In cooperation with the Bureau of Land Management

Alvey-Fairview Transmission Line Rebuild Project

Draft Environmental Assessment

February 2014

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Acronyms and abbreviations

APE	Area of Potential Effects
ARPA	Archaeological Resources Protection Act
BA	biological assessment
BLM	Bureau of Land Management
BMP	best management practice
BPA	Bonneville Power Administration
CBWR	Coos Bay Wagon Road
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
COTR	Contracting Officer's Technical Representative
CZMA	Coastal Zone Management Act
dBA	decibels on the A-weighted scale
dbh	diameter at breast height
degrees F	degrees Fahrenheit
DEQ	Oregon Department of Environmental Quality
DOE	U.S. Department of Energy
DOGAMI	Oregon Department of Geology and Mineral Industries
DSL	Oregon Department of State Lands
EA	environmental assessment
EFH	essential fish habitat
EIA	U.S. Energy Information Administration
EIS	environmental impact statement
EMF	electric and magnetic fields
EPA	Environmental Protection Agency
ESA	Endangered Species Act
ESU	evolutionary significant unit
FAA	Federal Aviation Administration
FCC	Federal Communications Commission

FONSI	Finding of No Significant Impact
FR	Federal Register
G	units of gauss
GeoBOB	Geographic Biotic Observations
HFCs	hydrofluorocarbons
HPA	high probability area
IPCC	Intergovernmental Panel on Climate Change
IWWW	in-water work window
kV	Kilovolt
kV/m	thousands of volts per meter
mG	thousandths of a gauss
MPD	Multiple Property Documentation
N_2O	nitrous oxide
NAAQS	National Ambient Air Quality Standards
NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NESC	National Electric Safety Code
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NPDES	National Pollutant Discharge Elimination System
NRHP	National Register of Historic Places
O&C lands	Oregon and California Railroad Revested Lands
ODA	Oregon Department of Agriculture
ODF	Oregon Department of Forestry
ODFW	Oregon Department of Fish and Wildlife
ODOT	Oregon Department of Transportation
ORS	Oregon Revised Statutes
ORWAP	Oregon Rapid Wetland Assessment Protocol
PCP	pentachlorophenol
PFCs	perfluorocarbons
PM	particulate matter
PM-10	particulate matter with a diameter of 10 micrometers or less

ppb	parts per billion
ppm	parts per million
PSS	palustrine, scrub-shrub
QPF	Quantitative Precipitation Forecast
RCRA	Resource Conservation and Recovery Act
RMP	Resource Management Plan
RV	recreational vehicle
SF6	sulfur hexafluoride
SHPO	Oregon State Historic Preservation Office/Officer
SPRR	Southern Pacific Railroad
UGB	urban growth boundary
U.S.C.	United States Code
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
V/m	volts per meter

Chapter 1. Purpose of and need for the Proposed Action

1.1 Introduction

The Bonneville Power Administration (BPA) is proposing to rebuild its Alvey-Fairview ***transmission line*** which runs from Eugene to Coquille, Oregon (Figure 1-1). The aging, 97.5-mile-long 230-***kilovolt (kV)*** line requires replacement of its wood-pole ***structures*** and other line components and needs improvements to its access road system, the roads that provide access to the transmission line ***right-of-way*** for ongoing operations and maintenance.

Terms in *bold italics* are defined in Chapter 6 Glossary.

This chapter describes the need for the Alvey-Fairview Rebuild Wood Pole Replacement Project (Rebuild Project). This chapter also identifies the purposes that BPA is attempting to achieve in meeting this need, identifies the cooperating agency involved in the development of this Environmental Assessment (EA), and summarizes the public scoping process conducted for the EA.

BPA is a federal agency that owns and operates more than 15,000 miles of high-***voltage*** transmission lines. The transmission lines move most of the Northwest's high-voltage power from facilities that generate the power to users throughout the region. BPA has a statutory obligation to ensure that its transmission system has sufficient capability to serve its customers while maintaining a system that is safe and reliable. The Federal Columbia River Transmission System Act directs BPA to construct improvements, additions, and replacements to its transmission system that are necessary to maintain electrical stability and reliability, as well as to provide service to BPA's customers (16 United States Code [USC] § 838b(b-d)).

As a federal agency, BPA must assess the impacts its actions may have on the environment as required by the National Environmental Policy Act of 1969 (NEPA) (42 USC § 4321 *et seq*.) and its implementing regulations. Major federal actions significantly affecting the quality of the human environment must be evaluated in an Environmental Impact Statement (EIS). BPA prepared this EA to determine if the Rebuild Project would cause effects of a magnitude that would warrant preparing an EIS, or whether it is appropriate to prepare a ***Finding of No Significant Impact (FONSI)***.

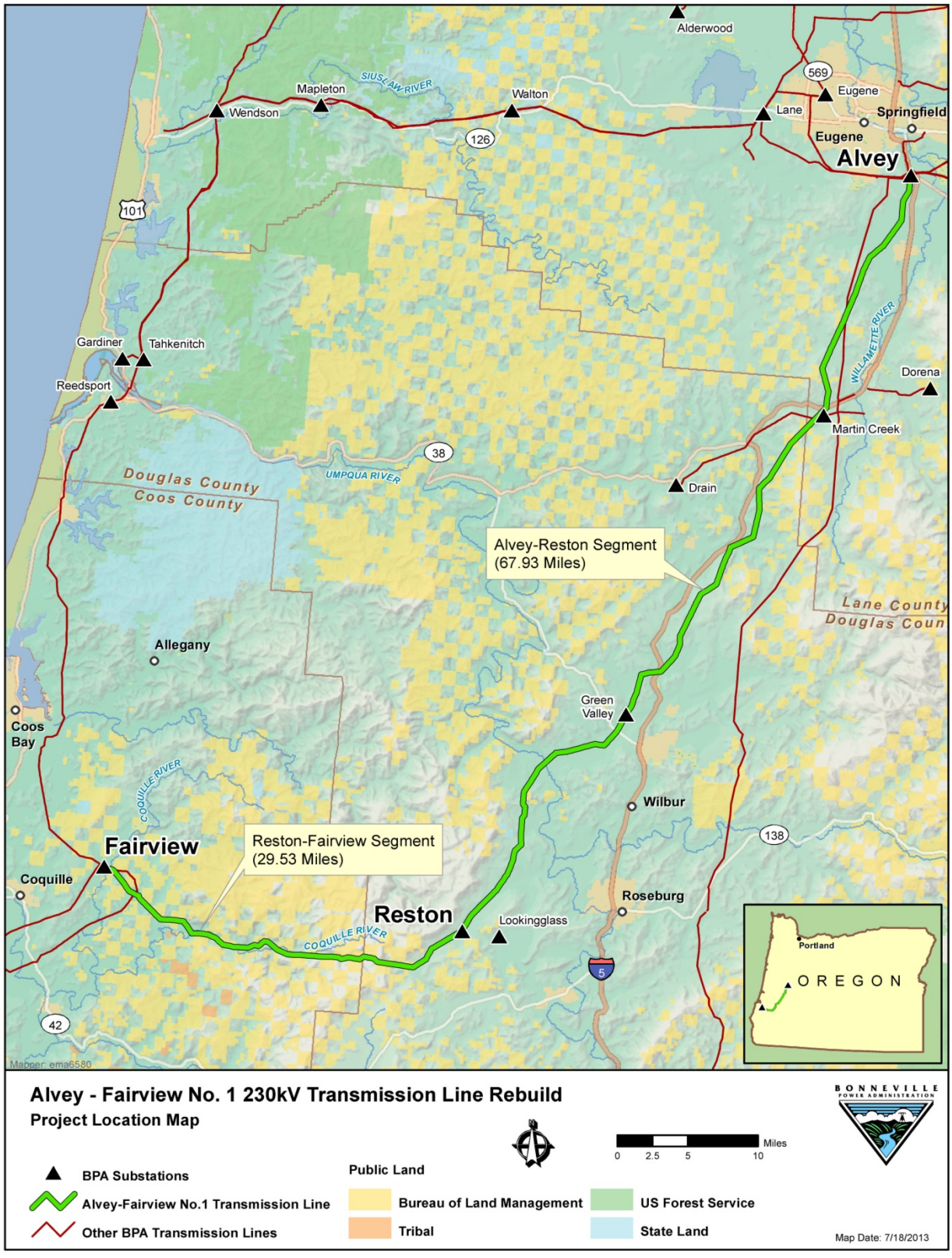

Figure 1-1. Project vicinity map

1.2 Need for action

BPA needs to ensure the integrity and reliability of its existing 230-kV Alvey-Fairview transmission line, which serves BPA's utility customers, who in turn serve communities in southwestern Oregon. No major rebuild work has been done on the Alvey-Fairview transmission line since it was originally built in 1957. In general, wood poles for transmission lines are expected to have a service life of 55 to 60 years, at which point they are usually replaced due to age, rot, or other forms of deterioration. Most structures on the Alvey-Fairview line have reached the end of their service life and are physically worn, and in places are structurally unsound.

In addition, many of the poles are made of Douglas-fir in which the center of the pole was not treated with preservative to prevent rot and decay. These poles are experiencing a high frequency of decay at the ground that makes them more prone to collapse. Collapse of these poles could lead to failure of the line, which presents safety hazards to the public and BPA workers, as well as ***outages*** that would adversely affect power deliveries to BPA's customers in southwestern Oregon.

In addition, BPA needs to maintain access and access-rights to the transmission line by reconstructing, improving and in some cases building roads to allow safe and prompt access the transmission line for ongoing operations and maintenance activities, and emergency repairs.

1.3 Purposes

The purposes are goals to be achieved while meeting the need for action. BPA has identified the following purposes that would help evaluate the proposed alternatives:

- Maintain or improve transmission ***system reliability*** to BPA and industry standards
- Continue to meet BPA's contractual and statutory obligations
- Minimize environmental impacts
- Demonstrate cost-effectiveness

1.4 Cooperating agency

The Council on Environmental Quality regulations implementing NEPA allow for the designation of other federal, state, and local agencies and Indian Tribes as cooperating agencies for an EA where appropriate (CEQ, 1981). Agencies or tribes may be designated as a cooperating agency if they have jurisdiction by law or special expertise with respect to any environmental impact involved in a proposed project.

BLM is a cooperating agency for this EA because parts of the Rebuild Project and some associated access roads cross BLM land. BPA submitted a right-of-way application (SF-299 form) to BLM to obtain additional access-rights to use 6.4 miles of roads on BLM land (Coos Bay District and Roseburg District) for construction of the Rebuild Project and operation and maintenance. These are existing access roads and BPA is proposing no additional reconstruction or improvement to these roads. BLM is authorized by the Federal Land Policy and Management Act (43 USC 1701 *et seq.*) and its implementing regulations to issue right-of-way grants for facilities and systems, including transmission and distribution systems. Access to the Roseburg District is granted under Instructions 44 L.D. 513, rather than a right-of-way grant. The BLM would use this EA to meet its NEPA obligations and to assist in its review of BPA's right-of-way application.

Other federal, state, and local agencies may also be involved in reviewing portions of the EA (Chapter 4). These agencies may use this EA to fulfill their applicable environmental review requirements for any actions they may need to take in regard to the Rebuild Project.

1.5 Public involvement

BPA mailed letters on November 15, 2011, to potentially interested and affected persons, agencies, Tribes, and organizations. The public letter provided information about the Rebuild Project and EA scoping period, requested comments on issues to be addressed in the EA, and described how to comment (mail, fax, telephone, the BPA website, and at scoping meetings). The public letter was also posted on a project website established by BPA to provide information about the Rebuild Project and the EA process:

http://efw.bpa.gov/environmental_services/Document_Library/Alvey-Fairview/

BPA determined that five Tribes have a potential interest in this project—the Confederated Tribes of Coos, Lower Umpqua and Siuslaw Indians; Coquille Indian Tribe; Cow Creek Band of Umpqua Tribe of Indians; the Confederated Tribes of the Grand Ronde; and the Confederated Tribes of the Siletz. BPA requested comments on the Rebuild Project from the Tribes, as well as on potential cultural resources to help shape the field investigation.

BPA held three public scoping meetings to describe the project and to solicit comments. Public meetings were held on November 30, 2011, in Sutherlin; December 6, 2011, in Coquille; and December 7, 2011, in Cottage Grove. The public comment period began on November 15, 2011 and BPA accepted comments on the project from the public until December 28, 2011. About 40 people attended the scoping meetings.

Comments received during the scoping period were considered in the development of the Draft EA. Twenty-two (22) comments were received during the scoping period. After the scoping period ended, BPA continued to receive comments; these comments continued to influence the environmental review. Comments received can be found on the project website.

Comments were largely focused on requests that BPA continue, or initiate, coordination activities with landowners along the transmission line to minimize any possible impacts to crops, animals, existing habitat areas (e.g., streams, ponds), the properties themselves, and to maximize the benefit of the Rebuild Project. There was one comment requesting that public meetings also be scheduled closer to the western end of the transmission line right-of-way. There were some comments that noted areas where improvements to existing BPA structures are needed, generally regarding culverts and other drainage components, as well as access roads. A few comments also discussed the removal of ***danger trees*** and how this work would be performed in certain areas, and a few others asked for details regarding the timing of work activities.

Comments were generally supportive of the Rebuild Project. Specific questions or requests included:

- **Comment**: What would be the impacts if the Rebuild Project was not done?

  Response: This comment is addressed throughout Chapter 3 under the No Action Alternative sections.

- **Comment**: Would BPA consider increasing the transmission capacity of the line during the Rebuild Project?

  Response: BPA bases its transmission capacity on current and future demand, which justify continued operation at 230-kV.

- **Request**: Record a survey of the final transmission line with the Coos County Surveyor's Office.

  Response: BPA would record a final survey of the transmission line design with the Coos County Surveyor's Office.

Chapter 2. Proposed Action and alternatives

This chapter describes the Proposed Action (Rebuild Project), compares the Proposed Action and the No Action Alternative to the project purposes, and summarizes the potential environmental effects of the alternatives. Figure 1-1 in Chapter 1 shows the location of the Proposed Action.

2.1 Proposed Action

The Proposed Action is to rebuild the existing 97.5-mile-long Alvey-Fairview 230-kV transmission line. The transmission line extends from BPA's Alvey ***Substation***, 68 miles to BPA's Reston Substation and continues an additional 29.5 miles to BPA's Fairview Substation. The line crosses through Lane, Douglas, and Coos counties. Additionally, the Proposed Action includes construction and improvement work on the access road system that allows BPA to get to and from the transmission line[1].

The Proposed Action would involve the following:

- Removal and replacement of all wood-pole transmission line structures (including ***cross arms***, ***insulators***, ***dampers***, and ***guy wires***).
- Reuse of existing ***conductors*** (electric wires) and ***fiber optic cable***.
- Replacement of overhead ***ground wire***.
- Installation of new 230-kV ***candlestick circuit switcher*** and addition of a second ***potential transformer*** for redundancy.
- Replacement of hardware that holds conductors on lattice-steel towers.
- Improvement of the access road system (including upgrading [improving or reconstructing] existing roads, developing new roads, installing temporary roads, obtaining access rights, and replacing or installing gates).
- Installation of new culverts and bridges, replacement of existing culverts, or repair of existing bridges as part of access road improvements.
- Removal of some vegetation along the transmission line right-of-way and access roads.
- Establishment of temporary staging areas and ***tensioning sites*** (for pulling and tightening conductors).
- Revegetation of areas disturbed by construction activities.

[1] This document uses the term transmission line to collectively refer to the transmission line (including right-of-way on either side of the transmission line) and the access road system.

The transmission line would remain in the existing transmission line right-of-way and would continue to be operated at 230-kV. The existing 62 steel-lattice towers that are dispersed throughout the transmission line, ranging in height from 42 to 70 feet, are not in need of replacement, and would remain in their existing locations. Table 2-1 provides details of the Proposed Action. Each of the activities associated with the Proposed Action is described in detail in the remaining portions of this chapter.

2.1.1 Rights-of-way and easements

The transmission line crosses private property and BLM land. BPA has easements or other authorizations with underlying landowners for all of the transmission line right-of-way and for most access roads. The first 68 miles of line (from Alvey Substation to Reston Substation) is located in a 125-foot wide right-of-way. The last 29.5 miles of line (from Reston Substation to Fairview Substation) parallels BPA's Reston-Fairview 230-kV lattice steel line in a right-of-way that is generally 250 feet wide. The rebuilt transmission line would remain in the existing transmission line right-of-way and would not require new easements.

On BLM land, BPA has existing access-rights to use most roads to access the transmission line right-of-way. BPA would continue to use these existing access-rights roads, and as part of this project would either use the roads as is (direction of travel), or reconstruct or improve these roads (see Table 2-2 below). In a few locations, however, BPA currently does not have access-rights to use certain roads on BLM land. As part of the Proposed Action, BPA submitted an *Application for Transportation and Utility Systems and Facilities on Federal Lands Application (SF-299)* to the BLM (April 4, 2013) (BPA, 2013). This application requested a BLM right-of-way grant for new access-rights on 6.4 miles of road on BLM land so that crews can get to transmission structures for construction and yearly operation and maintenance activities (see Table 2-3 below). These roads are referred to as "new access-rights roads on BLM land" in this document.

Table 2-1. Proposed Action description

Proposed description	Quantity
Transmission line elements	
Corridor length	97.5 miles
Corridor right-of-way width	Same (125 feet/250 feet)
Number of existing wood-pole structures/Number of new wood-pole structures	709/709
New wood, two-pole suspension	551
New wood, three-pole suspension	158
Structure height range	
Wood-pole structures[1]	40-95 feet
Operating voltage	230-kV
Number of new structures outfitted with guy wires	173
Conductors	3
Conductor diameter	1.1 inches
Access road activities[2]	
Total length of access road activities	160.2 miles
New Construction	7.8 miles
Reconstruction	54.1 miles
Improvement	33.9 miles
Temporary	1.3 miles
Direction of Travel	63.1 miles
Acquire access roads/routes *easements*	25.7 miles
Release access roads easement[3]	1.2 miles
Gates (replacements and new)	145
Bridges	4 replaced, 3 new
Culverts	157
New culverts	44
Replaced culverts	113
Fords	0
Vegetation removal	
Removal or disturbance of low-growing vegetation within the transmission line right-of-way	About 266 acres as needed
Removal of danger trees outside transmission line right-of-way	100 (approximately 1 tree/mile)
Removal of other tees along access roads[1]	180 (dispersed across the access road system)

1. Rebuilt structures may increase in height by 5 to 10 feet for conductor clearance.
2. For details of the differences between the types of access road work discussed, please see Section 2.1.5 Access roads.
3. Release of access road easements involves returning the existing rights to the underlying fee owner. Once the release is completed, BPA has no rights to use that road in the future.

2.1.2 Replacement of transmission structures

The transmission line structures are individually numbered by ***line mile*** and structure within the mile (e.g., structure 3/4 is the fourth structure in mile three). Structure 1/1 is near the Alvey Substation and structure 98/9 is at the Fairview Substation. The Proposed Action would replace 551 two-pole wood structures and 158 three-pole structures; one existing two-pole structure along the current line would be replaced with a three-pole structure[2]. Spans between individual structures range from 400 feet up to 1,000 feet, with about nine towers for each mile of line.

Two-pole wood structures are used where the structures are in a straight alignment or where turning angles are small (less than 15 degrees). They are the lightest structures because they do not have to withstand the stresses created by angles in the conductors.

The three-pole wood structures are stronger and are placed at intervals along the line to independently hold the weight and tension of the conductors. They are also used at angles greater than 15 degrees or on longer spans such as road crossings (Figure 2-1). The lattice-steel towers are larger and heavier than the wood-pole structures and are used for the longer and higher spans needed to cross canyons or steep terrain. None of the 62 existing lattice-steel towers along the line would be replaced as part of the Proposed Action, but the conductor and insulators on the towers would be replaced (Section 2.1.3).

BPA would use the same type of wood-pole structure at each existing structure location, except in one location where a two-pole wood structure would be replaced with a three-pole wood structure. Like most wood poles used for utility or telephone lines, the wood poles would be treated with a preservative called pentachlorophenol (PCP) to lessen wood rot and extend the life of the poles. The cross arms that connect the wood poles would also be replaced. The height of the new structures would be similar to the existing structures in most cases, ranging from 40 to 95 feet above ground depending on terrain, requirements for road crossings, and the distance between the top of vegetation and the conductor. Proposed structure heights in some locations would be increased by approximately 5 to 10 feet to provide better conductor clearance.

Structures would be placed in the holes of the existing poles, which would be cleaned-out and re-augured an additional 2 feet deeper to a total depth of 7 to 12 feet. Excess soils excavated from existing wood pole holes may contain wood preservatives and would be properly handled, removed, characterized, transported, and disposed of according to all applicable regulations at a permitted facility that accepts these materials. If the existing hole could not be reused, then the structure would be located as

[2] The term “structure” will be used henceforth to mean the two-pole wood structures and the three-pole wood structures.

close to the existing hole as feasible, and wetlands would be avoided, if possible. No blasting would be anticipated for structure replacement activities.

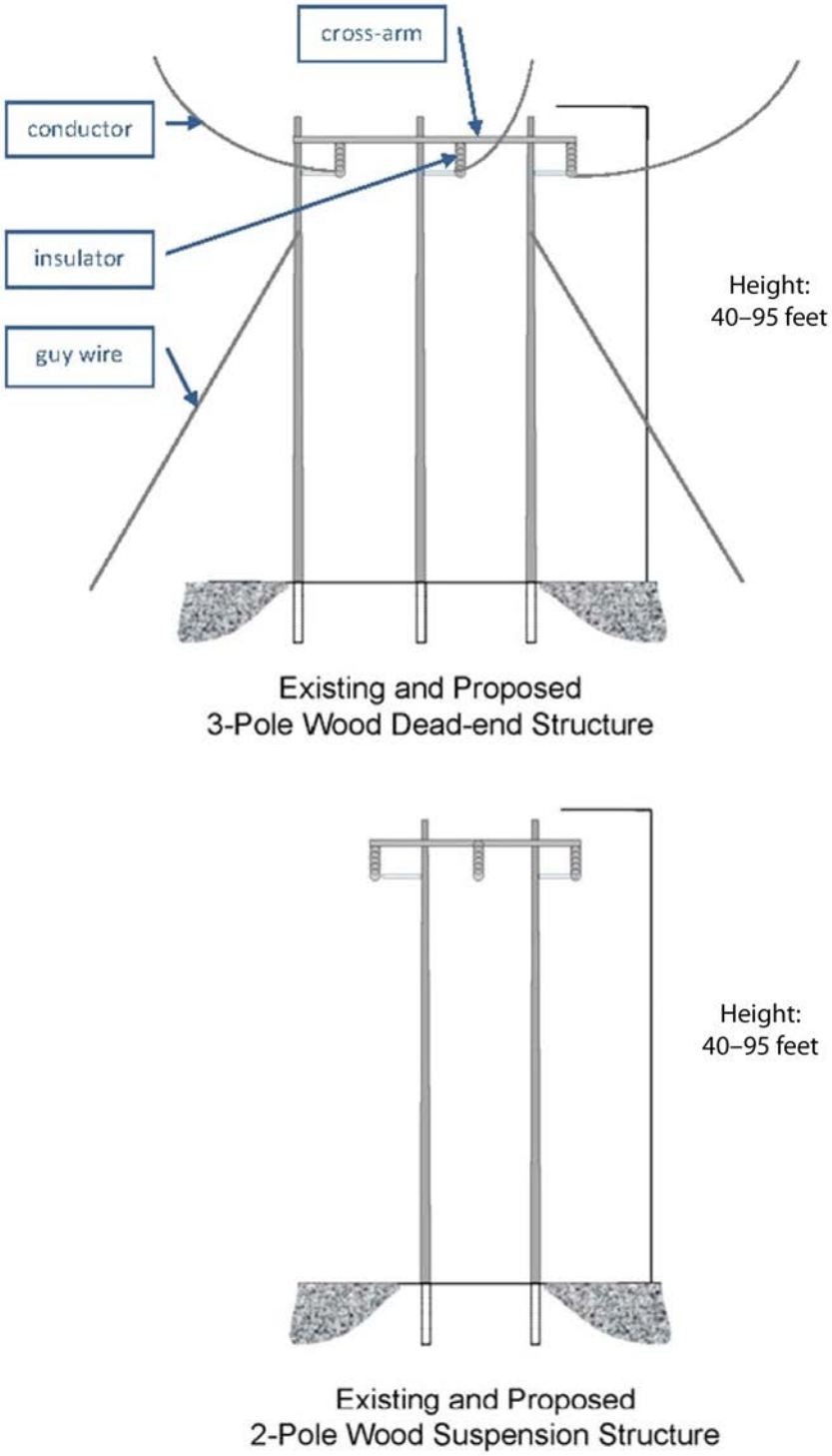

Figure 2-1. Existing and proposed wood-pole structures

Some of the existing structures currently have guy wires. Guy wires attach at various points along the structure and are anchored at the ground to lend stability to structures subject to stress. The old guy wires would be cut off and dug out and BPA would install replacement guy wires and anchors in the same location as they currently exist. Guy wire anchors would be set in crushed rock about 10 feet deep and the remainder of the hole would be backfilled.

