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Agriculture

**Forest
Service**

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Environmental Assessment

Portland General Electric Special Use Permit

Detroit Ranger District, Willamette National Forest
Clackamas Ranger District, Mt. Hood National Forest
Crooked River National Grassland, Ochoco National Forest

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1. Purpose and Need for Action

1.1 Document Structure

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

Purpose and Need: This section describes the project area, the purpose and need for the project, and the agency's proposal for achieving that purpose and need. This section also outlines applicable management direction, details how the Forest Service informed the public of the proposal, and the list of issues identified from the public.

Comparison of Alternatives, including the Proposed Action: This section provides a more detailed description of the agency's proposed action.

Environmental Consequences: This section describes the environmental effects of implementing the proposed action and other alternatives. This analysis is organized by resource area. Within each section, the existing condition is described first, followed by the effects of the no action alternative that provides a baseline for evaluation and comparison with the Proposed Action.

Agencies and Persons Consulted: This section provides a list of preparers and agencies consulted during the development of the environmental assessment.

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 at the Detroit Ranger District Office in Detroit, Oregon.

1.2 Background

On August 28, 2002, the Federal Energy Regulatory Commission (FERC) issued an order deleting Portland General Electric's (PGE) Bethel-Round Butte transmission line from the operating license for the Pelton Round Butte Hydroelectric Project (FERC No. 2030). The order stipulated that deletion of the transmission line from the license shall be effective on the date the licensee (PGE) receives all necessary permits/approvals from the United States Department of Agriculture - Forest Service (USDA-FS) and United States Department of the Interior - Bureau of Land Management (USDI-BLM), as appropriate, for the continued use of federal lands. As a result of the FERC order, PGE applied to the USDA-FS and USDI-BLM on March 6, 2003, for authorization to continue to operate and maintain its transmission line on federal lands. Specifically, PGE applied for a right-of-way on the Mt. Hood (MHNF) and Willamette (WNF) National Forests, the Ochoco National Forest - Crooked River National Grassland (ONF-CRNG), and a right-of-way grant on lands administered by the USDI-BLM's Salem District

Office. The USDI-BLM subsequently issued PGE a right-of-way grant for the facility, effective October 1, 2003.

1.3 Location

The Bethel-Round Butte transmission line is a single-circuit 230-kV line that runs from PGE's Round Butte Switchyard near Round Butte Dam in Central Oregon to PGE's Bethel Substation near Salem, Oregon, a distance of approximately 100 miles. Near the Round Butte Switchyard, the transmission line crosses approximately 0.3 mile (Table 1-1) of the Ochoco National Forest-Crooked River National Grassland before it spans the Deschutes River and proceeds northwest across the Warm Springs Reservation of Oregon (Figure 1-1). The transmission line crosses the crest of the Cascade Range near Olallie Butte and heads west across approximately 6.2 and 20.5 miles of the MHNF and WNF, respectively, before entering State Forest lands. Further west, the transmission line crosses BLM-administered lands and numerous private landholdings. The ONF-CRNG portion of the transmission line is located in Jefferson County; the MHNF and WNF portions are in Marion County.

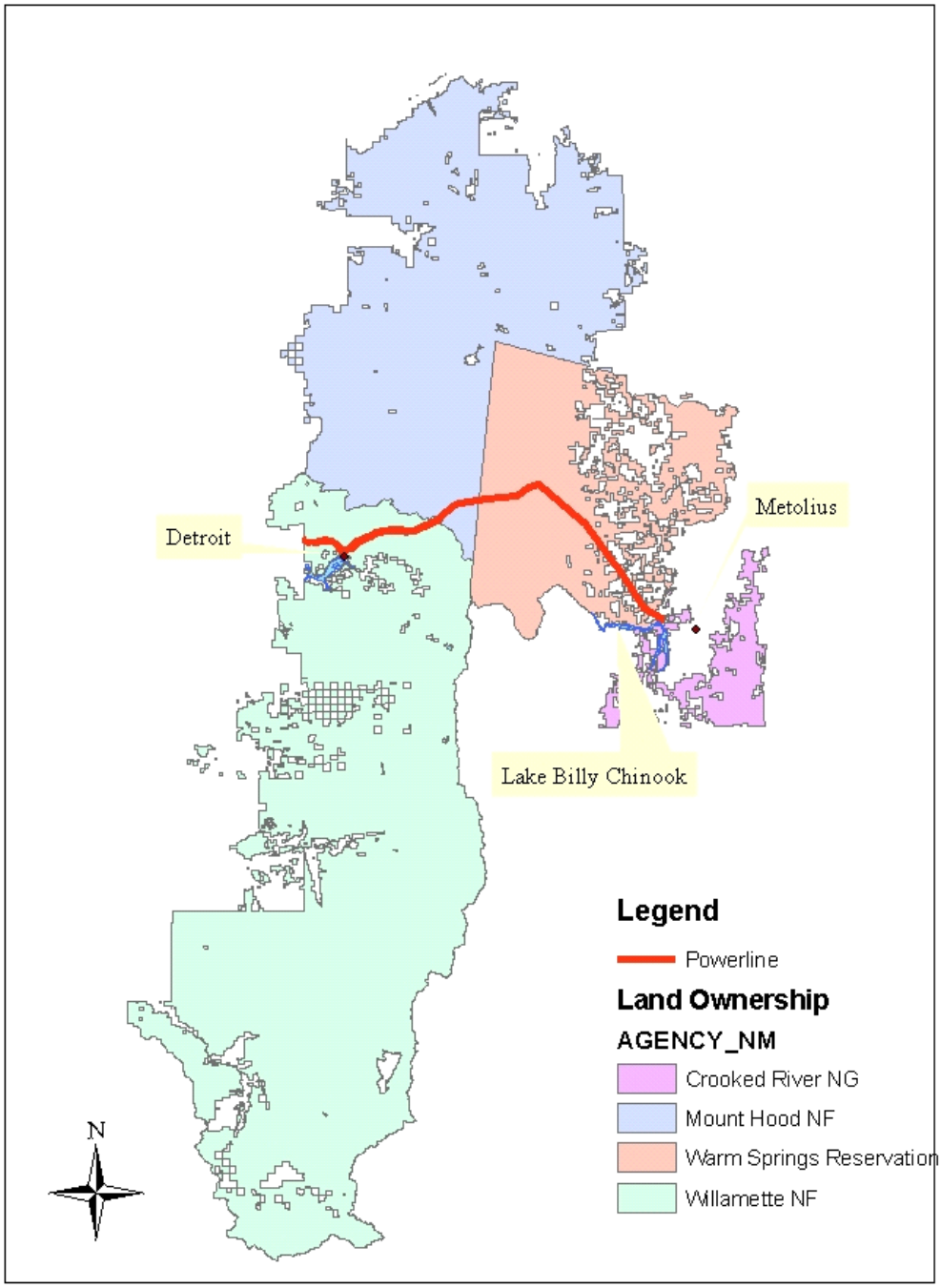
The ROW clearance area, or corridor associated with the transmission line, averages about 125 feet wide (62.5 feet on each side of the centerline). The ROW occupies 5.2 acres on the ONF-CRNG, 105.5 acres on the MHNF, and 311.9 acres on the WNF. Original clearing of the ROW occurred in 1962-1963 and the transmission line was constructed between 1962 and 1964. On MHNF and WNF lands, the transmission line parallels one, and in some places, two transmission lines owned and operated by the Bonneville Power Administration (BPA).

Table 1-1. A description of the Bethel-Round Butte transmission line on USDA-NF lands.[1]

Land Ownership	Transmission Line Length (mi.)	ROW Width (ft)	Acres in ROW
ONF-CRNG	0.3	125	5.2
MHNF	6.2	125	105.5
WNF	20.5	125	311.9

[1] There is an additional area impacted by PGE activities – the "area of potential effect." Activities outside the ROW that may affect Forest Service lands include the removal of danger trees and other vegetation management activities. This area varies along the powerline corridor.

Figure 1-1. Portland General Electric Bethel-Round Butte Powerline



1.4 Purpose and Need

The Willamette, Mt. Hood, and Ochoco National Forests are proposing to issue a permit authorizing operation and maintenance of the existing Portland General Electric transmission line across portions of the Detroit and Clackamas Ranger Districts and the Crooked River

National Grassland. This permit would allow the operation and maintenance of the existing powerline, including pole structures, wires, and access roads. There is a need to issue this permit so the applicant will comply with Forest Service policy on the occupancy and use of National Forest System lands.

1.5 Proposed Action

Authorize the following in a 20-year Special Use Permit :

- On the ONF-CRNG, MHNF, and WNF, a ROW that authorizes 1) continued operation and maintenance of the transmission line facilities; 2) routine vegetation management within the ROW; and 3) use and maintenance of service or access roads within the ROW.
- A special use authorization on the three National Forests that authorizes 1) management of danger trees outside the ROW; and 2) use and maintenance of transmission line service and access roads outside the ROW.

This decision will also adopt the Portland General Electric Operation and Maintenance Plan which provides more detail, including terms and conditions governing how this corridor will be maintained and operated. This plan is included in the project file.

The Proposed Action includes six elements: 1) Transmission Line Maintenance Program; 2) Vegetation Maintenance Program; 3) Invasive Nonnative Plant Species Program; 4) Revegetation Program; 5) Inspection Program; and 6) Coordination. More detail on these six elements is in Chapter 2.

1.6 Decision to be Made

The Responsible Official for this proposal is the Forest Supervisor for the Willamette National Forest. Given the purpose and needs for the proposed action, the Responsible Official will review the analysis to make the following decisions:

- Should a special use permit be issued?
- Whether to implement the proposed action, a modified version of the proposed action alternative, or choose to take no action at this time.
- Whether this action will have a significant impact upon the quality of the human environment, and thus require development of an environmental impact statement.
- If a selected action alternative is consistent with the Forest Plan or if a site-specific Forest Plan amendment is necessary.

1.7 Tiering and Incorporating by Reference

This Environmental Assessment incorporates by reference the following documents:

- Willamette National Forest Land and Resource Management Plan and Record of Decision as amended by the Northwest Forest Plan (USDA Forest Service, 1990a),

- Mt. Hood National Forest Land and Resource Management Plan and Record of Decision as amended by the Northwest Forest Plan (USDA Forest Service, 1990b);
- Crooked River National Grassland Land and Resource Management Plan and Record of Decision (USDA Forest Service, 1989), and
- Northwest Forest Plan (USDA Forest Service and USDI BLM, 1994).

This EA is tiered to the following documents:

- Final Environmental Impact Statement for the Willamette Land and Resource Management Plan (USDA Forest Service, 1990),
- Final Environmental Impact Statement for the Mt. Hood Land and Resource Management Plan (USDA Forest Service, 1990),
- Final Environmental Impact Statement for the Crooked River National Grassland Land (USDA Forest Service, 1989), and
- Final Environmental Impact Statement on the Management of Habitat for Late-Successional and Old-Growth Forest Related Species within the Range of the Northern Spotted Owl (Northwest Forest Plan) (USDA Forest Service and USDI BLM, 1994)

Table 2-1 shows management allocations within the transmission line right-of-way. Nearly all of the activities included in the Operation and Maintenance Plan are in the management areas included in Table 2. Occasional removal of danger trees may occur outside of the right-of-way. Historically, the removal of danger trees outside the right-of-way has been fairly minimal (generally 10-15 trees every 3 year cycle) (David Johnson, personal communication, March 31, 2008). This danger tree removal will occur in management areas outside a special use permit area/utility corridor. These management areas, along with brief descriptions of their management direction are included in the project file.

Figures 1-2, 1-3, and 1-4 show the LRMP management allocations for the Willamette and Mt. Hood National Forests and the Crooked River National Grassland both within the right-of-way and in the vicinity of the corridor.

On the Willamette National Forest, the Northwest Forest Plan designation for the majority of the transmission line right-of-way is "administratively withdrawn." On the Mt. Hood National Forest, about five miles of the right-of-way goes through the North Willamette Late Successional Reserve, while another mile or so is in the matrix allocation.

Table 2-1. LRMP Management Areas within Transmission Line Right-of-Way

		Transmission Line Approximate Distance (mi.)		
Description	**LRMP Designation**	**WNF**	**MHNF**	**ONF-CRNG**
Special Use Permit Areas (MA 13a)	Land Allocation	20.5	---	---
Special Interest Area – Olallie Lake Scenic Area (MA A4)	Land Allocation		1.25	

		Transmission Line Approximate Distance (mi.)		
Description	**LRMP Designation**	**WNF**	**MHNF**	**ONF-CRNG**
A1-CLA_Clackamas Wild and Scenic River Corridor	Land Allocations		<.1	
Scenic Viewshed (MA B2)	Land Allocation		.50	
Roaded Recreation (MA B3)	Land Allocation		4.45	
Late Successional Reserve	Land Allocation		5	
Riparian Reserves[2] (MA 15)	Land Allocation	75	10	---
Utility Corridors (MA-G16)	Management Area	---	---	0.3

[2] Indicates approximate number of times the transmission line spans the riparian reserves.

Figure 1-2. Willamette LRMP Management Area Designations

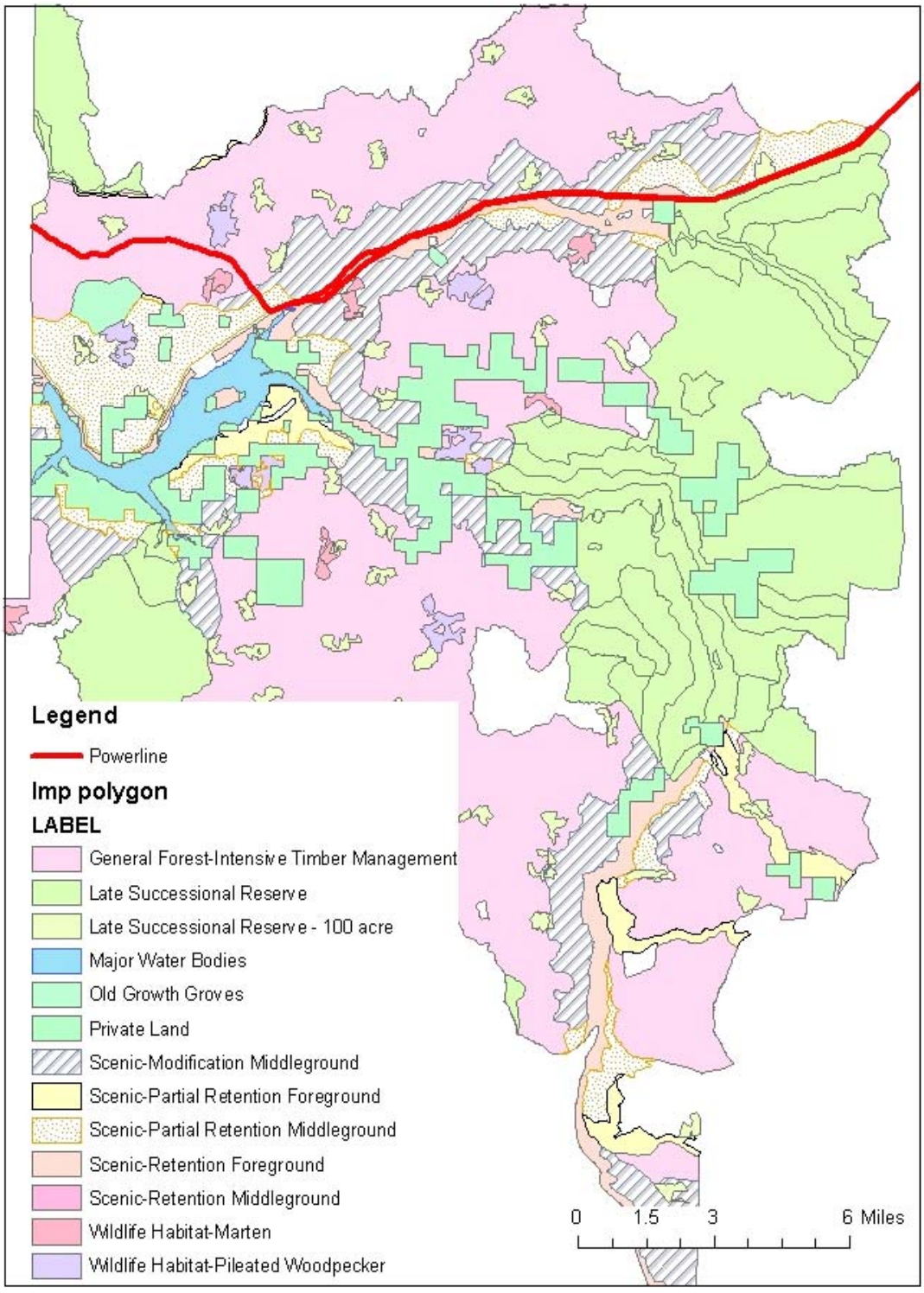


Figure 1-3. Mt Hood Management Area Designations

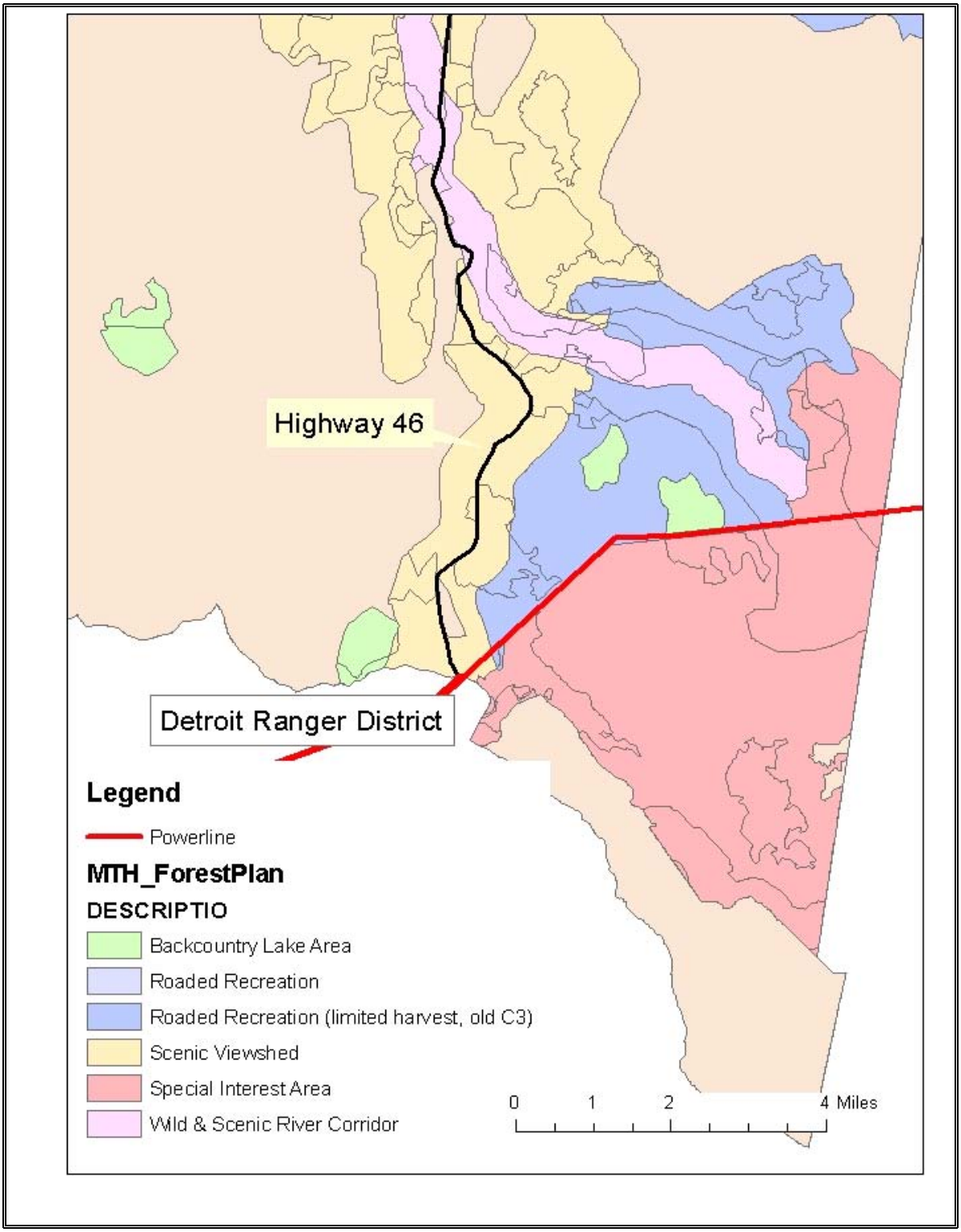


Figure 1-4. Mt. Hood – Clackamas River Wild and Scenic Section

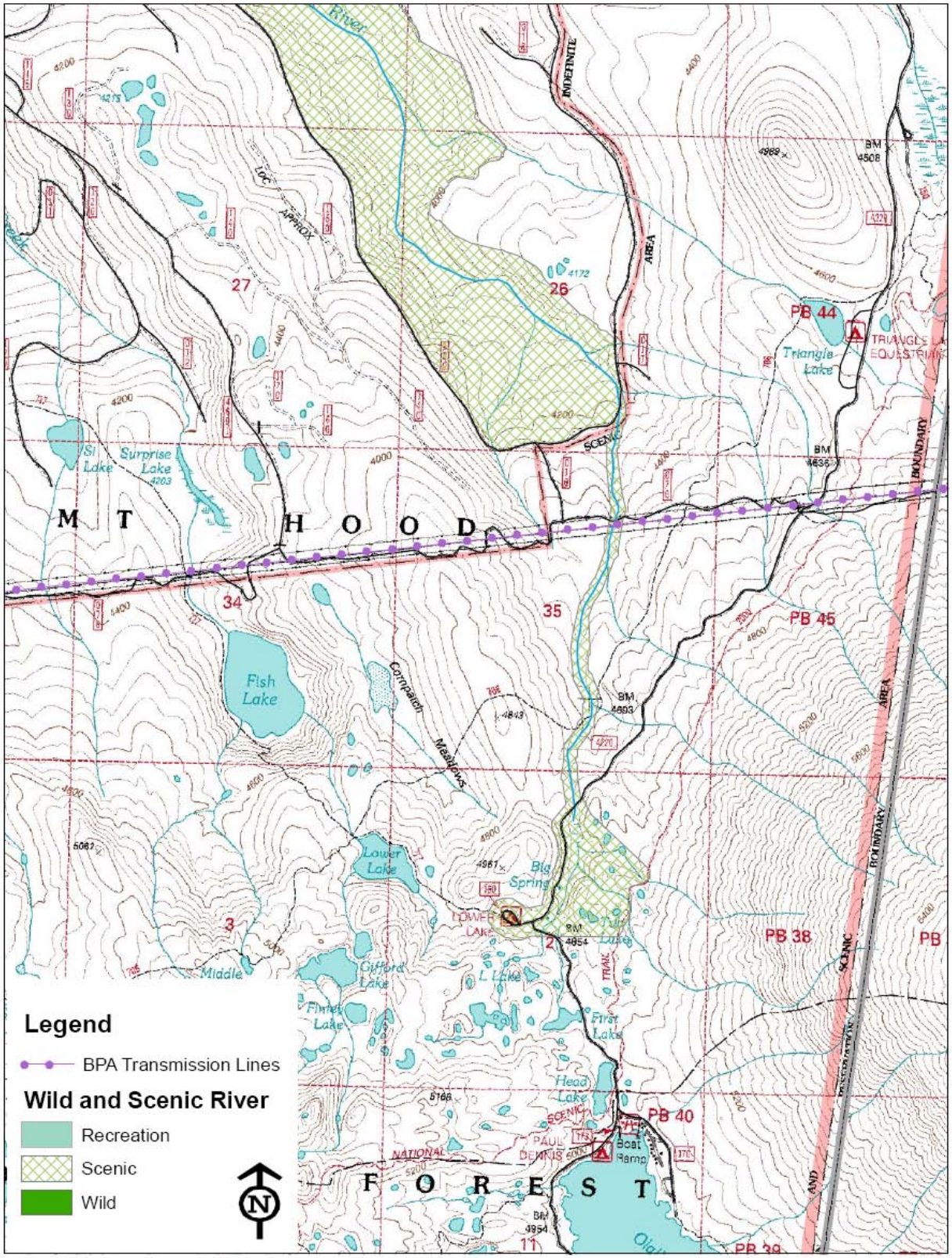
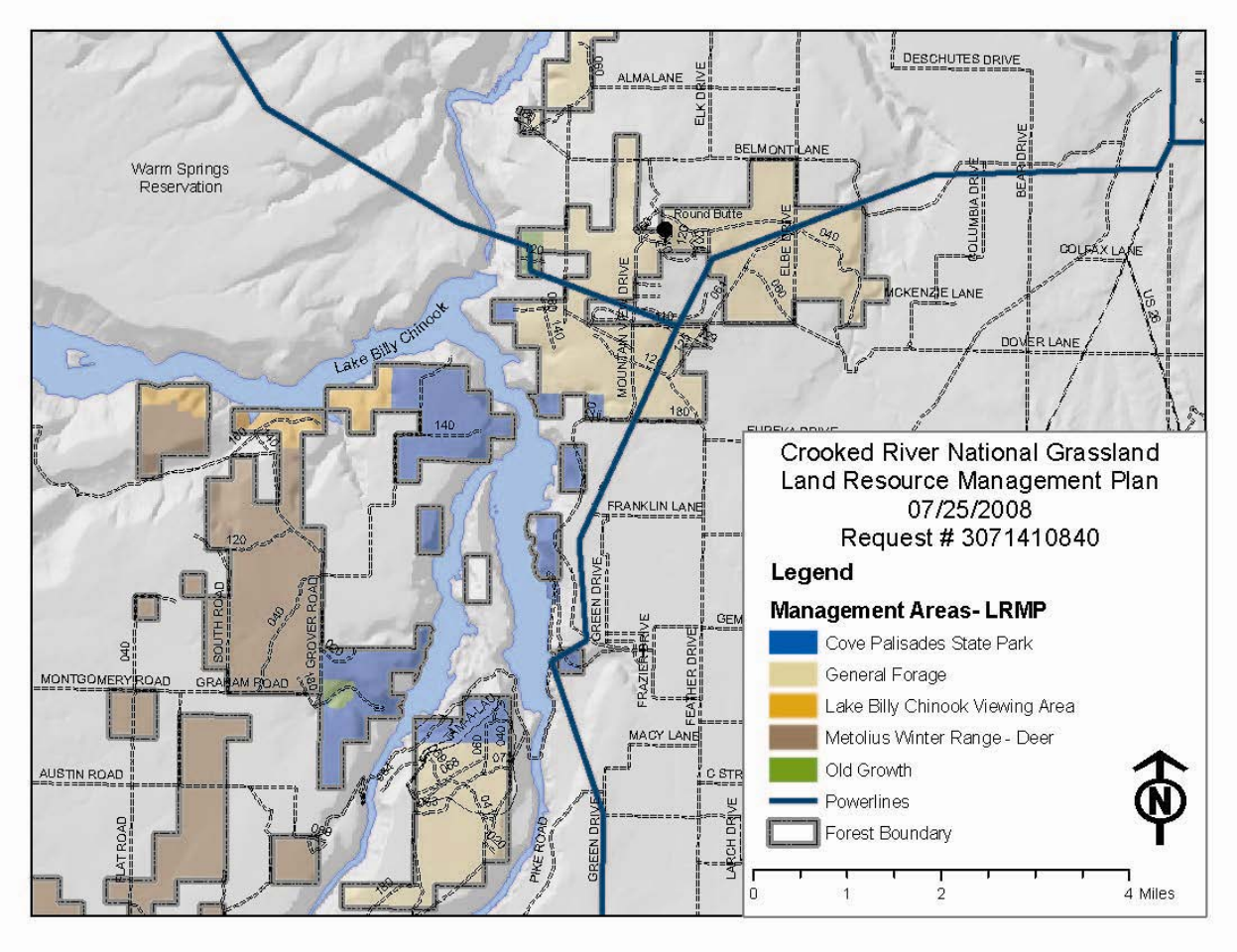


