodies currently, or historically, accessible to salmon in Washington, Oregon, Idaho, and California. Three salmonid species are identified under the MSA, chinook salmon, coho salmon and Puget Sound pink salmon. Chinook and coho salmon occur on the Mt. Hood National Forest in the Clackamas River, Hood River, and Sandy River basins. Chinook and coho salmon utilize the mainstem Clackamas River for migration, rearing, and spawning habitat. Because of the distance of the project area to any habitat where chinook and coho salmon occur, the proposed project would not have any adverse effect on water or substrate essential to the life history of coho, chinook, or chum salmon within the Clackamas River Basin.

Implementation of the Cascade Crest would **Not Adversely Affect** essential fish habitat for chinook or coho salmon. This activity would not jeopardize the existence of any of the species of concern or adversely modify critical habitat and would not adversely affect Essential Fish Habitat as designated under the 1996 Amendment to the Magnuson-Stevens Act.

#### 4.3.12 **Fish Stocks of Concern**

The effects of the implementation of the Cascade Crest Project on fish stocks of concern is based on populations of ESA listed fish species and resident fish populations classified as management indicator species in the Mount Hood Land and Resource Management Plan (LRMP) that occur within and downstream of the project area.

ESA listed species that occur downstream of the project area are Lower Columbia River steelhead, Upper Willamette River chinook salmon, Lower Columbia River chinook, and Lower Columbia River coho salmon. Details about these fish can be found in the Biological Evaluation in appendix C.

#### 4.3.13 **Effects to Fish Stocks of Concern**

Project design criteria was developed in the planning process to minimize or eliminate any adverse impacts the propose action might have on have on water quality, fisheries, and aquatic resources and still meet the project purpose and need. The analysis of potential effects has determined that the probability of any impact to fish species of concern would be very low, of a short-term duration, and of a magnitude that would be immeasurable at the site-specific and watershed scale. There would be no measurable long-term effect to any habitat or watershed indicator where fish species occur. The effects determination for fish stocks is as follows:

##### **Alternative A (no action)**

Lower Columbia River Steelhead – No Effect (NE)

Upper Willamette River Chinook - No Effect (NE)

Lower Columbia River Coho - No Effect (NE)

Lower Columbia River Chinook - No Effect (NE)

Coastal Cutthroat Trout – No Impact (NI)

##### **Alternative B**

Lower Columbia River Steelhead – No Effect (NE)

Upper Willamette River Chinook - No Effect (NE)

Lower Columbia River Coho LCR - No Effect (NE)

Lower Columbia River Chinook - No Effect (NE)

Coastal Cutthroat Trout – “May impact individuals or habitat but will not likely contribute to a trend towards federal listing” (MIIH).

## **4.4 Northern Spotted Owl (Threatened)**

Some of the treatment areas occur within a late-successional reserve (LSR, Upper Clackamas – RO 207B) and two critical habitat units (CHU, OR-11 and OR-13).

### **4.4.1 Existing Condition**

- 4.4.1.1 **Habitat Characteristics** - Habitat for the owl is defined as either suitable or dispersal habitat. Suitable habitat for the northern spotted owl consists of habitat used by owls for nesting, roosting and foraging (NRF). Generally suitable habitat is 80 years of age or older, canopy cover exceeds 60 percent, is multi-storied and has sufficient snags and down wood to provide opportunities for nesting, roosting and foraging. Dispersal habitat for the owl usually consists of mid-seral stage stands between 40 and 80 years of age of age with a canopy closure of 40 percent or greater and an average diameter of 11”. Spotted owls use dispersal habitat to move between blocks of suitable habitat and

juveniles use it to disperse from natal territories. Dispersal habitat may have roosting and foraging components, enabling spotted owls to survive, but lack structure suitable for nesting. Owls can also disperse through suitable (NRF) habitat.

- 4.4.1.2 **Analysis Areas** – The project proposal involves the removal of suitable habitat for spotted owls. This removal of suitable habitat may affect spotted owls that have an established nest site; either by causing them to abandon their current site due to loss of habitat or causing reduced reproductive success due to poor foraging. Since there are no recent surveys for spotted owl that show the locations of the active nest sites, historical spotted owl information was used. Historical nest sites are used because studies show nest sites are used for many years. The analysis will examine effects to spotted owls from alternation of their home ranges and core areas.

For the Willamette Province the home range is a 1.2 mile radius circle (2,955 acres) centered on the historic nest site. The proposed project is within the home range of nine historical pairs. Incidental take would be presumed to occur when suitable habitat is removed from a home range and if suitable habitat is less than 40% of the home range.

A core area has been defined as the area within a home range that receives disproportionately high use (503 acres or 0.5 mile radius circle). Incidental take would be presumed to occur when suitable habitat is removed from a core and if suitable habitat is less than 50% of the core.

Out of the nine historical pair's home range circles, seven are currently considered to be below take thresholds by the U.S. Fish and Wildlife Service.

In addition to the analysis of home range and core areas, an analysis will be displayed for LSRs, CHUs and Areas of Concern identified in the LSR assessment.

- 4.4.1.3 **Existing Condition of Upper Clackamas Late-Successional Reserve 207B:** A portion of this project occurs within Upper Clackamas LSR (207B) and is within the High Cascades Province. This portion of LSR 207 lies in the Upper Clackamas Watershed and has a long narrow band along the Upper Clackamas River and a wider portion near the Olallie Lake area. LSR 207 as a whole (Roaring River and Upper Clackamas combined) has 104,108 acres, of which 86,942 are capable and 46,395 acres are suitable habitat for the spotted owl. The percent of capable that is suitable is 53% (USDI 1998). The proposed project occurs within the southern portion of this LSR. This area is in higher elevation habitat, much of which is mapped as either capable or non-habitat. In the Mountain Hemlock Zone of the LSR, the trees may never grow large enough to achieve late-successional characteristics. Much of this area is never expected to provide spotted owl habitat due to elevation limitations and fire occurrence. This high elevation habitat at the south end of the Upper Clackamas LSR creates a barrier to some species. As a result, this LSR is not well connected to the Mt. Jefferson Wilderness or to the LSRs to the south (USDA1998).

- 4.4.1.4 **Existing Condition of Critical Habitat Units OR-11 and OR-13:** Spotted owl critical habitat units serve to identify lands that are considered essential for the conservation and recovery of the spotted owl. The functional value of the critical habitat is to preserve options for species recovery.

CHU 11 occurs on the Clackamas River Ranger District and borders the western edge of the Warm Springs Indian Reservation on the crest of the Cascade Range. This CHU is designed to provide for essential nesting/roosting/foraging habitat and to support clusters of owl pairs. The CHU consists of 35,929 acres; 14,103 acres of which is considered suitable habitat for owls. Approximately 44 percent of the capable lands in this CHU are providing nesting/roosting/foraging habitat for the spotted owls.

OR-13 occurs on both the Clackamas River Ranger District of the Mt. Hood National Forest as well as the Willamette National Forest. CHU 13 provides essential nesting/roosting/foraging and dispersal habitat. This CHU consists of approximately 30,277 acres; 9,953 of which are suitable acres. About 35% of the capable lands in this CHU are providing nesting/roosting/foraging habitat for the owls.

- 4.4.1.5 **Existing Condition of Olallie Lake Area of Concern**

Dispersing owls can be affected by habitat removal, either dispersal or suitable habitat, when dispersal opportunities are lacking in the area. About 614 acres of the project area occurs within the Olallie Lake area of concern for spotted owl dispersal. This Area of Concern is discussed within the North Willamette LSR Assessment and was identified due to connectivity concerns between the adjacent LSR and the Warm Springs Reservation.

- 4.4.1.6 **Existing Condition of Proposed Project Area** – The project area consists of elevations ranging from 4200 to 5200 feet in elevation. The stands proposed for treatment include mid-seral mixed conifer stands, mature mixed conifer stands, and young plantations. Much of the project area consists of the mid-seral stands of high elevation mixed conifer stands that likely grew up after a large stand replacement fire. The late-seral stands are in mostly isolated patches within the project area, but are connected to relatively large areas of contiguous mature stands outside the project. The early-seral stands are primarily 30-50 year old managed plantations but the trees are relatively small still because of the high elevation slow growing conditions. Pacific silver fir, mountain hemlock, and lodgepole pine are the most common tree species in the project area, with lesser amounts of Engelmann spruce, noble fir, western white pine, western hemlock, Douglas-fir, Alaska yellow cedar, and grand fir.

The following is a table displaying the different spotted owl habitat types found within the project area. Dispersal habitat described below is total dispersal habitat: a combination of nesting/roosting/foraging habitat (suitable) and dispersal-only habitat. (Owls can disperse through suitable habitat). Capable habitat (i.e. habitat that usually has the potential to become suitable in the future) for this area has been designated as forested habitats generally below 5000 feet in elevation. Although the normal elevational limit for nesting owls is 4500 feet, nesting has been documented for four historical owl

pairs above 4500 feet in this area. For analysis purposes the elevational nesting limit has been set at approximately 5000 feet for this project. Although classified as capable, it is recognized that much of this habitat above 4500 does not have the potential to become suitable due to high elevation growing conditions and wildfire. Non-habitat areas include meadows and non forest areas that are not capable of becoming suitable habitat in the future.

**4.4.1.7 Acres Affected**

	<b>Total Acres</b>	<b>Suitable Habitat</b>	<b>Dispersal Habitat</b>	<b>Capable Habitat</b>	<b>Non-Habitat Acres</b>
<b>Total Project Area</b>	852	205	226	625	1
<b>Upper Clackamas LSR Portion of Project Area</b>	316	57	61	254	1
<b>CHU OR-11 Portion of Project Area</b>	510	133	150	360	0
<b>CHU OR-13 Portion of Project Area</b>	188	5	5	182	0

The suitable habitat in the project area is mature mixed conifer stands scattered throughout the project area, but most of it is concentrated in the lower elevations in the northern part of the project area. The dispersal habitat in the project area is mostly comprised of the suitable habitat, since little dispersal-only habitat exists in the project area. Much of the mid-seral lodgepole pine and mixed-conifer stands and all of the early-seral stands have trees that are too small to be considered dispersal habitat for owls. Many of the lodgepole stands have been attacked and killed by mountain pine beetle. This mortality has opened up the canopy to less than 40% in many stands, making them unsuitable for dispersing owls. It is likely that lodgepole pine will continue to be killed, further reducing the canopy cover across the landscape.

**4.4.1.8 Elements of Proposal Analyzed** - The following actions have the potential to affect spotted owls in the project area: cutting trees in suitable or dispersal habitat; as well as activities that make noise above the ambient noise level of the area and are within the disruption distance of a known or historic owl nest site. Other actions such as log haul or road repair would not have a meaningful or measurable affect on habitat but could create noise disturbance.



## 4.4.2 Direct and Indirect Effects

### 4.4.2.1 **Alternative A**

No short-term effects to the spotted owl would be predicted with this alternative. The spotted owl habitat present in the project area would continue to function as spotted owl habitat. The project is in an area of high wildfire risk. See the Fire Hazard and Risk Section (s. 4.1). While it is not possible to predict the exact size a fire might attain with or without a fuel break, it is likely that intense crown fires would get larger with no action and burn more spotted owl habitat. With no action, a wildfire could potentially burn through the LSR or CHUs, effectively reducing suitable spotted owl habitat to non-habitat. There are currently nine historic spotted owl nests within 1.2 miles of the project area, and more farther away. A wildfire has the potential to remove the nest site by consumption of the nest tree, or by removing enough of the available suitable habitat in the core area or home range to render the nest site un-usable by the spotted owl pair. The wildfire would likely occur during the breeding period for owls jeopardizing reproductive success. The reduction in suitable habitat, depending on the amount, could have substantial negative effects to the spotted owl population residing in the area.

With no action there would be no noise related disturbance to owls.

### **Proposed Action**

#### 4.4.2.2 **Effects to Owl Habitat on a Stand Scale**

The proposed harvest treatments would open up the canopy cover to less than 40% in all areas, making them unsuitable for nesting, roosting, foraging, or dispersing for owls. The proposed treatments would remove permanently approximately 205 acres of suitable and 216 acres of dispersal habitat from the project area. This removal of habitat would occur as a result of opening up the canopy from its current condition of 40-100% down to 20-35%; as well as the loss of snags and down woody debris currently in the stands.

The decline of the spotted owl has been linked to the removal and degradation of available suitable habitat through timber harvest and other disturbances such as wildfire. Appropriate vegetation and structural components are necessary to maintain suitable habitat. The removal of 205 acres of suitable habitat could potentially adversely affect the local spotted owl population in several ways. These include:

- The immediate displacement of birds from traditional nesting areas
- The concentration of displaced birds into smaller, fragmented areas of suitable nesting habitat that may already be occupied.
- Increased competition for suitable nest sites
- Decreased potential for survival of remaining spotted owls and offspring due to increased predation and/or limited resource (forage) availability
- Diminished reproductive success for nesting pairs
- Diminished population due to declines in productivity and recruitment; and
- Reduction of future nesting opportunities.

There are no historic nest sites within the proposed fuel break, however there could be newer nest sites that were not in use at the time of previous surveys. Since the fuel break follows heavily used roads, it is less likely that a nest tree would occur there. The nearest historic nest site is 900 feet from the road.

After the fuel break is established, regular maintenance is expected. The maintenance of the fuel break would prohibit the stand from growing back into habitat for spotted owls.

#### 4.4.2.3 **Effects to the spotted owl Dispersal Area of Concern**

The LSR Assessment identified the Olallie Lake Area of Concern as an area where dispersal habitat and connectivity were lacking. This area of concern also partially overlaps the LSR and a CHU. The LSR assessment also identified an area of concern for fire hazard that also overlaps this zone (s. 4.4.4.2). The proposed action would remove spotted owl dispersal habitat in this area of concern. Dispersal habitat is lacking in this area for reasons discussed in the existing condition section. The proposed action would remove 278 acres of dispersal habitat within this area of concern, further reducing the ability of spotted owls to move through these stands. The removal of dispersal habitat could also change the habitat use and home-range of spotted owls residing in or near the proposed fuel break. Since several historical nest sites are close to the proposed fuel break, the loss of dispersal habitat could alter the birds foraging habitats; or shift the core use area of an individual.

The proposed actions could have a meaningful effect on the ability of spotted owls to forage or shelter while they are dispersing in the area.

#### 4.4.2.4 **Effects Due to Noise Disturbance**

Disturbance to spotted owls is negatively related to stimulus distance and positively related to noise level. Substantial noise, smoke and human presence can result in disruption of breeding, feeding, or sheltering behavior of the spotted owl such that it creates the potential for injury to the individuals (i.e. incidental take in the form of harassment). For a significant disruption of spotted owl behavior to occur as a result of disturbance caused by the proposed actions, the disturbance and owl(s) must be in close proximity to one another. A spotted owl that may be disturbed at a roost site is presumably capable of moving away from a disturbance without a substantial disruption of its behavior. Since spotted owl forage primarily at night, projects that occur during the day are not likely to disrupt its foraging behavior. The potential for effects is mainly associated with breeding behavior at active nest sites.

The proposed actions for this project that generate noise above local ambient levels are heavy equipment and chainsaw use. Disruption distances of 35 yards for heavy equipment use and 65 yards for chainsaw use have been set by the Fish and Wildlife Service. If disturbance were to occur during the critical breeding period (March 1 –

July 15<sup>th</sup>) near a nest site, breeding could be adversely affected. However, none of the historic nest sites occurs within these disruption distances.

However, two historic nest sites occur within 440 yards of the project area and some equipment noise travels that far.

Because recent surveys have not been conducted, there is the possibility that new nest sites are present close enough to the fuel break to be disturbed by noise. Using the best available information, some of the assumptions used to evaluate the effects of the proposed action (disturbance only) on spotted owls include:

- Suitable habitat is likely to be occupied at a rate of only one occupied nest site per 4,754 acres. The fuel break is almost entirely covered by historic home ranges, indicating that the available habitat may be fully occupied.
- Spotted owls normally do not nest every year and for the Willamette Planning Province the nesting rate is estimated at 50 percent per year, based on information from the West Cascades demographic study area (Anthony 2004).
- Effects would only be adverse if the proposed activity occurred during the critical breeding period near an active spotted owl nest, and within the applicable disturbance distance for the activity. It is not likely that the project would be implemented during the critical breeding period within the disruption distance of an active nest site. If noise did occur during the breeding period, adult owls would be able to distance themselves from the disturbances but the survival of eggs or young birds may be affected.

