

United States Department of Agriculture

Forest Service

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# Preliminary Assessment Huckleberry Enhancement

Clackamas River Ranger District, Zigzag Ranger District, Mt. Hood National Forest, Clackamas County, Oregon

The project is located in T.4 S., R.8 E.; T.5 S., R.8 E.; T.4 S., R.8<sup>1</sup>/<sub>2</sub>E.; T.6 S., R.8 E.; T.6 S., R.8<sup>1</sup>/<sub>2</sub> E.; T.7 S., R.7 E.; and T.8 S., R.7 E.; Willamette Meridian.

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# 1.0 SUMMARY

The project is located in the Clackamas River Ranger District and the Zigzag Ranger District, Mt. Hood National Forest, Oregon. The Mt. Hood National Forest proposes to enhance huckleberry production by thinning. The Mt. Hood National Forest will be referred to as 'the Forest' in this document.

The proposed action is to enhance huckleberries by thinning and harvesting wood fiber from approximately 2,300 acres of matrix land. Refer to section 2.3 (s. 2.3) for greater detail.

# 2.0 INTRODUCTION

Huckleberries are a major component of the understory vegetation in certain high elevation coniferous forests of the Mt. Hood National Forest. Several species are present but *Vaccinium membranaceum* or big huckleberry is the variety most often harvested.

Most popular huckleberry picking areas originated from uncontrolled wildfires that were common in the Northwest before modern fire protection and control techniques were applied. After a large wildfire, huckleberries resprout, become fully productive in 10 to 15 years and remain productive for many years. However, with fire exclusion, trees grow up and eventually produce too much shade. The bushes survive in the shade for many years but fruit production drops off until bushes are fruitless.

Many of the historic picking areas are currently Wildernesses.

Most Forest visitors delight at finding ripe huckleberries. Some come specifically to harvest. Most who have picked for many years have noticed the decline of huckleberry production.

American Indians have had a long tradition with huckleberries. Several tribes picked in these areas including those represented by the Confederated Tribes of the Grande Ronde Community and the Confederated Tribes of the Warm Springs Reservation. In 1997, a Memorandum of Understanding (MOU) between the Forest and the Confederated Tribes of Warm Springs set a framework for a working relationship for managing huckle-



berry resources.

Beginning in 2000, several Harmony Workshops have been held at Warm Springs Reservation to bring land managers from several National Forests and Bureau of Land Management together with the Confederated Tribes for a solid grounding in the history and culture of the Confederated Tribes. In June 2008, the Northwest Huckleberry workshop was sponsored by Confederated Tribes of Warm Springs Reservation, Confederated Tribes of Siletz Indians, Forest Service and Oregon State University Extension Service.



At these workshops, managers learned about the cultural importance of huckleberries as 'first foods' and their decline across the landscape as traditional harvesting areas have been shaded out by conifers. The Treaty of 1855 guarantees the Confederated Tribes of Warm Springs Reservation the right to gather huckleberries on

ceded lands and their usual and accustomed gathering grounds which includes the Mt. Hood National Forest. Popular picking areas are in high elevation burned areas.

More information about huckleberries can be found at <u>http://www.reo.gov/ecoshare/huckleberry/</u>.

The Confederated Tribes of Warm Springs Reservation and the Mt. Hood National Forest have been discussing, planning, implementing and monitoring huckleberry enhancement projects. The Tribes have implemented over 600 acres of treatments, <a href="http://www.reo.gov/ecoshare/huckleberry/jimenez.pdf">http://www.reo.gov/ecoshare/huckleberry/jimenez.pdf</a>. To test and monitor enhancement practices, a 60 acre treatment on the Forest called Summit Thinning was completed in 2007. Another project called Salmonberry was completed in the Sherar Burn area to enhance huckleberries and test summer logging techniques. These efforts showed immediate results: bushes that had few berries before treatment now have abundant crops due to the increase in sunlight reaching the plants.

This pair of photos taken in mid August 2009 show an example of what the stands currently look like with a closeup of bushes with few berries.



The photo to the right was taken on the same day, a short distance away in the Summit Thinning project area where berries are now plentiful. The Summit Thinning treatment involved a thinning where trees were skidded over snow to protect existing huckleberry bushes and slash was piled at landings so that walking through the stand would not be impeded by debris.





The photo to the left shows how the Summit Thinning project looks after project completion. This is a 70year-old stand of Douglas-fir and lodgepole pine that grew up after a large wildfire. Huckleberry plants were protected and the increased sunlight has resulted in bountiful crops of berries.

At this time, the Forest and the Tribes seek to build on these early efforts by implementing similar projects on a larger scale. The Forest's current proposal involves thinning approximately 2,300 acres of second growth stands that have huckleberry bushes but little fruiting due to the lack of sufficient sunlight.

Two areas are being considered: the Power Line Burn section near the Summit Thinning, and the Abbott Burn section. These sections were once key picking areas that have abundant huckleberry plants but fruit production has declined due to tree growth and shading. Thinning using timber sales, stewardship contracts and service contracts may be the management tools used to accomplish huckleberry enhancement. Some temporary road construction would be included.



This photo shows the Wolf Camp area of the Sherar Burn taken in 1953.



# 2.1 Document Structure

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. This document uses a section number system. This paragraph for example is in section 2.1 and may be referred to as s. 2.1. 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.
- *Consultation and Coordination:* This section provides a list of preparers and agencies consulted during the development of the environmental assessment.
- *References and Appendices:* The appendices provide more detailed information to support the analyses presented in the environmental assessment.

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

The following purpose of this project is derived from the Mt. Hood National Forest Land and Resource Management Plan as amended (USDA 1990b). (It will be referred to as the Forest Plan in this document.)

#### 2.2.1 Huckleberry Enhancement

The purpose of this project is to enhance huckleberry production. This purpose is in recognition of Tribal treaty rights on usual and accustomed huckleberry harvesting lands as well as collection of huckleberries by the general public.

This action is needed because stands are growing denser over time creating too much shade for optimal huckleberry production. If no action is taken, huckleberry production would continue to decline. Section 4.1 has more detail about huckleberries.

- **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 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 and sets the stage for project level analysis.
  - 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 2005 Record of Decision for Preventing and Managing Invasive Plants (USDA 2005). Consistency is addressed in section 4.8.

**2.2.3** Maps – In addition to the vicinity map above, Appendix A contains maps showing the proposed actions, land allocations and other details.

#### 2.2.4 Land Allocations

Allocation	Approximate
	Acres
C1 – Timber Emphasis	1142
B2 - Viewsheds	917
B11- Summer Range	124
B12 – Backcountry Lakes (Summit Lake)	117

**2.2.5** Watershed Analysis – The project is covered by the Oak Grove Watershed Analysis (1996) and the Salmon River Watershed Analysis (1995).

The Salmon River Watershed is a key watershed (this is not a land allocation). The watershed analyses address huckleberry management (Salmon River - page 7-13, Oak Grove – page 32).

A portion of the project (281 acres) lies in the Warm Springs Watershed. A watershed analysis has not been completed for this watershed. The Northwest Forest Plan indicates that projects can proceed without watershed analysis if they are not in Key Watersheds, are not in Inventoried Roadless Areas and are not in Riparian Reserves. The huckleberry enhancement areas are not in these three designations and can proceed. The treatment areas are near the crest of the Cascades which, in this area is a broad gently sloping ridge. The stands on either side of the watershed boundary are similar and it is appropriate to use the guidance from the Oak Grove watershed for the nearby stands in the Warm Springs watershed.

#### 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 160 feet. While streams, rivers, ponds, wetlands and certain unstable geological features were shown on maps in the watershed analysis, they were conceptual based on data available at the time with limited field verification. For this project, maps were refined based on field inspections. For example, some streams shown on the watershed analysis maps were found to not be there. This field-verified information was 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 Roads Analysis – A Forest-wide Roads Analysis was completed in 2003 (USDA 2003. Section 4.11 discusses roads for this project and how they relate to the Forest-wide analysis.

# 2.2.8 Desired Future Condition

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

Huckleberry	Huckleberry picking opportunities are plentiful across a broad landscape. Four-121, FW-630 & 631.
Health	Forest stands have low levels of disease, damaging insect populations and storm damage. Four-92, FW-382; and Four-292, C1-22.
Growth	Forest stands are healthy and vigorous, and have growth rates commensurate with the site's potential (at a rate at which the mean annual increment has not culminated). Four- 5, #44; and Four-86, FW-306; and Four-91, FW-372; and Four-90, FW-361.
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 page B-11.
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. Landscapes are actively managed. Four-2 to 5. The project is not within a wildland-urban interface but is within an area where high-intensity stand- replacement fires are expected.
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 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. At the Forest scale, most timber outputs come 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.

## 2.2.9 Forest Plan goals, standards and guidelines related to huckleberries

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.

The following sections address management goals, desired future conditions and standards and guidelines that relate to huckleberries. Page numbers are from the Forest Plan unless otherwise noted.

2.2.9.1 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, page Four-2)

The treaty rights and privileges of Native Americans shall be honored. Treaty rights and privileges should supersede other management direction. (FW-630 & 631, p. Four-121)

The Forest should not deny access to Native Americans for any area confirmed as traditionally used in connection with tribal ceremonial or traditional rites. (FW-636, p. Four-121)

The primary purpose of this project is to honor treaty rights as they relate to huckleberry gathering.

2.2.9.2 Dispersed recreation opportunities shall be provided and encouraged. Hiking and trail use, driving for pleasure, hunting, wildlife viewing, berry picking, cross-country skiing, the use of off-road vehicles, and cultural resource interpretation are examples of possible activities. (C1-001, p. Four-291)

This project is consistent with the goal of enhanced dispersed recreation through better huckleberry gathering opportunities.

#### 2.3 **Proposed Action (Alternative B)**

The Forest proposes a thinning project in mid-seral stands to enhance huckleberry production. The proposed action is to thin and harvest wood fiber from approximately 2,300 acres of matrix land.

Two areas are included: the Power Line Burn section and the Abbott Burn section. These areas were once key picking areas that have abundant huckleberry plants but fruit production has declined due to tree growth and shading. Thinning using timber sales, stewardship contracts and service contracts may be the management tools used to accomplish huckleberry enhancement.

Trees would be retained at 85 – 95 square feet of basal area (outside of skips).

Skips (unthinned patches) would be created that would vary in size and number and would add up to 10% of each unit. Skips may be placed where there are special features such as clumps of minor species, legacy trees, down logs or key snags, or at locations of rare or uncommon species or where there are gaps in huckleberry distribution.

## 2.3.1 Unit Table

Unit	Acres	Unit	Acres
2	49.4	38	18.7
4	139.6	40	62.7
6	239.1	42	103.0
8	29.4	44	124.7
10	173.2	46	35.0
12	16.2	48	58.7
14	36.2	50	34.1
16	116.3	52	3.4
18	70.6	54	43.3
20	11.1	56	20.8
22	34.9	58	11.1
24	27.4	60	20.3
26	125.8	62	47.6
30	128.9	64	47.6
32	321.0	66	8.6
34	71.9	68	10.2
36	52.0		

**2.3.2 Riparian Reserves** – This project does not include the thinning of riparian reserves. For this project, riparian reserve widths are 160 feet for non-fish-bearing streams and 320 feet for fish-bearing streams.

#### 2.3.3 Roads

Temporary roads are roads that are built by timber operators to access landings and are closed upon completion of logging until they are needed again. They are not considered part of the Forest's system of permanent roads. The units proposed for thinning have never been logged and some temporary roads would be constructed to access landings. Approximately **1.4 miles of existing temporary** roads would be reused. Approximately **4.7 miles of new temporary roads** would be constructed. These roads would be obliterated upon project completion.

For this document, the term obliteration is used for temporary roads to describe the type of closure that is standard practice now. After use, temporary roads are bermed at the entrance, water barred, decompacted and roughened with the jaws of a loader or excavator, and debris such as rootwads, slash, logs or boulders are placed near the entrance and along the first portion of the road. Some of the temporary roads would be treated in a way that leaves a walking trail for huckleberry picking access.

#### 2.3.4 Adaptive Management

This project will utilize the concept of adaptive management. The treatment strategy that is currently considered appropriate for each unit was based on initial field visits and analysis. However, the exact treatment details may be adjusted at the time of implementation. For example:

- The mapped locations of proposed temporary roads are preliminary based assumptions about feasibility and access needs. Because the terrain slopes gently and has relatively few streams, there are many options for road location. The final location of temporary roads would be adjusted if necessary based on sitespecific information or to better fit the terrain. The final road mileage would be similar to the estimated quantity in this document.
- Monitoring of huckleberry response and harvest would be used to adjust overstory density, and plan follow-up treatments such as removal of brush or small trees.
- Temporary road obliteration would be monitored to make sure vehicles are kept out while allowing reasonable walk-in access. Additional treatment may be necessary to more effectively block vehicles or to more effectively control erosion.

Before adjustments are made, an interdisciplinary team would be assembled to review the proposal and make recommendations to the District Ranger. The review would consider whether the adjustment meets the purpose and need, would consider its cost effectiveness and would determine whether the scope of the adjustment and the anticipated effects fall generally within the range of effects and benefits described in the EA. It would consider effects and benefits to threatened, endangered, sensitive or rare species of plants and animals. If necessary, a supplemental heritage resource report would be prepared. Documentation of the change would be signed by the District Ranger and kept in the analysis file.

# 2.3.5 Best Management Practices (BMPs) and Design Criteria

These are practices that are part of the proposed action. 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

- 1a **Soils:** No operation of off-road ground-based equipment would be permitted between November 1 and May 31 unless soils are frozen or snow covered. *This is a BMP and implements Forest Plan standards and guidelines FW-022 and FW-024*.
- 1b Northern Spotted Owl: No owl restrictions are needed for this project.
- 1c **Deer and Elk Summer Range:** No harvest operations, road construction, or use of motorized equipment would be permitted in the B11 winter range land allocation between April 1<sup>st</sup> to July 30<sup>th</sup>. This applies to units 34 and 38.
- 2. **Snags & wildlife trees:** To enhance diversity, variable-density thinning would include the retention of snags and wildlife trees.
- 2a Key snags would be retained in all units where safety permits. Dead lodgepole pine trees are small in size and are very common in this area; they are not considered key snags. If key snags must be cut for safety reasons they would be left on site.
- 2b To increase the likelihood that key snags would be retained, they may be included in skips.
- 2c Certain live trees would also be selected as leave trees that have the "elements of wood decay" as described in the DecAID advisor. This may include trees with features such as dead tops, broken tops and heart rot. They may be retained in skips.
- 2d If funding becomes available, some live trees would be treated to provide future snags and future cavities. Techniques would vary and may include but would not be limited to topping and inoculation with fungus. **One to two trees per acre would be treated.**

## 3. Down Woody Debris:

- 3a Old down logs currently on the forest floor would be retained. Prior to harvest, contract administrators would approve skid trail and skyline locations in areas that would avoid disturbing key concentrations of down logs or large individual down logs where possible.
- 3b Additional down woody debris would be generated by thinning. This would include the retention of cull logs and any snags that would be felled for safety reasons.
- 3c If funding becomes available, some trees would be felled or girdled to provide future habitat. **Two to three trees per acre would be treated.** *This implements Forest Plan standards and guidelines as amended.*
- 4. **Riparian Reserves** This project does not occur in riparian reserves. For this project, riparian reserve widths are 160 feet for non-fish-bearing streams.

#### 5. Harvest Systems and Roads

- 5a Ground based harvest systems would be used. Skid trails, temporary roads and landings would be located where feasible where there are gaps in huckleberry distribution.
- 5b Harvest would be conducted in the winter over snow to further protect existing huckleberry plants. This winter requirement may be waived if the operator can show how soil resources and huckleberry plants including below ground rhizomes would be adequately protected.
- 5c Slash would be treated by yarding tops to the landing to minimize fire hazard and to maintain walking access for huckleberry picking.
- 5d Snow plowing on haul roads would be done in a way that allows continued snowmobile use.
- 7. Erosion: To reduce erosion from project activities, bare soils would be revegetated or covered with slash or other debris. 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*.
- 7a Native plant materials are the first choice in revegetation of bare soils, [e.g., *Elymus glaucus* (blue wildrye), lupine (*Lupinus latifolius*)]. Nonnative, non-invasive plant species may be used if native plant materials are not available or as an interim measure designed to aid in the reestablishment of native plants.[e.g., *Lolium multiflorum* (annual ryegrass), Madsen sterile wheat.] 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*.
- 7b **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*.
- 7c When **straw and mulch** are utilized, it would be certified by the State of Oregon, or would originate from fields which grow State of Oregon certified annual ryegrass seed, or originate from Willamette Valley Oregon fields which grow only annual ryegrass seed for seed production. In place of straw, wood fiber mulch may be used. *This implements Forest Plan*

standard and guideline FW-148, and standard 3 of the Regional Invasive Plants Record of Decision.

- 8. **Invasive species:** This implements Executive Order 13112 dated February 3, 1999, and standards and guidelines of the Regional Invasive Plants Record of Decision.
- 8a 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.
- 8b Gravel or rock used for roads would come from weed free sources.
- 8c Road blading, brushing and ditch cleaning in areas with high concentrations of invasive plants would be conducted in consultation with invasive plant specialists.
- 9. Contracts would contain provisions for the protection of **heritage resource** sites found during project activities. In the event that sites are located during implementation, project activities would be halted until consultation with the Forest Archeologist can determine appropriate site-specific mitigation. Protection measures would be developed in consultation with the Oregon State Historic Preservation Officer (SHPO), appropriate Tribes, and, if necessary, the Advisory Council on Historic Preservation.

Unless otherwise specified, the linear features below would be protected by flagging all blaze trees and retaining them as leave trees and the inclusion of an equipment exclusion buffer. The buffer would be 25 feet wide on each side of the feature. Huckleberry enhancement would occur and trees would be cut in this zone but ground based equipment would be excluded except at approved routes or crossings. There would be no restrictions for equipment operating over snow.

- 9a Archaeological site 665EA227 (Skyline Trail) is located within harvest units 64 and 66.
- 9b Archaeological site 665EA246 (Summit Lake Telephone/Insulator Line) is located near and within unit 44. This site consists of a 10-foot wide by 1,882-foot long corridor. There are approximately 1,238 feet of 9 gauge telephone wire and 1 white insulator lying on the ground. The majority of this site is located along the southwest boundary of unit 44 with approximately 650 feet of the corridor heading east into the center of the unit. The southwest boundary of unit 44 would be located 25 feet away from this line. The remaining site area that comes into the unit would have the standard equipment exclusion buffer.

- 9c Archaeological site 665EA247 (Rock Spring Trail) is near and within proposed units 30 and 32. The site consists of both candle stick and single blazed trees along its length (1.27 miles). The trail tread has been used as a road.
- 9d Archaeological site 665EA249 (Sheep Springs Trail South) is in unit 38. The site consists of both candle stick and single blazed trees with a visible trail tread and corridor along the trails length.
- 9e Archaeological site 665EA250 (Sheep Sky Drive Trail) is in unit 64. This trail begins at the Skyline trail and heads in a northeastern direction exiting onto the Warm Springs Reservation.
- 9f Archaeological site 669EA252 (Clear Lake/Dry Meadow Drive Trail) is within units 18, 22 and 24.
- 9g Archaeological site 669EA253 (Basin Point Trail) is within units 16 and 18.
- 9h Archaeological site 669EA254 (Dinger Lake Trail) is within units 4 and 6.
- 9i Archaeological site 669EA255 (Jackpot Meadow/Blackwolf Mdw. Tr.) is a drive trail that has both candle stick and single blazed trees with visible trail tread. This site is in units 4 and 6.
- 9j Archaeological site 662EA47 (Summit Camp) is adjacent to unit 30. This site would have a 30-foot no-cut buffer around its perimeter.
- 10. **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.
- 11. Monitoring: This Implements Forest Plan and NFP monitoring requirements.

Prior to advertisement of a contract, the provisions of the contract and other implementation plans would be reviewed 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, snag and coarse woody debris retention, stream protection, erosion prevention, soil protection, road closure and protection of historical sites.

Monitoring of huckleberry fruit production would be conducted.

Post harvest reviews would be conducted where needed prior to post harvest activities such as slash treatment and firewood removal. Based on these reviews, post harvest activities would be adjusted where needed to achieve project and resource objectives.

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 <u>http://www.fs.fed.us/r6/mthood</u> under Forest Publications.

# 2.4 Public Involvement

A scoping process to request public input for this project was conducted. A letter describing the proposed project and requesting comments was sent out on September 15, 2009. The Forest publishes a schedule of proposed actions (SOPA) quarterly. The project first appeared in July 2009, and in subsequent issues.

#### Issues

#### **Key Issues**

No key issues were identified to generate alternatives to the proposed action. The following concerns were identified through scoping.

#### 2.4.1 Road Construction

A public comment suggested not constructing any new roads.

The impacts of road construction are addressed in s. 2.3.3, s. 2.3.5-5&7, s. 4.1.4, s. 4.2, s. 4.3.2, s. 4.4.4, s. 4.5.4.5, s. 4.6, s. 4.7, s. 4.9, and s. 4.11. Roads are needed for this project to access the landings and to provide for feasible thinning treatment. Some short temporary roads are needed to get landings off paved roads and out from under power lines.

#### 2.4.2 Unroaded and Undeveloped Areas

A public comment suggested no treatment in unroaded areas larger than 1,000 acres. The comment contained a map of five areas of concern. The commenters state that

these areas should be protected to serve the unique ecological functions that are provided by the lack of human disturbances such as roads and logging. These include: water quality; healthy soils; fish and wildlife refugia; centers for dispersal, recolonization, and restoration of adjacent disturbed sites; reference sites for research; non-motorized, low-impact recreation; carbon sequestration; refugia that are relatively less at-risk from noxious weeds and other invasive non-native species, and many other significant values.

The project does not occur in inventoried roadless areas. Alternative A would not change these areas. The impacts to unroaded and undeveloped values are addressed in s. 4.2.

## 2.4.3 Burning

A public comment suggested burning instead of logging.

*This option was considered and elaborated in s. 3.3.2.* 

#### 2.4.4 Plantations

A public comment suggested that huckleberry treatments should happen only in existing plantations and not in these mid-seral forests that have grown up after wildfire.

Some treatments have been identified for plantations. However the best areas to restore huckleberry production are in mid-seral forests that have grown up after wildfire. See section 3.3.3.

#### 2.4.5 Single Species Management

A public comment suggested that the project should not favor single species management over ecosystem management. The commenters suggest that huckleberry enhancement in large concentrated areas is an example of prioritizing one plant species over another in a landscape that cannot function without diversity. This would cause future management concerns similar to plantations; invasive species encroachment, excessive predation and an unnatural presence of edge habitat. *The project is emphasizing huckleberry management on a relatively small portion of the range of the plant and a small portion of the areas that were once key huckleberry gathering areas. Abundant huckleberries are part of a diverse landscape (s. 4.1). The No-action addresses this issue.* 

#### 2.4.6 Reintroduction of Wildland Fire Disturbance Processes

A public comment suggested that fire suppression is the root of the problem of declining huckleberry production. If fires were allowed to burn, areas of high huckleberry production would move around the landscape in a shifting mosaic. They feel that natural disturbance processes like fire should be reintroduced.

This concept is elaborated in s. 3.3.1. It is outside the scope of this analysis.