Structure replacement activities would disturb an area approximately 100 feet by 100 feet (0.2 acre). The disturbance area could be reduced to a 25-foot radius from the structure center point (0.05 acre) in certain circumstances, for instance where work is near sensitive sites such as ***wetlands***.

Photos of the existing lattice-steel towers and wood-pole structures are shown in Figure 2-2.

Existing lattice-steel tower
Line Mile 53

Existing transmission line
Line Mile 3—single line location

Existing transmission line
Line Mile 92—two parallel lines location;
BPA's Reston-Fairview 230-kV lattice-steel tower pictured on left

Figure 2-2. Photos of existing lattice-steel tower and wood-pole structures

2.1.3 Conductors, overhead ground wire, and fiber optic cable

Conductors are the wires on the structures that carry the electrical current. The transmission line carries three conductors. The conductors would be reused and reinstalled with new hardware and insulators, which are bell-shaped devices that prevent electricity from arcing from the conductors to the structures and traveling to the ground.

For safety reasons, the National Electric Safety Code (NESC) establishes minimum conductor heights. BPA requires the conductors to be at least 30 feet from the ground, which exceeds NESC's minimum conductor height of 24.9 feet for 230-kV construction, for most of the transmission line because of past safety and landform variation concerns. Additional clearance would be provided over roadway and river crossings.

In addition, dampers may be added on the conductors if necessary. Dampers are devices that are used to suppress wind-induced vibrations on taut conductors for better protection against storms. Dampers would be located within 15 feet of the insulators and would help protect the conductors from wear and premature fatigue failures.

Replacement components would be compliant with the *Suggested Practices for Avian Protection on Power Lines* prepared by the Avian Power Line Interaction Committee (2006). ***Bird diverters*** would be placed on the conductors on spans where an increased risk of bird strikes exists (e.g., wetlands and rivers), and where technically feasible.

Overhead ground wire is currently installed on the Alvey-Fairview transmission line for the first one-half mile out of the Alvey Substation to protect substation equipment from lightning strikes; this ground wire would be replaced. There is also a series of wires, grounding rods, or both (called ***counterpoise***) buried in the ground at the Alvey-Fairview structure 1/2. These wires are used to establish a low resistance path to earth for lightning protection. The counterpoise at structure 1/2 would be replaced during construction.

The existing fiber optic cable that runs for the length of the line would be reused and reinstalled on the structures or lattice-steel towers.

2.1.4 Staging areas and tensioning sites

Temporary staging areas would be needed to store and stockpile materials, trucks, and other equipment during construction. The staging areas would occupy approximately 30 acres each. The staging area size would be based on the area needed to accommodate new and replaced poles. These staging areas would be within about 5 miles of the transmission line on existing flat, paved or graveled lots, most likely in an industrial or commercial area. Staging areas would be identified by the construction contractor, prior to construction and appropriate environmental review and approval of the identified sites by BPA would be conducted.

Tensioning sites are used for pulling and tightening the conductor and fiber optic cable to the correct tension once they are mounted on the transmission structures. Tensioning sites would be located within the right-of-way where possible or in rare cases just outside of the right-of-way where the line would make a sharp turn or angle. The sites would disturb an area approximately 150 feet by 100 feet (approximately 0.35 acre).

The Proposed Action would likely only need a few tensioning sites because the existing conductors would be re-used by re-hanging them on the new structures.

2.1.5 Access roads

The system of roads that provide access to the transmission line (access roads) needs improvement for the construction phase and to improve the ability to reach the transmission line right-of-way for operation and maintenance activities. The access road system consists of a mix of permits or access road easements across public and private land; access roads are located within the transmission line right-of-way as much as possible, but are also located outside the transmission line right-of-way. Generally, BPA obtains a 50-foot wide easement for access road rights. In some cases, BPA purchases easements to structures where no access road is located, such as the temporary access roads described above, in order to access the transmission line for periodic or emergency maintenance.

Typical BPA access roads are built 14-feet wide with an additional 3-foot offset from each side of the road for slopes or drainage ditches. The total disturbance width for typical BPA access roads is about 20 feet. Additional widths would be disturbed during access road construction in areas with curves or on steep slopes because cut and fill would be required. In specific wetland areas, the access road widths are reduced to 12 feet and the offsets on either side are reduced to 2 feet for a total area of disturbance of 16 feet to minimize temporary and permanent impacts.

Access road improvements fall into the following categories (see Table 2-1):

- New construction—About 7.8 miles of new permanent access roads would need to be constructed where none currently exist. New construction would involve clearing vegetation, grading and developing the road prism, and gravelling.
- Access road reconstruction—About 54.1 miles of existing access roads that have deteriorated to the point of being unusable by construction equipment would be reconstructed (e.g., vegetation removal, road prism reconstruction, grading, widening to pre-existing conditions, or gravelling).
- Access road improvements—About 33.9 miles of existing access roads or driveways would be improved with minor adjustments (e.g., cleaning, widening to pre-existing conditions, or gravelling).
- Temporary access roads—About 1.3 miles of temporary access roads would be built for construction activities then removed and restored to pre-construction conditions following construction. These access roads typically cross agricultural land when a structure or lattice-steel tower is located in a

field and can involve the use of removable mats or geotextile fabric and gravel.

- Direction of travel—About 63.1 miles of direction of travel road would be accessed for the construction activities. This category includes existing access roads sufficient for construction activities, and agricultural land that can be accessed without temporary access road construction.

The total area of existing access roads and improvements is approximately 440 acres for permanent roads and 2.2 acres for temporary roads. The temporary disturbance includes the total length of temporary roads (1.3 miles) at a width of 14 feet where crane mats, temporary gravel, and/or geotextile fabric is laid down on top of existing soil. Gabion walls, a common type of low gravity retaining structure to stabilize slopes, would be installed along access roads in areas of known slope instability.

Gates, culverts, and bridges

Other access road improvements would include the replacement or addition of a total of 145 gates at the entrances to access roads to prevent public access to private lands and to the transmission line right-of-way. Gate locks would be coordinated with appropriate landowners to ensure that both BPA and the landowner can unlock them.

About 44 new culverts would be installed at existing stream or drainage crossings, 113 existing culverts would be replaced, 3 new access road bridges would be constructed, and 4 existing access road bridges would be replaced to support construction equipment. Additional culverts or cross-drains are proposed to address drainage requirements for new access road construction or to address drainage deficiencies that exist on access roads to be reconstructed or improved.

Access-rights roads on BLM land

As discussed above, access road improvements on BLM land, also referred to as access-rights roads on BLM land, fall into the following categories:

- New construction—There would be no new permanent access roads constructed on BLM land.
- Access road reconstruction—Access roads that have deteriorated to the point of being unusable by construction equipment would be reconstructed (e.g., vegetation removal, road prism reconstruction, grading, widening to former profile, or gravelling). There would be about 6.04 miles of reconstruction occurring on existing access-rights roads and no reconstruction occurring on new access-rights roads BLM land (Table 2-2 and Table 2-3).

- Access road improvements—Existing access roads or driveways would be improved with minor adjustments (e.g., cleaning, grading, or gravelling). There would be about 7.56 miles of improvements occurring on existing access-rights roads and no improvements occurring on new access-rights roads on BLM land (Table 2-2 and Table 2-3).
- Direction of travel—This category includes existing access roads sufficient for construction activities, and agricultural land that can be accessed without temporary access road construction. There would be about 10.12 miles of direction of travel on existing access-rights roads and 6.4 miles of direction of travel on new access-rights roads BLM land (Table 2-2 and Table 2-3).
- Temporary access roads—There would be no temporary access roads on BLM land.

Table 2-2 summarizes the amount and type of work to be done on existing access-rights roads on BLM land. BPA does not need to request a right-of-way grant from BLM to conduct this work because BPA already has existing access-rights for these roads. Table 2-3 describes and Figure 2-3 shows work associated with the Proposed Action on new access-rights roads on BLM land.

Table 2-4 shows the guidance that BPA would follow for existing and new access-rights roads on BLM land. Drainage spacing is the maximum allowed distance between drainage features.

Table 2-2. Summary of Proposed Action work on existing access-rights roads on BLM land

BLM District	Reconstruction (miles)	Improvement (miles)	Direction of travel (miles)
Coos Bay	3.73	4.81	6.21
Eugene	1.03	0.86	0.03
Roseburg	1.28	1.89	3.88
TOTAL	6.04	7.56	10.12

Table 2-3. Description of Proposed Action work on new access-rights roads on BLM land

BLM District	BPA road number/ BLM road number	Towers accessed	Reconstruction (miles)	Improvement (miles)	Direction of travel (miles)	Culverts cleaned
Coos Bay	78015/28912	n/a	0	0	0.46	n/a
Coos Bay	78015/28912	77/7-78/4	0	0	2.32	C-078-020
Coos Bay	81020/289150	77/7-81/2	0	0	1.36	C-080-013 C-080-015 C-080-019
Coos Bay	78015/28912	77/7-78/4	0	0	0.36	n/a
Coos Bay	81020/289230 A	77/7-81/2	0	0	0.72	n/a
Roseburg	81020/28819	77/7-81/2	0	0	1.18	n/a
TOTAL	n/a	n/a	0	0	6.4	4 culverts

Note: All road surfaces would be gravel. There would be no new access-rights roads on the BLM Eugene District.

Table 2-4. Drainage spacing guidance by soil erosion class and road gradient for access-rights roads on BLM land

Gradient (%)	Drainage Spacing[1]	
	Natural Road Surface (feet)	Rock or Paved Road Surface (feet)
3-5	200	400
6-10	150	300
11-15	100	200
16-20	75	150
21-35	50	100
36+	50	50

[1]Spacing is the maximum allowed for the grade. Drainage features may include cross drains, waterbars, ditch-outs, or water dips.

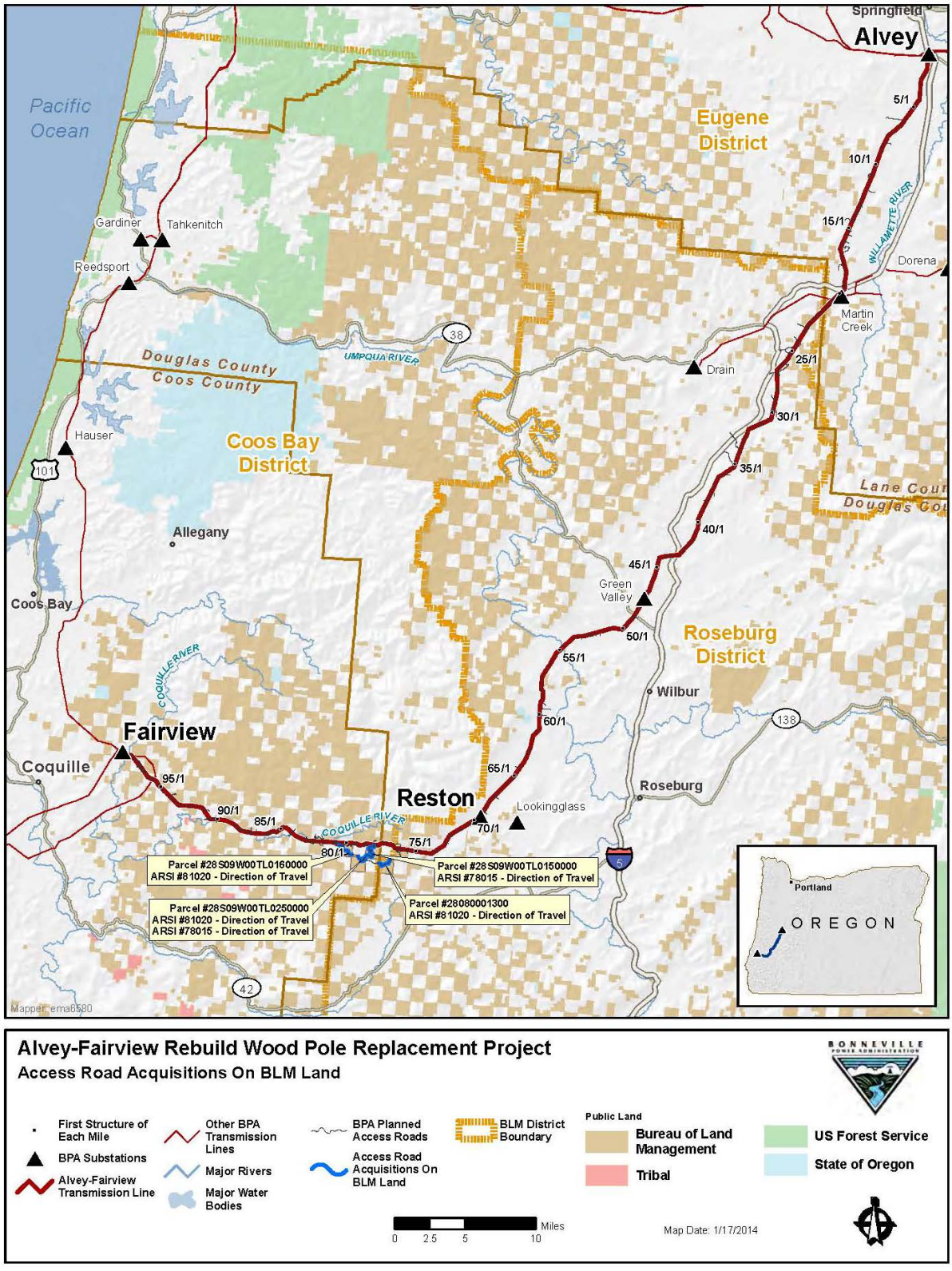

Figure 2-3. Map of Proposed Action work on new access-rights roads on BLM land

Design features for new access-right roads on BLM land

Table 2-5 describes measures designed to avoid, minimize, or rectify impacts from work done to access-rights roads on BLM land. These measures are included as part of the Proposed Action. Design features are site-specific measures, restrictions, requirements, or ***mitigation*** included in the design of a project in order to reduce, if not eliminate, adverse environmental impacts that would be implemented by BPA.

Table 2-5. Environmental design features/mitigation measures for new access-rights roads on BLM land

- Monitor access road conditions during winter use to prevent rutting of the rock surface and delivery of fine sediment to stream networks.
- Install additional sediment filters, if necessary, to prevent sediment from entering stream channels from access road ditch lines during winter.
- Suspend access road use if the ground is already saturated from winter rains and more than 1 inch of precipitation is predicted in the transmission line right-of-way over the next 24 hours. Operations may resume after the 24-hour suspension, except when another storm (exceeding 1 inch) is forecasted. Predictive models, such as the Quantitative Precipitation Forecast (QPF) available at http://www.hpc.ncep.noaa.gov/qpf/qpf2.shtml, would be used to obtain precipitation predictions.
- Restrict access road reconstruction and improvement work during the critical breeding periods (March 1—August 5) and apply daily timing restrictions from August 6—September 15 to minimize disturbance from noise to spotted owls and marbled murrelets.
- Apply the same drainage and erosion control practices on reconstructed or improved access roads as newly constructed access roads, including dry season grading and ditch-relief culvert replacements, appropriate end-haul and disposal areas, and proper dispersal of water from ditch-relief culverts.
- Plan access road maintenance activities to minimize soil erosion and potential stream sedimentation. Access road maintenance activities may include, but are not limited to, grading to remove ruts, removal of bank shedding, and adding gravel lifts where needed in the access road surface.
- Retain existing drainage ditches that are functioning and have a protective layer of non-woody vegetation.
- Install other stream culverts or cross-drains in areas with deficient drainage as necessary during road reconstruction and improvement. Use Table 2-4 as guidance to determine access road drainage spacing, if needed.
- Install an access road drainage feature upslope of each stream crossing to route most ditch flow away from the stream and onto forest soils where it can reinfiltrate, if necessary, and provide about 100 feet from the drainage feature outlet to the channel depending on slope and other site conditions.
- Limit access road and landing construction activities to the dry season, generally from May to October.
- Design and construct access roads to BLM standards, aiming for the narrowest and smallest sizes that would meet safety standards, objectives of anticipated uses, and resource protection. For this project, rocked and natural surface access roads would typically have a road surface of 14 feet.
- Locate new access road construction on stable locations, such as ridge tops, stable benches or flats, and gentle-to-moderate side-slopes.
- Design access road drainage to minimize soil erosion and stream sedimentation. Energy dissipaters, culvert down pipes, or drainage dips would be used where water is discharged onto loose material and onto erodible or steep slopes.
- Direct access road drainage (when possible) onto convex slopes (ridges) and not onto concave slopes (troughs) to prevent adding more water to typically wet, slide-prone areas.
- Use access road surface shapes (e.g., crowning, insloping, and outsloping) that meet planned use and resource protection needs.
- Seed/mulch/fertilize all disturbed areas with a BLM-approved seed mix according to specifications set forth in the Western Washington Stormwater Manual, BMP C120 and C121, that takes into account site conditions and future phases of construction unless otherwise specified by the BLM, or site-specific riparian planting plan.

- Complete permanent stabilization of exposed soils to prevent soil erosion and provide cover (70% of the natural vegetative cover; or 100% non-vegetative cover), and monitor for up to three years. Vegetative stabilization combined with non-vegetative erosion controls (e.g., rolled erosion control products, bonded fiber matrix (BFM) applications, etc.) is required where there is high potential for soil erosion (e.g., steep slopes, highly erodible soils, etc.).
- Ensure all seed mixes, mulches, and non-vegetative erosion controls are "Certified Noxious Weed Free."
- Set right-of-way clearing limits (including the roadbed) at approximately 35 feet in width.
- Divert stream flow around the work area when installing stream culverts; contain sediment using appropriate filters or barriers, and pump turbid water from the excavation site onto a vegetated terrace or hill slope.
- Follow Oregon Department of Fish and Wildlife's (ODFW) in-stream timing guidelines for stream culvert placement, which is typically from July 1—September 15.
- Clean all vehicles and equipment (e.g., power washed) and inspected to ensure they are free of soil, mud, seeds, plant parts, and petroleum products prior to entering project areas and/or waterways.
- Develop a weed management plan to detail preemptive measures to minimize transport and expansion of weed occurrences during construction.
- Flag infestations for avoidance (as practicable) during construction.
- Conduct a weed survey prior to construction to identify infestation areas. BPA would target existing infestation areas for treatment, using BLM-approved methods, prior to construction. BPA would perform follow-up monitoring and treat infestation areas after construction if needed. Limit travel through noxious weed-infested areas to the extent practical.

2.1.6 Vegetation removal

As part of the Proposed Action, vegetation would be removed to facilitate construction and ensure safe operation of the line. A total of about 266 acres of grasses, low-growing shrubs, and agricultural crops would be disturbed or cleared for construction activities; an estimated 100 danger trees would be cut adjacent to the transmission line right-of-way (danger trees), and 180 trees would be cleared for access road work (Table 2-6).

Danger trees are trees located outside of the transmission line right-of-way; they are trees that have the potential to fall or grow into or grow too close to the conductor and cause flash-overs or line outages. Routine vegetation management activities have recently removed danger trees along the transmission line right-of-way. However, following construction, additional danger trees could be identified that require removal depending on whether the conductor sags differently such that a tree would potentially touch or grow too close to the wires. BPA estimates that there could be an estimated 100 danger trees that may require removal following construction. These trees would likely be relatively evenly dispersed along the 97.5-mile transmission line right-of-way (or, on average, one tree per mile).

The estimated 100 danger trees that could require removal are dispersed over the 97.5-mile long transmission line right-of-way (or, on average, one tree per mile). In addition, the 180 trees needing removal for the access road work (new road construction, existing road widening, or to provide sufficient clearance for construction equipment) are dispersed over the access road system, and are not located in one specific area. All areas disturbed would be reseeded following construction. BPA would remove these trees so that long construction vehicles, such as trucks with trailers carrying the wood-pole

structures, could navigate turns along the access road system. Table 2-6 summarizes vegetation removal from the Proposed Action.

Table 2-6. Summary of vegetation removal

Proposed Activity	Quantity
Removal or disturbance of low-growing vegetation within the transmission line right-of-way	About 266 acres as needed
Removal of danger trees outside transmission line right-of-way	Estimated 100 (approximately 1 tree/mile)
Removal of other tees along access roads[1]	180 (dispersed across the access road system)
BLM[2] Coos Bay District	1
BLM Eugene District	6
BLM Roseburg District	29
Non-federal lands	144

1 The trees to be removed for access road construction include 23% conifer, 73% deciduous, 4% unidentified; 84% are 16-inch dbh (diameter at breast height [dbh]) or smaller.
2. Removal of trees on BLM land would occur as a result of existing access-rights road work, not new access-rights road work.

2.1.7 Construction activities

Construction would likely take place from June 2014 to December 2015. A typical construction crew for a wood-pole structure replacement project consists of 50 to 80 people, including transmission line and road construction workers, inspectors and administrative personnel, surveyors, and other support personnel.

While structures are being replaced one bucket truck, one excavator, two cranes, and one dump truck would be working at the site. While work is being done on access roads, any combination of dump trucks, rollers, graders, bulldozers, and excavators would be at the site. The existing transmission line would be taken out of service temporarily and existing conductors, insulators, and attachment hardware would be removed. The conductors would be suspended in mid-air by a line truck (bucket truck) to maintain tension in the line while the wood-pole structures are replaced. The conductor would be reused once the pole structures were replaced.

Removal of existing wood-pole structures

The removed poles and hardware would be trucked off site for recycling or disposal at an appropriate facility. Prior to and concurrent with pole replacement, access road construction and other improvements would be implemented. BPA would pay landowners for any crop damage, as appropriate, that could occur as a result of construction activities.

Anticipated construction schedule

The schedule for construction of the Proposed Action depends on the completion and outcome of the environmental review process, including the duration of regulatory

agency reviews and timing of permit approvals. If the Proposed Action is implemented, construction would likely begin in June 2014. Construction work would be done in phases, with construction occurring on more than one structure at a time in different parts of the transmission line right-of-way. Two construction seasons (late spring-early fall 2014 and 2015) would likely be needed to complete the Proposed Action. Construction would likely begin in 2014 on the Reston to Fairview segment and in 2015 on the Alvey to Reston segment. If construction begins in June 2014 all major construction activities would likely be completed by December 2015.

The following seasonal construction restrictions would be implemented for construction of the Proposed Action to avoid or minimize impacts to fish and wildlife:

- In-water work:
  - Coast Fork Willamette River subbasin: In-water work would be conducted between July 1 and September 30 or during ODFW biologist approved extensions.
  - Umpqua, South Umpqua, and Coquille subbasins: In-water work would be conducted between July 1 and September 15 or during ODFW biologist approved extensions.
- Other wildlife restrictions:
  - Northern spotted owl critical breeding period: No work within established disturbance distance between March 1 and July 7.
  - Marbled murrelet critical breeding period: No work within established disruption distance and limited work within disturbance distance between April 1 and August 5.
  - Marbled murrelet daily timing restrictions: Apply August 6 through September 15.
  - Fender's blue butterfly adult flight season: No work within priority suitable habitat between April 15 and July 7.

2.1.8 Ongoing maintenance and vegetation management

BPA conducts routine periodic inspections, maintenance, and vegetation management of the 15,000-mile federal transmission system in the Pacific Northwest. BPA has operated and maintained the Alvey-Fairview transmission line since this line was built in 1957. This ongoing operation and maintenance would continue whether or not the Proposed Action was implemented. However, because the Proposed Action is essentially a major maintenance project and includes replacement of worn parts of the existing transmission line and improvements to the access road system, the need for future

maintenance and repairs would be less frequent and on a smaller scale than currently required.

BPA conducts vegetation management along the Alvey-Fairview transmission line right-of-way every three to five years to keep vegetation a safe distance from the conductor, maintain access to structures, and to help control noxious weeds. Vegetation management is guided by BPA's *Transmission System Vegetation Management Program Final EIS/Record of Decision* (BPA, 2000). Depending on the vegetation type, environment, and landowner, a number of different vegetation management methods could be used: manual (e.g., hand-pulling, clippers, chainsaws), mechanical (e.g., roller-choppers, brush-hog), or chemical (e.g., herbicides).