Figure 1-5. Crooked River National Grasslands Management Area Designations



Description of LRMP Management Areas

MA 13a – Special Use Permit Areas (Willamette National Forest): The primary goals of this management area are to provide safe and efficient sites for permitted facilities and improvements, to promote the public welfare in an environmentally sound manner, and to maximize consistency of permitted uses with surrounding land uses.

MA A4 – Special Interest Area – Olallie Lake Scenic Area (Mt. Hood National Forest): The goal of this management area is to protect, and where appropriate, foster public recreational use and enjoyment of important historic, cultural, and natural aspects of our national heritage. Preserve and provide interpretation of unique geological, biological, and cultural areas for education, scientific, and public enjoyment purposes.

MA B2 – Scenic Viewshed (Mt. Hood National Forest): The goal of this management area is to provide attractive, visually appealing forest scenery with a wide variety of natural appearing landscape features. Utilize vegetation management activities to create and maintain a long term desired landscape character.

MA B3 – Roaded Recreation (Mt. Hood National Forest): The goal of this management area is to "provide a variety of year-round recreation opportunities in natural appearing roaded

settings. A secondary goal is to maintain a healthy forest condition through a variety of timber management practices.

A1- CLA Clackamas Wild and Scenic River Corridor (Mt. Hood National Forest): This management area has the goal of maintaining the free-flowing character of the river and to protect the rivers outstandingly remarkable values which are: Fisheries, Botany and Ecology, Cultural Resources, Recreation and Wildlife. The area crossed is very narrow as the river there is quite narrow.

MA G3 – General Forage (Crooked River National Grassland): This management area includes management for forage production and utilization in a manner consistent with general standards and guidelines for other resources.

Riparian Reserves: On the Willamette and Mt. Hood National Forests, Riparian Reserves overlay existing management areas. This designation is one of the components of the Aquatic Conservation Strategy outlined in the Northwest Forest Plan ROD (USDA Forest Service, 1994). Riparian reserves, "provide an area along all streams, wetlands, ponds, lakes, and unstable and potentially unstable areas where riparian-dependent resources receive primary emphasis" (Northwest Forest Plan, p. A-5). They also serve to "improve travel and dispersal corridors for many terrestrial animals and plants, provide greater connectivity within the watershed," and serve as connectivity corridors among Late-Successional Reserves (Northwest Forest Plan Record of Decision, A-5 and B-13).

Late Successional Reserves: On the Mt. Hood National Forest, the powerline corridor goes through approximately five miles of Late Successional Reserve (Upper Clackamas LSR -207B). "Late-Successional Reserves are to be managed to protect and enhance conditions of late-successional and old-growth forest ecosystems, which serve as habitat for late-successional and old-growth related species including the northern spotted owl" (NWFP ROD, p. C-11).

"Existing developments in Late-Successional Reserves such as campgrounds, recreation residences, ski areas, utility corridors, and electronic sites are considered existing uses with respect to Late-Successional Reserve objectives, and may remain, consistent with other standards and guidelines. Routine maintenance of existing facilities is expected to have less effect on current old-growth conditions than development of new facilities. Maintenance activities may include felling hazard trees along utility rights-of-way, trails, and other developed areas" (NWFP ROD, p. C-17).

1.8 Public Involvement

The NEPA process and the associated Forest Service implementing regulations provide for an open public involvement process. The NEPA phase of a proposal begins with public and agency scoping. Scoping is the process used to identify major issues and to determine the extent of environmental analysis necessary for an informed decision to be made concerning a proposed action. Issues are identified, alternatives are developed, and the environmental analysis is conducted and documented.

Since winter 2007, the proposal has appeared in the Willamette, Mt. Hood, and Ochoco Schedule of Proposed Actions (SOPA). This proposal has since appeared in all subsequent SOPA editions.

The proposal was contained in a scoping packet that was mailed to the public and other agencies for comment on June 9, 2008. The packet was sent to adjacent landowners, government agencies, and conservation and environmental organizations.

The scoping package for this project was mailed to tribal contacts including Klamath Tribe, Confederated Tribes of the Grand Ronde, Confederated Tribes of the Siltez Indians and, Confederated Tribes of the Warm Springs. In 2008, this project was included in the District's program of work package that is presented and discussed with the Tribes at the annual coordination meetings.

The scoping process did not result in any responses.

1.9 Issues

As a result of the overall scoping process, no significant issues in regard to the proposed action were identified. As a result, alternative development was responsive to meeting the purpose and needs rather than resource-based tradeoffs centered on differing strategies in response to a range of issues.

Chapter 2 – Alternatives, Including the Proposed Action

This chapter describes and compares both alternatives considered for the Portland General Electric Special Use Permit Project. The Proposed Action (Alternative 2) was developed in response to the purpose and need, in accordance with the three Land and Resource Management Plans, as amended. This alternative, as developed and analyzed in this EA, is fully compliant with LRMP standards and guidelines, as amended, and is consistent with meeting the goals and objectives of lands allocated to the management areas in the project area. In addition to the Proposed Action, the No Action Alternative is described in this section.

2.1 Alternatives Considered but Eliminated from Detailed Study

Federal agencies are required by NEPA to rigorously explore and objectively evaluate all reasonable alternatives and to briefly discuss the reasons for eliminating any alternatives that were not developed in detail (40 CFR 1502.14).

Only one alternative that was responsive to the purpose and need was fully developed and analyzed. During the scoping phase of the project, no issues—significant or otherwise—were raised by the public. The Proposed Action was developed with input from the Forest Service and Portland General Electric. Internal issues that came up during the formulation of the Proposed Action were incorporated into the proposal.

No Forest Plan amendment, site-specific or otherwise, would be required for implementation of Alternative 2. The proposed action of Alternative 2 is compliant with the standards and guidelines for all resource areas, as contained in the Forests' LRMP, as amended.

2.2 Alternatives Considered in Detail

2.2.1 Alternative 1. No Action

Under the No Action alternative, a special use permit would not be issued to authorize the continued use, operation and maintenance of the existing PGE powerline transmission line. If a special use permit is not issued, the Forests would have to look at options and likely develop some other proposed action in the future. Under this alternative, management of the corridor would continue as it occurs today. This alternative is not responsive to the special use application, and does not meet the needs in the proposed action.

2.2.2 Alternative 2. Proposed Action

The Proposed Action contains five primary elements: 1) Transmission Line Maintenance Program; 2) Vegetation Maintenance Program; 3) Invasive Nonnative Plant Species Prevention and Control Program, 4) Revegetation Program, 5) Inspection Program, and 6) Coordination. The Proposed Action will also adopt the Operation and Maintenance Plan contained in the project file.

I. Transmission Line Maintenance Program

Maintenance of the transmission line facility includes routine maintenance, major maintenance, and emergency maintenance. This EA and the Special Use Permit issued to Portland general Electric will only cover routine and emergency maintenance.

These three levels of transmission line maintenance are described in the following sections.

Routine Maintenance

Routine maintenance normally occurs on an as needed basis and typically involves repair or replacement of worn or damaged conductor components identified during inspections[3] of the transmission line. Routine maintenance generally results in little or no disturbance to vegetation, soil, or sensitive resources and consists of short to moderate duration projects (1-3 weeks per year). Seasonal restrictions will be adhered to in regards to routine maintenance (wildlife, fisheries, water quality etc...). Routine maintenance will also be planned in such a manner as to avoid resource concerns (e.g. wet periods, high recreation time periods).

The following are examples of routine maintenance:

- Insulator testing and/or replacement – Involves climbing towers or poles to test and repair insulators. Boom trucks are often used for this maintenance activity. Access to the structure is by pickup truck or ATV, or by foot if there is no road access to the site. Vehicles and boom trucks may need to leave road surfaces for short distances, but ground disturbance is unlikely.
- Connector, clamp replacement – Equipment and access is similar to that for insulator replacement.
- PGE uses a number of Forest Service and Bonneville Power Administration (BPA) roads to access the powerline corridor. The company also has a number of their own roads that cross Forest Service lands (see the Operation and Maintenance Plan, available in the project file, for a list of BPA, PGE, and Forest Service roads). The roads included in Appendix B of this Plan are the roads that PGE is authorized to use. If additional roads are needed to access the corridor, PGE shall inform the Forest Service prior to the use of the road. PGE is authorized to use three types of roads in this operation and maintenance plan:

  Many of the roads used by PGE are not regularly maintained. In order to access the transmission line, PGE may have to perform minor maintenance on these roads. Unless otherwise noted, maintenance on all roads will need to be at "t-specifications" or to a level that is appropriate for that road. T-specifications are available at: *http://www.fs.fed.us/database/acad/om/tsmaintenance_specs.htm* and include activities such as blading, ditch maintenance, drainage structure maintenance, and other maintenance activities.

  Many of the roads PGE uses are in close proximity to listed fish habitat. In Alternative 2, Project Design Criteria (PDCs) from the *Northwest Oregon Programmatic Biological Assessment* have been adopted as mitigation measures that would apply to Alternative 2.

[3] Maintenance inspections are generally conducted twice a year by helicopter. Ground inspections are conducted once every five years, or as needed.

Appendix C lists the applicable PDCs for road maintenance.

Forest Service roads used by PGE: Public use of these Forest Service roads is generally low, although some relative use is reported as "high." PGE does not have the primary responsibility for the maintenance of these roads[4], but if maintenance is required to access the powerline corridor, this maintenance must be done to the appropriate standard and Best Management Practices (BMPs) and PDCs will be applied as mitigation measures.

Bonneville Power Administration (BPA) roads: PGE shall work with BPA to ensure that roads are maintained to the appropriate standard. Again, BMPs and PDCs listed in Appendices B and C will apply to Alternative 2. For roads currently open, the Forest Service will work with BPA and PGE to determine the desirability of leaving these roads open to the public. The Forest Service will share the responsibility of maintenance on roads used by the public. If public access on these roads is not desired, PGE and BPA will be responsible for the installation and maintenance of closure devices on these roads.

PGE roads: There are a number of PGE roads that access the powerline corridor. Some of these roads are reported as "open," others are "closed." Open PGE roads must be maintained to the appropriate standard and BMPs and PDCs will be applied as mitigation measures. Some of these open roads are allowing public access into areas that would otherwise be inaccessible. PGE and the Forest Service will work together to determine whether this recreational access is desirable. If the determination is made to continue to allow this recreation, the Forest Service will be responsible for the management of the recreation and will share the responsibility for maintenance on these roads. If public use of these roads is not desired, PGE will be responsible for the installation and maintenance of closure devices on these roads.

Closed roads must be put into hydrological storage. This type of activity is considered major maintenance (see major maintenance section below).

PGE is responsible for ensuring their roads meet BMPs and are maintained to an appropriate standard. The Forest Service will inform PGE if these roads are not complying with BMPs. If roads out of BMP compliance are not brought up to standard, they will be closed to use.

The Forest Service retains administrative right to use PGE roads.

Major Maintenance

Major maintenance usually involves large-scale undertakings that have a greater potential to disturb soils and vegetation and other sensitive resources. These activities often require larger maintenance crews and equipment, and usually take several days or more to finish. Major maintenance activities are conducted on an infrequent basis and usually only as needed. Because the extent and location of major maintenance projects are unknown and difficult to predict, this analysis does not include an analysis of those actions. These projects shall be discussed at the

[4] The exceptions to this statement is the 4600-076 and 4690-016 Roads on the Mt. Hood NF. These roads are part of the Mt. Hood road system and their primary purpose is access to the corridor. If PGE and BPA want to continue using these roads, they will need to assume all maintenance responsibilities including installation and maintenance of gates or other traffic control structures to limit traffic on the road to PGE and BPA use. If no agreement is reached between PGE and BPA, these roads will be closed.

annual planning meeting and the appropriate level of site-specific analysis will be determined at that time. Examples of major maintenance activities include tower and conductor replacement and road reconstruction/new construction.

Emergency Maintenance

Emergency maintenance occurs when unforeseen circumstances result in a transmission line failure that threatens public safety or other resources. Depending on the extent of the problem or damage to the line, emergency maintenance can resemble both routine and major maintenance activities. Emergency situations can arise as a result of the following conditions:

- Line or system outages or fire hazards resulting from trees falling onto the conductors.
- Damage to the transmission line from severe storm events that involve high winds, ice, or other weather-related conditions.
- Transmission line damage due to lightning strikes or wildfires.
- Damage to transmission line structures or conductors from vandalism, such as shooting.
- Eminent failure or breaking of crossarms or insulators.

II. Vegetation Maintenance Program

This section provides a set of measures and procedures to guide PGE's routine removal and disposal of vegetation that potentially interferes with safe and effective operation of the Bethel-Round Butte transmission line. All vegetation maintenance activities along the ROW will be conducted in a way that meets the American National Standards Institute's (ANSI) Pruning Standards Best Management Practices for Utilities and all applicable standards set by the Occupational Safety and Health Administration (OSHA 1910.269). Crews will also observe the Industrial Fire Precaution Level (IFPL) and have proper fire-suppression tools and materials, as required by the USDA-FS. In addition, the following measures will be implemented, as appropriate:

- Gas power tools will be equipped with approved spark arresters.
- Areas of ground disturbance will be subject to weed control activities and revegetated according to the guidance in this document.
- Heavy mechanical clearing will be conducted only when the ground is dry or firm enough to support the equipment being used.
- Emphasis will be placed on maintaining or restoring habitat conditions and riparian resource integrity (NWFP LH-2) through maintenance of certain vegetation within the riparian area.

The ROW clearance area, or corridor associated with the transmission line, averages about 125 feet wide (62.5 feet on each side of the centerline). PGE manages vegetation within this corridor with the goal of providing a safe and reliable supply of electricity to its customers and preventing forest fires. PGE's vegetation maintenance in and along the transmission line corridor includes four types of activities: 1) inspection; 2) danger tree management; 3) under clearance; and 4) slash/debris management.

Inspection – This is the first step in ROW vegetation management and involves examining the transmission line and ROW with the intent of identifying competing vegetation that poses a threat to operation of the power line. Vegetation growing under the power line that will mature at a height greater than 12 feet, eventually contacting the conductors, or trees located adjacent to the ROW that are potentially at risk of falling onto the lines or towers, are the primary concerns. Any of these conditions require vegetation maintenance to avoid a power outage, fire, or public safety concern.

Danger tree management – Danger trees are defined as any tree or significant part of a tree determined to have a higher than normal potential for failure during extreme weather conditions, and that could come within 30 feet of the centerline of the ROW if they fell. Danger trees are typically large trees outside the ROW for a transmission line that are diseased, deformed, dead, dying, decayed, or unstable, and show obvious signs of imminent failure. In addition to the obvious indicators of a potential tree failure, other factors considered when identifying danger trees include the direction of prevailing winds, slope, and soil depth. These trees are usually identified during routine or periodic ground inspections conducted to assess damage from a specific storm or wind event. The primary objective in managing danger trees is felling or topping, as safely as possible.

Cutting with chainsaws is the primary method for managing danger trees in the vicinity of transmission lines. Danger trees can either be felled or topped. Considerations for danger tree management include the species, size, condition, and location. Unless the USDA-FS specifies differently, PGE will convert danger trees into snags by topping below a height that would contact the transmission line if the tree were to fall. If topping presents a worker safety hazard, PGE will fell the tree and leave it in place to provide habitat for wildlife species that use down wood. To the extent possible, trees will be cut in a manner that minimizes damage to the trunk and root systems of adjacent trees. In riparian areas, danger trees should be felled (where possible) into riparian areas and stream channels to improve instream wood component lost during previous management.

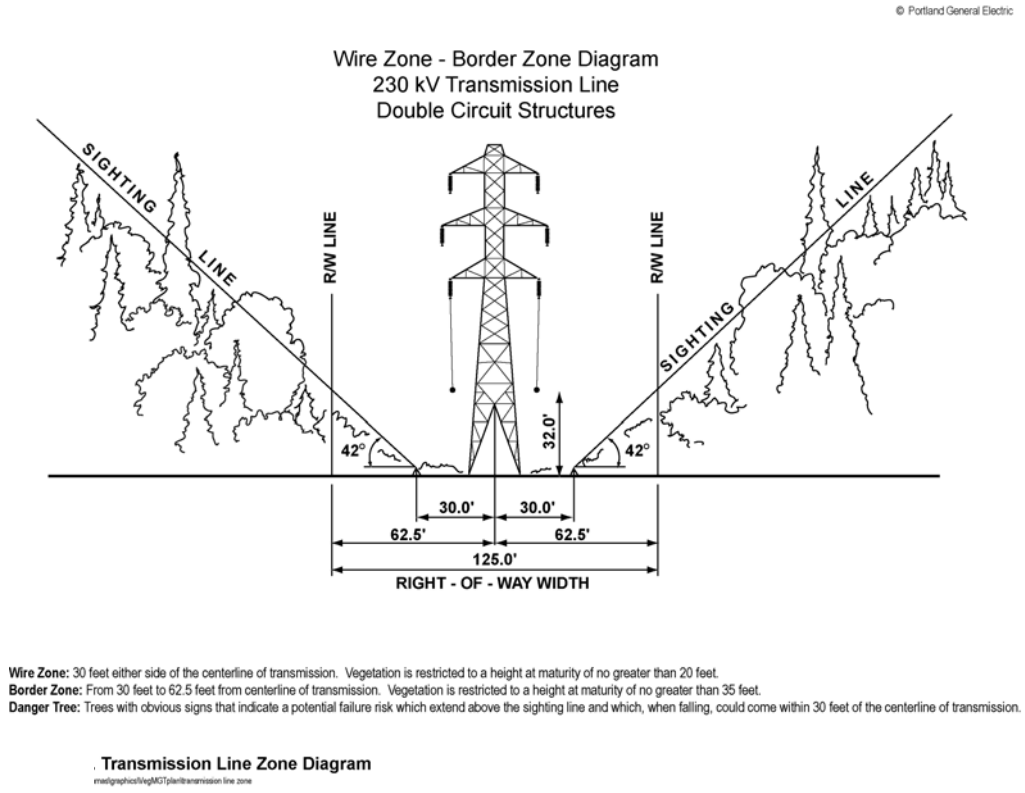
Typically, PGE removes ten to fifteen danger trees every three years. This number can vary, though, particularly after severe weather events and Forest Service vegetation management projects in close proximity to the powerline.

To the extent possible, PGE should coordinate danger tree removal with the Forest Service. This coordination includes prior to removal reviewing with the Forest Service Silviculturist tress deemed a danger to the powerline. This field review will ensure that the definition of a danger tree is being applied consistently.

At a minimum, PGE will report, on an annual basis, the locations and numbers of danger trees removed outside the ROW.

Under clearance – The National Electrical Reliability Council, NESC, and Oregon Public Utilities Commission require utilities (such as PGE) to clear trees growing under power lines. The primary objective of under clearance is to prevent fires and outages that can result when vegetation contacts ungrounded supply conductors. Where possible, PGE also tries to minimize damage to existing low-growing species that do not conflict with power lines, with the secondary objective of maintaining or promoting an early seral successional stage (grasses, forbs, and shrubs).

Figure 2-1. Transmission Line Zone Diagram



The extent of under clearance varies according to distance from the center transmission line, which is defined by two zones, and also by the presence of riparian reserves or highways:

- Wire Zone – The area within 30 feet of either side of the center of the transmission line. Depending on ground clearances, vegetation in the wire zone is restricted to a height of 32 feet or less at maturity (Figure 2). Taller vegetation may be allowed in the wire zone in areas where the line is substantially above ground level, such as where it crosses a ravine.
- Border Zone – The area from 30 feet to 62.5 feet on either side of the center of the transmission line. Depending on ground clearances, vegetation in the border zone is restricted to a height at maturity of not greater than 42 feet (Figure 2). Taller vegetation may be allowed in the border zone in areas where the line is substantially above ground level, such as in a ravine.
- Riparian Reserves – Riparian Reserves overlay both the wire and border zones for portions of the transmission line within the MHNF and WNF. Clearance requirements for the wire zone will be applied to Riparian Reserves. However, conifers and other tall-growing trees will be allowed to remain in the border zone in Riparian Reserves, provided they have at least 50 feet of clearance from the conductors. Tall conifer trees will be felled towards the stream channel and not removed or topped. Young reproductive conifers will be thinned, with some allowed to remain. The growth of dense, native shrub communities will be encouraged in Riparian Reserves. Under

clearance activities may need to occur more frequently in Riparian Reserves to ensure that fast-growing trees in the border zone do not get too tall.

Under clearance is accomplished using manual (i.e., hand pulling, lopping by hand crews), and mechanical (i.e., chainsaws, mowing) methods, or a combination of these techniques. The specific methods selected will depend on location, tree size, and presence of sensitive resources. Conifers will be cut below the lowest live limb to eliminate the continued growth of lateral branches. Stumps will be cut parallel to the ground to prevent injury. Around towers, stumps are to be ≤ 2 inches from the ground; elsewhere, stump height will be ≤ 6 inches from the ground. Objectives for slash/debris management will determine if the cut trees are removed or left within or near the ROW.