#### 2.4.7 **Decadence** (dead trees, down logs and trees with disease)

A public comment suggested there should be greater attention paid to the value of dead and down trees. Healthy ecosystems should have an abundance of large decaying live trees, large snags and coarse woody debris.

Some snags and down logs would be retained in the units. Recruitment of snags and down logs would be emphasized in skips, riparian reserves and across a broad landscape outside of units. Skips and riparian reserves would have processes where mortality would create an abundance of snags and down wood. Snags and down logs are addressed in s. 4.5.3.

#### 2.4.8 How much is enough?

A public comment questioned why the Confederated Tribes of Warm Springs can't meet their huckleberry needs on their reservation and that the treatment of 2,300 acres on the Forest is too much. They can't possibly need that many huckleberries.

The Confederated Tribes of Warm Springs has done some huckleberry enhancement on the reservation and will likely do more. This project would provide huckleberries for members of many tribes as well as the general public. This project is emphasizing huckleberry management on a relatively small portion of the range of the plant and a small portion of the areas that were once key huckleberry gathering areas. For these reasons, the Forest developed a proposed action of 2,300 acres.

# **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 huckleberry enhancement or other associated actions would be implemented to accomplish project goals.

**3.2 Proposed Action** See detail in s. 2.3

#### 3.3 Other Alternatives Considered

3.3.1 **Using Wildfire** - A public comment suggested that fire suppression is the root of the problem of declining huckleberry production. They suggest that if fires were allowed to burn, areas of high huckleberry production would move around the landscape in a shifting mosaic.

The natural fire regime for the project area is one where large stand replacing fires burn and kill most trees (Simonin 2000). However past fire suppression, insect mortality in lodgepole pine and the ingrowth of ladder fuels has created a situation where wildfires would burn intensely.

Large intense wildfire is not the desired condition for this landscape at this time. The landscape is managed for many human values such as scenery, clean air, forest products, recreation and huckleberries. It is also managed to provide habitats for species such as spotted owls and threatened fish. A series of large unchecked wildfires would likely burn through and damage nearby old growth, late-successional reserves, riparian reserves, wilderness areas, residential areas, ski areas and power lines. Smoke would create health issues in nearby recreation areas, residential areas and in more distant cities. Smoke would also result in visibility concerns and would impact Wilderness Class I airsheds. It would also burn up plantations and forests allocated for timber management. It could cross onto private or tribal lands.

Unchecked wildfire would burn through areas with and without huckleberries. Huckleberry bushes would be burned and if intense, it may also kill the underground rhizomes. Where fire burns with moderate to low intensity, new growth would sprout from the rhizomes but fruit production would be delayed approximately 10-15 years. A stand replacement fire would kill virtually all the trees and greatly reduce resprouting of huckleberries (Simonin 2000), leaving the area exposed to total sunlight and the extremes of temperature and moisture. If a wildfire is hot enough, it can damage both the underground rhizomes and the mycorrhizae that coexist with huckleberries (Simonin 2000). The dead trees would eventually fall making access for picking very difficult.

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. The suggestion of allowing wildfires to burn is outside the scope of this analysis and

would not likely be perceived as desirable by those that appreciate the resources the forest provides.

3.3.2 **Using Prescribed Fire** - A public comment also suggested using prescribed fire to enhance huckleberries. A prescribed fire would be one that is much less intense than described above in s 3.3.1, and would be controlled to achieve project objectives.

Using prescribed fire in the project area to achieve huckleberry objectives is possible but would be difficult and expensive (Minore 1977)(Minore 1979). The fire would have to be sufficiently intense to kill half of the trees (to open up the stand to get increased sunlight to huckleberry plants) without killing all of them (some live trees are desired as described in s. 4.1.1.3). This balance would be very difficult to achieve. If prescribed fire were attempted during the dry summer months there would be a high risk an escaped fire burning out of control becoming a crown fire that would need to be suppressed. However, during the normal prescribed fire season, the stands are often too wet and there is insufficient fuel on the ground to carry an appropriate controlled ground fire (Minore 1977)(Minore 1979).

FVS modeling has shown that approximately 80 trees per acres would need to be felled and allowed to dry to provide sufficient fire intensity during the prescribed fire season to carry the fire, keep it on the ground, and kill enough of the standing trees. The final stand basal area target would be 85 to 95 square feet per acre of live trees. Many stands contain tree species such as lodgepole pine and hemlock which are readily killed by even low intensity fire making it difficult to retain sufficient numbers of live trees in those stand types. Tractor constructed fire lines would have to be constructed around the unit perimeters prior to ignition. Preparing and carrying out this type of treatment would cost approximately \$500 per acre.

Prescribed fire would result in smoke that would create health issues in nearby recreation areas, residential areas and in more distant cities. If the burn escapes containment, there would be additional suppression costs and some of the same impacts described in s. 3.3.1. There is no likely funding source for this type of burning.

Prescribed burning would result in a delay of approximately 10-15 years to get full huckleberry fruit production (Barney 1999). Trees killed by the burn would eventually fall adding to the 80 felled trees per acre making access for picking very difficult.

Prescribed burning may be an appropriate tool in some places but it is not part of the proposed action nor is it a fully developed alternative because of the costs and the difficulties and resource impacts addressed above. Prescribed burning does not seem to fit the types of stands identified in the proposed action. If funding were available, burning could be tried in other stand types such as where fire resistant species are present in the overstory, where existing ground fuels are sufficient to carry the fire, and where slope, aspect and natural fire breaks make burning cost effective. None of

these stand characteristics are known to occur in huckleberry habitat where land allocations permit prescribed burning.

3.3.3 A public comment suggested using plantations to enhance huckleberry production (s. 2.4.4). Plantation habitat is discussed in s. 4.1.3.2. Certain appropriate plantations will be treated when they overlap the range of Big Huckleberry. Precommercial thinning prescriptions would be adjusted where appropriate to gain sufficient sunlight to enhance fruit production and to minimize impact to huckleberry plants and walk-in access for picking. Precommercial thinning is generally Categorically Excluded from documentation in an EA. A recent Decision Memo for precommercial thinning includes this provision. These treatments would be included in contracts that are developed for precommercial thinning.

There are many areas where this treatment would not be appropriate including plantations in late-successional reserves or Wilderness areas where other objectives predominate. The public comment suggested that most or all of huckleberry production needs could be met by treating plantations and that treatments in mid-seral stands would not be needed. The estimated acreage available for precommercial treatment is 100 to 200 acres which would not be sufficient to meet the need for huckleberry production.

# 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.

# **Cumulative Effects**

- 4.0.1 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.
- 4.0.2 The land area and the time scale used for cumulative effects analysis varies by resource.
- 4.0.3 The analysis considers the impact of activities on other ownerships where appropriate. Future logging on the Warm Springs Reservation is likely but details of location and timing are not known. Where appropriate, estimates are included in the analysis.

4.0.4 In order to understand the contribution of past actions to the cumulative effects of the proposed action and alternatives, this analysis relies on current environmental conditions as a proxy for the impacts of past actions. This is because existing conditions reflect the aggregate impact of all prior human actions and natural events that have affected the environment and might contribute to cumulative effects.

The cumulative effects analysis does not attempt to quantify the effects of past human actions by adding up all prior actions on an action-by-action basis. There are several reasons for not taking this approach:

- A catalog and analysis of all past actions would be impractical to compile and unduly costly to obtain. Current conditions have been impacted by innumerable actions over the last century (and beyond), as well as by natural processes of growth and recovery since. Trying to isolate the individual actions that continue to have residual impacts would be nearly impossible.
- Providing the details of past actions on an individual basis would not be useful to predict the cumulative effects of the proposed action or alternatives. In fact, focusing on individual actions would be less accurate than looking at existing conditions, because there is limited information on the environmental impacts of individual past actions, and one cannot reasonably identify each and every action over the last century that has contributed to current conditions.
- Focusing on the impacts of past human actions risks ignoring the important residual effects of past natural events, which may contribute to cumulative effects just as much as human actions. By looking at current conditions, we are sure to capture all the residual effects of past human actions and natural events, regardless of which particular action or event contributed to those effects.
- The Council on Environmental Quality issued an interpretive memorandum on June 24, 2005 regarding analysis of past actions, which states, "agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into the historical details of individual past actions.
- The cumulative effects analysis in this document is also consistent with Forest Service National Environmental Policy Act (NEPA) Regulations (36 CFR 220.4(f)) (July 24, 2008), which state, in part:

"CEQ regulations do not require the consideration of the individual effects of all past actions to determine the present effects of past actions. Once the agency has identified those present effects of past actions that warrant consideration, the agency assesses the extent that the effects of the proposal for agency action or its alternatives would add to, modify, or mitigate those effects. The final analysis documents an agency assessment of the cumulative effects of the actions considered (including past, present, and reasonable foreseeable future actions) on the affected environment. With respect to past actions, during the scoping process and subsequent preparation of the analysis, the agency must determine what information regarding past actions is useful and relevant to the required analysis of cumulative effects. Cataloging past actions and specific information about the direct and indirect effects of their design and implementation could in some contexts be useful to predict the cumulative effects of the proposal. The CEQ regulations, however, do not require agencies to catalogue or exhaustively list and analyze all individual past actions. Simply because information about past actions may be available or obtained with reasonable effort does not mean that it is relevant and necessary to inform decision making. (40 CFR 1508.7)"

Each resource includes a discussion of how information on past projects was considered. For the reasons discussed above, the analysis of past actions is primarily based on current environmental conditions. Some resources utilize the current GIS vegetation layer which includes information on current condition of forest stands as they have been affected by events such as forest fires, past regeneration harvest and road construction as well as the growth that has occurred since.

## 4.1 HUCKLEBERRY ECOLOGY AND USE

(This section elaborates on Purpose and Need - section 2.2.3)

## 4.1.1 Huckleberry Ecology

There are six species of the genus *Vaccinium* present on the Forest. Two have red berries – *V. parvifolium* or the red huckleberry and *V. scoparium* or grouse whortleberry; three have predominately blue berries – *V. alaskaense* or Alaska huckleberry, *V. ovalifolium* or oval-leaf huckleberry and *V. delisiosum* or the Cascade or blue huckleberry; and one with a deep purple or near black berry – *V. membranaceum* or the big or black or thinleaf huckleberry. All are edible although the big and Cascade huckleberries are the most popular in terms of human consumption. The following descriptions are derived from plant guides at http://plants.usda.gov and from local knowledge.

*V. parvifolium* is found on the west slope of the Cascades and can be found from the lowest elevations to Government Camp. It is a fairly common component of Douglas-fir stands where thinning or other disturbances have allowed light to reach the forest floor. It is adapted to rooting on decaying logs and is commonly found at the tops of stumps and tall snags. This species is not particularly well adapted to dense stands or stands dominated by shade tolerant hemlock or true fir. It is a relatively prolific and consistent berry producer although the berries are relatively small.

*V. scoparium* is the smallest of the *Vacinnium*s, rarely reaching heights of 12 inches, and has the smallest berry. It also does not appear to be a consistent or prolific berry producer. It is also relatively rare, generally occupying cold, dry sites including cold air drainages. It is also found in the mixed hemlock/true fir and true fir stands above Government Camp with disturbances or other activities maintain relatively high light levels but the bushes are protected by a shrub or tree overstory from cold and other

adverse environmental conditions. On some sites, it can be found growing between and among *V. membranaceum* and beargrass (*Xerophyllum tenax*).

*V. alaskaense* and *V. ovalifolium*, the two very common blue huckleberries, generally occupy a relatively narrow elevational niche on the Forest. While they can be found both above 4000 feet and below 2500 feet, they are most prevalent and dominating between approximately 3000 and 4000 feet. Depending upon site conditions, they can be relatively small, 1-2 feet in height or relatively tall, 5-6 feet or more depending on site conditions. These two species are commonly found together and can form rather dense and extensive thickets. Both produce a blue berry that tends to be pulpy and tart to bitter to the taste. These two species also interbreed. These species tend to dominate sites in the Wildcat, Lolo Pass and Government Camp area, especially at elevations above 3500 feet and into the lower elevations where *V. membranaceum* begins to appear. Experience and observation suggest that in these areas and elevations, *V. membranaceum* is unable to overcome the competitive advantage these other two species have on these sites. These two species are found predominately on the west slope of the Cascades.

*V. delisiosum*, the third of the three blue huckleberries, is perceived to be relatively rare. Looking very much like *V. membranaceum*, it is likely commonly misidentified as big huckleberry. However, this species is more tolerant of poorly drained soils and is more likely to be found around subalpine meadows, ponds and marshes. It has been reported around Red Top Meadows and could be present around Summit Meadows, Salmon River Meadows, Government Camp, Mirror Lake, Enid Lake, Frying Pan Lake and other similar sites. While its elevational range is reported from 1900 to over 6000 feet, it is likely to be most common on the Forest at elevations between 3500 and 5000 feet, overlapping both the upper end of the ovalleaf/Alaska habitat and the lower to mid-range big huckleberry habitat.

From approximately 3800 feet to timberline, *V. membranaceum* is the most common, and often, the only huckleberry species found. Like *V. alaskaense* and *V. ovalifolium*, it can range in height from 1-2 to 5-6 feet depending upon site conditions. Unlike those species, *V. membranaceum* is most common in the high Cascades or Cascade Crest. This species has the greatest geographic range as it is found in Oregon, Washington, Idaho, Montana as well as into Canada, Alaska, the central and southern Rockies and California. It is the species most commonly harvested for personal use and commercially for use in making syrups, jams and pies. It tends to favor relatively well-drained soils with relatively high moisture holding capacity, a relatively common characteristic of soils in the high Cascades due to past volcanic activity and volcanic ash deposition.

4.1.1.1 All of these huckleberry species are rhizomatous. A rhizome is a horizontal stem usually found underground that sends out roots and shoots. Regeneration is predominately from suppressed buds on the rhizomes that are released after disturbance such as fire or the overstory being removed. (Regeneration from seed is rare although seedlings can be grown in a nursery from seed and transplanted (Barney

1999)) Because reproduction is typically vegetative, genetic variation within a given stand may be quite low with many or all of the plants being from one or two clones (Barney 1999). Fruit production can be greater if cross pollination occurs between plants of different clones (Barney 1999).

Rhizomes are generally relatively shallow with most being within 4-6 inches of the soil surface although some may go as deep as 9 inches. After disturbance, and depending upon the type and intensity of disturbance, resprouting can be quite rapid with significant increases in the number of new stems. Where damage is limited to above ground portions of the stem, the number of new stems is lower than when old stems are killed back to the rhizome and portions of the rhizome damaged.

4.1.1.2 Historically, fire is believed to be the primary disturbance agent. Many large wildfires burned the same areas over and over again. Not much is known about early fires but evidence assembled includes aerial photographs, panoramic photos from mountain peaks, current stand age, and the absence of large charred snags and down logs (USDA 1995). The Abbott Burn actually burned twice in modern history; once in 1900 and again in 1920. The Power Line Burn occurred in the 1920s.

American Indians intentionally set fires to control or eliminate competition from regenerating trees while other fires may have ignited from abandoned cooking fires or drying fires (Mack 2003). Fires from lightning may have played a role, especially in the High Rocks/Abbott Burn, Olallie and Sherar Burn areas where summer lightning storms are relatively common. If fires burn during the driest season they can burn with high intensity and heat killing the shallow rhizomes leaving only deeper rhizomes to provide new shoot regeneration. After such fires, bush populations and berry production tend to be lower and bushes more clumpy (Brown 2000). When the above ground stems are burned, berry production commonly takes 10-15 years before full production resumes and may take longer depending upon the severity of the disturbance and site conditions (Barney 1999).

4.1.1.3 In terms of berry production, the most productive areas tend to be open or at least predominately open. If optimal conditions of moisture, light, temperatures and other environmental and site conditions occur, the largest per acre yields are generally found in open areas (Barney 1999). In some years, conditions are not optimal and fruit production is reduced. However, more consistent production occurs in areas where there is at least partial shade. Production tends to be more consistent over time due to the moderating effects provided by overstory vegetation. With an overstory, temperature extremes at ground level tend to be moderated; the high temperatures in summer tend to be lower and the low temperatures in winter tend to be higher. Moisture levels, both atmospheric and soil, tend to be higher during mid to late summer and fall when berries are ripening. While huckleberries tend to need sun for growth and berry production, too much sunlight can damage the leaf by inhibiting or breaking down the photosynthesis process thereby depriving the plant of needed

energy to produce berries. Areas with a tree overstory are also likely to retain snow further into the summer helping to maintain available moisture levels.

Despite being associated with open areas and full sunlight, huckleberry bushes are quite shade tolerant. Bush vigor and expansion is maintained under canopy covers that often result in significant reductions in both numbers and vigor of other species. Berry production does decline as canopy cover increases. Tree species composition in addition to the height of the canopy will affect the type, quantity, and quality of the shade. Assuming similar stocking levels, stands dominated by shade tolerant species such as hemlock will provide more shade due to greater crown depth than stands dominated by more shade intolerant species such as lodgepole pine which tend to have sparse crowns.

- 4.1.1.4 Current conditions in historic berry picking areas are no longer conducive to the production of berries or the maintenance of bush productivity (Minore 1979). Overstory trees almost without exception, dominate historic picking areas. Where trees dominate the overstory, huckleberry bushes are commonly present but berry production is at greatly reduced levels. If stands are dominated by species with denser and/or deeper crowns, berry production is extremely limited or non-existent.
- 4.1.1.5 Rotten logs, particularly those in late stages of decay such as decay classes 4 and 5, also appear to contribute to bush health and vigor as well as berry production (Barney 1999). Huckleberries also respond to high levels of organic matter. Logs with blocky decay structures such as those characterized by any of the brown cubical rots provide a suitable habitat for roots and rhizomes of huckleberry to colonize to obtain moisture and nutrients. As wood decays, nutrients in forms easily utilized by plants are slowly released and made available. Decaying wood is like a sponge, soaking up and storing water, which is then available to plants during dry periods. Some areas that have burned frequently often lack coarse woody debris because some of it would be burned each time and because large trees were not able to become established.
- 4.1.1.6 Weather conditions and micro-site conditions can affect berry production and bush development; particularly important are temperature extremes and lack of moisture. Even though huckleberries are found on cold sites, fruit production can be harmed by certain cold conditions. Snow cover moderates the effect of extreme cold by protecting buds and stems. The presence of a residual overstory trees or other taller vegetation can also moderate temperature extremes near plants and can reduce the likelihood of a damaging frost when new growth or flowering is occurring during the spring and early summer. During flowering and pollination, overstory vegetation can also protect the plant from damaging hail or strong rain storms which might damage flowers. As berries develop, drought conditions can affect the size and quality of berry produced.
- 4.1.1.7 Huckleberries compete with and coexist with other plants. Tree species that share the site have been addressed above in s 4.1.1.3 and 4.1.1.4. Huckleberries compete for growing space, sunlight, nutrients and moisture with other plants such as

rhododendron, chinquapin and bear grass. These species and others tend to be aggressive competitors and under certain conditions may outcompete or eventually exclude huckleberries. The various huckleberry species can also compete with each other if they are present at the same site.

4.1.1.8 Berry ripening usually occurs over a period of time both within a given area and on a given bush. Locally, berries may begin to ripen in August and continue until the first frosts in the fall. Lower elevation sites ripen earliest and appear to have the shortest period between initiation and completion on a given bush and within a given area. At higher elevations, ripening may occur over a longer period. Experience with some sites suggests that this may be up to two months or more before the last berries ripen.

#### 4.1.2 Historic Use

American Indians once lived in the area that is now the Mt. Hood National Forest. The area was utilized by a number of American Indian groups for a variety of purposes including hunting, fishing and gathering food and medicinal resources. Many areas and uses have spiritual significance. Trails crisscrossed the area providing access to popular sites as well as access to the Columbia River and the Willamette Valley (USDA 2000).

In the 1855 "Treaty with the Tribes of Middle Oregon" the Wasco and Warm Springs Tribes ceded 10,000,000 acres of lands to the United States. They retained rights to continue traditional activities (including huckleberry gathering) on ceded lands east of the Cascade crest and on 'usual and accustomed' lands west of the Cascade crest.

There are a number of other tribes who traditionally inhabited the Willamette Valley or west slopes of the Cascades who also utilized portions of the Forest. It is likely that American Indian tribes from areas in Washington State also utilized areas on the Forest to some degree.

Tribes that picked huckleberries in these areas include those represented today by the Confederated Tribes of the Grande Ronde Community and the Confederated Tribes of the Warm Springs Reservation.

4.1.2.1 In 1997, a Memorandum of Understanding (MOU) between the Forest and the Confederated Tribes of Warm Springs set a framework for a working relationship for managing huckleberry resources. This was updated by a new MOU in 2003. The Omnibus Public Land Management Act of 2009 contains a provision for the consultation with Indian tribes in the development and implementation of a management plan that meets the cultural foods obligations of the United States under applicable treaties. While this plan is not yet completed, it is likely that projects like this one would be considered integral to meeting treaty obligations. This huckleberry enhancement project has been in development for many years in consultation with tribes. Beginning in 2000, several Harmony Workshops have been held at Warm Springs Reservation to bring land managers from several National Forests and Bureau of Land Management together with the Confederated Tribes for a solid grounding in the history and culture of the Confederated Tribes. In June 2008, the Northwest Huckleberry workshop was sponsored by Confederated Tribes of Warm Springs Reservation, Confederated Tribes of Siletz Indians, Forest Service and Oregon State University Extension Service.

At these workshops, managers learned about the cultural importance of huckleberries as 'first foods' and their decline across the landscape as traditional harvesting areas have been shaded out by conifers. Some travel to other locations such as the areas south of Mt. Adams to harvest.

4.1.2.2 American Indian use of resources tended not to focus on single resources. Due to the locations of resources, distances from home areas and the seasonal aspects of many of those resources, harvest often involved several activities that could be accomplished at the same time, in the same area or along the route of travel during the same trip. The harvest of one resource such as berries or the hunting of game could also require the concurrent harvest and utilization of other resources such as cedar bark for baskets or roots (Richards 2006).

American Indian uses of the Forest included everything from camps to fishing sites to hunting grounds to root areas and berry picking areas. Huckleberries are both a food source and a sacred food and therefore have both religious and cultural significance. Huckleberries are specifically mentioned in the 1855 treaty.

There are a number of historic huckleberry areas on and immediately adjacent to the Mt. Hood National Forest ranging from the Brietenbush and Mt. Jefferson areas on the south to the Columbia Gorge on the north. The majority of the sites identified in the various ethnographic studies are located along the crest of the Cascades from Mt. Hood to Mt. Jefferson with a majority located in the Clackamas, Salmon and Zigzag River drainages. Most are located on the upper slopes or ridgelines of the numerous high ridges, buttes or peaks in the area.

Many huckleberry sites were utilized depending on the success of the crop in any given year. Picking often began in the lower elevations and continued to higher elevations as fruit ripened (Richards 2006).

4.1.2.3 Berry picking areas were reportedly managed by periodic burning. Such fires could have been started intentionally or accidentally from abandoned camp or drying fires. With the advent of fire control in the early 1900s, the primary tool to establish and maintain berry picking areas was phased out over time. Another transition that has occurred recently is the harvest of huckleberries by the non American Indian population for personal use and in some cases for commercial use (Mack 2003)(Richards 2006).