Vegetation management includes keeping tall growing vegetation from growing within the transmission line right-of-way, noxious weed control, as well as removing select danger trees adjacent to the transmission line right-of-way that have the potential to grow or fall into the line. Identifying danger trees includes determining tree height and growth potential, how the tree leans, stability and health (e.g., root pathogen damage), and whether they are located in areas with severe storm damage potential. Although much of the transmission line right-of-way crosses agricultural fields where there are no threats of danger trees, it also passes through areas of adjacent dense or scattered trees where danger trees are often identified. Vegetation management was most recently conducted in the winter of 2012-2013.

When line and road maintenance or vegetation management is required for a BPA transmission line, BPA conducts environmental review for those site-specific maintenance activities as appropriate.

2.2 No Action Alternative

Under the No Action Alternative, BPA would not rebuild the transmission line or upgrade access roads, bridges, or culverts, as a single coordinated project. Construction activities associated with the Proposed Action would not occur. However, the reliability and safety concerns that prompted the need for the Proposed Action would remain. BPA would continue to operate and maintain the existing transmission line in its current condition, replacing aged and rotting structures as they deteriorate, maintaining access roads to allow access to structures on an as-needed basis, and managing vegetation for safe operation.

Given the current poor condition of the transmission line, the No Action Alternative would likely result in more frequent and more disruptive maintenance activities along the transmission line than has been required in the past. It might be possible to plan some of this maintenance, but some repairs would likely occur on an emergency basis as various parts of the transmission line continue to deteriorate. Access road

improvements or construction may be required under the No Action Alternative to allow access to the structures for both planned and unplanned maintenance activities.

2.3 Comparison of alternatives

Table 2-7 compares the Proposed Action and the No Action Alternative with the purposes of the project described in Section 1.3. Table 2-8 summarizes the potential environmental impacts of these two alternatives. Table 2-9 summarizes the environmental design features and mitigation measures included as part of the Proposed Action for the 97.5-mile transmission line rebuild and access road work.

Table 2-7. Comparison of the Proposed Action and No Action Alternative

Purpose of Project	Proposed Action	No Action
Maintain or improve transmission system reliability to BPA and industry standards	Replacing wood poles would increase transmission system reliability by reducing unplanned outages and emergency repairs due to deteriorating components. Improved access roads would allow for quicker responses to make emergency repairs.	The reliability of the transmission line would be compromised as the risk of outages for repairs of physically worn structures and associated equipment increases. Emergency response times could increase due to access roads that are in poor condition.
Continue to meet BPA's contractual and statutory obligations	Improvements in the reliability of the rebuilt transmission line would allow BPA to maintain system reliability and meet its contractual and statutory obligations to deliver power to its customers in southwestern Oregon.	Decreased transmission line reliability associated with ongoing repairs of the line could affect BPA's ability to meet contractual and statutory obligations to deliver power to its customers in southwestern Oregon.
Minimize environmental impacts	Environmental impacts from construction would occur (See Table 2-8 for a comparison of the environmental impacts of the alternatives). Construction-related impacts would be primarily short-term, and would be mitigated through appropriate Best Management Practices (BMPs) and mitigation measures described in Table 2-9.	There would be no construction-related environmental impacts at this time, but maintenance impacts would increase as existing structures and roads deteriorate and require additional maintenance (See Table 2-8 for a comparison of the environmental impacts of the alternatives). Emergency repairs could negatively impact vegetation, wildlife, soils and other resources, and any downed lines resulting from structure failure could have a potential for causing fires in the vicinity.
Demonstrate cost-effectiveness	Total costs would be about $25 to $35 million.	No cost for construction would be expended, but maintenance costs related to ongoing repairs would continue to increase to maintain the deteriorating line and could be higher than under the Proposed Action.

Table 2-8. Comparison of the environmental impacts to resources from No Action Alternative and Proposed Action

Land use and recreation	
No Action	Replacement of wood-pole structures and structure components, and access road work, would not occur so there would be no construction impacts to land use and recreation at this time. Replacement of wood-pole structures would increase and landowners could be disrupted by noise and dust more often than under normal line maintenance conditions. Emergency repairs could be needed and if conditions prevent access along existing access roads, new impacts to land use and recreation, such as vegetation removal and traffic delays, could occur.
Proposed Action	Construction activities would temporarily disturb approximately 130 acres of agricultural land for structure replacement and roughly 95 acres of agricultural land. Therefore, a total of 225 acres of agricultural land would be disturbed: 16.8 acres of Prime Farmlands and 103.9 acres of Farmlands of Statewide Importance. This temporary impact would represent a small amount of agricultural land in comparison with the total existing agricultural land. Impacts would be temporary and localized, therefore, low. Impacts to forestry lands would also be temporary and localized, therefore, low. Wood pole structures would be replaced in the same location, if possible, and construction would be temporary and localized; therefore, impacts would be low for commercial, industrial, residential, public, and recreational uses along the transmission line right-of-way. Construction of new access roads would permanently convert approximately 7 acres of land from existing land uses (primarily agricultural). Construction of temporary roads would temporarily disturb approximately 2 acres of agricultural land. Access road reconstruction and improvement would require removal of approximately 180 trees. In the context of the land uses in the three counties, and with mitigation measures applied (Table 2-9), the permanent and temporary impacts associated with access roads would be relatively small, and therefore, low.
Geology and soils	
No Action	Replacement of wood-pole structures and structure components, and access road work, would not occur so there would be no construction impacts to geology and soils at this time. Increases in the number of visits to repair deteriorating structures could lead to more erosion and compaction than is currently experienced, especially if repairs require access to portions of the line during wet or muddy conditions.
Proposed Action	Impacts to soils would result primarily from ground clearing and soil piling, as well as compaction from heavy equipment. Ground that has been cleared of vegetation could be susceptible to erosion. Ground compaction could degrade the soil structure and reduce the soil productivity and the soil's ability to absorb water. Construction activities for structure replacement would temporarily disturb approximately 131 acres, which would be revegetated or allowed to return to active agriculture. Construction of new access roads would permanently disturb 32 acres of soil, and 2 acres would be temporarily disturbed for temporary access roads. With mitigation measures applied (Table 2-9), impacts would be low.
Vegetation	
No Action	Replacement of wood-pole structures and structure components, and access road work, would not occur so there would be no construction impacts to vegetation at this time. Current levels of disturbance to vegetation would increase as repairs to existing deteriorating structures increase. Emergency maintenance could not be planned for, potentially requiring work during winter when damage to some vegetation could occur. Emergency repair activities could require unplanned movement of personnel and vehicles through existing noxious weed infestations that could allow the spread of noxious weeds.
Proposed Action	Low impacts to the upland grassland/herbaceous, wetland, agricultural/pastoral, and urban/developed communities within the transmission line would occur due to clearing and vegetation removal during construction. Impacts to the adjacent riparian community would be low because very few trees would be removed near the transmission line right-of-way. Impacts from the potential spread of noxious weeds would be considered low because noxious weed infestations already exist throughout the transmission line and BPA would implement mitigation measures described in Table 2-9; therefore, the Proposed Action would not be expected to cause a major effect on the productivity of adjacent vegetation communities.

Table 2-8. Comparison of the environmental impacts to resources from No Action Alternative

Streams and fish	
No Action	Replacement of wood-pole structures and structure components, and access road work, would not occur so there would be no construction impacts to streams or fish at this time. However, the number of maintenance activities, and thus potential erosion, could increase as structures deteriorate. Impacts on water quality due to structure replacement activities, such as soil erosion and sedimentation, could occur. Fish would not benefit from improved access to additional upstream habitats because culverts would not be replaced, and proposed channel improvements at stream-road crossings would not occur. In addition, access roads would not be improved. Reduced sediment delivery to streams based on proposed road and drainage improvements would not occur. Culvert replacements or repairs near stream crossings could result in greater fish mortality and larger habitat impacts, if necessary for emergency access during higher flow conditions or periods when ESA-listed fish species are present. Impacts to fish from the No-Action Alternative would likely be low-to-moderate.
Proposed Action	Other than sedimentation from temporary erosion, the Proposed Action would not be expected to contribute to impaired water quality, and the Proposed Action would not inhibit any water quality recovery efforts on streams crossed by the transmission line. The limited amount of tree removal would cause little to no temperature change in streams. Measures described in Table 2-9 would minimize the impacts of turbidity, sedimentation, accidental oil or fuel spills, and tree removal would cause little to no change in water temperature, so impacts to streams would be low. Specific potential construction impacts to any fish species potentially present during construction activities include: • Increased sediment loads which could reduce available food for fish and alter habitat necessary for fish reproduction. • Damage to fish (e.g., gill abrasion, clogging) could occur from construction sediments entering streams. • Construction equipment disturbance of the substrate and release of sediments or compaction could reduce an area's ability to support vegetation after construction. • Vegetation destruction or removal within or adjacent to streams could cause a loss of stream shading, and a reduction in the existing vegetation's buffer capacity which could reduce available habitat and food for fish. • Individual fish could be disturbed (e.g., killed or displaced from habitat) from equipment operating in or near streams. Fish salvage activities (removing fish from in-water work/construction areas) could also harm or harass fish. • Petroleum fuel products, hydraulic oil and other hazardous materials typically associated with construction activities could enter a stream, causing fish kills, aquatic invertebrate kills and death or injury to a number of other species that fish depend on for food. With mitigation measures applied (Table 2-9), few or none of the impacts described above would occur. Impacts to Oregon chub would be low and impacts to Chinook salmon and Coho salmon would be low-to-moderate. Short-term disturbance of a federally listed fish species may constitute a take. However, with mitigation (e.g., construction timing restrictions, fish salvage), short-term construction-related disturbances would result in low -to-moderate impacts to these fish species. Take permits would be obtained from (NOAA/NMFS) and USFWS and all work would conform to the conditions of the Biological Opinions or letters of concurrency issued by those agencies.
Wetlands, floodplains, and groundwater	
No Action	Replacement of wood-pole structures and structure components, and access road work, would not occur so there would be no construction impacts to wetlands, floodplains, or groundwater at this time. Although impacts associated with rebuilding the transmission line would not occur as a consolidated project, Over time wood-pole structures would need to be replaced and roads reconstructed or improved , creating the same impacts as described below for the Proposed Action. However, because the work could be needed on an emergency basis during the wet season, or through multiple trips into one or more wetlands or floodplains, impacts to wetland, floodplains, or groundwater would be moderate-to-high.

Table 2-8. Comparison of the environmental impacts to resources from No Action Alternative (continued)

Proposed Action	Wetlands Replacement of 88 structures would result in low impacts to wetlands, because in most cases, structures would be placed in the same holes from which they were removed. The use of culverts surrounding the poles would help prevent leaching of PCP into surrounding areas. If structures need to be relocated, wetlands would be avoided if possible. Permanent impacts resulting from removal and replacement of the wood-pole structures would be minimal at approximately 3,555 square feet (0.082 acre) distributed across 54 wetlands. Temporary impacts from structure replacement would be expected to be less than 2,800 square feet (0.06 acre) per structure for a total of 3.45 acres of temporary wetland impact and 0.48 acre of temporary impacts to jurisdictional waters. Access road work would cause 6.5 acres of permanent impacts and 2.09 acres of temporary impacts to wetlands, and 0.62 acres of permanent impacts and 0.005 acre of temporary impacts to jurisdictional waters. Overall, improvements to access roads would result in low impacts, and reconstruction of access roads would results in moderate impacts. However, implementation of other BMPs would reduce and minimize the potential for impacts to wetlands (Table 2-9). Floodplains Replacement of 36 wood pole transmission structures would temporarily disturb approximately 1.6 acres of floodplains. These impacts would be short-term, would not alter the floodplain ecological characteristics, and would only have the potential to slightly decrease the existing ecological characteristics of the floodplains. Impacts to floodplains would be low. Construction of four new access roads and reconstruction of two existing access roads in floodplains would disturb approximately 1.9 acres of floodplains. This would result in a long-term impact but would only minimally decrease flood-storage capacity and would not alter the course of floodwaters, resulting in a low-to-moderate impact to floodplains. Groundwater Any impacts to groundwater quality from structure replacement would be localized, short-term, would not exceed state or federal water quality criteria and, thus, would be low. EPA has estimated that environmental concentrations of PCP for surface water due to PCP-treated wood poles are less than one ppb (EPA, 2008), so PCP concentrations would not be anywhere near EPA's level of concern (10,465 ppb for adults and 2.990 ppb for children). There would be some compaction of the soils underlying the road surface, which could inhibit infiltration in localized areas. However, the roads would not be paved with an impermeable surface so infiltration would still occur; therefore, impacts to groundwater would be low.
Wildlife	
No Action	Replacement of wood-pole structures and structure components, and access road work, would not occur so there would be no construction impacts to wildlife at this time. There would be an increasing need for wood-pole structure replacement as they continue to deteriorate. Emergency repairs could occur in areas or during times of year where impacts to nesting bird species could occur, resulting in low-to-moderate impacts to wildlife.

Table 2-8. Comparison of the environmental impacts to resources from No Action Alternative

Proposed Action	Impacts to common wildlife would be moderate. Habitat modification would be temporary and construction would occur within specific structure locations for short durations. Short-term impacts from loss of foraging and ground-nesting habitat around existing structures, due to ground disturbance, would be moderate and may result in injury or death of common wildlife, such as common rodents, birds, or amphibians. Through the implementation of design features and mitigation measures described in Table 2-9, the impacts to threatened, endangered, candidate, and special-status species would be low for all species except for marbled murrelet. Structure replacement, re-stringing of conductor using a bucket truck, tree removal and access road work would occur during the breeding season within the disturbance distance (0.25 mile) of ten of the suitable marbled murrelet nesting habitat areas. However, this work would be temporary and would not occur within the disruption distance (100 yards). Construction happening within the disturbance distance (0.25 mile) of nesting marbled murrelets may temporarily affect nesting behavior; however, BPA would restrict construction activities as described in Table 2-9, and would abide by the conditions of the Biological Opinion issued for the project from USFWS to minimize disturbance, resulting in moderate impact to marbled murrelets.
Cultural resources	
No Action	Replacement of wood-pole structures and structure components, and access road work, would not occur so there would be no construction impacts to cultural resources at this time. Emergency maintenance actions, including repairs, could occur in areas or during times of year where impacts to cultural resources may occur, if any are present.
Proposed Action	Archaeological resources: Three of eight sites would not be disturbed by the Proposed Action, while five sites could be affected by structure and hardware replacement activities. New structures would be placed in the hole from which the existing structures would be removed, to the extent possible, and only a small amount of augering would be required. Access road construction could disturb four sites; the main impact would be disturbance of artifacts on or near the ground surface. The potential impact on cultural resources due to tree removal would be expected to be low because there would be no tree removal in areas of known sites and only surface disturbance would occur. Historic/architectural resources: the Proposed Action would not alter the integrity of materials, design, or workmanship of the transmission line and would likely have no adverse effect on the transmission line, Alvey Substation, Reston Substation, or Fairview Substation. The Proposed Action would have no adverse effect on the Oregon & California/Southern Pacific Railroad. BPA would implement BMPs described in Table 2-9 to minimize impacts to cultural resources, and BPA would coordinate with the SHPO and tribes if any previously undiscovered cultural resources are discovered during construction.
Visual quality	
No Action	Replacement of wood-pole structures and structure components, and access road work, would not occur so there would be no construction impacts to visual quality at this time. Emergency repairs, similar to the construction impacts of the Proposed Action, but would likely occur more frequently.
Proposed Action	During structure replacement, there would be temporary, short-term impacts to visual quality in both visual environments (rural, pastoral and forested), but overall these impacts would be low because the change in views would be of short duration and there would be a small number of sensitive viewers that would see the construction activities. Furthermore, the replaced structures would appear nearly identical to the existing structures, with some potential increases in height of 5 to 10 feet. The visual impact of improving or reconstructing access roads would be low, because in most cases the road corridor already exists, and the Proposed Action would involve grading, gravelling, and minor vegetation removal within that existing corridor. Furthermore, viewers would be few because the access roads would be gated. In a few locations, new access roads would be constructed. The dispersed removal of trees would not substantially change the existing visual environment.

Table 2-8. Comparison of the environmental impacts to resources from No Action Alternative (continued)

Socioeconomics and public services	
No Action	Replacement of wood-pole structures and structure components, and access road work, would not occur so there would be no construction impacts to socioeconomics, public services, or environmental justice populations at this time. Employment and income benefits of construction activities would not occur, and there would be no need for temporary housing for construction workers. Residents and businesses along the transmission line right-of-way would experience noise or air quality impacts from construction equipment as structures deteriorate on a more frequent basis. The structures have already exceeded their expected life span, and as they continue to deteriorate, the transmission line's reliability would be reduced. This could lead to negative impacts on the social and economic vitality of communities that rely on power supplied by the transmission line. Adverse impacts to all local residents, public facilities, community services, and businesses could include power outages, and voltage fluctuations.
Proposed Action	Short-term positive benefits could result by temporarily stimulating the economy in communities near the transmission line through the purchase of local supplies, materials, food, hotel or campground stays, and other direct or indirect spending by construction workers. No impact is anticipated to population, community character, or public services because the project would not require new right-of-way and the property owners who would be affected by new access road acquisition would be compensated. Temporary short-term negative impacts would occur to residences, commercial uses, and industrial uses along the transmission line right-of-way from noise, dust, and temporary land closures and/or traffic delays associated with construction activities. From an environmental justice standpoint this would affect all persons, regardless of race, age, or income; thus, no disproportionate adverse effects would occur to environmental justice populations.
Noise, public health and safety, and electromagnetic fields	
No Action	Replacement of wood-pole structures and structure components, and access road work, would not occur so there would be no construction impacts to noise, public health and safety, and electromagnetic fields at this time. However, impacts to public health and safety would be moderate because the existing line is at high risk of failure due to aging components and deteriorating wood-pole structures. Local and regional power outages could result from failure of this line, which could put public safety agencies, health providers and businesses that rely on a steady source of power at risk. Any downed lines resulting from structure failures would have a high potential for causing fires in the vicinity of the downed line or electrocution as a result of accidental or inadvertent contact with an energized, downed line. Continual emergency repairs would impact nearby noise-sensitive land uses from construction noise. Increased noise levels associated with these activities in any one location would be temporary, though.

Table 2-8. Comparison of the environmental impacts to resources from No Action Alternative

Proposed Action	Noise Noise impacts due to construction would be low because they would be temporary and construction equipment noise would be similar to machinery noise from regular agricultural practices, and corona noise from the transmission line would not change from current levels. Public health and safety There are no known occurrences of hazardous materials or reported contamination within the transmission line right-of-way; therefore, the risk to public health and safety from contaminated material is low. Impacts resulting from a hazardous materials release to soil or groundwater during construction would likely be low because of the BMPs that BPA would implement (Table 2-9). Electromagnetic fields No impacts to the EMF levels in the vicinity of the transmission line would occur except in a few isolated cases where structure heights would be raised slightly to increase the conductor-to-ground clearances. In these areas, ground-level EMF would decrease slightly within the transmission line right-of-way. The operating voltage of the Proposed Action would be the same as the existing operating line voltage. Additionally, the Proposed Action would add new, properly-installed connecting hardware that would reduce any risk associated with aging hardware. Thus, the Proposed Action would either not change or possibly reduce the potential for radio and television interference along the transmission line.
Transportation	
No Action	Replacement of wood-pole structures and structure components, and access road work, would not occur so there would be no construction impacts to roads or traffic at this time. Temporary closures and periodic disruptions to traffic flow would increasingly occur due to emergency repair of the line.
Proposed Action Construction and Permanent Impacts	Structure replacement and access road work would cause temporary and localized delays on county roads, state highways, and transmission line access roads, which would result in low impacts.
Air quality	
No Action	Replacement of wood-pole structures and structure components, and access road work, would not occur so there would be no construction impacts to air quality at this time. However, emergency repair of the existing transmission line would continue to have low-level impacts on air quality, primarily from dust and vehicle emissions as these impacts would be localized, temporary in nature, and would not result in violations of air quality standards. Short-term generation of dust and vehicle and equipment emissions would occur along the transmission line from these activities.
Proposed Action	Air quality impacts resulting from structure replacement and access road work would be low because these impacts would be limited to the construction site, would be temporary in nature, and would not produce enough dust and contaminants to result in violations of air quality standards.
Greenhouses gases	
No Action	Replacement of wood-pole structures and structure components, and access road work, would not occur so there would be no construction impacts to greenhouse gases at this time. Greenhouse gas emissions related to construction vehicle trips would be avoided. However, vehicle emissions for emergency repairs would likely be greater than what was presented for the Proposed Action because BPA would likely make more frequent trips to maintain the deteriorating structures. Overall, the impact on greenhouse gases would be low.
Proposed Action	Construction vehicle emissions would result in an estimated 242.8 metric tons of carbon dioxide (CO_2) equivalent for the entire 2-year construction period. This is equivalent to the annual carbon dioxide emissions of 44 passenger vehicles. The carbon released during tree removal for trees at their current size would be 112 metric tons. Of the 280 trees removed, none of them would have reached full maturity or maximized carbon sequestration capacity.

Table 2-9. Environmental design features/mitigation measures included as part of the Proposed Action

Land use and recreation
• Provide a construction schedule to all potentially affected landowners. • Post a construction schedule in affected recreational areas. • Maintain existing access to residences and other areas during construction. • Schedule construction during periods when active farms along the corridor are likely to be fallow, to the extent practicable, to minimize the potential for crop damage. • Leave gates as they were found to avoid disturbances to livestock. • Limit construction activities to the existing right-of-way and easements to minimize impacts to crops. • Coordinate with individual landowners to ensure that new or temporary access roads and gates and construction and maintenance activities would minimize disruptions to agricultural and commercial operations. • Compensate landowners for the value of commercial crops damaged or destroyed by construction activities. • Coordinate with local agencies to avoid construction activities that could conflict with their own construction activities.
Geology and soils
• Place new structures in existing structure holes to the maximum extent practicable to reduce ground disturbance. • Conduct project construction, including tree removal, during the dry season when rainfall, runoff and stream flow are low to minimize erosion, compaction, and sedimentation, to the extent practicable. • Follow *Landslide Investigation and Mitigation* guidance or other current geotechnical engineering guidance to minimize impacts from structure replacement and road work in known landslide hazard areas (Transportation Research Board, 1996). • Contact BPA geotechnical specialists if geotechnical issues, such as new landslides, arise during construction. • Install sediment barriers and other appropriate erosion-control devices where needed to minimize sediment transport. • Retain vegetative buffers where possible to prevent sediment from entering waterbodies. • Control runoff and prevent erosion on access road improvements by using low grades, water bars, and drain dips. • Properly space and size culverts on access roads. • Use water trucks on an as-needed basis to minimize dust and reduce erosion due to wind. • Till or scarify compacted soil at structure sites prior to reseeding. • Reseed disturbed areas with a native seed mix as soon as work in that area is completed. • Inspect reseeded and revegetated areas to verify adequate growth; implement contingency measures as needed. • Conduct construction activities in coordination with agricultural activities to the extent practicable. • Assist farm operators in restoring productivity of compacted soils for structure sites on agricultural lands. • Allow agricultural activities to resume on temporarily disturbed lands as soon as construction is complete. • Stabilize permanently disturbed areas for new access roads with a top layer of pavement or gravel for the roadway and revegetate the roadway shoulders. • Inspect and maintain facilities to ensure proper function and nominal erosion levels after construction.

Table 2-9. Environmental design features/mitigation measures included as part of the Proposed Action (continued)

Vegetation
• Demarcate vegetation clearing limits prior to disturbance. • Clearly mark trees identified for removal and demarcate tree removal disturbance limits and staging areas. • Use existing road systems (including forest/farm access roads), where practicable, to access structure locations. • Minimize the construction area (footprint) to the extent practicable, especially within wetlands and adjacent waterbody crossings. • In sensitive vegetation areas, install construction "envelopes" of silt fencing, weed free straw wattles, or other barrier materials around construction sites to prevent vehicle turnaround, materials storage, or other disturbance outside designated construction areas. • Place materials storage and staging areas in upland areas (away from wetland/waterbodies). • Implement appropriate measures to minimize the introduction and broadcast of weed seeds/propagules, including inspection of vehicles before entering construction areas and appropriate equipment cleaning measures. • Conduct as much work as possible during the dry season when stream flow, rainfall, and runoff are low to minimize erosion, sedimentation, and soil compaction. • Return temporarily disturbed areas to the original (pre-construction) contours and conduct site restoration and revegetation measures as soon as practicable following construction. • Reseed disturbed areas with native grasses and forbs to ensure appropriate vegetation coverage and soil stabilization prior to the beginning of the rainy season (November 1). • Inspect seeded sites to verify adequate growth and implement contingency measures as needed. Noxious weeds • Conduct a noxious weed survey within the transmission line right-of-way prior to construction to more specifically identify existing infestations of noxious weeds. • Visit existing noxious weed infestations and conduct preemptive measures to minimize transport and expansion of weed occurrences during construction; flag infestations for avoidance (as practicable) during construction. • Minimize ground disturbance in proximity to existing noxious weed populations during construction. • Install and use weed wash stations at selected locations along the transmission line right-of-way.