It is not likely that nesting owls would be disturbed by noise. While adverse effects are possible, they are not reasonably certain to occur.

### 4.4.3 Cumulative Effects

A cumulative effects analysis has been conducted for spotted owls within the historic owl nest site analysis areas since there is a meaningful change in both suitable and dispersal habitat.

Home ranges are the appropriate analysis area for this analysis. An analysis has been conducted separately for each of the nine historic nest site home ranges as well as an analysis that combines all of the home ranges into one analysis area. For the purpose of cumulative effects analysis, all land within the home ranges would be included regardless of ownership or land allocation.

- 4.4.3.1 Generally, suitable habitat is 80 years of age or older, has canopy cover exceeding 60 percent, is multi-storied and has sufficient snags and down wood to provide opportunities for nesting, roosting and foraging. Generally, dispersal habitat has canopy cover greater than or equal to 40 percent and conifer trees greater than or equal to 11 inches average diameter. Capable habitat is a forested stand that does not meet the above criteria but may someday grow into those conditions. Most of the natural un-managed stands in the

analysis area below 5000 feet are considered suitable or capable habitat. There is little dispersal habitat because harsh growing conditions and past wildfires have resulted in widespread stands of small diameter mixed conifer and lodgepole pine. While these small diameter stands are considered capable habitat, there is the likelihood that they may never grow to achieve suitable habitat characteristics because of effects of insects and wildfire. There are plantations primarily in the northern portion of the planning area that are considered capable habitat. No commercial thinning has occurred in the analysis area.

**4.4.3.2 Past, Present and Foreseeable Future Projects and Actions**

<b>Project Name</b>	<b>Extent, Size, Type, &amp; Distance</b>	<b>Overlap In Time Or Space</b>	<b>Type Of Potential Effect To Owl Habitat</b>	<b>Measurable Effect To Owl Habitat</b>	<b>Rationale For Inclusion Or Exclusion From Analysis Below</b>
Olallie Hazard Reduction Project at Olallie Lake Lodge	Removal of several acres of dead hazard trees near cabins.	No, outside of home ranges.	Stand is non-habitat due to elevation	No	Exclude. No loss dispersal or suitable habitat occurred.
Past – regeneration harvest	About 3,112 acres of spotted owl habitat removed from home ranges.	Yes	Loss of suitable and dispersal habitat	Yes	Include.
Past – road construction	Throughout Analysis Area	Yes.	Permanent loss of dispersal or suitable habitat	Yes.	Include.
Past – rock quarries	Throughout Analysis Area	Yes. Rock quarries are permanent.	Permanent loss of dispersal and suitable habitat	Yes	Include.
Past – Power Line	Southern portion of Analysis Area, Trees that grow under power line are cut for safety before they can become dispersal habitat.	Yes. Power lines are permanent	Permanent loss of dispersal and suitable habitat	Yes	Include.
Past – road decommissioning	Minor amounts in Analysis Area	Yes, but benefits would be too far in the future to be meaningful.	Trees begin to grow in roads and could eventually become owl habitat.	No	Exclude. No detrimental effect. Benefits too far off.
Past and present watershed restoration projects	Culvert replacement, road repairs, etc.	Yes.	None	No	Exclude. No effect to dispersal or suitable habitat.
Activities on other	Past logging. No known foreseeable	Yes, Logging has occurred	Loss of dispersal and	Yes	Include. A loss of dispersal and suitable

Project Name	Extent, Size, Type, & Distance	Overlap In Time Or Space	Type Of Potential Effect To Owl Habitat	Measurable Effect To Owl Habitat	Rationale For Inclusion Or Exclusion From Analysis Below
ownerships	future logging.	on the Warm Springs Reservation Lands	suitable habitat		habitat has occurred from past logging.
Future timber harvest	Unknown, but potential for timber harvest such as plantation thinning.	Unknown location. Plantations would not be ready for commercial thinning for many years.	Unknown intensity of treatments.	No	Exclude. No site specificity. Can not be modeled at this time. The appropriate time to conduct a cumulative effects analysis would be in a future EA after a firm proposal is developed.
Off highway vehicle use	Occasional dispersed use throughout the Analysis Area (s)	Yes	Compaction and disturbance	No	Exclude. No effect to dispersal or suitable habitat.
Past Wildfires	The Multnomah fire burned several hundred acres.	Yes	Burned suitable habitat and plantations.	Yes	Include.
Past Wildfires	Olallie Complex	No, outside analysis area.	Burned forest above 5000 feet elevation.	No	Exclude. Outside analysis area.
Past Wildfires	Other fires	Yes, many years ago.	Burned suitable and dispersal habitat.	Yes	Include. Older fires are included in terms of how they affected currently mapped vegetation.

4.4.3.3 This analysis looks at the existing condition of vegetation as it has been affected by past regeneration harvest timber sales, fires, power line and rock quarry creation, and road construction. These disturbances are tracked by stand age (Data source – GIS data from 2007 Forest-wide Owl Habitat.shp and Roads.shp).

The combined analysis area is 16,307 acres (not including lands above 5000 feet).

Currently there is:

- 5134 acres of suitable habitat (31%)
- an additional 238 acres of dispersal only habitat for a total of 5,372 acres of total dispersal habitat (33%)
- 10,696 acres of capable habitat (66%)
- 239 acres of non-habitat below 5000 feet

The capable habitat is 7,584 acres of natural stands and 3,112 acres of plantations. It is likely that most of these plantations were providing suitable habitat for owls prior to logging. Approximately 20% of the analysis area was converted to plantations, roads, power line corridors or quarries. The 239 acres of non-habitat consists of lakes, meadows, and talus outcrops. Roads comprise approximately 196 acres within the

analysis area and once provided 132 acres of capable habitat, 60 acres of suitable habitat and 64 acres of dispersal habitat prior to construction.

4.4.3.4 The following table shows the quantities of habitats before active management, now, and after fuel break implementation.

<b>Spotted Owl Habitat Type</b>	<b>Analysis Area Prior to Active Management</b>	<b>Current Condition</b>	<b>After Implementation</b>
Suitable	8,246 acres (51%)	5,134 acres (31%)	4,929 acres (30%)
Total Dispersal	8,484 acres (52%)	5,372 acres (33%)	5,146 acres (32%)

4.4.3.5 **Effects to the Historic Owl Nest Sites in the Vicinity of the Project**

There are nine historic owl activity centers whose home range (1.2 mile radius) overlaps the project area.

Incidental take thresholds for suitable habitat are 40% for the home range and 50% for the core.

4.4.3.6 The following table displays the current condition and project effects to the nest stand, core area, and home range of each historic nest site. The analysis includes habitat and historic nest sites on the Warm Springs Reservation. The **bolded** text indicates the pair is below the threshold and would be brought further below by the proposed action.

<b>Owl Pair</b>	<b>Distance To Fuel Break (miles)</b>	<b>Analysis Area</b>	<b>Current Suitable (acres)</b>	<b>Current Condition (%)</b>	<b>Post-treatment Suitable (acres)</b>	<b>Post-treatment Condition (%)</b>
<b>3302</b>	0.4	Nest Stand	27	N/A	No change	N/A
		<b>Core Area</b>	<b>219</b>	<b>44%</b>	<b>205</b>	<b>41%</b>
		Home Range	1378	48%	1295	45%
<b>3560</b>	0.66	Nest Stand	29	N/A	No Change	N/A
		Core Area	225	48%	No Change	No Change
		<b>Home Range</b>	<b>844</b>	<b>29%</b>	<b>827</b>	<b>29%</b>
<b>3572</b>	0.13	Nest Stand	17	N/A	No Change	N/A
		<b>Core Area</b>	<b>125</b>	<b>25%</b>	<b>117</b>	<b>23%</b>
		<b>Home Range</b>	<b>446</b>	<b>15%</b>	<b>437</b>	<b>15%</b>
3649	0.98	Nest Stand	31	N/A	No Change	N/A
		Core Area	328	65%	No Change	No Change
		Home Range	1476	51%	No Change	No Change

Owl Pair	Distance To Fuel Break (miles)	Analysis Area	Current Suitable (acres)	Current Condition (%)	Post-treatment Suitable (acres)	Post-treatment Condition (%)
3685	0.72	Nest Stand	15	N/A	No Change	N/A
		Core Area	351	70%	No Change	No Change
		Home Range	1525	53%	1499	52%
3791	0.18	Nest Stand	3	N/A	No change	N/A
		<b>Core Area</b>	<b>108</b>	<b>21%</b>	<b>107</b>	<b>21%</b>
		<b>Home Range</b>	<b>537</b>	<b>19%</b>	<b>528</b>	<b>18%</b>
3940	0.79	Nest Stand	31	N/A	No Change	N/A
		Core Area	268	53%	No Change	No Change
		<b>Home Range</b>	<b>760</b>	<b>26%</b>	<b>737</b>	<b>25%</b>
3998	0.65	Nest Stand	27	N/A	No Change	N/A
		Core Area	165	33%	No Change	No Change
		<b>Home Range</b>	<b>578</b>	<b>20%</b>	<b>525</b>	<b>18%</b>
3999	0.36	Nest Stand	30	N/A	No Change	N/A
		<b>Core Area</b>	<b>180</b>	<b>36%</b>	<b>179</b>	<b>36%</b>
		<b>Home Range</b>	<b>601</b>	<b>21%</b>	<b>601 (.4 acre loss)</b>	<b>21%</b>

No historical pairs that are currently above the take threshold would be brought below the threshold with the proposed fuel break. However, 7 historical pairs that are already below the thresholds would have further loss of suitable habitat resulting in further harm.

4.4.3.7 **Effects of Past Actions:**

The landscape pattern of vegetation has been affected by past timber harvest, fires, etc, substantially impacting the habitat for spotted owls. Some ecologically important features of landscape pattern are: amount of edge habitat, degree of fragmentation of late-successional forest, and amount of interior forest. As fragmentation of a landscape pattern increases, the amount of interior forest habitat decreases and the amount of edge habitat increases. As fragmentation increases, the amount of interior forest habitat decreases, impacting organisms that prefer large patches of interior habitat, such as the spotted owl.

Past management actions and past fires have reduced the amount of suitable and dispersal habitat within the analysis area(s) by approximately 3,112 acres.

The incremental affect of the proposed action can be found in tables 4.4.3.4 and 4.4.3.6.

The loss of approximately 226 acres of dispersal habitat from the fuel break would further reduce the ability of spotted owls to move through these stands. The ability of the owls to move across the landscape in the analysis area might not be adequate since adequate dispersal did not originally exist prior to project implementation in the appropriate quantities and distribution. There might not be enough dispersal habitat remaining in the analysis area to allow the birds to adequately disperse between suitable habitat blocks.

The loss of suitable and dispersal habitat within the fuel break could affect the ability of the spotted owls to forage, nest, or shelter.

In this analysis area, the limiting factor for spotted owl occupancy of the area is the lack of spotted owl suitable habitat, lack of connectivity between these suitable habitat blocks and lack of dispersal habitat. Past fires and logging have created a landscape where there is marginal quantity, quality and distribution of suitable and dispersal habitat. The incremental effect of the fuel break would be to further reduce total dispersal habitat by 226 acres, 205 acres of which is also considered suitable habitat. This represents a reduction of 1% of the 16,307 acre analysis area.

#### 4.4.4 **Forest Plan Goals, Standards and Guidelines**

##### **Mt. Hood Forest Plan References**

Forestwide Wildlife Standards and Guidelines – FW-170 to 186, page Four-69

**Northwest Forest Plan** - Standards and Guidelines - section C

Refer to sections 4.1.7.7 through 4.1.7.13 for discussion of LSR standards and guidelines.

##### 4.4.4.1 The Northwest Forest Plan gives the following guidance for areas that have similar fire hazard as the East Cascades Province (Northwest Forest Plan Standards and Guidelines p. C-13).

East of the Cascades – Given the increased risk of fire in these areas due to lower moisture conditions and rapid accumulation of fuels in the aftermath of insect outbreaks and drought, additional management activities are allowed in LSRs. (Northwest Forest Plan Standards and Guidelines p. C-12) While risk-reduction efforts should generally be focused on young stands, activities in older stands may be appropriate if: (1) the proposed management activities will clearly result in greater assurance of long-term maintenance of habitat, (2) the activities are clearly needed to reduce risks, and (3) the activities will not prevent the Late-Successional Reserves from playing an effective role in the objectives for which they were established. Such activities in older stands may also be undertaken in Late-Successional Reserves in other provinces if levels of fire risk are particularly high.

This project is near the crest of the Cascades but is west of the divide in the Clackamas River Watershed. The project area is very similar in terms of fire hazard to east side stands. The Northwest Forest Plan allows LSRs in other provinces to be managed using East Side standards and guidelines if the levels of fire risk are particularly high.



- 4.4.4.2 The fire management plan in the North Willamette LSR Assessment states that a major goal for managing LSRs is to maintain and protect late-successional forest ecosystems from loss due to large-scale fire (LSR Assessment, chapter 5). The wildfire management goal in the LSR is to keep all stand-replacing events as small as possible while at the same time ensuring that firefighter and public safety is the highest priority.

The North Willamette LSR Assessment also has a fire risk mitigation recommendation specifically related to the Upper Clackamas LSR (page 5.8). “The southern part of the Upper Clackamas LSR (Olallie Lake Scenic Area) and the area directly north, lie in an area called the ‘Cascade Lighting Belt.’ Numerous lightning fires have been recorded along this north/south line that divides the East and West sides of the Cascades Mountain range. Associated with the above average ignition potential from lightning is the high recreational use in the Olallie Lake area and the declining vigor of the high elevation mountain hemlock stands. Increasing tree spacing and reducing residual fuel loading would reduce the probability of a stand replacing fire and reduce the impacts should one start. The area north of the LSR could pose a potential threat to the LSR in the event of an East wind driven fire. Increased vegetation management in this area could provide a buffer for the LSR from an east wind driven fire.”

The proposed fuel break is consistent with the recommendations of the LSR Assessment. Construction and maintenance of the fuel break is intended to aid in the suppression of a large-scale wildfire. There is increasing fire hazard in the area caused by dead and dying trees, dense vegetation, and the accumulation of fuels on the ground. While it is not possible to predict the exact size a fire might attain with or without a fuel break, it is likely that with a fuel break in place, fires would be kept smaller with less risk to spotted owls and their habitat.

- 4.4.4.3 The LSR Assessment contains many recommendations for thinning timber harvest. While the proposed action is not a traditional timber harvest the following section will address those recommendations. The italicized text represents how the project responds to those recommendations.

- Snags – Manage at 15-30 snags/acre. *Snags would need to be removed for a fuel break to be effective.*
- Down wood – Manage at 15 percent cover of logs. *Down logs would need to be removed for a fuel break to be effective.*
- Old trees - Avoid harvest in stands greater than 80 years of age. *The largest trees would be retained but some trees over 80 years old would be removed to achieve the necessary crown spacing.*
- Tree density - Thin no more than 10% of the stands to less than 50 trees per acre. *The project is not a traditional thinning. Trees would be spaced so that the outside edge of the crowns would be 20 feet apart. Where trees have broad crowns this would result in having fewer than 50 trees per acre. Approximately 18% of the fuel break would have fewer than 50 trees per acre.*

- Gaps - Openings or gaps should not be greater than ¼ acre in size. *The fuel break does not have the objective of creating openings however some areas have only dead lodgepole pine.*
- Large trees - Trees ≥20” diameter should not be cut. *The largest trees would be retained but some trees larger than 20 inches diameter years old would be removed to achieve the necessary crown spacing.*
- Project objective – The objective of the treatment should be to develop late-successional habitat. *The objective of the project would be to reduce the amount of late-successional habitat impacted by wildfire. It is appropriate to manage this portion of the LSR as described in s. 4.4.4.1 where snags, fuels, and some large trees greater than age 80 may be removed to achieve hazard reduction objectives.*

**4.4.4.4 The proposed action is consistent with the following standards and guidelines**

FW 170 & 171	Not applicable to individual projects.
FW-174	Habitat has been identified and managed in accordance with the ESA (1973), the Oregon ESA (1987), and FSM 2670.
FW-175	Habitat is managed at the landscape scale. This standard and guideline is not applicable to individual projects.
FW-179	The creation of Species Management Guides is not applicable to individual projects.
FW-180	Not applicable to individual projects.
FW-181	This document does not include location information.