#### 4.1.3 Management Options

Human use of huckleberries is focused primarily on the use of the berries as food. There are also other uses including transplants and medicinal products (USDA 2000). Huckleberries are an important food for many wildlife species such as bear and birds and the leaves are eaten by deer (Barney 1999). More detail on wildlife species can be found in the Wildlife section.

Conditions in traditional berry picking areas are currently not conducive to the production of huckleberries. As discussed in the previous section, overstory trees dominate historic areas.

4.1.3.1 Many historic areas are currently located within the boundaries of designated Wilderness. This is particularly true of the areas on Zigzag Mountain, between High Rocks and Old Baldy south of the Salmon River and Eagle Creek, and to a lesser extent between Fir Tree and Hunchback Mountain between the Salmon River and Still Creek. Huckleberry picking can occur in wildernesses but berry production has declined as described in section 4.1.1.4, and certain restoration treatments would not be appropriate.

Other historic picking areas are not readily available, particularly near Mt. Hood. Some areas are located adjacent to or within the boundaries of special use permit areas such as ski areas, private lodges, residences and the Government Camp town site. Some areas such as the Bull Run watershed are not available to the public.

#### 4.1.3.2 Traditional Timber Harvest

Traditional timber harvest and regeneration practices often utilized clearcuts with broadcast burns or mechanical slash piling. The hot burns also appear to have severely damaged or killed both bushes and rhizomes reducing both the population and distribution as well as slowing new regeneration. Where bush regeneration has occurred, bushes tend to be clustered in areas near residual logs and successful tree regeneration. Distribution is random and sporadic, possibly a result of the random pattern of burning and burn intensity. Berry production resumes again in 10 to 15 years and appears to increase as the new plantation ages and the trees begin to provide site protection by moderating site environmental factors and limiting the influence of significant weather events such as frosts or hail. Some plantations now have productive huckleberries but this is likely an unexpected result rather than a planned objective.

The harvest areas that seem to be most productive are where the shelterwood method was used. While not particularly common in areas above 4000 in elevation, several existing shelterwood treatments that are present do contain populations of producing huckleberry bushes.

There are a number of young plantations that were reforested following harvest that now have a reasonably good huckleberry component. Plantations often have too many trees and precommercial thinning is needed to optimize growth. Precommercial thinning is a practice used in young plantations to reduce competition, accelerate diameter growth and remove damaged or stunted trees. Typically, trees in plantations are cut depending on such characteristics as species, form and spacing. They are left where they fall on-site without regard to orientation. If plantations with huckleberries are not thinned, the trees would eventually provide too much shade and huckleberry production would decline. However, traditional precommercial thinning has the potential to cover huckleberry plants and to impede walking access to the plants. Future precommercial thinning practices would be modified to meet both silvicultural and huckleberry enhancement objectives.

#### 4.1.3.3 Restoration Thinning

There has been increasing interest in restoring huckleberry productivity using special timber harvest techniques.

The Confederated Tribes of Warm Springs Reservation have implemented over 600 acres of treatments. To test and monitor enhancement practices, a 60 acre treatment on the Forest called Summit Thinning was completed in 2007. Other timber sales including Snowshoe, Sherar and Salmonberry made specific efforts to create conditions considered conducive to huckleberry enhancement and production.

One technique that has worked well involves thinning to open up the stand where trees are skidded over snow to protect existing huckleberry bushes and rhizomes and slash is piled at landings so that walking through the stand would not be impeded by debris. The Salmonberry project tested summer techniques. These efforts showed immediate results: bushes that had few berries before treatment now have abundant crops due to the increase in sunlight reaching the plants.

Since stands never remain static it is important to address maintenance. It is likely that over time competing brush species may need to be cut and reseeded conifers would need to be kept at appropriate levels.

#### 4.1.3.4 Fire Management

Since fire was once the disturbance agent that created and maintained good huckleberry productivity, some have suggested using this tool again to restore huckleberries. Some options for using fire are addressed in s. 3.3.1 and 3.3.2.

#### 4.1.4 Access

Reasonable access to both historic and existing berry picking areas is an issue that affects huckleberry pickers.

Some of the following issues have been raised in relation to access:

- Treatment areas should be reasonably close to roads.
- Certain roads that are to be closed or decommissioned that access picking areas should be treated in a way that provides a safe walking surface.
- Where treatment occurs in the winter and near snowmobile routes, coordinate with local snowmobile clubs to provide for safe use.
- Consider the needs of the elderly and individuals with limited mobility.
- Consider designating certain areas for American Indian picking only.
- If commercial picking permits are requested, consider limiting commercial use to certain areas so that personal use and American Indian needs are met.
- Consider not decommissioning roads that access important picking areas.

#### 4.1.5 **Proposed Treatment Areas**

Two areas were examined for treatment: Power Line Burn and Abbott Burn.

#### 4.1.5.1 Power Line Burn Section

This section is on a broad gently-sloping ridge that straddles the crest of the Cascades with part overlapping the Oak Grove Fork of the Clackamas River watershed and part overlapping the Warm Springs River watershed. Elevations range from 3900 to 4400 feet. It is near Summit Lake and is bisected by a power line corridor with two sets of high voltage towers. The primary access is via road 4200. The areas proposed for treatment are mid-seral stands; primarily lodgepole pine with patches of mixed conifer. The trees seeded in naturally after a wildfire and the stand age is now approximately 80. The project is adjacent to the Summit Thin project which was designed to test huckleberry enhancement techniques. The 60 acre unit was thinned in 2007 and huckleberry production was high in both 2008 and 2009.

#### 4.1.5.2 Abbott Burn Section

This section is on a broad gently-sloping ridge that lies partly in the Oak Grove Fork of the Clackamas River watershed and partly in Salmon River watershed. Elevations range from 3800 to 4400 feet. It is near Fryingpan Lake. The primary access is via road 5800, also known as the Abbot road. (The Abbott Burn and the Abbot road are named after different people and are spelled differently.) The areas proposed for treatment are mid-seral stands; with lodgepole pine and mixed conifer. The trees seeded in naturally after a wildfire and the stand age is now approximately 90.

#### 4.1.6 Effects

No-action would result in a continued decline in huckleberry productivity across the landscape. As time goes by, those that pick huckleberries would have less and less success finding the berries they need.

The proposed action would provide areas for people to pick berries. It would show a serious commitment toward meeting American Indian treaty obligations. It would return an element of diversity to the landscape that has been gradually declining.

## 4.2 UNROADED AND UNDEVELOPED CHARACTER

American Indians have had a long tradition with huckleberries: first accessing the areas by trail and later by road as new roads were built into the Forest. Most popular huckleberry picking areas originated from uncontrolled wildfires that were common in the high elevation areas (4,000 - 6,000 feet) where huckleberries are abundant. After a large wildfire, huckleberries resprout, become fully productive in 10 to 15 years and remain productive for many years until shaded out by encroaching trees (Minore 1979). Because burned over areas had few trees of merchantable size, they were past over during the intensive logging and road building period that occurred on the Mt. Hood Forest between the 1950s and 1990s. Many of the historic picking areas are now in Wilderness Areas or are in areas of low road density. The burned areas with huckleberries targeted by this project now have tree cover that has caused huckleberry fruit production to be quite low.

#### 4.2.1 Wilderness

Recently, the Omnibus Public Land Management Act of 2009 took effect creating several new Wilderness Areas and expanding existing Wilderness Areas on the Mt. Hood National Forest. The bill also included designations for Potential Wilderness, a National Recreation Area, Wild and Scenic Rivers and Protection Areas. The proposed huckleberry enhancement project is not in or adjacent to any of these designations. The nearest huckleberry enhancement unit is approximately 1,400 feet from the nearest designated area: the Salmon River Meadows section of the Salmon-Huckleberry Wilderness.

#### 4.2.2 Inventoried Roadless Areas (IRAs)

Several efforts have been made to inventory roadless areas. Appendix C of the Mt. Hood Forest Plan contains a detailed discussion of roadless areas. The 2001 Forest Service Roadless Area Conservation rule discusses the same areas as the IRAs in Appendix C of the Forest plan. Courts have enjoined this and the Bush administration roadless plan. The proposed huckleberry enhancement project is not in or adjacent to any Inventoried Roadless Area. The nearest huckleberry enhancement unit is approximately 2,000 feet from the nearest Inventoried Roadless Area.

During initial project development the agency looked at huckleberry enhancement opportunities in the Sherar Burn area. Treatments in this area are not proposed at this time because:

- 1. The treatment would have been adjacent to the Minore study plots (Minore 1979) and researchers may be interested in follow-up measurements.
- 2. Additional needed heritage resource inventories would cause project delay.
- 3. The haul route would go through a key winter ski area creating a potential conflict with the desire to do the huckleberry enhancement over snow in the winter.

#### 4.2.3 Forest Service Potential Wilderness

Wilderness criteria are found in FSH 1909.12, Chapter 71. (Note: The recent Omnibus Public Land Management Act of 2009 created an area called Potential Wilderness in the Roaring River area. This area has been high altered in the past by Forest roads and by clearcut logging and does not meet the criteria described below. The wilderness bill uses a different definition of 'potential wilderness' than what is used by the Forest Service. The wilderness bill did not create any 'potential wildernesses' in the project area.)

Criteria	Existing Situation
Areas contain 5,000 acres or more.	The areas affected by the proposed action are less
	than 5,000 acres in size.
Areas contain less than 5,000 acres, but can be	The areas affected by the proposed action are
preserved due to physical terrain and natural	relatively flat terrain. Several primitive roads are
conditions.	present. Snowmobile use is common.
Areas contain less than 5,000 acres, but are self-	The areas affected by the proposed action are not
contained ecosystems, such as an island, that can	islands: they are part of a much larger ecosystem.
be effectively managed as a separate unit of the	
National Wilderness Preservation System.	
Areas contain less than 5,000 acres, but are	The areas affected by the proposed action are not
contiguous to existing wilderness, primitive	adjacent to Wilderness, Primitive Areas or
areas, Administration-endorsed wilderness, or	Inventoried Roadless Areas. One unroaded and
potential wilderness in other Federal ownership,	undeveloped block is 1,500 acres in size and is
regardless of their size.	separated from a Wilderness by a wide aggregate-
	surfaced forest road.
Areas do not contain forest roads (36 CFR	There are areas affected by the proposed action
212.1) or other permanently authorized roads,	that have no forest roads. The project area is west
except as permitted in areas east of the 100th	of the 100 <sup>th</sup> meridian.
meridian (sec. 71.12).	

Considering these criteria the project does not meet Forest Service criteria for potential wilderness.
#### 4.2.4 Unroaded/Undeveloped

During public scoping, comments were received about unroaded and roadless areas, some with maps of areas that were of concern to the writers. The proposed action involves both thinning and temporary road construction in areas that are relatively 'undeveloped' and 'unroaded.' These terms have different meanings for different people: the absence of certain types of roads and certain types of logging activities may be considerations and sometimes a minimum size is considered.

In this document, the terms "unroaded" and "undeveloped" are used to denote any areas that are not already Wilderness, an Inventoried Roadless Area or a Forest Service potential wilderness. Unroaded and undeveloped areas are portions of the landscape that do not contain forest roads (36 CFR 212.1). 'Forest roads' have been called system roads, classified roads or forest development roads: they are a part of the Forest's network of roads necessary to protect, administer, and use the national forest system and its resources. Refer to the glossary of the Forest-Wide Roads Analysis for more on these terms. <u>http://www.fs.fed.us/r6/mthood/documents/current/forest-wide-roads-analysis/appendix-1-glossary.pdf</u> Other roads may or may not be present such as temporary roads, user created roads, or old decommissioned roads. Unroaded and undeveloped areas generally do not contain developments such as rock quarries, camp grounds or clear-cut logging that have changed the character of the area.

The following section focuses on what is "special" about the unroaded and undeveloped parts of the project area. No minimum acreage size will be used to exclude areas from this discussion.

## 4.2.4.1 Abbott Burn section

The Abbot Burn section is part of a large landscape that was burned by several very large wildfires in the early 1900s, most recently in 1920. This burned area includes much of the Salmon-Huckleberry Wilderness, the Roaring River Wilderness and the Abbott Burn section. The panoramic photographs below show the intensity of the fire. The fire burned intensely in some areas while skipping other areas. A large portion of the area that the fire skipped has been logged and roaded and no longer has unroaded or undeveloped character. The portion that burned intensely has regrown and is now a mid-seral forest of lodgepole pine and mixed conifer. These mid-seral areas were likely mid seral or younger before they burned because there is little evidence of charred large stumps or large down logs. The area is bisected by forest road 5800; the primary access to the Abbott Burn section. The proposed huckleberry enhancement units touch five separate unroaded and undeveloped parts of the landscape. The acreages are approximately 500, 1100, 1300, 1400 and 1500. These blocks are bounded by forest roads and old clear cuts. See map below, (note: these maps are best viewed in their original color format).

- 4.2.4.2 The following statements describe the look and feel of the unroaded and undeveloped portions of the area and what recreational uses occur:
  - The huckleberry enhancement units have relatively flat topography with no streams.
  - There are no viewpoints or scenic vistas.
  - The Pacific Crest Trail crosses the area near the huckleberry enhancement units.
  - The area is used by hunters.
  - There are no camp grounds or other developments in the project area.
  - The area is heavily used by snowmobiles in the winter both on forest roads and off roads including routes that traverse the unroaded and undeveloped blocks.
  - Primitive roads cross the 500, 1300 and 1500 acre unroaded and undeveloped blocks. These are very old user created roads and are not considered Forest roads.
  - The area receives some use by Off-Highway Vehicles (OHV) but is not considered a heavily used area. The terrain is gentle making it possible for the development of unauthorized user created routes. This area is not in a designated OHV area in any of the alternatives of the Forest Wide Off-highway Vehicle Management Plan Draft Environmental Impact Statement. When this plan takes effect, OHV use in this area would not be permitted. Snowmobile use would still be permitted.
  - Cattle are grazed in the project area.
  - The forest stands are relatively uniform mid-seral lodgepole pine and mixed conifer stands that average approximately 12 inches in diameter.
  - There is little old-growth in the unroaded and undeveloped blocks.
  - The lodgepole pine stands in the project area are at an age where they are susceptible to attack by Mt. Pine Beetle. Some beetle mortality is occurring in the project area and is likely to continue killing trees as it spreads and expands in the project area. This beetle has caused significant mortality in other portions of the Forest.
  - The shapes of the blocks are shown on the map below. Some of the blocks have convoluted shapes as they wrap around forest roads and clear cuts. One way to describe the degree of convolution is comparing the ratio of the block area and perimeter to that of a square of similar acreage. If the block were square it would have a ratio of 1; the greater the ratio, the greater the convolution.

Block	Ratio
500 ac.	1.52
1100 ac.	1.86
1300 ac.	1.19
1400 ac.	2.36
1500 ac.	1.59

4.2.4.3



4.2.4.4 The following panoramic photos were taken in 1933 from High Rock near the Abbott Burn Section. They show the intensity and extent of wild fires in the area. No salvage logging took place in any of these burns.



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#### 4.2.4.5 Power Line Burn section

The fire burned very intensely across this landscape some time in the 1920s. No salvage logging occurred after the fire. The area has regrown and is now a mid-seral forest of lodgepole pine and mixed conifer. These mid-seral areas were likely mid seral or younger before they burned because there is little evidence of charred large stumps or large down logs. The area is bisected by forest road 4200; the primary access to the Power Line Burn section. The proposed huckleberry enhancement units touch on several separate unroaded and undeveloped blocks. The larger two are approximately 1,900 acres each and the smaller blocks south of the power line are approximately 500 and 700 acres in size. These blocks are bounded by the power line, forest roads and old clear cuts. One of the unroaded and undeveloped blocks extends onto the Warm Springs Reservation. See map below.

- 4.2.4.6 The following statements describe the look and feel of the unroaded and undeveloped portions of the area and what recreational uses occur:
  - The huckleberry enhancement units have relatively flat topography with no streams.
  - There are no viewpoints or scenic vistas.
  - The area is heavily used by snowmobiles in the winter both on forest roads and off roads including routes that traverse the unroaded and undeveloped blocks.
  - The area is used by hunters.
  - Summit Lake is near but outside the unroaded and undeveloped blocks. There is a small campground adjacent to the lake.
  - A primitive road crosses the unroaded and undeveloped blocks. This is a very old user created road and is not considered a Forest road.
  - The area receives some use by Off-Highway Vehicles (OHV) but is not considered a heavily used area. The terrain is gentle making it possible for the development of unauthorized user created routes. This area is being considered as a designated OHV area in Alternatives 2 and 3 of the Forest Wide Off-highway Vehicle Management Plan Draft Environmental Impact Statement. If either of these alternatives is selected, OHV use in this area would increase. An existing primitive road through the 700 acre block would be converted to an OHV trail and a new OHV trail would be constructed in the southern 1900 acre block. Alternative 3 includes the decommissioning of three forest roads in the Summit Lake area.
  - The area is bisected by a large power line with two sets of metal towers.
  - The power lines create a crackling buzzing noise.
  - The proposed Palomar pipeline includes an alternative route that parallels the power line. If this route is selected, development of the pipeline would likely occur directly adjacent to the power line corridor and would remove trees on the 50-foot wide right-of-way, but this would not dramatically change the overall character of the area because it is directly adjacent to the already developed power line corridor.
  - The forest stands are relatively uniform mid-seral lodgepole pine and mixed conifer stands that average approximately 12 inches in diameter.

- There is little old-growth in the unroaded and undeveloped blocks.
- The lodgepole pine stands in the project area are at an age where they are susceptible to attack by Mt. Pine Beetle. Some beetle mortality is occurring in the project area and is likely to continue killing trees as it spreads and expands in the project area. This beetle has caused significant mortality in other portions of the Forest.
- The shapes of the blocks are shown on the map below. Some of the blocks have convoluted shapes as they wrap around forest roads and clear cuts. One way to describe the degree of convolution is comparing the ratio of the block area and perimeter to that of a square of similar acreage. If the block were square it would have a ratio of 1; the greater the ratio, the greater the convolution.

Block	Ratio
500 ac.	1.94
700 ac.	1.2
1900 ac. N.	2.07
1900 ac. S.	2.06

4.2.4.7



#### 4.2.5 Analysis of Effects

Section	Block	Acres of	Miles of
		Huckleberry	temporary
		Enhancement	road
			constructed
Abbott Burn	500 ac.	143	0.29
Abbott Burn	1100 ac.	17	0
Abbott Burn	1300 ac	225	0.35
Abbott Burn	1400 ac	150	0.43
Abbott Burn	1500 ac	98	0
Power Line Burn	500 ac.	42	0.05
Power Line Burn	700 ac.	352	0.95
Power Line Burn	1900 ac. N.	201	0.65
Power Line Burn	1900 ac. S.	313	0.76

The proposed action would alter some of the unroaded and undeveloped character of the project area. The following analysis focuses on several key resources that are often considered well provided for in unroaded and undeveloped blocks and lacking in other parts of the developed landscape.

Public comments suggested that fire be considered a tool for the enhancement of huckleberries instead of logging and road building. Section 3.3.1 and 3.3.2 elaborate on two fire options. This analysis addresses both the proposed action and these fire options.

The following resources can be part of what makes unroaded and undeveloped blocks special.

#### 4.2.5.1 High quality or undisturbed soil

Soils are addressed in s. 4.7. The soils were affected by intense fire. Road construction removes soil and clear cut logging can impact soils depending on the logging system and the intensity of site preparation. The proposed project would be logged in the winter over snow and frozen ground. Temporary roads and landings would result in some soil impact. Soil impacts would be within the limits set by Forest Plan standards and guidelines for long-term productivity.

The burning option would result in the construction of firelines. Large quantities of down trees would gradually decay enhancing soil productivity.

#### 4.2.5.2 High quality water and sources of public drinking water

Water quality is addressed in s. 4.6. There are very few streams in the project area. The flat terrain and project design criteria such as no harvest in riparian reserves combine to minimize the risk that sediment would reach any stream. Portions of the project are in the Clackamas Watershed which provides drinking water for many people. Water is removed from the Clackamas River more than 30 miles downstream. The project would enhance huckleberries on less than ½ of one percent of the watershed.

The burning option would not likely impact water quality unless the prescribed burn escapes containment and burns many more acres.

#### 4.2.5.3 High quality air

Air quality is addressed in s. 4.12. The unroaded and undeveloped blocks are too small to have an airshed that would be unaffected by surrounding air pollution sources. Where the blocks are surrounded by aggregate or unsurfaced forest roads, dust from vehicles would penetrate into the unroaded and undeveloped blocks. The proposed action would result in tops piled at the landing. Operators would be encouraged to remove this material as biomass for power generation or other utilization. If it is not removed it would be burned at landings resulting in some smoke during the late-fall burning season.

The burning option would create much more smoke than would occur with pile burning.

4.2.5.4 Diversity of plant and animal communities

Diversity is addressed in s. 4.1 and s. 4.5. The proposed action would leave some snags and down wood. Skips and riparian reserves would be retained untreated and minor species would be retained. Productive huckleberry plants are part of a diverse landscape; however their productivity has declined in recent decades as forests become too dense. The proposed action would enhance conditions so that huckleberry plants can thrive and produce abundant crops of berries.

The burning option would enhance diversity in some respects because it would result in an abundance of small snags and down logs. However it would not be possible to protect skips and minor species. Minor species such as cedar and hemlock would likely be killed.

4.2.5.5 Habitat for threatened, endangered, proposed, candidate, and sensitive species

Fish are addressed in s. 4.6. The proposed action would have no effect on threatened fish species.

Owls are addressed in s. 4.4. The proposed action would remove dispersal habitat for the threatened northern spotted owl but would not affect any suitable habitat. Forest roads do not generally impede the owl's ability to disperse across the landscape. The effects determination for the proposed action is the same as the effects determination for other recent projects that occur in roaded and developed portions of the landscape.

Botanical species are addressed in s. 4.8. No sensitive botanical species would be affected.

The burning option would result in minimal impact to fish. The effects to owls would be similar in that there would be a reduction of dispersal habitat but the increase in snags and down logs may improve the prey base. There would be no way to protect rare botanical species.

4.2.5.6 Habitat for those species dependent on large, undisturbed areas of land

Wildlife is addressed in s. 4.4. The edge effect of surrounding forest roads and clear cuts, and the noise generated by vehicles on adjacent forest roads reduce the habitat effectiveness of these unroaded and undeveloped blocks for species that need unfragmented mid-seral habitat and solitude. The proposed action would reduce the size of the unroaded and undeveloped blocks. The convoluted nature of some of the unroaded and undeveloped blocks makes the core interior sections relatively small. Species that require large undisturbed areas of land would find similar forest types in nearby wilderness areas.

Some species that depend on large, undisturbed areas would be negatively affected by burning. Other species might benefit from the introduction of fire to this landscape.

4.2.5.7 Primitive, Semi-Primitive Non-Motorized, and Semi-Primitive Motorized classes of dispersed recreation

Recreation is addressed in s. 4.3. The project area is currently allocated to motorized uses. The unroaded and undeveloped blocks are relatively small and the surrounding forest roads and clear cuts, and the noise generated by vehicles on adjacent forest roads reduce the opportunities for solitude. The proposed action would not change the allocated recreational uses of the area but it would restore huckleberry picking opportunities. For some this is a subsistence activity while others view it as recreational.

The burning option would result in many down logs that would impede walking access for huckleberry pickers and other recreators attempting to walk through the forest.