In general, trees will be cut if they are >6 feet and felled in a manner that minimizes damage to low-growing native shrubs.

Under clearance is usually conducted on a 3-year cycle and will be included as a planned activity for review in the annual planning meeting and Annual Planning Memorandum (APM) (see section VI) for the year in which this activity is scheduled. In years with planned vegetation maintenance along the transmission line ROW, PGE will confer with the USDA-FS to identify under clearance areas that may have restrictions or coordination requirements related to: (1) temporal and/or spatial constraints, or survey requirements prior to ground-disturbing activities, for federally listed wildlife species, or as required for other special status (SS) species[5]; (2) visual objectives; and/or (3) habitat management objectives (e.g., forage enhancement areas). In particular, riparian buffer widths will be defined for all stream corridors identified for under clearance work on National Forest lands. With information provided by PGE in the APM on vegetation management activities planned for a given year, the appropriate Forest Service line officer will determine whether surveys for SS species prior to ground-disturbing activities or other mitigation measures are required. Under clearance in areas with temporal or spatial constraints for SS species on National Forest lands may require consultation with USDA-FS biologists to ensure that sensitive resources are protected. PGE will also coordinate with USDA-FS to ensure that habitat and/or visual management objectives are addressed in and near the ROW through National Forest lands.

Slash and debris management – Slash is defined as brush and limbs <6 inches in diameter that are removed during under clearance and danger tree management activities. Debris is woody material >6 inches in diameter, and includes tree trunks and large limbs. The objective of slash/debris management is to ensure that these materials are left in or near the transmission line ROW in a manner consistent with fuel loading requirements and USDA-FS resource objectives for the site.

There are three primary ways of managing slash and debris along the transmission line ROW. It can be: (1) chipped, with the residual chips blown on site or removed; (2) lopped and scattered on site; or (3) piled on site. Slash and debris are typically lopped and scattered on site, provided that they do not block access or represent a safety or fire hazard (PGE 2004). Branches will be cut flush with the trunk, so that tree trunks lie directly on the ground; stems and limbs should be lopped and scattered. Slash and debris will not be placed in streams or along embankments.

[5] Special status species include proposed, endangered, threatened, sensitive and strategic species.

Chipping or slash piles may be used for slash/debris disposal in areas where lopping and scattering on site is not possible because of fuel conditions or safety concerns. Chipping is only an option where there is suitable access for equipment. Slash/debris that is chipped will either be removed from the site or scattered or blown on-site to a depth of ≤ 4 inches. Slash piles should not be obvious to the public, limit access, block drainages, be placed in streams, lakes/ponds, or wetlands, or create a fire hazard.

III. Invasive Nonnative Plant Species Prevention and Control Program

This section outlines the measures that PGE will use to limit the establishment and control the spread of invasive non-native plant species, including noxious weeds, on National Forest lands along the Bethel-Round Butte transmission ROW and other non-ROW National Forest lands affected by operation and maintenance-related activities.

Control is defined as eradicating, suppressing, reducing, or managing invasive non-native species populations; preventing spread of invasive species from areas where they are present; and taking steps, such as restoration of native species, to reduce the effects of invasive species and to prevent further invasions (Executive Order 13122, 1999). Several of the many invasive non-native species known or potentially occurring on National Forest lands along the ROW are ubiquitous and widespread and would be extremely difficult to control. In general, the USDA-FS tries to eradicate or contain small populations of problematic species before they establish or spread. PGE's highest priorities for control are species that have the potential to rapidly invade areas and affect habitat or water quality, for example the knapweed and knotweed species. In addition, there are several other species that are more widespread, but may be important to control in areas where they are either: (1) not yet well established, such as Scotch broom along some areas of the ROW; or (2) severely degrading habitat quality.

PGE and the MHNF, WNF, and ONF-CRNG identified a number of priority species along the powerline corridor (see the Operation and Maintenance Plan, available in the project file). Priority species are defined as invasive non-native plants that currently occur within the ROW, and meet at least one of the following criteria:

- Rated by the USDA-FS as "A" - of limited distribution on the National Forest and subject to intensive control or eradication where feasible.
- Rated by the USDA-FS as "B" - too widely distributed on the National Forest to be efficiently treated by currently available intensive control methods. Isolated infestations and infestations threatening specific resource damage may be subject to intensive controls. Populations at large would be subject to less intensive methods such as biological controls or vegetative competition.
- Rated by PGE as "H" - believed to have the ability to spread rapidly and degrade habitat and water quality. High control priority.
- Rated by PGE as "F" - Problematic, but more wide spread. Focused control efforts to eradicate or contain small populations in areas not already affected or in locations where severe habitat degradation is occurring.

Priority species will be the focus of control efforts on National Forest lands within the ROW and other non-ROW National Forest lands affected by O&M-related activities. The list of Priority

species will be reviewed and updated every 3 years or sooner, if needed, to reflect the establishment of new invaders, major infestations, or changing control priorities.

Inventory

Inventory and monitoring involves two distinct tasks: (1) an initial inventory to document the location and extent of weed populations at the outset of any weed control program, and (2) periodic inventory/monitoring to collect the same information on known populations for comparison with initial inventory data and to identify any new infestations.

Initial ROW Inventory

A comprehensive inventory is the first step in implementing a strategic prevention and control program for invasive non-native species. PGE conducted an initial inventory for terrestrial species of non-native invasive plants along the ROW in 1998. These surveys included mapping invasive non-native plant occurrences, focusing on areas with a high probability of supporting weed species. During the summer of 2008, this inventory was updated.

Periodic Invasive Non-native Plant Inventory

The objectives of the periodic invasive non-native plant inventories are to: (1) identify any new infestations of invasive non-native species on National Forest lands within the ROW and on other non-ROW National Forest lands affected by O&M-related activities, and (2) to monitor existing infestations that have not been treated.

Methods

Periodic surveys for invasive non-native plant species will focus on the ROW and along PGE-maintained roads that provide access to the ROW. The surveys will be conducted from a vehicle and/or on foot. Federal lands outside of the direct influence of the ROW will not be surveyed. New infestations will be mapped onto U.S. Geological Survey topographic maps and recorded using a global positioning system. The number of plants in each mapped infestation will be estimated, as well as cover class, which will be recorded using the cover classes developed by the North American Weed Management Association: trace (T=<1%), low (L=1-5%), moderate (M=5.1-25%), high (H=25.1%-100%). Each infestation will be mapped as accurately as possible, to a resolution of approximately 0.1 acre. Prior to conducting the periodic inventories, PGE will consult with the USDA-FS and ODA to update the list of invasive non-native species known or potentially occurring in the vicinity of the ROW, and the list of Priority Species for control. Surveyors will fill out a form[6] documenting new infestations to provide the data needed by the USDA-FS for its Natural Resource Inventory System (NRIS) and the Terrestrial (TERRA) Invasive Plants Database.

Methods Toolbox

Controlling infestations of invasive non-native species generally requires repeated and coordinated methods over time, a process referred to as "integrated weed management." Integration and perseverance are the keys to successful control; it is unlikely that a single application of one method will be effective.

In general, control efforts will be focused on infestations of Priority invasive non-native plants and in areas where there is the greatest chance of success. Manual methods will usually be

[6] The form will vary by Forest. There is a form for the Mt. Hood NF and a form for the Willamette NF.

restricted to infestations much less than 1 acre in size or the treatment of scattered individuals over a larger area that are either just beginning to invade or remaining following application of another control method. Large existing infestations, as well as newly establishing populations, will require aggressive treatment, most likely with chemicals, using a combination of methods over a number of years. Large-scale use of herbicides within the corridor is not consistent with the Willamette National Forest Weed EA. The preferred method of treatment is a program based on species and environmental factors. The use of chemicals may also be restricted near SS plant populations, wetlands and riparian areas. Biological agents might be appropriate to control some species, particularly in more remote areas of the ROW. Control measures should be followed by revegetation when it is unlikely that surrounding native vegetation will readily recolonize the area. Control of Priority species will generally be limited to areas affected by O&M-related activities, but may extend beyond these areas during cooperative efforts with the BPA and USDA-FS.

At least six high priority species occur on National Forest lands along the ROW. These six species – Canada thistle, bull thistle, False brome, Scotch broom, St. John's wort, and tansy ragwort – would be subject to focused control efforts to eradicate or contain small populations in areas not already affected or in locations where other vegetation maintenance activities are occurring.

A variety of methods are available to control invasive non-native plant species. These control methods can be broadly grouped into five main types:

- Manual
- Mechanical
- Cultural
- Chemical
- Biological

Manual Methods

Manual control is defined as the use of any non-mechanized approach to control or eliminate invasive non-native plants. Manual methods for the control of invasive non-native terrestrial plant species include the following:

- Handpulling – Physically pulling invasive non-native plants from the soil or using a weed wrench.
- Cutting/lopping/clipping – Using shears, clippers, or brush saws to sever aboveground parts of plants.
- Solarizing – Covering plants with black plastic or jute and depriving them of sunlight.
- Grubbing– Using a Pulaski, hoe, or shovel to remove entire plants, including roots, from the ground.

Mechanical Methods

Mechanical methods to control terrestrial species of invasive non-native plants include, but are not limited to, the following:

- Cutting – Using chainsaws and other power tools to remove the branches and stems from invasive non-native plants that have woody stems and branches.
- Mowing –Cutting invasive non-native plants by mowing with a rotary head attached to tractors or rubber-tired vehicles, weed-eater, or high-wheel mower.
- Discing – Using a tractor-pulled disc to blade and turn the soil in areas infested with invasive non-native plants.

Cultural Methods

Cultural methods for controlling invasive non-native terrestrial plant species involve measures that help establish or maintain competitive native vegetation. Cultural methods include the following:

- Grazing – Using livestock (cattle, sheep, or goats) to reduce the aboveground portions of plants.
- Reseeding, mulching, and fertilizing – Planting and amending the soil to provide competitive vegetation.
- Burning – Using fire to remove or reduce the aboveground portions of plants and seed banks.

Chemical Methods

Chemical methods involve the use of naturally derived or synthetic chemicals, also referred to as herbicides, to eliminate or control the growth of invasive non-native plants. **The use of herbicides should only be considered when other methods have either failed or are not considered effective.** Herbicides can be considered for new invaders because the control target or desired future condition is eradication. For established infestations herbicides use will be considered if some other resource is being damaged (e.g., where meadow or riparian vegetation is impacted or in forage seeding units where the weeds are competing with forage grass plantings).

The use of herbicides needs to be reported to the Forest Service during the annual planning meeting. Their use needs to be reported in the Forest Service's FACTS Database.

Biological Controls

Biological control is defined as the use of non-native agents, including invertebrate parasites and predators, and plant pathogens, to reduce populations of non-native invasive plants. Insects, diseases, and other pathogens attack plants, affecting survival and productivity. However, many non-native plants lack natural enemies, which gives them a competitive advantage over native species. Biological control works best when there are several insects or pathogens per plant species. However, not all noxious weed species have available biological controls.

Schedule for Treatment of Specific Sites

PGE will begin controlling Priority invasive non-native species along the ROW after approval and acceptance of this O&M Plan. PGE will work with the USDA-FS and BPA to identify and develop cooperative treatment plans for selected infestations on National Forest lands. Treatments involving mechanical control methods, such as chainsaws, will be scheduled to avoid temporal constraints for SS wildlife. PGE will conduct or fund noxious weed control activities

on National Forest lands within the ROW and on other National Forest lands affected by O&M-related activities. PGE and/or the USDA-FS and BPA will cooperate on the treatment of infestations that span the ROW and include adjoining areas.

Monitoring and Education

In their O&M Plan, PGE has committed to a monitoring and education plan that will help limit the establishment and spread of noxious weeds. The O&M Plan provides additional details on these programs.

IV. Revegetation Program

Revegetation is an integral part of preventing and controlling invasive non-native species. It is also an aspect of facility and ROW maintenance, new construction, and erosion control. This section on revegetation provides direction for replanting/reseeding of areas where O&M activities associated with the Bethel-Round Butte transmission line have resulted in ground disturbance. The overall intent of revegetation is to prevent the establishment of weeds, enhance wildlife habitat, control erosion, improve aesthetics, and restore native vegetation communities along the ROW.

Activities Requiring Revegetation

PGE will revegetate sites disturbed by O&M-related activities. Activities related to O&M that may involve revegetation include but are not limited to the following:

- Power pole or tower replacement,
- Large-scale clearance under the transmission line that results in ground disturbance,
- Areas under the transmission line ROW identified by PGE and the USDA-FS for deer/elk forage enhancement,
- Access road improvements, and
- Some weed control projects.

Small (less than 0.25 acres) O&M Sites on National Forest Lands

To the extent possible, routine O&M activities planned for the upcoming year on National Forest lands that could result in ground disturbance will be discussed at the annual meeting and listed in the APM. However, it is likely that not all ground-disturbing activities and their locations will be known at the time of the annual meeting.

USDA-FS staff will come to the annual meeting prepared to suggest species that can be purchased as seed and used to revegetate disturbed sites less than 0.25 acre on National Forest lands. Native grass species currently used on the west side of the MHNF and WNF include blue wild rye (*Elymus glaucus*) in the open or Columbia brome (*Bromus vulgaris*) in the shade. In addition, non-native annual rye (*Lolium multiflorum*) is used in some disturbed areas on the MHNF only because it is judged non-invasive and non-persistent. On the Willamette, if immediate stabilization is needed, use winter wheat or oats. Unless otherwise specified at the annual meeting, additional consultation between PGE and USDA-FS will not be required for assessing revegetation of small sites disturbed by O&M-related activities.

Large (more than 0.25 acres) O&M Sites on National Forest Lands

Planning well in advance for O&M projects expected to disturb more than 0.25 acre of National Forest lands is critical because it can take 2 years or more to acquire some local native species in the amounts needed for revegetation. PGE will conduct a preliminary assessment of any site on National Forest lands where disturbance is expected to exceed 0.25 acre to evaluate specific revegetation needs for erosion control, aesthetics, wildlife, and weed prevention. PGE will then prepare a draft Site-specific Revegetation Plan that includes revegetation objectives, based on the surrounding native vegetation, as well as slope, aspect, and soil conditions, and associated monitoring to ensure that objectives are met. USDA-FS staff will collaborate with PGE to develop a list of species that meet the USDA-FS Native Plant Policy and estimate needed amounts of seed and/or plant stock to revegetate the site. In addition, USDA-FS will be consulted to ensure that selected native plants are compatible with any habitat enhancement programs that include or are close to the site to be revegetated. Information from this consultation will be used to finalize the Site-specific Revegetation Plan and upon approval of the USDA-FS, as appropriate, PGE will order needed plant materials. PGE will be responsible for planning for and acquiring appropriate plant materials from the USDA-FS or other USDA-FS approved sources.

V. Inspection Program

For routine maintenance, PGE conducts both aerial and ground inspections of the transmission line and ROW. Aerial inspections of the power line are conducted from a helicopter and typically scheduled twice per year—once in the spring (April) and again in the fall (September). Depending on the weather, the entire 100-mile long line can be inspected in a single day. Additional inspections are conducted as needed, such as during an emergency line outage, or after a severe storm event. An aerial inspection may trigger a ground inspection if damage is noted or suspected during the flight, otherwise, ground inspections of the transmission line are usually conducted every 5 years. Ground inspections are conducted on foot or from a motor vehicle (pickup truck and/or off-road vehicle). If road access is not unavailable, PGE maintenance personnel inspect the line on foot. The fifth-year ground inspection generally requires 1-2 weeks to complete on National Forest lands.

Before conducting annual helicopter patrols, PGE will review the spatial and/or temporal constraints associated with special status wildlife locations/habitats along the transmission line and will schedule inspections of these areas at an appropriate time or conduct them on foot if necessary. Spatial and temporal constraints will be identified by the Forest Service.

For vegetation, routine ground patrols of the ROW are scheduled on a 3-year cycle. Periodic ground inspections are also conducted after severe storms, during outages, and during and after any activities that may alter vegetation or land uses (logging, development, or fire) on adjacent properties. All ground surveys are conducted by accessing the area by vehicle or on foot. Routine ground patrols are scheduled in spring so that maintenance activities can occur during the warmer, drier weather in the summer and fall. Inspections occasionally identify hazard trees, which are fast-growing trees that could potentially contact the line prior to the next scheduled cycle of under clearance. Hazard trees are considered an imminent threat to the power line and are removed as soon as possible.

Aerial and ground patrols associated with outages, storms, or the management of danger or hazard trees for public safety reasons are considered emergencies and are not restricted by

temporal or spatial constraints. If an emergency inspection is necessary while temporal or spatial constraints are in effect, then PGE will notify the USDA-FS prior to the inspection.

An inventory of invasive non-native plant species on National Forest lands within the ROW and on other non-ROW National Forest lands affected by O&M-related activities will be conducted every 3 years. The invasive non-native plant species database and map and the list of Priority Species will also be updated every 3 years, or sooner if needed, to reflect new species or major infestations that are observed opportunistically by PGE staff or USDA-FS personnel.

VI. Coordination

PGE will convene an annual planning meeting consisting of representatives from PGE and the USDA-FS. Each entity will designate representatives who will coordinate O&M Plan-related activities. These Plan Coordinators, along with the PGE Forester, PGE General Foreman for Transmission and Distribution, PGE Transmission Line Patrolman, and other appropriate staff from PGE and the USDA-FS will meet within the first quarter of each calendar year to discuss the upcoming year's facility and vegetation management activities. These activities will be documented in a brief Annual Planning Memorandum (APM). For each year, this memorandum will include the following:

- A summary of vegetation management activities from the previous year;
- A summary of facility maintenance activities from the previous year;
- A summary of weed eradication measures from the previous year;
- Planned aerial and ground inspections;
- Planned vegetation maintenance projects;
- Planned invasive non-native plant inventory, monitoring, or control projects;
- Planned revegetation projects; and
- Planned facility maintenance projects.

The PGE Plan Coordinator will take the lead in scheduling and convening the annual planning meeting and coordinating preparation of the APM. The Plan Coordinators will be responsible for attending the meeting and cooperatively developing the APM, with input from others, as needed. Prior to the annual planning meeting, PGE and USDA-FS staff will be responsible for updating maps of SS species in or near the ROW. These maps will be used to determine if any spatial or temporal constraints are necessary for facility or vegetation management activities planned for the upcoming year.

If possible, O&M activities expected to require revegetation within the 2 years beyond the current plan year will also be identified, with an emphasis on projects that need lead time to acquire native plant materials and/or require analysis under the National Environmental Policy Act (NEPA).

This O&M Plan will be reviewed by PGE in consultation with the USDA-FS every 5 years, and revised and updated as necessary. The Plan Coordinators will be responsible for reviewing the existing O&M Plan and determining if revisions or updates are needed. The Plan Coordinators will summarize any needed revisions at the annual planning meeting and develop a revised draft O&M Plan for review within 3 months of the meeting, consulting with appropriate resource

specialists and PGE O&M staff as needed. All participants in the annual planning meeting for that year will review and comment on the revised draft O&M Plan. The Plan Coordinators will then prepare a final revised O&M Plan for approval by the PGE and the USDA-FS.

2.3 Comparison of Alternatives

An EA typically includes a summary table comparing alternatives, particularly in terms of significant issues. There were no significant issues identified for this project and as the analysis in Chapter 3 shows, there are not major differences in the effects related to Alternative 1 and 2. The following table provides a qualitative comparison of Alternatives 1 and 2.

Table 2-1 Alternative 1 and 2 Comparison

Alternative 1 (No Action)	Alternative 2 (Proposed Action)
No special use permit issued.	Operation and maintenance of the powerline corridor will come under a special use permit.
No operation and maintenance plan – management continues in an ad hoc fashion.	Operation and maintenance adopted.
Activities along the powerline corridor are not formally coordinated between PGE and Forest Service.	Annual planning meeting provides structured, predictable coordination between PGE and Forest Service
No formal weed eradication, revegetation, vegetation management, or maintenance plan in place.	Operation and maintenance is adopted in this alternative and it lays out specifics as to how the corridor is managed.

Chapter 3 – Existing Conditions and Environmental Consequences

This section summarizes the physical, biological, social and economic environments of the affected project area and the potential changes to those environments due to implementation of the alternatives.

3.1 Past, Present and Reasonably Foreseeable Future Activities

The cumulative effects discussed in this section include an analysis and a concise description of the identifiable present effects of past actions. These effects are described to the extent that they are relevant and useful in analyzing whether the reasonably foreseeable effects of the agency proposal for action and its alternatives may have a continuing, additive, and significant relationship to those effects. The cumulative effects of the proposed action and the alternatives in this analysis are primarily based on the aggregate effects of the past, present, and reasonably foreseeable future actions. Individual effects of past actions are not listed or analyzed, and are not necessary to describe the cumulative effects of this proposal or the alternatives. (36CFR220.4(f))

Analysis Scale

The Portland General Electric Special Use Permit will authorize activities along a powerline corridor that is nearly 27 miles long, but only 125' wide. Even with the danger tree cutting that may occur outside the right-of-way and the limited maintenance on access roads, effects related to this project are expected to be localized and minor. The cumulative effects analysis scale for this project, therefore, will generally include the right-of-way corridor and the areas immediately adjacent to this corridor.

Vegetation Management

Past Activities

On the Detroit Ranger District since the mid-1990s, there has been approximately 250 acres of timber harvest within 500' of the powerline corridor. The majority of this harvest occurred in the French Creek Drainage in the Hammond Thin (1995) and Tumbug Timber Sales (2003).

Since 1995, there has not been any timber harvest within 500' of the powerline corridor on the Clackamas Ranger District

With the implementation of the PGE project, there is no expectation that any residual effects associated with these past timber harvests will result in cumulative effects.

Present Activities

French Bug Timber Sale (Willamette National Forest) – The French Bug Timber Sale is located along French Creek, Humbug Creek and the Breitenbush River. A decision for this 1200

acre timber sale was signed in August 2008. The project includes about 200 acres of thinning and gap cuts adjacent to the powerline corridor. Implementation of this project will likely occur after 2011.

Cascade Crest Fuels Break (Mt. Hood National Forest) – The project would create a continuous shaded fuel break approximately 500 feet wide and adjacent to roads 4230 and 4220. Approximately 852 acres would be treated. The fuel break would be accomplished by cutting some trees and brush and cleaning up fuels on the ground along roads 4220 and 4230 to aid in the safe suppression of large scale wildfires. At the eastern edge of the Clackamas Ranger District, the 4220 Road crosses the PGE powerline corridor. Fuel treatments are proposed for this section of the road.

A decision on this project is expected in fall 2008.

Round Butte 3 Fuels Project (Crooked River National Grassland) – This project proposes to reduce hazardous fuels on 815 acres in the wildland-urban interface next to the Round Butte subdivision and a PGE substation, 6 miles west of Madras. Junipers over 5'' in diameter at breast height (dbh) would be thinned to 30-40 foot spacing. All junipers under 5" dbh would be cut. Old growth juniper would not be cut.

A 200 acre treatment unit is in close proximity to the PGE substation and powerline. A decision is expected on this project in fall 2008.

Reasonably Foreseeable Activities

Sardine Timber Sale (Willamette National Forest) – This sale is still in a planning phase. It is anticipated that there will be one thinning unit (approximately eleven acres) adjacent to the powerline corridor. Implementation of this project will likely occur after 2012.

Recreation

Reasonably Foreseeable Activities

Travel Management (all three forests)

By the end of 2009, the Willamette, Mt. Hood, and Ochoco National Forests will be implementing the Forest Service's Travel Management Rule. The rule requires each national forest or ranger district to designate those roads, trails, and areas open to motor vehicles.

Designation will include class of vehicle and, if appropriate, time of year for motor vehicle use. A given route, for example, could be designated for use by motorcycles, ATVs, or street-legal vehicles.

Once designation is complete, the rule will prohibit motor vehicle use off the designated system or inconsistent with the designations.

In some areas (for example, the Breitenbush area), the powerline corridor has likely led to the creation of user-created trail. The implementation of the Travel Management Rule should help to reverse this trend.