**4.4.5 Endangered Species Act Compliance**

**4.4.5.1 Effects to Spotted Owl Habitat within Critical Habitat Unit OR-11 and OR-13**

The following table displays the total spotted owl habitat acres proposed for treatment within both Critical Habitat Units.

**Proposed Treatments as Related to Critical Habitat Units OR-11 and 13.**

Critical Habitat Unit	Total Acres Treated	Suitable Habitat Removed (acres)	Dispersal Habitat Removed (acres)
CHU OR-11	510	133	150
CHU OR-13	188	5	5
<b>Total</b>	698	138	155

**4.4.5.2 Existing condition and effects to Critical Habitat Units**

CRITICAL HABITAT UNIT	SPOTTED OWL HABITAT						
	TOTAL SPOTTED OWL HABITAT ACRES IN CHU	CURRENT ACRES OF SUITABLE HABITAT	ACRES OF SUITABLE HABITAT POST-HARVEST	PERCENT SUITABLE HABITAT CHANGE	CURRENT ACRES OF DISPERSAL HABITAT	ACRES OF DISPERSAL HABITAT POST-HARVEST	PERCENT DISPERSAL HABITAT CHANGE
OR-11	17,295	14,013	13,880	-0.9%	17,295	17,145	-0.9%
OR-13	16,385	9,953	9,948	-0.05%	16,385	16,380	-0.03%

4.4.5.3 **Effects to critical habitat** - The effect determination for the proposed action on northern spotted owl critical habitat units OR-11 and OR-13 is, “**May Affect, Likely to Adversely Affect.**” This determination is due to the removal of all the primary constituent elements within the stands currently providing suitable and/or dispersal habitat. The primary constituent elements of spotted owl critical habitat are those physical and biological habitat features which support nesting, roosting, foraging, and dispersal. The proposed action would add cumulatively to the decline of suitable and dispersal habitat.

Because the fuel break follows key roads and must remove trees to be effective, there is no way to avoid the loss of suitable and dispersal habitat in CHUs. While it is not possible to predict the exact size a fire might attain with or without a fuel break, it is likely that with a fuel break in place, fires would be kept smaller with less risk to spotted owls and their critical habitat. While the short-term effects to the CHUs are adverse, there could be long-term benefits to owl recovery.

A very small percentage of the available suitable and dispersal habitat within the CHUs would be removed (s 4.4.5.2). The resultant spotted owl habitat within these CHUs as a whole after project completion would be sufficient to provide spotted owl nesting and dispersal. The proposed action would not appreciably diminish the functionality of these CHUs to provide habitat conditions that support the recovery of the northern spotted owl. The removal of suitable spotted owl critical habitat would not affect the conservation value of critical habitat to support spotted owls.

4.4.5.3 **Effects to spotted owl at the project scale** - The proposed action would have an effects determination of “**May Affect, Likely to Adversely Affect**” because of the effect to suitable habitat, as well as dispersal habitat in this area designated as an Area of Concern.

4.4.5.4 **Effects to spotted owl on the entire range of the species (Washington, Oregon, and California)**

The Northwest Forest Plan established a system of land allocations and a rate of timber harvest (probable sale quantity) that is considered to be consistent with maintaining viability for the northern spotted owl across its range (USDA, USDI 1994b). The proposed action would **not significantly alter the landscape's capability to provide for the continued viability of the northern spotted owl on Federal Lands.**

A report titled "Scientific evaluation of the status of the Northern Spotted Owl" was published by Sustainable Ecosystems Institute (Courtney 2004). The report is a review and synthesis of information on the status of the Northern Spotted Owl. The report was prepared to aid the U.S. Fish and Wildlife Service in their 5-year status review process, as set out in the Endangered Species Act. The report did not make recommendations on listing status or on management, but focused on identifying the best available science and the most appropriate interpretations of that science. The focus is on new information developed since the time of listing in 1990. The report relied on demography studies summarized in a report titled "Status and Trends in Demography of Northern Spotted Owls, 1985-2003" (Anthony 2004).

One of the topics discussed in this Report was the barred owl and the species' expansion into northern spotted owl territory from northeastern Canada since about 1900 and its subsequent movement into Washington, Oregon and Northern California; in some cases displacing spotted owls. Barred owls may be expanding their range because of changes to forest structure from logging, wildfire or climate change. Barred owls are known to be present on the District. By casual observation and incidental surveying since 1994, barred owls do appear to be more common on the district than they were since surveying began on 1979. Since routine surveys have not been completed for owls since approximately 1994, it is unknown as to what extent their presence has affected the population of spotted owls on the District.

This barred owl information and all other topics discussed in the Report do not reveal effects concerning the impacts of the Cascade Crest Fuel Break proposal in a manner or extent not previously considered. See the wildlife biological assessment for more detail on this report.

## 4.5 Other Wildlife

### 4.5.0.1 Management Indicator Species

The 2005 planning rule for National Forest System Land and Resource Management Planning addresses management indicator species. (36 CFR 219.14f) "(f) *Management indicator species.* For units with plans developed, amended, or revised using the provisions of the planning rule in effect prior to November 9, 2000, the Responsible Official may comply with any obligations relating to management indicator species by considering data and analysis relating to habitat unless the plan specifically requires population monitoring or population surveys for the species. Site-specific monitoring or

surveying of a proposed project or activity area is not required, but may be conducted at the discretion of the Responsible Official.”

Management Indicator Species for this portion of the Mt. Hood National Forest include northern spotted owl (s. 4.4), pileated woodpecker (s. 4.5.2, s. 4.5.6), pine marten (s. 4.5.6), deer (s. 4.5.3), elk (s. 4.5.3), salmonid smolts and legal trout (4.3) (Forest Plan p. four-13). The analysis in these sections discusses the project’s impacts to these species and their habitats.

Monitoring at the Forest scale has been documented in Annual Monitoring Reports available on the Forest’s web site - <http://www.fs.fed.us/r6/mthood> in the Publications section. There is no requirement in the Mt. Hood Forest Plan as amended to survey for or gather project-scale population data for management indicator species prior to implementing a site-specific project. The Mt Hood Forest Plan as amended by the Northwest Forest Plan provides habitat to maintain viable populations of these species. Land allocations that provide habitat for these species include Pileated Woodpecker and Pine Marten Habitat Areas (B5), Late-successional Reserves (LSR), and Riparian Reserves (RR) for pine marten, pileated woodpecker and the northern spotted owl; Winter Range (B10) and Summer Range (B11) for deer and elk; and Riparian Reserves (RR) for fish. Of these land allocations, the project overlaps Summer Range (B11), Late-successional Reserves and Riparian Reserves. There are also numerous Forest-wide standards and guidelines that pertain to these species. This project has been designed to reduce the impact that wildfires would have on management indicator species.

#### 4.5.1 Effects to Sensitive Species and Other Rare or Uncommon Species

Species	Suitable Habitat Presence	Impact of Proposed Action*
Northern Bald Eagle	Yes	MII-NLFL
Oregon Slender Salamander	Yes	MII-NLFL
Larch Mountain Salamander	NO	No Impact
Cope’s Giant Salamander	Yes	MII-NLFL
Cascade Torrent Salamander	Yes	MII-NLFL
Oregon Spotted Frog	Yes	MII-NLFL
Painted Turtle	No	No Impact
Northwestern Pond Turtle	No	No Impact
Horned Grebe	No	No Impact
Bufflehead	Yes	MII-NLFL
Harlequin Duck	Yes	MII-NLFL
American Peregrine Falcon	No	MII-NLFL
Gray Flycatcher	No	No Impact
Baird’s Shrew	Yes	MII-NLFL
Fringed Bat	Yes	MII-NLFL
California Wolverine	Yes	MII-NLFL
Puget Oregonian	No	No Impact

Species	Suitable Habitat Presence	Impact of Proposed Action*
Columbia Oregonian	No	No Impact
Evening Fieldslug	No	No Impact
Dalles Sideband	No	No Impact
Crater Lake Tightcoil	Yes	MII-NLFL

“MII-NLFL” = May Impact Individuals, but not likely to Cause a Trend to Federal Listing or Loss of Viability to the Species

Effects to the species listed above include changes to habitat as well as potential harm to individuals caused by physical impacts of logging equipment, falling and dragging trees, noise, fuels treatment, road repair, and log haul.

- 4.5.1.1 **Terrestrial Mollusks:** The Puget Oregonian, Columbia Oregonian, evening fieldslug and Crater lake tightcoil are the mollusk species with ranges that include the Clackamas River Ranger District. The Puget Oregonian and Columbia Oregonian are found at low to mid-elevations in old-growth forests. No known sites for the Puget Oregonian or Evening fieldslug are present on the district. However, several known sites exist for the Columbian Oregonian at elevations ranging from 2600 to 3280 feet in elevation. The project area’s elevation ranges from 4200 to 5400 feet in elevation and is considered too high an elevation to be potential habitat for the Puget Oregonian, Columbia Oregonian, and Evening fieldslug. No surveys were conducted for these species due to lack of habitat.
- 4.5.1.2 **Crater lake tightcoil:** This snail is generally found in mid to high elevation habitat adjacent to perennial wet areas. Surveys were completed for this species between June 5 and October 18, 2007. This snail was found at two locations in the project area. These sites would be protected during project implementation. A no treatment buffer large enough to protect the site would be applied in these two areas.
- 4.5.1.3 **Red-tree vole:** Habitat for this species consists of conifer forests containing Douglas-fir, grand fir, Sitka spruce, western hemlock and white fir. Optimal habitat for the species occurs in old-growth Douglas-fir forests. Large, live old-growth trees appear to be the most important habitat component. Although part of the project area does contain mature old-growth stands, the species composition is different than what is preferred by the species. The mature stands in the project area are dominated by primarily mountain hemlock, western hemlock and pacific silver fir; with lesser amounts of Douglas-fir and Engelmann spruce. In addition, the lowest elevation of the project area is 4200 feet in elevation. Red-tree voles are relatively uncommon in the North Cascades Region, with most records of species located at the lower elevations along the Columbia River and the western foothills of the Cascades. The species appears to be uncommon at elevations above 2,500 feet and extremely rare above 4,260 feet in the Cascades. It is believed that red tree voles are rare in high elevation true fir forests because their arboreal nests do not provide adequate insulation against cold winter temperatures. It is also thought that tree voles find it difficult to forage in high elevation forests during winter, when tree branches

are frequently covered with snow and ice for extended periods (Forsman 2004). There also have not been any records of red tree voles found from the east slope of the Cascades.

The project area occurs in high elevation true fir forests ranging in elevation from 4200 to 5400 feet in elevation. This area has long winters with abundant snowpacks. It is on the crest of the Cascades and has habitat more similar to the east side of the Cascades. There has not been a red tree vole documented in this area. For these reasons it is highly unlikely a red tree vole would be nesting in the project area. Surveys were not conducted due to lack of habitat.

- 4.5.1.4 **Great gray owl:** There is potential habitat for the Great Gray Owl in the mature stands directly adjacent to the Olallie Meadow. Project design has been adjusted to minimize effects to nesting habitat s. 2.3.4.5.

The Northwest Forest Plan amended the Forest Plan adding standards and guidelines for the white-headed woodpecker, black-backed woodpecker, pigmy nuthatch, flammulated owl, Canada lynx and bats. Of these species, the black-backed woodpecker is the only species potentially affected by the project.

- 4.5.1.5 **Black-backed woodpecker:** Habitat for this species is found in mixed conifer and lodgepole pine stands in the higher elevations of the Cascade Range. The project area has potential habitat for the species. A standard and guideline requires an adequate number of large snags and green-tree replacements for future snags be maintained in sufficient numbers to maintain 100 percent potential population levels. The 100 percent population potential for black-backed woodpeckers is 0.12 conifer snags per acre in the hard decay stage. These snags would be at least 17 inches diameter or largest available if 17 inch diameter snags are not available. The black-backed woodpecker also requires beetle infested trees for foraging. With the proposed action, snags would be removed for a fuel break to be effective. Some snags would be retained in riparian areas. Within the fuel break itself the 100 percent potential population level for black-backed woodpecker would not be met but there would be an abundance of snags, particularly beetle infested lodgepole pine snags across the landscape to meet the habitat needs for this species.

#### 4.5.2 Snags and Down Wood

**Existing Situation** – The snag and down woody debris density data in the Upper Clackamas watershed analyses was based on surveys completed in 1987 in unmanaged stands (late seral and naturally regenerated mid-seral stands) and from 1992 surveys in managed stands (plantations and clearcuts). This information is summarized below to give an idea of the levels of snags and down woody debris that can be expected in these types of stands.

4.5.2.1 Estimated snag levels

	<b>PSF Series – Large Conifer</b>	<b>PSF Series – Small Saw</b>	<b>MH Series – Large Conifer</b>	<b>MH Series – Small Saw</b>
<b>Hard snags 15.0-20.9” diameter in unmanaged stands</b>	4.5 snags/acre	3 snags/acre	0 snags/acre	0.5 snags/acre
<b>Hard snags ≥21” diameter in unmanaged stands</b>	8 snags/acre	2 snags/acre	3 snags/acre	1 snag/acre
<b>Totals</b>	12.5 snags/acre	5 snags/acre	3 snags/acre	1.5 snags/acre

	<b>All Series – Large Conifer and Small Saw</b>
<b>Snags 15.0 – 20.0” diameter in plantations</b>	0 snags/acre
<b>Snags ≥21” in plantations</b>	0 snags/acre
<b>Totals</b>	0 snags/acre

\*Large conifer stands are defined as stands dominated by conifers at least 21” in DBH. The small saw category includes small sawtimber stands dominated by conifer trees ranging from 8-21” diameter.

4.5.2.2 Within the fuel break itself, it is apparent that there is a wide variation in the amount and size of snags and down wood. Many of the un-managed small diameter mixed conifer and lodgepole pine stands have been affected by the mountain pine beetle and currently have moderate to high levels of small-diameter lodgepole pine snags and down woody debris. Other stands have less mortality and have lower levels of snags and down wood. The mature stands have varying levels of large diameter snags and down wood. Most of the managed plantations of varying ages have very low levels of snags and down wood.

The two cavity-nesting guilds present in the project area are lodgepole pine and mature Engelmann spruce/mountain hemlock. The primary and secondary cavity nesting species for the lodgepole pine stands are: hairy woodpecker, Williamson sapsucker, red-breasted nuthatch, black-backed woodpecker, and northern three-toed woodpecker. The 100% biological potential level is 3.2 snags per acre (Austin 1995). The primary and secondary cavity nesting species for the mature Engelmann spruce/mountain hemlock stands are: pileated woodpecker, northern flicker, hairy woodpecker, black-backed woodpecker, northern three-toed woodpecker, Williamson sapsucker, and red-breasted nuthatch. The 100% biological potential level is 3.7 snags per acre (Austin 1995).

Many species in the Pacific Northwest evolved to use large snags and logs that were historically abundant in the landscape. The loss of snag and log density from managed stands affects biodiversity and potentially could cause a loss of critical function in the landscape such as control of forest insects.



#### 4.5.2.3 DecAID Advisor

DecAID is a planning tool intended to help advise and guide managers as they conserve and manage snags, partially dead trees and down wood for biodiversity (Mellen 2003). It also can help managers decide on snag and down wood sizes and levels needed to help meet wildlife management objectives. This tool is not a wildlife population simulator nor is it an analysis of wildlife population viability.

A critical consideration in the use and interpretation of the DecAID tool is that of scales of space and time. DecAID is best applied at scales of subwatersheds, watersheds, subbasins, physiographic provinces, or large administrative units such as Ranger Districts or National Forests. DecAID is not intended to predict occurrence of wildlife at the scale of individual forest stands or specific locations. It is intended to be a broader planning aid not a species or stand specific prediction tool.

Modeling biological potential of wildlife species has been used in the past. DecAID was developed to avoid some pitfalls associated with that approach. There is not a direct relationship between the statistical summaries presented in DecAID and past calculations or models of biological potential.

Refer to the DecAID web site listed in the References section for more detail and for definition of terms. This advisory tool focuses on several key themes prevalent in recent literature:

- Decayed wood elements consist of more than just snags and down wood, such as live trees with dead tops or stem decay.
- Decayed wood provides habitat and resources for a wider array of organisms and their ecological functions than previously thought.
- Wood decay is an ecological process important to far more organisms than just terrestrial vertebrates.