#### 4.2.5.8 Reference landscapes

Similar landscapes are present in abundance on the Forest in places such as the Salmon-Huckleberry Wilderness, the Roaring River Wilderness and the Olallie Scenic Area. These areas have large expanses of mid-seral forest stands where huckleberry is being shaded out. These areas provide opportunities for researching and experiencing these landscapes and are much larger than the unroaded and undeveloped blocks in the project area. The proposed action would provide a different reference landscape available for research or observation: one where open forest stands provide huckleberry production.

The burning option would also provide a different reference landscape: one where fire impacts and the recovery of huckleberries can be examined.

#### 4.2.5.9 Natural appearing landscapes with high scenic quality

Scenery is addressed in s. 4.3. The power line that crosses the area and the checkerboard nature of clearcut blocks has affected the quality of scenery at the landscape scale. The proposed action would meet visual quality objectives. There are no viewpoints or scenic vistas. The unroaded and undeveloped blocks are not a large enough portion of the viewshed to create a sense of unbroken wildness. The proposed action is a thinning that would have the appearance of an open stand. Skips retained in the stands would create variability and diversity in the resulting scenery.

The burning option would create a landscape with a mix burned trees and live trees. The high number of down logs and char would not likely be visually appealing in the foreground but visual quality objectives would be met.

#### 4.2.5.10 Traditional cultural properties and sacred sites

This is addressed in the Heritage Resource section 4.14, as well as the purpose and need section 2.2. American Indians have a long history with huckleberry gathering and want opportunities to harvest this traditional food. American Indians see these areas as changed by excessive tree growth that has crowded out open huckleberry fields changing them into dense forests where huckleberries are unproductive. The Forest Service has been coordinating with tribes for years to achieve projects like the proposed action.

The burning option would restore huckleberries but there would be a 10 to 15 year delay before plants are fully productive. There are historic trail locations with blazed trees which would likely be damaged by burning.

4.2.5.11 Other locally identified unique characteristics

No other unique characteristics have been identified.

- 4.2.5.12 Other topics raised during scoping
  - Centers for dispersal, recolonization, and restoration of adjacent disturbed sites

Other mid-seral forest stands not proposed for huckleberry enhancement could provide this function. The proposed action would enhance huckleberries on 14% of the unroaded and undeveloped areas analyzed here.

➢ Carbon sequestration

Carbon sequestration is addressed in s. 4.13.

Refugia that are relatively less at-risk from noxious weeds and other invasive non-native species

Invasive species are addressed in s. 4.9.

#### 4.2.6 Public Involvement

Oregon Wild submitted a letter with comments about unroaded and undeveloped characteristics.

They indicated that the project area appears to overlap several unroaded areas greater than 1,000 acres that they feel should be protected to serve the unique ecological functions that are provided by the lack of human disturbances such as roads and logging. They also suggest that regeneration harvest areas younger than 50 years be removed. They provided maps. They identified two areas in the Abbott Burn section: the 1300 acre and 1500 acre blocks. They identified two areas in the Power Line Burn section: the two 1900 acre blocks. Their mapping is similar in these four areas to the mapping above, however they did not identify a concern with the other areas. They also identified a concern about the Sherar Burn area which is not part of the proposed action.

Oregon Wild indicated that they might support careful hand treatment of vegetation followed by prescribed fire in unroaded areas, but they oppose commercial logging and all forms of road construction. The option of burning is addressed in s. 3.3.2.

BARK submitted a letter with comments about unroaded characteristics.

They indicated that roadless areas are the future of restoring our forests from decades of mismanagement and that impacts from logging in roadless areas far exceed the

benefit that could possibly be gained by commercial thinning projects. They requested that all logging proposed in any roadless area larger than 1,000 acres be dropped from this project. They did not submit a map or address existing clear cuts. They also identified a concern about the Sherar Burn area which is not part of the proposed action.

# 4.3 **RECREATION AND SCENERY**

#### 4.3.1 Existing Situation

The proposed huckleberry enhancement occurs in 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 area receives more roaded recreation and hunting, than other uses except where the Pacific Crest Trail crosses. Huckleberry harvesting is a subsistence activity for some and a recreational activity for others. The routes that take visitors to the huckleberry enhancement areas take travelers through a landscape that has been intensively managed for timber production with clear cuts and plantations of various ages.

On the landscape scale, there are some areas where a "patchwork" pattern exists and observers can see the difference in texture and line between plantations and adjacent forest stands. This pattern is subtle as seen from the most sensitive viewer positions but is much more noticeable from local forest roads. Power lines cross through the area creating a straight line effect. Some of the proposed treatment areas are directly adjacent to the power line right-of-way.

- 4.3.1.1 **Campgrounds** Summit Lake is in the center of a B12 Backcountry Lakes land allocation. It has a very small informal campground adjacent to it than can handle 2 or 3 vehicles.
- 4.3.1.2 **Trails** The Pacific Crest National Scenic Trail is adjacent to the project. Approximately 3000 feet of the trail crosses near the project on very flat terrain. There are some other unmaintained and user created routes present.
- 4.3.1.3 **Unroaded Recreation/Wilderness/Inventoried Roadless Area** Section 4.2 has an in-depth discussion of this topic.
- 4.3.1.4 **Dispersed Recreation** The primary use of the area is dispersed camping, hunting and snowmobiling. Fire rings are present at old landings and road junctions.
- 4.3.1.5 **Roaded/Motorized Recreation** The Forest is developing a plan to designate road and trail routes for off-highway vehicles (OHV). The OHV plan would designate OHV routes within certain proposed OHV areas and restrict it elsewhere. The Power Line section is being considered as a designated OHV area in Alternatives 2 and 3 of the Forest Wide Off-highway Vehicle Management Plan Draft Environmental Impact Statement. If either of these alternatives is selected, OHV use in these areas would increase. Currently, none the proposed project areas get very much OHV use.

The area does get used by snowmobiles in the winter. The OHV plan would not restrict or change snowmobile uses. Snowmobile routes are groomed by local clubs. Some use occurs off groomed routes as well.

Area	Viewer Position	Visual Quality Objective *
Timothy Lake	Lake, Road 57	Partial Retention – Mid & Back Ground (B2)
Salmon River	Salmon River	Partial Retention – Mid & Back Ground (B2)
Summit Lake	Campground, Lake Shore	Retention – Foreground (B12)
Pacific Crest Trail	Trail	Retention – near Foreground
All other areas	Local open roads	Modification
*Γ Γ (D1		

#### 4.3.1.6 Visual Quality Objectives

\* From Forest Plan

4.3.1.7 **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 objective for the project area is Roaded Natural.

# 4.3.2 Direct and Indirect Effects

Section 4.1 describes in detail the effects to huckleberries and to the recreational aspect of both no action and the proposed action.

The following 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.
- Temporary road construction and obliteration even after revegetation these routes would be visible.
- Burning would create smoke.
- The prescribed burning option (s. 3.3.2) would create some recreational and scenery impacts: more smoke would be created, trees would be felled and left and the burn would kill some trees and char the stems of trees. Walking through the treatment areas would be difficult. Huckleberry production would be set back 10 to 15 years.

Project design elements such as leaving live trees, leaving skips, yarding logs over snow to minimize ground disturbance and the removal of most debris would result in open looking stands. These would help minimize the change to visual dominance elements (line, form, color, and texture) that could result without these practices. Along the travel routes of roads 58 and 42, short temporary roads would be constructed to get the landings off the primary road and farther out of sight. 4.3.2.1 Effects to scenery as seen from sensitive viewer positions - Timothy Lake, Road 57, Salmon River, Pacific Crest Trail, and Summit Lake. The proposed huckleberry enhancement would not be seen from Timothy Lake, Road 57 or the Salmon River. Alterations to scenery if any would be very slight because of a combination of topographic screening, vegetative screening near the viewer position, the density of green trees retained, the distance (the project is approximately 3 miles away) and the viewer angle. These factors combined would result in no noticeable change to the casual observer; the viewer would not notice any dramatic changes in forest structure or see bare ground or slash.

Hikers on the Pacific Crest Trail may observe changes when they cross through the proposed huckleberry enhancement area. There would be a 100-foot no treatment buffer. In this buffer the terrain is very flat and there are understory trees and shrubs that would screen the view. Yarding logs in the winter would result in no noise disturbance for hikers and would minimize ground disturbance.

Campers at Summit Lake would have observed the huckleberry enhancement areas on their drive in to the lake. The lake would have a 320-foot no treatment buffer. This would screen viewers from the huckleberry enhancements. It is likely that campers during the late summer would pick and enjoy the huckleberries that would be plentiful after treatment.

4.3.2.2 Effects to scenery as seen from local roads - Local roads are generally roads that were built by loggers to access the forest for timber harvest. Drivers on these local roads would expect to see other roads and some evidence of logging. They would see a closer view of the "patchwork" pattern that exists and would see landings, stumps, skid trails and rock quarries.

Some changes to foreground views from local open roads would occur with the proposed action. Yarding logs in the winter would minimize ground disturbance. Log landings and temporary roads would be noticeable in the short term. Landing size would be kept to the minimum size needed for safety and areas of bare soil would be seeded with grass for erosion control. Temporary roads would also be revegetated.

Similar huckleberry enhancement has been implemented and the results there confirm that this type of treatment has little effect to scenery. The project would meet visual quality objective of modification from these viewer positions because human activity is allowed to dominate the characteristic landscape but would utilize natural established form, line, color, and texture.

4.3.2.3 **Roaded/Motorized Recreation** - Since the project would occur in the winter there is the potential to impact snowmobiling. The previous huckleberry enhancement project was coordinated with local snowmobile clubs to ensure that potential issues

were resolved. Snow plowing was kept narrow so that a groomed route was still available within the road right-of-way. This technique and other lessons learned during implementation of the previous project would be used with this project so minimize impact to both the contractor and the snowmobiling public.

## 4.3.3 Cumulative Effects

The foreseeable projects that may occur in the project area include the potential for the Power Line section to be designated as an OHV area depending on the alternative selected for the OHV plan. There is also the potential for the location of the Palomar pile line parallel to the power line. There is also a 60-acre huckleberry enhancement project completed in 2007 to test and monitor the type of treatment proposed on a larger scale in this document. Road closures and decommissioning across the Forest reduces access for huckleberry gathering.

If OHV use is encouraged on designated routes in the project area there would be potential conflicts with huckleberry gatherers. The quality of the huckleberry gathering experience would be reduced due to OHV noise that would disrupt a normally quiet pursuit. The stands are already relatively flat and open to the potential for unauthorized user created routes and the huckleberry enhancement would make them even more open. The OHV plan would result in improved communication with users about appropriate riding routes and improved efficiency of law enforcement efforts to successfully keep OHV users on designated routes.

The proposed Palomar pipeline includes an alternative route that parallels the power line. If this route is selected, development of the pipeline would likely occur directly adjacent to the power line corridor and would remove trees on a 50-foot wide rightof-way, but this would not dramatically change scenery or recreational opportunities because it would be directly adjacent to the already developed power line corridor and would be buried underground.

The Summit Thinning is described in section 2.0 including photos. It is directly adjacent to enhancement unit 32 and Road 42. It was developed to test and monitor huckleberry enhancement practices. In terms of recreational opportunities and scenery, this test has shown that the treatment both meets scenery objectives and provides an improved recreational experience for forest users. The fruit production in this area responded immediately attracting many pickers.

Road decommission and closures across the Forests are gradually reducing the accessibility for huckleberry gathering. The Forest is committed to examining all of its watersheds for road decommissioning opportunities. Roaded recreation opportunities would eventually decline Forest-wide as decommissioning and other road closures occur. Huckleberry gatherers walk into stands to pick but the farther a stand is from an open road, the less utilization there is.

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

Forest Plan References

Forestwide Visual Resource Standards and Guidelines - FW-552 to FW-597, page Four-107 Scenic Viewsheds Standards and Guidelines - B2-12 to B2-42, page Four-221 Mt. Hood FEIS pages IV-127, IV-131, IV-142, and IV-155 to IV-167

FW-554, B2-012 & B12-013 Visual Quality Objectives

For the reasons described in s. 4.3.2.1 and s. 4.3.2.1, the project would meet visual quality objectives. The recreational opportunity spectrum of Roaded Natural would be met with this project.

## 4.4 NORTHERN SPOTTED OWL

A Biological Evaluation has been prepared and is incorporated by reference and summarized below. Some of the units occur within the 1992 critical habitat unit designation (CHU, OR-11). The project does not occur within Late-Successional Reserves (LSRs); however, the LSR Assessment (USDA 1998b) identified areas outside the LSRs where there are concerns about connectivity. A portion of the project occurs within a Spotted Owl Area of Concern (AOC) as well as the Salmon River General Connectivity Area of Concern.

In May 2008, the U.S. Fish & Wildlife Service released a final recovery plan for the northern spotted owl that identifies criteria and actions needed to stop the owl's decline, reduce threats and return the species to a stable, well-distributed population. This project is consistent with the goals and criteria identified in the recovery plan: It does not occur in Managed Owl Conservation Areas (MOCAs) and does not alter mature forests.

Barred owls are known to be present on the Forest. Barred owls have been expanding into northern spotted owl territory from northeastern Canada since about 1900 and in some cases have been displacing spotted owls (Anthony 2004) (Courtney 2004). Barred owls may be expanding their range because of changes to forest structure from logging, wildfire or climate change. By casual observation and incidental surveying since 1994, barred owls do appear to be more common on the Forest than they were when 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 Forest.

**4.4.1 Habitat Characteristics** - Habitat for the owl is split into suitable, dispersal and capable. Suitable is 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. Many stands in the analysis area are

over 80 years of age yet still have not attained the characteristics of suitable habitat due to slower growth rates at these elevations and the inclusion of lodgepole pine which rarely grow large enough.

Dispersal habitat is typically over 40 years of age of age with a canopy cover of 40 percent or greater and an average diameter of 11". Many stands in the analysis area are over 40 years of age yet still have not attained the characteristics of dispersal habitat due to slower growth rates at these elevations and the inclusion of lodgepole pine which rarely grow large enough. 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 habitat. In this document, the term dispersal habitat is used to describe the stands that provide for dispersal but are not suitable unless otherwise noted. Sometimes the term total dispersal habitat will be used to include the sum of dispersal only habitat and suitable habitat.

Capable habitat is other forested lands with the potential to eventually grow and become dispersal or suitable habitats. Young plantations fit this category. Some lodgepole pine stands are also mapped as capable because they do not fit the criteria for dispersal habitat. In the absence of disturbance, lodgepole pine stands could someday become dispersal habitat, however because of the physiology of lodgepole pine and its relationship with mountain pine beetle and fire, this is unlikely without a conversion to some other species.

## 4.4.2 Analysis Area - Noise Disturbance

The U.S. Fish and Wildlife Service has concluded that noise can result in a disruption of breeding, feeding, or sheltering behavior of the spotted owl such that it creates the potential for injury to individuals (i.e. incidental take in the form of harassment). For a significant disruption of spotted owl behavior to occur, the disturbance and spotted owl(s) must be in close proximity.

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 owls forage primarily at night, projects that occur during the day are not likely to disrupt its foraging behavior. The concern about noise is with breeding behavior at active nest sites.

In the late breeding period, potential effects from disturbance decline because juvenile spotted owls are increasingly more capable of moving as the nesting season progresses. The critical breeding period is March 1<sup>st</sup> through July 15<sup>th</sup>. After July 15<sup>th</sup>, most fledgling spotted owls are capable of sustained flight and can move away from most disturbances.

The U.S. Fish and Wildlife Service has developed disruption distances based on interpretation of best available information. The proposed actions for this project that generate noise above the local ambient levels are heavy equipment and chainsaw use. Normally the analysis area for noise around known nest sites would be 35 yards for heavy equipment use, and 65 yards for chainsaw use. However for historic activity centers that have not been verified recently, 300 meters is used.

# 4.4.3 Analysis Area – Habitat

The project proposal involves the temporary removal of dispersal habitat for spotted owls. While the degradation or removal of suitable habitat is usually the greatest concern, the temporary loss of dispersal habitat by thinning may also result in impacts to owls. The removal of dispersal habitat may affect spotted owls that have an established activity center, either by causing them to abandon their current site or reducing foraging opportunities. To evaluate the likelihood of owls using habitat for nesting, roosting or foraging, the analysis considers the entire home range for affected pairs. Since there are few recent surveys for spotted owls that show the locations of active nest sites, historical spotted owl information was used. Historical activity centers are used because studies show nest sites are used for many years. In addition, predicted owl sites will be used. These are areas that may be able to support resident spotted owls (i.e. a potential breeding pair) as determined by the USFWS et al. (2007) northern spotted owl occupancy template. This is used for determining effects to spotted owls where survey data is insufficient.

For the Willamette Province the home range is a 1.2 mile radius circle (2,955 acres) centered on the activity center. 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.

The nest stand is a 300-meter radius circle around the activity center.

The proposed project is within 6 historical and 1 predicted pair's home range.

In addition to using home ranges, the analysis includes acreage summaries and discussion of effects for Critical Habitat Units (CHUs) and Areas of Concern (AOC).

**4.4.4 Elements of Proposal Analyzed -** The following actions have the potential to affect spotted owls: actions that remove or kill trees to a level below 40% canopy cover and activities that make noise are considered to result in a greater risk of adverse effects. The actions for this project include thinning and trees removed for skid trail, landing

and road construction. Other actions such as log haul or road reconstruction would not affect habitat but may create noise disturbance.

# 4.4.5 Existing Condition of Proposed Huckleberry Enhancement Units

The units range in age based on the mosaic pattern of burning from several fires and the time it took for stands to become reestablished afterward. Ages range from approximately 70 to 100 years. Approximately 846 acres are considered capable habitat for the spotted owl: they do not meet the size and canopy cover requirements of dispersal habitat because of the predominance of lodgepole pine with small diameters and narrow crowns. Approximately 1,446 acres are providing dispersal-only habitat. None of the units are considered suitable (i.e. nesting, roosting, and foraging) habitat because they lack a multi-storied structure, large diameter trees and appropriate levels of snags and down wood.

Snag and down woody debris are important components of spotted owl habitat. The majority of snags and down wood present in the units consist of small diameter lodgepole pine intermixed with other conifer species. The levels range from low to high, depending on the site conditions. Mountain pine beetle infestations have caused high levels of snags and course woody debris in pockets throughout the project area. There are scattered large diameter snags and down woody debris also present in the units.

The project area ranges from approximately 3800 to 4400 feet in elevation. This is approaching what is normally considered the upper range for owls. The highest historical nest site in the analysis area is at 4,120 feet. The highest nest site known on the district occurs at 4,900 feet near Sisi Butte.

**4.4.6** Critical Habitat Unit (OR-11): Spotted owl critical habitat units serve to identify lands that are considered essential for the conservation and recovery of the spotted owl.

The CHU borders the western edge of the Warm Springs Indian Reservation along the crest of the Cascade Range (see map in Appendix A). This CHU provides nesting/roosting/foraging habitat and to support clusters of owl pairs.

**4.4.7 Spotted Owl Area of Concern:** The LSR Assessment (USDA 1998b) identified areas outside the LSRs where there are concerns about dispersal. This Spotted Owl Area of Concern lies between the Roaring River LSR, the White River LSR, the Warm Springs Indian Reservation and the Salmon-Huckleberry Wilderness.

There are several reasons this area of concern was delineated.

- Some of the stands in this area lack dispersal characteristics due to the abundance of lodgepole pine.
- Some areas have been intensively managed and are now young plantations.
- The area also has few riparian reserves. In other areas of Matrix between LSRs, riparian reserves are relied upon for their network of mature forest connectivity across the landscape. This area is relatively flat and dry with fewer streams than are typical on other landscapes. As a result, the network of riparian reserves does not provide the level of owl dispersal that is provided for in greater quantities in other landscapes.
- **4.4.8 General Connectivity Area of Concern:** The LSR Assessment (USDA 1998b) identified areas outside the LSRs where there are concerns about connectivity. The delineation of this General Connectivity AOC is not only for spotted owls but addresses the broader need for species movement and connectivity. It overlaps the Spotted Owl AOC. This area is important for connectivity between the Salmon-Huckleberry Wilderness Complex and the White River LSR to the east. This area has little late-successional habitat but does have large amounts of dispersal habitat. Low levels of course woody debris may be a concern in some areas. Since this delineation has abundant dispersal habitat and the project would only affect a small quantity of it, the analysis below focuses instead on the Spotted Owl Area of Concern.

## 4.4.9 Summary

	Size (acres)	Total Dispersal Habitat (acres)	Capable Habitat (acres)	Non Habitat (acres)
Huckleberry Enhancement Units	2,292	1,446	847	0
Spotted Owl Area of Concern	40,557	22,620	15,474	2,454
CHU (OR-11)	50,157	29,521	20,056	580

# 4.4.10 Direct, Indirect and Cumulative Effects

## 4.4.10.1 No Action

No short-term effects to the spotted owl would occur with this alternative. For the short term (0-10 years), the areas that are currently providing dispersal habitat would continue to function as dispersal habitat. Snag and down wood levels would

gradually increase due to insects and diseases in the area.

Eventually the stands would start to differentiate to varying degrees and show a substantial increase in the levels of snags, down wood and understory development. Where these developments occurred, they would improve the dispersal habitat characteristics being provided within some stands. The quality of dispersal habitat would improve only somewhat in these stands due to the slow growth rates inherent in these high elevation stands. Stands with a large component of lodgepole pine may eventually succumb to mountain pine beetle and dispersal habitat would decline.

Most of the plantations currently providing capable habitat would grow into dispersal habitat in the next 30 years.

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

# 4.4.10.2 Proposed Action - Cumulative Effects

A cumulative effects analysis is displayed for dispersal habitat. The proposed project would have no effect on suitable habitat, and therefore, no cumulative effects analysis is necessary for this habitat type.

The analysis considers the condition of stands on the Warm Springs Reservation. Future logging on the reservation is likely but details of location and timing are not known.

This analysis relies on current environmental conditions as a proxy for the impacts of past actions. This information comes from the current GIS vegetation, roads and activity layers which include data such as the current condition of forest stands and the age of plantations. These layers track forest vegetation and other features as they have been affected by events such as forest fires and past regeneration harvest as well as the growth that has occurred since. The analysis includes road construction, power lines and rock quarries. Recently implemented projects such as the Summit Thin are included.

Stands that have a canopy cover greater than or equal to 40 percent and conifer trees greater than or equal to 11 inches average diameter are considered dispersal habitat for spotted owls. As plantations grow, these conditions would be met at approximately age 40. Stands older than this would be considered functioning dispersal habitat and would not enter into this analysis unless their canopy has been reduced to less than 40%.

## 4.4.10.3 Foreseeable future actions –

There is potential for future logging on the Forest and on the Warm Springs Reservation. However there are no other proposed actions at this time that can be

reasonably analyzed. Effects cannot be modeled without site specificity of timing and location. A discussion of potential effects of unknown future actions would be speculative. The appropriate time to conduct a cumulative effects analysis for future actions would be in a future EA after a firm proposal is developed.

The Forest is developing a plan to designate road and trail routes for off-highway vehicles (OHV). The OHV plan would designate OHV routes within certain proposed OHV areas and restrict it elsewhere. The Power Line section is being considered as a designated OHV area in Alternatives 2 and 3 of the Forest Wide Off-highway Vehicle Management Plan Draft Environmental Impact Statement. If either of these alternatives is selected, OHV use in these areas would increase. Currently, none the proposed project areas get very much OHV use. This proposal would not alter dispersal habitat but would increase noise. None of the proposed routes would come within the disturbance buffer distances discussed in s. 4.4.2.