3.2 Vegetation

Existing Condition

The total power line right-of-way (ROW) represents about 0.05% of the acres on the Detroit Ranger District, Clackamas Ranger District, and Crooked River National Grassland acres (see table 3-1). The vegetation within the ROW corridor is predominantly in an early seral stage. This is a result of the power line under clearance requirements where, in general, trees are not allowed to grow beyond the sapling or pole stage. Approximately 85% of the ROW corridor can be characterized as having vegetation less than 20 feet tall within the wire zone and 35 feet tall within the border zone (see figure 2-1 for a description of these zones). The vegetation is primarily composed of small trees, shrubs or grasses depending on the location. The remaining 15% of the ROW corridor is dominated by trees that have reached crown closure, are in a mid seral stage, and range from 9 to 21 inches in diameter. These scattered clumps of mid seral conditions occur on the Detroit and Clackamas Ranger Districts in riparian areas or areas where the line is substantially above ground level, such as across a ravine. Table 3-1 provides an estimate, based on aerial photo-interpretation, of the distribution of seral stages within the ROW.

Table 3-1. Distribution of seral stages within the National Forests' right-of-way (ROW).

Forest	Total Acres	ROW Acres	Percent of Forest in ROW acres	Acres in Early Seral Stage	Acres in Mid Seral Stage	Percent of ROW acres in Early Seral Stage
Detroit RD	300,000	311.9	0.10%	260	52	83%
Clackamas RD	426,000	105.5	0.02%	93	13	88%
Crooked River National Grassland	112,000	5.2	0.00%	5	0	100%
TOTAL	831,000	422.6	0.05%	358	65	85%

The vegetation adjacent to the ROW corridor is dominated by stands with trees that typically range from an average of 9 to 21 inches in diameter and 100 to 150 feet in height. This diameter class is the largest grouping of stands along the corridor and makes up about 59 percent of all stands along the line. In terms of miles, there are about 15.9 miles of these types of stands adjacent to the PGE line. The next largest grouping of stands make up about 33% of the stands and have trees that typically range from an average of 5 to 8.9 inches in diameter and 40 to 85 feet in height. This equates to about 8.9 miles adjacent to the PGE line. The remaining adjacent stands are in seedling and sapling size classes with diameters up to 5.9 inches in diameter and heights up to 30 feet. Typically, PGE removes ten to fifteen danger trees every three years from these adjacent stands. Danger trees are defined as any tree or significant part of a tree determined to have a higher than normal potential for failure during extreme weather conditions, and that could come within 30 feet of the ROW centerline if they fall (O&M Plan, 2008).

Environmental Consequences

Direct and Indirect Effects – Alternative 1 and 2

The effect of PGE's under clearance requirements within the ROW corridor is the continued maintenance of the 422.6 acres in an early seral stage. Stand development and succession occur over time, causing changes in stand structure and species composition. Forest stands typically

grow larger and taller trees over time until a disturbance occurs. Disturbances are relatively discrete events that disrupt the structure or species composition and/or change resource availability or the physical environment (Tappeiner et al, 2007). The routine vegetation management within the corridor causes an almost continuous disturbance within the corridor, disrupting the natural stand development processes. Since both alternatives perform the same routine vegetation management, they both disrupt this natural development process. However, this disruption is considered minor because the ROW corridor represents only about 0.05% of the land base for the Detroit Ranger District, Clackamas Ranger District and the Crooked River National Grassland.

As the stands adjacent to the ROW corridor continue to grow in height, the trees will increase in their ability to fall and strike the power lines. As they age, there will be an increase in mortality from insects and diseases as well as inter-tree competition for resources. Over the next 20 years it is expected that there will be an increase in the amount of potential danger trees along the corridor that will need to be removed. Since 92% of the total T-line length on National Forests has forested stands with trees greater than 40 feet tall, it can be expected that danger tree removal may go from 10 to 15 trees every three years to double, or even triple, that amount. The effect on stand structure will be an increase in the amount of large woody material since trees will either be topped or cut and left in the stand. Both alternatives propose danger tree removal based on the same criteria therefore the effects would be the same.

Cumulative Effects – Alternatives 1 and 2

As stated in Section 3.1.2, harvesting is expected to occur on about 211 acres in stands adjacent to the ROW corridor on the Detroit Ranger District, about 12 acres on the Clackamas Ranger District and about 200 acres on the Crooked River National Grassland. These future projects involve commercial thinning, shaded fuel breaks and small gaps adjacent to the corridor.

Commercial thinning and shaded fuel breaks are expected to reduce the amount of future mortality in the stands by reducing inter-tree competition and removing less vigorous trees. However, it may also increase tree height on the residual trees by reducing competition for resources so the cumulative effect on the increase in danger tree risk is considered negligible.

Up to 2 acres of small gaps (one acre or smaller) will likely occur adjacent to the power line corridor in the next five to ten years. These gaps, within proposed commercial thinning units, are designed to remove identified potential danger trees and/or modulate or soften the hard visual lines created on the landscape by the ROW corridor. The small gaps will cumulatively reduce the risk of increased danger tree removal in the next twenty years on about 0.5% of the acres adjacent to the ROW corridor.

3.3 Fire and Fuels

Direct and Indirect Effects – Alternative 1

Under the No Action alternative, a special use permit would not be issued to authorize the continued use, operation and maintenance of the existing PGE powerline transmission line. Without an operation and maintenance plan underlying growth, over-hanging trees or snags and potential slash will be left unchecked and allowed to accumulate within the right-of-way

boundaries. Under the right weather and fuel moisture conditions this may increase the hazard or risk of wildfire.

Under Alternative 1, there would not be an O&M plan in place for maintaining the powerline. The fuels issue that is potentially affected by the operation and maintenance of the powerline ROW is the potential hazard associated with cutting and leaving of vegetation in the transmission right-of-way. The increased fuel loadings could be associated with a greater fire intensity and higher burn severity. Should a wildfire occur, there exists a potential for damage to surrounding forest ecosystems, private properties and the risk to public and firefighter safety.

Cumulative Effects – Alternative 1

The cumulative effects of the No Action Alternative would be increasing accumulation of fuels, which will inevitably lead to wildfires that are much more difficult to control than fires in areas where the under-lying vegetation has been treated. If allowed to continue on the path of natural succession the potential for trees to fall on the lines igniting fuel accumulations below is much greater. A severe, large wildfire may not occur within the area for 25 years or more, but natural combinations of weather and fuel conditions will ensure that it will happen eventually.

Direct and Indirect Effects – Alternative 2

This alternative would implement an O & M plan for vegetation maintenance. There would be no change to the powerline infrastructure under this alternative and the same maintenance activities would occur. Components of the powerline maintenance plan that deal with the prevention and control risk of forest fire include:

- Inspection ROW vegetation
- Danger Tree/ Under clearance removal of blow-down and other high hazard vegetation
- Slash and debris management

The proposed O & M plan would reduce the potential for a wildfire to exceed the capabilities of a direct attack (ground personnel with hand tools, flame lengths less than 4 feet). Conditions would be stabilized and/or improved by treatments that reduce fuel accumulations and remove trees that are susceptible to blowdown. This will allow for a safer environment for firefighters responding to fires; for this reason the threat to the powerline operation, adjacent private and National Forest land would be greatly diminished.

Cumulative Effects – Alternative 2

Past, present, and reasonably foreseeable activities described in Section 3.1 were considered for cumulative effects. Given the limited intensity and scope of effects associated with the Proposed Action, no cumulative effects are expected from this project.

3.4 Wildlife

The purpose of the wildlife section is to identify the desired condition for wildlife and to evaluate the effects of the proposed alternatives on wildlife species, including terrestrial insects and mollusks, and to determine consistency with Forest Plan and other regulatory direction for wildlife management on National Forest lands. The topics discusses in this section are big game; snags; downed wood; migratory birds; raptors and colonial nesting birds; management indicator

species; rare and uncommon species; and proposed, threatened, endangered and sensitive species.

Big Game

Direct and Indirect Effects – Alternative 1

There would be no roads created or proposed for new closures with this alternative. Over time the lack of management of powerline vegetation would result in decreasing forage values and increasing hiding cover. Forage is currently limiting in the analysis area and lack of powerline maintenance under this alternative would further decrease forage values. Current habitat effectiveness values would remain below minimum Forest Plan desired levels for all winter range areas and overall Big Game Emphasis Area values.

Direct and Indirect Effects – Alternative 2

Forage

The small increase in forage quality would not measurably change the current habitat effectiveness values for forage in the analysis area. Forage values would remain below Forest Plan desired levels overall and in winter range. Forage quality would be increased by powerline maintenance designed to improve forage species availability and quality.

Roads

The effects resulting from road management would not change those described for alternative 1. There would be no roads proposed for new closures under this alternative.

Big Game Winter Range

The project area includes 18.6 miles of big game winter range and 2 miles of summer range. The implementation of the Alternative 2 is not expected to change the current condition of big game summer or winter range.

Cumulative Effects – Alternatives 1 and 2

Past management practices increased forage in the area which was low in forage and resulted in an increase in big game populations. Over time forage value has decreased as trees planted in previously harvested areas have grown and are crowding out forage species.

The cumulative effects in the project area are expected to be inconsequential. The French Bug timber sale in the powerline area would increase forage quality. Existing past harvest units are expected to continue to decline in forage value in the near future as conifers continue to grow. What will increase is the quality and maintenance of existing forage areas when they are improved by powerline related management.

Road closures are not proposed under this alternative. Additional road closures are occurring in the powerline area as a result of the French Bug timber sale.

The French Bug Timber Sale, the proposed Sardine Timber Sale and the Cascades Crest Fuel Break Project have units in the powerline area. It is likely that the two thinning sales will include mostly thinning units so it is not likely that any cumulative effects will result from these two sales happening in the same area. A portion of the Cascade Crest Fuel Break Project occurs adjacent to the powerline and is within summer range. Implementation of both projects will not result in any substantive cumulative effects to big game habitat.

Other projects listed in Section 3.1 will not result in cumulative effects for big game.

These activities in conjunction with the proposed project would have a slight positive overall cumulative effect on big game habitat in the powerline area. The overall road densities will remain unchanged. As a result of this project and other projects in the area, forage quality may be increased slightly and maintained in the powerline corridor.

Snags

Existing Condition

Snag levels are the result of past management practices with unique characteristics and locations. In the 1920-30's railroad logging occurred at lower elevations in low gradient areas on which railroads could be built. As a result of past railroad logging and fires many stands are between 9"-21" dbh. Generally the powerline follows the low gradient areas. The Eastern 5 miles of the powerline, on the Detroit R.D., has a few stands of older trees adjacent to the original clearing corridor, mostly east of the Breitenbush hot spring area. The original clearing corridor includes the current open area under the powerlines and approximately 200 additional feet on either side of the open area. The year of origin for these stands is 1960 making the current stand age 48 years. The Bonneville Power Administration line adjacent to the PGE line in the Breitenbush river drainage and the Mt. Hood National Forest will continue to be maintained in a non-forested condition.

Direct and Indirect Effects – Alternative 1

Existing levels of snags would be maintained. Existing unharvested natural stands would continue produce large snags through natural processes. Stands which are 70-100 years old would continue to produce small diameter snags through competition induced mortality. Generally competition induced mortality occurs in the smallest trees which average approximately one half the average stand diameter. Snag diameters and numbers, in the original cutting corridor adjacent to the current open area under the powerline, would continue to increase over time due to tree growth.

Direct and Indirect Effects – Alternative 2

Generally alternative 2 maintains the existing condition. The powerline corridor will remain in early seral conditions and not provide snags. Maintenance activities will have inconsequential effects to adjacent forested areas and snag levels.

Cumulative Effects – Alternatives 1 and 2

Over time, previously railroad logged areas have developed larger average stand diameters and are producing small diameter snags. Over time these stands will begin producing trees which will meet forest plan S&G's for snag size and it is estimated this will begin occurring in approximately 20-30 years. Snags produced in these stands are generally smaller diameter trees killed by competition mortality so although there are trees of sufficient diameter to meet minimum snag diameter sizes they generally are not snags.

In the future, previously harvested stands adjacent to the project are expected to be harvested and snags would be created from the larger diameter trees as part of the harvest. This will result in larger snags being produced sooner than in naturally occurring mortality in unmanaged stands. Over time the stands adjacent to the right-of-way are expected to produce more snags of larger

diameter than are currently available. Riparian areas will produce larger snag diameters more slowly than thinned stands and will produce them for an indefinite period of time. Changes to snags as a result of this project would not alter the existing level of larger snags.

Salvage logging and routine hazard tree felling along roads and powerline corridors would continue to reduce snag levels in areas where these activities occur.

Downed Wood

A renewable supply of large down logs is critical for maintaining populations of fungi, arthropods, bryophytes, amphibians and various other organisms that use this habitat structure. Provision of coarse woody debris is also a key standard and guideline for the Northern spotted owl, American marten, fisher, two amphibians, and two species of vascular plants. Coarse woody debris well distributed across the landscape, provides for ecological functions for these animals.

Existing Condition

In stands that grew after railroad logging, trees are small because growth has been limited by high density conditions. Conditions described in the snags section apply to downed wood as well. Small amounts of down wood are added to the powerline corridor yearly when hazard trees are felled and left. Existing unharvested natural stands adjacent to the project would continue to produce large diameter DWD through natural processes.

Direct and Indirect Effects – Alternative 1

In the No Action Alternative, management of the powerline corridor would likely continue as it is managed today. No special use permit, however, would be issued. The corridor would continue to be managed and cleared of vegetation that poses risk to the powerline. The corridor would continue to be an area not conducive to large snag recruitment.

Direct and Indirect Effects – Alternative 2

Generally alternative 2 maintains the existing condition. The powerline corridor will remain in early seral conditions and not provide downed wood. In the future there will continue to be losses of snags in the area for safety reasons as a result of road and powerline maintenance activities. Maintenance activities will have inconsequential effects to adjacent forested areas and downed wood levels.

Cumulative Effects – Alternatives 1 and 2

Salvage logging and routine hazard tree felling along roads would continue to reduce snag levels in areas where these activities occur. Firewood cutting along roadways open to the public reduces down wood levels adjacent to roads.

Clearcut harvest units from approximately 1940-1980 did not leave wildlife trees. In 50-70 years after harvest these stands would begin to produce trees large enough to provide snags of 18-20" dbh which later become DWD. Natural recruitment in unmanaged regeneration stands may take 20-30 years longer to produce the same size snags as thinning in managed stands. Stands harvested over the last 20 years have provided for wildlife tree habitat by leaving green trees in the units and topping them to create future snags and DWD as a measure to meet Forest Plan standards. Most harvest units in the analysis area were harvested prior to the time when snags and downed wood were left to provide for wildlife needs. Stands that have been previously

managed are expected to mature and in the future provide more DWD resources in the project area than are currently available.

Suppression of wildfires which historically were stand replacing fires has resulted in increases of down wood accumulations across the landscape. Underburning in low intensity fire areas has not occurred as a result of fire suppression creating more downed wood debris than were historically present.

Migratory Birds

Existing Condition

The original 1918 statute (Migratory Bird Treaty Act) implemented the 1916 Convention between the U.S. and Great Britain (for Canada) for the protection of migratory birds. Later amendments implemented treaties between the U.S. and Mexico, the U.S. and Japan, and the U.S. and the Soviet Union (now Russia).

Forested habitats may contain warblers, swallows, swifts and other migratory species. Most of the habitat in the project area is coniferous forest with hardwoods in riparian areas. This landscape provides a mix and distribution of habitat types important to migratory land bird species. Stand changes from various projects provide a mix of structure and seral type conditions which provides habitat for a mix of migratory land bird species. Powerline corridors are maintained in early seral stages which favor birds that specialize in open areas. Adjacent forest habitat types dominate the landscape. Early seral stage habitat is decreasing across the landscape which reduces species diversity in the area.

Direct and Indirect Effects—Alternative 1

Species using forested habitats and densities of migratory birds are not expected to change. Adjacent Bonneville Power Administration lines will continue to provide open habitat and early seral stages of forest development. Some areas will be maintained in meadow habitat for use by early seral dependant species.

Direct and Indirect Effects—Alternative 2

Early seral forest conditions and meadow habitats will be maintained under the powerline. Riparian areas with hardwoods have a higher concentration of neo-tropical migratory birds than general forest. Hardwood areas are generally maintained under the powerline corridor with willow dominating in these areas. No shift in species abundance is expected to occur as a result of maintaining open areas under the powerline corridor.

Cumulative Effects – Alternatives 1 and 2

Other projects in the area are not expected to change migratory bird species composition or abundance.

Raptors and Colonial Nesting Birds

Existing Condition

Surveys were not conducted to identify raptor or colonial nesting birds in the project area. Surveys adjacent to Detroit Reservoir and the lower Breitenbush River were conducted for Bald Eagles and osprey in past years. Ospreys are expected to continue utilizing the area adjacent to the Breitenbush River and Detroit Reservoir for nesting where residual old growth trees are

present. Large trees which could be used by nesting raptors or colonial nesting birds are present adjacent to the powerline corridor and it is known some of these trees are used for nesting and roosting.

Direct and Indirect Effects – Alternative 1

Active roost and nest sites for raptors and colonial nesting birds would not be disturbed. Stands will continue in their current trajectory toward larger sized forests.

Direct and Indirect Effects –Alternative 2

Active roost and nest sites for raptors and colonial nesting birds have been identified in the project area. Nest trees are expected to remain after maintenance activities as they are normally outside the corridor managed for powerline corridors.

Cumulative Effects – Alternatives 1 and 2

There are no past, present or reasonably foreseeable cumulative effects related to raptors and colonial nesting birds in the project area. Other sales in the area have seasonal restrictions to protect these species from disturbance during the nesting period. Other activities in the area are not expected to reduce availability of trees used for nesting or result in habitat alteration.

Management Indicator Species

The 2005 planning rule for National Forest System Land and Resource Management Planning addresses management indicator species. (36 CFR 219.14f) "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."

Management Indicator Species in the Mt. Hood National Forest portion of the PGE project area include northern spotted owl, pileated woodpecker, pine marten, deer, and elk.

For the Willamette National Forest, the following MIS are in the PGE project area: northern spotted owl, bald eagle, peregrine falcon, cavity excavators, pileated woodpecker, pine marten, and big game (deer and elk).

Spotted owl, peregrine falcon and bald eagles are discussed in the Threatened, Endangered, and Sensitive Species section. Habitat for elk and deer is discussed under the Big Game section. Cavity excavators are discussed in the Snags section. Pine marten and pileated woodpeckers are discussed in this Management Indicator Species section.

American Marten and Pileated Woodpecker

Existing Condition

No pileated woodpecker or pine marten habitat areas are located adjacent to the powerline corridor.

Direct and Indirect Effects – Alternative 1

Powerline corridor clearings are not expected to begin providing habitat for these species for at least 80 years. The adjacent area will continue to provide old-growth characteristics in a

fragmented pattern and with an improvement in connecting habitat along the Breitenbush River in the next 10-30 years.

Direct and Indirect Effects – Alternative 2

Effects to American marten and Pileated woodpecker are expected to be inconsequential as danger tree management will not remove or degrade habitat for these species. No change is expected under alternative 2 when compared to the existing condition.

Cumulative Effects – Alternatives 1 and 2

The projects described in Section 3.1 were reviewed. There are no effects associated with past, present and reasonably foreseeable activities in the project area that when added to the effects of the proposed actions are expected to result in cumulative effects. No projects are known in the project area which will reduce available old-growth conifer forests in the area. Over time protection of riparian areas will result in the development of more old-growth forest which will better connected existing areas of similar habitat.

Rare and Uncommon Species

Potential habitat for great gray owls does not occur in the analysis area, and therefore is not discussed below.

Rare and uncommon species applicable to this project area include Red Tree Voles (RTVs).

Introduction and Existing Condition

Based on the literature, old-growth habitat appears to provide optimum conditions for red tree vole populations. The tall, multi-layered canopies of old growth retain humidity and intercept fog, which functions as a climatic buffer and a source of free water. Large branches provide stable support for nests, protection from storms, and travel routes (Gillesberg and Carey 1991, as cited in the Survey Protocol for the Red Tree, Vole Version 3.0). Active nests have been found in remnant older trees in younger stands indicating the importance of legacy structural characteristics (Biswell pers. Comm. as cited in the Survey Protocol for the Red Tree, Vole Version 3.0). Little is known about the minimum number or size of conifer trees, or other stand characteristics, required to sustain a local population of red tree voles. Red tree voles have been documented in conifer stands from sea level to 5,500 feet in elevation (Manning and Maguire 1999 as cited in the Survey Protocol for the Red Tree Vole, Version 3.0).

In September 2007 Survey Protocol for the Red Tree Vole, Version 3.0 was issued. Range changes based on extensive survey results and exclusion areas from survey requirements were defined in this document. The Detroit and Clackamas River Ranger Districts are in the Northern mesic forest distribution zone.

Potential red tree vole habitat is located adjacent to some sections of the powerline corridor. Stands under 80 years of age which do not contain two or more predominant conifer trees per acre are typically poor habitat for RTVs. Many stands are approximately 50 years old and are a result of the original clearing of the powerline area. Other stands are a result of railroad logging and are from 70-80 years old. Overall the area adjacent to the powerline is poor habitat for RTV's.

Direct and Indirect Effects – Alternative 1

Forest habitat under the current powerline clearing will begin to develop characteristics suitable for red tree vole occupancy in approximately 80 years. Older stands discussed in the existing condition section will produce these characteristics over the next few decades. Most habitat associated with red tree voles is located outside the powerline corridor and is plentiful in the surrounding area. The overall change associated with trees in the powerline corridor developing into suitable habitat in the future is inconsequential at a landscape level as suitable habitat is plentiful.

Direct, Indirect Effects, and Cumulative Effects – Alternative 2

The action alternative complies with the management direction for this species. As habitat is not being removed and large areas of suitable habitat occur in the surrounding area will remain intact no impacts are expected to this species from the proposed alternative. Conditions will remain essentially the same as the existing condition. Danger trees proposed to be removed annually are generally dead trees or trees which are leaning toward the powerline. Dead trees do not provide suitable habitat for red tree voles. The number of danger trees removed annually, 10-15 in 3 years, are from stands which have poor characteristics for red tree vole occupancy. The probability that an active red tree vole nest would be impacted by danger tree removal is remote.

Cumulative Effects – Alternatives 1 and 2

Other projects occurring in the analysis area comply with management requirements for the Red Tree Vole. No known active nest sites have been located in the analysis area or on the Detroit Ranger District. There are no effects associated with past, present and reasonably foreseeable activities in the project area that when added to the effects of the proposed actions are expected to result in cumulative effects.

Proposed, Endangered Threatened & Sensitive Species

Existing Condition

Species dropped from further analysis

The following species have no habitat in the powerline project area and will not be discussed further in this document:

Table 3-2. Species Dropped from Consideration Based on a Lack of Habitat

Species	Forest[7]
Black Swift	W
Bufflehead	MH, W
Lewis' Woodpecker	W, MH
Northern Waterthrush	W
Purple Martin	W
White-headed Woodpecker	W, MH

[7] MH – Mt. Hood National Forest, W – Willamette National Forest

Species	Forest[7]
Yellow Rail	W
Foothill Yellow-Legged Frog	W
Northwestern Pond Turtle	W
Oregon Spotted Frog	MH, W
Larch Mountain Salamander	MH
Mardon Skipper	W, MH
Puget Oregonian	MH
Columbia Oregonian	MH
Dalles Sideband	MH
Rhyacophila	W

Table 3-3 lists the proposed, threatened, endangered and sensitive species on the Willamette and Mt. Hood National Forests (USDA Forest Service, 2004). Additional detailed information about these species is in the PGE Powerline Biological Evaluation for Wildlife.

Table 3-3. Threatened, Endangered and Sensitive Species with Habitat in the PGE Powerline Project Area

Species	Forest[8]	Habitat Present in Project Area?	Status	
			Federal	Region 6 (USFS)
American peregrine falcon	MH, W	Yes	N/A	Sensitive
Harlequin duck	MH, W	Yes	N/A	Sensitive
Northern bald eagle	MH, W	Yes	N/A	Sensitive
Northern spotted owl	MH, W	Yes	Threatened	N/A
California wolverine	MH, W	Yes	N/A	Sensitive
Pacific Fisher	W	Yes	Candidate	Sensitive
Baird's shrew	W	Yes	N/A	Sensitive
Pallid bat	W	Yes	N/A	Sensitive
Townsend's Big-eared bat	MH, W	Yes	N/A	Sensitive
Fringed Myotis	MH, W	Yes	N/A	Sensitive

[8] MH – Mt. Hood National Forest, W – Willamette National Forest

Species	Forest[8]	Habitat Present in Project Area?	Status	
			Federal	Region 6 (USFS)
Cope's giant salamander	MH	Yes	N/A	Sensitive
Oregon slender salamander	MH, W	Yes	N/A	Sensitive
Johnson's hairstreak (butterfly)	MH, W	Yes	N/A	Sensitive
Evening field slug	MH, W	Yes	N/A	Sensitive
Salamander slug	MH	Yes	N/A	Sensitive
Crater Lake tightcoil	MH, W	Yes	N/A	Sensitive
Crowned Tightcoil	MH	Yes	N/A	Sensitive

Spotted owls will be discussed separately after the sensitive species section. Spotted Owls are the only species listed as federally threatened in the project area.