#### 4.5.2.4 Snags and Down Wood Levels Compared to DecAID Data

The fuel break is located within the habitat type identified in DecAID as the Montane Mixed Conifer Forest. The vegetation conditions are divided into second-growth for small/medium size trees and mature for stands with larger trees. DecAID offers several tolerance levels (30%, 50% and 80%) to give managers a range of options.

For snags in unmanaged second-growth:

- The 30% tolerance level is 10 snags per acre greater than 10 inches diameter of which 2.7 per acre are greater than 20 inches diameter.
- The 50% tolerance level is 16.6 snags per acre greater than 10 inches diameter of which 4.2 per acre are greater than 20 inches diameter.
- The 80% tolerance level is 14.4 snags per acre greater than 10 inches diameter of which 4.5 per acre are greater than 20 inches diameter.

For down wood in unmanaged second-growth (only wood greater than or equal to 4.9 inches diameter in all decay classes):

- The 30% tolerance level is 2.5% cover. Clumps of up to 6% cover would benefit species such as the three-toed woodpecker.
- The 50% tolerance level is 4% cover. Clumps of down wood of at least 10% cover would benefit small mammals, three-toed woodpecker and the American marten.
- The 80% tolerance level is 8% cover.

The managed plantations within the project area have snag levels well below the 30% tolerance level. Down wood levels within the plantations are close to the 30% tolerance level. Some of the unmanaged second-growth lodgepole pine/mixed conifer stands have much higher levels of snags and down wood due to mortality caused by the mountain pine beetle. Snag levels would likely fall in the 50 or 80% tolerance levels for small snags but these stands typically do not have large snags due to past fire history. Down wood levels would likely fall in the 50 to 80% tolerance level range for these stands.

For snags in mature stands:

- The 30% tolerance level is 11 snags per acre greater than 10 inches diameter of which 6.5 snags per acre are greater than 20 inches diameter.
- The 50% tolerance level is 15 snags per acre greater than 10 inches diameter of which 9 snags per acre are greater than 20 inches diameter.
- The 80% tolerance level is 27 snags per acre greater than 10 inches diameter of which 15 per acre are greater than 20 inches diameter.

For down wood in mature stands (only wood greater than or equal to 4.9 inches diameter in all decay classes):

- The 30% tolerance level is 3.3% cover.
- The 50% tolerance level is 5% cover. Clumps containing over 10% cover would occur on about 12% of the landscape.
- The 80% tolerance level is 10% cover.

The mature stands within the project area likely have levels of snags and down wood ranging from the 30 to 50% tolerance level. There are likely clumps of down wood in the stands containing 6-10% down wood cover.

**4.5.2.5 Elements of Proposal Analyzed** – The proposed action involves the removal of most snags within the fuel break boundary except those near certain streams. When a wildfire occurs, snags burn readily and spread embers. They are also hazardous to firefighters because they may fall at any time. The proposed action also involves the removal of most down logs except those in advanced stages of decay that can not be picked up my machinery. Down logs add to the total quantity of fuel available to burn and add to the cost and time required to create fire lines.

**Direct and Indirect Effects –**

4.5.2.6 **Alternative A** – With no action, the fuel break would not be constructed. The mountain pine beetle would continue kill lodgepole pine trees. Other species of trees would be expected to succumb to a certain level of mortality as well. Snags generally less than 20 inches diameter would substantially increase in numbers in these stands. This would eventually create a subsequent increase in the down woody debris cover as well. Snag levels in the mature old-growth stands would either stay the same or increase. Down wood levels would likely increase over time.

Dead and dying lodgepole pine stands would increase the fire hazard in the area. While it is not possible to predict the exact size a fire might attain with or without a fuel break, it is likely that fires would be larger with no action resulting in more snags and down wood across the landscape. However some species that depend on snags and down wood may not be mobile enough to escape a large scale wildfire.

**4.5.2.7 Proposed Action**

Most snags would be cut down during creation of the fuel break. Approximately 3,048 snags 15 inches diameter or greater would be removed. Where feasible, down woody debris would be removed from the site. The wood that is not removed would be piled and burned. These actions are necessary for an effective fuel break.

After the proposed fuel break is established, periodic maintenance work would be needed, such as the felling and removal of trees that have since died. Trees that fall into the fuel break would also need to be removed. The proposed action represents a conscious choice to have a fuel break with few snags and little down wood. The fuel break is narrow and occupies a small part of a larger landscape where snags and down wood are abundant.

Some species that utilize snags and down wood in this habitat type are pileated woodpecker, three-toed woodpecker, black-backed woodpecker, American marten, northern flying squirrel, fisher, black bear, ruffed grouse, great grey owl, ensantina, and various snail species. The loss of the current and future developing lodgepole pine / small diameter mixed conifer snags in the project area is not expected to measurably impact these or other species that use snags in this habitat type. There is an abundance of dead and dying lodgepole pine and various other mixed conifer species present in the southern portion of the Upper Clackamas Watershed, including the Olallie Lake Scenic Area and areas north that are bordering the crest of the Cascades. The amount of area with high concentrations of dead lodgepole pine snags is expected to increase over the next few decades. The Olallie Lake fire complex burned 2,622 acres in 2001 none of which was salvaged.

The loss of large diameter snags and down wood in the project area is likely to have more of an impact on species utilizing large diameter coarse woody debris. In the past, timber harvest focused on mature stands that contained large snags and large down wood. The mature stands do not have large quantities of lodgepole pine and are only minimally

affected by the mountain pine beetle infestation. Mature forest stands are lacking in this landscape compared to forests in lower elevations.

The fuel break would aid in the suppression of large scale wildfires. While it is not possible to predict the exact size a fire might attain with or without a fuel break, it is likely that with a fuel break in place, fires would be smaller but they are still likely to occur. When fires occur they would create snags and down wood.

The Upper Clackamas Watershed analysis (USDA 1995) states that the quantity of late-seral forest in the mountain hemlock zone is below the historical range of variability, whereas the quantity of late-seral forest in the Pacific silver fir zone is above the historical range of variability.

In terms of DecAID, the fuel break would be at the 0% tolerance level for snags and down wood. However across the landscape there are abundant snags primarily in the smaller size class.

**4.5.2.8 Cumulative Effects –**

Snags are utilized by species that have medium size home ranges so appropriate size analysis areas using topographic features have been developed to calculate cumulative effects for snags. Four analysis areas were delineated using drainage boundaries. Portions of the analysis areas are on the Warm Springs Reservation.

**Past, Present and Foreseeable Future Projects and Actions**

<b>Project Name</b>	<b>Extent, Size, Type, &amp; Distance</b>	<b>Overlap In Time Or Space</b>	<b>Alteration of snags</b>	<b>Meaningful Effect</b>	<b>Rationale For Inclusion Or Exclusion From Analysis Below</b>
Olallie fire Complex	Lightning caused wildfire	Nearby but outside of snag analysis areas.	Yes, many snags and down logs created.	yes	Exclude. Outside of four snag analysis areas.
Past – regeneration harvest	Throughout Analysis Area	Yes	A loss of snags in all size classes has occurred.	yes	Include.
Past – commercial thinning	Throughout Analysis Area	Yes	A loss of snags, mainly in the small to moderate size classes has occurred.	yes	Include.
Past – road construction	Throughout Analysis Area	Yes. roads occur throughout the Analysis Area	A loss of snags in all size classes has occurred.	yes	Include.
Past – rock quarries	Throughout Analysis Area	Yes. Rock quarries are permanent and occur throughout the Analysis Area	A loss of snags in all size classes has occurred.	yes	Include.
Past – Power Line	Southern portion of Analysis Area	Yes. Power lines are permanent	A loss of snags in all size classes has occurred.	yes	Include.

Project Name	Extent, Size, Type, & Distance	Overlap In Time Or Space	Alteration of snags	Meaningful Effect	Rationale For Inclusion Or Exclusion From Analysis Below
Past and Present – developed camp ground	3 camp grounds	Yes	Hazard snags have been felled.	yes	Include.
Past – road decommissioning	Minor amounts in analysis area.	Yes, but benefits would be too far in the future.	no	No	Exclude. Exclude. No detrimental effect. Benefits too far off.
Past and present watershed restoration projects	Culvert replacement, road repairs, etc.	Yes.	no	No	Exclude. No meaningful loss of snags would occur.
Activities on other ownerships	Past logging. No known foreseeable future logging.	Yes, Logging has occurred on the Warm Springs Indian Reservation Lands	A loss of snags in all size classes has occurred.	Yes	Include. A loss of dispersal and suitable habitat has occurred from past logging.
Future timber harvest	Unknown, but potential for timber harvest such as plantation thinning.	Unknown location. Plantations would not be ready for commercial thinning for many years.	Unknown of intensity of treatments	No	Exclude. No site specificity. Can not be modeled at this time. The appropriate time to conduct a cumulative effects analysis would be in a future EA after a firm proposal is developed.
Past Wildfires	The Multnomah fire burned several hundred acres.	Yes	Some snags were created.	Yes	Include.

The snag analysis presented in the table below is based on stand type and plant associations and was generated from field surveys completed by Forest inventory and ecology crews (see Existing Situation in the Snag and Down Wood Section). Weighted averages include the entire land base including all forest types, as well as all non-forest areas within the analysis area. The 100% biological potential would be between 3.2 to 3.7 snags per acre.

The analysis of snag habitat within the snag analysis areas includes all past and present projects including Cascade Crest Fuel Break.

4.5.2.9 **Snag Habitat** (analysis areas that overlap Cascade Crest Fuel Break)

Snag Analysis Area	Total Acres	Snags/Ac. 15-21” existing condition	Snags/Ac. > 21” existing condition	Total Snags/Ac. Existing Condition*	Snags/Ac. 15-21” Post-sale Condition	Snags/Ac. >21” Post-sale Condition	Total Snags/Ac. Post-sale Condition
Lemiti	7496	1.72	2.53	4.2	1.67	2.49	4.16
Pinhead	4426	1.83	2.84	4.6	1.73	2.69	4.42
Slow	7699	2.11	1.95	4.1	2.05	1.88	3.93
Squirrel	8251	1.69	2.47	4.2	1.68	2.45	4.13

\* This represents the existing situation after all of the projects in s. 4.5.2.8 are incorporated.

The analysis shows that within the snag analysis areas, the snag levels after the past and present harvest activities would still be above the 100% biological potential level.

## **Forest Plan Goals, Standards and Guidelines**

### **4.5.2.10 Snags -**

**FW-215** - For timber harvest units the goal is to have 60% of the full biological potential, which translates into 2.0 snags per acre in the lodgepole pine stands and 2.3 snags per acre in the Engellman spruce/mountain hemlock stands. There are other snag related standards and guidelines such as FW-163, 164, 165, 169, 218, 230 and 231.

This standard address timber harvest units (e.g. regeneration harvest and commercial thinning). The proposed fuel break is not a traditional timber harvest and is neither regeneration harvest nor commercial thinning. However, because the project is similar to timber harvest in many ways, exemptions for all of these standards and guidelines will be made. Most snags need to be removed for a fuel break to be effective. There are sufficient snags at the landscape scale to meet the needs of snag dependent species. FW-240 indicates that exceptions to snag standards and guidelines may occur within near-foreground area in designated viewsheds such as in the Olallie Scenic Area.

**FW-216** indicates that snags at the landscape scale be at 40% of biological potential, which equates to about 1.4 snags in the lodgepole pine stands and 1.6 snags per acre in the Engelman Spruce/mountain hemlock stands. The table in s. 4.5.2.9 above shows that this level is currently being met throughout the entire planning area.

### **4.5.2.11 Down Wood -**

FW-219 indicates that project activity areas should have 6 down logs per acre in decomposition class 1, 2, and 3. There are other down wood related standards and guidelines such as FW-166, 167, 169, 221-229.

The Northwest Forest Plan standard and guideline for the Matrix indicates that the amount of down logs left should reflect the timing of stand development cycles and that existing wood on the ground should not be disturbed to the extent possible. However subsequent watershed analysis and the LSR Assessment recommended fuel treatments in this area.

FW-240 indicates that exceptions to down wood standards and guidelines may occur within near-foreground area in designated viewsheds such as in the Olallie Scenic Area. The proposed project would not maintain or provide down logs except in the no-treatment areas. Most down wood needs to be removed for a fuel break to be effective. There is sufficient down wood at the landscape scale to meet the needs of dependent species. An exemption would be made for these standards and guidelines.

### 4.5.3 Deer and Elk Habitat (Management Indicator Species)

4.5.3.1 **Habitat Characteristics** – Elk herds in the Clackamas drainage exhibit a close association with riparian habitat in areas of gentle terrain and low road density. A study within the Clackamas River Ranger District from 1987 to 1992 recorded location and habitat type being utilized by radio-collared elk (Fiedler 1994). Seventy percent of all observations on these elk occurred within 100 meters of a stream or wetland. It was also noted that shrub/seedling stage clearcuts received more than twice as much use than they were proportionally available to elk as a habitat type. Also, elk were observed to browse on a wide range of native shrubs, trees, forbs and grasses as well as utilizing non-native grasses (Fiedler 1994).

High open-road densities lead to harassment of elk herds. Harassed elk move more often than elk left alone and use of habitat decreases as open-road density increases (Witmer 1985). The study mentioned above also reported that elk within or moving through areas of high open-road densities moved longer distances; several miles per day was not uncommon.

For this proposal, the following actions have the potential to affect deer and elk (both positively and negatively): actions that remove or kill trees to a level below 70% canopy cover would reduce thermal and optimal cover but would also increase forage availability. Activities that make noise may potentially affect deer and elk. Other actions such as log haul and road repair would not have a meaningful or measurable affect on habitat but would create noise disturbance.

4.5.3.2 **Existing Situation** – The entire proposed project area is located within summer range (SR). Thermal cover for elk is defined as a stand of coniferous trees at least 40 feet tall with an average crown closure of 70 percent or more. Thermal cover for deer may include saplings, shrubs, or trees at least 5 feet tall with a 75 percent crown closure. Optimal cover is found mainly in multi-storied mature and old-growth stands. Hiding cover is present when there is vegetation capable of hiding 90 percent of a standing deer or elk from the view of a human at a distance of 200 feet. Forage includes all browse and non-woody plants available to wildlife for grazing.

The proposed treatment areas contain various levels of optimal, thermal, and hiding cover; as well as forage areas.

Analysis areas for deer and elk were established around topographic features such as ridges and streams as well as the winter/summer boundary. Section 4.5.3.8 describes the existing situation for each analysis area.

The elk herds residing in the vicinity of the project area during the summer usually spend the winter in lower elevation areas off the Mt. Hood National Forest. The elk closer to the southern part of the project area likely move further south in the Willamette National Forest, while those near the eastern part of the project area move into the Warm Springs Reservation. Studies along the Cascade Crest show that adult and calf elk mortality

outside the hunting season is relatively high in the Sisi/Lemiti/Olallie area. The cause of mortality is unknown.

Some of the largest elk herds in the watershed are located in the Lemiti and northeast Sisi areas, although these areas seem to have a shortage of optimal and thermal cover. One reason for this is that these areas are still relatively isolated and still roaded more lightly than many other areas on the district. These areas may represent “security areas” for elk despite the low proportion of optimal and thermal cover. “Effective” thermal cover may be less critical to deer and elk in summering areas than in wintering areas, since deer tend to forage at night when temperatures tend to be much cooler.

Elk are known to congregate in the Lemiti mountain areas during the fall.

Deer have not been studied intensively within the watershed, but are generally considered to be wider ranging, more tolerant of human disturbance, and less dependent on riparian areas.

Optimal cover is lacking in the project vicinity due the influence of past fires and slow growing conditions. Forage is widely available within the analysis area, but is generally of low quality. The low quality of the forage, especially in winter range, and the lack of wetlands and permanent low-gradient streams within winter range are considered the limiting factors for elk and possibly deer on the District.

### **Direct and Indirect Effects**

- 4.5.3.3 **Alternative A** – In the short term, there would be no change in cover or forage. The lodgepole pine/mixed conifer stands would continue to lose hiding and thermal cover due to the mountain pine beetle outbreak. It is likely within the next 10 years that much of the currently available thermal and hiding cover in the lodgepole pine type would be lost. Some forage would be gained as trees die but it would be relatively low quality.

Dead and dying lodgepole pine stands would increase the fire hazard in the area. While it is not possible to predict the exact size a fire might attain with or without a fuel break, it is likely that fires would be larger with no action resulting in reduced optimal and thermal cover and increased forage across the landscape.