The proposed Palomar pipeline includes an alternative route that parallels the power line. If this route is selected, development of the pipeline would likely occur directly adjacent to the power line corridor and would remove trees on the 50-foot wide rightof-way. This would amount to approximately 20 acres of clearing as it crosses the project area. It is not known if this or any other route near the project area would be selected. If it is selected the effect of the project would amount to a fraction of a percent of the project area and would not likely have a significant effect on dispersal habitat when combined with the effects of the huckleberry enhancement. The potential pipe line route would not come near any of the owl activity centers.

## 4.4.10.4 Effects to Owl Habitat on a Stand Scale

The huckleberry enhancement treatment would reduce the canopy cover to below 40% making them no longer dispersal habitat. Approximately 1,446 acres are currently dispersal habitat. Down logs and snags would be retained (where safety permits).

As the stands grow they may eventually become dispersal habitat again.

## 4.4.10.5 Effects to Spotted Owl Home Ranges

Many of the units are within the home range (1.2 miles) of historic activity centers. Research has shown that activity centers that have been utilized in the past are likely to continue to be utilized in the future.

A study by Meiman (2004) reports changes in spotted owl use following a commercial thinning in stands near core areas in Clatsop State Forest. Although sample sizes were not large, proportional use of the thinned area was significantly less during and after harvest operations than during the pre-harvest period. The nature of this effect is not clear, but it may include an influence on prey availability,

microclimate conditions, or higher vulnerability to predation. In addition, home range expansion of one spotted owl was observed, and a shift of the core use area away from the thinned stand. These effects suggest that commercial thinning in proximity to spotted owl activity centers may have a short-term effect on home-range and habitat-use patterns of individuals.

The loss of dispersal habitat would affect the ability of owls to move through these stands. The removal or reduction of dispersal habitat could also change the habitat use and home-range of any spotted owls residing in or near the proposed treatment areas. Since many units are within the home range of a pair, the loss of habitat could alter the birds foraging habitats; or shift the core use area of an individual away from the thinned stand. Since suitable habitat in the owl circle analysis areas appear to be well below preferred levels thought required for survival of a spotted owl pair, dispersal habitat in these areas is predicted to be more important than dispersal habitat in other areas. However, suitable habitat is still the most important for owls in this area. Although negative impacts are possible with implementation of the proposed action, it is unlikely that the proposed harvest activities would substantially negatively impact the resultant survival of any birds residing close to the project area.

The following table displays the current condition and project effects to the nest stand, core area, and home range of each site. Incidental take thresholds for suitable habitat are 40% for the home range and 50% for the core. The **bolded** text indicates the pair is below the threshold. There is no threshold for dispersal habitat.

Owl Pair	Analysis Area	Current Suitable	Current Dispersal acres	Dispersal Removed acres
2016	Nest Stand	33%	56	-
	Core Area	21%	379	-
	Home Range	15%	2161	38
2018	Nest Stand	56%	30	-
	Core Area	45%	152	-
	Home Range	31%	1958	48
2273	Nest Stand	4%	39	-
	Core Area	16%	349	-
	Home Range	22%	2161	53
2190	Nest Stand	44%	26	-
	Core Area	44%	328	7
	Home Range	38%	1845	379
2192	Nest Stand	70%	0	-

4.4.10.6 Effects to Owl Historic & Predicted Activity Centers

	Core Area	52%	370	49
	Home Range	40%	1778	167
3722	Nest Stand	60%	52	-
	Core Area	49%	338	-
	Home Range	33%	2189	128
Pred-	Nest Stand	69%	69	-
icted	Core Area	34%	330	-
site	Home Range	30%	1762	157

Based on current conditions, 6 pairs are currently below take thresholds in either their core area or home range. Within all of these owl activity circles, dispersal habitat would be removed. Since these pairs are currently lacking in suitable habitat, the impact on dispersal habitat might have a greater effect on these pairs than in the others. The impacts of the proposed action are primarily in the outer parts of the home range with very little impact in the core area. Since the project would not affect suitable habitat, it is unlikely that the proposed action would negatively impact the health or resultant survival of any owls residing close to the project area.

# 4.4.10.7 Effects to Dispersal Habitat within Critical Habitat Unit

Critical Habitat Unit	Proposed Acres Treated	Proposed Acres Treated in Dispersal Habitat	Proposed Acres Treated in Capable Habitat
CHU OR-11	907	431	476

## 4.4.10.8 Existing condition and effects to Critical Habitat Unit

CRITICAL	то	TOTAL DISPERSAL HABITAT (INCLUDES SUITABLE)			
HABITAT UNIT	ACRES IN CHU	ACRES OF HABITAT	ACRES Removed	PERCENT OF CHU REMOVED	PERCENT OF HABITAT REMOVED
OR-11	50,157	29,521	431	0.9%	1.5%

#### 4.4.10.9 Effects to Spotted Owl Area of Concern

The Forest has identified an Area of Concern (AOC) in the vicinity of Timothy Lake: the entire Abbott Burn section is in this AOC. (See map in Appendix A.) The concern about dispersal habitat has been highlighted in the following documents: North Willamette LSR Assessment, Northern Spotted Owl Final Supplemental EIS, Scientific Assessment Team (SAT), Forest Ecosystem Management Assessment Team (FEMAT), and the Conservation Strategy for the Northern Spotted Owl.

Spotted owl dispersal habitat is limited due to past timber harvest in two portions of the Timothy Lake AOC: one is directly south of the lake and the other is to the east and just north of the lake. These areas have the potential to be biological bottlenecks for south/north and west/east movement. The area farthest north in the AOC has abundant dispersal habitat but its quality is marginal due to the quantity of lodgepole pine that grew up after wildfires.

The basis of the concern comes both from the existing condition of the forest as affected by past fires and timber harvest and the underlying land allocations. The concern about land allocation is based on the assumption that most dispersal habitat would eventually be harvested in the matrix. LSRs, Wilderness, riparian reserves, 15% green tree retention, other administratively withdrawn areas, and 100-acre LSRs should provide adequate dispersal habitat in most areas. However, in the case of the Timothy Lake AOC, there has been intensive regeneration harvest and there is a low density of streams and riparian reserves. Since the Area of Concern was delineated, several new Wildernesses have been created in areas that had previously been matrix. Even so, dispersal habitat is likely to be a concern for the next 20 years until young plantations grow and become dispersal habitat.

The northern portion of the AOC has been affected by past wildfire. Most fire affected stands are currently dispersal habitat but these stands may never have optimal conditions for dispersal due to the amount of lodgepole pine and its typical characteristics of small diameter trees with narrow canopies. Lodgepole pine trees in nearby portions of the Forest are being killed by mountain pine beetle and it is likely that most of the lodgepole pine in the AOC would also be killed.

Approximately 746 acres of dispersal habitat within the project falls within the Timothy Lake AOC. The project would degrade this dispersal habitat to non-habitat. The proposed treatments would open up the stand to approximately 30-40% canopy cover. A side benefit of this treatment is that wildfire risk would be reduced, protecting adjacent dispersal habitat.

Since dispersal habitat is being removed, the proposed action is expected to adversely affect the Area of Concern. However, the proposed action would not remove suitable habitat or nest trees. It would not remove any habitat within the historic and predicted nest patches and core areas. It would remove 139 acres of dispersal habitat from the home ranges of three historic owl activity centers. The dispersal habitat being removed is of low to moderate quality with few opportunities for foraging or roosting.

The proposed action occurs in the northern part of the AOC where connectivity is currently adequate. After implementation, it is likely that there would continue to be adequate connectivity within the Timothy Lake AOC for owls to disperse from the

Salmon-Huckleberry Wilderness/LSR complex to the Warm Springs Indian Reservation or from Wilderness complex to the White River LSR.

#### 4.4.10.10 Effects Due to Noise Disturbance

There are no actions within 300 meters of activity centers so no seasonal restrictions are required.

Since surveys have not been conducted recently, there may be newer unknown activity centers. Proposed activities that occur within <sup>1</sup>/<sub>4</sub> mile of unsurveyed suitable habitat have the potential to disrupt the normal behavior patterns of individual owls or breeding pairs. The potential is low that the unsurveyed suitable habitat adjacent to a proposed harvest unit would be occupied since suitable habitat is predicted to be occupied at a rate of only one nest site per 4,754 acres and because the project area is already covered by many historic home ranges. Effects of the proposed project would only be predicted to be adverse if the proposed activities occurred during the breeding season near an active spotted owl nest, and within the applicable disturbance distance for the activity. Winter logging would not affect breeding. Because adult owls are able to distance themselves from disturbances, adverse affects if any would be to breeding pairs when eggs or young are tended.

Adverse effects are possible but they are not reasonably certain to occur.

#### 4.4.10.11 Summary:

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 and the amount of edge habitat decreases, impacting organisms that prefer large patches of interior habitat, such as the spotted owl.

The loss of dispersal habitat would affect the ability of owls to move through these stands. However, the ability of the owls to move across the landscape in the analysis area would still be adequate since adequate dispersal habitat still exists in the appropriate quantities and juxtaposition. Abundant dispersal habitat would remain in the analysis area to allow the birds to adequately disperse between suitable habitat blocks.

The loss of dispersal habitat could change the habitat use and home range and could alter the birds foraging habitats or shift the core use area of an individual away from the thinned stand. Since dispersal habitat would still be available in the analysis area in adequate quantities and distribution, it is unlikely that these actions would substantially impact the resultant survival of any birds residing within the analysis area.

While dispersal habitat has been emphasized, particularly for the spotted owl area of concern, it is actually suitable habitat that is more limiting.

# 4.4.10.12 Burning Option

The option of prescribed burning would have some impact on spotted owls. Section 3.3.2 describes this option. Smoke would cause some disturbance but burning would not occur during the primary breading season and adult birds would be able to move temporarily out of the smoke. This option would remove the same quantities of dispersal habitat as the proposed action but would create far more snags and down wood which are important elements for owls. There is some risk of escaped fire burning into and damaging nest stands or suitable nesting roosting and foraging habitat. Fire could burn into late-successional reserves.

# 4.4.11 Forest Plan Standards and Guidelines

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

Forestwide Wildlife Standards and Guidelines – FW-170 to 186, page Four-69 Northwest Forest Plan - Matrix Standards and Guidelines - page C-9

The action alternatives are consistent with the following standards and guidelines

FW 170 & 171	This standard and guideline is not applicable to individual projects.
FW-174	Habitat for threatened, endangered and sensitive species has been identified and managed in accordance with the ESA (1973), the Oregon ESA (1987), and FSM 2670.
FW-175	Habitat for threatened, endangered and sensitive species is managed at the landscape scale. This standard and guideline is not applicable to individual projects.
FW -176	A Biological Evaluation has been prepared.
FW 177 & 178	Consultation with USFWS is ongoing.
FW-179	The creation of Species Management Guides is not applicable to individual projects.
FW-180	The maintenance of lists of threatened, endangered and sensitive species is done but this standard is not applicable to individual projects.
FW-181	This document does not include location information.

# 4.4.12 Endangered Species Act Compliance

4.4.12.1 Effects to critical habitat - The effect determination for the action alternatives on northern spotted owl critical habitat unit OR-11 is, "May Affect, Likely to Adversely Affect." This determination is due to the removal of currently functional dispersal habitat. The proposed harvest treatments would open up the canopy cover to less than 40% in all the units, making them unsuitable for dispersing owls. Within this CHU, the proposed actions would in the short-term reduce dispersal habitat, a primary constituent element of northern spotted owl critical habitat. See s. 4.4.10.7&8.

However, the resultant spotted owl habitat within CHU OR-11 as a whole after project completion would be sufficient to provide spotted owl nesting and dispersal. The action alternative would not appreciably diminish the functionality of this CHU to provide habitat conditions that support the recovery of the northern spotted owl.

- 4.4.12.2 Effects to spotted owl at the project scale The action alternatives would have an effects determination of "May Affect, Not Likely to Adversely Affect" because of the effect to dispersal habitat. See s. 4.4.10.5.
- 4.4.12.3 Effects of Disturbance Because some of the units occur near unsurveyed suitable habitat; the disturbance effects call for the proposed project is may affect, not likely to adversely affect. See s. 4.4.10.10.
- 4.4.12.4 Effects to spotted owl on a province scale (Willamette Province) The conclusion reached after considering the cumulative effects of this is that the action alternative is not likely to jeopardize the continued existence of the spotted owl and is not likely to destroy or adversely modify designated critical habitat for the spotted owl.
- 4.4.12.5 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.

# 4.5 OTHER WILDLIFE

Many animals eat huckleberries. They can be an important part of the diet of birds such as grouse and many varieties of song birds, small mammals such as squirrels and mice and bears. Deer and elk browse on berries and foliage.

# 4.5.1 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 Forest include northern spotted owl (s. 4.4), pileated woodpecker (s. 4.5.3, s. 4.5.5), pine marten (s. 4.5.5), deer (s. 4.5.4), elk (s. 4.5.4), salmonid smolts and legal trout (4.6) (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 - <u>http://www.fs.fed.us/r6/mthood</u> in the Publications section. There is no requirement in the 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 Forest Plan as amended provides habitat to maintain viable populations of these species. Land allocations near the project area 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, two units overlap Summer Range (B11). There are also numerous Forest-wide standards and guidelines that pertain to these species. This project has been designed to minimize effects on management indicator species.

# 4.5.2 Special Status Species

The following table summarizes effects to Sensitive Species from the Biological Evaluation.

Species	Suitable	Impact of Proposed
	Habitat	Action*
	Presence	
Johnson's Hairstreak	No	No Impact
Mardon Skipper	No	No Impact
Oregon Slender Salamander	Yes	MII-NLFL
Larch Mountain Salamander	No	No Impact
Cope's Giant Salamander	No	No Impact
Oregon Spotted Frog	No	No Impact
Lewis's Woodpecker	No	No Impact
White-Headed Woodpecker	No	No Impact
Bufflehead	No	No Impact
Harlequin Duck	No	No Impact
Bald Eagle	No	No Impact
American Peregrine Falcon	No	No Impact
Townsend's Big-eared Bat	No	No Impact
Fringed Myotis	Yes	MII-NLFL
California Wolverine	Yes	MII-NLFL
Puget Oregonian	No	No Impact
Columbia Oregonian	No	No Impact
Evening Fieldslug	No	No Impact
Dalles Sideband	No	No Impact
Crater Lake Tightcoil	No	No Impact
Crowned Tightcoil	No	No Impact

\* "NI" = No Impact

"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 construction, reconstruction, obliteration, log haul, snag creation, and down woody debris creation.

**4.5.2.1 Terrestrial Mollusks:** The Puget Oregonian, Columbia Oregonian, evening fieldslug and Crater Lake tightcoil are mollusk species with ranges that include the Clackamas River and Zigzag Ranger Districts.

The Columbia Oregonian was originally known from only the margins of a few seeps and spring-fed streams at low elevations within the east end of the Columbia River Gorge. Within the Mt. Hood National Forest, newly discovered records of these species are from western hemlock managed plantations (i.e. mid-seral stands) where the snails were found associated with woody debris under a relatively closed canopy. Within these mid-elevation sites, they were found from 2600 to 3260 feet in elevation. None of these specimens were from the edge of streams. Instead most

were in damp situations under relatively closed canopies in western hemlock midseral stands that included some Douglas-fir, cedar, vine maple, and alder. All the sites were found under rotten logs and had a vegetative component of salmonberry, alder, sword fern, and Oregon oxalis. All were found on gently north-facing slopes.

There are no known sites for the Puget Oregonian on the Westside of the Mt. Hood National Forest. This species occurs in moist forests, such as mid to late-seral hemlock/sword fern associations, and it appears to be associated with hardwoods-particularly bigleaf maple.

All the proposed harvest units occur in mid-seral lodgepole pine/mixed conifer stands at elevations of 3800 feet and above. The stands are all in dry upland areas that contain no riparian habitat. Many of the stands have relatively open canopies and all do not contain damp understories. Large down logs are present, but are not in a "moist/rotting" condition. The understory vegetative component is unlike the typical areas where the mollusks have been found. The stands occur in the Pacific silver fir and mountain hemlock vegetative zones, not the western hemlock zone where the Columbia Oregonian and Puget Oregonian are expected to occur.

The evening fieldslug is found within meadow habitats and the Crater Lake tightcoil is found at mid to high-elevations adjacent to perennial wet areas. No known sites exist on the District for the evening fieldslug, but two exist for the Crater Lake tightcoil. There are no meadows or riparian areas that occur within or directly adjacent to the harvest units.

## 4.5.2.2 Other Rare or Uncommon Species

**Fringed myotis:** Although the fringed myotis bat is found in a wide variety of habitats throughout its range, they seem to prefer forested or riparian areas. Their nursery colonies and roost sites are established in caves, mines, and buildings. The species is thought to forage by picking up food items from shrubs or the ground. It consumes beetles, moths, harvestmen, crickets, craneflies, and spiders. No breeding or roosting sites are known to occur in project area. There is the potential for the project area to contain foraging habitat, although foraging usually occurs near the species' breeding and roosting sites. Species would only occur in area during dispersal or possibly foraging.

**Red-tree vole:** Habitat for this species is 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. The proposed harvest units are mid-seral stands that contain mostly small diameter trees. There are a few patches with larger legacy trees that would be retained in skips. The red-tree vole forages on Douglas-fir and needs this species in its habitat to exist. Due to lack of habitat, it is highly

unlikely a red-tree vole would be nesting in the project area. Surveys were not conducted for this species due to lack of habitat.

White-headed woodpecker, pigmy nuthatch, and flammulated owl: These three species are found generally in mature ponderosa pine habitat on the east side of the Cascades. The project area does not contain any ponderosa pine trees. No habitat present in project area for these species, therefore the standards and guidelines and management recommendations for these species do not apply.

**Black-backed woodpecker:** Habitat for this species is found in mixed conifer/ lodgepole pine stands in the higher elevations of the Cascade Range. Habitat does exist for this species within the project area. The Forest Plan states that 100 percent population potential for the black-backed woodpecker is 0.12 hard conifer snags per acre greater than 17 inches in diameter (or largest available).

**Great gray owl:** Potential habitat for the great gray owl is stands of large diameter trees for nesting located within close proximity to foraging sites such as meadows. None of the units proposed for harvest are providing either foraging or nesting habitat for the species.

**Canada lynx:** This species is not known or suspected to occur on the Mt. Hood National Forest.

**Bats:** Caves, mines, abandoned wooden bridges and buildings that could provide roost sites for bats are not present within the project area.

## 4.5.2.3 Forest Plan Standards and Guidelines

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

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

The action alternatives are consistent with the following standards and guidelines

FW-176	Biological Evaluations have been prepared.
FW-186	None of the proposed actions would occur within $\frac{1}{4}$ mile of an active peregrine falcon nest between April 1 and July $31^{st}$ .
Survey and Manage	The project is consistent with the applicable Survey and Manage standards and guidelines.

# 4.5.3 Snags and Down Wood

#### **Existing Situation**

There is a wide variation in the amount and sizes of course woody debris within and between units. Some of the stands have been affected by mountain pine beetle and currently have moderate to high levels of lodgepole pine snags and down woody debris. Sizes of this course woody debris generally are 15" diameter and smaller. It is likely that additional future mortality of lodgepole pine would result in an abundance of small snags and down woody debris.

Other stands are relatively healthy and have lower levels of snags and down wood. There is some large diameter coarse woody debris scattered throughout the project area.

The project area is primarily within the Pacific silver fir zone with some acreage in the mountain hemlock zone.

The primary and secondary cavity nesting species for the Pacific silver fir zone are: pileated woodpecker, northern flicker, hairy woodpecker, Williamson's sapsucker, red-breasted sapsucker, and the red-breasted nuthatch. Mid-seral stands in the project area in this zone have approximately 8 snags per acre greater than 15 inches in diameter. The 100% biological potential level is 4 snags per acre at 15" diameter and larger (Austin 1995). The 60% biological potential level is 2.4 snags per acre. The primary and secondary cavity nesting species for the mountain hemlock zone are: pileated woodpecker, northern flicker, hairy woodpecker, black-backed woodpecker, northern three-toed woodpecker, Williamson sapsucker, and red-breasted nuthatch. Mid-seral stands in the project area in this zone have approximately 3 snags per acre greater than 15 inches in diameter. The 100% biological potential level is 3.7 snags per acre at 15" diameter and larger (Austin 1995). The 60% biological potential level is 2.3 snags per acre.

Many species in the Pacific Northwest evolved to use large snags and logs that were historically abundant in the landscape. If snags and logs are lost, biodiversity can be affected and potentially cause a loss of some function in the landscape such as control of forest insects.

## 4.5.3.1 DecAID Advisor

DecAID is a planning tool intended to 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.

DecAID does not use the same process as the modeling of biological potential. There is not a direct relationship between the statistical summaries presented in DecAID and 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.

# 4.5.3.2 Snags and Down Wood Levels Compared to DecAID Data

All of the units are located within the habitat type identified in DecAID as the mixed montane conifer and vegetation condition of "small/medium trees." Within this type, the DecAID advisor identifies the 30%, 50%, and 80% tolerance levels for these mid-seral stands (small/medium trees). They are described in the following table.

Montane Mixed Conifer/Small-Med. Tree Habitat Type	30% Tolerance Level	50% Tolerance Level	80% Tolerance Level
Snags ≥10" DBH	10 per acre	16.6 per acre	32 per acre
Snags <u>&gt;</u> 20" DBH	2.7 per acre	4.2 per acre	9.5 per acre
Down Wood Cover ≥5"	2.5 percent	4 percent	8 percent
diameter	_	_	_

It is likely that most of the units within the Huckleberry Enhancement Project currently contain snag and down wood numbers at the 30% or greater tolerance level. Some areas affected by mountain pine beetle, may exceed the 50% level for the small snag category.

4.5.3.3 Elements of Proposal Analyzed - The following actions have the potential to affect snags and down logs. Since snags may be hazardous some of them may be felled adjacent to operations such as tree felling, landing use, skidding, road use, road construction, road repair, road closure and log haul. Existing down logs may be disturbed by yarding operations. Some aspects of the proposal are specifically designed to attempt to maintain snag dependent species and species that unitize down logs by the strategic placement of skips around snag and down wood patches as well as the placement of skid trails and landings. This can be found in design criteria 2 and 3.

#### **Direct and Indirect Effects –**

4.5.3.4 **Alternative A** – The stands would continue to provide the current levels of snags and down wood. The Forest Plan standard would continue to be met and DecAID coarse woody debris tolerance levels would range from 30 to over 50%.

The project area would continue to experience mortality of lodgepole pine. Snag generally less than 20" diameter would substantially increase in numbers in these stands. This would eventually create a subsequent increase in the down woody debris.

Other species of trees in these stands would also be expected to succumb to a certain level of mortality from damaging agents such as insects and diseases. Snag and down wood levels in the non-lodgepole pine stands would increase over time at varying levels. Mixed conifer stands have the potential to grow larger trees and therefore larger snags and down wood.

Widespread lodgepole pine mortality could increase the risk of a large intense wildfire.