For the small portion of the powerline ROW across the Crooked River National Grassland, there are no additional species to consider. Ten wildlife species are listed as potential, endangered, threatened, or sensitive on the Regional Forester's List for the Ochoco National Forest but only four have potential or existing habitat on the Grassland—the northern bald eagle, American peregrine falcon, gray flycatcher, and bufflehead. There are no species listed as "Proposed" on the CRNG. None of these ten species are listed as endangered under ESA.

There are two threatened species: northern bald eagle and Canada lynx. Only the bald eagle has potential habitat on the Grassland. Canada lynx will not be discussed further.

There are eight sensitive species: the American peregrine falcon, greater (formerly western) sage grouse, tricolored blackbird, gray flycatcher, pygmy rabbit, bufflehead, upland sandpiper, and the California wolverine.

There is no habitat and have been no sightings for the tri-colored blackbird, the upland sandpiper, or the California wolverine on the Grassland. The greater (formerly western) sage grouse was extirpated from the Grassland in the 1950s. There is no habitat within the project area for the pygmy rabbit, bufflehead or gray flycatcher. These species will not be discussed further.

Although there is no potential habitat for the northern bald eagle or American peregrine falcon, these species are included as they have potential habitat on the Willamette and Mt. Hood portions of the project area.

Regionally Sensitive Species

Introduction

Sensitive species are designated by the regional forester for species which have population viability concerns which are evidenced by: 1) Significant current or predicted downward trends in population numbers or density or 2) Significant current or predicted downward trends in habitat capability that would reduce a species existing distribution. All actions are taken to ensure that management activities do not jeopardize the continued existence of sensitive species

or result in an adverse modification of their essential habitat (FSM 2670.3, Region-6 ID 2670-92-1, 1/91).

Analysis of impacts was done based on the process established in Section 2670 of the Forest Service Handbook and the R-6 Interim Direction R-6 2670-92-1.

Existing Condition

Detailed information on abundance, distribution, and habitat use by these sensitive species in this section can be found in the PGE SUP biological evaluation for wildlife.

Direct and Indirect Effects – Alternative 1

Habitat adjacent to the existing powerline opening is expected to continue in its current progression toward more mature forests. Habitat in the clearing under the powerline is expected to stay in early seral forest stage as vegetation clearing continues in the corridor. Some meadow areas will also continue to be maintained to provide early seral habitat for species limited by lack of this habitat type. No disturbance activities which would impact sensitive species is proposed under alternative 1.

Direct and Indirect Effects – Alternative 2

Habitat conditions for the species listed below, is not expected to change in the future as a result of this project. The existing condition is expected to be maintained over time.

American Peregrine Falcon nesting habitat is not expected to be affected by proposed project activities as cliffs and the primary nest zones do not have proposed treatments. Two management areas are present adjacent to the powerline corridor along the Breitenbush River. Additional unoccupied cliff areas are located adjacent to the powerline corridor and may become occupied in the future.

Harlequin Duck habitat and individuals have the potential to be affected by proposed project activities. The powerline corridor does not cross the Breitenbush River where Harlequin Ducks are know to forage and nest in adjacent forests. French Creek has been surveyed for other projects and found to not support harlequin ducks. Humbug Creek is the only stream suitable for Harlequin Duck occupancy which the powerline crosses. Habitat suitable for harlequin duck nesting and foraging will remain unchanged as a result of powerline maintenance. Due to the limited overlap of the powerline with Harlequin Duck habitat no impacts are expected to occur from this project.

Northern Bald Eagle or its habitat is not expected to be affected as a result of this proposed alternative. Trees suitable for nest building are remnant old growth trees which are present in stands adjacent to the powerline corridor. Bald Eagles have been documented foraging in the French Creek, Humbug Creek, Breitenbush River and Olallie Lake drainages. Potential exists for Bald Eagles to nest adjacent to the powerline corridor. With required seasonal restrictions potential disturbance impacts to Bald Eagles will be avoided. Restrictions on activities with the potential to disturb nesting Bald Eagles are required from January 1 – August 31. This seasonal restriction within the MHNF is only required if a known bald eagle nest becomes known adjacent to the powerline. Currently no known bald eagle nest occurs near the portion of the powerline that resides on the MHNF.

California Wolverine or its habitat is not expected to be impacted by proposed project activities. Potential foraging may occur through the area as wolverine home ranges usually are

between 170 to 270 square miles. Wolverines tend to avoid areas of human disturbance. The project area is heavily used by people for recreation activities which discourages wolverine use of the area. Wilderness areas are expected to continue to provide potential habitat for wolverines. Disturbance by equipment is of limited duration and not expected to impact wolverines if they forage through the area. Wolverine presence in the planning area is highly unlikely. The last verified wolverine sighting in Oregon was in 1992.

Pacific Fisher habitat or individuals are not expected to be impacted by the proposed project. Habitat will remain available for fisher use in the project area and wilderness areas. The potential for effects to fishers is reduced because the probability is low that there are any fishers in the area. Past carnivore surveys on the Detroit Ranger District and the Willamette National Forest did not detect fishers. The closest known population is southern Oregon where existing populations are descendant from individuals transplanted from other states.

Baird's shrew or its habitat may be impacted by the proposed project if they are present and using the forested riparian environment which may be present along the powerline ROW. Baird's shrew habitat use in not well understood but disturbance to individuals is of limited duration and is not expected to exclude Baird's shrews from using the area. Habitat is not expected to be made unsuitable to Baird's shrew use. Impacts to Baird shrew are likely to be very minimal overall, due to the large amount of potential habitat adjoining the powerline ROW that would not be affected by proposed activities.

Pallid Bat, Townsend's Big-eared Bat and Fringed Myotis are expected to roost in older forests adjacent to the powerline corridor and forage for insects in the open area under the powerline. Habitat for foraging is expected to be unchanged and will continue to provide opportunities. Older forest trees with cavities and defects outside the corridor are not expected to be impacted by powerline maintenance as these trees generally are not danger trees.

Salamander habitat occurs throughout the project area. There is little potential for habitat alteration and disturbance of individuals if they are present in the project area. Bark and other woody debris is expected to be present in the powerline corridor. Small amounts of wood will be added to the project area when hazard trees in adjacent stands are felled which may provide habitat for salamanders. Impacts to individuals would be of short duration and insignificant in effect as the surrounding unaffected area as well as the project area will continue to provide habitat for this species.

Johnson's hairstreaks may be present in the overstory canopy in the forests adjacent to the powerline corridor. Danger tree falling may disturb individuals present in the stands. The disturbance is not expected to harm individuals or interfere with normal foraging activities. Suitable habitat is not proposed to be removed by the project.

Evening Field Slug habitat is present in forested areas adjacent to the powerline corridor. There is a chance (although low) that individuals may be impacted by danger tree management. Habitat is not being removed by the project.

Salamander Slug habitat is present in forested areas adjacent to the powerline corridor at lower elevations, primarily in the French Creek drainage. Individuals may be impacted by danger tree management with the probability of impact being unlikely to occur. Habitat is not being removed by the project.

Crater Lake Tightcoil and Crowned Tightcoil (MHNF only) Snail (pristiloma) potential habitat may occur in the powerline corridor. Riparian areas which may have habitat suitable for pristiloma have been managed in their current condition for decades. Continued management of the powerline corridor is not expected to alter potential habitat. Disturbance to individuals could occur if maintenance occurs in a perennially wet area occupied by pristiloma. The probability of pristiloma occurring in the project area is very low with potential disturbance to individuals unlikely. Surveys were not conducted to determine locations of suitable habitat. This species of mollusk has not been located on Detroit Ranger District during surveys for other projects. There are known sightings of the Crater Lake Tightcoil within the South Fork Lemiti Drainage of the MHNF. There are no known sites for the Crowned Tightcoil.

Cumulative Effects – Alternatives 1 and 2

The projects described in Section 3.1 were reviewed for potential cumulative effects.

For sensitive species, the cumulative effects analysis area is the project and adjacent area. Cumulative effects resulting from other activities and the action alternatives in this project are not expected for sensitive species.

Federally listed threatened and endangered species

The Endangered Species Act (ESA), administered by the U.S. Fish and Wildlife Service (USFWS), mandates protection of threatened and endangered species.

Need for further consultation with the U.S. Fish and Wildlife Service is based on the project's effects on T&E species and critical habitat. Based on the finding in the project's Biological Evaluation that powerline maintenance is not likely to adversely affect northern spotted owls, concurrence is needed from the USFWS for this determination.

Existing Condition

The northern spotted owl is primarily an inhabitant of old growth and mature forests.

Suitable spotted owl habitat has been defined in various documents: The ISC Report, USFWS Critical Habitat Determination, Memorandum Decision and Injunction for Judge Dwyer's Decision, and the FSEIS on Management of the Northern Spotted Owl in the National Forests. General guidelines for suitable spotted owl habitat are:

- Forested stands of Douglas-fir, Western hemlock, Western red cedar, or Ponderosa pine older than 200 years and having a moderate to high canopy closure of 60-80%.
- Adequate amounts of snags and downed material with diameters greater than 32 inches dbh (ISC Report 1990)
- An under-story of multi-layered conifers and hardwoods open enough to still allow owls to fly within and beneath it

However, all of the above characteristics do not need to be present for spotted owls to make use of an area, and for habitat to be determined suitable.

Dispersal habitat typically does not have large, old-growth nest trees, multi-layered canopy, or many large snags and logs. The minimum canopy closure for dispersal habitat is about 40% with minimum stand diameter of 11" dbh.

Another component of spotted owl habitat is foraging habitat. Foraging habitat is typically 80 years of age or older and 18" in diameter or larger. If older trees with structural conditions which support nesting are present in predominately foraging habitat birds sometimes nest in these areas. In analysis of suitable habitat for spotted owls both suitable nesting and foraging habitats are combined.

Challenges to spotted owl conservation exist range-wide, including potential threats from wildfires, barred owl competition, great horned owl predation, West Nile Virus and sudden oak death. Disturbances on the landscape from wildfires and wind storms have affected spotted owl habitat.

Suitable habitat in the planning area is well connected by dispersal habitat. The area adjacent to the existing powerline corridor is primarily spotted owl dispersal habitat more than 48 years and less than 80 years old. The powerline corridor is adjacent to a Critical Habitat Unit from the Breitenbush Hot Spring area east to the Willamette National Forest Boundary. The PGE powerline is the northern of two parallel corridors and is not immediately adjacent to the CHU which is parallel to the Southern edge of the shared corridor.

On the Clackamas Ranger District, the powerline corridor crosses or is in close proximity to Critical Habitat Units (CHU) # OR-11 and OR-13 and the Upper Clackamas Late Successional Reserve (LSR).

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

Existing Condition of Critical Habitat Units OR-11 and OR-13: Spotted owl critical habitat units serve to identify lands that are considered essential for the conservation and recovery of the spotted owl. The functional value of the critical habitat is to preserve options for species recovery. CHU OR-11 occurs on the Clackamas River Ranger District and borders the western edge of the Warm Springs Indian Reservation on the crest of the Cascade Range. This CHU is designed to provide for essential nesting/roosting/foraging habitat and to support clusters of owl pairs. The CHU consists of 35,929 acres; 14,103 acres of which is considered suitable habitat for owls. Approximately 44 percent of the capable lands in this CHU are providing nesting/ roosting/foraging habitat for the spotted owls. CHU OR-13 occurs on both the Clackamas River Ranger District of the Mt. Hood National Forest as well as the Willamette National Forest. It provides essential nesting/roosting/foraging and dispersal habitat. This CHU consists of approximately 30,277 acres; 9,953 of which are suitable acres. About 35% of the capable lands in this CHU are providing nesting/roosting/foraging habitat for the owls.

Direct and Indirect Effects — Alternative 1

Currently, the cleared corridor lacks primary constituent elements of suitable spotted owl habitat such as large downed wood, snags and trees with nesting structure. In approximately 50 years the corridor would develop into dispersal habitat. In 80 years the corridor would begin to develop foraging habitat characteristics. The area included in the original clearing corridor is currently developing into dispersal habitat and will reach foraging habitat age in approximately 30 years. No activities which would disturb nesting or foraging activities of northern spotted owls would occur under this alternative.

Direct and Indirect Effects – Spotted Owls – Alternative 2

Effects of Habitat Modification

The proposed project occurs in habitat suitable for spotted owl dispersal and in non-habitat. Nesting and foraging habitat is not present in the powerline corridor. Danger tree management in adjacent stands and along access roads may occur in suitable and dispersal habitat. Suitable habitat and dispersal habitat for spotted owls is not proposed to be removed by this alternative.

Powerline maintenance is included in danger tree management activities at the ranger district level and is submitted to USFWS every two years in a programmatic consultation package. This project is categorized by the USFWS as an activity that may affect and is not likely to adversely spotted owls. The current letter of concurrence covering this activity in 2007-2008 is USFWS reference number 1-7-06-I-0192.

Effects of Disturbance

No spotted owl activity centers are located within or adjacent to the powerline corridor. The nearest activity center to the powerline corridor is 0.3 miles. At this distance the only potential disturbance activity from proposed activities is helicopter use or blasting. Consult the Biological Assessment and USFWS letter of concurrence for protection measures needed to avoid disturbance to nesting spotted owls. With protection measures for blasting and helicopter use protecting nesting spotted owls during the critical breeding season no adverse effects to spotted owls will occur from disturbance.

Cumulative Effects – Alternatives 1 and 2

Projects described in Section 3.1 were considered for cumulative effects.

Ongoing road maintenance is expected to continue to fall hazard trees adjacent to roads which will continue to reduce the quality of suitable spotted owl habitat in the planning area. Personal use firewood cutting is expected to continue near roadways and is expected to maintain reduced amounts of downed wood and thus lower the quality of suitable habitat adjacent to road corridors.

Due to suitable habitat not being proposed for treatment in other projects and dispersal habitat being well connected with suitable habitat in the adjacent landscape these foreseeable actions in conjunction with the effects of implementing Alternative 2 are not expected to compromise the functionality on any NSO home ranges or create barriers to dispersal across the project area.

Table 3-4 Consistency with Direction and Regulations

	Alternative 1	Alternative 2
Big Game	Yes	Yes
Snags	Yes	Yes
Down Wood	Yes	Yes
Green Tree Retention	Yes	Yes
Migratory Bird Treaty Act	Yes	Yes
Raptors and Colonial Nesting Birds	Yes	Yes
Management Indicator Species	Yes	Yes
Threatened Endangered and Regionally Sensitive Species	Yes	Yes

3.5 Botanical Resources

Threatened, Endangered, Sensitive and Proposed Plant Species

During the summer of 2008, a botanical survey was conducted along the entire 27 mile powerline corridor. No threatened, endangered, sensitive or proposed plant species were found during these surveys.

Existing Condition

The powerline corridor contains previously cut ground to accommodate the powerlines. This includes the constant maintenance to keep the ground clear of the types of vegetation that can grow tall such as all trees. Special habitats and noxious weeds were documented throughout the proposed permit powerline corridor. Potential habitat for several sensitive plant species occurs within the powerline corridor. Dry rocky outcrops could potentially harbor sensitive mosses such as *Andreaea schofieldiana*, *Conostomum tetragonum*, *Hieracium horridum* and forbs like *Asplenium septentrionale*, *Eucephalus gormanii*. Wet seepy, swamps and meadows could contain sensitive *Botrichiums*, *Gentiana newberryi*, *Sisyrinchium sarmentosum*, *Rhynchospora alba*, and *Jungermannia polaris*.

Direct and Indirect Effects – Alternative 1 and 2

There will be no direct and indirect effects to threatened, endangered, sensitive and proposed plant species since none were documented in the project area.

Cumulative Effects – Alternatives 1 and 2

There will be no cumulative effects to threatened, endangered, sensitive and proposed plant species since none were documented in the project area.

Special Habitats

Several special habitats were documented along the powerline corridor within the project area. Although many were already cut for the powerline, many were still connected to intact portions

on both sides of the corridor. Most expanded outside of the corridor. These habitats included seeps, springs, swamps, wet meadows, dry meadows, moist and dry rock outcroppings.

Direct and Indirect Effects – Alternative 1 and 2

No direct and indirect effects will occur since there will be no changes to the current condition of the existing special habitats.

Cumulative Effects – Alternatives 1 and 2

Section 3.1 was reviewed for relevant past, present, and reasonably foreseeable activities. Given the limited scope and magnitude of this project, no cumulative effects are expected with the implementation of Alternative 1 or 2.

Invasive Plants

There are several invasive plant populations along the powerline corridor. Invasive plants within the Detroit Ranger District portions of the PGE powerline corridors include Himalayan, European, and Evergreen blackberries *(Rubus armeniacu*, *Rubus vestitus* and *Rubus lacinatus*), Foxglove (*Digitalis purpurea*), Scotch broom (*Cytisus scoparius*), St. John's-wort (*Hypericum perforatum*), ox-eye daisy (*Chrysanthemum luecanthemum*), Cheatgrass (*Bromus tectorum*), Spotted knapweed (*Centaurea stoebe*), Bull thistle, (*Circium vulg*are), Canadian thistle (*Cirsium arvense*), and Evergreen clematis (*Clematis vitalba*).

Common invasive plants documented within the Mt Hood National Forest are Canada thistle (*Cirsium arvense*), Queen Anne's lace (*Daucus carota*), St. Johnswort (*Hypericum perfo*ratum), and Oxeye daisy (*Leucanthemum vulgare*)

Invasive Plants within the Ochoco National Forest include Cheatgrass (*Bromus tectorum*) and Medusahead (*Taeniatherum caput-medusae*).

Direct and Indirect Effects – Alternative 1

No action would mean that a special use permit would not be issued and weed management in the corridor would continue in an ad hoc fashion. Without an invasive plant management plan, the corridor would be taken over with weeds and the spread would continue up and down the roads of the corridor.

Direct and Indirect Effects – Alternative 2

The updated invasive plant management plan will have positive direct and indirect effects on weed control. Some weeds may be eradicated while other, more aggressive weeds will at least be controlled from spreading further from their populations up and down the corridor and out of the corridor via roads.

Cumulative Effects – Alternatives 1 and 2

Section 3.1 was reviewed for relevant past, present, and reasonably foreseeable activities. Timber projects in close proximity to the powerline corridor may increase the risk of noxious weed spread in the area. With proper mitigations and design measures, this should not occur.

Indeed, the implementation of this project along with travel management may result in a positive trend towards controlling the spread of weeds along the powerline corridor and along some of the access roads that may be closed to the public.

3.6 Soils

Direct and Indirect Effects – Alternative 1

Under the No Action alternative, a special use permit would not be issued to authorize the continued use, operation and maintenance of the existing PGE powerline transmission line. If a special use permit is not issued, the Forests would have to look at options and likely develop some other proposed action in the future. This alternative is not responsive to the special use application, and does not meet the needs in the proposed action.

From a soils resource perspective, maintenance, whether routine, major or emergency that is needed to protect the integrity of the power line, will occur with or without the special use permit. Consequently, the action alternative and the no action option have the same basic effects to the soil resource. It is likely that PGE will utilize the same soil protection measures that any prudent operator would employ to meet State or Oregon standards. Therefore, no direct or indirect effects are anticipated.

Direct and Indirect Effects – Alternative 2

The primary impact to the soils resource comes during maintenance of the power line corridor. Maintenance of the transmission line facility includes routine maintenance, major maintenance, and emergency maintenance.

The action alternative has the same basic effects and the same soil protection measures, as the no action option. What changes is that with the special use agreement in effect, the soil protection measures and erosion control procedures are specifically agreed to and formalized.

Cumulative Effects – Alternatives 1 and 2

Relevant past, present, and reasonably foreseeable activities in Section 3.1 were reviewed for potential cumulative effects. Given the very limited direct and indirect effects to the soil resource from the project, no cumulative effects are anticipated.

3.7 Aquatics

Existing Condition

On the Detroit Ranger District, the powerline crosses the Detroit Reservoir/Blowout Divide Creek and North Fork Breitenbush HUC 5 watersheds. Humbug Creek, French Creek and the Breitenbush River are the prominent water ways in the project area; all streams flow into Detroit Lake, which was built in 1953 to control flooding and produce hydroelectric power. The North Santiam River continues into the Santiam, the Willamette and Columbia rivers before emptying into the Pacific Ocean. Other fish-bearing channels that the powerline ROW crosses from East to West include Mansfield Creek, Short Creek, Scorpion Creek, Fox Creek, Humbug Creek, Deadhorse Creek, Byars Creek, Canyon Creek, Marten Creek, French Creek and several unnamed tributaries to French Creek and the Breitenbush River.

On the Clackamas Ranger District, the powerline crosses the Clackamas and Upper Clackamas Watersheds. Several streams cross the powerline corridor, including Cub Creek and Squirrel Creek. Both of these streams are fish bearing. They support resident cutthroat . There are also brooktrout in these streams that have recruited from lake stocking.

Listed fish habitat occurs approximately 1.3 miles downstream of the powerline corridor in Cub Creek. (This is designated critical habitat for Lower Columbia River steelhead). Listed fish habitat in Squirrel Creek is 3 miles downstream from the corridor.

On the Crooked River National Grassland, no streams cross the short stretch of powerline.

Beneficial users, dependent on aquatic resources, along this ROW are: aquatic non-fish species, resident and anadromous fish, recreation use, road maintenance use; and riparian dependent species use. Flood plains and jurisdictional wetland are avoided with this OM plan.

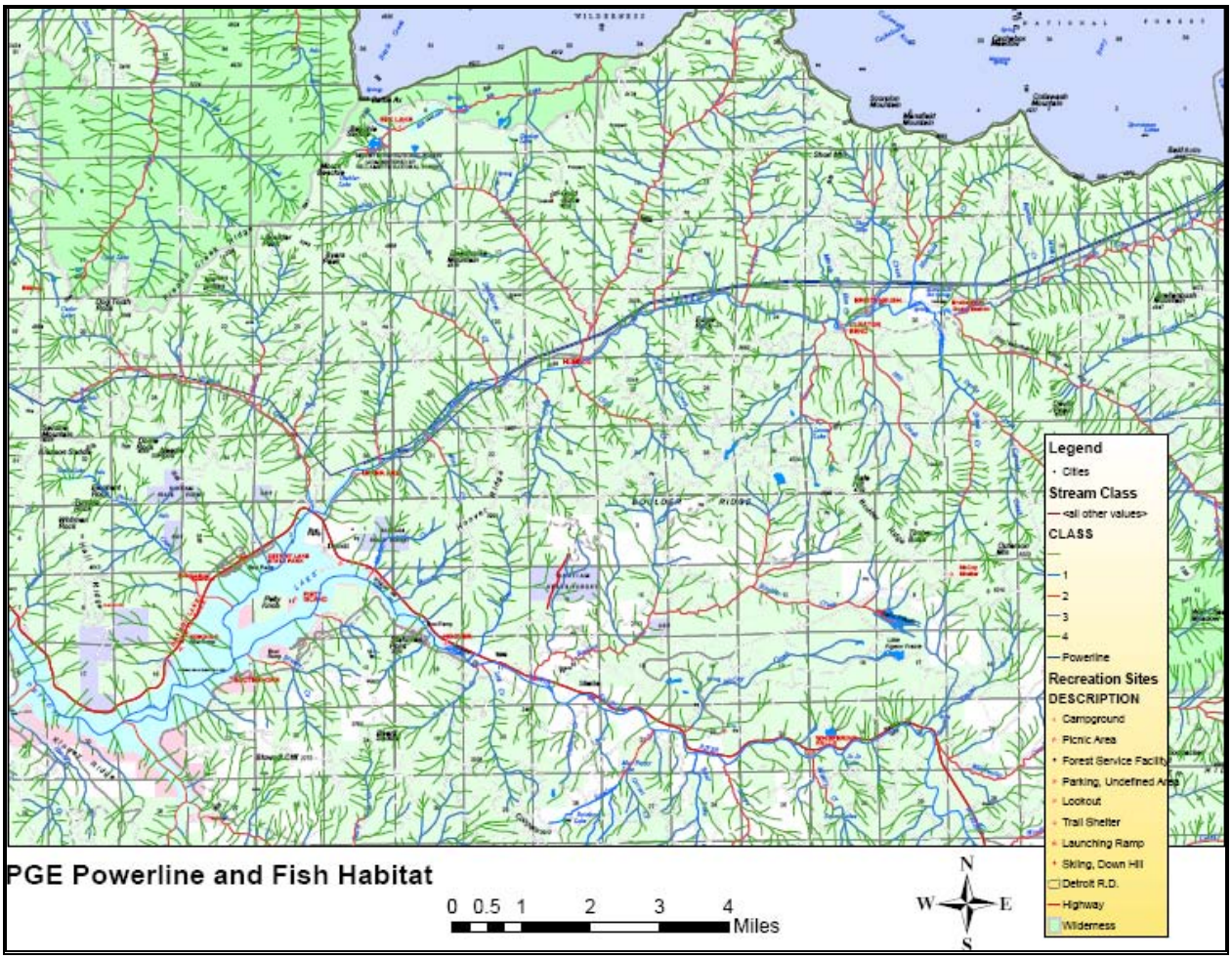
Streams along the ROW contain high water quality with flushes of sediment typically in the fall with the first bank full discharges. Rainfall and upper elevation snow accumulations determine flows found in these streams. Water storage tends to be associated with colluvial and alluvial deposits adjacent to stream courses. Geothermal influences affect the Breitenbush Rivers chemical and thermal properties due to geothermal hot spring being present. The 2004/2006 303d list states that all waters associated with the ROW meets State of Oregon standards.