### 4.5.3.4 **Proposed Action**

The proposed action includes heavy thinning within approximately 852 acres of stands within summer range for deer and elk. Portions of the stands in stream protection buffers would be unthinned.

Creating the fuel break would remove any optimal, thermal, or hiding cover present. This habitat would be downgraded to non-habitat. There would likely be an increase in forage. The increase in forage would be caused by increased sunlight reaching the forest



floor as a result of opening up the canopy. Opening up the canopy to this degree would promote the development of understory vegetation. Usually this vegetation consists of shrubs and sometimes grasses highly palatable to deer and elk. This forage created by the thinning is predicted to be moderate to high in quality. Since the proposed shaded fuel break is to be maintained over time, the forage benefits gained would remain consistent.

The stream protection buffers would maintain their forest structure and continue to provide cover.

There would be approximately 673 acres of cover lost. The table in s. 4.5.3.8 shows the changes for each analysis area. However, cover is not considered a limiting factor for deer and elk on the district, especially in summer range. Some of the increase in forage in the treated stand would occur close enough to cover for it to be utilized by deer and elk. However, most of the forage gains would occur close to an open road in an area where essentially all cover would be removed. For this reason, it is likely that some of this forage may not be fully utilized by deer and elk. Elk tend to perform most of their daily activities away from human view. The loss of cover adjacent to these roads would also increase the chance of harassment to the animals.

Deer are a ubiquitous species and can easily adapt to a fuel break. No impacts are predicted to the deer populations in the area. However, the elk are more selective and not as adaptive. The proposed fuel break could cause some changes in distribution of the elk herds in the area. The negative effects of lost cover would be offset by the positive benefits of increased forage; no measurable changes to the herds are predicted with the proposed action.

While it is not possible to predict the exact size a wildfire might attain with or without a fuel break, it is likely that with a fuel break in place fires would be kept smaller resulting in less impact to optimal and thermal cover and reduced forage across the landscape.

**4.5.3.5 Disturbance** - The creation of the fuel break and road repair could potentially disturb animals that happen to be in the area at the time of implementation. The project area is in summer range and disturbance that occurs during this season could potentially displace animals, and may have the potential to affect the health of individuals if the disturbance occurs near active calving sites. At the center of the fuel break are roads that are open and receive high volumes of traffic. Animals seeking solitude would not likely be near these roads.

Project activities would not be occurring all at once, but only in a few places at any one time. The potential disturbance associated with the proposed project is predicted to be small in scale, temporary in nature and only affect a few individuals negatively. The noise caused by the project is not predicted to cause a measurable reduction in the current local population of deer or elk.

There would be no changes in either temporary or permanent open-road densities with the proposed action.

**4.5.3.6 Cumulative Effects**

Analysis areas for deer and elk were established using subwatershed boundaries and the winter/summer boundary.

**4.5.3.7 Past, Present and Foreseeable Future Projects and Actions**

Project Name	Extent, Size, Type, & Distance	Overlap In Time Or Space	Type Of Potential Effect	Measurable Effect?	Rationale For Inclusion Or Exclusion From Analysis Below
Olallie fire complex	Lightning caused wildfire	Nearby but outside of the analysis areas.	Fire removed cover.	Yes	Exclude. Outside of analysis area.
Past – road construction	Throughout Analysis Area	Yes.	Permanent loss of cover	Yes	Include
Past – regeneration harvest	Throughout Analysis Area	Yes.	Loss of cover	Yes	Include.
Past – rock quarries	Throughout Analysis Area	Yes. Rock quarries are permanent.	Permanent loss of cover	Yes	Include
Past – Power Line	Southern portion of Analysis Area	Yes. Power lines are permanent	Permanent loss of cover	Yes	Include. Trees that grow under power line are cut for safety before they can provide optimal or thermal cover.
Future timber harvest	Unknown, but potential for timber harvest such as plantation thinning.	Unknown location. Plantations would not be ready for commercial thinning for many years.	Unknown of intensity of treatments.	No	Exclude. No site specificity. Can not be modeled at this time.
Off highway vehicle use	Minor dispersed use throughout the Analysis Area	Yes	Disturbance	No	Exclude. No effect to thermal or optimal cover

The following table displays the level of thermal and optimal cover within each of the applicable deer and elk summer range analysis areas.

The current condition for each of the analysis areas takes into consideration all the past and present activities shown in the table in s 4.5.3.7.

4.5.3.8 **Cover and Forage Analysis** (acres and percent of analysis area)

Analysis Area	Existing Condition*			Change After Treatment		
	Optimal Cover	Total Thermal Cover **	Forage	Optimal Cover (reduced)	Total Thermal Cover (reduced)	Forage (gained )
KS2	1117 - 30%	1607 -43%	269 - 7%	56 - 1.5%	65 - 1.7%	158 - 4.2%
SR11	1494 - 27%	3313 - 60%	884 - 16%	91 - 1.7%	145 - 2.7%	192 - 3.5%
SR13	403 - 13%	1600 -53%	125 - 4%	4 - 0.1%	6 - 0.2%	23 - 0.8%
SR15	3615 - 59%	4441 - 72%	607-10%	54 - 0.9%	59 - 1%	67 - 1.1%
SR16	1164 -19%	2862 -46%	211 - 3%	11 - 0.2%	72 - 1.2%	235 - 3.8%

\* Existing Condition also represents the no-action alternative.

\*\*Optimal cover also provides thermal cover habitat. The thermal cover column represents optimal and thermal cover combined.

Within the analysis areas, the level of thermal and optimal cover only changes by a few percentage points. For deer and elk, forage availability is likely more of a limiting factor than cover. There has been a decline in clearcutting in recent years and trees in young plantations are growing rapidly shading out forage. For these reasons there is projected to be a long-term trend of declining forage, and there is expected to be a commensurate decline in deer and elk populations. Forage would be created in the fuel break but its accessibility to deer and elk would be limited due to its proximity to an open road and the lack of nearby cover. This gain in forage would not be sufficient to counter the landscape’s trend of declining forage.

4.5.3.9 **Forest Plan Goals, Standards and Guidelines**

**Mt. Hood Forest Plan References**

Forestwide Wildlife Standards and Guidelines – FW-187 to 214, page Four-71

The following table displays the level of thermal and optimal cover within each of the applicable deer and elk summer range analysis areas. There are no Forest Plan standards and guidelines for hiding cover or forage. The Forest Plan recognizes different categories of summer range. All of the project area occurs within “inventoried” summer range. Special portions of this summer range are referred to as “designated” summer range and these areas have a land allocation (B11). A portion of the fuel break overlaps a designated B11 area (labeled KS2 in tables). However, the standards for cover are the same as in the rest of the inventoried summer range on the district.

4.5.3.10 Thermal and Optimal Cover (Forest Plan Standard and Guideline FW-205)

Cover Analysis Area	Optimal Cover Post-Harvest %	Minimum FP Level for Optimal Cover	Thermal Cover Post Harvest %*	Minimum Forest Plan Level for Thermal Cover (%) *
KS2	29%	20	41%	30
SR 11	25%	20	57%	30
SR 13	<b>13%</b>	20	53%	30
SR 15	58%	20	71%	30
SR 16	<b>19%</b>	20	45%	30

\*Optimal cover also provides thermal cover habitat. These columns represent optimal and thermal cover combined.

Thermal cover levels would be met in all of the summer range analysis areas after project implementation. However, optimal cover is currently below Forest Plan Standards in summer ranges 13 and 16 and would remain so after project implementation. In summer range 13, 4 acres of optimal cover would be removed and in summer range 16, 11 acres of optimal cover would be removed. That would equate to a 0.1 and 0.2 percent drop, respectively.

4.5.3.11 The proposed action is consistent with the following standards and guidelines.

FW-187	Key habitat areas such as wetlands would be protected.
FW-188	The Forest communicates with ODFW regularly and they are given an opportunity to comment on all projects. ODFW does not develop population objectives for each project planning area but for much larger regions.
FW-189	Natural meadows and openings are being protected.
FW-190	The proposed action would not result in levels of slash that would impede deer or elk movements.
FW-192 & 193	Most of the proposed treatments would create forage areas within 600 feet of cover.
FW-194	The proposed action would produce forage areas for deer and elk.
FW-202 to 207	See discussion above. Although two summer range areas are currently below standards, proposed action would not move an analysis area that is currently meeting standards to not meeting.

4.5.6 Pine Marten & Pileated Woodpecker (Management Indicator Species)

The status and condition of management indicator species are presumed to represent the status and condition of many other species. This analysis focuses on the habitat of certain key species and does not specifically address common species except to the extent that they are represented by management indicator species.

The pileated woodpecker was chosen as an MIS because of its need for large snags, large amounts of down woody material, and large defective trees for nesting, roosting and foraging. The pine marten is an indicator species to mature or older forests with dead and defective standing and down woody material. It has a feeding area that utilizes several stand conditions that range from poles to old growth (USDA 1990a).

- 4.5.6.1 **Existing Situation** – The pileated woodpecker is associated with forest habitats that have large trees, especially snags for nesting and foraging. It will use both coniferous and deciduous trees, but tends to be most common in old-growth Douglas-fir forests in western Oregon (Csuti 1997).

Pine martens are associated with forested habitats at any elevation, but will wander through openings and even up into alpine areas. They prefer mature forests with closed canopies, but sometimes use openings in forests if there are sufficient downed logs to provide cover (Csuti 1997).

The project area provides potential habitat for both the pine marten and pileated woodpecker. Both species are more likely to be found in the unmanaged stands that have a mature stand structure with abundant snags and down woody debris. Quality habitat exists for the pine marten in these stands, and to a lesser extent the pileated woodpecker. The pileated woodpecker prefers stands with a heavy component of Douglas-fir. Although some of the stands have close to 50% Douglas-fir, most of them have various other species, such as pacific silver fir, mountain hemlock and lodgepole pine.

#### 4.5.6.2 **Direct and Indirect Effects**

**Alternative A:** No effects to the pine marten or pileated woodpecker habitat would occur with this alternative.

The potential exists for a wildfire to burn suitable habitat for the pine marten and pileated woodpecker. See the discussion on late-successional reserves and snags. Pine marten and pileated woodpecker use late-successional habitat. A wildfire could potentially burn through this area, effectively reducing habitat for these species. The wildfire could occur during the breeding season for these species affecting reproductive success.

With no action there would be no noise related disturbances to these species.

#### **Alternative B:**

The fuel break would reduce potential habitat for pine marten and pileated woodpecker by approximately 205 acres. Portions of the stands along certain streams and wet meadows would be unmanaged.

The proposed treatments would permanently remove approximately 205 acres of potential habitat for pine marten and pileated woodpecker. This removal of habitat would occur as a result of opening up the canopy from its current condition of 60-100% down to

20-35%; as well as the loss of snags and down woody debris currently in the stands. The resultant stands would likely become too open to provide habitat for these species.

The removal of 205 acres of suitable habitat during implementation of the proposed project could potentially adversely affect the local pine marten and pileated woodpecker population in several ways. These include:

- The immediate displacement of the animals from their traditional areas
- The concentration of displaced animals into smaller, fragmented areas of suitable habitat that may already be occupied.
- Increased competition for suitable habitat
- Diminished reproductive success
- Diminished population due to declines in productivity and recruitment; and
- Reduction of future breeding opportunities.

After the fuel break is established, regular maintenance is expected. The maintenance of the fuel break would prohibit the stand from growing back into habitat for pine marten or pileated woodpecker.

While it is not possible to predict the exact size a fire might attain with or without a fuel break, it is likely that intense crown fires would be kept smaller with a fuel break in place and less habitat for these two species would be removed.

#### 4.5.6.3 Forest Plan Standards and Guidelines

There are no applicable standards and guidelines for pine martin or pileated woodpeckers because none of the proposed actions are within B5- Pileated Woodpecker/Pine Marten land allocation. Snag standards and guidelines are discussed in section 4.5.2.

#### 4.5.7 Migratory Birds

A Draft Memorandum of Understanding (MOU) between the USDA-Forest Service, USDI-Bureau of Land Management and USDI – Fish and Wildlife Service has been developed to promote the conservation of migratory birds (USDA-USDI 2001). The MOU meets the requirements of the Executive Order 13186, January 17, 2001 on the responsibilities of federal agencies to protect migratory birds. The purpose of the MOU is to strengthen migratory bird conservation by identifying and implementing strategies that promote conservation and minimize the take of migratory birds through enhanced collaboration between the Forest Service, BLM and the Fish and Wildlife Service, in coordination with state, tribal, and local governments. This MOU directs the Forest Service to protect, restore, enhance, and manage habitat of migratory birds, and prevent the loss or degradation of remaining habitats on National Forests and BLM land.

- 4.5.7.1 **Existing Situation** – Close to 30 species of migratory birds occur within the District, some of which are likely present within the project area during the breeding season. Some species favor habitat with late-successional characteristics while others favor early-

successional habitat with large trees. Some of the species that prefer late-seral habitats are as follows: Hermit/Townsend's warbler complex, hermit thrush, golden-crowned kinglet, Pacific-slope flycatcher, rufous hummingbird, olive-sided flycatcher, Hammond's flycatcher, etc. There are no known Important Bird Areas such as nesting, wintering or stop-over areas within the project area.

#### 4.5.7.2 **Direct and Indirect Effects**

**Alternative A** - There would be no alteration of habitat for migratory birds unless a wildfire was to burn through the area.

##### **Proposed Action –**

The proposed action would remove approximately 205 acres of late-seral habitat that is preferred habitat for several species of migratory birds. The removal of this habitat could impact these species residing in the area. However, the project covers a small portion of the migratory birds breeding habitat on the Forest.

Snag habitats are discussed in section 4.5.2.

In general, viability of species dependent upon National Forest System lands is considered in determining if a species should be managed as a sensitive species. Current management guidelines are designed to provide for a diversity of habitats. Management direction is not specific to individual bird species, except for those designated as threatened, endangered or sensitive, and management is generally focused on habitats rather than individuals.

With a fuel break in place, it is likely that intense crown fires would be kept smaller and less habitat for migratory birds would be removed.

## **4.6 Soil Productivity**

### 4.6.1 **Introduction**

The soil interpretations were developed from field visits in August 2008, interpretation of 1974, 1981, 1989, 1995, and 2004 aerial photos, topographic maps, and the Soil Resource Inventory (SRI) for the Mt. Hood National Forest (Howes, 1979) containing a general map of the soils associated with landforms in the project area. Field verification reveals that the SRI soil mapping of this area is generally accurate.

The project area is located in the Upper Clackamas River watershed, within the Pinhead Creek, Lemiti Creek, South Fork of Lemiti Creek, Olallie Creek, and the headwaters segment of the Upper Clackamas subwatersheds. The project area ranges from 4,250 to 4,950 feet in elevation. The maritime influenced climate is typified by warm, but rarely hot, summers and cool winters. Persistent freezing temperatures and winter snowpack

are common. Estimated average annual precipitation is 70 to 110 inches. Most of the precipitation falls during the fall and winter. Summer rainfall is light (Howes, 1979).

Landforms in the project area are shaped by alpine glaciers that occupied upper mountain slopes during the most recent glacial advance. A riparian network formed by Lemiti Creek, South Fork Lemiti Creek, and Olallie Creek and the headwaters of the Clackamas River runs through the area, slightly dissecting the landscape. The topography is typified by level ground within meadows (Olallie Meadow, South Fork Lemiti Meadow, Lost Lake Meadow), nearly level to undulating slopes surrounding meadows and riparian areas, gently sloping uplands, and steeper slopes surrounding the various volcanic cones found in the area (Sisi Butte, Olallie Butte, Lemiti Butte, West Pinhead Butte, and South Pinhead Butte).

#### 4.6.1.1 **Analysis Area**

The analysis area for soil resources for direct, indirect and cumulative effects is the boundary of the fuel break. This is an appropriate boundary because actions outside the proposed fuel break boundary would have little or no affect to soil productivity within the fuel break, and the actions within the fuel break boundary would have little or no affect to soil productivity elsewhere. Because the risk of wildfire impacts is integral to the need for a fuel break, indirect effects to soils are also discussed in general terms for wildfire that may occur outside the fuel break.

Actions within the fuel break boundary may have an effect on hydrologic properties or sedimentation elsewhere. That analysis can be found in the fish and water quality section (s. 4.3).