#### 4.5.3.5 **Proposed Action**

Some snags are difficult to retain during logging and road construction because of their inherent instability and danger. It is likely that some snags would need to be cut down during harvest operations due to safety considerations and that some downed logs would be degraded through the process of logging.

Snags that are left standing after the timber sale would be more prone to wind damage and snow breakage than they would have been without thinning. There would likely be some loss of the remaining snags within 10 years after harvest. These would become down wood.

Design Criteria #2 would increase the likelihood that snags would be retained after timber harvest. It also addresses defective trees or those that have the elements of decay as described in the DecAID advisor. Hollow structures are created in living

trees by heartrot decay organisms over many years. These hollow structures in living trees provide especially valuable habitat for a variety of wildlife, including cavity users. Trees that have heartrot decay present may include features such as openings in the bole, broken boles with bayonet tops, large dead tops or branches, punk knots, flattened stem faces, old wounds on the bole, crooks in the bole signifying previous breakage, and the presence of fruiting bodies. Defective trees with deformities such as forked tops, broken tops, damaged and loose bark or brooms caused by mistletoe or rust can also provide important habitat for a number of species.

Logs existing on the forest floor would be retained. Prior to harvest, contract administrators would approve skid trail in areas that would avoid disturbing key concentrations of down logs or large individual down logs where possible. The harvesting operations would also add small woody debris of the size class of the cut trees to the site. This would include the retention of any snags that would be felled for safety reasons. Snags or green trees that fall down after the harvest operation would contribute to the down wood component of the future stand.

Currently tree sizes within the huckleberry enhancement area average 12 inches in diameter. The propose action would reduce the amount of natural selection that would have occurred through the process of stress and mortality. Some of the snags and downed logs that might have formed in the future from the death of the intermediate and suppressed trees would be removed through the timber harvest. As a result, the proposed action would delay the attainment of moderate-sized snags and down wood through natural process because of the reduction in density of the stands.

The potential for a mountain pine beetle outbreak would also be reduced, and subsequently the opportunity for concentrated areas of lodgepole pine snags. The proposed action would reduce this habitat component. However, there is an abundance of concentrations of lodgepole pine snags across the landscape, and it is expected to increase substantially with future mountain pine beetle outbreaks in the vicinity of the project.

The proposed action may result in some deduction of snags in the units. However, the treatment would leave the largest trees standing and growing and this would accelerate the growth and size of trees and would eventually provide larger snags in the long term. Some would eventually fall naturally to create large coarse woody debris as well.

4.5.3.6 **DecAID levels for snags and down wood:** Most stands meet at least the 30% tolerance level, while stands affected by the mountain pine beetle likely occur at the 50-80% tolerance level.

Leave trees damaged during the harvesting operation sometimes have the potential to become trees useful for wildlife species.
Tolerance levels would likely be reduced to 30% or below within units. Areas in skips should retain most of its snag and down woody debris component. Some skips would be placed around patches of snags. The project would not remove any existing coarse woody debris; although it would likely damage some of the pieces in decay class 3, 4, and 5, since the harvest method would be predominantly a ground-based system.

4.5.3.7 **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. A similar process was used as described in s. 4.4.10.2 with the exception that different analysis areas are used for snags that roughly align with drainages.

The Forest is developing a plan to designate road and trail routes for off-highway vehicles (OHV). Roads that are currently open would have hazard snags removed along their length. There may be some additional snags that could be felled if this area is selected as an OHV area.

The proposed Palomar pipeline includes an alternative route that parallels the power line. Some snags may be removed during the construction phase if this route is selected.

A distribution analysis compares the current condition to reference conditions as represented by the vegetation inventory distribution histograms in DecAID. The charts below represent data from the Oak Grove Fork Watershed for mixed montane conifer wildlife habitat type. While some of the units are just outside the Oak Grove Fork Watershed, the stands are similar and the charts are representative of the adjacent stands.









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 3.7 and 4 snags per acre, respectively.

The analysis of snag habitat within the snag analysis areas includes all past and present projects including the Huckleberry Enhancement Project. For purposes of this analysis, it is assumed some snags would need to be felled for safety reasons in the Huckleberry Enhancement project. Past experience and monitoring indicate that there would likely be some snags remaining afterwards. Many past timber sales have had projects to create snags afterwards.

Snag Analysis Areas	Total Acres	Snags/Ac. 15-21"	Snags/Ac. > 21"	Total Snags/Ac. Existing Condition	Stands Proposed for Treatment (Acres)	Action Alternatives Snags/Ac. ≥15" *
		Powe	er Line Burn	Project Area		
Peavine	7977	3.8	3.3	7.1	49	7.1
Stone Creek	5412	5.1	4.3	9.4	854	9.0
Upper Oak Grove	5148	4.0	4.3	8.3	38	8.3
Warm Springs	5050	3.9	4.8	8.7	281	8.6
		Ab	bott Burn Pr	oject Area		
Draw Creek	4483	4.1	3.2	7.3	365	7.1
Dinger Creek	3823	3.0	2.3	5.3	48	5.3
Cooper Creek	3973	3.8	2.9	6.7	297	6.5
Crater Creek	5615	4.0	3.1	7.1	280	7.0
Upper Salmon	5056	4.5	3.4	7.9	79	7.9

4.5.3.8 **Snag Habitat** (analysis areas that overlap Huckleberry Enhancement units)

\* Presumes 2.0 snags per acre greater than or equal to 15 inches diameter were lost in harvest units.

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.

#### 4.5.3.9 **Burning Option**

The option of prescribed burning would create an abundance of snags and down logs. Section 3.3.2 describes this option. Some existing snags would burn and fall down, but many more new snags would be created. Trees would be felled in advance of burning. They would be charred but would still provide some down log habitat.

# 4.5.3.9 Forest Plan Standards and Guidelines

Mt. Hood Forest Plan References

Forestwide Wildlife Standards and Guidelines – FW-215 to 240, page Four-74. **Northwest Forest Plan -** Matrix Standards and Guidelines - pages C-40 to 42.

# Snags and Wildlife Trees - Forest Plan standards and guidelines FW-215, FW-216, FW-234 & FW-235

The standard and guideline from the Forest Plan (FW-215) for harvest units is 60% of the full biological potential, which translates into 2.4 snags and wildlife trees per acre in the medium to large size class for the units within the pacific silver fir zone and 2.3 snags and wildlife trees per acre in the mountain hemlock zone.

Currently most of the trees are not large enough to produce snags of the desired size, (FW-234 describes 22 inches diameter as the minimum snag size) but FW-235 allows the retention of smaller trees if the treated stand is too young to have trees of that size. In these cases, snags and green leave trees retained should be representative of the largest size class present in the stand.

Past experience and monitoring indicate that there would likely be some snags remaining after harvest. Retained wildlife trees with the elements of wood decay and areas retained in skips would add to existing snags retained.

After implementation, the proposed action would have more than the 60% biological potential level.

FW-216 indicates that snags and wildlife trees at the landscape scale be at 40% of biological potential, which equates to about 1.5 in the pacific silver fir zone and 1.6 snags per acre in the mountain hemlock zone. The table in s. 4.5.3.8 shows that this level is being met across the landscape.

# Down Logs - Forest Plan standards and guidelines FW-219, FW-223, FW-225 & FW-226

FW-219 and FW-223 indicate that stands should have 6 logs per acre in decomposition class 1, 2, and 3 and that they should be at least 20 inches in diameter and greater than 20 feet in length. However, FW-225 and FW-226 indicate that

smaller size logs may be retained if the stand is too young to have 20 inch trees. In these, cases, logs representing the largest tree diameter class present in the stand should be retained. Design Criteria #3 would result in additional protection to down woody debris which would protect some of this habitat in the interim.

NFP C-40	The amount of down logs left would reflect the timing of stand			
	development cycles.			
FW-215,	60% of maximum biological potential is currently being met in the			
234 to 239	proposed harvest units.			
FW-216 to	40% of maximum biological potential is being maintained at the			
217	landscape level.			
FW 218	All primary cavity nesting species indigenous to the site would be			
	considered in the wildlife tree prescriptions.			
FW-219 &	An average of 6 logs per acre in decomposition classes 1, 2, and 3 and			
229	in the appropriate size class would be retained in the proposed harvest			
	units.			
FW-230 to	Snag and wildlife trees would be well distributed. No 10-acre area in a			
231	unit would be devoid of wildlife trees.			
FW - 232	The priority for wildlife tree retention would be Douglas-fir. Emphasis			
& 233	would be placed on retaining windfirm wildlife trees, such as western			
	red cedar within riparian areas.			

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

# 4.5.4 Deer and Elk Habitat (Management Indicator Species)

**Habitat Characteristics** – All the harvest units are located in summer range and affect thermal cover. Thermal cover is defined as a stand of coniferous trees at least 40 feet tall with an average crown cover of 70 percent or more. Optimal cover is found mainly in multi-storied mature and old-growth stands and would not be affected by this project. Elk herds exhibit a close association with riparian habitat in areas of gentle terrain and low road density. Forage is widely available 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 limiting factors for elk and deer.

High road densities lead to harassment of elk herds. Harassed elk move more often than elk left alone and use of habitat decreases as road density increases (Witmer 1985). Elk within or moving through areas of high open-road densities moved longer distances; several miles per day was not uncommon (Fiedler 1994).

4.5.4.1 **Elements of Proposal Analyzed -** 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 cover but would also increase forage availability. Activities that make noise may potentially affect deer

and elk. These actions would include thinning, landing creation, trees removed for skid trails, trees removed for road construction, and trees killed for snags and down wood. Other actions such as log haul, road reconstruction, road repair or road closures would not have a meaningful or measurable effect on habitat but would create noise disturbance.

# **Direct and Indirect Effects**

4.5.4.2 Alternative A – There would be no change to thermal cover. No cover would be lost and no forage would be gained in this alternative. With no action the stands would continue to provide forage at their current levels and road densities would remain unchanged from current conditions.

# 4.5.4.3 **Proposed Action**

The proposed thinning would remove any thermal cover currently present in the stands. This habitat would be downgraded to non-cover for deer and elk but there would be an increase in forage for deer and elk. The increase in forage would be caused by increased sunlight reaching the forest floor as a result of opening up the canopy. This forage created by the thinning would be moderate/high in quality due to wide-tree spacing of the residual trees. Opening up the canopy to this degree allows abundant sunlight to reach the forest floor, promoting the development of understory vegetation. Usually this vegetation consists of shrubs and sometimes grasses highly palatable to deer and elk.

The loss of thermal cover and increase in forage in the proposed harvest units could alter distribution of deer and elk use of the project area. Some of the forage gained would not occur close enough to cover for it to be utilized by deer and elk. Because thermal cover is not limiting, the project would likely increase the quality of deer and elk habitat in the area because of the increased forage provided in the treated stands.

4.5.4.4 **Disturbance -** The logging and road construction/reconstruction activities could potentially disturb animals that happen to be in the area at the time of implementation. Approximately 4.7 miles of temporary road construction and 1.4 miles of old temporary road reconstruction are proposed with this alternative. The health of individuals could be impacted if the disturbance occurs near active calving sites. Units 34 and 38 occur within a key summer range area that is considered important for fawning, calving, and rearing. Logging and associated activities would be restricted from April 1<sup>st</sup> to July 30<sup>th</sup>. Logging in the winter would not disturb animals in the vicinity of the huckleberry enhancement because they would not be present. However haul routes cross through winter range where animals may be present. Winter haul would only occur on approved backbone roads to minimize the effect to deer and elk.

4.5.4.5 **Open-Road Density** – Approximately 4.7 miles of new temporary road construction and 1.4 miles of old existing temporary roads would be reopened. These roads would not be open to the public and the only disturbance occurring as a result of these roads being opened is their use by the loggers, truck drivers and associated Forest Service personnel required to accomplish the logging operations. After logging, the temporary roads that were constructed or opened would be closed and decommissioned and open-road density would be back to the current level. There would be no increase in the long-term harassment of deer and elk with this alternative; effects would be short-term only. There would be no increase in the permanent roads open to the public, and therefore no increase in open-road density with this alternative.

Roads in this area are used for forest management, recreational driving, hunting and fire suppression.

# 4.5.4.6 Cumulative Effects

A similar process was used as described in s. 4.4.10.2 with the exception that different analysis areas are used for thermal cover that roughly align with drainages.

The Forest is developing a plan to designate road and trail routes for off-highway vehicles (OHV). There would be noise and disturbance if this area is selected as an OHV area.

The proposed Palomar pipeline includes an alternative route that parallels the power line. It would remove 20 acres of thermal cover.

There would be a measurable change in thermal cover within the deer and elk analysis areas. Since the proposed project would have no effect on optimal cover, no cumulative effects would occur to this deer and elk habitat type. The proposed project would only have very minor impacts on disturbance/ harassment issues to deer and elk and neutral or beneficial effects on open-road densities.

The land area and the time scale for a cumulative effect analysis varies by resource. In terms of the "space" criteria, the effects to thermal cover within the deer and elk analysis areas are used for a cumulative effects analysis because the project would have a measurable direct effect on the amount of thermal cover available in the analysis area. In terms of the "time" criteria, stands that consist of coniferous trees 40 feet or more tall with an average crown cover of 70% or more are considered thermal cover for elk. As plantations grow, these conditions would be met at an age of approximately 25 years. Stands older than this would be considered functioning thermal cover and would not enter into this analysis unless their canopy cover has been reduced.

Analysis Area	Total Thermal Cover	Acres of Thermal	Total Post-Harvest Thermal	
Existing Condition		Cover Lost in	Cover (acres and percent)	
	(acres and percent)	Proposed Action		
Upper Salmon	4662 acres (92%)	63 acres	4,599 acres (91%)	
Draw Creek	3616 acres (81%)	365 acres	3,251 acres (73%)	
Crater Creek	3461 acres (74%)	55 acres	3,406 acres (73%)	
Cooper Creek	2918 acres (73%)	264 acres	2,654 acres (67%)	
Dinger Creek	2219 acres (58%)	43 acres	2,176 acres (57%)	
Sheep Spring B11	2396 acres (71%)	87 acres	2,309 acres (69%)	
Stone Creek	3959 acres (66%)	95 acres	3,864 acres (64%)	
Summit Lake	2612 acres (85%)	345 acres	2.267 acres (74%)	
Clack Lake	1757 acres (47%)	25 acres	1,732 acres (46%)	
Dry Creek	1966 acres (65%)	146 acres	1,820 acres (60%)	

4.5.4.7 **Total Thermal Cover** 

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

For deer and elk in this area, forage availability is more of a limiting factor than thermal cover. Because of a decline in clearcutting in recent years and because the trees in young plantations are growing rapidly shading out forage, 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 (USDA 2004c, p. 72). Forage in the analysis areas is declining by approximately 1% per year. This project has the potential to add quality forage in the project areas, in the thinned stands as well as the landings and skid roads. However this would not be sufficient to counter the landscape's trend of declining forage.

# 4.5.4.8 Forest Plan Standards and Guidelines

# Mt. Hood Forest Plan References

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

The Forest Plan recognizes different categories of summer and winter range: 1/ The entire area used by deer and elk in the winter is often referred to as "inventoried" winter range. 2/ The rest of the Forest is often referred to as "inventoried" summer range. 3/ Special portions of the winter range are referred to as "designated" winter range and these areas have a land allocation (B10), and 4/ Special portions of the summer range are referred to as "designated" summer range are referred to as "designated" summer range and these areas have a land allocation (B10). Standards and guidelines for B10 and B11 only apply to those land allocations while the forest-wide standards and guidelines apply across all portions of the inventoried range.

The Huckleberry Enhancement project overlaps designated summer range (B11) and inventoried summer range. Forest Plan Standard and Guideline FW-205 indicates that 30% of the analysis area should be total thermal cover. Section 4.5.4.7 indicates that all of the analysis areas would be well above 30%.

There would be no increases in open road densities with this proposed project. The proposed action does not add to the open-road network therefore FW-208 is not applicable.

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. This standard and guideline is not applicable at the project			
	scale.			
FW-189	Natural meadows and openings are being protected.			
FW-190	Logging slash would be yarded to landings. Experience in similar			
	completed thinning has shown that any remaining slash is pressed down			
	by snow and deteriorates quickly. The action alternatives would not			
	result in levels of slash that would impede deer or elk movements.			
FW-191	Thinning design has incorporated skips.			
FW-192 &	This project does not have an objective of creating forage areas.			
193				
FW-194 to	Not applicable. The proposed action does not involve regeneration			
197	harvest.			
FW-198 &	Forage would temporarily be increased. Grass and other plants seeded			
199	for erosion control would also enhance forage quality.			
FW-200 &	Not applicable			
201				
FW-202 to	See detailed analysis above where applicable.			
212				

# 4.5.5 Pine Marten & Pileated Woodpecker (Management Indicator Species(MIS))

The status and condition of management indicator species are presumed to represent the status and condition of many other species. This EA focuses on 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 for 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).

**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 units are mid-seral stands and do not contain mature forest habitats, large snags or large down logs. They do provide marginal habitat particularly in the stands with minimal lodgepole pine.

# **Direct and Indirect Effects**

# Alternative A

There would be no affect to pine marten or pileated woodpecker.

### Alternative B

The proposed treatments would remove potential nesting habitat for the pine marten and pileated woodpecker. This removal of habitat would occur as a result of opening up the canopy to below 40%; 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 habitat could potentially adversely affect the local pine marten and pileated woodpecker population in several ways. These include:

- Immediate displacement of the animals,
- Concentration of displaced animals into smaller, fragmented areas of suitable nesting habitat that may already be occupied,
- Increased competition for suitable nest sites,
- Diminished reproductive success,
- Diminished population due to declines in productivity and recruitment, and
- Reduction of future nesting opportunities.

However, the overall effect to the pine marten and pileated woodpecker population is not expected to be substantial. Only the predominantly mixed conifer stands have potential habitat for the species; the lodgepole pine stands are not considered habitat for the species. Only a small portion of the landscape's overall habitat for the species would be removed.

# Forest Plan Standards and Guidelines

### Mt. Hood Forest Plan References

Management Area Standards and Guidelines - B5-001-B5-042, page Four-242

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.

# 4.5.6 Migratory Birds

A Memorandum of Understanding (MOU) between the USDA-Forest Service and USDI – Fish and Wildlife Service has been developed to promote the conservation of migratory birds (USDA-USDI 2008). 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 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 land.

**Existing Situation** – Close to 30 species of migratory birds occur within project area, 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.

# **Direct and Indirect Effects**

**No Action -** There would be no alteration of habitat for migratory birds. There would be no benefits to species that prefer thinned stands or negative effects to species that prefer un-thinned stands.

**Proposed Action** – Research has demonstrated that thinning enhances habitat for a number of migratory species and provides habitat for some species that are rare or absent in un-thinned stands. However, some species of migratory songbirds have been shown to decline following thinning. The effects of thinning in these stands would most likely have a combination of positive, neutral, and negative impacts on migratory bird use within the stands depending on which species are present. The following migratory species present in the watershed may benefit from thinning: Hammond's flycatcher, warbling vireo and western tanager. The following migratory species may be negatively impacted by thinning: hermit warbler, Pacific slope flycatcher, black-throated warbler and Swainson's thrush. This project covers only a small portion of the migratory songbirds breeding habitat on the Forest. Since these types of mid-seral stands on the Forest are relatively common, any loss of habitat

would not result in any measurable population change of the species, only a redistribution of the individuals affected.

# 4.6 FISHERIES AND WATER QUALITY

The Huckleberry Enhancement Project lies in three watersheds: Salmon River, Oak Grove Fork Clackamas River and Warm Springs River.

These rivers originate from rainwater and snowmelt on the crest of the Cascades. Annual precipitation can be up to 100 inches in the form of rain and snow. The streams in the vicinity of the project in the Oak Grove Fork watershed are Peavine Creek, Stone Creek, Dinger Creek, Copper Creek and Crater Creek. The streams in the vicinity of the project in the Salmon River watershed are the Upper Salmon River and Draw Creek. The stream in the vicinity of the project in the Warm Springs watershed is Dry Creek.

The Salmon River is classified as Tier I, Key Watershed in the Northwest Forest Plan. Tier I watersheds have been identified as crucial refugia for at-risk fish species. A narrow portion of the Oak Grove Fork watershed along the river is also a Tier I Key Watershed but this not near the propose huckleberry enhancement.

These watersheds support populations of spring Chinook salmon, winter steelhead and coho salmon in their lower reaches. Stone Creek and the upper reaches of the Salmon and Oak Fork do not have anadromous fish present due to barriers existing downstream. They do support native resident cutthroat trout as well as small populations of introduced trout species. The portion of the Warm Springs River located downstream on the Forest and on the adjacent Warm Springs Indian Reservation is listed as Critical Habitat for Middle Columbia Steelhead.

For this proposal, the following actions have the potential to affect water quality and aquatic species or their habitats: timber felling, road construction, log yarding, log haul, and road obliteration. The project would not occur in riparian reserves.

All of project/action area is located more than two miles from any anadromous habitat, and more than 320 feet from any fish bearing stream. Therefore, any potential direct or indirect effects to aquatic species from implementing this project would not likely be measurable.

# 4.6.1 Direct and Indirect Effects

#### 4.6.1.1 No Action

There would be no short-term effects to water quality or peak flows, since there would be no ground disturbance or loss of forest canopy.

#### **Proposed Action**

**4.6.1.2** Sediment from Road Construction, Road Obliteration, and Road Maintenance Activities: Road construction and road maintenance activities have the potential to indirectly introduce fine sediment into stream channels. Road maintenance prior to log haul would help maintain the design drainage of the road surface and ditches. While this may result in short-term sediment input, keeping the road in a well maintained condition reduces the potential for larger sediment inputs that could occur on unmaintained roads.

The proposed action would re-use approximately 1.4 miles old temporary roads, and construct approximately 4.7 miles of new temporary roads. These roads would be obliterated after project completion.

Maintenance of the existing system roads includes the placement of new aggregate surfacing where necessary, blading, brushing out encroaching vegetation, removing berms, and ditch and culvert inlet cleanout where needed. Aggregate road surfacing and asphalt paving minimizes the amount of fine sediment from road surfaces entering streams following log haul, especially during and following rainfall events.

Road-related ground disturbing activities have been designed to minimize the risk of sediment being transported to streams from erosion or surface run-off. Road construction, repair and maintenance would occur in the dry season between June 1 and October 31.

The proposed temporary roads are not in riparian reserves, have no stream crossings and have no hydrologic link to streams. As a result, there would be a very low probability of any sediment from temporary road surfaces reaching streams. These roads would be constructed along ridgetops, benches or gentle slopes, where they would not cause an increase in the stream drainage network. Because of the distance of any proposed new or existing temporary roads to any live water source, and the fact that these roads do not cross any perennial streams, vegetative buffers would act as an effective barrier to any sediment being transported into stream channels by surface erosion or runoff.

All temporary roads used would be obliterated and revegetated directly following completion of harvest operations to help reduce compaction, increase infiltration rates, minimize surface erosion and re-establish natural drainage patterns.

While there is a possibility of sediment entering streams due to these activities, most road-related sediment would be trapped and stored in the ditches or on the forest floor below cross drains. In the event that sediment was to reach stream channels, most fine particles would likely be trapped and stored in the small tributary streams before they are able to reach any habitat where ESA listed fish species are found. Any impacts from the minimal amount of sediment generated during these activities would be for a short-term duration, and undetectable at a subwatershed (6<sup>th</sup> field) or

watershed (5<sup>th</sup> field) scale. The probability of any impacts to water quality or fisheries resources caused by sedimentation due to road construction, reconstruction, maintenance, or road obliteration, is extremely low.