The predominant erosion process found along the ROW tends to be gully and rill erosion. A 2008-site inventory indicated over 60 locations of gully and rill erosion associated to the access roads associated to the ROW. In 2000, 29 inventory sites were identified. This shows an increase in gully and rill erosion associated with the ROW. Not all of these rill and gully sites connect to active stream channels. The increase in rill and gully erosion is resulting from a decrease in road maintenance.

The ROW is a linear feature that intersects various hydrologic features. Rain and rain on snow dominate the hydrology for the ROW. Seeps and springs are present within the ROW as are live and intermittent streams. Approximately 120 stream channels are crossed with the transmission line on the Detroit Ranger District alone. The lines are suspended and towers hold the lines in place, creating a discontinuous impact to the ground. Access roads to the towers disturb the hydrology by intercepting surface and shallow ground water and redirecting it down the road surface. Gully and rill erosion dominates the erosion processes that influence the hydrology of the ROW (62 sites inventoried in 2008).

Fish species in the project area include Chinook salmon, rainbow trout, cutthroat trout, naturalized sockeye salmon (commonly referred to as kokanee salmon), long-nosed and speckeled dace, and sculpin. French Creek is habitat for cutthroat trout, rainbow trout, sculpin, and giant pacific salamanders. Historically, bull trout and steelhead were found in both watersheds. Naturally reproducing populations of bull trout and steelhead no longer exist above Detroit and Big Cliff Dams. The Breitenbush River and Humbug Creek provide spawning, rearing, and migration habitat for Chinook salmon; French Creek does not. Fish bearing tributaries to these main waterways provide habitat for rainbow trout, cutthroat trout, and sculpin. Figure 3-1 shows fish habitat distribution in the powerline ROW.

Figure 3-1. PGE Powerline and Fish Habitat on the Detroit Ranger District



This project occurs adjacent to French Creek and crosses Humbug Creek and the Breitenbush River, which provide Listed Fish Habitat (LFH) for Chinook salmon. To mitigate effects so that the project is not likely to adversely affect spring Chinook Salmon, Project Design Criteria (PDC) for the OM plan were adopted from the *Biological Assessment for Programmatic USDA Forest Service and USDI Bureau of Land Management Activities Affecting Bull Trout, Lower Columbia Coho Salmon, Lower Columbia Steelhead, Upper Willamette Chinook Salmon, Upper Willamette Steelhead, Mid-Columbia Steelhead, Columbia River Chum Salmon, Lower Columbia Chinook Salmon, Oregon Coast Coho Salmon and Essential Fish Habitat Assessment for Chinook and Coho Salmon within Northwestern Oregon* (April 2008). Meeting the PDCs and consulting on the variations of PDCs with NMFS would complete the necessary ESA requirements. Alternative 1 would not meet the in the programmatic biological opinion because there would be no O&M plan in place to implement the Project Design Criteria. Alternative 2 meets the appropriate direction and guidelines found in the Forests' Land and Resource Management Plan, the Northwest Forest Plan, the Aquatic Conservation Strategy, and Best Management Practices. Alternative 2 is also consistent with other guidance or direction such as the Endangered Species Act (ESA) of 1973, the Magnuson-Stevens Fishery Conservation and Management Act (MSA) of 1996, the Clean Water Act, Wild and Scenic Rivers Act, and Executive Orders 12962, 11988, and 11990.

Environmental Consequences

Alternative 1

Management of the powerline ROW includes road maintenance, routine tower maintenance (no ground disturbance), and vegetation management including hazard tree falling and clearing of brush and trees in the ROW. These activities effect fish habitat parameters including temperature, sediment turbidity and substrate, chemical contaminants and nutrients, large wood, large pool quality and frequency, streambank condition, and riparian resources. In this alternative, management of the powerline ROW would continue to occur without an operation and maintenance plan.

Direct and Indirect Effects

Fish habitat and water quality parameters that are potentially affected by the operation and management of the powerline ROW include: temperature, sediment turbidity and substrate, chemical contaminants and nutrients, large wood, large pool quality and frequency, streambank condition, and riparian reserves. There is currently no O&M plan in place for the maintenance of the PGE powerline. Under this alternative there would be no change to the current management of the PGE powerline ROW. Effects the fisheries resource would continue at the current levels.

Hydrology

Management of the transmission line ROW includes road maintenance, routine tower maintenance, and vegetation management including hazard tree falling and clearing of brush and trees in the ROW. These activities affect the hydrology by accessing the area and capturing surface runoff and removing vegetation that utilized ground water. In this alternative, management of the transmission line ROW would continue to occur without an operation and maintenance plan.

Hydrology parameters that are potentially affected by the operation and management of the transmission line ROW include drainage patterns and flow rates. There is currently no O&M plan in place for the maintenance of the PGE transmission line. Under this alternative there would be no change to the current management of the PGE transmission line ROW. Effects on the hydrology resource would continue at the current levels. Spring and winter runoff amounts would not change with minor increases in available groundwater through the clearing under the transmission line. There are indirect effects to the watershed condition and water table where the roads intercept overland and underground flow of water.

Temperature

Powerline maintenance requires vegetation to be cleared within the ROW. All vegetation that poses a risk to the powerline is cleared to minimize the risk of power failures. Vegetation is controlled by removing limbs, hazard trees, and brush that have the potential to affect powerlines in any manner. Clearing of brush and trees in riparian areas increases solar radiation to streams and the forest floor which heats microclimates adjacent to streams. Cleared vegetation at stream crossings directly increases solar radiation resulting in increased temperatures. The PGE powerlines are located within riparian areas of the Breitenbush River and French Creek for several miles increasing peak summer temperature and decrease nighttime winter temperature along the distance cleared. The powerline also crosses many small tributaries and Humbug Creek, which flow directly into the Breitenbush River. There are no guidelines for managing vegetation currently in place, and in this alternative none are proposed.

There would be direct and indirect effects to water quality due to increases in water temperature. Direct effects include solar radiation to streams in the ROW. Indirect effects to stream temperature occur downstream from the ROW crossings with the heating of microclimates in riparian areas and direct solar radiation to the water upstream.

Sediment, Turbidity, Stream Substrate

Repair and maintenance of roads that access the powerlines has the most potential for negative effects on the fisheries resource. Non-emergency maintenance is usually completed outside of the rainy season (October-May) whenever possible and appropriate. Although not currently required, the use of BMPs (silt fences, hay bales, and seeding) is encouraged because storms mobilize disturbed soils if the site has not had time to be revegetated. Turbidity increases from road maintenance activities could last a few hours to days after a storm event depending on the amount of soil disturbance at the site. Powerline maintenance access uses smaller equipment (truck, ATV, and backhoe) traveling over secondary roads and trails. This would have very small effects on sediment input to streams because disturbance is light and localized.

Line maintenance is not likely to measurably affect substrate composition in streams in or adjacent to the ROW. As described under turbidity, some sediment may enter streams from road maintenance. The amount of sediment is likely to be small and of short duration, but could impact tributary streams and LFH directly.

Direct effects to the sediment, turbidity, and substrate of streams in the rivers in the ROW would only result from soil disturbance within 50 feet of the water way. Indirect effects to these water quality parameters include maintenance activities and access in the remainder of the ROW.

The current condition of the powerline access roads vary with use. Access roads that are not often used are well vegetated and in most cases stable. Roads that are accessed by the public are more open and rutted in sections where the roads that need culverts and proper drainage installed. There are indirect effects to the watershed condition and water table where the roads intercept overland and underground flow of water.

Chemical Contamination/Nutrients

Heavy equipment (chipper, bucket and collection trucks) and chainsaws working near streams can present a potential hazard from leaks and spills. The likelihood of effects is very small because most operations would occur on upland areas outside of riparian reserves and fuel quantities would, in almost all cases, be less than 30 gallons.

Large Woody Debris

Instream wood can be influenced by limbing, topping, or removal of hazard trees in the ROW through riparian reserves. The powerlines were established in the 1950s and have been cleared of most large trees and wood. Where streams cross or closely parallel the powerlines, there is a lack of large wood for aquatic habitat. There is currently no O&M plan with established methods and management practices for the powerline. The direct effects of this alternative are the continued removal of potential wood recruitment to the stream channels. Indirect effect to large wood in stream channels in the powerline ROW is related to the loss of recruitment potential from the riparian reserves.

Large Pools, Pool Frequency and Quality

Limbing, topping, or removing hazard trees near powerlines reduces pool size and frequency adjacent stream channels. Since large wood is needed to create large quality pools, the reduction of direct recruitment and potential recruitment reduces available fish habitat. The recruitment potential of large wood from riparian reserves where the PGE powerline adjacent to stream channels is reduced the most. The direct effect is fewer pools where the ROW crosses stream channels and downstream. Indirect effects to large pools are a result of reduced wood recruitment to the edges of the riparian reserve and the complete removal of danger trees and tops that could be potentially recruited to stream channels.

Streambank Condition

Streambank condition is negatively impacted by removal of vegetation. Large trees were removed during the construction of the ROW and will not return until it is no longer managed. Current streambank vegetation in the ROW includes brushy species such as willow and alder maintained at a height of 30 feet directly below the wires. This vegetation maintains bank stability, but lacks the deep root strength and complete shade coverage of the large conifers that once grew on the streambanks. The powerlines only affect the streambank condition at crossings, which are approximately 150 feet wide. The direct effect of the ROW maintenance to the streambank condition is the continued management of the vegetation in an early seral condition, which reduces resilience during flood conditions. The indirect effect of streambank vegetation management is the loss of root strength, which may cause bank failure, resulting sedimentation and an increased stream width to depth ratio.

Riparian Reserves

Riparian vegetation varies from openings with smaller shrubs and trees to thinned forest where streams frequently cross or parallel a line. The topping, limbing, and falling trees would continue to influence stand structure and appearance in the riparian reserve. The degree to which maintenance affects riparian vegetation varies with the proximity of the line is to streams and over what distance of which the ROW parallels it. No indirect effects would occur as a result of ROW management.

Cumulative Effects – Alternative 1

The complete list of past, present, and foreseeable future projects in the analysis area is located in Section 3.1. For this alternative there would be no change to the current condition or the footprint on the ground. The powerline would remain in place and vegetation maintenance, roads maintenance, road use, tower access, and tower maintenance would all continue to occur as they do currently. Because the infrastructure and current management practices would remain in place there would be no change to the cumulative effect for the watersheds with implementation of Alternative 1.

Alternative 2

This alternative would implement an O&M plan for operation of the powerline and the associated ROW. There would be no change to the powerline infrastructure under this alternative and the same maintenance activities discussed in Alternative 1 would occur. However, the maintenance activities would be modified by the O&M plan, which would reduce effects of powerline maintenance by implementing guidelines to reduce impacts to natural resources on National Forest System lands and meet current regulations and laws. The O&M plan includes four primary components for powerline maintenance.

1. Transmission Line Maintenance – includes routine, major, and emergency maintenance of the transmission line facility, including service/access roads, to ensure safe and effective operation of the facility.
2. Vegetation Maintenance Program - includes routine and emergency management of vegetation that could interfere with the safe and effective operation of the transmission facility, and with an emphasis on the long-term establishment of 'conductor' compatible vegetation.
3. Invasive Non-native Plant Species Prevention and Control Program - promises cooperative prevention and control of invasive non-native plant species on National Forest lands affected by O&M-related activities.
4. Revegetation Program – ensures revegetation of sites affected by ground disturbing O&M-related activities.

The entire O&M plan is located in the project file.

Direct and Indirect Effects

In this alternative, management of the powerline ROW includes road maintenance, routine tower maintenance (no ground disturbance), and vegetation management including hazard tree falling and clearing of brush and trees in the ROW.

For the fisheries resource, project actions that cause ground disturbance within 50 feet of stream channels or remove vegetation adjacent waterways have the potential to affect habitat. Invasive plant management and revegetation of ground disturbance after maintenance would moderate the effects of powerline management to fish, water quality and overall watershed condition.

These activities affect fish habitat parameters including temperature, sediment turbidity and substrate, chemical contaminants and nutrients, large wood, large pool quality and frequency, streambank condition, and riparian resources.

Temperature

The effects of vegetation management on stream temperature would be somewhat less than those discussed in alternative 1. PDCs in the O&M plan require streamside vegetation to be maintained. Young reproductive conifers will be thinned, with some allowed to remain. The growth of dense, native shrub communities will be encouraged in Riparian Reserves. Under clearance activities may need to occur more frequently in Riparian Reserves to ensure that fast-growing trees in the border zone do not get too tall. Brushing in riparian areas would be minimized, leaving a minimum 25 foot buffer along streams.

Removal and treatment of noxious weeds, especially scotch broom, may improve streamside shade by allowing the recovery of willow, alder and, maple trees in riparian areas.

There would be a slight increase in vegetation and shade adjacent to streams on the ROW with the implementation of this alternative. The direct effect would be a decrease of solar radiation to streams and the adjacent riparian reserve. The result would be reduced stream temperatures. The indirect effects to downstream temperature would also be reduced by increasing shade in ROW stream crossings.

Hydrology

Direct and indirect effects of this alternative would be the same as those discussed in Alternative 1. Road maintenance would occur in such a manner as to maintain natural drainage patterns. Indirect effects through time would include reduced surface erosion and reestablishment of natural subsurface drainage patterns.

Sediment, Turbidity, and Stream Substrate

Repair and maintenance of roads that access the powerlines has the most potential for negative effects on the fisheries resource as discussed in Alternative 1. Non-emergency maintenance would be completed outside of the rainy season (October-May) and appropriate BMPs (silt fences, hay bales, and seeding) outlined in the OM plan would be implemented in this alternative. In this alternative road conditions would slightly improve. Culverts and proper drainage features would be installed on access roads to reduce erosion and sediment transport to streams and waterways leading to a direct decrease in sediment input as access on road maintenance on Forest Service roads would be to timber-sale specifications.

Chemical Contamination/Nutrients

Heavy equipment (chipper, bucket and collection trucks) and chainsaws working near streams can present a potential hazard from leaks and spills. However, the OM requirement for refueling at least 150 feet from a stream and having spill equipment on hand would almost eliminate the likelihood of a hazardous fuel spill reaching streams and waterways.

Large Woody Debris

Effects of ROW maintenance on large wood are similar as those described in Alternative 1. In this alternative, danger trees would be topped to create snags at a height that would contact the transmission line if the tree were to fall. If topping presents a worker safety hazard, PGE will fell the tree and leave it in place to provide habitat for wildlife and riparian species that use down wood. Where possible, PGE would also minimize removal of existing low-growing species that do not conflict with power lines, with the secondary objective of maintaining or promoting an early seral successional stage (grasses, forbs, and shrubs). Conifers and other tall-growing trees would be allowed to remain in the border zone in Riparian Reserves, provided they have at least 50 feet of clearance from the conductors.

Tall conifer trees would be felled, not topped and left on the ground in riparian reserves. Young reproductive conifers would be thinned, with some allowed to remain. The growth of dense, native shrub communities would be encouraged in Riparian Reserves. Under clearance activities may need to occur more frequently in Riparian Reserves to ensure that fast-growing trees in the border zone do not get too tall. Under clearance is usually conducted on a 3-year cycle. Brushing in riparian areas would be minimized, leaving a minimum 25 foot buffer along streams. Hazard trees would be directionally felled toward streams and riparian areas where it is safe and feasible to do so. Hazard or blow down trees would be left on the ground in lengths as long as possible in riparian areas.

Direct and indirect effects of this alternative would be the same as those discussed in Alternative 1, but trees felled in riparian reserves would be left on site to be potentially recruited as large wood and trees may be felled towards or into stream channels. Overall, this alternative reduces the impacts of ROW clearance on the large wood fish habitat parameter.

Large Pools, Pool Frequency and Quality

Large wood is a crucial component of fish habitat providing nutrients, cover and pool forming structure. Large wood input directly affects pool habitat in stream channels. Therefore the increased potential for large wood input in this alternative would improve future fish habitat as wood is recruited into the stream and creates pool habitat. The indirect effect would be improved as well with recruitment of trees on the edges of the riparian reserve and downed wood retained in floodplain.

Streambank Condition

Streambank condition would be similar to Alternative 1. Large trees would continue to be removed and brushy species such as willow and alder maintained at about 30 feet tall. Brushing in riparian areas would be minimized, leaving a minimum 25 foot buffer along streams. This vegetation maintains bank stability, but lacks the deep root strength of the large conifers that once grew on the streambanks. The powerlines only affect the streambank condition at crossings, which are 125 feet wide, and not places where the powerline parallels stream channels.

Riparian Reserves

Effects to the riparian reserve would be similar to Alternative 1. Riparian vegetation varies from openings with smaller shrubs and trees to thinned forest where streams frequently cross or parallel a line. The O&M plan would help to protect riparian vegetation more than past ROW management practices. However, topping, limbing, and falling trees would continue to influence stand structure and appearance. The degree to which maintenance affects riparian vegetation would depend on how close the line is to a stream and over what distance they parallel. In general, areas underneath powerline corridors are in an early successional condition, and it is likely powerline corridors will remain in an early successional condition.

Treatment of noxious weeds would improve riparian condition in this alternative. Downed wood in riparian reserve would improve habitat for all riparian dependant species including fish. Improved road maintenance practices would also lessen impacts to the riparian reserve condition in this alternative.

Cumulative Effects – Alternatives 1 and 2

The complete list of past, present, and foreseeable future projects in the analysis area is located in Section 3.1. Some of the projects described (particularly the French Bug Timber Sale which is adjacent to the powerline corridor) have the potential to impact some of the resources discussed in this section (e.g. water temperature, sediment, woody debris etc…). However, the effects associated with the activities included in the PGE operation and maintenance plan are so minimal, that there is no expectation that cumulative effects will result.

Conclusions

The proposed project can best be described as a low risk to no effect for hydrology, stream channels and water quality. The risks are low for this area due to the design criteria proposed in the O&M plan, BMP's utilized, and the area of disturbance being small compared to the size of the watersheds involved.

Alternative 2 meets the appropriate laws and regulations associated with water and wetland/flood plain protection. The waters currently flowing off the site meet Oregon's water quality standards, and will continue to do so provided design criteria and best management practices are implemented.

Guidelines within the O&M plan also meet Aquatic Conservation Strategy Objectives, as defined in the Northwest Forest Plan.

3.8 Recreation and Scenic Resources

Existing Condition

Dispersed Recreation Uses: Over the last twenty years the PGE powerline right of way (ROW) has attracted dispersed recreation uses. The dominant recreation uses in the ROW to date include camping in undeveloped sites, off-highway vehicle (OHV) driving on access roads, target shooting, and fall hunting. Visitors' attraction to the ROW is related to a number of characteristics: easy road access off forest road 46, primitive roads running through the ROW, large opening areas for gathering and staging, close proximity to the Breitenbush River, and a lack of regulations and law enforcement common to developed campgrounds. Clearly the dominant factor that facilitates recreation uses within the ROW is road access and road networks.

In general, the Forest Service and PGE have accepted recreation uses within the ROW as a legitimate public use. In the case of Fox Creek Group Site, the Forest Service has actively managed group camping and recreation by installing improvements (i.e. toilets, tables, firerings, and signs) and regulating site use with a reservation system. Improvements at Fox Creek were an attempt to regulate the undesired effects of past behavior at this site without resorting to closing vehicle access to a popular area.

Field surveys have found approximately 17 clusters of dispersed camping sites (one to four sites off a common road network) connected to the ROW. These are sites that are routinely used by the public and patrolled by Forest Service staff during the summer recreation season. There are likely other smaller sites scattered across the landscape near the ROW that receive less public use and have yet to attract the attention of agency field staff. While using these known dispersed sites for camping, visitors may also take part in the other recreation uses listed above. The powerline ROW also attracts day visitors who engage in driving OHV's, target shooting or seasonal hunting in the fall.

For the most part, the public's recreation use of the powerline ROW creates resource impacts that are acceptable by the Forest Service or can be readily mitigated. Mitigation measures that have been used in the recent past include:

- Increased law enforcement and patrols to educate visitors
- Placement of natural barriers to limit site expansion or soil erosion
- Placement of crushed rock on local roads to armor impacted wet sites from further damage

At some ROW locations, however, recreation use impacts have exceeded Forest Service tolerances and triggered management actions more restrictive than the mitigation measures listed above. These restrictions actions have included:

- Closure of local access roads or individual dispersed sites.
- Regulations to close defined areas to specific activities (for example, no target shooting near Detroit Reservoir).

- Conversion of dispersed sites to developed sites with the placement of facilities and increases in agency presence and visitor controls.

Vandalism: The public's access to the powerline ROW has occasionally resulted in vandalism to PGE or Forest Service property. Whether this aberrant behavior can truly be considered a consequence of recreation uses continues to be debated. For this analysis, property vandalism will be discussed in this recreation section. Vandalism can take several forms and may or may not involve visitors at dispersed camp sites within the ROW. Vandalism also does not always involve firearms, such as shooting at insulators. Property vandalism within the ROW increases maintenance costs for PGE or the Forest Service for replacing damaged property. Past management responses to repeated acts of vandalism in one area have been road closures and/or increased law enforcement patrols.

Scenic/Aesthetic Resources: Approximately 22.25 miles of the total 26.75 miles of the PGE powerline on National Forest lands is surrounded by management areas with an emphasis on scenic resources. Most of these miles closely track the West Cascades Scenic Byway (forest road 46), with the remaining miles traveling along the north edge of the Ollalie Lake Scenic Recreation Area. While the ROW is technically classified as a Special Use Corridor (MA-13A, page 157, 1990 USDA), the Willamette National Forest Management Plan directs that corridor actions "…should consider the visual sensitivity of adjacent management areas" (MA-13a-05, page 158, USDA Forest Service, 1990a).

The PGE ROW currently exists as a 125-foot or 250-foot strip of early seral vegetation. The wider strip of managed vegetation occurs when the PGE powerline shares a ROW with the BPA powerline. Most of the powerline ROW interacts with Retention Foreground (MA-11f) and Modification Middleground (MA-11a) scenic management area for the Willamette National Forest. The ROW also interacts with Partial Retention Middleground (MA-11c) scenic management areas along the eastern reaches of forest road 46 on the Willamette. These scenic resource objectives were created primarily for the benefit of forest road 46 travelers and visitors in developed recreation sites located along this road. A short section of the PGE ROW where it splits from BPA powerline and heads northwest also travels through a Partial Retention Middleground management area and could influence scenic views from Detroit Reservoir. Most of this section is located low within the French Creek drainage and hidden from Detroit Reservoir boaters by topography and vegetation.