Table 2-9. Environmental design features/mitigation measures included as part of the Proposed Action (continued)

Wetland, floodplains, surface and groundwater
Wetlands • Avoid and minimize wetland/waters impacts where possible by re-routing access roads, decreasing road width, or only crossing wetlands during the dry season. • Obtain and comply with applicable Corps of Engineers Clean Water Act and State of Oregon Removal/Fill permits for all work in wetlands or streams. • Identify and flag wetland boundaries before construction. • Install erosion-control measures prior to work in or near wetlands (e.g., silt fences, straw wattles, and other sediment control measures) and reseed disturbed areas as required. • Place new poles installed in wetlands inside a four-foot diameter corrugated metal pipe. This measure would help prevent leaching of wood preservative to surrounding wetlands or waters. • Deposit and stabilize all excavated material not reused in an upland area outside of wetlands. • Avoid construction within wetlands to protect wetland functions and values, where possible. Avoid using these areas for construction staging, equipment or materials storage, or fueling of vehicles. • Use existing road systems, where possible, to access structure locations. • Remove all temporary fill and geotextile fabric and revegetate temporary roads built in wetlands after use. • Restore all temporary disturbance areas to original contours and decompact, if necessary. • Replant all temporary disturbance areas within wetlands with native species and remove or control invasive plants until native plants are well-established. Monitor revegetated wetland areas for three years. Use herbicides to control vegetation near wetlands in accordance with BPA's *Transmission System Vegetation Management Program Final Environmental Impact Statement /Record of Decision* (BPA 2000) to limit impacts to water quality. • Purchase wetland mitigation bank credits and/or in-lieu fee program mitigation credits, and/or participate in payment-in-lieu programs as mitigation for 264,905 square feet (6.08 acres) of permanent wetland impacts. • Purchase 3.2 credits at the Coyote Prairie North Mitigation Bank to replace lost wetland functions and values for 3.2 acres of wetland impact in the Coast Fork Willamette River watershed. • Purchase 2.40 credits from either the Cow Hollow Mitigation Bank or the Umpqua Interior Foothills In-Lieu Fee Program to replace lost wetland functions and values for the 2.39 acres of wetland impact in the Upper and South Umpqua River watersheds. • Purchase 0.28 credits at either the Cow Hollow Mitigation Bank or the Umpqua Foothills In-Lieu Fee to mitigate for 0.49 acre of impacts through the purchase of 0.28 credits at either the Cow Hollow Mitigation Bank or the Umpqua Foothills In-Lieu Fee Program, and purchase of 0.21 credits from the Oregon State Payment-in-Lieu Program.

Table 2-9. Environmental design features/mitigation measures included as part of the Proposed Action (continued)

Floodplains

- Deposit and stabilize all excavated material not reused in an upland area outside of floodplains.
- Install erosion-control measures prior to work in or near floodplains.
- Avoid construction within floodplains to protect floodplain function, where possible.

Surface and Groundwater

- Prepare and implement a storm water pollution prevention plan.
- Inspect and maintain tanks and equipment containing oil, fuel, or chemicals for drips or leaks to prevent spills onto the ground or into waterbodies.
- Maintain and repair all equipment and vehicles on impervious surfaces away from all sources of surface water.
- Refuel and maintain equipment away from natural or manmade drainage conveyances, including streams, wetlands, ditches, catch basins, ponds, and culverts.
- Provide spill containment and cleanup and use pumps, funnels, and absorbent pads for all equipment-fueling operations.
- Keep, maintain, and have readily available appropriate spill containment and cleanup materials in construction equipment, in staging areas, and at work sites.
- Place sorbent materials or other impervious materials underneath individual wood poles at pole storage and staging areas to contain leaching of preservative materials.
- Place poles located in wetlands inside metal culverts backfilled with crushed rock to help prevent leaching of the preservative material into surrounding areas.
- Install erosion control measures prior to work in or near floodplains.
- Monitor revegetation and site restoration work for adequate growth; implement contingency measures as necessary.
- Monitor erosion control BMPs to ensure proper function and nominal erosion levels.

Table 2-9. Environmental design features/mitigation measures included as part of the Proposed Action (continued)

Streams and fish
In-water work BMPs and specifications: • Conduct in-water work in the Coast Fork Willamette River subbasin between July 1 and September 30, or during ODFW biologist-approved extensions. • Conduct in-water work in the Umpqua, South Umpqua, and Coquille subbasins between July 1 and September 15, or during ODFW biologist-approved extensions. • Conduct fish salvage according to National Marine Fisheries Service (NMFS)/ODFW requirements (NOAA Fisheries, 2000; ODFW, 2014). • Divert stream flow around the work area and maintain downstream flow during construction. • Isolate in-water work areas prior to culvert and bridge installations. Dewater work area as necessary for construction and to minimize turbidity. Do not discharge turbid water to streams. • Install culverts, bridge crossings in accordance with NMFS/ODFW fish passage requirements. Access roads/drainage BMPs and specifications: • Restrict construction vehicles and equipment access to access roads and existing work areas only. Return temporary disturbance areas for bridge, culvert, and road work to pre-existing contours and seed. • Dispose of waste material generated from access road work in a stable upland site approved by a geotechnical engineer or other qualified personnel, smooth to match adjacent grades, and seed for stability. • Conduct soil disturbing activities during dry conditions to the greatest extent practicable. • Outslope access roads (e.g., 2 to 5%), maintaining natural drainage patterns and minimizing interceptions and concentration of upgradient runoff when practicable (e.g., less than 7%slopes). • Cross-drains: ▪ Utilize minimum of 18 inch diameter pipes for replacements and installation of additional cross-drains. ▪ Install cross-drains at a slope steeper than road slope and skew approximately 30 degrees from perpendicular to the road to help with self-cleaning. ▪ Install cross-drains long enough so that outlets extend beyond road fill and into upland/forest soils. ▪ Excavate cross-drain inlets to allow for initial sediment influx after construction. ▪ Armor first 25 feet of ditch upgradient from cross-drain and catch basin with rock (e.g., pit-run/jaw rock or equivalent) decrease the water's energy and slow flow. ▪ Armor cross-drain outlets (e.g., pit run/jaw rock, slash, or equivalent) to decrease the water's energy and slow flows. • Design headwaters culverts (non-fish drainages) for the 100-year storm event and include a blockage allowance when sizing culverts to minimize future maintenance needs. • Size non-fish culverts to provide a free flow condition for the 100-year storm event. • Develop a spill prevention and spill response plan prior to rebuild construction. • Maintain emergency spill control materials, such as oil booms and spill response kits, on-site at each bridge/culvert replacement site at all times and ready for immediate deployment. • Include small sorbent booms (sausage booms), sorbent sheets/pads and socks, vermiculite/kitty litter, duct tape, heavy duty garbage bags, zip ties, and nitrile gloves in spill kits. Restock materials within 24 hours if used. • Outfit heavy machinery (e.g., excavators) with fire extinguisher, shovel, first aid kits, and caps and plugs for machine hydraulic lines and associated attachments (e.g., hammer/plate compactor, etc.). • Stockpile and make available large sorbent booms, straw bales, straw wattles, and turbidity curtains at each specified bridge/culvert replacement site to quickly respond to any spills or turbidity and erosion concerns during construction. • Store, fuel, and maintain all vehicles and other heavy equipment (when not in use) in a designated upland staging area located a minimum of 150 feet away from any stream, waterbody, or wetland or where any spilled material cannot enter natural or manmade drainage conveyances. • Confirm equipment is clean (e.g., power-washed) and that it does not have fluid leaks prior to contractor mobilization of heavy equipment to site. Inspect equipment and tanks for drips or leaks daily and make necessary repairs within 24 hours. • In the event of a spill, immediately contain the spill, eliminate the source and deploy appropriate measures to clean and dispose of spilled materials in accordance with federal, state, and local regulations.

Table 2-9. Environmental design features/mitigation measures included as part of the Proposed Action (continued)

Vegetation management/revegetation/weed control BMPs and specifications:

- Minimize disturbance to vegetation; only remove vegetation that would interfere with the proposed construction activities.
- Return temporarily disturbed areas to their original (pre-construction) contours and conduct site restoration and revegetation measures before or at the beginning of the first growing season following construction.
- Restore all temporarily disturbed soils resulting from roadwork (e.g., spoil areas, cut/fill slopes, staging areas, etc.) according to BLM requirements and agency Biological Opinions for seeding and mulching
- Replant native riparian species at specified bridge/culvert replacement locations during the dormant season (November 1 to February 1).
- Salvage and stockpile selected topsoil for replacement on cut/fill slopes to improve site restoration and plant establishment.
- Conduct a weed survey prior to construction to identify infestation areas. BPA would target existing infestation areas on BLM land for BLM-approved treatment prior to construction; BPA would perform follow-up monitoring and treat infestation areas after construction if needed.
- Install and use weed wash stations at selected locations along the transmission line right-of-way.
- Conduct post-construction site restoration monitoring with at least three field visits per year until site stabilization is achieved.

Access controls BMPs and specifications:

- Install permanent gates at selected locations to minimize unauthorized use of BPA access roads and unauthorized entry to BPA right-of-way as part of project construction.

Wildlife

- Install bird diverters where the line crosses rivers, wetlands, or other high bird-use areas, and would be technically feasible.
- Minimize the construction area to the extent practicable.
- Leave a small percentage of cut and felled danger trees as snags in upland and wetland areas within the transmission line as additional habitat/structure for wildlife, particularly small mammals and amphibians.
- Top, trim, or girdle a percentage of designated danger trees to create snags (e.g., in higher quality habitat areas) to reduce impacts to vegetation and wildlife species, such as small mammals and amphibians.
- Limit removal of Fender's blue butterfly host or nectar plants to the minimum necessary for construction.
- Restore areas cleared for construction to pre-construction condition.
- Re-vegetate disturbed areas with weed-free seed mixes and plantings that include nectar plants for Fender's blue butterfly.
- Implement the following construction timing restrictions:
    - Northern spotted owl critical breeding period: No work within established disturbance distance between March 1 and July 7.
    - Marbled murrelet critical breeding period: No work within established disruption distance and limited work within disturbance distance between April 1 and August 5. Following daily timing restrictions during the entire breeding within the disturbance distance: Start work two hours after dawn and stop work two hours before dusk.
    - Fender's blue butterfly adult flight season: No work in line miles 1 and 2 between April 15 and July 7.
- Provide support for USFWS's research activities benefiting ESA-listed species.

Table 2-9. Environmental design features/mitigation measures included as part of the Proposed Action (continued)

Cultural
• Stop work immediately and notify local law enforcement officials, appropriate BPA personnel, the Oregon State Historic Preservation Office (SHPO), and the interested Tribes if cultural resources (either archaeological or historical materials) are discovered during construction activities. • Develop an Inadvertent Discovery Plan that details crew member responsibilities for reporting in the event of a discovery during construction. • Stop construction in the area immediately should human remains or burials be encountered. Secure the area, placing it off limits for anyone but authorized personnel, and immediately notify proper law enforcement, the BPA archaeologist, the Oregon SHPO, and the Tribes. • Implement any additional mitigation measures for cultural resources identified by the Oregon SHPO through the Section 106 consultation process.
Visual quality
• Use non-reflective insulators (e.g., non-ceramic insulators or porcelain) to reduce refraction and glare. • Focus construction lighting on work areas to minimize spillover of light and glare. • Require that contractors maintain a clean construction site and remove all construction debris.
Socioeconomics and public services
• Maintain access to all businesses, residences, and public facilities during construction. • Coordinate with utility providers that share BPA right-of-way to determine the exact locations of utilities and minimize service disruptions to other utility lines. • Compensate landowners at market value for any new land rights required to acquire new, temporary, or permanent access roads on private lands and apply for applicable permits to obtain new access rights on public lands.
Noise, public health and safety, and electromagnetic fields
Noise Since there would be no significant changes to the noise environment in the vicinity of the line, and no impacts would result from operational activities, no avoidance, minimization, or mitigation measures would be needed. Public health and safety BPA would implement spill prevention and response BMPs as described earlier in this table under the Fish section to avoid, minimize, or mitigate impacts to public health and safety from the Proposed Action. Electromagnetic fields Since there would be no significant changes to the EMF environment in the vicinity of the line, and no impacts would result from operational activities, no avoidance, minimization, or mitigation measures would be needed.
Transportation
• Prepare a notice about construction activities and a proposed schedule for posting on the Oregon Department of Transportation's (ODOT) traffic advisory web site called Trip Check (http://www.tripcheck.com). • Schedule construction activities at transmission line crossings of Interstate 5 and Oregon Route 99 so as to avoid lane closures during peak travel times, as determined in coordination with ODOT. • Use traffic safety signs and flaggers to inform motorists and manage traffic during construction activities on affected roads. • Repair damage to roads caused by construction. • Keep construction activities and equipment clear of residential driveways to the extent possible.
Air quality and Greenhouse gases
• Use water trucks to control dust during construction. • Keep all vehicles in good operating condition to minimize exhaust emissions. • Turn off construction equipment during prolonged periods of non-use. • Drive vehicles at low speeds (less than 5 miles per hour) on access roads and the BPA easement to minimize dust during high dust conditions.

Chapter 3. Affected environment and environmental consequences

This chapter describes the existing environmental resources that could be affected by the Proposed Action and the potential impacts the Proposed Action would have on those resources. Please see Table 2-9 for a list of the design features and mitigation measures that would lessen or avoid impacts to the environment. The term "transmission line" refers to the combination of the transmission line right-of-way (the area in which the structures are located) plus the access road system.

3.1 Land use and recreation

3.1.1 Affected environment

The transmission line is located in Lane, Douglas, and Coos counties, beginning south of Eugene at the Alvey Substation in Lane County and continuing generally south roughly 68 miles to the Reston substation in Douglas County by way of the Martin Creek and Green Valley Substations. From the Reston Substation, the transmission line continues west about 29.5 miles to the Fairview Substation in Coos County. Structures 48/9 through 49/3 are located within the urban growth boundary (UGB) and city limits of Sutherlin. The transmission line also passes through other unincorporated rural communities such as Umpqua, Dora, Lookingglass, and Fairview.

The transmission line crosses Interstate 5 twice, near structures 19/7 and 43/4. It crosses the Umpqua River once between structures 54/2 and 54/3 in Douglas County, and the east and north forks of the Coquille River, once in Douglas County, between structures 77/6 and 77/7, and 10 times in Coos County, between structure 78/4 and 98/7.

The predominant land uses are forest and agriculture, with some rural residential lands. Figure 3-1 illustrates existing ***zoning*** along the transmission line.

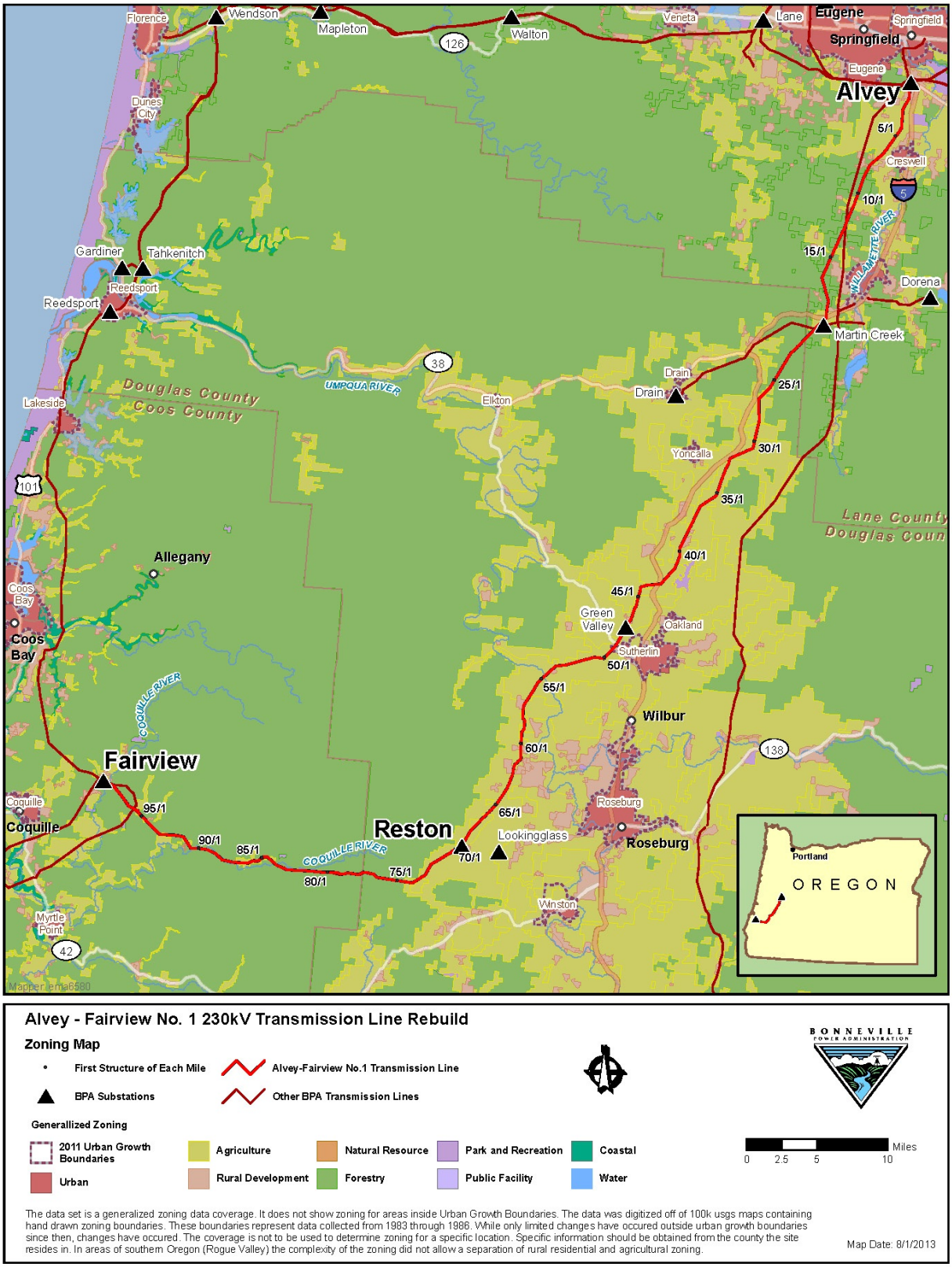

Figure 3-1. Existing zoning intersecting the transmission line

Land ownership along the transmission line is a mix of public and private ownership. In addition to parcels owned by BPA, publicly-owned parcels include parcels owned by cities and counties, and parcels owned and/or managed by the BLM. Most of the BLM parcels are part of the Oregon and California Railroad Revested Lands (O&C lands) and Coos Bay Wagon Road (CBWR) lands, which form a checkerboard pattern throughout western Oregon. These lands were originally deeded to the Oregon and California Railroad company as an incentive to complete the Portland to San Francisco railroad, but Congress took back the title on more than 2 million acres of O&C lands and 93,000 acres of CBWR lands after the railroad failed to sell land to settlers. Active federal management of the O&C and CBWR lands began in 1937 under the O&C Lands Act of 1937 (43 USC § 1181a et seq.). These lands are managed by BLM under their 1995 Resource Management Plans (RMPs) which incorporated the 1994 Northwest Forest Plan (BLM, 1995; BLM, 2008a; BLM, 2012a).

Table 3-1 describes characteristics of farms in Lane, Douglas, and Coos counties. Where the transmission line lies within the UGB for and the limits of the city of Sutherlin, the land is undeveloped.

Table 3-1. Farm characteristics in Lane County, Douglas County, Coos County, and Oregon

Geographic area	Number of farms	Land in farms	Average farm size	Top three commodity groups by value of sales
Lane County	3,335	245,531 acres	74 acres	1. Other crops and hay 2. Nursery, greenhouse, floriculture, and sod 3. Fruits, tree nuts, and berries
Douglas County	2,095	396,984 acres	189 acres	1. Cattle and calves 2. Fruits, tree nuts, and berries 3. Other crops and hay
Coos County	746	145,675 acres	195 acres	1. Fruits, tree nuts, and berries 2. Milk and other dairy products from cows 3. Cattle and calves
Oregon	38,553	16,399,647 acres	425 acres	1. Nursery, greenhouse, floriculture, and sod 2. Cattle and calves 3. Other crops and hay

Source: USDA, 2007.

Land uses outside of the transmission line are regulated by the ***comprehensive plan*** and zoning ordinance of the jurisdiction within which they are located. Zoning outside of the transmission line right-of-way includes land designated for agriculture, exclusive farm use, forest, public uses, rural residential, and small areas of rural industrial and rural center. Land use zones are listed by jurisdiction in Table 3-2.

Table 3-2. County and city zoning districts along the transmission line

Jurisdiction	Zoning district
Lane County	E25—Exclusive Farm Use (25 acre minimum)
	E-40—Exclusive Farm Use (40 acres minimum)
	F1—Non-Impacted Forest
	F2—Impacted Forest
	ML—Marginal Lands
	RI—Rural Industrial
	RPF—Rural Public Facility
	RR5—Rural Residential (5 acre minimum)
Douglas County	5R—Rural Residential 5
	AW—Agriculture and Woodlot
	F3—Exclusive Farm Use—Cropland
	FF—Farm Forest
	FG—Exclusive Farm Use—Grazing
	PR—Public Reserve
	TR—Timberland Resource
City of Sutherlin	FR-75—Forest Resource
Coos County	EFU—Exclusive Agriculture
	F –Forest
	RC—Rural Center
	RR-2—Rural Residential
	RR-5—Rural Residential

Source: City of Sutherlin, 2008; Coos County, 2012a; Douglas County, 2011; Lane County, 2008.

The transmission line crosses through two parks in Douglas County; a third park in Coos County is located adjacent to the transmission line right-of-way (Table 3-3). No BLM trails or recreation areas are adjacent to the transmission line right-of-way, and no additional recreation facilities are planned for development within or adjacent to the transmission line right-of-way. There are no public uses, such as libraries and town halls, other than the county-owned parks and the BLM land located within or adjacent to the transmission line.

The transmission line is located in an area subject to the Coastal Zone Management Act (CZMA), which is implemented in Oregon through the Oregon Coastal Management Plan. Chapter 4 includes more information about the CZMA and the Oregon Coastal Management Plan, as well as a discussion of the local land use plans and policies.

Table 3-3. Parks within and adjacent to the transmission line

Park description	Photo
Iverson Memorial Park is managed by Douglas County Parks Department and is located in Douglas County adjacent to CBWR, less than one mile east of Dave Busenbark Park. The transmission line crosses the southern tip of this park at about line mile 74. This park is approximately 33 acres, with Tenmile Creek running through it. This day use park offers trails and a picnic area. The picnic area and trail head are located approximately 400 feet north of the transmission line and are separated from the line by CBWR and Wilson Creek and large trees; the line is not visible from this area.	
Dave Busenbark Park is managed by Douglas County Parks Department and is located in Douglas County on both sides of CBWR, less than one mile west of Iverson Memorial Park. The transmission line crosses the northern portion of this park at about line mile 75. This park is approximately 27 acres in size, with Wilson Creek running through the park. The park does not include any amenities.	
Frona County Park is managed by Coos County Parks and is located in Coos County on CBWR, approximately 17 miles west of Dave Busenbark Park. The transmission line is located adjacent to the north side of the park at about line mile 92, but it is not visible from the developed portion of the park. The park is approximately 77 acres in size, with the East Fork of the Coquille River running through the park. This park offers picnic areas, playground equipment, outhouses, and primitive camp sites, which are approximately 450 feet south of the transmission line and separated by a hill and large trees; the line is not visible from this area of the park.	

Source: Coos County, 2012b; Douglas County, 2012a; Douglas County, 2012b; Lane County, 2007; Parsons Brinckerhoff, 2012; South Coast Oregon Directory, 2012.