No measureable direct effect to water quality is expected to be associated with road maintenance, improvement, or temporary road construction or obliteration.

**4.6.1.3** Sediment from harvest activities: Ground-based skidding has the potential to impact water quality. Any erosion produced from ground-based skidding would travel short distances before being trapped by duff, woody materials and other obstructions. The probability of overland surface runoff on uncompacted soil surfaces is low for the soils in the project planning area. The buffer created by riparian reserves and the gentle terrain would act as an effective barrier to any soil particles being transported into stream channels by surface erosion or run-off and would minimize the risk of any water quality impacts. Logging over snow would result in minimal ground disturbance.

The probability that sediment from logging would enter any stream is low.

- **4.6.1.4** Sediment from log haul: Log hauling along aggregate surface or native 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 because most of the haul routes are asphalt or durable crushed rock. All native surfaced roads along the haul route are along ridge tops or gentle terrain, and have no hydrological connection to any streams. Road use however would be restricted to periods when road related runoff is not likely to occur and as such, little sediment is expected to leave the road bed and enter streams while haul is occurring.
- **4.6.1.5 Water Temperature:** There are no perennial streams in the vicinity of the project. Riparian reserves would provide shade and no change in stream temperature is expected.

# 4.6.1.6 Burning Option

Public comment suggested the consideration of burning instead of logging to enhance huckleberries. The primary impact of this option would be in the construction of fire lines, some of which would parallel streams approximately 160 feet away. Fire lines would be a potential source of sediment. This option would also have some risk of escaped fire crossing into and damaging riparian reserves.

**4.6.2** Cumulative Effects and Peak Flows: Cumulative effects to fisheries, aquatic resources and water quality generally focus on changes in peak stream flows, fine sediment input into streams and the loss of stream shading.

The Aggregate Recovery Percentage (ARP) index is often used to estimate the potential for adverse cumulative effects related to past, present and foreseeable future actions. It is also a tool to determine compliance with Forest Plan standards and guidelines pertaining to cumulative watershed effects (Forest Plan, FW-061 to FW-065). By measuring the percent of an area in a hydrologically recovered condition, the ARP model evaluates the risk of increased peak flows from rain-on-snow events. In stands with little or no forest canopy cover within the transient snow zone, more snow accumulates than beneath a partially or fully hydrologically recovered forest. The 4,200-foot elevation line is generally considered the threshold for the transient snow zone in this area. Approximately half of the proposed huckleberry treatment areas are above 4,200 feet. Areas above this would not likely affect peak flows. Stand alterations below the transient snow zone could result in more runoff from nonhydrologically recovered stands when there is rapid melting during rain-on-snow events (Christner 1982). The ARP model ranks recovery from 0 to 100 with 100 being fully recovered. The Forest Plan often refers to watershed impact area or threshold of concern which are the inverse of ARP with 0 being fully recovered.

Stands that have trees greater than 8 inches in diameter and over 70% canopy cover are considered fully recovered in terms of hydrology (Forest Plan, FW-064). In the ARP model, stand age is used to determine whether stands meet these criteria. Forest hydrologists have developed recovery curves to model the changes to hydrology as young stands grow as well as the effects to hydrology for projects such as thinning that remove only a portion of the trees in a stand.

The stands proposed for thinning are currently hydrologically recovered. Because there has been relatively little regeneration harvest in the past two decades, all of the drainages are currently between 85 and 90% recovered and are steadily moving toward full hydrologic recovery. The ARP values are increasing by approximately 1% per year in these watersheds as young plantations grow.

The effect of changes in estimated hydrologic recovery (ARP) are not measurable acre by acre or unit by unit, and therefore direct effects to peak flows or stream channel stability, if any, are not predicted with this model. The units of this project are dispersed over a wide landscape; they overlap parts of nine drainages in three different 5<sup>th</sup> field watersheds. The ARP analysis includes all of the huckleberry enhancement units and road construction even though some of them are above the rain-on-snow threshold of 4,200 feet. It also includes all past timber harvest, road construction, and other openings such as the power line and the proposed Palomar pipe line. Of the nine drainages, only four would have a change in ARP greater than 1%; Stone Creek, Draw Creek, Cooper Creek and Crater Creek. With the proposed action these drainages would change by approximately 2%. Since the drainages are

currently at 85 to 90% recovered, it is very unlikely that the proposed huckleberry enhancement activities would cause stream channel instability or increases in peak flows during rain-on-snow events. The model also shows that after treatment, it would take approximately 2 years for the growth of plantations in the drainages to erase the 2% dip caused by the proposed action. Effects to hydrology in terms of peak flow changes, if any, would not be considered meaningful or measurable.

Cumulative effects on water temperature or sediment are not expected because of the protection provided by riparian reserves.

# 4.6.3 Forest Plan goals, standards and guidelines

#### **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

### 4.6.3.1 Aquatic Conservation Strategy

The Aquatic Conservation Strategy of the Northwest Forest Plan was developed to restore and maintain the ecological health of watersheds and aquatic ecosystems. Management actions incorporate the objectives of the Aquatic Conservation Strategy which are elaborated on page B-11 of the Northwest Forest Plan. The objectives are to maintain and restore nine key elements of watershed and aquatic ecosystems. There are several indicators that make up the elements of the Aquatic Conservation Strategy objectives; they are evaluated to determine if the project would restore, maintain, or degrade aquatic resources.

The following table displays the Aquatic Conservation Strategy objectives and the indicators that are used for each objective. All of the indicators that are checked for a particular objective should be evaluated together to determine whether the action maintains or enhances the specific Aquatic Conservation Strategy objective.

	Aquatic Conservation Strategy Objectives								
Indicators	#1	#2	#3	#4	#5	#6	#7	#8	#9
Temperature		Х		Х				X	Х
Sediment				Х	Х	х		х	х
Chemical Contamination				х				x	х
Physical Barriers	Х	Х						х	Х
Substrate			Х		Х	Х			Х
Large Woody Debris			Х					Х	Х
Pool Frequency			Х						Х
Pool Quality			Х						Х
Off-Channel Habitat	Х	Х	Х						Х
Refugia	Х	Х						х	Х
Width/Depth Ratio			Х					х	Х
Streambank Condition			Х			Х		х	Х
Floodplain Connectivity	Х	Х	Х				Х	Х	Х
Peak/base Flows					Х	Х	Х		
Drainage Network Increase					x	x	x		
Riparian Reserves	Х	Х	Х	X	Х	Х		Х	Х

The following is a summary of the nine Aquatic Conservation Strategy objectives and how the proposed action would influence them:

1. **Distribution, Diversity and Complexity of Watershed and Landscape-Scale Features:** This project would meet this objective because of the protection that Riparian Reserves provide. The project would avoid Riparian Reserves. The project would have no new stream crossings.

- 2. **Spatial and Temporal Connectivity Within and Between Watersheds:** This project would meet this objective because of the protection that Riparian Reserves provide. Stream temperature would be maintained.
- 3. **Physical Integrity of Aquatic Systems:** This project would meet this objective because of the protection that Riparian Reserves provide. Design criteria #5 &7 would minimize erosion. The project would not alter shorelines, banks or bottom configurations.
- 4. Water Quality: This project would meet this objective through design criteria and the protection provided by Riparian Reserves. Stream temperature would be maintained. Riparian Reserves also provide a place for entrapment and deposition of moving soil particles to minimize sedimentation. Design criteria #5 &7 would minimize erosion.
- 5. Sediment Regimes: This project would meet this objective through design criteria and the protection provided by Riparian Reserves. Riparian Reserves also provide a place for entrapment and deposition of moving soil particles to minimize sedimentation. Design criteria #5 &7 would minimize erosion.
- 6. **In-Stream Flows:** This project would maintain hydrologic recovery well above the levels identified in the Forest Plan. There would be no measurable change in peak flow.
- 7. **Timing, Variability and Duration of Floodplain Inundation:** This project would meet this objective because of the protection that Riparian Reserves provide. This project would maintain hydrologic recovery well above the levels identified in the Forest Plan. There would be no measurable change in peak flow. Meadows and areas with high water tables are excluded from units.
- 8. Species Composition and Structural Diversity of Plant Communities in Riparian Areas and Wetlands: This project would meet this objective through protection provided by Riparian Reserves.
- 9. Well-Distributed Populations of Native Riparian-Dependent Species: This project would meet this objective through protection provided by Riparian Reserves.

# 4.6.3.2 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. Salmon River is a key watershed. The project would not build any new permanent roads and several miles have already been decommissioned in the key watershed.

### 4.6.3.3 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 2004).

There are no Oregon State Department of Environmental Quality 303d listed streams in the project area. The Salmon River, downstream of a portion of the project area was on the 303d list due to high water temperatures but it has been removed from the list because there is a Total Maximum Daily Load (TMDL) plan in place to reduce water temperature. The Forest's strategy for complying with the TMDL is implementing the standards and guidelines for riparian reserves. Project design criteria would ensure that no water temperature increases occur in the intermittent streams that are found in the project area: the project is consistent with the Clean Water Act.

# 4.6.3.5 Other Standards and Guidelines - FW-054 to FW-079, FW-080 to FW-136, FW-137 to FW-147, and B7-001 to B7-070.

The project is consistent with these standards and guidelines. Project design criteria would provide protection to fisheries and riparian dependent resources. 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.

#### 4.6.4 Special Status Species (Aquatic)

Special Status Species are those plant and animal species for which population viability is a concern. Special Status aquatic species that occur on the Forest include:

#### Interior Redband Trout (Oncorhynchus mykiss spp.)

Redband trout occur in streams flowing east from the crest of the Cascades including the Warm Springs watershed.

#### Columbia Dusky Snail (Lyogyrus n. sp. 1)

This species of aquatic mollusks has a very sporadic distribution in the central and eastern Columbia Gorge, Washington and Oregon. Known sites on the Mt. Hood National Forest occur in Clackamas, Multnomah, and Hood River counties. Lyogyrus species have been identified in the Upper Clackamas, Lower Clackamas, and Oak Grove Fork watersheds. Their habitat consists of cold, well-oxygenated springs, which do not occur in the action area.

#### Barren Juga (Juga hemphilli hemphilli)

Habitat for the barren juga is low elevation; cold, pure, well-oxygenated water in springs and small-medium streams. The project site is not adjacent to or likely to impact any springs or spring outflows.

#### Purple-lipped Juga (Juga hemphilli maupinensis)

Habitat for the purple-lipped juga is low elevation; cold, pure, well-oxygenated water in large streams. The project site is not adjacent to or likely to impact any springs or spring outflows.

#### Scott's Apatanian Caddisfly (Allomyia scotti)

Habitat for the Scott's apatanian caddisfly larvae is low to high elevation; cold, pure, well-oxygenated water in springs, and small creeks. The project site is not adjacent to or likely to impact any springs or spring outflows.

The decision to conduct surveys for all special status species lies with the line officer based on site-specific recommendations from resource specialists. In making such determination, the line officer considered 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. Surveys for special status species would not be conducted as part of this project, even though some species may occur in the watershed. 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 aquatic species. Anticipated effects of implementing the proposed action would not significantly affect habitat or species persistence. For those species that are on the Regional Forester's Sensitive Species List, the effects determination would be **"No Impact"**.

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

# 4.6.5.1 Designated Critical Habitat

Critical habitat exists downstream in the affected watersheds for lower Columbia River steelhead, lower Columbia River chinook, upper Willamette River chinook, Columbia River bull trout, lower Columbia River coho salmon and middle Columbia River steelhead. The proposed action warrants a **"No Effect"** determination for these species. There would be no direct or indirect effects to any listed or proposed fish or their habitat within or outside of the designated action area. This effects determination is based on the following factors:

- The project is located outside of Riparian Reserves on gentle terrain. There is a very low probability that sediment would be transported into downstream reaches where species occur.
- The project is several miles from any occurrence of upper Willamette River chinook, lower Columbia River steelhead, or lower Columbia River coho salmon.
- The project is located over two miles from any occurrence of middle Columbia River steelhead.
- Lower Columbia River chinook occur over 35 miles downstream of the project area in the lower Clackamas River below River Mill Dam.

# 4.6.5.2 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. The proposed project is located several miles above any habitat that could be utilized by these species. Implementation of the project would have **No Effect** on essential fish habitat for chinook or coho salmon. The proposed project would not have any effect on water or substrate essential to the life history of coho or chinook salmon that occur within any basin on the Mt. Hood National Forest.

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.

Based on the **No Effect** determination of this project proposal, consultation with USFW and NOAA Fisheries is not required.

# 4.7 SOILS

### 4.7.1 Introduction

Logging has not occurred within the proposed treatment stands.

The productivity and health of entire plant communities depend on the maintenance of healthy soils. The Mount Hood National Forest Soil Resource Inventory (SRI), (Howes, 1979), contains a general map of the soils associated with landforms in the analysis area. Each soil map unit (number) has been assessed for many risks and hazards called management ratings (e.g. erosion risk, compaction hazard, etc.). The SRI is most useful as an initial broad-scale planning tool to identify and display maps of possible soil concerns or sensitive areas. Interpretations are based on observations of soil characteristics at sites thought to best represent the entire soil mapping unit. Because of the scale of the SRI (1 inch per mile), soil properties can vary significantly within a mapping unit and on-site investigations are often required to refine or modify interpretations. Qualified soil scientists adjust management interpretations to reflect on the ground conditions and provide resolution to the soil map units at a site-specific scale.

# 4.7.1.1 Methodology

A five-step methodology was used to gather data needed for this effects analysis. In addition, previous field experience, personal observation and knowledge of how soils respond to the proposed types of management actions were used to predict impacts.

*Review of existing data* involved interpretation of 1974, 1995, and 2004 aerial photos, topographic maps, and the SRI.

*Revised soil mapping* - Representative stands were visited for field evaluation and validation of SRI soil mapping. Appropriate map changes were made to reflect field observations. With updated and validated soil mapping, pertinent management interpretations should be more accurate and therefore provide high confidence when determining levels of risk.

*Assessment of existing and potential soil disturbance condition* - Representative stands proposed for treatment were visited during the summer and fall of 2009. The stands were assessed in the field for the percentage of area with existing soil disturbance. The degree of impact from over-snow logging was observed in the adjacent Summit Thin unit, a recent huckleberry enhancement project. Impact from summer logging was observed on adjacent units of the same soil types found in the treatment units.

Assessment of slope stability condition within the planning area was accomplished by a review of aerial photos, the landslide risk layer on GIS, and a discussion with the forest geologist. Landslides are not a concern in this analysis area, so further analysis was not pursued.

*Areas of concern* - specific soil concerns were checked, such as proximity of logging to riparian areas, to soils with high water tables, and to unsuitable ground due to high soil rock content.

# 4.7.1.2 Measures

For this analysis the following measures are used to assess impacts:

#### Erosion

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 occurs when runoff from bare areas carries soil particles to water bodies, where it becomes sediment. Sediment is also addressed in the Water Quality and Fisheries section. This hazard rating is based upon bare surface soil properties that affect detachability, such as soil texture, slope, etc. Slight erosion risk soils that are compacted and bare can become erosive even on gentle slopes. Conversely, erosive soils occurring on steeper slopes may be stable for decades because of sufficient protective groundcover (tree needles, leaves, wood, rocks, vegetation, etc.).

# Soil Disturbance

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.

# **Organic Matter**

Soil fertility and soil biological systems would properly function if certain components are present, such as appropriate levels of organic matter and coarse woody debris. Poor or non-functioning soil biological systems may lead to difficulties in revegetation efforts, or decline in existing desirable vegetation. Soil biology involves complex interactions occurring between organisms and their soil habitats, including physical and chemical characteristics.

### 4.7.1.3 Analysis Area

The analysis areas for soil resources for direct, indirect and cumulative effects are the boundaries of the units proposed for thinning. These are appropriate boundaries because actions outside the unit boundaries and adjacent areas would have little or no affect to soil productivity within the units, and the actions within and adjacent to the unit boundaries would have little or no affect to soil productivity elsewhere.

# 4.7.1.4 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 of logs, the use of harvesters (mechanical tree fellers), temporary road and landing construction, burning of logging debris on landings. Some actions are specifically designed to benefit soil productivity including over-snow logging and the obliteration of temporary roads and landings.

The analysis also considers restorative actions and the design criteria and Best Management Practices (BMPs) that minimize impact. For example: existing roads would be reused where feasible, over-snow logging would be used where feasible, equipment would be restricted to appropriate slopes, and erosion control methods such as water bars, seed, fertilizer, and mulch would be used. Refer to section 2.3.5 for details.

#### 4.7.1.5 **Physiographic Factors**

The maritime influenced climate of the area is typified by warm, but rarely hot summers and cool winters. Persistent freezing temperatures and winter snowpack are common. All the proposed units are located between 3,800 and 4,400 feet in elevation. Estimated average annual precipitation is 70 inches falling in the form of rain, snow, or rain-on-snow. Most of the precipitation falls during the fall and winter. Summer rainfall is light (Howes 1979).

In general, landforms in the project area are typical of terrain shaped by the alpine glaciers that occupied upper mountain slopes during the last ice age. The forested topography is typified by broad ridges, and gentle to moderately sloping upland hillslopes that are lightly dissected and have generally rounded shapes.

#### 4.7.1.6 Soil Characteristics

Summary of the major soil types in the analysis area and associated management interpretations from the SRI.

	Soil Map	Acres of proposed treatment within	Compaction	Erosion Risk			
	Unit	Soil Mapping Unit	Hazard	Surface	Subsurface		
Gla	icial deposits	: < 30% slope					
	304	1,499	Low – Moderate	Slight	Low – Moderate		
	320	1,010	Moderate	Slight	Moderate		
Gla	icial deposits	: 30 to 60% slope					
	305	87	Low	Slight-Moderate	Moderate		
	321,322	25	Low-Moderate	Moderate	Moderate - High		
	337	11	Moderate	Moderate	Moderate - High		

# 4.7.2 Direct, Indirect and Cumulative Effects

The current condition described in the analysis below incorporates all past actions that have occurred within the analysis areas which correspond to the proposed thinning unit boundaries.

# 4.7.2.1 **EROSION**

#### **Existing Condition**

On glacial soils with gentle slopes, surface erosion potential is slight and subsoil erosion potential is moderate. On steeper slopes, surface erosion potential is moderate, and subsoil potential is moderate to high. Existing surface erosion is mainly confined to exposed soil on unpaved road surfaces, road cutbanks, road ditches, and cutbanks.

#### **Direct and Indirect 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 occurs when runoff from bare areas carries soil particles to water bodies, where it becomes sediment.

#### **No Action**

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

#### **Proposed Action**

All thinning units would have a reduction in effective ground cover. Erosion would

not occur where duff and other effective ground cover is retained. Therefore, practices which limit the amount of soil exposure, or which re-establish ground cover after soil is exposed, would result in less erosion. Ground-based systems working over a snow-pack result in a lower amount of ground exposure than one operating without a cushion of snow. Units that are prescribed for huckleberry treatments generally have gentle to moderate slopes, so even if the potential for erosion may be high, eroding materials would not move far before redeposition occurs. Design criteria and BMPs would result in a low potential for sediment to be delivered to streams. Low slopes, operating over an adequate snowpack, use of designated skidtrails, and establishing effective ground cover by applying seed, fertilizer, and straw mulch on the disturbed soils would aid in minimizing erosion.

### 4.7.2.2 SOIL DISTURBANCE

Soil disturbance, such as soil compaction, soil displacement and 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.

#### **Existing Condition**

All areas were burned by wildfire in the early 1900's. None of the proposed treatment units have been logged. The extent of detrimental soil condition is confined primarily to specified and temporary roads, and their adjacent cut and fillslopes.

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

#### **No Action**

Percent disturbed soil condition would remain the same at less than 1%.

#### **Proposed Action**

The cumulative effect of all aspects of the proposed action would result in approximately 3% in disturbed soil condition while operating over snow compared to approximately 9% if logged in the summer.

# 4.7.2.3 ORGANIC MATTER

#### **Existing Condition**

Duff layers are relatively thin, presumably due to the past wildfire history, and range from 0.5 to 3 inches. Generally there is a lack of course woody debris (CWD) on the forest floor in most units also presumably due to the past wildfire history. These

levels are relatively low compared to most westside mature forests but they are very typical of mid-seral forests that have grown up after repeated wildfires. Repeated wildfires are evidenced by the lack of legacy snags or large down logs. Stands that have repeatedly burned and have thin duff and few down logs have lower inherent productivity.

# **Direct and Indirect Effects**

### **No Action**

Forest organic litter input, organic decomposition rates, duff layer development and soil fauna and microbe activity would continue as they are. Organic matter decomposition and nutrient cycling is influenced substantially by temperature and moisture. Organic materials would be subject to natural disturbances such as windthrow, insect outbreaks, fire, and natural climatic change.

### **Proposed Action**

Logs existing on the forest floor would be retained. Skips would be located in areas that would maximize retention of existing down wood. The harvesting operations would also add small woody debris of the size class of the cut trees to the site. This would include the retention of branches, broken logs and any snags that would be felled for safety reasons.

Soil microbial populations would likely be reduced initially in areas of exposed or burned soils until soil organic matter and litter layers build back up. Leaving some slash and needles where trees are felled should help contribute to carbon and nutrient levels.

Duff disturbance would be minimized where over-the-snow ground based yarding occurs. Approximately 15 tons per acre of dead and down woody material would likely be retained.

# 4.7.2.4 Burning Option

A public comment suggested burning to achieve huckleberry enhancement. If the units were burned there would be impacts to soils.

Bare soil would be exposed as vegetation, down logs, and duff layers are consumed by the prescribed underburn. An estimated 920 acres of mineral soil would be exposed, and have an increased erosion potential as a result of the fire. Disturbed areas, particularly where slopes are greater than 20%, would be potential chronic sources of sediment until they are revegetated successfully.

While there would be less disturbance from logging and road construction, there would be the impact of constructed fire lines.

A net increase of approximately 9% in disturbed soil condition is predicted where soils are severely burned, or firelines and fire breaks are constructed to protect adjacent stands. Restoration of firelines and fire breaks by subsoiling and revegetation would initiate recovery of productivity, but is not expected to return the soil to its original condition and productivity.

Fire consumption of the litter and duff layers may exceed 50% of natural depths over a large portion of the treatment area.

# 4.7.3 Forest Plan 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-016, page Four-46 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-24	Minimization of rutting would be achieved through the BT6.6 and CT6.6 or similar provisions in the contract.		
FW-25	Ground cover would be maintained at the prescribed levels.		
FW-28 to 30	Not applicable.		
FW-31 to 34	Woody debris would be left on site including existing down logs and		
	branches and trees felled to create coarse woody debris.		
FW-037	Many aspects of the project include design features that limit		
	disturbance to the soil's organic horizon.		
FW-038	The option of burning may consume greater than 50% of the natural		
	depth of litter and mulch.		

# 4.7.3.1 Exceptions

An exception to Forest Plan standard and guideline FW-033 is proposed. FW-033 suggests the retention of 25 tons of dead and down material on the westside of the Forest and 15 tons on the eastside. The project area straddles the Cascade Crest with some on the eastside and some on the west. Due to its fire history, the area has relatively low levels of dead and down material. The objective of the project is to have an open stand were huckleberry pickers can walk through without being obstructed by excessive quantities of down wood or debris. FW-036 allows for exceptions to FW-033 on sites that naturally produce less dead and down material. It is estimated that approximately 15 tons would remain after the huckleberry enhancement treatment.