The PGE ROW also interacts with management areas with heightened scenic resource objectives on the Mt Hood National Forest. The ROW parallels the northern boundary of the Olallie Lake Scenic Recreation Area (MA A-4) which has Retention Foreground and Partial Retention scenic resource objectives. These scenic resource objectives are meant for visitors within recreation area, as well as visitors traveling roads to the scenic recreation area.

Field surveys have found few viewpoints on forest road 46 where visitors have a view of the ROW or powerline facilities. For much of the scenic corridor, travelers are limited to foreground views within a dense tunnel of conifer forest with little natural variety of scale. Within the first five miles of this road, eastern travelers catch only brief side window views of powerline towers, and only one straight-on view of towers at milepost 5. Only when travelers reach milepost 10, do they experience a sustained foreground exposure to the early seral vegetation within the ROW. These vegetative conditions contrast with the characteristic natural landscape in line,

color, and texture, and are most notable because the road travels down the ROW for about 1.5 miles. East-bound travelers once again gain a brief exposure to the ROW at milepost 14.

The only other significant exposure to the ROW for travelers occurs at milepost 17 at the ridgeline defining the boundary between the two national forests. At this location, forest road 46 cuts underneath the powerline and gives travelers both foreground and middleground views of the ROW corridor. This viewpoint is probably the most intrusive exposure to the ROW, because middleground views of the ROW in both directions accentuate a striking contrast between the ROW and the characteristic natural landscape.

West-bound travelers on forest road 46 experience similar exposures to the powerline ROW at the same mileposts. These travelers may catch slightly different glimpses of powerline towers and lines, but their exposure to the vegetative conditions in the ROW are essentially the same as east-bound travelers.

Travelers on the Mt Hood National Forest connect with the powerline ROW where forest roads 4600-076 and 4691 intersect just north of Fish Lake. This connection continues all the way to the junction with forest road 4220. Road and trail travelers in this area are exposed to extended foreground views of contrasting vegetation in the ROW as they cut under the powerlines. The gentle terrain helps natural vegetation to mask extended middleground views of the ROW from most viewpoints on these travelways. However, the foreground views are dominating.

In addition to its dominant open spaces and unnatural lines at key mileposts mentioned above, the powerline ROW compromises scenic objectives for travelers with concentrations of Scotch broom. The color and texture of Scotch broom, particularly when flowering, creates a striking contrast to the form and color of natural forest communities in the Oregon Cascades. Scotch broom may also inhibit the establishment of natural brush species that could limit extended views down the ROW and soften the corridors presence for travelers.

Environmental Consequences

Dispersed Recreation Uses

Alternative 1 – Direct and Indirect Effects

Alternative 1 would continue the existing management of dispersed recreation within the powerline corridor. No significant changes would occur to the public's access of dispersed sites within the corridor or their ability to use open roads within the corridor. The powerline corridor and existing dispersed sites would continue to attract visitors interested in group camping outside of campgrounds, off-highway riding on local roads, target shooting, and fall hunting.

Undesirable impacts at dispersed sites (i.e. localized devegetation, soil compaction, litter, human waste, and overall site expansion) would continue within the ROW corridor as public access to these sites is maintained through access roads. Other localized site impacts created by OHV traffic on low standard corridor roads would continue under Alternative 1. Vandalism of PGE facilities and Forest Service gates would continue to occur over the next twenty years under Alternative 1 as road access would not change.

Alternative 1 would create needs for the Forest Service to change management strategies at the more impacted sites as public use levels increase in response to projected population growth in the Willamette Valley. Existing management strategies (e.g. new facilities, natural barriers, re-vegetation, and law enforcement patrols) would continue to be used at sites experiencing

unacceptable impacts from dispersed recreation. Road closures in cooperation with PGE would occasionally be used for closing motorized access to some sites in response to resource impacts or unacceptable vandalism to facilities that could not be mitigated by other means.

Alternative 2 – Direct and Indirect Effects

Alternative 2 would produce the same direct effects from dispersed recreation as Alternative 1 and rely upon the same management tools for mitigating resource impacts around dispersed sites. Alternative 2 could eventually foster an expanded partnership between the Forest Service and PGE for managing dispersed recreation within the powerline ROW, beyond regulating access on local roads. Expanded partnerships could evolve as an outgrowth of increased cooperation between the parties to achieve wildlife or vegetation goals under Alternative 2. Otherwise, Alternative 2 can be expected to produce the same effects described for Alternative 1.

Cumulative Effects – Alternatives 1 and 2

Over the past 5 years, the Forest Service has made site improvements at popular dispersed sites along the Breitenbush River. Some sites are located directly inside the powerline ROW. These improvements have included:

- closing secondary non-system roads to sites,
- placing boulders, large logs, or fencing around sites to restrict site growth,
- placing crushed rock on access routes, and
- revegetating impacted areas.

These improvements were motivated by an agency desire to reduce or limit human impacts at dispersed sites affecting riparian or wildlife habitat values. In 2009, the Willamette National Forest will implement a Travel Management strategy that is designed to more directly regulate off-highway vehicles uses. This strategy will define existing road and dispersed sites that will remain open to OHV traffic, and will add some user-created spurs to the managed road system.

Alternatives 1 and 2 would continue improvement work at other dispersed sites within the powerline corridor over the next 20 years. Cumulatively, anticipated site restoration work will reduce site impacts created by dispersed camping activities.

Vandalism

Alternative 1 – Direct and Indirect Effects

Alternative 1 would continue to provide the public the same access to roads and dispersed sites within the powerline ROW that has been enjoyed over the last five years. Periodic acts of vandalism to powerline infrastructure or dispersed site facilities would likely continue under Alternative 1. Acts of vandalism may be shifted across the Breitenbush corridor in response to the placement of recreation improvements and increased patrols projected at the most popular dispersed sites. However, unless there is an increase in funding for law enforcement patrols in the Breitenbush corridor, no changes to the pattern of vandalism can be expected over the next 20 years.

Alternative 2 – Direct and Indirect Effects

Alternative 2 is expected to create the same level of resource impacts from acts of vandalism as described under Alternative 1.

Cumulative Effects- Alternatives 1 and 2: No cumulative effects beyond those described under direct and indirect effects are anticipated for this issue.

Scenery/Aesthetic Resources

Alternative 1 – Direct and Indirect Effects

Over the next 20 years, Alternative 1 would continue the same scenic resource effects from the powerline ROW on the viewshed of corridors for both the Willamette and Mt Hood National Forests. This conclusion draws on the assumption that any vegetation currently offering visual screening of the ROW will not significantly change through intended management or natural disturbance (wildfire, windthrow, disease). Periodically PGE will need to cut down or top hazard trees outside the ROW, and their actions may create small vistas for spying powerline infrastructure. Such changes to the natural screens along forest road 46 and Mt Hood roads are not expected to reduce scenic values in a substantial way.

Travelers on forest road 46 and Mt Hood roads accessing the Olallie Lake Scenic Recreation area would continue to experience glimpses of powerline towers through the trees as they move along the ROW corridor. Such glimpses would remain subservient to the natural landscape features and meet scenic resource objectives. Over time, these glimpses of powerline infrastructure are likely to become less noticeable as vegetation next to travelways matures.

In three to six locations along road or trail travel corridors intersecting the powerline, travelers would experience extended views of open field conditions that do not meet scenery objectives for Retention and Partial Retention management areas. Views of this man-made landscape would become most prominent to travelers during the flowering season for non-native Scot's broom, as concentrations of yellow flowers would create a striking contrast to the natural vegetation.

Foreground views within the ROW would be somewhat masked by scattered patches of vine maple, willow, and small conifers. The most notable impacts to travelers' scenic experiences will continue to be at milepost 17 where the ROW crosses into the Mt Hood National Forest. Travelers at this location are draw to pause by one of the few viewpoints with distal views of the landscape. Their visual experience at this location will continue to be punctuated by an unnatural contrast between the ROW corridor and the surrounding natural vegetation.

Over the next ten years, travelers are likely to catch fewer glimpses of powerline infrastructure just outside the Olallie Lake Scenic Recreation area, as plantations and burned-over areas next to roads and trails mature and restrict middleground views further.

Alternative 2 – Direct and Indirect Effects

Alternative 2 is likely to create similar effects to scenic resource values as Alternative 1 with a few exceptions. As PGE cooperates with the Forest Service to eliminate Scotch broom from the ROW and replaces it with native brush species, foreground views for travelers are likely to soften from the current contrast between the ROW and the surrounding landscape. Through this vegetative management, travelers moving through the ROW will have fewer extended views of an early seral corridor and will experience less color contrast associated with Scotch broom. Despite changes in ROW vegetation, lasting views of powerline infrastructure will remain a constant for corridor travelers.

Alternative 2 would not likely moderate middleground views of the powerline ROW as seen from the milepost 17 viewpoint, unless cooperative efforts are made to establish a vegetative screen of native species along the roadside.

Forest Plans do not require that all adverse impacts be mitigated meet standards. Despite existing impacts of the powerline corridor from a visual resources perspective, the Proposed Action is consistent with relevant Forest Plan Standards and Guidelines.

Cumulative Effects- Alternatives 1 and 2

Over the next 20 years, natural vegetation along travel corridors can be expected to grow and further prevent views of powerline infrastructure. Natural growth and establishment of shrub species like vine maple and willow is also likely to expand within the ROW and further reduce expansive views for travelers moving through. While natural disturbance events like windthrow and fire can be expected near the powerline and associated roads, resulting in more exposure to the powerline, their effects on scenic resources cannot not be predicted or assessed.

No cumulative effects on scenic resources beyond those previously discussed are expected.

3.9 Heritage Resources

Existing Condition

The prehistory and history of the North Santiam River Sub-basin have previously been summarized in Cultural Resource Overview for the Willamette National Forest, Western Oregon (Minor and Pecor 1977), the ten-year update of the above overview (Minor 1987), Prehistory and History of B. L. M. Lands in West-Central Oregon: A Cultural Resource Overview (Beckham, Minor, and Toepel 1981), Archaeology of Oregon (2nd Edition) (Aikens 1986), The Prehistory of the North Santiam Subbasin, on the Western Slopes of the Oregon Cascades (Kelly 2001), and the Final Technical Report of Cultural Resources Studies Pelton-Round Butte Hydroelectric Project FERC NO. 2030 (Pettigrew 1998). These documents provide adequate detail of ethnographic and historic background for this report.

Ethnographic research indicates that highly mobile prehistoric and early historic aboriginal groups, probably the Molala, Kalapuya, and their ancestors used the western Cascade Mountains for the main purpose of seasonal hunting, fishing, and plant gathering. Ethnographic evidence also suggests that the Molala Indians were indigenous to the area and lived during the winter along low elevation streams, accessing the uplands during the summer and fall to hunt game and gather berries and other important plant resources. The Molala are linguistically related to Willamette Valley groups, but are thought to be a montane-based band that were living in the western Oregon Cascades during the historic period. The Molala generally are known to be split into two subgroups: the Northern Molala located in the vicinity of Mount Hood's drainage systems and the Southern Molala located west of the Klamath Lake area. Little is known of a third group, referred to as the Upper Santiam/Santiam band of Molala known to have occupied Linn and Lane counties in areas between the Northern and Southern groups. The Molala are also often culturally grouped with the Kalapuya who were based in the Willamette Valley but probably made seasonal forays to the Cascades for large game and berries. Many of the Molala and Kalapuya were removed to the Grand Ronde Reservation in western Oregon after the signing of the Dayton and Molalla Treaties of 1855. Other Molala shifted to the Siletz Reservation along

the Oregon coast, the Klamath reservation to the south and east into Central Oregon where they were absorbed into the Confederated Tribes of Warm Springs Reservation of Oregon.

A review of historical maps of the project area indicates that prehistoric or historic trails and roads crossed through the project vicinity. A trail is depicted on a 1931 Santiam National Forest (SNF) map (SNF [map] 1931, on file WNF Office in Hylton et al. 2007) originating at the Warm Springs Reservation near Schoolie Pasture Ranger Station (RS). The trail extends west and crosses Camas Prairie, "Camas R.S.", Lemiti Meadows, and Lemiti RS before dropping south through Wolf Spring and joining the Breitenbush River near the Breitenbush Hot Springs and Breitenbush RS. The trail continues west along the Breitenbush River past Detroit and off the map but presumably down to the Willamette Valley. Viola Kalama, a Warm Springs elder and former member of the Warm Springs Cultural and Heritage Committee, is familiar with a well known trail following this route (Personal communication 2007 in Hylton et al. 2007). According to Ms. Kalama, the trail provided Warm Springs Tribal residents with access to high Cascade area huckleberry fields, favored fishing and hunting areas, and cash employment in the hop fields of western Oregon. The presence of this trail, or portions thereof, on a 1937 Santiam National Forest and 1947 WNF map (SNF [map] 1937, on file WNF Office; WNF [map] 1947, on file WNF Office in Hylton et al. 2007) suggests the trail continued to be used throughout the historic period.

Prehistoric resources left behind by the Indians include chipped obsidian lithic scatters and obsidian lithic isolates, representing tool use, modification, or manufacture related to hunting and gathering. Ongoing stone tool analysis, both by agency archaeologists and contractors, supports that this portion of the Cascades was occupied primarily by highly mobile people indigenous to the Cascades. Those people were probably ancestral to the Molala people that were involved in early but unratified treaties of the 1850s.

Several pre-contact archaeological sites are recorded along the transmission line corridor. These sites are considered eligible or potentially eligible to the National Register of Historic Places (NRHP) and must be protected from project activities or evaluated to determine their eligibility to the NRHP. PGE shall avoid ground disturbing actions in the cultural site areas. If site protection measures are not reasonably possible within those sites determine eligible to the NRHP, then PGE shall conduct further mitigation at the site which may include data recovery as deemed appropriate (site number 06180400397). For those sites unevaluated, PGE shall not conduct project related activities that have the potential for ground disturbance within or near any of these sites until evaluation test excavations have been conducted at the site to determine its eligibility for inclusion in the NRHP (site numbers 06180400349, 06180400350, 06180400342 and 06180400362).

Alternative 1

Direct and Indirect

Transmission line maintenance (routine, major and emergency), vegetation maintenance and invasive nonnative plant species prevention and vegetation control to varying degrees cause ground disturbance and can affect the integrity and significance of eligible or potentially eligible known cultural sites. Maintenance activities using vehicles or other heavy equipment, tree felling and removal, vegetation clearing, construction of temporary roads and steel tower replacement can displace, compress, or erode surface or subsurface cultural deposits adversely affecting their integrity. Indirect effects to these sites have occurred from impacts caused by

general recreational use of these areas, as well as from vandalism directed at these archaeological sites.

Under this alternative, all of the above transmission line and transmission line corridor activities would continue to occur without an operation and maintenance plan. Implementation of the no action alternative could directly and indirectly effect cultural resource because no direction would be provided to the transmission line operator for avoiding or minimizing impacts to significant or potentially significant cultural sites.

Alternative 2

Direct and Indirect Effects

This alternative would implement the issuance of a special use permit that authorizes PGE: 1) the continued use, operation and maintenance of the existing Bethel-Round Butte transmission line facilities; 2) routine vegetation management within the ROW; and 3) use and maintenance of service or access roads within the ROW; 4) Control of Nonnative and Plant Species) and 5) a revegetation program on the ONF-CRNG, MHNF, and WNF. All of these actions to varying degrees can involve ground disturbance and potentially affect the integrity and significance of eligible or potentially eligible historic properties.

Direct effects to the cultural sites include maintenance activities using vehicles or other heavy equipment, tree felling and removal, vegetation clearing, construction of temporary roads and steel tower replacement which can displace, compress, or erode surface or subsurface cultural deposits adversely affecting their integrity (PGE 2002). Indirect effects to these sites have occurred from impacts caused by general recreational use of these areas, as well as from vandalism directed at these archaeological sites.

The Proposed Action implements the Portland General Electric Operation and Maintenance Plan which provides detailed procedures and practices to follow to avoid adverse impacts to all eligible or potentially eligible historic properties during all operation and maintenance activities along the transmission corridor. Since appropriate and approved surveys and cultural site protection measures are already in place for this project (see Operation and Maintenance Plan, pp. 11-12), the potential direct effects would be in the form of inadvertent damage to the integrity of cultural resources which were not discovered during initial survey. Any sites uncovered during implementation of the project would require the application of Design Measures described in the Operation and Maintenance Plan.

Cumulative Effects – Alternatives 1 and 2

The Bethel Round Butte Transmission line corridor was constructed between 1962 and 1964 and covers approximately 423 acres on Forest Service land. The operation and maintenance activities have occurred over the past 50 years to maintain the line, towers and control corridor vegetation. Construction of the transmission line and ROW has exposed cultural sites and opened the area to recreation use. That use includes 4-wheel drive vehicles, ATV activities, dispersed form of recreation and camping that facilitate site degradation. The effects of the No Action Alternative would result in additional cumulative effects because there would be no operation and maintenance procedures and practices to follow in the protection of eligible and potentially eligible sites. It is not anticipated that there would be cumulative effects to the eligible and potentially eligible cultural resource sites along the PGE Bethel-Round Butte Transmission Line

as long as the Heritage mitigation and Design measures are implemented when conducting the operation and maintenance along the transmission line corridor and associated activities.

3.10 Consistency with Direction and Regulation

All proposed action alternatives would comply with the following directions and regulations:

- Willamette and Mt. Hood National Forests Land and Resource Management Plans as amended by the Northwest Forest Plan, including applicable Standards and Guidelines
- Ochoco National Forest Land and Resource Management Plan
- National Forest Management Act

  The National Forest Management Act reorganized, expanded and otherwise amended the Forest and Rangeland Renewable Resources Planning Act of 1974, which called for the management of renewable resources on national forest lands. The National Forest Management Act requires the Secretary of Agriculture to assess forest lands, develop a management program based on multiple-use, sustained-yield principles, and implement a resource management plan for each unit of the National Forest System. It is the primary statute governing the administration of national forests.

  There are several important sections within the act, including Section 1 (purpose and principles), Section 19 (fish and wildlife resources), Section 23 (water and soil resources), and Section 27 (management requirements that relate to perspective project planning).

  The Proposed Action was developed to be in full compliance with NFMA via compliance with the Willamette, Mt. Hood, and Ochoco National Forests Land and Resource Management Plans, as amended.
- Executive Order 12898 - Environmental Justice in Minority Populations and Low Income Populations

  Agencies are directed to address effects accruing in a disproportionate way to minority and low-income populations. This project is focused on the operation and maintenance of a powerline corridor. Implementation of the Proposed Action is not expected to disproportionately impact minority or low income populations.
- Clean Air Act
- Clean Water Act
- Endangered Species Act of 1973
- Wild and Scenic Rivers Act
- General Water Quality Best Management Practices Handbook (Pacific Northwest Region, November 1988).

Additional Direction and Regulations applicable to certain sections of this document include:

Resource Area	Direction and Regulation
Fire	State of Oregon Smoke Management Guidelines Northwest Oregon Fire Management Plan
Wildlife	Biological Assessments USFWS Biological Opinions Letters of concurrence
Hydrology and Fisheries	Aquatic Conservation Strategy Objectives Clean Water Act DEQ Sufficiency Analysis for Stream Temperature 303d Listing Executive Orders 11988 and 11990 Magnuson-Stevens Fishery Conservation and Management Act (MSA) 1996 Wild and Scenic Rivers Act Executive Orders 12962, 11988, and 11990
Heritage	National Historic Preservation Act

Other applicable Standards and Guidelines and/or Best Management Practices may exist which were not directly referenced in this document. Their exclusion does not indicate that they were overlooked or are inapplicable.

3.11 Irretrievable Irrevocable Commitment of Resources

None of the specialists consulted for this project anticipated any commitment of irretrievable or irrevocable resources.

Chapter 4. Consultation and Coordination

Preparers and Contributors

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

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Federal, State, and Local Agencies

For this project, need for further consultation with the U.S. Fish and Wildlife Service is based on the project's effects on T&E species and critical habitat. Based on the finding in the BE that powerline maintenance is not likely to adversely affect northern spotted owls, concurrence is needed from the USFWS for this determination.

Powerline maintenance is included in danger tree management activities at the ranger district level and is submitted to USFWS every two years in a programmatic consultation package. This project is categorized by the USFWS as an activity that may affect and is not likely to adversely spotted owls. The current letter of concurrence covering this activity in 2007-2008 is USFWS reference number 1-7-06-I-0192.

Consultation with the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries) was completed using the *Endangered Species Act Section 7 Informal Consultation for the 2007-2009 Thinning Timber Sales Programmatic on the Mt. Hood and Willamette National Forests and portions of the Eugene and Salem Bureau of Land Management Districts* (NMFS Reference 2007/00170) referred to as Programmatic Timber Sale BA Programmatic Timber Sale BA (2007).

Under the Programmatic Agreement among the USDA, Forest Service Pacific Northwest (Region 6), The Advisory Council on Historic Preservation, and the Oregon State Historic Preservation Officer regarding Cultural Resource Management in the State of Oregon by the USDA Forest Service (2004) the North End Forest Heritage Specialist has project review authority, and certifies that the project complies with Section 106 of the National Historic Preservation Act.

Tribes

During the scoping of issues and concerns, as part of the public participation process, letters were mailed to tribal governments in June 2008. No issues were raised regarding the proposed project as a result of that mailing.

Individuals and Organizations

A scoping package for this project was sent out in June 2008. No scoping comments were received from any groups or individuals.

Appendix A – List of Citations

Aikens, C. Melvin. 1986. Archaeology of Oregon (2nd Edition).

Beckham, Minor, and Toepel 1981. Prehistory and History of B. L. M. Lands in West-Central Oregon: A Cultural Resource Overview

Gillesberg, A.M.; Carey, A.B. 1991. Arboreal nests of *Phenacomys longicaudus* in Oregon. Journal of Mammalogy. 72(4): 784-787. (as cited in the Survey Protocol for the Red Tree, Vole Version 3.0)

Kelly, Cara McCulley. 2001 The Prehistory of the North Santiam Subbasin, on the Western Slopes of the Oregon Cascades. Masters Thesis, Oregon State University, Corvallis.

Manning, T., and C. C. Maguire. 1999. A new elevation record for the red tree vole in Oregon: Implications for National Forest management. The American Midland Naturalist 142:421-423. (as cited in the Survey Protocol for the Red Tree Vole, Version 3.0).

Minor, Rick et al. 1987 Cultural Resource Overview of the Willamette National Forest: A 10-Year Update. Heritage Research Associates Report 60, Eugene, Oregon.

Minor, R., Pecor, A.F., 1977. Cultural resource overview of the Willamette National Forest. University of Oregon, Oregon, Anthropological Paper No. 12.

Pettigrew, Richard 1998. The Final Technical Report of Cultural Resources Studies Pelton-Round Butte Hydroelectric Project FERC NO. 2030

Tappeiner, J.C., D.A. Maguire, and T.B. Harrington. 2007. Silviculture and ecology of western U.S. forests. Oregon State University Press. 440 pp.

USDA Forest Service, Ochoco National Forest and Crooked River National Grassland. 1989. Land and Resource Management Plan, Final EIS, and Record of Decision.

USDA Forest Service, Willamette National Forest. 1990a. Land and Resource Management Plan, Final EIS, and Record of Decision.

USDA Forest Service, Mt. Hood National Forest. 1990b. Land and Resource Management Plan, Final EIS, and Record of Decision.

USDA Forest Service, US Department of the Interior. 1994a. Final Supplemental Environmental Impact Statement and Record of Decision on Management of Habitat for Late-Successional and Old-Growth Forest Related Species with the Range of the Northern Spotted Owl.

USDA Forest Service. 1998. North Willamette Late-Succession Reserve Assessment. Pacific Northwest Region, Mt. Hood National Forest.

USDA Forest Service, 2004. Sensitive Species List.

Appendix B – Best Management Practices

PGE will apply Best Management Practices[9] (BMPs) to road use and maintenance, including the following:

R-2. Title: Erosion Control Plan

Objective: To limit and mitigate erosion and sedimentation through effective planning prior to initiation of road construction activities and through effective contract administration during construction.

Explanation: Land disturbing activities, such as road construction, usually result in short term erosion. By effectively planning for erosion control, sedimentation can be minimized. Prior to starting work, the Contractor submits a general plan, which sets forth erosion control measures to be used. Operations cannot begin until the Forest Service has given written approval of the plan. The plan recognizes the mitigation measures required in the contract. All contracts specify that operations be scheduled and conducted to minimize erosion.