#### 4.6.1.2 **Elements of proposal that could affect soil productivity**

For this project, the following actions have the potential to affect soil productivity: actions that disturb soil such as skidding and yarding of logs and landing creation, the use of harvesters (mechanical tree fellers), actions that harvest trees and reduce tree canopy, slash piling and burning.

The analysis also considers restorative actions and the design criteria and best management practices that minimize impact. For example: existing roads, landings and skid trails would be reused where feasible, equipment would be restricted to appropriate slopes, erosion control methods such as water bars, seed and mulch would be used. Refer to section 2.3.3 for details.



4.6.2 Soil Mapping Unit Attributes

Soil Map Unit	Slopes	Compaction Hazard	Erosion Risk		Windthrow Hazard
			Surface	Subsoil	
<b>Wet Meadows and Poorly Drained Forested Bottomlands</b>					
3	flat	High	Very Slight	Low	-
4	flat	Moderate-High	Very Slight	Low	High
<b>Rock Outcrops and talus slopes</b>					
7	various	-	-	-	-
13	various	Low	Slight	Moderate-High	Low
<b>Shallow Glacial till deposits - somewhat compacted</b>					
300	0-30%	Low	Slight	Low	High
301	30-60%	Low	Slight-Moderate	Low-Moderate	High
<b>Deep Glacial till deposits - compacted till layer present</b>					
304 & 304A	0-30%	Low-Moderate	Slight	Low-Moderate	Moderate
305	30-60%	Low	Slight-Moderate	Moderate	Moderate
309	0-30%	Low	Slight	Moderate	Moderate-High
310	30-60%	Low	Moderate	Moderate-High	Moderate-High

4.6.3 Soil and Wildfires

Because the risk of wildfire impacts is integral to the need for a fuel break, this section discusses the impact that would occur in the event of a wildfire based on previous experience with the nearby Olallie Lake fire complex.

4.6.3.1 Burn Severity

Burn severity relates specifically to effects of the fire on soil conditions and hydrologic function; amount of surface litter and duff, erodibility, soil structure, infiltration rate, and runoff response. Although burn severity is not primarily a reflection of fire effects on vegetation, vegetative conditions and pre-fire vegetation density are among indicators used to assess burn severity. Generally, the denser the pre-fire vegetation and the longer the burn time, the more severe the effects of the fire are on soil hydrologic function.

Site indicators used to evaluate burn severity include soil hydrophobicity (water repellency), ash depth and color (burn intensity), size of residual fuels (fire intensity), soil texture and structure, and post-fire effective ground cover. These observations provide clues about fire burn time, depth of litter layer consumed, radiant heat throughout the litter layer and upper topsoil, and ease of detachability of the surface soil. Burned areas are mapped into high, moderate, and low burn severity categories.

Generally there is a correlation between soil properties and the amount of heat experienced by the soils, and the residence time of the heat in contact with the soil.

#### 4.6.3.2 Soil Condition

Fires are a part of the ecosystems in the project area and produce impacts to the soil. Soil condition and hydrologic function are important components to healthy ecosystems that can be affected by wildfires. A wildfire has the potential to impact the soil beyond the limits of natural variability, including reduced soil aggregate stability, reduced permeability, increased runoff and erosion, and reduced organic matter/nutrient status. These combined effects would cause the runoff following a rain event to increase significantly; increasing the overland flow available to initiate soil erosion, either as sheet or rill erosion. The potential for erosion is higher on the steeper slopes that burn with a high burn severity.

Soil characteristics most important to hydrologic assessment following fire include infiltration and percolation. Soil condition parameters include changes in litter and duff (vegetative ground cover), loss of soil structure, destruction of fine and very fine roots in the surface horizon, susceptibility to erosion, and development of hydrophobic (water repellent) soil surfaces.

Formation of hydrophobic soil: When soils are heated by fire, one result can be development of a hydrophobic layer on or in the surface soil horizon. This occurs due to volatilization of organic matter in and on the surface soil that have high amounts of lignin and other waxy compounds. After the fire passes, the gasses cool to a waxy coating on soil particles. If the hydrophobic layer is thick, or the degree of water repellency is strong, it can seriously inhibit infiltration of rainfall, increase runoff and detach surface soil particles, increasing flooding, erosion and sedimentation. Some soils can be significantly hydrophobic, even without wildfire. Vegetation type, amount of organic matter and soil texture are the primary factors that determine whether or not soils will become hydrophobic.

Observations made after the Olallie Complex Fires indicated that undisturbed and low burn severity sites typically had a moderate degree of hydrophobic character in the upper inches of soil. The moderate burn severity sites had a strong degree of hydrophobic condition down to 3-4 inches below the surface. The high burn severity sites had weak to no hydrophobic character in the upper 2-3 inches and some moderate hydrophobic conditions like the undisturbed sites below that depth. Therefore, in general, the moderate burn severity sites would tend to shed the most water during a precipitation event until the surface soil layer becomes wetted. Observations made in the moderate and severely burned areas surrounding Olallie and Monon Lakes after the 2001 wildfires were that both moderate and high burn severity sites shed large amounts of water, and that two to three weeks of rainfall events did not moisten the soil below the ash layer, prior to the snow pack becoming established. Most rainfall became overland flow, greatly increasing the lake levels in very short times during and following the rain events.

Transport of sediment appeared to be minor. The mixture of burnt soil and ash, when combined with rainwater, seemed to be very cohesive. Following the small rain event of 8/23/01 it became a 3 inch thick layer of slippery gooey mud. During subsequent rain events the overland flow did not appear to be carrying sediment. In terms of turbidity, streams and lakes remained clear.

### **Measures Used to Assess Soil Impacts**

For this analysis the following measures are used to assess impacts: Organic Matter/Soil Fertility, Erosion, Detrimental Soil Condition and Windthrow Hazard.

#### **4.6.4 Organic Matter / Soil Fertility**

The soil resources in the project area support forested conifer stands within the Pacific silver fir and mountain hemlock zones. Plant associations include such indicator species as lodgepole pine, mountain hemlock, grouse huckleberry, and beargrass. These plant species indicate a cold, harsh climate and nutrient poor soils. The climate is drought and frost-prone. Inherent soil productivity is low. The productivity is limited by the cryic and frigid soil temperature regimes which result in a relatively low nutrient cycling ability, and the high coarse fragment content of the soil profile and compacted till layer which limit the effective rooting depth.

Nutrient cycling is very important in this ecosystem. Plant associations run on low nutrient budgets that are highly dependent on recycling of the nutrients that are present. Due to low temperatures, decomposition rates are slow. Areas with stony soils have limited rooting space. This results in less soil volume for microbial nutrient cycling and makes the soil more prone to leaching of mobile nutrients. Substantial organic matter accumulation has not occurred due to the relative youth of these soils. The low organic matter content along with the coarse soil texture make these soils susceptible to loss of nutrients through leaching and a low cation exchange potential (a measure of the capacity of a soil to retain and release nutrients). Precipitation and rapid snowmelt in late spring flush the soil of mobile nutrients.

##### **4.6.4.1 Existing Condition**

Surface litter layer is sparse to thin, ranging from one-eighth to three inches thick. Litter layer is thinnest in areas where lodgepole pine is the most prevalent trees species, or previous timber management activities have occurred. Soil fertility is low and is closely tied to the input of needles, branches, and other woody debris. Most soil nutrients are concentrated in the top 12 inches and are closely tied to the amount of organic matter present. In most areas the upper topsoil horizon has up to 60% of its volume occupied by very fine plant roots.

Typically the surface soil layers found in much of the project area are naturally hydrophobic (water repellent) to a moderate degree when they are dried out, due to the high root volume in the surface horizons. They become less hydrophobic once they are wetted.

These soils do not wet easily. Soils on South Pinhead Butte, just northeast of the project area were observed to be dry, even in spring, just after snowmelt.

Portions of the project area have had organic matter reduced due to the occurrence, manner, and extent of past timber harvest and fuel treatment activities. Previously logged areas make up 39% of the proposed project area, including both partial and regeneration harvest between 1962 and 2003 using ground-based equipment. Subsequent fuel treatment and site preparation included broadcast burning, windrowing or machine piling.

#### 4.6.4.2 **Direct, Indirect and Cumulative Effects**

The organic component of soil is extremely important in long term soil productivity. It is an important source of soil moisture-holding capacity and nutrient storage. Organic matter provides a favorable microsite for many microbes in the rhizosphere (the volume of soil immediately affecting/affected by plant roots).

Timber removal and slash disposal can reduce the nutrient capital of forested ecosystems (Clayton 1985). Nutrient loss is greatest when intensive utilization is involved (Jurgensen 1990; Leaf, 1979). A wildfire of high or moderate burn severity, or an intentionally set backfire, may also consume large amounts of organic matter and reduce the nutrient capital of the site.

When a forest floor is exposed through timber removal or wildfire, there is a sharp increase in solar radiation and an accompanying reduction of transpiration. The forest canopy buffers the forest floor from large temperature, moisture, and nutrient fluctuations. Removal of timber results in a more extreme microclimate which results in large temperature, moisture and nutrient fluctuations in soils. Timber harvest activities can reduce ectomycorrhizal populations which are important for nutrient and water uptake by plants and root pathogen resistance. Changes in soil microclimate results in changes in microbial populations and organic matter decomposition.

#### 4.6.4.3 **Alternative A – No Action**

Soil organic matter and corresponding soil functions would continue to occur as they are. Input of needles, branches, and other large woody debris would continue. The duff layer would remain undisturbed. Organic matter decomposition and nutrient cycling is influenced substantially by temperature and moisture which would remain unchanged. Soil fauna and microbe activity would remain stable. Organic materials would be subject to natural disturbances such as windthrow, fire, and climatic change.

If a large scale wildfire were to occur, soil effects similar to those observed in the Olallie Lake fire complex are anticipated. In high burn severity areas the fire consumed the entire organic surface layer and burned the upper portion of the topsoil horizon, burning off the fine root mass, leaving a layer of loose fine grained structure-less burnt soil and vegetation ash approximately 3 inches deep. Burn depth was much less in the moderate burn severity areas. The organic surface layer was burned away and the upper ½ to 1 inch of topsoil (with fine roots) was consumed. At the low burn severity sites, only the

organic surface layer, or a portion of it, was consumed during the fire (Olallie Lake Complex, 2001). If a large scale wildfire were to occur, additional disturbances would occur from firefighting operations. Likely tactics are discussed in s. 4.1.

#### 4.6.4.4 **Alternative B**

During fuel break construction, equipment would disturb the duff layer and bare soil would be exposed. The net export of nutrients and carbon from the ecosystem by timber harvest, fuel treatments, and debris removal would reduce soil fertility and impact nutrient cycling. Soil microbial populations would be impacted. The project Design Criteria discuss the maintenance and re-establishment of effective ground cover on exposed soil areas.

If a large scale wildfire were to occur, additional disturbances would occur from firefighting operations. Inside the fuel break fire would burn with less intensity but outside the fuel break, effects would be similar as described for Alternative A.

#### 4.6.5 **Erosion**

Erosion is loss of soil due to forces such as raindrop impact, overland flow, snow and ice melt, wind, and gravity. It occurs most readily when effective vegetative cover and litter is removed or does not exist. Erosion potential depends on factors such as climate, slope gradient and length, soil texture and structure, permeability of the surface soil, and hydrologic characteristics of the soil and bedrock materials.

##### 4.6.5.1 **Existing Condition**

Due to the gentle relief and infiltration rates of glacial till, surface erosion potential is slight over most of the project area and moderate on the few areas with slopes 25% or greater. Subsoil erosion potential is low to moderate on the gentle slopes, and moderate to high on slopes greater than 25%. Existing surface erosion is mainly confined to exposed soil on skidtrails in previously managed units, unpaved road surfaces, road cutbanks, and road ditches.

Portions of the project area have experienced erosion due to the occurrence, manner, and extent of past road construction, timber harvest and fuel treatment activities. Previously logged areas make up 39% of the proposed project area, including both partial and regeneration harvest between 1962 and 2003 using ground-based equipment. Subsequent fuel treatment and site preparation included broadcast burning, windrowing or machine piling.

##### 4.6.5.2 **Direct, Indirect and Cumulative Effects**

Soil erosion can directly affect soil productivity by reducing soil depth and volume, resulting in a loss of nutrients and water holding capacity. An indirect affect from soil erosion is runoff from bare areas carrying soil particles to water bodies where it becomes

sediment.

#### 4.6.5.3 **Alternative A – No Action**

Erosion rates within the analysis area would remain as they are. Over time, as bare areas become revegetated, erosion levels would decrease.

If a large scale wildfire were to occur, some soil erosion is expected on the high and moderate burn severity sites. Flatter gradient slopes have a low to moderate susceptibility to surface soil erosion. The steeper and longer length slopes that burn with a high burn severity have a high susceptibility to surface soil erosion. Because of the uneven terrain, small depressions, and anticipated downed trees and islands of unburned vegetation, detached soil would not be transported very far down slope.

#### 4.6.5.4 **Alternative B**

The amount of soil erosion increase due to project activities depends on how much effective ground cover is removed. All treatment areas would have a reduction in effective ground cover. Surface soil erosion would be reduced where areas with bare mineral soil are revegetated with an effective vegetative cover suitable to the area. Vegetation would be established on roadsides, skidtrails, and landings after project activities to reduce surface soil erosion potential.

### 4.6.6 **Detrimental Soil Condition**

Soil productivity can be affected by compaction, puddling, displacement, erosion and severe burning. These conditions, if severe enough can result in soils that have low levels of porosity, reduced root penetration, increased runoff, reduced infiltration, reduced soil water storage capacity, reduced soil water availability, reduced nutrient availability, and reduced levels of mycorrhizae and other soil organisms.

#### 4.6.6.1 **Existing Condition**

The extent of detrimental soil condition from past activities was determined from field observations, aerial photo interpretation, and a review of Total Resource Inventory (TRI) records listing past management activities. Previously managed areas within the project area were visually compared to units in the general area that had been previously evaluated for amount of detrimental disturbance by transecting units and classifying soil disturbance using Howes (2000) protocol. The level of disturbance was rated as a percentage of each unit area.

The percentage of area in a detrimental soil condition varies from stand to stand due to the occurrence, manner, and extent of past timber harvest, fuel treatment, fire suppression, recreation, and powerline maintenance activities. Previously logged areas make up 39% of the proposed project area, including both partial and regeneration harvest between 1962 and 2003 using ground based equipment. Subsequent fuel treatment and site preparation included broadcast burning, windrowing or machine piling. A wildfire and resulting

suppression activities occurred in 1992 at the northeastern end of the project area. Management practices during the early years did not restrict machine movement, skid trail density, removal of woody debris or intense burning; therefore existing detrimental impacts to soil are generally higher than allowed under the current Forest Plan standards and guidelines. Some units have been more recently cut, and meet the current standards.

Most of the soil types in the area are only moderately susceptible to detrimental compaction. The medium texture that dominates these soil types, along with the high rock content, makes them somewhat resilient to compaction; however, because of the rock content, they are difficult soil types to restore (Howes, 1979).

The majority of readily observable ground disturbances in the field were compacted skid trails, landings, and temporary roads. Also observed were areas where soil displacement or excess removal of organic material had occurred from historic logging, fuel treatments involving equipment piling and burning, and electrical powerline construction and maintenance activities.

Detrimental soil condition in the previously managed units ranged from 8% to 24%. It is estimated that 68% of the area previously harvested exceeds 15% detrimental soil condition.

#### 4.6.6.2 **Direct, Indirect and Cumulative Effects**

Soil disturbance, such as soil compaction, soil displacement, puddling, severe burning, accelerated erosion, excess removal of organic material, and aggravated mass wasting equate to an irretrievable loss of soil productivity (for definitions of listed impacts, see Forest Service Manual [FSM] 2521.1, Region 6 supplement 2500-96-2, effective 6/4/96). See Chapter 4, Soil Physical Properties: Importance to Long-Term Forest Productivity (Perry, 1989) for a review of impacts and effects of compaction, surface soil disturbance, soil loss, and fire effects, and their relation to long-term soil productivity.

#### 4.6.6.3 **Alternative A**

Percent disturbed soil condition would slowly decline as compacted areas move toward recovery due to physical and biological processes. Areas of soil displacement would not change.

If a large scale wildfire were to occur, it is estimated (based on observations made after the Olallie Lake fire complex) that approximately 5 to 25 % of the area would have a severely burned detrimental soil condition. Fire suppression activities (cat trails, helicopter landings, handline, fire camps, etc.) would increase the extent of detrimental condition.