The transmission line intersects lands of three different BLM Districts: Eugene, Roseburg, and Coos Bay. BLM's 1995 RMPs designated three types of land use allocations that intersect the transmission line: Late ***Successional*** Reserves, Riparian Reserves, and Matrix areas. They are managed with the following objectives:

- Late Successional Reserves—These areas protect and enhance conditions of late-successional and old-growth forest ecosystems that serve as habitat for related species, including the northern spotted owl and marbled murrelet; and these areas maintain a functional, interacting, late-successional and old-growth forest ecosystem.
- Riparian Reserves—These areas provide habitat for special-status (***threatened*** or ***endangered species***, proposed threatened or endangered

species, ***candidate species***, state listed species, BLM sensitive species, BLM assessment species) and other terrestrial species; these are a component of the BLM's Aquatic Conservation Strategy.

- Matrix (General Forest Management Areas/Connectivity Blocks)—These areas provide a sustainable supply of timber and other forest commodities; provide connectivity between Late Successional Reserves; provide early-successional habitat; and provide for important ecological functions (BLM, 1995).

3.1.2 Environmental consequences—Proposed Action

Transmission line right-of-way

Agricultural and forestry uses

An approximately 100 foot by 100 foot area would be temporarily used for staging and construction of each structure that would be replaced, which is equivalent to 10,000 square feet (roughly 0.2 acre). Potential construction impacts to agricultural lands and uses from construction of the Proposed Action could include temporary and localized disruption of crops and/or harvesting activities in actively cultivated fields and disruption of livestock grazing.

A number of the structures are located within transmission line right-of-way on actively cultivated fields and fields used for livestock grazing. These structures would be replaced in their current locations, which could result in the temporary disturbance of approximately 130 acres of agricultural land; construction of temporary access could disturb approximately 95 acres of agricultural land. Therefore, a total of approximately 225 acres of agricultural land could be temporarily disturbed (16.8 acres are ***Prime Farmlands*** and 103.9 acres are ***Farmlands of Statewide Importance***). While construction would likely span two growing seasons (2014 and 2015), individual landowners would likely only be affected for one season as construction would be conducted in phases and all construction activities along a given segment of the transmission line would be conducted within a period of a few months.

This temporary impact would represent a small amount of agricultural land in comparison with the total existing agricultural land in Lane County (245,531 acres), Douglas County (396,984 acres), and Coos County (145,675 acres). The short-term disturbances from equipment movement, staging, and construction could result in some crop loss on approximately 225 acres of active agricultural fields. None of these activities would permanently alter existing agricultural uses. Other impacts to agricultural uses adjacent to the transmission line right-of-way could include temporary and localized increases in dust, noise, soil compaction, and erosion. Because the construction impacts would result in short-term disturbances, and BPA would

implement construction BMPs, the Proposed Action would have a low impact on agricultural land uses.

The transmission line right-of-way is cleared of vegetation as part of routine operations and maintenance, including sections that traverse forested areas and BLM's late-successional reserve and matrix lands. Since structure replacement would occur within the existing transmission line right-of-way, construction impacts on forestry activities would be limited to danger tree removal (approximately one tree removed per mile), temporary disruption of forestry activities (i.e., if the property owner crosses the transmission line right-of-way with equipment, they might have to change their route), or temporary access changes to properties, so the Proposed Action would have a low impact on forestry land uses.

BLM land managed as Late Successional Reserves and Riparian Reserves are managed primarily for fish and wildlife habitat and are not used for timber production. Impacts to fish habitat are discussed in Section 3.4, Streams and fish, and impacts to wildlife habitat are discussed in Section 3.6, Wildlife.

Commercial and industrial uses

There are a few rural commercial and industrial uses adjacent to the transmission line right-of-way that may experience temporary impacts from construction activities. These impacts could include increases in noise and dust in the vicinity as well as temporary access closures. Because the construction impacts would be short-term, and would still allow for the continuance of existing land uses, the Proposed Action would have a low impact on commercial and industrial land uses.

Residential uses

Construction of the Proposed Action near the rural residences adjacent to the transmission line would be limited to temporary noise, dust, and access disruptions due to construction activities. Because impacts would be short-term, and would not change use of the land, the Proposed Action would have a low impact on residential uses.

Recreation

Impacts to recreation would be limited to temporary disturbances to recreational uses near the transmission line because construction activities would primarily occur within the transmission line right-of-way. None of the structures that would be replaced are located within the boundaries of the parks located along the transmission line; however, there are structures that would be replaced adjacent to these properties. Potential impacts include traffic delays to access the parks from public roadways, temporary access closures to undeveloped portions of the parks for access road activities (see Access Roads section below), and dust and noise from construction activity. Iverson Memorial Park and Frona County Park, described in Table 3-3, provide picnic areas,

trails, and a play area where visitors might be disturbed by these activities. However, it is unlikely that access to these developed facilities would need to be closed during construction, and the transmission line is not visible from these areas of the parks, so visitors would most likely only be disturbed by temporary construction noise and dust. Given the short duration of construction disturbances (on average less than one day per structure replacement, and one to three days per mile of access road work), impacts to recreational uses would be low.

Access roads

Agricultural and forestry uses

Construction of 1.6 miles of new access roads outside of the transmission line right-of-way would permanently convert approximately 7 acres of land to new roads. New road segments would be relatively short (0.2 mile or less) and would not prohibit the remainder of the property from continuing to be used for agriculture. The rest of the new construction access roads would occur within the transmission line right-of-way. Furthermore, many of these road segments would be located near the perimeter of the property, so they would not bisect existing agricultural activities. Additionally, construction of temporary roads, both within and outside of BPA's right-of-way, would temporarily disturb approximately 2 acres of agricultural land.

Construction of new access roads would not be expected to impact forestry land uses. However, some existing access roads outside of the right-of-way are located in forested areas and have likely become overgrown, so access road reconstruction and improvement would require removal of approximately 180 trees, and could temporarily impact forestry activities and property access. Impacts to forestry uses would be relatively low since there would be approximately 180 trees removed over the entire 160.2 miles of proposed access roads (less than 2 trees per mile), which would not substantially change existing forestry land uses.

Residential and recreational uses

Access road construction work could temporarily disturb residences and users of recreational facilities through temporary and localized increases in dust, noise, soil compaction, and erosion. Access road construction near the three parks along the transmission line right-of-way (see Table 3-3) would include the following:

- Iverson Memorial Park—Segments of access road reconstruction and improvements would take place in the BPA right-of-way that crosses the southeast corner of the park property. The transmission line is not visible from the picnic area, and construction activities would be about 400 feet south of the picnic area, separated by CBWR, Wilson Creek, and vegetation. Noise and dust could temporarily affect park visitors.

- Dave Busenbark Park—There would be short segments of access road reconstruction and improvement in the BPA right-of-way near the park, but construction would be outside of park boundaries. This park has no developed facilities, so potential disturbances to visitors due to construction activity would likely be none-to-low.
- Frona County Park—Access road reconstruction would occur in BPA's right-of-way adjacent to the north side of this park. In addition, a temporary direction of travel route would extend 200 feet into the north side of the park. The transmission line is not visible from the developed portion of the park, and construction activities would be about 400 feet away from the picnic area, playground, and camp sites. Noise and dust could temporarily affect park visitors.

The improved access roads could potentially increase public access to BLM land or other public lands (including land owned by the City of Creswell and Douglas County), or private lands. Unauthorized use of BPA's access roads could result in activities such as off-road vehicle use, illegal dumping, and trespassing on private properties. However, BPA would be installing or replacing 145 gates at the entrance to access roads to deter unauthorized access.

Because the acreage permanently converted for new access roads would be relatively small in the context of existing agricultural uses, and impacts to residential and recreational uses would be limited to construction disturbances, impacts of access road work on land use and recreation would be low.

Environmental consequences from access-rights roads on BLM land

The reconstruction and improvement of approximately 13.6 miles existing access-rights roads would have no effect on land use as the roadways are previously-disturbed areas. There would be 36 trees removed roads on BLM land in order to either reconstruct or improve roads or to accommodate the length or turning radius of large construction vehicles. Other impacts from reconstruction or improvement of existing access-rights roads on BLM land are the same as those for access roads as discussed above and would be low. There would be no reconstruction or improvement on new access-rights roads on BLM land.

3.1.3 Environmental consequences—No Action Alternative

Under the No Action Alternative, impacts to land uses and recreation associated with the construction of the new structures and structure components would not occur at this time. However, as existing structures continue to deteriorate line repairs would increase and landowners could be disrupted much more often than under normal line maintenance conditions. Impacts would be similar to the Proposed Action (disturbance

of individual structure sites and portions of the transmission line, interference of access to individual properties, and noise and dust), but spread out over time. Emergency repairs could be needed and if conditions prevent access along existing access roads, new impacts to land use and recreation, such as vegetation removal and traffic delays, could occur.

3.2 Geology and soils

3.2.1 Affected environment

Geology and topography

The Alvey-Reston segment of the transmission line begins at the southern terminus of the Willamette Valley ***physiographic province*** and proceeds through valleys and foothills at the confluence of the Cascade Range and Coast Range provinces. The geology consists of unconsolidated and semi-consolidated sediments consisting of gravel, sand, silt, and clay in the valleys and sedimentary and volcanic rock in the hills. The Reston-Fairview segment of the transmission line is located solely within the Coast Range physiographic province crossing moderately- to steeply-sloping terrain. The geology consists of primarily marine sedimentary rock (Wells et al., 2000; Walker and Duncan, 1989). The elevation ranges from about 100 feet near Fairview to a maximum elevation of about 2,900 feet within the Coast Range. Steep slopes are found along the transmission line through the Coast Range.

The alignment crosses several areas that are mapped as landslide hazard areas as displayed in Figure 3-2 (DOGAMI, 2012). However, no site-specific landslide hazard data is available for the transmission line right-of-way; thus, there could be additional landslide hazard areas present along the transmission line right-of-way that are not shown in Figure 3-2. Approximately 17 structures are located within the mapped landslide hazard areas, and some access roads are within or near mapped landslide areas.

Soils

One-hundred twenty-nine soil types are present within 50 feet of the structures within the transmission line right-of-way (USDA, 2012). These soils are susceptible to low-to-moderate levels of erosion when exposed to water or wind (USDA, 2012).

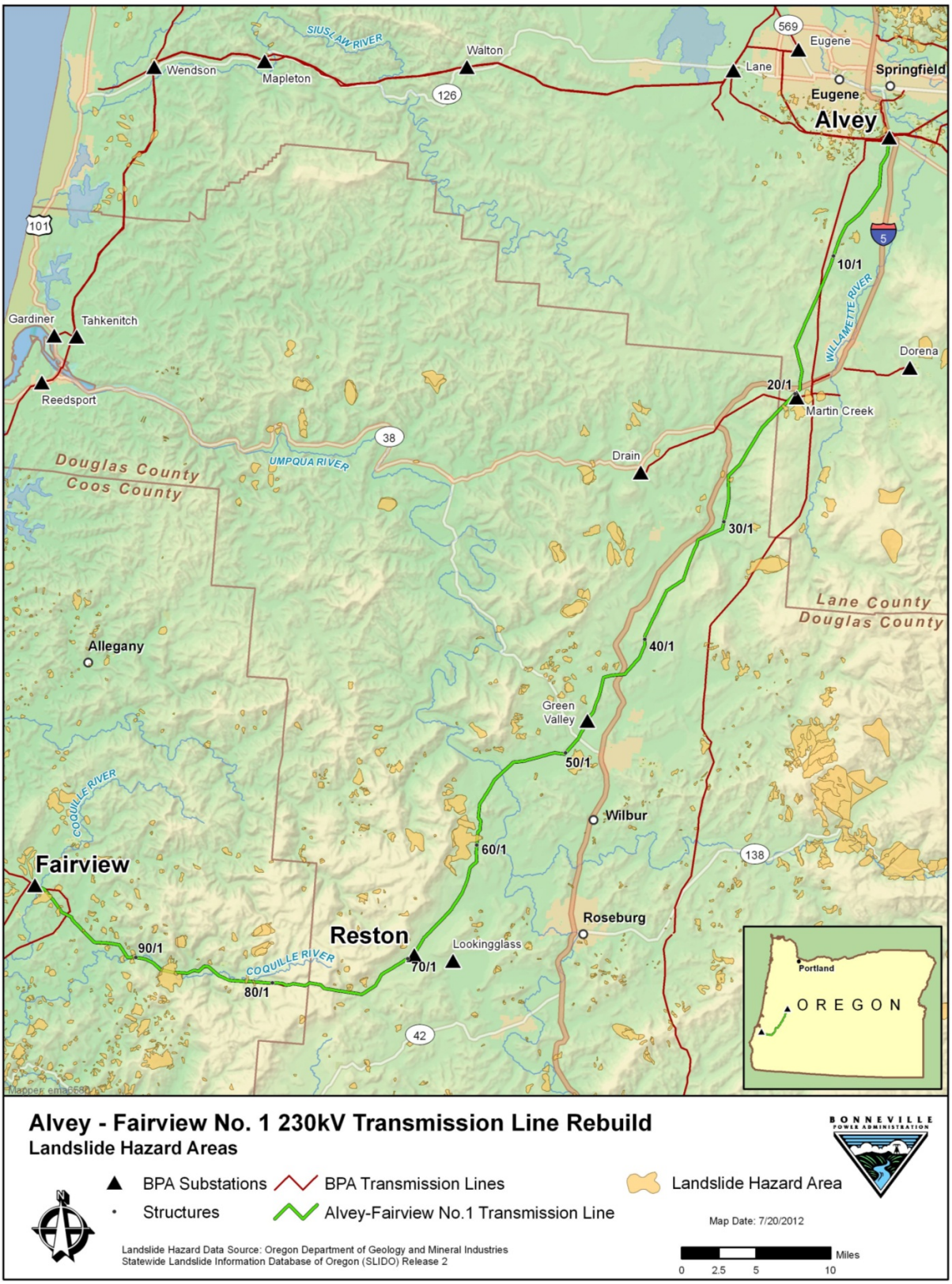

Figure 3-2. Landslide hazard areas

3.2.2 Environmental consequences—Proposed Action

Transmission line right-of-way

Impacts to soils could result from ground clearing and soil piling, compaction from heavy equipment, or contamination from wood pole preservative or accidental equipment spills. Ground that has been cleared of vegetation could be susceptible to erosion and establishment of noxious weeds (Section 3.3). Ground compaction could degrade the soil structure and reduce soil productivity and the soil's ability to absorb water.

At most structure sites, structure replacement activities would disturb an area approximately 100 feet by 100 feet per structure (approximately 0.2 acre). In sensitive habitats, such as wetlands, this area would be reduced to a 25-foot radius per structure (approximately 0.05 acre), centered on the structure center point to minimize the area disturbed by replacement activities. If the area is wet, crane mats would be used to minimize disturbance to soils. Replacement of the 709 wood pole structures would temporarily disturb about 131 acres of soils during structure replacement activities.

The existing structure holes would be used where possible for the new structures, minimizing potential soil disturbance. At most structure sites, additional soil removed by the auger would be spread evenly around the structure sites. At structure sites determined to be within sensitive areas (e.g., wetlands), the augered soil would be removed from the site and disposed of at an appropriate waste disposal site that BPA has reviewed and approved. Temporary soil compaction from the use of heavy machinery at each structure site would be limited to areas immediately adjacent to the structures. These areas would be revegetated or allowed to return to allowable uses following completion of construction.

The potential for erosion would be highest during heavy rainfall, or strong winds during dry weather, and on steep slopes. Prompt mulching, seeding and fertilizing of exposed soils would help reduce the potential for erosion from disturbed sites. Until vegetation becomes reestablished, soil erosion and the creation of small channels could occur; however, once vegetation is established erosion would be unlikely. With the implementation of BMPs and conducting peak construction work during the dry season impacts to soils would be low. Erosion and compaction impacts at staging areas would also be unlikely since the area used would likely be previously disturbed, level, and already paved or graveled. Because erosion or dust impacts would be short-term and in a relatively small area, the impacts to soils would be low.

Impacts on soils due to danger tree removal along the transmission line would include soil erosion and dust, but with mitigation measures listed in Table 2-9 those impacts would be low because danger tree removal would be limited (one tree per mile).

Structures located within active landslide areas can be problematic if the structures move with the sliding earth. Two-pole and three-pole structures are relatively flexible and can withstand minor movement; however, if minor movement occurs over several years (or even decades) the cumulative movement may be enough to stress the structures and conductor causing the structure to fall, potentially jeopardizing the functioning of the transmission line and public safety. However, there is a low risk for landslides occurring from structure replacement because BPA would be reusing the same pole location, and would follow geotechnical BMPs for construction within landslide hazard areas to avoid overburdening unstable areas.

The wood-pole structures would be treated with a wood preservative called PCP that is commonly used for treatment of utility poles. PCP contains chlorinated dibenzodioxins and chlorinated dibenzofurans that have the potential to leach into soils or water (if the pole is in contact with water, such as wetlands).

PCP can move through the pole and leach from the bottom of the pole into the soil near the underground portion of the pole (EPA, 2008). PCP tends to move through the pole rapidly for the first few years of use, and then becomes relatively constant with time (EPA, 2008), has a tendency to rapidly degrade in the environment, and concentrations decrease rapidly with distance from the wood. PCP concentrations decrease by as much as two orders of magnitude between three and eight inches from the wood pole, but that migration is dependent on localized factors such as soil type, soil chemistry, local weather and topography, initial level of pole treatment, and age of pole (Electrical Power Research Institute, 1995). In wetlands, structures would be placed inside 48-inch diameter corrugated metal pipes to contain PCPs, and prevent them from leaching into surrounding soils.

Access roads

Construction of new access roads would disturb approximately 32 acres of soil. These permanent disturbance areas would be stabilized by a gravel top layer (14 feet wide) for the roadway.

In addition, construction of temporary access roads would disturb approximately 2 acres of soil, for a total disturbance of 34 acres of soils for access roads. These temporary disturbance areas would be revegetated or would return to allowable uses following completion of construction.

New construction and reconstruction of access roads within landslide hazard areas and steep terrain could increase the risk of landslides. However, BPA has conducted a landslide risk assessment associated with access road work, and would include geotechnical BMPs such as the construction of gabion walls, a common type of low gravity retaining structure to stabilize slopes, and repairing slumps during construction

to avoid overburdening unstable areas. Therefore, there is a low risk for landslides to occur from access road construction work.

Areas used for temporary access roads would be restored to pre-construction conditions following construction.

Environmental consequences from access-rights roads on BLM land

The reconstruction and improvement of approximately 13.6 miles of existing access-rights roads on BLM land would have the same impacts on geology and soils as those for access roads as discussed above. There would be no reconstruction or improvement on new access-rights roads on BLM land.

3.2.3 Environmental consequences—No Action Alternative

Under the No Action Alternative, construction would not take place at this time and, thus, no construction-related impacts would occur to geology or soils. Increases in the number of visits to repair deteriorating structures could lead to more erosion and compaction than is currently experienced, especially if repairs require access to portions of the line during wet or muddy conditions.

3.3 Vegetation

3.3.1 Affected environment

General vegetation

Vegetation is influenced by the topography, climate, soils, and current and past human activities. The transmission line crosses four distinct ***ecoregions*** in Oregon:

- Willamette River and Tributaries Gallery Forest
- Valley Foothills
- Umpqua Interior Foothills
- Mid-Coastal Sedimentary

The Willamette River and Tributaries Gallery Forest ecoregion includes broad floodplains, which have in large part been cleared for agricultural use since European colonization. Historically, the area has included native oak woodlands, coniferous forests, grasslands, and riparian forest (Franklin and Dyrness, 1973). Riparian gallery forests containing ash (*Fraxinus spp.*), black cottonwood (*Populus trichocarpa*), alder (*Alnus spp*.), and big-leaf maple (*Acer macrophyllum*) once grew on its fertile, ***alluvial*** soils, but most have been replaced by agriculture and rural residential, suburban, and urban development.

The Valley Foothills ecoregion is a transitional zone between the agricultural Willamette Valley and the more heavily forested Coast Range. Forest stands are generally dominated by Oregon white oak *(Quercus garryana)* in the Willamette Valley and Douglas-fir *(Pseudotsuga menziesii)* in the Coast Range. At present, rural residential expansion, grazing lands, and orchards are common.

The Umpqua Interior Foothills ecoregion is a complex of foothills and narrow valleys containing ***fluvial*** terraces and floodplains with mixed coniferous/evergreen broadleaf forests. Oregon white oak woodland, Douglas-fir, ponderosa pine *(Pinus ponderosa)*, Pacific madrone *(Arbutus menziesii),* and an understory ***chaparral*** community cover the slopes and intermingle with grazing lands, vineyards, orchards, and row crops.

The mountainous Mid-Coastal Sedimentary ecoregion lies outside of the coastal fog zone and is typically underlain by sandstone and siltstone. Its Douglas-fir forests are managed for logging.

Vegetation along the transmission line has been extensively modified by a variety of land uses, including livestock grazing, forestry, road and right-of-way construction and maintenance, and residential expansion. The introduction of nonnative plants such as Himalayan blackberry *(Rubus armeniacus)*, an assortment of broom species (*Cytisus spp.*, *Genista monspessulana*), and pasture grasses have displaced many native plant species.

Plant communities include upland grassland/herbaceous, wetland, riparian, agricultural/pastoral, evergreen, deciduous, and mixed coniferous/evergreen broadleaf forests, and urban/developed plant communities (Table 3-4). The percentage of each plant community in the transmission line right-of-way is shown in Figure 3-3.

Table 3-4. Plant communities within the transmission line right-of-way

Plant community	Common dominant species	Description
Upland grassland/herbaceous	Perennial ryegrass (*Lolium perenne*), tall fescue (*Festuca arundinacea*), orchard grass (*Dactylis glomerata*), Kentucky bluegrass (*Poa pratensis*), oxeye daisy (*Leucanthemum vulgare*), meadow knapweed (*Centaurea pratensis),* and poison oak *(Toxicodendron diversiloba)*	Grassland/herbaceous—areas dominated by graminoids or herbaceous vegetation, and not subject to intensive management such as tilling, but can be utilized for grazing.
Wetland areas	Oregon ash (*Fraxinus latifolia*), Meadow foxtail (*Alopecurus pratensis*), reed canarygrass (*Phalaris arundinacea*), creeping buttercup (*Ranunculus repens*), and velvet grass (*Holcus lanatus*)	Herbaceous wetlands with perennial herbaceous vegetation and woody wetlands forest or shrubland vegetation.
Riparian areas	Oregon ash, Oregon white oak (*Quercus garryana*), willow species (Salix spp.), red-osier dogwood (*Cornus stolonifera*), reed canarygrass, and meadow foxtail	Intermittent riparian communities.
Evergreen forests	Douglas fir (*Pseudotsuga menziesii*), California incense cedar (*Calocedrus decurrens*), Oregon white oak, cascara (*Rhamnus purshiana*), vine maple (*Acer circinatum*), beaked hazelnut (*Corylus cornuta*), oceanspray (*Holodiscus discolor*), snowberry (*Symphoricarpos albus*), sword-fern (*Polystichum munitum*), and poison oak	Evergreen/coniferous forests young and old.
Deciduous forest	Big-leaf maple (*Acer macrophyllum*), Oregon ash, Oregon white oak, California black oak (*Quercus kelloggii*), Pacific madrone (*Arbutus menziesii*), hairy manzanita (*Arctostaphylos columbiana*), and poison oak	Broadleaf deciduous forests.
Mixed coniferous/deciduous forests	Douglas fir, California incense cedar, big-leaf maple, Oregon white oak, snowberry, oceanspray, beaked hazelnut, and swordfern	Oregon white oak, Douglas-fir, and madrone forests.
Agricultural/pastoral	Perennial ryegrass, tall fescue, orchard grass, Kentucky bluegrass, oxeye daisy, meadow knapweed, and poison oak	Areas where crops are cultivated, and grasses, legumes are planted for livestock grazing, seed production, or hay crops.
Urban/developed	English hawthorn (*Crataegus monogyna*), Scotch broom (*Cytisus scoparius*), Himalayan blackberry (*Rubus armeniacus*), Tall fescue, orchard grass, oxeye daisy, meadow knapweed, and poison oak	Areas cleared for commercial, industrial, or residential structures, with associated lawns, and parking lots.

Sources: 2012 aerial photographs from the National Agricultural Imagery Program (USDA, 2011), U.S. Geological Service National Land Cover Data (USDA, 2006), and field observations (Turnstone, 2013).