Implementation and Responsibility: Mitigative measures are developed by design engineers, using an interdisciplinary approach; the measures are reflected in the contract's specifications and provisions.

Erosion control is required by contract provisions common to road construction. The Erosion Control Plan is implemented by the Purchaser on timber sale contracts or Contractor on Public Works.

This practice is commonly applied to road construction or timber sales, but should be extended to apply to road construction for mining, recreation, special uses, and other roadwork on the Forest.

Monitoring: Contract packet review, pre-work meetings, and operating plans along with tests, measurements, and observations by the COR or ER and watershed specialists. Also see Forest Plan monitoring plan.

R-3. Title: Timing of Construction Activities

Objective: To minimize erosion by conducting road construction operations during minimal runoff periods.

Explanation: Since erosion and sedimentation are directly related to runoff, scheduling operations during periods when the probabilities for rain and runoff are low is an essential element of effective erosion control. Contractors are to schedule and conduct operations to minimize erosion and sedimentation. Equipment shall not be operated when ground conditions are such that excessive damage will result. Such conditions are identified by the COR or ER with the assistance of watershed specialists as needed.

In addition, it is important to keep erosion control work as current as practicable with on-going operations during anticipated runoff periods. Construction of drainage facilities and performance of other contract work, which contribute to the control of erosion and sedimentation, shall be

[9] [9] These BMPs are from *General Water Quality Best Management Practices*; USDA Forest Service, Pacific Northwest Region, November 1988.

carried out in conjunction with earthwork operations, or as soon thereafter as practicable. The Contractor should limit the amount of area not graded to drain at any one time, and should install permanent drainage structures as soon as practical.

Implementation and Responsibility: Mitigative measures are developed by design engineers, using an interdisciplinary approach and are incorporated into the contracts.

Contracted projects are implemented by the Contractor or Purchaser. Compliance with plans, specifications, and the operating plan is determined with tests, measurements, and observations by the COR or ER through inspection.

Monitoring: Road construction review process. Also see Forest Plan monitoring plan.

R-4. Title: Road Slope Stabilization (Planning)

Objective: To reduce sedimentation by minimizing erosion from road slopes and minimizing the chances for slope failures along roads.

Explanation: Road stabilization considerations begin in the reconnaissance and location of the road. The first planning requirement is for an adequate engineering, hydrology, soils, and geology investigation to provide data for:

a. Cut and fill slope design.

b. Controlling surface and subsurface drainage.

c. Determining compaction standards and surfacing needs.

A prerequisite of stabilization is to provide basic mechanical stability of the soil, using data from the site investigations to develop requirements for proper slope angles, compaction, and adequate drainage.

Implementation and Responsibility: Erosion prevention must be included in planning for all road construction contracts.

Most, if not all, of the stabilization measures should be planned for completion on all disturbed ground prior to the winter season, when erosion is most severe.

At especially critical locations, with a high erosion or sedimentation potential, expensive remedies may be necessary.

Project location and mitigative measures are determined during the environmental analysis and road design process, and included in the project plan using an interdisciplinary approach.

Contracted projects are implemented by the Contractor or Purchaser. Compliance with project plan requirements and the operating plan is determined with tests, measurements, and observations by the COR or ER through inspection.

Monitoring: NEPA field review process, tagline review, plan-in-hand review, design review, road construction review process, and final inspection. Also see Forest Plan monitoring plan.

R-6. Title: Dispersion of Subsurface Drainage Associated with Roads

Objective: To minimize the possibilities of roadbed and cut or fill slope failure and the subsequent production of sediment.

Explanation: Roadways may change the subsurface drainage characteristics of a hillside. Since changes to normal areas and interruption of subsurface flows increase the risk of instability, it is sometimes necessary to provide special drainage (subsurface) to avoid saturation of the subgrade and slopes to reduce subsequent slope failure. The following are some dispersion methods, which can be used:

a. pipe underdrains

b. horizontal drains

c. stabilization trenches

d. drainage blankets or rock drains

e. ditches

Dispersal of collected water should be accomplished in an area capable of withstanding increased flows. On most soils, energy dissipators need to be placed at pipe outlets. This is a preventive practice.

Implementation and Responsibility: Locatable wet areas and areas with underground flows are designed with appropriate mitigative measures to provide subsurface drainage. Locating such areas may involve geologists, engineers, soil scientists, and hydrologists.

Contracted projects are implemented by the Contractor or timber sale Purchaser. Compliance with project plan and specifications requirements, and operating plans is determined with tests, measurements, and observations by the COR or ER. Additional sites found during construction, or necessary changes to known sites, are designed in the same manner as the original sites.

Monitoring: Plan-in-hand review, design review, and road construction review process. Also see Forest Plan monitoring plan.

R-7. Title: Control of Surface Road Drainage Associated with Roads

Objective: (1) To minimize the erosive effects of water concentrated by road drainage features, (2) to disperse runoff from or through the road, and (3) to minimize the sediment generated from the road.

Explanation: A number of measures can be used, alone or in combination, to minimize possible detrimental effects of surface drainage. Culverts or bridges are normally placed at all natural drainages crossed by roads. Ditches, cross drains, water bars, dips, and grade sags are used to take water off the roadbed surface.

Methods used to reduce erosion may include such things as energy dissipators, aprons, downspouts, gabions, debris racks, and armoring ditches and drain inlets and outlets. Soil stabilization can help reduce sedimentation by reducing the effects of erosion on borrow and waste areas, on fill slopes, and on roadbeds.

Dispersal of runoff from roads can be accomplished by rolling the grade, insloping with cross drains, outsloping, crowning, installation of water spreading ditches, contour trenching, etc.

Dispersal of runoff can reduce peak downstream flows and keep water in its natural drainage area.

Sediment travel can be reduced by installing measures such as sediment filters, settling ponds, and contour trenches.

Implementation and Responsibility: Soil erosion classification, parent rock, steepness of side slopes, soil type, and road grades are used to assist in project location, design criteria, and mitigative measures used by designers for surface drainage. The data is determined using an interdisciplinary approach during the environmental analysis and road design process, and then placed in contracts.

Contracted projects are implemented by the Contractor or Purchaser. Compliance with plans, specifications, and operating plans is determined with tests, measurements, and observations by the Forest Service COR or ER.

Monitoring: Tag-line review, design review, and road construction review process. Watershed specialists assist with implementation and effectiveness evaluations. Also see Forest Plan monitoring plan.

R-8. Title: Constraints Related to Pioneer Road Construction

Objective: To minimize sediment production and mass wasting problems associated with pioneer road construction.

Explanation: Pioneer roads are built to allow equipment access for removal and treatment of clearing debris, installation of drainage structures, haul of construction materials, and access to special sites. Pioneering is usually done within the prism of the planned road. To meet the objective of minimizing sediment, the following constraints should be followed:

a. Construction of pioneer roads shall be confined to the final roadway construction limits, unless otherwise approved by the ER or COR. Excavation shall be conducted so as to prevent undercutting the final cut slope and to minimize depositing materials outside the designated roadway limits.

b. Erosion control work will be completed prior to periods of seasonal precipitation and then kept up daily as work progresses.

c. Sites on live streams crossed by pioneer roads will be protected with temporary culverts or log structures unless approved otherwise (see Road System BMP R-13).

Implementation and Responsibility: Special access needs and mitigative measures are determined during the environmental analysis process using an interdisciplinary approach.

Contracted projects are implemented by the Contractor or timber sale Purchaser. Compliance with plans, specifications, and operating plans is determined with tests, measurements, and observations by the COR or ER.

Monitoring: Progress reviews during construction and road construction review process. Also see Forest Plan monitoring plan.

R-9. Title: Timely Erosion Control Measures on Incomplete Roads and Stream Crossing Projects

Objective: To minimize erosion have and sedimentation from disturbed ground on incomplete projects.

Explanation: The best drainage design can be ineffective if projects are incomplete at the end of the dry season. Affected areas can include roads, waste areas, tractor trails, skid trails, landings, fills, streamcrossings, and bridge excavations. Preventive measures include:

a. Removal of temporary culverts, culvert plugs, diversion dams or elevated streamcrossing causeways;

b. Installation of temporary culverts, side drains, flumes, cross drains, diversion ditches, energy dissipators, dips, sediment basins, berms, debris racks or other facilities needed to control erosion;

c. Removal of debris, obstructions, and spoil material from channels and floodplains;

d. Grass seeding, placement of hay bales, and mulching.

Implementation and Responsibility: Protective measures must be applied to all areas of disturbed, erosion-prone, unprotected ground. When conditions permit operations outside of the dry season, erosion control measures must be kept current with ground disturbance, to the extent that the affected area can be rapidly 'closed,' if weather conditions deteriorate. Areas should not be abandoned for the winter with remedial measures incomplete.

Project mitigative measures and location are developed and documented during the environmental analysis process using an interdisciplinary approach.

Contracted projects are implemented by the Contractor or Purchaser. Compliance with project plan criteria, contract specifications, and operating plans is determined with tests, measurements, and observations by the COR or ER.

Monitoring: Road construction review process and observation during and after project completion. Also see Forest Plan monitoring plan.

R-12. Title: Control of Construction in Streamside Management Units

Objective: To reduce the adverse effects of sediment from nearby roads on slope stability, vegetation, and aquatic resources along a designated stream zone by:

a. Acting as an effective filter for sediment generated by erosion from road fills, dust drift, and oil traces;

b. Maintaining shade, riparian habitat (aquatic and terrestrial), and channel stabilizing effects;

c. Maintaining the floodplain in an undisturbed condition.

Explanation: Except at designated stream crossings, road fills, waste areas and other embankments must be kept at a distance from nearby streams. Factors such as stream class, channel stability, sideslope, ground cover, and soil stability are taken into account in developing riparian and streamside management unit widths. It is vital to stabilize fill slopes and control water runoff to minimize the movement of sediment into streamside management units.

Stream classes and streamside management unit widths are determined by an interdisciplinary process involving hydrologists, fisheries biologists, and other specialists as required.

Implementation and Responsibility: Project location and mitigative measures are developed by the interdisciplinary team. Specifications are inserted into the contract by design engineers.

Contracted projects are implemented by the Contractor or Purchaser. Compliance with environmental criteria, contract specifications, and operating plans is determined with tests, measurements, and observations by the COR or ER.

Monitoring: NEPA field review process, tag line review, design review, and progress review during construction. Also see Forest Plan monitoring plan.

R-14. Title: Bridge and Culvert Installation and Protection of Fisheries

Objective: To minimize sedimentation and turbidity resulting from excavation for in-channel structures.

Explanation: Excavation is a common requirement for the installation of bridges, culverts and minor streamside structures such as weirs, check dams, or riprapping. Waste material developed in such operations should neither obstruct the streamcourse (including natural floodplains) nor the efficiency of the associated structures. Some preventive and corrective measures are:

a. Excavated materials shall be kept out of live streams unless they are designed to be placed there. (i.e. riprap, etc.)

b. Sediment producing materials will not be left within reach of anticipated flood flows.

c. It is sometimes necessary to divert flowing water around work sites to minimize erosion and downstream sedimentation.

d. When needed, bypass and access roads shall be suitably located with plans made for their subsequent obliteration and stabilization.

For streams designated as important fisheries by Forest Service fisheries biologists, culverts will be installed only during flow periods specified in the project plan. Normally, this work would occur during minimum flow periods when water could be more easily diverted; work would not be allowed during salmonid fish spawning periods or before eggs have hatched and fingerlings have emerged from the gravel. Downstream sediment basins may be necessary to mitigate impacts on low flows.

Implementation and Responsibility: Project location and mitigative measures are developed during the road design process to meet the project criteria, using an interdisciplinary approach when deemed necessary.

Contracted projects are implemented by the Contractor or Purchaser. Compliance with project criteria and the operating plan is determined with tests, measurements, and observations by the Forest Service COR or ER through inspection.

Monitoring: NEPA field review process, plan in hand review, design review, progress review during construction and road construction review process. Also see Forest Plan monitoring plan.

R-18. Title: Maintenance of Roads

Objective: To maintain roads in a manner which provides for water quality protection by controlling the placement of waste material, keeping drainage facilities open, and by repairing ruts and failures to reduce sedimentation and erosion.

Explanation: Roads normally deteriorate because of use and weather impacts. This deterioration can be reduced through adequate maintenance or restriction of use. All system roads will be maintained to at least the basic custodial care required to maintain drainage, protect the road investment, and minimize damage to adjacent land and resources. This level is the normal prescription for roads that are closed to traffic. Higher levels of maintenance may be chosen to reflect greater use or resource protection. Additional maintenance measures could include resurfacing, outsloping, clearing debris from ditches and cross drains, restoration of ditches, and spot rocking.

Annually, the Forest Service determines the maintenance needs of each road. Roads to be maintained by commercial users are considered. The process to accomplish maintenance activities are budgeted and contracted or scheduled for force account work. The Forest Service may collect deposits for commercial use to facilitate road maintenance and to equitably assess maintenance cost of each user.

Implementation and Responsibility: The work is controlled by maintenance engineers who prioritize work to fit the budget and develop a road maintenance plan. Maintenance levels for each road are documented in road management objectives. Maintenance on timber sale roads is a Contractor responsibility commensurate with their use. On roads not maintained by active timber sales, the work is accomplished with Forest Service crews or by contract. Compliance with the contract provisions is determined with tests, measurements, and observations by the COR or ER.

Monitoring: Timber Sale road package or Public Works Contract review and on the ground review of road maintenance practices on the Forest. Also see Forest Plan monitoring plan.

R-19. Title: Road Surface Treatment to Prevent Loss of Materials

Objective: To minimize the erosion of road surface materials and consequently reduce the likelihood of sediment production from those areas.

Explanation: Unconsolidated road surface material is susceptible to erosion during periods of precipitation. Likewise, dust derived from road use may settle onto adjacent water bodies.

Road Surface treatments include grading, watering, dust oiling, penetration oiling, sealing, aggregate, surfacing, chip-sealing, or paving, depending on traffic, soils, geology, road design standards, the road objectives, and available funding.

Implementation and Responsibility: Project location and mitigative measures are developed by the design or maintenance engineer to meet project criteria.

Contracted projects are implemented by the Contractor or Purchaser. Compliance with project criteria, contract specifications, and operating plans is determined with tests, measurements, and observations by the COR or ER.

Monitoring: Road construction review process. Also see Forest Plan monitoring plan.

R-20. Title: Traffic Control During Wet Periods

Objective: (1) To reduce road surface damage and rutting of roads, and (2) to lessen sediment washing from damaged road surfaces.

Explanation: The unrestricted use of roads during wet weather can result in rutting and churning of the road surfaces. Runoff from such damaged road surfaces carries a high sediment load. The damage and maintenance cycle for roads that are frequently used in winter can create a disturbed road surface that is a continuing sediment source.

Roads involving more than casual use during wet periods shall have a stable surface and sufficient drainage to allow such use with a minimum of resource impact. Rocking, oiling, paving, and armoring are measures' that may be necessary to protect the road surface and reduce material degradation. In many cases, use can be discouraged, but not eliminated. Where winter field operations are planned, roads may need to be upgraded, use restricted to low ground pressure vehicles, or maintenance intensified to handle the traffic without creating excessive erosion and damage to the road surfaces.

Implementation and Responsibility: Project-associated implementation procedures can be enforced by Forest Service personnel. Hauling activity can be controlled by the Sale Administrator or maintenance ER within active timber sales. The decision for restricted use is based on local weather, soil moisture conditions, and road damage criteria.

Mitigative measures are developed by engineers using an interdisciplinary approach as necessary. Contracted projects are implemented by the Contractor or Purchaser. Compliance with plans, specifications, and operating plans is determined with tests, measurements, and observations by the Forest Service COR or ER.

Monitoring: Timber Sale road package or Public Works Contract review, and forest road management inspection trips. Also see Forest Plan monitoring plan.

Appendix C – Project Mitigations Northwest Oregon Programmatic Biological Assessment

Project Design Criteria (PDC)[10] relevant to road maintenance

Category: Road Maintenance and Storm Proofing

Description: Road maintenance and storm proofing is used to maintain safety; control, reduce and/or prevent road erosion and sedimentation; and maintain or restore hydrologic function.

Road maintenance and storm proofing typically include use of heavy equipment for surface maintenance (grading, leveling), drainage maintenance, installation, replacement, or repair (ditch-lines, water dips, cross-drain culverts, and water bars), removal of fill to reduce potential sediment transport, vegetation management (brushing, limbing, seeding, mowing, and15 mulching), road cut and fill repair/stabilization, surface repair/replacement (paving, repaving,chip-sealing and rocking), small slide removal (i.e., routinely, quickly, and easily handled with typical maintenance equipment), snow-plowing, dust abatement (with water only), and18 maintenance and repair of structures (guardrails, signs, relief and stream crossing culverts, bridges).

This category includes the use of existing quarries for stockpiling waste material from road maintenance, slides, decommissioned roads, etc as well as aggregate for road surfacing.

See Road Prism Salvage and Road-side Hazard Tree Removal category for removal of trees from roadways. See Pump Chance/Helipond Maintenance and Use for water withdrawals for dust abatement.

Replacement of culverts on small streams (perennial and intermittent), which are not used by ESA-listed fish, can be covered with this consultation when the activity “may affect” ESA-listed fish or their habitat. These actions typically will occur on tributaries to streams 1 with ESA-listed fish habitat where there may be downstream effects, typically sediment or turbidity.

Replacement or removal of stream crossing culverts and bridges on streams with ESA-listed fish are covered under the regional programmatic aquatic habitat restoration consultations from NMFS, “Endangered Species Act Section 7 Formal Programmatic Consultation and Magnuson-7 Stevens Fishery Conservation and Management Act Essential Fish Habitat Consultation for Fish Habitat Restoration Activities in Oregon and Washington, CY2007-CY2012” (FS: P/NWR/2006/06530; BLM: P/NWR/2006/06532), and from USFWS, “ Biological Opinion and Letter of Concurrence, USDA Forest Service, USDI Bureau of Land Management and the Coquille Indian Tribe for Programmatic Aquatic Habitat Restoration Activities in Oregon and Washington that Affect ESA-listed Fish, Wildlife, and Plant Species and Their Critical Habitats (TAILS #13420-2007-F-0055).These activities are not included in this consultation.

Project Design Criteria

1. Dispose of slide and waste material in stable, non-floodplain sites approved by a geotechnical engineer or other qualified personnel. Use stable sites beyond floodplain within riparian areas

[10] These PDCs are from the Northwest Oregon Programmatic Biological Assessment.

only if an interdisciplinary process has identified the area as stable and not susceptible to delivery to the adjacent stream. Provide erosion control to minimize sediment delivery to streams.

2. Minimize disturbance of existing vegetation in ditches and at stream crossings. Leave grass in the ditch when/where the ditch is properly functioning to minimize exposed soil and transport to fish bearing streams.

3. Minimize soil disturbance and displacement. Where sediment risks warrant, reduce off site soil movement through use of filter materials (such as straw bales or silt fencing) if vegetated areas between the road and fish bearing streams are not present.

4. Implement "may affect" soil-disturbing maintenance activities during dry conditions the greatest extent practicable, except where the potential for greater damage to water quality and fish habitat exists if the emergency road maintenance is not performed as soon as possible.

5. Refuel power equipment and perform allowed machinery maintenance and repair activities, using absorbent pads or chemical containment devices (for example, spill containment tray with absorbent pad or a hole in the ground lined with plastic and absorbent pads) for immobile equipment, and prepare concrete at least 150 feet (or as far as possible from the water body where local site conditions do not allow a 150 foot setback from water bodies) to prevent direct delivery of contaminants into associated water bodies.

6. Where possible, take corrective actions to repair chronic problem areas such as sediment delivery or slope stability that have a potential to affect take of listed fish.

7. Where possible, ensure that all large wood is retained within, or as close to, the stream channel system during culvert cleaning activities. Large wood removed from the culvert inlet is typically placed below (downstream) of the culvert or in a nearby stream of floodplain area.

8. Road maintenance activities (e.g., grading, ditch cleaning, snow-plowing, etc.) would follow administrative unit Best Management Practices (see Appendix E. 2002 Northwest Oregon

9. Lead-based paint removal or removal of structures containing lead paints is not covered.

10. Fresh concrete (cured less than 72 hours), concrete contaminated wastewater, welding slag and grindings, concrete saw cutting by-products, and sandblasting abrasives shall be contained and not come in contact with waterbodies or wetlands.

11. Limit riprap use to scour protection of existing bridge or culvert structures and the replacement of pre-existing rock riprap. Riprap use will be minimized to the greatest extent possible and designed in consultation with a fish biologist or hydrologist. Outside of these uses riprap is not authorized.

12. Streambank stabilization shall use bioengineered solutions (e.g., root wads, log toes, coir logs, woody and herbaceous plantings). A minimum amount of rock may be used for infrastructure (e.g., road) protection when no alternative (e.g., road realignment) exists, but bioengineered components shall be the preferred design feature when feasible.

13. Replacement or removal of small stream crossing culverts on streams with no ESA-listed fish shall meet the following criteria:

a. Design replacement stream crossing culverts to pass the 100-year peak flood.

b. Minimum culvert width will be equal to the bankfull channel width.

c. For fish-bearing streams, follow ODFW fish passage guidelines.

14. Follow ODFW Guidelines for Timing of In-Water Work, where relevant, except where the potential for greater damage to fish, water quality, and fish habitat exists. Exception for bulltrout: Does not include roadwork conducted between Sept 1 and April 30 on road segments witha hydrologic connection and a potential to deliver sediment to bull trout spawning habitat.

15. Rock quarry use - If circumstances (e.g., emergency road repair) require such activities outside of the dry season, require all necessary BMPs and other mitigation measures to prevent sediment movement into streams, and, if appropriate, initiate emergency consultation. There are no active quarries within 300 feet of known bull trout spawning areas within the Action Area.

Category: Repair of Storm Damaged Roads

Description: This category includes routine projects to maintain safety, open access and prevent further damage to resources resulting from storm-related damage to roads. This category also includes immediate stabilization of storm-damaged roads to prevent or minimize adverse hydrologic effects or transmission of sediment into streams and other water bodies.

To be covered by this programmatic these activities must be considered as “emergency” actions, as determined by a line manager or their designated representative. Actions must be those where immediate stabilization actions are needed and when the work cannot be delayed until the appropriate ODFW in-water work window for that watershed. Examples of included actions would be the repair or replacement of a stream crossing culvert when immediate replacement will minimize adverse hydrologic and sediment effects, or the replacement of road fill where continued exposure to high stream flows will result in continued erosion and potential loss of the road. Projects involve actions such as the removal of landslide material; removal of downed trees; reconstruction, repair or minor relocation of roads damaged by surface erosion; fill failure, culvert failure; and stabilization of slopes. Work is accomplished using heavy equipment.

When activities are conducted under this category, the action agency is to notify, by e-mail, NMFS and/or USFWS within 1 working day following discovery of site after the storm event (or soon as feasible in case of power outages etc). Activities should always have a long-term neutral or beneficial effect on sediment regime or channel extension. This category is not applicable for deferred major storm damage repairs or extensive storm damage repairs. Deferred major storm damage repairs are those that are delayed to a future date due to funding or NEPA considerations, or when engineering design work is required, or imminent risk of damage to natural resources has been minimized. Extensive damage would be when more than localized damage has occurred. Extensive damage may require consultation under emergency consultation procedures.

Project Design Criteria

1. Dispose of slide and waste material in stable, non- floodplain sites approved by a geotechnical engineer or other qualified personnel. Use stable sites beyond floodplain within Riparian areas only if an interdisciplinary team has identified the area as stable and not susceptible to delivery to the adjacent stream. Provide the erosion control necessary to minimize the likelihood of sediment delivery to water bodies.

2. Minimize soil disturbance and displacement. Where sediment risks warrant, prevent offsite soil movement through use of filter materials (such as straw bales or silt fencing) if vegetative buffers are not available.

3. Develop and implement an approved spill containment plan that includes having spill containment kit on-site and identified containment kit locations.

4. Place vehicle staging, maintenance, refueling, and fuel storage areas a minimum of 150 feet horizontal distance from any stream, or as far as possible from a water body depending onsite conditions. When immobile power equipment is refueled, use absorbent pads or other chemical containment devices (for example, spill containment tray with absorbent pad or a hole in the ground lined with plastic and absorbent pads) to contain spills.