#### 4.6.6.4 **Alternative B**

Approximately 825 acres of ground-based felling, yarding, fuel treatment and debris removal would occur. The Design Criteria provide some protections for soils.

Changes to disturbed soil condition were estimated. Where there was no previous disturbance, detrimental soil condition would be approximately 10 to 14%. In previously disturbed areas there would be an increase of approximately 6 to 10% in areas that are already at approximately 8% to 24%.

If a large scale wildfire were to occur, additional detrimental soil condition would occur from firefighting operations. Inside the fuel break fire would burn with less intensity but outside the fuel break, effects would be similar as described for Alternative A.

**4.6.7 Windthrow Hazard**

All soil types encountered from approximately one half mile north of Olallie Meadow to the southern end of the project area have windthrow hazard ratings of High or Moderate-High. This is due to a shallow rooting depth either from very shallow soil to bedrock (MU 309, 310), or a compacted glacial till layer at approximately 20 inches that restricts rooting depth (MU 300, 301).

Evidence of windthrow was observed within these soil types.

The largest most windfirm trees would be retained where possible. If leave trees or trees along the fuelbreak edge blow down they would be dealt with as part of fuel break maintenance as described in section 2.3.

**4.6.8 Forest Plan Goals, Standards and Guidelines**

**Mt. Hood Forest Plan References**

Forestwide Soil Productivity Standards and Guidelines - FW-22 to FW-38, page Four-49

Forestwide Geology Standards and Guidelines - FW-1 to FW-21, page Four-46

Earthflow Standards and Guidelines - B8-28 to B8-41, page Four-264

See Mt. Hood FEIS pages IV-11, and IV-155 to IV-167

**Northwest Forest Plan** - Coarse Woody Debris Standards and Guidelines - page C-40

Soil Disturbance Standards and Guidelines - page C-44

Modify Fire and Pesticide Use, Minimize Soil Disturbance Standards and Guidelines - page C44

FW-1 to 21	The project has been examined by the Forest Geologist and there are no slope stability concerns.
FW-22 to 23	Most units that were logged with ground-based equipment in the original harvest are not consistent with these standards. See discussion below for exception.
FW-24	Minimization of rutting would be achieved through the BT6.6 and CT6.6 provisions in the Timber Sale Contract.
FW-25	Ground cover would be maintained at the prescribed levels.
FW-31 to 34	For a fuel break to be effective, woody debris needs to be removed. See discussion below for exception.



FW-037	Many aspects of the project include design features that limit disturbance to the soil’s organic horizon. Existing landings and skid trails would be reused where appropriate.
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4.6.9 **Exceptions**

Exceptions to Forest Plan standards and guidelines FW-022, FW-028, FW-030 and FW-031 through FW-038 are proposed.

4.6.9.1 FW-022

This standard and guideline suggests that cumulative detrimental soil condition should not exceed 15%. Some areas already exceed this level. Even though there was no standard for long-term soil productivity when the original clearcuts were logged, the stands continue to grow well. The proposed action has been designed to minimize additional soil impact. The plantations where the soil impact is the greatest are not old enough for traditional commercial thinning and existing skidtrails there would not likely be reused. Instead, small trees would be cut and piled for burning. In areas where skid trails are not reused, natural recovery would continue to occur as roots and burrowing animals penetrate and break up compacted soils, and as organic matter accumulates. The purpose of the fuel break is to aid in the suppression of large scale wildfires. This project represents a choice to manage a relatively small portion of the landscape as a shaded fuel break where long-term productivity is a secondary objective. While it is not possible to predict the exact size a fire might attain with or without a fuel break, it is likely that fires would be kept smaller with a fuel break resulting in reduced impact to long-term productivity across the landscape.

4.6.9.2 FW-028 & FW-030

This standard and guideline suggests rehabilitation of impacted soils where the cumulative detrimental condition is greater than 15%. Most units that were logged with ground-based equipment in the original clear cut harvest would remain above 15% detrimental soil condition. Mechanical treatment of skid trails in these units would cause excessive root damage that would lead to reduced growth, and increased root disease and tree mortality. The proposed action would reuse existing skid trails where appropriate but not all areas that were disturbed in the original logging would be disturbed again because of the requirements of the design criteria and best management practices. In areas not disturbed again, natural recovery would continue to occur as roots and burrowing animals penetrate and break up compacted soils, and as organic matter accumulates.

#### 4.6.9.3 FW-031 through FW-038

These standards and guidelines discuss levels of organic matter that should be retained. The purpose of the fuel break is to aid in the suppression of large scale wildfires. For a fuel break to be effective, most of the woody material on the ground needs to be removed. One objective is to have flame lengths of 4 feet or less to eliminate crowning and to provide for firefighter safety. This project represents a choice to manage a relatively small portion of the landscape as a shaded fuel break where long-term productivity is a secondary objective. While it is not possible to predict the exact size a fire might attain with or without a fuel break, it is likely that fires would be kept smaller with a fuel break in place resulting in reduced impact to long-term productivity across the landscape.

## 4.7 Botany

This section addresses rare or uncommon botanical species including fungi, bryophytes, lichens and vascular plants some of which are on the Regional Forester's Sensitive Species list.

The following actions have the potential to affect rare or uncommon botanical species: actions that disturb soil such as skidding and yarding of logs, tree felling, slash piling and pile burning.

Intuitive-controlled field surveys were conducted for rare or uncommon botanical species and invasive plant species from June through July 2007.

The project area was surveyed and no rare botanical species were found.

### Effects of Fire

A moderate to high-severity wildfire will very likely occur along the crest of the Cascades, (see section 4.1 for a discussion of fire hazard and risk). Such a fire would likely create a complex landscape mosaic of intensively and moderately burned patches with some lightly burned and unburned patches. Upland forest stands dominated by beetle-killed trees would be the most fire-prone habitats (where fire severity would be most severe) and from which intense wildfire would spread to adjacent forest stands. Wet and dry meadows would be some of the least fire-prone habitats (where fire severity would be least severe).

High-severity fire generally kills most trees and consumes the vital upper soil horizon, rich in organic matter and nutrients, on which all forest plants depend, resetting the ecological clock in terms of soil productivity (fertility), plant succession, and forest development. High-severity fire can (a) volatilize nutrients stored in soil organic matter, (b) increase soil erosion and thereby lengthen the recovery period for plant succession

and forest development, and (c) increase growing-space opportunities for invasive alien plant species.

Meadows lack the amount of large woody fuels or fuel loads (tree densities, snags, downed logs, and other coarse woody debris) needed to sustain a high-severity fire. Fire in meadows, would likely be low intensity and may result in beneficial effects to botanical species by reducing conifer encroachment and releasing nutrients stored in vegetation and soil organic matter for post-fire plant succession. Fire would promote the creation or maintenance of meadow habitats, on which some rare plant species, such as pale blue-eyed grass (*Sisyrinchium sarmentosum*), threeleaf goldthread (*Coptis trifolia*), and ground cedar (*Diphasiastrum complanatum*), depend.

### **No Action**

With no action, there would be no impacts to botanical species. In meadows where most rare botanical species occur, fire would cause little or no impact.

### **Action Alternative**

The project area contains unique habitat (particularly wet and dry meadows containing streams, pools, and seeps) where there could be sites for rare plant species such as pale blue-eyed grass, threeleaf goldthread and ground cedar.

Intensive botany surveys for the proposed project were not conducted in these meadow habitats because the project avoids them.

Surveys to detect the presence certain fungi are not considered practical because of the variability in fruiting-body (mushroom, truffle) production from year to year. These fungi were not targeted during the field surveys. The Biological Evaluation identifies 17 fungi that are presumed to be present.

The botany biological evaluation concludes that ground-disturbing activities associated with the fuel break construction **may impact individuals or habitat of rare plants, but will not likely contribute to a trend towards Federal listing or loss of viability to the population or species.** Rare plants, such as pale blue-eyed grass, threeleaf goldthread, and ground cedar, were not found or detected, but habitat (wet and dry meadows) for these and other rare species does exist in the proposed project area. Ground disturbance and tree removal could indirectly affect meadows or open-forest habitat where such species may occur.

## **4.8 Management Of Competing And Unwanted Vegetation**

This section addresses invasive plants and unwanted vegetation.

The Record of Decision and Mediated Agreement (MA) for the "Managing Competing and Unwanted Vegetation" Final Environmental Impact Statement (FEIS) apply to invasive plants (sometimes called noxious weeds), unwanted native vegetation, brush control and fuel treatments. Invasive plant management is now covered by the 2005 Record of Decision for Preventing and Managing Invasive Plants (USDA 2005) that amended the Forest Plan.

**Invasive plants** are species not native to a particular ecosystem that may cause economic or environmental harm. They are sometimes informally referred to as "weeds" and are listed in Appendix B of the Preventing and Managing Invasive Plants Final Environmental Impact Statement, 2005. Invasive plants can alter natural ecosystems by displacing native species and by reducing natural biological diversity through the replacement of native communities with invasive weed monocultures.

The following actions have the potential to affect invasive plants: actions that disturb soil such as skidding and yarding of logs, felling of trees, landing creation, slash piling and burning, road repair, road maintenance, road use by any vehicle and vehicle or equipment transportation to the project area from off-site. Invasive plant species were found along roads, in skid roads and old landings, and in forest openings with ground disturbed by previous timber harvest activities. Also considered in this analysis are the design criteria to minimize the spread of invasive plants (#4 and 8 in section 2.3.9). The proposed action does not involve the use of herbicides.

Invasive plants are spread by people, wild and domestic animals, and natural processes (e.g., wind, water, fire). Vehicles can transport entire plants, parts of plants, or seeds onto National Forest System lands. Ground-disturbing activities can often expose bare ground where invasive plants can colonize and spread. These activities/processes can result in the spread of weeds and infestation of previously un-infested sites. Many invasive plant species can be found wherever one travels along roads on the Mt. Hood National Forest.

The Forest has completed a Draft EIS for the treatment of invasive plants entitled *Site-Specific Invasive Plant Treatments, Environmental Impact Statement (EIS) for the Mt. Hood National Forest and Columbia River Gorge National Scenic Area*. The final EIS will be completed followed by a Record of Decision (ROD) expected in 2008. The DEIS identifies 208 invasive plant populations/infestations that would be treated manually, mechanically, or chemically (with herbicides). Additionally, the DEIS includes an early detection/rapid response strategy (EDRR) for treating new populations/infestations (i.e., newly discovered sites or not yet inventoried sites on the Forest).

#### 4.8.1 Existing Situation

Many of the roads in the project area contain tansy ragwort (*Senecio jacobaea*), St. Johns-wort (*Hypericum perforatum*), Canada thistle (*Cirsium arvense*), Scotch/Scot's broom (*Cytisus scoparius*), common mullein (*Verbascum thapsus*) and oxeye daisy

(*Leucanthemum vulgare*). These species also can be found within forests in the project area, especially in forest openings where ground disturbance has occurred.

### **Direct and Indirect Effects**

#### **4.8.2 No Action**

It is expected that invasive plants would continue to invade roadsides, timber harvest units, burned areas, and other disturbed ground within the project area. People driving the roads in the project area inadvertently transport, introduce, and spread invasive plants. It is expected, for both the short and long term, that invasive plant populations would increase in the project area because of human activities. Increased visitor use is expected as human population growth continues to expand in the Portland metropolitan area and surrounding areas over time. Also, routine road maintenance may spread weeds. For example, mowing roadside vegetation can spread invasive plants such as Japanese knotweed, spotted and diffuse knapweed, tansy ragwort, St. Johns-wort, Canada thistle, bull thistle, Scotch broom, oxeye daisy, and cats-ear. All of these species, except for oxeye daisy and cats-ear, are listed as noxious weeds by the Oregon Department of Agriculture (ODA 2006). Existing populations would be expected to expand into disturbed habitat because invasive plants are able to outcompete native plant species in disturbed habitats. It is likely that some of the invasive plant populations in the project area would be treated when the *Site-Specific Invasive Plant Treatments EIS for the Mt. Hood National Forest and Columbia River Gorge National Scenic Area* is implemented.

#### **4.8.3 Proposed Action**

It is highly likely that opportunities for spreading invasive plants across the landscape within the project area would increase. Increased traffic on Forest Service roads due to logging operations would likely spread weeds. Roads are conduits for the spread of weeds and vehicles are weed-spreading vectors. Construction of landings, and skid roads would provide opportunities and growing space for weeds to colonize. Openings in forest stands with disturbed ground resulting from creation of the fuel break would provide opportunities and growing space for weeds. The magnitude of increase can not be accurately predicted. Forest Service roads in the project area already receive a good deal of traffic from recreation seekers. In general, however, traffic intensity can be expected to increase with logging operations, which create ground-disturbed areas where invasive plants can thrive.

Scotch broom is considered naturalized, but is still listed as a noxious weed by the ODA. Canada thistle, bull thistle, tansy ragwort, and St. John's-wort are common and widespread on the Forest, including in the project area, and are also listed as noxious weeds by the ODA. There are approximately eight small populations of spotted and diffuse knapweed on the Clackamas River Ranger District. These populations have been treated manually and chemically by the ODA in the past, and ODA continues to treat them manually and monitor them. Both knapweed species are listed as noxious weeds by the ODA, are highly invasive, and especially problematic in drier eastside forest and

range lands. Oxeye daisy and cats-ear are common and widespread on the Forest, including in the project area, but are not listed as noxious weeds by the ODA.

Design criteria such as cleaning and washing the undercarriage of vehicles in order to reduce the possibility of spreading invasive plants from one thinning site to another and the use of weed-free seed and mulch would minimize the risk of spread of invasive plants. However, even with these measures it is likely that invasive plants would spread more with the proposed action than with no action. The best management practice for reducing weed populations is prevention (blocking their establishment) and early detection followed by rapid response with appropriate treatment when weed populations are found. It is likely that some of the invasive plant populations in the project area would be treated. The most aggressive weeds such as knapweed, but other weeds that are common on the Forest, especially along roadsides, such as tansy ragwort and St. John’s-wort, have not been identified as high priorities for treatment. As a result the common weeds would likely spread along more roads. If new sites develop, the early detection/rapid response strategy would be applied where appropriate.

**4.8.4 Cumulative Effects**

Past actions have resulted in the presence of invasive plants discussed in the existing situation section. All recently planned and future actions would use similar design criteria to limit the spread of invasive plants. Several foreseeable future actions are the implementation of the practices outlined in the Regional Invasive Plant EIS, adoption of the Forest Invasive Plant EIS, and development of a Forest-wide invasive plant prevention strategy. The prevention practices and rapid response techniques developed in these processes would result in a landscape where invasive plant populations are stable or declining.

**4.8.5 Forest Plan Standards and Guidelines**

Mt. Hood Forest Plan was amended by the 2005 Record of Decision for Preventing and Managing Invasive Plants.

Standards from the Regional Invasive Plant Record of Decision

<b>Standard #</b>	<b>Topic</b>
<b>1</b>	Prevention of invasive plant introduction, establishment and spread will be addressed in assessments. <i>Section 4.8.</i>
<b>2</b>	The cleaning of heavy equipment. <i>Design Criteria #5.</i>
<b>3</b>	Use of weed-free straw and mulch. <i>Design Criteria #2.</i>
<b>7</b>	Use only gravel, fill, sand, and rock that is weed free. <i>Design Criteria #5.</i>
<b>8</b>	Road blading, brushing and ditch cleaning in areas with high concentrations of invasive plants. <i>Design Criteria #5.</i>
<b>13</b>	Native plant materials are the first choice in revegetation. <i>Design Criteria #2.</i>
<b>4,6,11,12,14,</b>	Not Applicable

<p>15,16,18,19, 20,21,22,23</p>	
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The proposed action would meet applicable standards and guidelines for invasive plants.

**4.8.6 Other Competing and Unwanted Vegetation**

This section discusses the Record of Decision and Mediated Agreement (MA) for the "Managing Competing and Unwanted Vegetation" Final Environmental Impact Statement (FEIS) (USDA 1998a). These documents focus on competing and unwanted vegetation including logging slash that is managed for the purpose of reforestation (FSEIS, summary-6). The proposed fuel break does not involve the use of herbicides or reforestation. However the proposal does involve the removal of trees and debris and the piling and burning of debris that is not utilized for the purpose of hazard reduction. The FEIS uses the term "damage threshold" to describe when management activities such as logging create brush or slash that are too great for successful reforestation. It also emphasizes consideration of the prevention strategy.