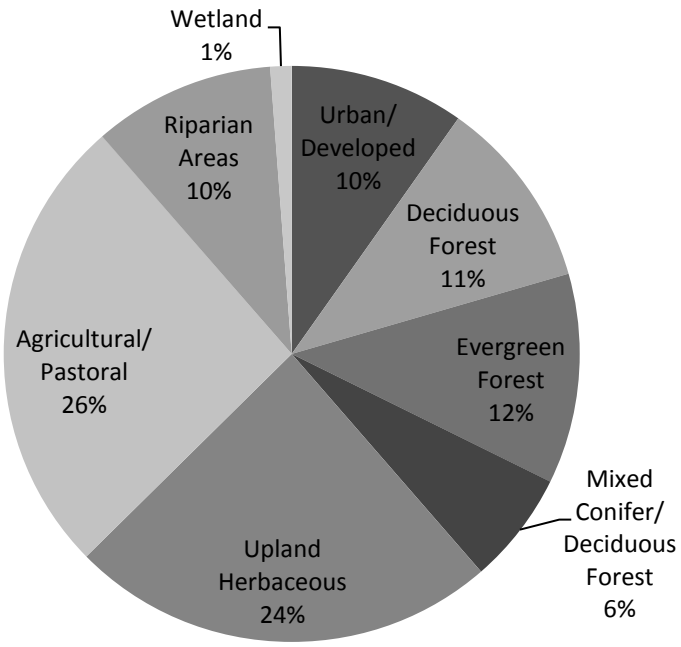

Figure 3-3. Plant communities within the transmission line right-of-way by percentage

Special-status plant species

Special-status plant species have been identified for protection and/or management under federal or state laws or other mandates. Several special-status plant species listed under the ESA are known to occur in Coos, Douglas, and Lane counties (Table 3-5).

Of the special-status species known to occur in the counties crossed by the Proposed Action, the following six species have the potential to occur along the transmission line:

- Kincaid's lupine (Lane and Douglas counties)
- Bradshaw's desert parsley (Lane County)
- Willamette daisy (Lane County)
- Rough popcornflower (Douglas County)
- Shaggy horkelia (Lane and Douglas counties)
- Whitetop aster (Lane County)

Table 3-5. Special-status species potentially occurring within the transmission line right-of-way

Common name	Scientific name	ESA listing status		Lane County	Douglas County	Coos County
		Federal	State			
Willamette daisy	*Erigeron decumbens var. decumbens*	LE	LE	X		
Gentner's fritillary	*Fritillaria gentneri*	LE	LE		X	
Western lily	*Lilium occidentale*	LE	LE			X
Bradshaw's desert parsley	*Lomatium bradshawii*	LE	LE	X		
Kincaid's lupine	*Lupinus sulphureus ssp. kincaidii*	LT	LT	X	X	
Rough popcornflower	*Plagiobothrys hirtus*	LE	LE		X	
Pink sand-verbena	*Abronia umbellata*	SOC	LE	X	X	X
Koehler's rockcress	*Arabis koehleri var. koehleri*	SOC	C		X	X
Gasquet manzanita	*Arctostaphylos hispidula*	SOC			X	
Bensoniella	*Bensoniella oregona*	SOC	C	X	X	
Crenulate grape fern	*Botrychium crenulatum*	SOC	C	X		
Cox's mariposa lily	*Calochortus umpquaensis*	SOC	LE		X	
Cliff paintbrush	*Castilleja rupicola*	SOC		X	X	
Cold-water corydalis	*Corydalis aquae-gelidae*	SOC	C	X		
Clustered lady's slipper	*Cypripedium fasciculatum*	SOC	C		X	
Willamette Valley larkspur	*Delphinium oreganum*	SOC	C	X		
Peacock larkspur	*Delphinium pavonaceum*	SOC	LE	X		
Wayside aster	*Eucephalus vialis*	SOC	LT	X	X	
Shaggy horkelia	*Horkelia congesta ssp. congesta*	SOC	C	X	X	
Fragrant kalmiopsis	*Kalmiopsis fragrans*	SOC			X	
Thin-leaved peavine	*Lathyrus holochlorus*	SOC		X	X	
Frye's limbella	*Limbella fryei*	SOC	C	X	X	X
White meconella	*Meconella oregana*	SOC	C		X	
Red-root yampah	*Perideridia erythrorhiza*	SOC	C		X	
Silvery phacelia	*Phacelia argentea*	SOC	LT			X
Whitetop aster	*Sericocarpus rigidus*	SOC	LT	X		
Henderson's checker-mallow	*Sidalcea hendersonii*	SOC		X	X	
Siskyou checkerbloom	*Sidalcea malviflora ssp. patula*	SOC	C			X
Hitchcock's blue-eyed grass	*Sisyrinchium hitchcockii*	SOC		X	X	
Leach's brodiaea	*Triteleia hendersonii var. leachiae*	SOC	C			X

Source: U.S. Fish and Wildlife Service (USFWS), Oregon Fish and Wildlife Office, 2012.
C = Candidate; LE = Listed endangered; SOC = ***Species of concern***; LT = Listed threatened; (See Chapter 6, glossary).

None of these six special-status species were found along the transmission line right-of-way or access roads during surveys of areas that would have the potential for these species. Surveys were conducted by qualified botanists during the appropriate flowering periods in June, 2011; May, June, and July, 2012; and June, 2013, and documented in the Alvey-Fairview Transmission Line Rebuild Threatened and Endangered Plant Species and Fender's Blue Butterfly Nectar Species Survey, which is incorporated by reference into this EA (Turnstone, 2013).

In addition, no designated critical habitat for Kincaid's lupine or Willamette daisy intersects the transmission line. The nearest designated critical habitat units for these two prairie species are clustered over seven miles northwest of the Alvey Substation, ranging from Willow Creek to Fern Ridge Reservoir (Turnstone, 2013).

Noxious weeds

Noxious weeds are nonnative plants designated as undesirable plants by federal and state laws. Noxious weeds displace native species, decrease plant species diversity, degrade habitat for rare species and wildlife, decrease productivity of farms, rangelands and forests, create unattractive areas dominated by single species, and impair full use of the landscape by wildlife and humans. The Oregon Department of Agriculture (ODA) divides noxious weeds into categories A, B, and T:

- A-list designated weeds are weeds of known economic importance that occur in the state in small enough infestations to make eradication or containment possible. The recommended action for infestations is eradication or intensive control when and where found.
- B-list designated weeds are weeds of economic importance that are regionally abundant but may have limited distribution in some counties. Recommended control actions are limited to intensive control at the state, county, or regional level as determined on a site-specific, case-by-case basis.
- T-list designated weeds are priority species for prevention and control by the Noxious Weed Control Program because they pose an economic threat to the State of Oregon.

To determine the extent of A-, B-, and T-list noxious weed infestation, noxious weed surveys of the transmission line and associated access roads were conducted in September and October, 2012, and June, July, and August, 2013. The nineteen weed species observed are summarized below in Table 3-6.

Table 3-6. Noxious weeds found within the transmission line

Common name	Scientific name	ODA category	Location relative to transmission line
Plumeless thistle	*Carduus acanthoides*	A	Found within transmission line right-of-way: line miles 42-47, 50-53, and 67-68
Diffuse knapweed	*Centaurea diffusa*	B	Found within transmission line right-of-way: line miles 35 and 38-46
Meadow knapweed	*Centaurea pratensis*	B, T	Found within transmission line right-of-way: line miles 57, 59, 72, and 48-52 in upland grasslands, agricultural, and urban areas
Spotted knapweed	*Centaurea stoebe*	B, T	Found within transmission line right-of-way: line miles 46-48
Canada thistle	*Cirsium arvense*	B	Widespread throughout the transmission line right-of-way
Bull thistle	*Cirsium vulgare*	B	Widespread throughout the transmission line right-of-way
Poison hemlock	*Conium maculatum*	B	Widespread throughout the transmission line right-of-way
Field bindweed	*Convolvulus arvensis*	B	Found within transmission line right-of-way: line miles 31-32, 41-45, 50-53, and 68
Scotch broom	*Cytisus scoparius*	B	Widespread throughout the transmission line right-of-way
Japanese knotweed	*Fallopia japonica*	B	Present in Coos, Douglas, and Lane counties
Giant knotweed	*Fallopia sachalinensis*	B	Present in Coos, Douglas, and Lane counties
St. John's wort	*Hypericum perforatum*	B	Widespread throughout the transmission line right-of-way
English Ivy	*Hedera helix*	B	Present in Coos, Douglas, and Lane counties
Perennial peavine	*Lathyrus latifolia*	B	Found within transmission line right-of-way: line miles 28, 29, 44, and 54
Himalayan knotweed	*Polygonum polystachyum*	B	Present in Douglas county
Himalayan blackberry	*Rubus armeniacus*	B	Widespread throughout the transmission line right-of-way
Tansy ragwort	*Senecio jacobaea*	B, T	Found within transmission line right-of-way: line miles 40, 43-46, 52, and 56-58
Medusahead rye	*Taeniatherum caput-medusae*	B	Found within transmission line right-of-way: line miles 48-50, 52-54, and 58-59
Gorse	*Ulex europaeus*	B, T	Present in Coos, Douglas, and Lane counties

3.3.2 Environmental consequences—Proposed Action

Transmission line right-of-way

General vegetation

Construction impacts would be generally associated with vegetation removal and noxious weed propagation. Tree removal has the potential to increase available sunlight, water and nutrients, increase temperature variability, and diversify the age structure of the adjacent riparian and forested communities (evergreen forests, deciduous forest, and mixed coniferous/deciduous forests). However, the estimated 100 danger trees that could be removed would be spread over an average of only one danger tree per line mile, so the potential to alter adjacent vegetation communities is low. Given the density of vegetation in the areas, it would be expected that tree/shrubs would quickly revegetate areas where trees would be removed. Residual dormant seeds in the existing soil seed bank would also contribute to subsequent shrub and tree recruitment and disturbed site revegetation.

Within the upland grassland/herbaceous, native wetland, and agricultural/pastoral plant communities, impacts could occur through direct clearing or crushing for construction activities associated with replacing structures and associated hardware such as guy wires and guy wire anchors. Additional impacts could occur from the use of heavy equipment on local soils, including compaction and physical movement of soils. Compaction of soils could prevent precipitation from infiltrating plant root zones. Decreases in groundcover from vegetation removal could cause increases in erosion during storm events and correspondingly less infiltration to support remaining plant communities. Compaction could also inhibit germination of seeds in the upper soil horizon, favor the development of bare-soil areas, or foster compaction-tolerant annual grass and forb species.

Soil disturbance resulting from transmission line work, could eliminate plant cover and change the ability of some plant communities to reestablish. Areas cleared of vegetation could be invaded by nonnative species, including noxious weeds, which could preclude growth of native vegetation.

The effects of soil disturbance and plant cover changes would be reduced or avoided through a variety of BMPs and environmental design features described in Table 2-9.

The impact to upland grassland/herbaceous, wetland, urban/developed, and agricultural/pastoral plant communities would, therefore, be low. The disturbance to common plant species in the immediate vicinity of construction would be temporary and those temporary effects would be minimized through planning and implementation of these BMPs.

Potential accidental spills of hazardous materials (e.g., hydraulic fluids, petroleum products) that would be used during construction could result in vegetation impacts including mortality, reduced viability for some species, and reduced potential for successful revegetation within spill areas. Because potential spills would be small and localized, and BMPs would be implemented as described in Table 2-9 to reduce the possibility of spills affecting vegetation, the impact to general vegetation would be low.

Special-status plant species

There would be no impact to ESA-listed plants or other special-status species because none are historically known to occur within the transmission line right-of-way and none were found during plant surveys.

Noxious weeds

Construction could disrupt vegetation and disturb and relocate soils and noxious weed propagules thereby increasing the potential for noxious weeds to invade new areas. Noxious weeds could colonize disturbed soils along the road edge, and new roads could provide new avenues for the dispersal of noxious weeds. Vehicles and the materials they transport could import new species or inadvertently transport seeds or propagules from infested areas to new locations and access roads. If conditions are appropriate, these species could take advantage of disturbed soils and the lack of competing vegetation in recently cleared areas and establish new populations.

However, disturbance to vegetation would be minimized by only removing vegetation that would directly interfere with the proposed construction activities, and by pre-construction and post-construction treatment of noxious weeds. BPA would use BMPs and applicable environmental design features described in Table 2-9, including restoring disturbed areas to pre-construction conditions.

Access roads

The Proposed Action would require the clearing of trees and vegetation where new roads would be built or existing roads reconstructed or improved. The 180 trees that would be removed are mostly deciduous trees less than 16 inches in diameter that are leaning into existing roadways. Due to their existing proximity to roadways, the removal would not create new significant openings in canopy cover or new high-contrast edges. Removal of overstory trees along existing roadways may allow understory vegetation located farther from the roadbed to grow as a result of increased light availability.

Environmental consequences from access-rights roads on BLM land

There would be no effect on special-status plant species from the reconstruction and improvement of approximately 13.6 miles of existing access-rights roads on BLM land as the roadways are previously-disturbed areas and do not contain habitat for these

species. Based on the noxious weed mitigation measures in Table 2-5, the likelihood of noxious weeds spreading would be low. There would be no reconstruction or improvement on new access-rights roads on BLM land.

3.3.3 Environmental consequences—No Action Alternative

Under the No Action Alternative, impacts to vegetation due to the transmission line rebuild would not occur at this time. However, current levels of disturbance to vegetation would increase as repairs to existing deteriorating structures increase. Crop damage, soil disturbance, and temporary access road creation for routine or emergency maintenance activities could result in short-term impacts similar to the Proposed Action. Additionally, since the timing of emergency maintenance cannot be controlled, emergency work could be required during winter when accessing structure locations and the transport of materials and supplies could result in damage to some vegetation.

In addition, emergency repair activities could require movement of personnel, materials, and vehicles through existing noxious weed infestations that could allow the spread of weeds to other areas.

3.4 Streams and fish

3.4.1 Affected environment

Streams

The transmission line lies within four watershed subbasins: Coast Fork Willamette, Umpqua River, South Umpqua River, and Coquille River (Figure 3-4). The transmission line crosses numerous streams, rivers, or their headwaters, including the Camas Swale Creek, Hill Creek, Bennett Creek, Elk Creek, Calapooya Creek, Umpqua River, East Fork Coquille River, Camas Creek, and North Fork Coquille River.

Coast Fork Willamette Subbasin

The Coast Fork Willamette Subbasin is located in the southern-most portion of the Willamette Basin. The Coast Fork Willamette River flows into the Willamette River at the confluence of the Middle Fork Willamette River. The subbasin's 426,238 acres, mostly in Lane County, include four watersheds. Eighty-two (82) percent of the subbasin is forestland, most of which is under industrial ownership. The remaining land, most of which supports grass, hay, pasture, orchards, vineyards, berries, and Christmas trees is typically used by small-acreage farmers.

Figure 3-4. Watershed subbasins intersected by the transmission line

Umpqua River Subbasin

The Umpqua River Subbasin is located in the center of the larger Umpqua River Basin. The North Umpqua River meets with the South Umpqua River to form the main stem Umpqua River east of the transmission line right-of-way crossing of the main stem Umpqua River between structures 54/2 and 54/3. The subbasin's 961,700 acres, mostly in Douglas County, include eight watersheds. Eighty-six (86) percent of the subbasin is forestland, and one-third of that is publicly-owned. About 10 percent of the subbasin is hayland and pastureland that is typically in small acreage farms.

South Umpqua River Subbasin

The South Umpqua River Subbasin is located in the southern-most portion of the larger Umpqua River Basin. The subbasin's 1,152,000 acres, mostly in Douglas County, include 13 watersheds. Eighty-six (86) percent of the subbasin is forestland, and the remainder is primarily small farms, privately-owned grassland, hayland, and pastureland.

Coquille River Subbasin

The Coquille River Subbasin, located in southwestern Oregon, is the largest completely coastal river subbasin in Oregon. The subbasin's 675,000 acres, mostly in Coos County, include five watersheds. Ninety (90) percent of the subbasin is private and public forestland. Less than ten percent is used for pasture, hay, and other various uses.

Table 3-7 lists each named stream the Proposed Action crosses; however, given pole and access road placement as well as line spans, impacts to most named drainages are avoided.

Table 3-7. Named streams crossed by the Proposed Action by watershed

Coast Fork Willamette subbasin Line miles 1-22	Umpqua subbasin Line Miles 22-61		South Umpqua subbasin Line miles 61-76	Coquille subbasin Line miles 76-98
Wild Hog Creek	Bear Creek	Wilson Creek	Willow Creek	East Fork Coquille River*
Camas Swale Creek	Buck Creek	Cabin Creek*	Doerner Creek	Camas Creek
North Fork Hill Creek*	Thief Creek	Williams Creek	Callahan Creek*	Hantz Creek
Hill Creek*	Lees Creek	Calapooya Creek*	Flournoy Creek*	Cherry Creek*
Bennett Creek*	Curtis Creek	Cook Creek*	Rock Creek*	Middle Creek
Silk Creek	Cox Creek*	Burke Creek	Tenmile Creek	North Fork Coquille River*
Barrett Creek	Bennet Creek*	Mill Creek*	Wilson Creek	
Boren Creek	Elk Creek	Umpqua River*		

*Indicates where in-water activities are scheduled to occur on named drainage or their fish-bearing tributaries.

Water quality

None of the four subbasins meet Oregon Department of Environmental Quality's (DEQ) water standards for all factors. Failure to comply with these standards results in listing on the DEQ's ***303(d), water quality limited waters*** (303[d]) list. Table 3-8 lists the standards which each subbasin does not meet. The transmission line does not cross either the main stem of the Coquille River or the Upper South Fork Coquille Watershed.

Table 3-8. Subbasins within the transmission line right-of-way with impaired water quality parameters

Subbasin	Water Quality Standards not met as indicated by DEQ's 303(d) List
Coast Fork Willamette Subbasin	Temperature, dissolved oxygen, iron, and mercury
Umpqua River Subbasin	Temperature, arsenic, beryllium, copper, dissolved oxygen, iron, lead, manganese, mercury, pH, and sedimentation
South Umpqua River Subbasin	Temperature, arsenic, cadmium, copper, dissolved oxygen, e-coli, fecal coliform, iron, lead, manganese, nickel, pH, sedimentation, and zinc
Coquille River Subbasin	Temperature, chlorophyll, dissolved oxygen, and fecal coliform

Source: DEQ, 2010.

Fish

Fish presence, particularly in the higher foothills and mountainous areas crossed by the transmission line is often precluded by natural barriers (e.g., steep slopes, waterfalls) and small watershed size in the headwaters along ridge tops. However fish species that occur in streams that may be impacted by the Proposed Action include Coho salmon, Chinook salmon, steelhead trout, Oregon chub, and coastal cutthroat trout. Pacific lamprey, rainbow trout, and a variety of other common native and introduced fish species, including warm-water species, also occur within these streams. ESA-listed fish species potentially present in streams that may be impacted by the Proposed Action include Upper Willamette River Chinook, Oregon Coast Coho, and Oregon chub.

Threatened, endangered, candidate, and special-status fish species

Chinook salmon (*Oncorhynchus tshawytscha*), Upper Willamette River Evolutionary Significant Unit

The Upper Willamette River Chinook salmon ESU was originally listed as threatened on March 24, 1999 (64 FR 14308), and its threatened status was reaffirmed on June 28, 2005 (70 FR 37160). Critical habitat was designated for Upper Willamette River Chinook on September 2, 2005 (70 FR 52630) with an effective date of January 2, 2006. No Critical Habitat for Upper Willamette River Chinook is intersected by the transmission line (Aquatic Contracting, 2013a).

Protected fish include all naturally spawned spring-run populations of Chinook salmon (and their progeny) residing in streams in the Upper Willamette River Basin of western Oregon, upstream of Willamette Falls (64 FR 14308). This includes the main stem Willamette River and its tributaries, which also includes the Coast Fork Willamette River and tributaries which are crossed by the transmission line.

Coho salmon (*Oncorhynchus kisutch*)

The Oregon Coast Coho ESU was reaffirmed as threatened under the ESA on June 20, 2011. Critical habitat was designated on February 11, 2008. The Oregon Coast Coho ESU includes all naturally spawned populations of Coho salmon in Oregon coastal streams south of the Columbia River and north of Cape Blanco (Sixes River), Oregon. Along most streams, the proximity of coho salmon to the transmission line right-of-way is not precisely known given limited survey data. Fish passage barriers, both natural (steep gradients and low water flow) and human-made (impassable culverts) exist throughout the transmission line, preventing Coho use in some streams. BPA relied on current and historical fish distribution data from ODFW, ODF, and NMFS, as well as interviews and site visits with staff from these agencies to determine Coho presence in areas with little or no survey data (Aquatic Contracting, 2013a; J. Muck, 2012—2013; C. Claire, 2012-2013; J. Ziller, 2012-2013; K. Reis, 2012-2013; and J. Brandt, 2012-2013).

Designated critical habitat for Oregon Coast Coho consists of the water, substrate, and adjacent riparian zone reaches, including off-channel habitats below longstanding, naturally impassable barriers such as natural waterfalls in existence for at least several hundred years. The primary constituent elements of critical habitat are biological or physical habitat features essential for the conservation of the ESU. The primary constituent elements that may be present in streams crossed by or near the transmission line right-of-way include: freshwater spawning sites that support spawning, incubation, and larval development; freshwater rearing sites that enable juvenile salmon to forage, grow, and develop; and freshwater migration corridors that enable fish to successfully avoid predators and swim upstream to reach spawning areas on limited energy stores.

Oregon chub (*Oregonichthys crameri*)

The Oregon chub is a small minnow found in the Willamette River basin. The species was listed as ***endangered*** under the ESA on October 18, 1993 (October 18, 1993, 58 FR 53800). Because of improvements in the population, the status of the Oregon chub was changed to threatened on April 23, 2010 (50 FR 11010), effective May 24, 2010. Critical habitat was designated on March 10, 2010, and was effective April 9, 2010 (50 FR 11010). Critical habitat for Oregon chub is not intersected by the transmission line right-of-way.

Historically, Oregon chub were distributed throughout lowland areas of the Willamette River drainage in off-channel habitats such as sloughs, ***alcoves***, and overflow ponds. The historical records note collections from the Coast Fork Willamette River, Middle Fork Willamette River and the main stem Willamette River and other drainages (Scheerer, 2002). Chub have been documented within Camas Swale Creek (a tributary to Coast Fork Willamette River crossed by the transmission line) near Goshen, and Oregon chub may also be present in other low gradient tributaries to Camas Creek crossed by the transmission line where suitable habitats with ponding, low flow, silty substrates and a prevalence of aquatic vegetation are found (Aquatic Contracting, 2013b; Bangs pers. comm., 2012; various).

Pacific lamprey (*Entosphenus tridentatus*)

The Pacific lamprey is a federal species of concern and is an ***Oregon state sensitive species***. Pacific lamprey is an ***anadromous*** species with habitat and spawning requirements similar to ***salmonids***. Pacific lamprey is present in many streams crossed by the project.

3.4.2 Environmental consequences—Proposed Action

Transmission line right-of-way

Streams

In general, vegetation removal and soil disturbance from structure replacement work could increase the rates of wind and water erosion, resulting in sediment deposition directly into surface water and increased turbidity. Increased erosion and subsequent runoff could occur where structures are replaced immediately adjacent to streams. Sixty-four (64) structures along the transmission line right-of-way are within 100 feet of streams where erosion and runoff could occur. Runoff of eroded soil that enters streams would continue to impact those streams that are already water quality limited for sedimentation in the Umpqua River and South Umpqua River Subbasins.

Runoff of eroded soils and the subsequent decrease in water quality in streams near these structure sites would depend on the timing of construction, weather conditions, local topography, the erosion potential of soils and the effectiveness of BMPs implemented during construction to minimize soil erosion. Since most of the construction work would be performed in the summer and early fall, rainfall amounts from storms during that period would be expected to be small and would not result in significant erosion of soil. Erosion of soil from excavation in existing structure holes would be expected to be low because any soil that is not used to refill the structure hole would be disposed of in upland areas away from waterbodies, and all disturbed soils would be seeded to facilitate site restoration.

Other than sedimentation from temporary erosion, the Proposed Action would not be expected to contribute to impaired water quality for the parameters identified in Table 3-8; no metals, fecal coliform, fertilizers, temperature loading discharges, and alkaline or acidic liquids would be used as part of the Proposed Action, and the Proposed Action would not affect dissolved oxygen levels or contribute to nitrogen or phosphate. With implementation of erosion control measures described in Table 2-9, the amount of sedimentation potentially entering streams would be low and the Proposed Action would not inhibit any water quality recovery efforts on streams crossed by the transmission line.

Potential impacts to surface water quality resulting from accidental oil or fuel spills into streams from construction equipment used adjacent to streams would be low because the BMPs described in Table 2-9 would be implemented, including setback distances for fueling and staging areas from waterbodies to minimize spills.

Danger tree removal would have a little to no temperature impact on streams with total maximum daily load limits for temperature because the estimated removal of approximately one tree per mile would not reduce stream shading. Danger tree removal would focus on the mature trees and not the understory, thus the ground surface would remain intact and post-removal site runoff would not be expected to be different from existing conditions. Mitigation in the form of riparian tree plantings at selected bridge and culvert replacement sites could eventually increase shading and help to offset any temperature impacts to habitat.