### 4.8 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. Invasive species are discussed in s. 4.9. The following is a summary of the Botanical Biological Evaluation.

The following actions have the potential to affect rare or uncommon botanical species: actions that disturb soil such as skidding and yarding of logs, temporary road construction, actions that harvest or kill trees and landing creation.

No federally listed endangered or threatened plant species, or plant species proposed for federal listing, are known to occur on the Mt. Hood National Forest (MTH). Intuitive-controlled field surveys were conducted for rare or uncommon botanical species in 2009. No special status botanical species were found in the proposed project area.

4.8.1 Surveys to detect the presence of most fungi species are not considered practical because of the variability in fruiting-body production from year to year. Therefore, fungi (other than *Bridgeoporus nobilissimus*) were not targeted during field surveys.

Where field surveys determined the presence of suitable habitat for a particular species of fungi, it was presumed to be present. There are 31 species of rare or uncommon fungi identified as having potential habitat in the project area. For fungi that are on the Regional Forester's Sensitive Species list, the action would have an effects determination of May Impact Individuals or habitat but is not likely to lead to a trend toward federal listing.

4.8.2 Where habitat is present for rare or uncommon species that were not found during field surveys there is still the potential to alter habitat. There are 3 species of vascular plants, 5 species of bryophytes, and 11 species lichens identified as having potential habitat in the project area. For species on the Regional Forester's Sensitive Species list, the action would have an effects determination of **May Impact Individuals or habitat but is not likely to lead to a trend toward federal listing.** 

# 4.9 COMPETING AND UNWANTED VEGETATION

This section addresses invasive plants and unwanted vegetation. Invasive plants are sometimes called noxious weeds.

Invasive plant management is covered by the 2005 Record of Decision for Preventing and Managing Invasive Plants (USDA 2005) that amended the Forest Plan. The Record of Decision and Mediated Agreement for the "Managing Competing and Unwanted Vegetation" Final Environmental Impact Statement (USDA 1998a) apply to unwanted native vegetation, brush control and fuel treatments.

# 4.9.1 Introduction

Non-native plants are species that have been introduced either intentionally or unintentionally to areas where they do not naturally occur. Most invasive non-native plants in the Pacific Northwest originate from Europe and Asia. The predators and diseases that control these plant species in their native habitats are not present in the habitats where they have been introduced. Unchecked by predators or disease, such plants may become invasive and dominate a site, displacing native plants and altering a site's biological and ecological integrity. For example, invasive plants can reduce biological diversity, displace entire native plant communities, decrease and degrade wildlife habitat, alter fire regimes, change hydrology, disrupt mycorrhizal associations, alter nutrient dynamics, and increase soil erosion. Invasive plants can also poison livestock and reduce the quality of recreational experiences.

The Record of Decision for the *FEIS for Site-Specific Invasive Plant Treatments for the Mt. Hood National Forest and Columbia River Gorge National Scenic Area* (March 2008) provides guidance for managing invasive plants on the Forest. It identified 208 areas to be treated manually, mechanically, or with herbicides and providing an early detection/rapid response strategy for treating new infestations quickly. None of the 208 priority treatment areas are near the huckleberry enhancement project.

# 4.9.2 Risk Assessment

The risk level for the introduction or spread of invasive plants/noxious weeds is high for this project. The following species are present in the project area.

Species Name	Common Name
Centaurea stoebe $(=C.$	spotted knapweed
maculosa)	
Centaurea diffusa	diffuse knapweed
Cirsium arvense	Canada thistle
Cirsium vulgare	bull thistle
Cytisus scoparius	Scotch broom
Hypericum perforatum	St. John's-wort
Senecio jacobaea	tansy ragweed

The seven noxious weed species present in or nearby the proposed project area are included in the Oregon Department of Agriculture's (ODA) "A" or "B" List. These species are widely established regionally and management objectives are to control infestations on a case-by-case basis.

**4.9.2.1 Spotted and diffuse knapweed** populations are located along Highway 26 and Highway 35. The tap-rooted plants displace native vegetation and can form dense populations. The plants' distributions are spotty on the west side of the Cascade Range crest, but on the east side they can form dense populations that exclude native shrubs, forbs, and grasses.

Threats: Displaces native vegetation.

Mode of Establishment: Spreads by seed. Dispersal distances for the seed are short: seeds generally fall within a 3-12 dm radius of the parent plant. Movement over greater distances requires transport by rodents, livestock, vehicles, hay or commercial seed.

**4.9.2.2 Canada thistle** is a perennial weed distributed on the west side of the Cascade Range crest in areas with previous soil disturbance has occurred: e.g., roadsides, areas where timber harvest has occurred, plantations and manipulated forage openings. It is also present in some areas with little or no disturbance such as wet meadows.

Threats: This plant is a threat to agricultural lands and to native forest biodiversity.

Mode of Establishment: Spreads asexually via rhizomes (underground stems) or by wind, animals, and vehicles.

**4.9.2.3 Bull thistle** is a biennial weed with a short, fleshy taproot. It is not uncommon in areas with previous soil disturbance including roadsides, plantations, and manipulated forage openings.

Threats: This plant is a threat to agricultural lands and to native forest biodiversity.

Mode of Establishment: Spreads by wind, animals, and vehicles.

**4.9.2.4** Scotch broom establishes in open areas with little tree cover and along roadways at low and moderate elevations, mostly west of the Cascade Range crest. Management priorities on the Forest are two-fold: east of the crest, control populations to keep them from expanding, with the long-term goal of eradication; west of the crest, where the species is well-established, active management is considered on a site-by-site basis where there are overriding resource concerns. Bio-control insects are established west of the crest and are relied on to depress Scotch broom infestations where resource concerns are not critical.

Threats: Where broom establishes, it can form a monoculture, outcompeting and displacing native trees, shrubs, forbs, and grasses; delaying forest development; and altering ecologic functioning. The hard, long-lived seed can persist in the soil for up to 75 years.

Mode of Establishment: Scotch broom establishes from seed that may be transported

by vehicles carrying soil or plant parts.

**4.9.2.5 St. John's-wort** is distributed across the Forest along road shoulders, in rock storage areas, in quarries, and in other areas of soil disturbance. Similar to Scotch broom, active management to control or eradicate an infestation occurs when there are overriding resource concerns. Bio-control insects are well established on the Forest.

Threats: While infestations don't result in a great deal of economic harm in forest settings, St. John's-wort displaces native vegetation and can alter ecological functioning.

Mode of Establishment: St. John's-wort establishes from seed that may be transported by vehicles carrying soil or plant parts.

**4.9.2.6 Tansy ragwort** distribution on the Forest is similar to that of Scotch broom. Biocontrol insects are present west of the Cascade Range crest. East of the crest, biocontrol insects have not established, due to the colder winters. Management priority in this area is to control and eradicate infestations by manual, mechanical or chemical treatment methods.

Threats: Tansy ragwort is poisonous to livestock, particularly horses. At sites where it becomes dominant, it can displace native vegetation and alter ecologic functioning.

Mode of Establishment: The light seed is dispersed by wind and can be transported in soil on vehicles.

# 4.9.3 Summary

The invasive plants listed above (with the exception of the knapweeds) are common along roadsides, in old landings, in clearcuts, and in other areas with a history of ground disturbance throughout much of the Clackamas River and Zigzag Ranger Districts. Vehicles and heavy equipment are a major vector for the spread of invasive plants along roads and from roads into forest and forest openings.

The design criteria in s. 2.3.5 would minimize the likelihood that invasive plants would spread: #5 would minimize soil disturbance, #7 would prevent erosion and specifies the use of weed free erosion control methods, and #8 would require the cleaning of equipment and other practices to minimize the spread of weeds.

# 4.9.4 Other Competing and Unwanted Vegetation

Fuels treatments in thinning projects are exempt from the requirements of the Record of Decision and Mediated Agreement for the "Managing Competing and Unwanted Vegetation" Final Environmental Impact Statement. Slash treatments associated with road construction is included. However the slash, woody debris and root wads that result from the temporary road construction associated with this project would be

temporarily set aside and used to block the road when logging is completed. There would be no burning of this material.

There are some plant species that compete with huckleberries. There may be some follow-up treatments to hand cut brush.

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

# 4.10 ECONOMICS

One of the dual goals of the Northwest Forest Plan is to provide a sustainable level of forest products for local and regional economies and to provide jobs. The Northwest Forest Plan Final Environmental Impact Statement has an in-depth analysis of the economic basis behind the goal of providing forest products for local and regional economies. It also contains an analysis of the social and economic benefits and impacts of preservation, recreation and other values. The primary purpose of this project is to enhance huckleberries and to do that timber would be removed to allow more sunlight to the ground. To the extent that timber volume is removed, there would be associated benefits to local and regional economies from the harvest, processing and utilization of wood but there would also be benefits as huckleberries are enhanced and opportunities improve for both subsistence and recreational picking. Since timber is auctioned to bidders the project must have products that prospective purchasers are interested in and they must have log values greater than the cost of harvesting and any additional requirements.

Alternative A would not provide forest products consistent with the Northwest Forest Plan goal of maintaining the stability of local and regional economies. The proposed action would provide for jobs associated with logging and sawmill operations and would contribute to meeting society's forest product needs. The NFP (p. 3&4-297) contains an analysis of employment in the timber industry.

Based on past experience with projects with similar prescriptions and similar logging systems, it is likely that there would be sufficient value of timber removed to fund this huckleberry enhancement project.

The burning option would result in no timber outputs and would cost approximately \$500 per acre to implement (a total cost of over \$1,000,000).

# 4.10.2 Forest Plan standards and guidelines

#### Mt. Hood Forest Plan References

Forest Management Goals - 19, page Four-3, page Four-26, See FEIS page IV-112 Northwest Forest Plan Standards and Guidelines page A-1, and FSEIS pages 3&4-288 to 318 The proposed action is consistent with Forest Plan goal to efficiently provide forest products.

# 4.11 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.

The objective of this project-level roads analysis is to provide information to decision makers so that the future road system can be one that is safe, environmentally sound, affordable and efficient. A project level roads analysis may include topics such as: 1) construction of new permanent system roads, 2) reconstruction or stabilization of existing roads needed for the project, 3) making changes to road maintenance levels, 4) decommissioning system roads, 5) storm proofing, 6) road closures and 7) the construction or reconstruction of temporary roads.

Temporary roads are roads that are built by contractors to access landings and are closed upon completion of logging until they are needed again. They are not considered part of the Forest's system of permanent roads.

Section 4.2 has an in-depth discussion of inventoried roadless areas and undeveloped areas.

# 4.11.1 Existing Situation

The existing road network is not sufficient to access all of the proposed treatment areas.

In terms of aquatic risk ranking from the Forest-wide Roads Analysis, all of the roads in the project area score as low risk.

# **Direct and Indirect Effects**

# 4.11.2 Alternative A

With no action there would be no impact to the transportation network.

# 4.11.3 Proposed Action

Approximately **1.4 miles of existing temporary** roads would be reused. Approximately **4.7 miles of new temporary roads** would be constructed. These roads would be obliterated upon project completion. Some of the temporary roads

would be obliterated in a way that leaves a walking trail for huckleberry picking access. Section 4.1.4 addresses other access issues.

# 4.11.4 Cumulative Effects

The proposed action would result in little or no direct or indirect negative effect to the transportation system. No cumulative effects analysis is needed for transportation. Refer to the Forest-wide Roads Analysis (USDA 2003) for a discussion of the transportation system as a whole. An open-road density analysis can be found in the Wildlife section.

# 4.11.5 Forest Plan standards and guidelines

### **Forest Plan References**

Forestwide Timber Management Standards and Guidelines - FW-407 to FW-437, page Four-95 See FEIS page IV-123

The proposed action is consistent with Forest Plan goal to efficiently provide transportation.

# 4.12 AIR QUALITY

The following actions have the potential to affect air quality: burning slash, exhaust generated by vehicles, equipment and chainsaws and dust 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, Mt. Jefferson Wilderness and the many new smaller Wildernesses and wilderness additions. 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.

**4.12.1 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. Section 4.1 has a discussion of past fire history.

# **Direct and Indirect Effects**

Alternative A (No Action) would not change air quality. Fire hazard is a concern in the project area particularly as lodgepole pine trees succumb to mountain pine beetle. Alternative A would result in a trend toward increased risk of wildfire or degradation of air quality.
#### **Proposed Action**

- **4.12.2 Exhaust** and its pollutants would be created by vehicles and equipment. Pollutants would disperse and would not likely cause health concerns for forest users.
- **4.12.3** Dust would not be an issue because the hauling of logs would happen in the winter.
- **4.12.4 Smoke** would come from the burning of landings. The removal of biomass would be encouraged where feasible. Material that is not removed would be piled and burned at the landings. 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.

The option of burning to achieve huckleberry enhancement was considered (s. 3.3.1 & s. 3.3.2). The suggestion of letting wildfires burn with no suppression effort would result in substantial quantities of smoke. This smoke would not occur during the fall but instead would occur in the peak summer recreation season. Smoke from large wildfires would impact Class I airsheds. The option of using prescribed fire to achieve huckleberry enhancement would result in more smoke than the proposed action.

**4.12.5** 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. Since the quantity of burning is minimal and would be conducted when smoke dispersion conditions are favorable to minimize the potential for adverse affects there would be no effect to Class I airsheds.

**4.12.6** Cumulative Effects – The proposed action would have little or no effect to air quality in the Wildernesses or adjacent communities; therefore no cumulative effects analysis is necessary.

#### 4.12.7 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 analysis above shows that the project would be consistent with air quality standards and guidelines.

## 4.13 CLIMATE CHANGE

**4.13.1 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 would likely be one where the summers are drier and the snow melts earlier in the spring (Bare 2005) (Mote 2003), (Mote 2005), (Dale 2001). 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 mitigate or respond to potential climate change. This section addresses aspects of the project that may affect carbon emission or sequestration and how the project may help or hinder the forest's ability to deal with climate change. This analysis does not attempt to quantify carbon emission or sequestration.

## 4.13.2 Existing Situation

This project involves the thinning of mid-seral stands to enhance huckleberries. Forest health and growth issues are discussed in section 4.1.

## 4.13.3 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 focuses on key elements of forest management discussed in the scientific literature.

For this proposal, the following actions have the potential to affect carbon emissions or sequestration:

- Thinning to enhance huckleberries would have a side benefit of improving the health and growth of the residual stand resulting in trees that are better able to withstand stresses such as dry summer conditions (Millar 2007) (Spittlehouse 2003). The no-action alternative would result in trees that are stressed by moisture competition.
- Variable density thinning with skips and the retention of minor species would result in stands that are resilient and better able to respond to whatever changes come in the future (Millar 2007). The no-action alternative would result in the continuation of crowded stands.
- Fossil fuel is used by equipment such as saws, tractors and log trucks. 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.
- Tree tops would be yarded to landings. Operators would be encouraged to remove this material as biomass for power generation or other utilization. If it is not removed it would be burned at landings releasing carbon into the atmosphere. If tree tops were left in the stand they would impede access for huckleberry gathering and would result in a high fire hazard situation. The no-action alternative would not have any burning. If biomass is removed and used to generate electricity or to create biofuels, it may result in reduced reliance on fossil fuels to power vehicles or generate electricity (Bare 2005) (IPCC 2007).
- Woody debris retained on the ground increases soil carbon sequestration (Millar 2007). The proposed action would retain existing debris and logs on the ground and would add more as trees are felled to create large woody debris. The no-action alternative would result in stagnation of trees and some would eventually die and fall to the ground.
- Utilizing trees to create long-lived wood products sequesters carbon. The noaction alternative would not create any long-lived wood products (IPCC 2007) (FAO 2007) (Stavins 2005) (Upton 2007). While thinning to enhance huckleberries is the primary objective of this project, it would also result in the removal of logs to make lumber and other forest products. Some feel that on balance the process of harvesting wood and turning it into products may release more greenhouse gases than sequestering carbon in forests by leaving the trees there (Ingerson, 2009). Other literature (Upton 2007) compared the greenhouse gasses emitted and sequestered by wood based housing to alternative building materials and found that wood housing had a lighter impact than the alternatives.

To summarize, the alternatives would result in some carbon emissions and some carbon sequestration. The benefits to forest health and resiliency with the proposed

action would allow stands to better respond and adapt to the future climate. The purpose of this analysis is not to resolve debates about climate change. This project was not specifically designed to mitigate or respond to potential climate change and no attempt has been made here to quantify carbon emission or sequestration or to assert that one alternative would emit or sequester more than another.

The option of burning to achieve huckleberry enhancement was considered (s. 3.3.1 & s. 3.3.2). Prescribed fire would release similar amounts of carbon into the atmosphere. It would result in carbon sequestration in the forest in the form of the many down logs that would be felled and dead trees remaining in the stand.

## 4.14 HERITAGE RESOURCES

The National Historic Preservation Act (NHPA) and the National Environmental Protection Act (NEPA) both require consideration be given to the potential effect of federal undertakings on historic resources, (including historic and prehistoric cultural sites). The guidelines for assessing effects and for consultation are provided in 36 CFR 800. To implement these guidelines, in 2004, Region 6 of the Forest Service entered a Programmatic Agreement (PA) with the Oregon State Historic Preservation Office (SHPO) and the Advisory Council on Historic Preservation (ACHP).

#### Alternative A - No Action

Under this alternative no timber harvesting or other associated actions would be implemented to accomplish project goals. Heritage resources would only be affected by decay and other natural forces that are already occurring. This alternative would have no effect on heritage resources.

## Alternative B – Proposed Action

There are several archaeological properties located adjacent to or within units. The sites are old trails and associated features that are no longer maintained but have blazes and sometimes a visible trail tread. The design criteria in s. 2.3.5.9 would result in adequate protection for these sites.

With the burning option there would be potential to damage the blaze trees along trails and other wooden features. Protecting these features would be difficult and expensive. The many trees and other features would have to be wrapped with a fire retardant shield, dry forest litter would need to be raked from the base of each tree and some features may need to be covered with fire-retardant foam. Even with these measures it is likely that many blaze trees would be killed by radiant or convective heat to the crowns and the trees would eventually fall.

## 4.15 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 Estacada is 40 miles away. There are no known special places for minority or low-income communities in the area. Individuals may work, recreate, gather forest products or have other interests in the area. Neither the impacts nor benefits of this project would fall disproportionately on minorities or low-income populations. Directly adjacent to the project is the Confederated Tribes of the Warm Springs Reservation. There are no known areas of religious significance in the area. Section 4.1 describes the use of huckleberries by American Indians. The project has been developed in coordination with tribes. The no-action alternative however would result in continued decline in huckleberry production and would not be consistent with treaty obligations.

No adverse civil rights impacts were identified. There would be no meaningful or measurable direct, indirect or cumulative effects to environmental justice or civil rights.

#### 4.16 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

The use of rock for road surfacing is an irreversible resource commitment.

# 5.0 CONSULTATION AND COORDINATION

The Forest Service consulted the following Federal, State, and local agencies and tribes during the development of this environmental assessment:

U.S. Fish and Wildlife Service	National Marine Fisheries Service
Oregon Historic Preservation Office	The Dalles Watershed Council
City of The Dalles	Wasco Co. Board of Commissioners
City of Dufur	Hood River County Planning Department
City of Mosier	Wasco County Court
City of Hood River	Oregon DEQ
Oregon State Parks	Oregon Department of Transportation
Oregon Department of Fish and Wildlife	Oregon Department of Forestry
Oregon Marine Board	Oregon Division of Lands
Environmental Protection Agency	

## 5.1 FEDERAL, STATE, AND LOCAL AGENCIES

## 5.2 TRIBES

Confederated Tribes of Warm Springs The Confederated Tribes of the Grand Ronde Community of Oregon

## 5.3 Scoping and Public Involvement

A scoping process to request public input for this project was conducted. A letter describing the proposed project and requesting comments was sent out on September 15, 2009. The Forest publishes a schedule of proposed actions (SOPA) quarterly. The project first appeared in June 2009, and in subsequent issues. A list of persons and organizations that were sent notice is in the analysis file along with a list of commenters and the complete text of comments.

# 5.4 List of Preparers

Jeanne Rice – Ecologist. Graduate of Humboldt State University (1980) in Forest Management, completed the Forest Service silviculturist certification program (1988-1990), and is currently a member of the NW Oregon ecology group (Siuslaw, Willamette, and Mt Hood NFs) assisting forests and leading teams on huckleberry restoration, application of sustainability principles, deadwood condition assessment, fire regime condition class assessment, climate change, forest plan monitoring projects. Jeanne has spent years coordinating the huckleberry dialog with researchers and tribes. She helped develop the June 2008, Northwest Huckleberry Workshop which was sponsored by Confederated Tribes of Warm Springs Reservation, Confederated Tribes of Siletz Indians, Forest Service and Oregon State University Extension Service.

Glenda Goodwyne, - Forester, Certified Silviculturist. Glenda has B.S. Forest Management from Oregon State University, 1985 and an A.A.S. Forest Management from Tuskegee University, 1980. She completed Silviculture Institute at Oregon State University/University of Washington in 1998, and is certified as silviculturist and most recently re-certified in 2003. Glenda has worked as a forester with the Forest Service for 25 years in Oregon, Washington, and California.

Sharon Hernandez - Wildlife Biologist. Sharon graduated from Michigan State University in 1992 with a B.S. in Wildlife Management. She has worked as a biologist for the Forest Service for 15 years in Washington and Oregon.

David Lebo - Westside Zone Botanist, Mt. Hood National Forest. B.A. Frostburg State College; M.A. University of Montana; M.S. University of Washington (forest ecology). David specializes in forest ecology and botany with a particular interest in cryptogamic botany (fungi, lichens, and bryophytes). He has worked for the Forest Service for two decades in Washington and Oregon including a six-year stint as interagency ecologist for the BLM and Forest Service in the Klamath Basin in southern Oregon.

Regina K. O'Brien - Fisheries Biologist. Gina has a B.S. in Fisheries and a B.S. in Zoology from Oregon State University. She's worked for the Forest Service for ten years in Oregon and Idaho.

Jim Roden - Writer/Editor. Jim has a B.S. in Forest Management from Northern Arizona University. He has worked as a forester for the Forest Service for 30 years in Wyoming, California, Idaho and Oregon. He is a specialist in timber sale planning, geographic information systems and economic analysis.

James Rice – Supervisory Forester. Jim has a B.S. in Forest Science from Humboldt State University. He has worked for the Forest Service for 30 years in Southern California, Northern California and Oregon. He was a certified silviculturist in Region 5 and is currently a certified silviculturist in Region 6.

Gwen Collier - Soil Scientist. Gwen has a B.S. in Biology and Environmental Science from Willamette University and a B.S. in Soil Science from Oregon State University. She has worked for the Forest Service for 29 years in Oregon, Washington and Idaho. She is a specialist in soil science and hydrology.

Ivars Steinblums - Forest Hydrologist. Ivars has a B.S. in Forestry from Humboldt State University (1973), and a M.S. in Forest Engineering (Watershed Management) from Oregon State University (1977). He has worked 2 years as a timber appraiser for county government in Northern California, and 30 years as a hydrologist for the Forest Service in California and Oregon. 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.

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