For this project, the landscape is already in a situation where action is needed to minimize the impact of intense wildfire. The term "threshold of concern" will be used to describe what degree of fuel removal would be needed to achieve an effective fuel break.

**4.8.6.1 Site Analysis**

The threshold of concern is when fuels burning under typical wildfire conditions would result in flame lengths greater than 4 feet. Current fuels would result in a crowning wildfire with flame lengths of up to 100 feet.

Currently, the stands are mixed conifers with dead trees and ladder fuels. Removal of live and dead vegetation would be necessary in order to meet management objectives. Large woody debris contributes to the productivity of the site by providing a long-term source of nutrients. However most of it must be removed to provide an effective fuel break.

**4.8.6.2 Strategies**

Five strategies for dealing with vegetation and fuels are identified in the FEIS and Exhibit A of the Mediated Agreement. These are prevention, early treatment, maintenance, correction and no action.

### No Action Strategy

With no action, the fuel break would not be constructed and intense wildfires would likely get larger than they would with the construction of a fuel break.

### Prevention Strategy

The proposed fuel break is a prevention technique because it would reduce the size of wildfires, it would reduce smoke, and it would provide greater safety to firefighters and the public.

The following are standard practices and are also general guidelines are from Chapter 2 of the Vegetation Management FEIS:

- Develop a site-specific burning plan approved by a line officer.
- A job hazard analysis would be developed and discussed by workers to reduce exposure to hazards such as use of power tools, fire and walking in difficult terrain.

#### 4.8.6.3 **Human Health Effects**

The human health effects of mechanical treatments would be very low and would be limited to the operator who is inside a protected machine. Risks would increase as slopes increase. Risks for burning are greater. The risk to the general public would be very low.

Prescribed burning has the potential for both short and long-term effects to both workers and members of the public. There is the possibility of an escaped fire situation. Burning is only conducted during specific parameters of fuel moisture, humidity and wind speeds when the risk of catastrophic fire is low.

This project is consistent with standards and guidelines for competing and unwanted vegetation.

## **4.9 Air Quality**

The proposed action involves burning of slash. Exhaust is created by vehicles, equipment and chainsaws. Dust is created by vehicles that drive on aggregate surface and native surface roads.

The following are areas of concern for smoke and pollution intrusion: Portland/Vancouver metropolitan area, the Salem area, Mt. Hood Wilderness, Bull of the Woods Wilderness, Salmon–Huckleberry Wilderness and Mt. Jefferson Wilderness. The analysis area includes a large airshed that incorporates both the west side and east side of the Forest and the area adjacent to the Forest including the Warm Springs Reservation.



4.9.1 **Existing Situation** – Air pollution sources in the project area include campfire smoke and wildfire smoke. Air dispersing from the project area toward the areas of concern is generally good to excellent except when prolonged wildfires are burning. Fuel accumulation and wildfire hazard is a major concern in the project area (see section 4.1 for a full discussion of hazard and risk). The nearest area of concern is the Mt. Jefferson Wilderness which is a few miles from the fuel break. The nearest towns are Detroit and Warm Springs at a distance of 20 and 30 miles respectively.

#### 4.9.2 **Direct Effects**

##### Proposed Action

4.9.2.1 **Slash burning** would occur. The removal of biomass would be encouraged where feasible. Biomass or fuel that is not removed would be piled and burned. There would likely be several hundred piles but since implementation would likely be spread out over several years, the burning would also be spread out over several years. Burning has the potential to degrade local air quality for short periods of time. The principle impact to air quality from burning is the temporary visibility impairment caused by smoke to the recreational users. Past experience has shown that air quality declines are limited in scope to the general burn area and are of short duration. The effects to forest visitors would be minimal because burning would happen after the peak recreation season, in the fall (October – December).

Health risk are considered greater for those individuals (workers and others) in close proximity to the burning site. Particulate matter is measured in microns and calculated in pounds per ton of fuel consumed. Particulate matter that is 10 microns or less in size create the greatest health risk. At this size the material can move past normal pulmonary filtering processes and be deposited into lung tissue. Particulates larger than 10 microns generally fallout of the smoke plume a short distance down range. Members of the public are generally not at risk. Few health effects from smoke should occur to Forest users due to their limited exposure.

4.9.2.2 **Exhaust** and its pollutants would be created by vehicles and equipment used for all aspects of the proposed action. Pollutants would disperse and would not likely cause health concerns for forest users.

4.9.2.3 **Dust** from trucks and equipment driving on aggregate or native surfaced roads would drift approximately 100 meters. Dust would not be an issue for the portion of the project that would occur when roads are frozen.

4.9.2.4 Alternative A (No Action) would not result in exhaust, dust or smoke from pile burning.

4.9.3 **Indirect Effects** – All prescribed burning with the proposed action would be scheduled in conjunction with the State of Oregon to comply with the Oregon Smoke

Implementation Plan to minimize the adverse effects on air quality. Due to the season of the burn, strong inversions are unlikely to develop and hold a dense smoke plume to adversely affect distant residential areas. Burning would be conducted when smoke dispersion conditions are favorable to minimize the potential for adverse effects there would be no effect to these Class I airsheds - Portland/ Vancouver Metropolitan Area, Mt. Hood Wilderness, Bull of the Woods Wilderness, Salmon –Huckleberry Wilderness and Mt. Jefferson Wilderness. Burning would occur during the time of year when there are few visitors to the nearby Mt. Jefferson Wilderness.

Substantial quantities of smoke would occur in the event of a wildfire and that smoke would occur during the peak recreation season in the Olallie Lake Scenic Area. While it is not possible to predict the exact size a fire might attain with or without a fuel break, it is likely that with a fuel break, fires would be kept smaller and result in less smoke.

There is also a concern about public safety in the event of a fire requiring evacuation of the Olallie area. If the fire were burning adjacent to road 4220 with current conditions, the heat and smoke would be too intense to allow vehicles to pass. The fuel break would reduce fire intensity and smoke along road 4220 and public safety would be enhanced because vehicles could safely leave the area.

4.9.4 **Cumulative Effects** – The proposed action would have little or no effect to air quality in the Portland/Vancouver metropolitan area, the Salem area, Detroit, Warm Springs or in Wildernesses. Therefore no cumulative effects analysis is necessary.

4.9.5 **Mt. Hood Forest Plan References**

Forestwide Air Quality Standards and Guidelines – FW-39 to FW-53, page Four-51  
See Mt. Hood FEIS pages IV-19, and IV-155 to IV-167.

The project would be consistent with air quality standards and guidelines.

## 4.10 Climate Change

4.10.1 **Introduction** – A growing body of scientific evidence and climate modeling indicate that climate change is occurring. While there are no specific projections for the project area, the situation will likely be one where the summers will likely be drier and there will likely be earlier spring snow melt (Bare 2005). There are some who believe that climate change is not occurring or that it is not human caused. This document is not intended to present arguments on any of these theories because they are well documented elsewhere.

This project was not specifically designed to respond to potential climate change. This section will address aspects of the project that may affect or mitigate climate change and how the project may help or hinder the forest's ability to deal with climate change.

4.10.2 **Existing Situation**

This project involves the creation of a shaded fuel break to aid in the suppression of large wildfires. Rapidly growing forests are recognized as an excellent means of carbon sequestration (FAO 2007). Fire hazard and risk and forest health and growth issues are discussed in section 4.1.

#### 4.10.3 **Direct, Indirect and Cumulative Effects**

This project is not likely to have direct localized effects on climate. By its very nature, the discussion of a project's effect on climate change is indirect and cumulative because the effects occur at a different time and place, and because the scale of the discussion is global. Since it is not reasonable to measure a project's global impact, the discussion here will focus on key elements of forest management discussed in the scientific literature.

For this proposal, the following actions have the potential to contribute to or mitigate climate change:

- 4.10.3.1 Hot intense stand replacement fires have burned in the project area in the past and are likely to burn again. This type of wildfire would convert vast quantities of woody biomass into gaseous carbon dioxide and would kill most trees and plants. While it is not possible to predict the exact size a fire might attain with or without a fuel break, it is likely that with a fuel break, fires would be kept smaller and less gaseous carbon would be released into the atmosphere. With the fuel break, the trees there would likely survive because flame lengths would be 4 feet or less and without the fuel break trees would be killed and partially consumed by a fire with flame lengths up to 100 feet. Smaller fires would result in fewer trees and plants killed. Unburned areas would have live trees to continue to sequester carbon and fuels on the ground in unburned areas would sequester carbon into the soil.
- 4.10.3.2 The project would result in the removal of the smaller trees from the fuel break. However, some debris and woody material that can not be feasibly removed would be piled for eventual burning. Pile burning would release carbon dioxide into the atmosphere. The No-action Alternative would not have any planned burning.
- 4.10.3.3 Fossil fuel is used by equipment such as saws, tractors, trucks and fire suppression equipment. It is possible for some of this equipment to use biofuels, and it is likely to be used where it is available and price competitive. The No-action Alternative would not use fuel for fuel break construction but would result in fire suppression strategies that use more fuel compared to the strategies used if a fuel break is present.
- 4.10.3.4 Utilizing trees removed in the construction of the fuel break to create long-lived wood products sequesters carbon (FAO 2007). The No-action Alternative would not create any long-lived wood products.

- 4.10.3.5 Utilizing biomass removed in the construction of the fuel break to generate electricity would result in reduced reliance on fossil fuels to generate electricity (Bare 2005).
- 4.10.3.6 Utilizing firewood removed in the construction of the fuel break to heat homes would result in reduced reliance on fossil fuels (Bare 2005).
- 4.10.3.7 Thinning in the fuel break would enhance the growth of the residual trees and would sequester more carbon than would occur with no fuel break (Millar 2007).
- 4.10.3.8 Thinning in the fuel break would enhance the health of the residual trees and would result in trees that are resilient and better able to withstand stresses such as dry summer conditions (Millar 2007). The No-action Alternative would result in trees that are stressed by moisture competition.

To summarize, the proposed action would result in some carbon emissions and some carbon sequestration. While it is not possible to predict the exact size a fire might attain, it is likely that with a fuel break, fires would be kept smaller and less carbon dioxide would be released into the atmosphere. The benefits to forest health and resiliency with the proposed action would allow stands in the fuel break to better respond and adapt to the future climate.

#### **4.11 Economics – Financial Analysis**

The goal of the project is to aid in the suppression of large wildfires. There would be some value to the removed logs and biomass that may offset some of the cost of fuel break construction. It is expected that the cost of fuel break construction would be greater than the value of the removed material.

While it is not possible to predict the exact size a fire might attain with or without a fuel break, it is likely that fires would be kept smaller at less cost and with less risk of crossing onto the Warm Springs Reservation. The impacts and benefits to other resources with the proposed fuel break are discussed in their respective sections of this document.

The fuel break is designed to be cost efficient while providing resource protections.

#### **4.12 Transportation**

Roads Analysis is a process of considering landscape-level information before making site-specific decisions about road management. A Roads Analysis has been developed at the Forest scale (USDA 2003). Road management decisions are informed by this Forest-level analysis, and are focused by project-level specific information.

This project would not construct new roads or change the maintenance level of any existing roads.

The project includes approximately 28 acres of an inventoried roadless area. The proposed fuel break extends 100 feet from the road edge into the inventoried roadless area. Other portions of the fuel break touch or occur on other uninventoried roadless areas. An area adjacent to the project (Sisi Butte) is being considered for Wilderness designation.

Refer to the Recreation and Scenery section and the Fire Hazard and Risk section for more discussion of roads.

Road maintenance would be needed prior to and after the hauling of logs or biomass removed.

### **4.13 Heritage Resources**

Surveys have been conducted for this project and are discussed in heritage report number 2008-060605-001. Prehistoric archaeological resources and historic sites occur within the project area.

Prehistoric lithic sites 665NA209 and 665NA211 would be protected by avoidance. Buffer zones of 100 feet would be maintained around these site boundaries. No tree cutting or yarding activities would occur within these buffer zones.

Historic dump site 665EA210 would be protected by avoidance. A buffer zone of 25 feet would be maintained around the site boundary. Snags and danger trees along the outer perimeter of the buffer zone can be removed by directional felling.

The historic Mosquito Trail (site 665EA214) is a linear site and to protect the trail tread and the trail features a 25-foot buffer zone would be maintained along the trails length. Snags and danger trees along the outer perimeter of the buffer zone can be removed by directional felling.

New sections of the historic Skyline trail were also discovered and documented. Previous site reports documented other sections of the trail. The sections of the historic Skyline trail within the fuel break would have a 25-foot buffer zone along the length to protect the trail features and trail tread. Snags and danger trees along the outer perimeter of the buffer zone can be removed by directional felling.

Additional lithic material was discovered west of prehistoric site 35MA150, an addendum was completed and submitted with this report. Site 35MA150 is located on the decommissioned bed of an old system road (4220-018). This site would be protected by avoidance. A buffer zone of 100 feet would be maintained around the site boundary with no cutting of trees. The road would not be used as a road or skidtrail.

These measures would adequately protect known heritage resources. Site protection measures were developed in consultation with the Cultural Resource Program Manager, Confederated Tribes of the Warm Springs of Oregon. Documentation required under the Section 106 of the National Historic Preservation Act was submitted to the State Historic Preservation Officer (SHPO). The SHPO concurred with the agency determination that the proposed project would have no effect to potentially significant heritage resources.

Contracts would contain provisions for the protection of sites found during project activities.

## **Forest Plan standards and guidelines**

### **Mt. Hood Forest Plan References**

Forestwide Timber Management Standards and Guidelines - FW-598 to FW-626, page Four-118  
See FEIS page IV-149 and IV-155 to IV-167

The proposed action is consistent with Forest Plan goal to protect important cultural and historic resources.

## **4.14 Environmental Justice – Civil Rights**

Executive Order 12898 directs agencies to identify and address disproportionately high and adverse human health or environmental effects of projects on certain populations. This includes Asian Americans, African Americans, Hispanics, American Indians, low-income populations and subsistence uses. The Civil Rights Act of 1964 prohibits discrimination in program delivery and employment. There are communities with minorities and low-income populations that may be affected by the project. The town of Detroit is approximately 20 miles away and Estacada is 40 miles away.

Directly adjacent to the project is the Confederated Tribes of the Warm Springs Reservation. The proposed action responds to the request of the Tribal Council of the Confederated Tribes of the Warm Springs Reservation of Oregon under the authorities of the Tribal Forest Protection Act. The tribes are concerned that a large scale wildfire could impact Tribal archaeological sites, first foods, medicinal plants and other resources.

The impacts and benefits of this project would not fall disproportionately on minorities or low-income populations. No adverse civil rights impacts were identified. The project would result in no meaningful or measurable direct, indirect or cumulative effects to environmental justice or civil rights. The no-action alternative however would result in increased fire hazard and a disproportionately high risk to American Indians, in terms of health and the potential loss of property, resources and spiritual values.

## 4.15 Other

### **Farm And Prime Range Land**

There would be no effect upon prime farmland or prime rangeland. None are present.

### **Flood Plains Or Wetlands**

No flood plains or wetlands are affected by the proposed action.

### **Laws, Plans and Policies**

There are no identified conflicts between the proposed action and the objectives of Federal, Regional, State laws and local land use plans, or policies.

### **Productivity**

The relationship between short-term uses and the maintenance of long-term productivity: no reductions in long-term productivity are expected. See soils section.

### **Irreversible and Irretrievable Commitments**

There are no identified irreversible and irretrievable commitments of resources.

## **List of Preparers**

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Jerry Polzin - Logging Systems Specialist. Jerry received a certificate of completion from Missoula Technical Center in 1977. He completed Forest Engineering Institute at Oregon State University in 1981 and Sale Area Layout and Harvest Institute in conjunction with Oregon State University and the University of Idaho in 2002. He has worked in timber sale preparation for the Forest Service for 28 years.

Susan Rudisill - Archaeological Technician. Susan has worked for the Forest Service for 25 years. She has served as an Archaeological Technician for the Forest Service for 19 years in Oregon. Training: Archaeology at Mt. Hood Community College, Anthropology at Clackamas Community College, Lithic Analysis at The University of Nevada, Reno. She has also received the following training sessions through the Forest Service: Rec. 7, Federal Projects and Historic Preservation Laws.

Mike Moore- Assistant Fire Management Officer. Mike is a Prescribed Fire Burn Boss Type II and has been working in Fire and Fuels Management on the Mt. Hood NF since 1995.

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