Fish

Fish are impacted by changes to water quality (sedimentation, temperature increases, contaminants, loss of in-stream large wood coverage), loss of food sources, and displacement or direct mortality due to in-water work. Sedimentation can cause gill abrasion in fish and affect their food sources. As described above, the Proposed Action would create low levels of sedimentation, have a low risk of petroleum or fuel spills, and would not affect stream shading. With the implementation of erosion control and spill control measures, construction during the dry season, and replanting of riparian trees, fish habitat impacts would be low for the transmission line work.

In addition, the reduction in availability of large wood to stream systems would be minimal, since very few riparian trees that could fall into streams would require removal. There would be no direct work within streams for structure replacement (see access road analysis below for impacts to fish due to in-water work).

Access roads

Streams

Access road work is expected to result in similar surface water quality impacts as those from structure replacement. Culvert and bridge installation and replacement (Table 3-9) could temporarily disturb bank soils and streamside vegetation, which could result in eroded soils entering streams. Trees and other vegetation would need to be removed around culvert installation and replacement areas.

The amount of fine sediment introduced to streams during road work would be similar to natural erosion processes during the dry season because there is little or no flowing water on road surfaces. Traffic on gravel roads during the wet season has the largest potential to deliver sediment to stream channels. However, structure-replacement projects such as this usually involve about eight vehicle trips per day (four vehicles to and from the transmission line) so the amount of rock fines running off into streams and increasing sedimentation would be low. In addition, the design features described in Table 2-9 would minimize turbidity and sediment runoff into streams from construction activities. Further, erosion rates would likely return to their current levels once vegetation is reestablished. Therefore, impacts to surface water quality from access road work in the Proposed Action would be low.

Fish

Some in-water work would be required for access road construction and repairs, and the associated culvert and bridge replacements. These activities have the potential to result in impacts to fish within streams intersected by the transmission line that provide habitat for Oregon chub, Upper Willamette River Chinook salmon, Oregon coast Coho, cutthroat trout, and other native and non-native fish species. Culvert and bridge replacements and installations on fish-bearing streams within the transmission line right-of-way are summarized in Table 3-9.

Specific potential impacts to any fish species present during access road work including bridge and culvert construction include:

- Soil from access roads, cleared areas, culvert or bridge excavation, or stockpiles might enter streams, increasing sediment loads which could reduce available food for fish and alter habitat necessary for fish reproduction.
- Damage to fish (e.g., gill abrasion, clogging) could occur from construction sediments entering streams.

Table 3-9. Culvert and bridge replacements and installations on fish-bearing streams

Structure ID[1]	Stream name	Potential ESA fish present	In-water work	Fish salvage likely required	Tree removal
T-004-004	Unnamed tributary	Oregon Chub and Chinook salmon	No	No	None
T-005-002	Unnamed tributary	Oregon Chub and Chinook salmon	No	No	None
T-006-001	Unnamed linear excavation agricultural ditch	Oregon Chub and Chinook salmon	No	No	None
C-010-004	Unnamed tributary	Chinook salmon	Yes	Yes	None
B-010-001	Hill Creek	Chinook salmon	Yes	Yes	Yes
C-016-003	Near headwaters of Barrett Creek	N/A (Cutthroat)	Yes	Yes	Yes
C-029-006 (B-029-002)	Unnamed tributary	Oregon coast Coho	Yes	Yes	Yes
B-030-001	Bennet Creek	Oregon coast Coho	Yes	Yes	None
T-030-005	Unnamed Agricultural Ditch	Oregon coast Coho	No	No	None
C-042-001	Unnamed tributary	Oregon coast Coho	Yes	Yes	None
C-048-007 (B-048-001)	Cook Creek	Oregon coast Coho	Yes	Yes	None
C-51-002 / C-51-004	Unnamed tributary	Oregon coast Coho	Yes	No	None
C-057-004	Unnamed tributary	N/A (Cutthroat)	Yes	No	None
C-059-006	Unnamed tributary	N/A (Cutthroat)	Yes	No	Yes
B-065-001	Unnamed tributary	Oregon coast Coho	Yes	Yes	None
C-066-001	Unnamed tributary	Oregon coast Coho	Yes	No	None
C-066-002	Unnamed tributary	Oregon coast Coho	Yes	No	None
C-067-005	Unnamed tributary	Oregon coast Coho	Yes	No	None
C-068-004	Unnamed tributary	Oregon coast Coho	Yes	No	None
C-068-005	Unnamed tributary	Oregon coast Coho	Yes	No	Yes
C-068-008(a)	Unnamed tributary	Oregon coast Coho	Yes	No	Yes
C-069-003/004	Unnamed tributary	Oregon coast Coho	Yes	No	None
Mile 71 Culvert	Unnamed tributary	Oregon coast Coho	Yes	Yes	Yes
C-090-009 (B-090-001)	Unnamed tributary	Oregon coast Coho	Yes	Yes	Yes
C-091-001	Wetland swale	Oregon coast Coho	Yes	No	None
B-094-001	Cherry Creek	Oregon coast Coho	Yes	Yes	Yes
C-098-003	Unnamed tributary	Oregon coast Coho	Yes	Yes	Yes

[1] Structure IDs starting with “T” are temporary bridges, structure IDs starting with “C” are culverts, and structure IDs starting with “B” are bridges.

- Equipment moving across a stream could disturb the substrate and release sediments or result in compaction, disturbing nearby fish and reducing an area's ability to support vegetation after construction.
- Vegetation destruction or removal within or adjacent to streams (e.g., for access road construction, culvert placement or tree removal) could cause a loss of fish habitat, loss of stream shading and a reduction in the existing vegetation's buffer capacity which could reduce available habitat and food sources for fish.
- Individual fish could be disturbed (e.g., killed or displaced from habitat) from equipment operating in or near streams. Fish salvage activities (removing fish from in-water work/construction areas) could also harm or harass fish.
- Petroleum fuel products, hydraulic oil and other hazardous materials typically associated with construction activities could enter a stream, causing fish kills, aquatic invertebrate kills and death or injury to a number of other species that fish depend on for food.

Conducting road work and replacing culverts and bridges in or near fish-bearing streams could result in increased turbidity, erosion, and sedimentation which have the potential to harm fish by disturbing habitat, reducing available food sources, and directly harming fish. However, with the implementation of mitigation measures, including designing new and replacement culverts and bridges using fish passage design criteria from NMFS (NMFS, 2008) and ODFW (ODFW, 2006), conducting work during ODFW in-water work windows, isolating work areas, and conducting fish salvage if necessary, impacts on fish and fish habitat from access road work would be low-to-moderate.

As described in Section 3.3.2, the trees that would be removed for access road work are mostly deciduous trees less than 16 inches in diameter and removal would not create new significant openings in canopy cover. Therefore there would be little potential for stream water temperature increase as a result of vegetation removal.

Beneficial impacts from the Proposed Action include improved fish passage and fish access to additional upstream aquatic habitats, improved channel condition and more natural hydraulic conditions at stream-road crossings, reduced sediment inputs to streams based on improvements to existing access road conditions, and increased access controls (e.g., gates) to minimize unauthorized and off-road vehicle use of BPA access roads which would reduce potential erosion and sediment input to streams.

Environmental consequences from access-rights roads on BLM land

The reconstruction and improvement of approximately 13.6 miles of existing access-rights roads on BLM land would have the same impacts on streams and fish as those for

access roads as discussed above. There would be no reconstruction or improvement on new access-rights roads on BLM land. Four existing culverts on new access-rights roads would be cleaned as part of the Proposed Action (Table 2-3). No sedimentation to streams would be expected from this routine cleaning as the culverts are not connected to the stream network and the outflows empty into a heavily vegetated area.

3.4.3 Environmental consequences—No Action Alternative

Streams

There would be no construction impacts from the No Action Alternative at this time. The number of maintenance activities, and thus the level of impact, could increase as structures deteriorate. Areas where structures are in or adjacent to streams, especially those with no access, have a greater risk of sedimentation from maintenance around these structures. Temporary soil erosion and sedimentation of waterbodies could occur as soils are exposed during repair activities.

Fish

There would be no construction impacts from the No Action Alternative at this time. Undersized and impassable culverts would not be replaced, and bridges would not be constructed or replaced at 22 locations. Therefore, fish would not have improved access to additional upstream habitats and proposed channel improvements at stream-road crossings would not occur. In addition, access roads would not be improved. Reduced sediment delivery to streams based on proposed road and drainage improvements would not occur. Culvert replacements or repairs near stream crossings could result in greater fish mortality and larger habitat impacts, if necessary for emergency access during higher flow conditions or periods when ESA-listed fish species are present. Impacts to fish from the No-Action Alternative would likely be low-to-moderate.

3.5 Wetlands, floodplains, and groundwater

3.5.1 Affected environment

Wetlands and waters

Wetlands are defined as those areas where surface water or groundwater saturates the soils for sufficient duration during the growing season, and at a frequency to support vegetation adapted to saturated soil conditions [Clean Water Act, 40 Code of Federal Regulations (CFR) 230.3(t)]. Wetlands perform a number of functions that are considered valuable to society, including water storage, water filtration, and biologic productivity. Wetlands can support complex food chains that provide valuable sources of nutrients to plants and animals. Wetlands also provide general and specialized habitat for a wide variety of aquatic and terrestrial species. Jurisdictional waters ("waters" in

this section) include rivers, lakes, streams, ponds, ephemeral or intermittent drainages, and some roadside or agricultural ditches that have a connection to downstream jurisdictional waters. Rivers and streams are discussed in more detail in Section 3.4, Streams and fish.

Based on the results of the field investigations, wetland scientists identified 680 jurisdictional wetlands and waters, which included 274 wetlands totaling 215 acres, 281 streams, 104 ditches, and 21 ponds that could be affected by structure replacement and access road construction (PBS, 2013a). All wetlands and waters were assumed to be subject to federal and Oregon State jurisdiction. Assessments of wetland function were conducted in the field using best professional judgment and on representative wetlands from each of the four major watersheds using the Oregon Rapid Wetland Assessment Protocol (ORWAP).

Wetlands and waters along the corridor are associated with topographic depressions, flat valley bottoms, riparian areas, hill slopes, ravines, and drainage swales. Dominant hydrologic sources to these wetlands and waters include direct precipitation and surface and shallow subsurface flow. The wetlands in the Willamette River Valley often have a seasonally perched water table because of heavy clay soils, which can cause ponding in the winter months. This seasonal ponding may be more prevalent due to soil compaction from heavy grazing or farm vehicle traffic. Outside of the major river valleys, most of the wetlands observed were wetlands located on slopes (also referred to as slope wetlands).

Wetlands identified within the transmission line during the field investigation fall into the category of ***palustrine*** wetlands. Palustrine wetlands are non-tidal wetlands that are not associated with lake shores or rivers. They may be dominated by herbaceous vegetation (palustrine emergent), shrubs and low trees (palustrine, scrub-shrub [PSS]), forest (palustrine forested), or open water (palustrine open water). The vast majority of the wetlands within the corridor have been disturbed through grazing, agriculture, and development. Because of this disturbance and because the transmission line right-of-way is maintained free of trees, the majority of the wetlands identified in the project corridor were classified as palustrine emergent, with some PSS.

Common native and non-native herbaceous species found in disturbed palustrine emergent wetlands within the project area include pennyroyal (*Mentha pelugium*), spreading rush (*Juncus patens*), common rush (*Juncus effusus*), straightbeak buttercup (*Ranunculus orthorhynchus*), clovers (*Trifolium spp.*), bluegrass (*Poa spp.*), bentgrass (*Agrostis spp.*), tall fescue (*Schedonorus arundinaceus*), and meadow foxtail (*Alopecurus pratensis*). Reed canarygrass (*Phalaris arundinacea*) is infrequently a dominant in wetlands or parts of wetlands along the transmission line. Himalayan blackberry (*Rubus armeniacus*) and teasel (*Dipsacus fullonum*), both of which are considered noxious weeds in this area, often occur at the transition between wetland and upland.

Some additional natives are also present in these disturbed wetlands. Populations of camas (*Camassia spp*.) are interspersed in the herbaceous wetland community across the transmission line. A variety of native sedge species (*Carex spp.*), as well as woody natives such as Nootka rose (*Rosa nutkana*) and Douglas hawthorn (*Crateagus douglasii*), are also occasionally found in some of these disturbed herbaceous wetlands. Mannagrass (*Glyceria spp.*) is locally dominant in wetter areas with a longer duration of inundation. In the few lightly to moderately grazed/maintained wetlands, a wider variety of native wetland plants were observed including all those previously mentioned, as well as tufted hairgrass (*Deschampsia cespitosa*), slender rush (*Juncus tenuis*), dagger-leaf rush (*Juncus ensifolius*), Bolander's rush (*Juncus bolanderi*), slough sedge (*Carex obnupta*), American sloughgrass (*Beckmannia syzigachne*), broad-leaf cattail (*Typha latifolia*), bur-reed (*Sparganium spp.*), spikerushes (*Eleocharis spp.*), and Oregon avens (*Geum macrophyllum*).

In the less common PSS wetlands and waters, shrub species include several willow species (*Salix spp.*), Nootka rose (*Rosa nutkana*), sapling Oregon ash (*Fraxinus latifolia*), and sapling black cottonwood (*Populus balsamifera var trichocarpa*). Douglas spirea (*Spiraea douglasii*) is occasionally present.

Floodplains

The Federal Emergency Management Agency identifies areas with a one percent chance of being flooded in a given year as 100-year floodplains. The transmission line right-of-way crosses the 100-year floodplains of a number of waterbodies, as shown in Figure 3-5, including Calapooya Creek, Camas Swale Creek, Cherry Creek, East Fork Coquille River, Middle Creek, Umpqua River, and Williams Creek. In the transmission line right-of-way, 43 of the 771 existing structures (6 percent) lie within or on the boundaries of these floodplains. Existing and proposed access roads also lie within the floodplains of these waterbodies.

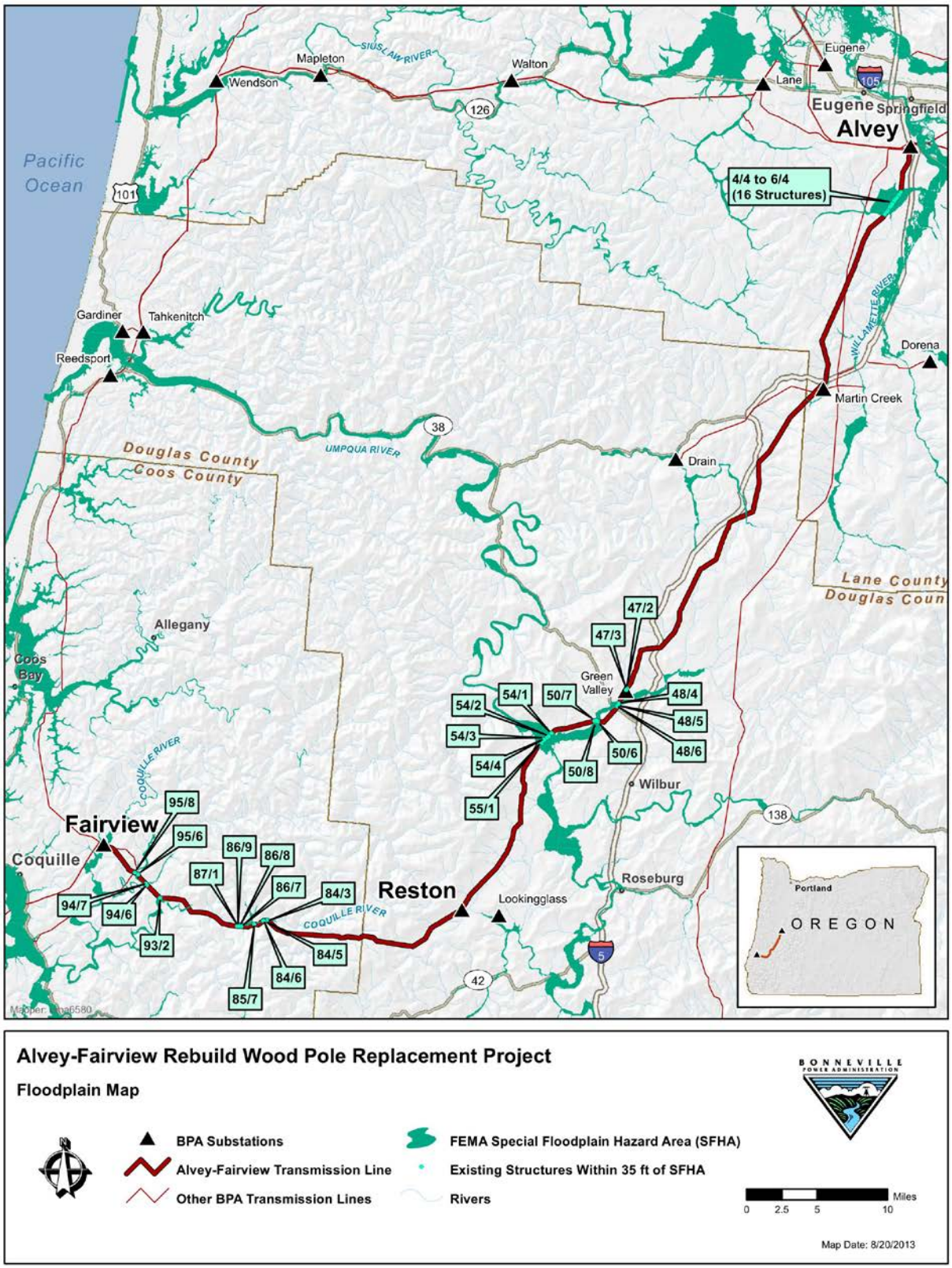

Figure 3-5. Floodplains intersection by the transmission line

Groundwater resources

Groundwater is heavily used as the domestic water supply along the majority of the transmission line. Well logs maintained by the Oregon Water Resources Department note the vicinity of the Alvey Substation in Lane County as having encountered first water at depths between 15 and 46 feet below ground surface with static water levels at depths of less than 20 feet below ground surface (Oregon Water Resources Department, 2012). Near the Reston Substation in Douglas County, well logs show encountering first water at depths between 26 and 46 feet below ground surface with static water levels at approximately 30 feet below ground surface. In Myrtle Point (Coos County) well logs show encountering first water at depths between 12 and 85 feet below ground surface with static water levels at approximately 25 feet below ground surface. There are no groundwater management areas or sole source aquifers along the transmission line.

3.5.2 Environmental consequences—Proposed Action

Transmission line right-of-way

Wetlands and waters

Eighty-eight existing wood pole structures are located within wetlands. Replacement of these structures would result in both temporary and permanent wetland impacts (PBS, 2013b). In most cases, structures would be placed in the same holes from which they were removed. To prepare for installation, each existing hole would be cleaned out and re-augered so that it is approximately five feet in diameter and 10 to 12 feet deep. A 4-foot diameter corrugated metal pipe (i.e., culvert) would be installed upright in the hole extending to the soil surface. The new structure would be placed within the vertical pipe and would be backfilled with crushed rock. The use of culverts surrounding the poles would improve the stability of the pole in soft wetland soils and increase the longevity of the structure and help prevent leaching of PCP into surrounding areas. If structures need to be relocated, wetlands would be avoided if possible. Permanent impacts resulting from removal and replacement of the wood-pole structures would be minimal at approximately 3,555 square feet (0.082 acre) distributed across 54 wetlands in the project area.

See Table 2-9 for proposed wetland mitigation through the use of mitigation banks. Temporary impacts associated with pole replacement would consist of construction access by heavy equipment within a 25-foot radius of the structure, construction of temporary roads, and the installation of guy wire anchors and grounding wires at some structures. Impacts to wetlands would occur as wetland vegetation is crushed and soil is compacted by construction equipment. Temporary impacts from structure replacement would be expected to be less than 2,800 square feet (0.06 acre) per structure for a total

of 3.45 acres of temporary wetland impact and 0.48 acre of temporary impacts to jurisdictional waters for the Proposed Action.

Most of the wetland vegetation that would be disturbed during the structure replacement consists of grasses and forbs in grazed pastures within the maintained right-of-way. In some areas, minor grading and re-contouring could be necessary to re-establish preconstruction contours. All disturbed areas would be reseeded with native grasses and forbs and monitored annually for 3 years, or until sufficient vegetation coverage and soil stabilization is achieved. Monitoring would continue until uniform perennial vegetation (e.g., evenly distributed without large bare areas) provides 70 percent or more of the density of coverage that was provided by vegetation prior to commencing earth-disturbing activities. Most of the wetland areas that would be disturbed are dominated by a mix of native and non-native forbs and grasses common in grazed pastures within the region. Therefore, the goal of the monitoring would be to ensure there is sufficient vegetative cover to prevent erosion, and not to re-establish native vegetation.

Structure replacement would temporarily disrupt wetland function, but functions would return to pre-construction conditions after construction and restoration.

Floodplains

Replacement of the 36 wood-pole structures located within the 100-year floodplain would temporarily disturb 1.6 acres of soils in floodplains during construction, as shown in Table 3-10. In addition, hardware would be replaced on six lattice-steel towers located within the floodplain; however, this would not result in any disturbance to floodplains. Any impacts associated with structure replacement within floodplains would be short-term and would likely not alter the floodplain function for several reasons. Soil compaction and removal of vegetation could increase erosion within the floodplain until new vegetation is established. Soil compaction could interfere with subsurface water flow in the floodplain, and vegetation removal could destroy habitat and hinder the capacity of the floodplain to dissipate water energy during floods. However, the proportion of each floodplain potentially cleared or compacted would be small. In addition, implementation of BMPs would minimize the potential for impacts to floodplains (see Table 2-9). Therefore, because the Proposed Action would have short-term impacts on floodplains from wood-pole structure replacement, the impacts to floodplains would be low.

Table 3-10. Transmission structure work within 100-year floodplain

Floodplain	Segment	Construction activity proposed	Disturbance area (square feet) in 100-year floodplain[1]
Camas Swale Creek	4/4-6/4	Replace 16 wood pole structures	31,400.0
Williams Creek	47/2-47/3	Replace 2 wood pole structures	3,925.0
Calapooya Creek	48/4-48/6	Replace 3 wood pole structures	5,887.5
	50/6-50/8	Replace 3 wood pole structures	5,887.5
	54/1-54/4	Replace hardware on 4 steel lattice towers	Temporary disturbance[2]
Umpqua River	55/1	Replace hardware on 1 steel lattice tower	Temporary disturbance
East Fork Coquille River	84/3	Replace hardware on 1 steel lattice tower	Temporary disturbance
	84/5-84/6	Replace 2 wood pole structures	3,925.0
	85/7	Replace 1 wood pole structure	1,962.5
	86/7-87/1	Replace 4 wood pole structures	7,850.0
	93/2	Replace 1 wood pole structure	1,962.5
Middle Creek	94/6-94/7	Replace 2 wood pole structures	3,925.0
	95/6	Replace 1 wood pole structure	1,962.5
	95/8	Replace 1 wood pole structure	1,962.5
Total		Replace 36 wood pole structures Replace hardware on 6 steel lattice towers	70,650.0 square feet (1.6 acres)

[1] Disturbance area assumes a 25 foot radius (1962.5 square feet) per structure.
[2] Temporary disturbance from construction equipment needed for replacing hardware.

Groundwater resources

Impacts to groundwater would be low. Groundwater flows could be impacted by soil compaction during construction, which would reduce infiltration capacity and increase surface runoff to streams. However, as discussed in Section 3.2, Geology and soils, soil compaction from the Proposed Action would be temporary and occur in a relatively small area.

Impacts on groundwater quality from accidental petroleum spills would also be low because the groundwater levels are deep, and spill containment BMPs would be implemented as described in Table 2-9. Any chemical spills would be of a small volume that could be contained and cleaned up quickly. Any impacts to groundwater quality would be localized, short-term, and likely would not exceed state or federal water quality criteria.

Once constructed, the new structures would have the potential to impact water quality by leaching PCP, a general biocide that is commonly used as a wood preservative treatment for utility poles. However, EPA studies estimate that the level of PCP in waters due to utility poles is a fraction of the levels that create health concerns.

The EPA has assessed the potential for PCP to occur in surface waters and impact drinking water as a result of PCP-treated poles. For adults, the calculated level of concern for acute and chronic dietary risk from PCP in drinking water is 10,465 parts per billion (ppb) of PCP; for children, this level is 2,990 ppb. Using modeling, available environmental fate data, and conservative assumptions, EPA has estimated that environmental concentrations of PCP for surface water due to PCP-treated poles are less than one ppb (EPA, 2008). In wetlands, the underground portion of the structures would be wrapped in a 48-inch corrugated metal pipe that extends to the ground surface to prevent leaching of PCP into surrounding soil. Therefore, the impacts of structure replacement to drinking water would be low.

Access roads

Wetlands and waters

The majority of the wetland and waters impacts associated with the Proposed Action would occur as a result of the improvement and reconstruction of existing access roads and the construction of new permanent access roads. BPA was able to reduce impacts to wetlands and waters associated with access roads through alignment revisions, reductions in the standard width from 14 feet to 12 feet in some locations, and removal of some of the access roads. Table 3-11 shows the proposed breakdown of impacts for the different types of access road work.

Since many of the wetlands are only seasonally wet, construction equipment would be able to gain access to sections of the transmission line right-of-way by driving over the wetland areas in the dry season and, thereby, minimizing impacts. If wet areas persist during the construction season, crane mats or temporary roads constructed of geotextile and rock or hog fuel would be used to cross wet areas and minimize wetland impacts. These mats or temporary roads would be removed following construction. Implementation of other BMPs described in Table 2-9 would reduce and minimize the potential for impacts to wetlands. Temporary construction roads could result in temporary impacts to approximately 88,484 square feet (2.03 acres) of wetlands and 235 square feet (0.005 acre) of ditches, though this number would likely be lower as most work would occur in the dry season.

Impacts from replacement of existing culverts would be mitigated by ensuring hydrologic connectivity and the same footprint of the existing culvert. Except in the case of the culverts designed to improve fish passage, the length of culverts on streams would typically not change.

Table 3-11. Impacts to wetlands and waters from access road activities

Access road activity	Wetlands				Waters			
	Permanent		Temporary		Permanent		Temporary	
	Square feet	Acres	Square feet	Acres	Square feet	Acres	Square feet	Acres
Road construction	72,859	1.673	0	0.000	189	0.004	0	0
Road improvement	15,387	0.353	0	0.000	3,503	0.080	0	0
Road reconstruction	173,614	3.986	0	0.000	3367	0.077	0	0
Culverts, drain dips, bridges, etc.	19,290	0.443	2,887	0.066	20,281	0.466	0	0
Temporary access	0	0	88,484	2.031	0	0	235	0.005
Total for all access road activities[1]	281,150	6.455	91,376	2.098	27,339	0.628	235	0.005

[1] Slight differences in the total for all access road activities are due to rounding.
Source: PBS, 2013b

Impacts to potentially jurisdictional ditches could occur from road reconstruction activities due to the need to widen the road and to stabilize narrow crossings where culverts are not possible. Any potential jurisdictional ditches impacted by the project would be replaced in-kind or with greater conveyance capacity. Hydrologic connections would be maintained to downstream jurisdictional wetlands and waters. Ditch impacts included in this category do not include ditches within wetlands. No ***compensatory mitigation*** is proposed for ditch impacts.

Improvements to existing access roads would result in low impacts to jurisdictional wetlands and waters but since this activity does not expand the roadbed by more than two feet, no mitigation is proposed for this activity.

Reconstruction of existing access roads would result in the greatest impacts to jurisdictional wetlands and waters because of the large number of roads requiring reconstruction. Many of these roads are dirt tracks and fill would be needed where they cross wetlands to make them serviceable.

The largest single wetland impact (0.62 acre) is associated with reconstruction of an existing roadbed within the transmission line right-of-way across a large Willamette Valley wetland near Springfield, Oregon. The subgrade of the existing road would need to be stabilized due to the wet conditions. The impacted wetland is a highly degraded wetland that has been subject to hydrologic modifications and is dominated by noxious weeds. See Table 2-9 for proposed wetland mitigation through the use of mitigation banks.

Floodplains

The construction of new access roads and reconstruction of existing access roads would result in low impacts to floodplains. As listed in Table 3-12, six access road segments would be constructed or reconstructed within the 100-year floodplains of the Camas Swale Creek, Calapooya Creek, East Fork Coquille River, and Middle Creek. These construction activities would result in a total disturbance area of 1.9 acres. Some temporary access road construction would occur within floodplains, but these temporary access roads would be removed and returned to their original contours following construction. Roadway improvements associated with construction and reconstruction activities would result in long-term alteration of the floodplain, but would only minimally decrease flood-storage capacity and would not alter the course of floodwaters. In addition, like the construction activities for the transmission structures, the access road construction activities would result in soil compaction and removal of vegetation, which could increase erosion, interfere with subsurface water flow in the floodplain, and hinder the capacity of the floodplain to dissipate water energy during floods. However, the proportion of each floodplain potentially cleared or compacted would be small. In addition, implementation of BMPs would minimize the potential for impacts to floodplains. Therefore, impacts of the Proposed Action to floodplains would be low-to-moderate.

Table 3-12. Access roads proposed for new construction and reconstruction within the 100-year floodplain

Floodplain	Construction activity proposed	Disturbance area (square feet) in 100-year floodplain[1]
Camas Swale Creek	Construction of approximately 807 feet of road between 6/3 and 6/5	16,145.3
Calapooya Creek	Construction of approximately 637 feet of road from Fort McKay Road to 50/8	12,744.3
	Reconstruction of approximately 295 feet of road from Fort McKay Road to 54/1	5,896.9
East Fork Coquille River	Construction of approximately 1,268 feet of road from Sitkum County Line Road to 85/8	25,350.2
	Reconstruction of approximately 993 feet of road from Myrtle Point-Sitkum Road to 93/2 and to connect to a temporary road that provides access to 93/1	15,881.7
Middle Creek	Reconstruction of approximately 319 feet of road from CBWR to connect to an access road proposed for improvement that provides access to 95/8 through 96/2	6,389.5
Total[2]	Construction of approximately 2,712 feet of road Reconstruction of approximately 1,607 feet of road	82,408 (1.9 acres)

[1] Disturbance area assumes a road width of 14 feet plus 3-foot shoulders on each side, for a total width of 20 feet, except for the reconstruction of the access road from Myrtle Point-Sitkum Road, which has a reduced width of 12 feet plus 2-foot shoulders for a total width of 16 feet because of its location within a wetland.
[2] Slight difference in the total is due to rounding.

Groundwater resources

The impacts to groundwater from access road construction would be expected to be the same as those described above for structure replacement. There would be some compaction of the soils underlying the road surface, which could inhibit infiltration in localized areas. However, the roads would not be paved with an impermeable surface so some infiltration would still occur. Construction-related impacts to groundwater from accidental petroleum spills would be expected to be the same as previously described for structure replacement.

Environmental consequences from access-rights roads on BLM Lands

Wetlands and waters

The reconstruction or improvement of 13.6 miles of existing access-rights roads on BLM land would have no impacts on wetlands and waters. No jurisdictional wetlands or waters were identified along the existing access-rights roads on BLM land. There would be no reconstruction or improvement on new access-rights roads on BLM land.

Floodplains

Improvement of the access road between structures 21/3 and 21/4 would not impact the mapped floodplain because the access road would be improved within the existing road prism which is already disturbed. There would be no reconstruction or improvement on new access-rights roads on BLM land.

Groundwater resources

The reconstruction and improvement of approximately 13.6 miles of existing access-rights roads on BLM land would have the same impacts on groundwater as those for access roads as discussed above. There would be no reconstruction or improvement on new access-rights roads on BLM land.

3.5.3 Environmental consequences—No Action Alternative

Although impacts associated with rebuilding the transmission line would not occur as a consolidated project, it would be expected that over time wood-pole structures would be replaced and roads reconstructed or improved as needed, creating the same impacts as described for the Proposed Action. However, because the work could be needed on an emergency basis during the wet season, or because multiple trips through one or more wetlands or floodplains could be necessary, or due to emergency construction of temporary access roads, impacts to wetland, floodplains, or groundwater could be moderate-to-high.

3.6 Wildlife

3.6.1 Affected environment

Wildlife evaluated in this section includes common wildlife as well as threatened, endangered, candidate, and special-status wildlife species.

Common wildlife

Open pasture areas and some shrub communities in the transmission line provide grazing habitat for black-tailed deer and elk. Wildlife grazing habitat has been degraded in some areas due to the abundance of nonnative plants that reduce or eliminate grazing potential and create barriers to the movement of large mammals. While few forested areas remain within the transmission line right-of-way due to vegetation management activities, some deep canyons remain forested and provide cover and food for grazing animals.

Intact riparian and wetland areas provide habitat for an assortment of wildlife species found in the transmission line, including mountain beaver, muskrat, river otter, mink, a wide variety of birds, and common amphibians. A wide variety of resident bird species and ***neotropical*** migrants frequent riparian areas for nesting and for foraging. Many of the smaller wildlife species use riparian corridors for migration and daily movement. In some farmed areas, at road crossings, and within utility crossings, riparian vegetation has been removed, trimmed, or replaced.

Other wildlife species known to occur in the transmission line include cougar, coyote, raccoon, striped skunk, porcupine, grey fox, brush rabbit, rodents, snakes, western fence lizards, nonnative turtles such as the red-eared slider, and a diverse array of invertebrates. In addition, numerous migratory bird species occur in or around the transmission line.

Certain bird species that could be prone to collisions with power lines are known to occur within the transmission line right-of-way including birds that fly at dawn and dusk low-light conditions such as marbled murrelet. Common wildlife species that have been observed in the vicinity of the transmission line are identified in Appendix A, Table 1, which is compiled from BLM's Geographic Biotic Observations (GeoBOB) database (BLM, 2008b), a database containing observations dating back to the 1800's, and from field observations during multiple site visits (July and November, 2012) (Turnstone, 2012).

Threatened, endangered, candidate, and special-status species

The Oregon Biodiversity Information Center was searched for an area of five miles surrounding the transmission line right-of-way to assess which threatened, endangered, candidate and special-status species occurred in the counties intersecting the transmission line (ORBIC, 2012). Five bat species, three mammals species, 18 bird

species, 12 reptile and amphibian species, and four invertebrate species occur in Coos, Douglas, and Lane counties (Appendix A, Table 2). The results of the search also showed 25 northern spotted owl activity centers, 10 sites occupied by marbled murrelet, and 21 special-status species populations. Field assessments were conducted in 2012 and 2013 to document the presence of suitable habitat for wildlife species, concentrating on ESA-listed species. While in the field, any incidental wildlife observations during daylight hours were recorded.

3.6.2 Environmental consequences—Proposed Action

Transmission line right-of-way

Transmission line reconstruction would cause short-term disturbances to wildlife including construction noise and dust, temporary displacement of wildlife near work areas, human intrusion, physical habitat changes, or harm to individual animals. Permanent impacts would include the modification, loss, and degradation of habitat, and the potential to cause avian collisions with the transmission line.

Common Wildlife

Impacts to common wildlife would be moderate, because habitat modification would be temporary and construction would only occur at each structure location for short durations.

Short-term disturbances, such as construction noise, dust, and human intrusion, could temporarily displace wildlife near work areas. Construction disturbance could impact wildlife species, including black-tailed deer, bald eagles, ***passerine*** bird species, waterfowl, raptors, small rodents, amphibian, and reptile species. Increased noise would result from the use of heavy equipment to remove and install structures and re-string the conductor. Noise from construction activities along the transmission line right-of-way would represent a temporary increase over ambient noise conditions. Impacts from noise would vary depending on the proximity of construction areas to wildlife and the duration of the noise disturbance. Based on similar pole replacement projects, this disturbance would generally last one to two days per structure replacement. However, wildlife would likely avoid construction areas during construction activities.

Nesting raptors are easily disturbed by construction noise, tree removal, and human presence, and they may abandon their nests if the disturbance is severe. Short-term impacts from loss of foraging and ground-nesting habitat around existing structures, due to ground disturbance, would be moderate and may result in injury or death of common wildlife, such as common rodents, ***mustelids***, birds, or amphibians. Species would likely use surrounding non-affected areas, outside the construction area for the Proposed Action, for foraging and ground-nesting activities. A temporary increase in noise during construction could result in moderate impacts on wildlife if noise levels reduce the

foraging effectiveness of adults or cause adults to abandon nest or den sites, thus leading to mortality of their young. Blasting or rip-rap trenching activities, if needed, would be done outside of the breeding season.

Permanent impacts could result if these displaced individuals moved indefinitely to areas of similar habitat nearby, resulting in increased competition for limited resources in the new habitat. However, because noise and activity would be temporary, wildlife would be expected to return after construction is complete and impacts would be moderate.

Of the estimated 100 danger trees that could be removed along the transmission line right-of-way, very few would be removed in riparian areas. Wildlife could be temporarily displaced by the removal of danger trees. Because of the dispersed and small scale of danger tree removal the impacts of danger tree removal on wildlife would be moderate.

Replacement of the transmission line structures could slightly increase the risk of avian-line collisions, although no avian collisions are documented within the existing transmission line right-of-way. Birds could collide with conductors, guy wires, and structures. Most replacement structures would be five to 15 feet taller than existing structures, but some replacement structures would be up to 30 feet taller than existing structures. The increased structure height could temporarily increase the risk of birds colliding with the transmission line, especially for resident birds who are accustomed to existing structure heights. The potential for avian collisions would be minimized by the installation of bird diverters on the conductor in areas that represent a significant hazard to birds (e.g., river or wetland crossings) and where placement is technically feasible. Bird diverters make conductors more visible to birds so they have time to avoid them. Other wildlife species would likely not be impacted by the presence of the transmission line because it does not present barriers to migration, create excessive noise, or otherwise cause major behavior changes.

Degradation of wildlife habitat could occur if noxious weeds establish themselves in the areas disturbed by construction activities. Nonnative plants provide poor forage for grazing animals, and thickets of gorse or other weed species can impede wildlife movement. Much of the transmission line right-of-way is already occupied by nonnative species. Some replanting with native vegetation would occur as part of the Proposed Action through reseeding and post-project weed treatments. Because weed control activities would be conducted as described in Table 2-9, degradation of habitat below existing conditions would not be expected. Therefore, impacts on wildlife habitat from degradation of habitat due to weeds would be low with implementation of appropriate weed control measures and environmental design features shown in Table 2-9.

Threatened, endangered, candidate, and special-status species

The impacts to threatened, endangered, candidate, and special-status species would be low for all species except for marbled murrelet (Appendix A, Table 3).

As required by Section 7 of the ESA, BPA prepared a BA for potential effects of the Proposed Action on northern spotted owl, marbled murrelet and Fender's blue butterfly to initiate consultation with USFWS (Turnstone, 2013). The Proposed Action's impacts to northern spotted owl and Fender's blue butterfly would be low. The Proposed Action's impacts to marbled murrelet would be moderate. Specific impacts of the Proposed Action to northern spotted owl, marbled murrelet, and Fender's blue butterfly are described below.

Northern Spotted Owl

During the breeding period, nesting northern spotted owl and their young are generally limited to the immediate vicinity of the nest. Noise and activity from construction activities within 35 yards of a nest is generally considered to cause disruption to nesting during the critical breeding period, March 1 to July 7 (USFWS, 2003; Turnstone, 2013). The Proposed Action would likely cause no disruption to nesting because there would be no construction within 35 yards of a known nest during the critical breeding period (Turnstone, 2013).

The USFWS has suggested that continuous loud activities within 0.25 miles of a northern spotted owl ***activity center*** would be enough to disturb natural bird behavior (USFWS, 2003). This includes noises associated with heavy equipment activities and chain saw use. There are three known or estimated northern spotted owl nests within 0.25 miles of the Alvey-Fairview transmission line. There would likely be a low impact to northern spotted owl behavior near the nest sites because BPA would apply seasonal restrictions on construction during the critical breeding period (March 1—July 7). Furthermore, the effects from increased construction noise and activity would be temporary.

Federal guidelines suggest a minimum of 60 percent canopy cover in a northern spotted owl home range (USFWS, 2011a). A home range is defined as 1.5 miles from an activity center in the Oregon Coast Range, and 1.2 miles from an activity center in the Willamette Valley Province. Danger tree removal could occur within northern spotted owl habitat; however, the removal would not affect the function of nesting, roosting, foraging, or dispersal habitats because canopy cover would remain above the 60 percent threshold (USFWS, 2011a).

Danger tree removal could occur along previously disturbed areas such as utility corridors or road alignments; therefore, the Proposed Action would not create newly disturbed areas. The Proposed Action would likely have a low impact on spotted owl

critical habitat because only 13 trees (estimated at 0.13 acre) would be removed or modified.

With the implementation of mitigation measures as agreed upon with USFWS in the BA, the Proposed Action's impacts on northern spotted owl would be low (Turnstone, 2013).

Marbled Murrelet

The disruption distance from marbled murrelet nests is 100 yards; the disturbance distance is 0.25 miles (USFWS, 2003). No construction work, such as heavy equipment activities or chainsaw use, would occur within the disruption distance of any suitable marbled murrelet nesting habitat during the critical breeding period (April 1 to August 5). Structure replacement, re-stringing of conductor using a bucket truck, and danger tree removal would occur during the breeding season within the disturbance distance (0.25 mile) of ten of the suitable marbled murrelet nesting habitat areas. However, this work would be temporary and would not occur within the disruption distance (100 yards). Furthermore, BPA would restrict construction activities as described in Table 2-9. Therefore, there would likely be moderate impacts to marbled murrelet, such as disruption of natural marbled murrelet behavior and temporary nest abandonment leaving eggs or nestlings vulnerable to predation.

No trees that provide nesting structure would be removed. Furthermore, the Proposed Action could remove or modify only six danger trees within designated critical habitat (USFWS, 2011b). Therefore, the impacts to marbled murrelet would be low as nesting and foraging habitat would remain.

Fender's blue butterfly

Fender's blue butterfly can be affected by the disturbance or removal of larval host plants, direct harm to larvae or eggs on host plants, harm to adults feeding or breeding, and degradation of habitat through invasion of noxious weeds.

Surveys of the transmission line right-of-way found no larval host plants, and there are no documented sites in or adjacent to the transmission line right-of-way (ORBIC, 2012; BLM, 2008b). Therefore, the Proposed Action would likely not affect butterfly larvae or eggs.

The Fender's blue butterfly spends only a few weeks in the adult stage and during this time the adults may feed within the transmission line right-of-way. The adults would likely move away from construction activities. Furthermore, BPA would restrict all ground-disturbing work in the first two line miles during the adult flight season (April 15 to July 7) (Table 2-9); therefore, no impacts to adult Fender's blue butterflies would be anticipated from the Proposed Action.

Disturbance of native vegetation during construction of the Proposed Action could increase the possibility of invasion of the habitat by nonnative plants. Nonnative species can out-compete native plants and could decrease the ability of larval host plants to reestablish residence in that location. The mitigation measures described in Table 2-9, including replanting with nectar species, would minimize the likelihood of habitat degradation. The impacts to Fender's blue butterfly would be low.

Access roads

Common wildlife

On access roads requiring travel but no road work, noise and activity levels during project activities could increase slightly compared to existing conditions. Short-term disturbances, such as construction noise, dust, and human intrusion, could temporarily displace wildlife near work areas. Construction disturbance could impact wildlife species, including black-tailed deer, bald eagles, passerine bird species, waterfowl, raptors, small rodents, amphibian, and reptile species. Increased noise would result from the use of heavy equipment to conduct access road work.

Improvements to access roads would modify wildlife habitat for resident and migratory wildlife, due to a temporary loss of vegetation. The area that would be lost would be relatively small compared to existing wildlife habitat. One hundred and eighty trees would be removed along the access road system due to centerline adjustments, road widening, and hazard trees.

Construction of less than eight miles of new roads is proposed. Where possible, access roads would be located in areas that have been previously disturbed, specifically avoiding further impact to the forest and riparian communities adjacent to the transmission line right-of-way. This minimal loss of habitat is not expected to adversely affect the viability or survival of any species at the population level. Therefore, ***direct impacts*** from loss of habitat would be low-to-moderate.

Threatened, endangered, candidate, and special-status species

Northern Spotted Owl

There would likely be no to low impacts to nesting northern spotted owls from access road work within the disruption distance (35 yards) or the disturbance distance (0.25 mile) of the three known spotted owl activity centers because BPA would apply seasonal restrictions to access road construction during the critical breeding period (March 1—July 7). Furthermore, the effects from increased noise and activity levels during project activities would be temporary.

The removal of trees for access road work would occur within suitable northern spotted owl habitat; however, the scale of tree removal, on average two trees per mile, would

likely maintain the function of nesting, roosting, foraging, or dispersal habitats because canopy cover would remain above the 60 percent threshold described previously (USFWS, 2011). Additionally, all tree removal for road work is located along existing access roads which are previously disturbed edge areas; therefore, new edge areas would not be created and there would be minimal loss of interior forest.

Overall, there would be a low impact on northern spotted owl designated critical habitat from access roads.

Marbled Murrelet

No access road improvements would occur within the disruption distance (100 yards) of any suitable marbled murrelet nesting habitat during the critical breeding period (April 1 to August 5). Limited access road work would occur within the disturbance distance (0.25 mile) of ten of the suitable nesting sites. Therefore, there would likely be moderate impacts to marbled murrelet, such as disruption of natural marbled murrelet behavior and temporary nest abandonment leaving eggs or nestlings vulnerable to predation.

Tree removal or modification for access road work would not occur within any suitable marbled murrelet nesting habitat.

Fender's Blue Butterfly

Access road construction would not disturb Fender's blue butterfly larval host plants, but it could harm individual butterflies or degrade feeding habitat by introducing noxious weeds. Mitigation measures described in Table 2-9 would minimize any temporary displacement of individuals due to ground disturbance activity during access road work, and would minimize the potential spread of noxious weeds.

Environmental consequences from access-rights roads on BLM land

The reconstruction and improvement of approximately 13.6 miles access-rights roads on BLM land would have a low effect on wildlife and wildlife habitat as the roadways are previously-disturbed areas. Impacts of existing access-rights roads on BLM land are the same as those for access roads as discussed above. There would be no reconstruction or improvement on new access-rights roads on BLM land. Since no vegetation is proposed to be removed adjacent to the new access-rights roads across BLM land, there would be no effect to special-status animal species.

3.6.3 Environmental consequences—No Action Alternative

There would be no structure replacement or access road work at this time. Impacts to wildlife resulting from the No Action Alternative would include disturbance activities associated with the increasing need for line and road repairs. Emergency repairs could

occur in areas or during times of year where impacts to nesting bird species could occur, resulting in low-to-moderate impacts to wildlife.

3.7 Cultural resources

The Proposed Action is subject to Section 106 of the National Historic Preservation Act of 1966 (NHPA), which requires federal agencies to take into account the effects their projects may have on historic properties (cultural resources that are eligible for, or on, the National Register of Historic Places [NRHP]).

Cultural resources include things and places that demonstrate evidence of human occupation or activity related to American history, architecture, anthropology, archaeology, engineering, and culture. Historic properties, a subset of cultural resources, consist of any district, site, building, structure, artifact, ruin, object, work of art, or natural feature important in human history at the national, state, or local level that meets eligibility criteria for the NRHP. Historic properties include prehistoric resources that pre-date European settlement. Cultural resources are evaluated for eligibility to the NRHP using four criteria commonly known as Criterion A, B, C, and D as identified in 36 CFR 60.4 (a—d). These criteria include an examination of the cultural resource's age, integrity, and significance in American culture, among other things. A cultural resource must meet at least one criterion to be eligible for listing.

Cultural resources investigations took place in two phases (Phase 1 and Phase 2). This methodology was designed in consultation with BLM archaeologists and the Oregon State Historic Preservation Office (SHPO). Phase 1 of the investigations included identification and evaluation of above-ground resources and a pedestrian archaeological survey of the transmission line right-of-way to identify surface sites and high probability areas (HPAs) in the Area of Potential Effects (APE; defined in 36 CFR 800.16(d)) where a subsurface survey should be conducted to determine whether buried archaeological resources are present (HRA, 2013). Phase 2 consisted of subsurface investigations (shovel probes) of HPAs where project-related disturbances would occur, as well as a pedestrian and subsurface survey of access roads.

3.7.1 Affected environment

The APE for the Proposed Action measures 2,249 acres and consists of the transmission line right-of-way and access road system. The APE traverses privately owned lands, BPA lands, two city (Creswell) parcels, one Douglas County tract, one small state parcel, and lands governed by the BLM Eugene, Roseburg, and Coos Bay districts.

Archaeological resources

The earliest investigations in the vicinity of the APE began in the late 1970s. The surveys were prompted by timber sales and Interstate 5 roadwork. Research at the Oregon

SHPO and BLM District offices indicate that there are 42 previously recorded archaeological sites within one mile of the transmission line.

Four of the sites previously recorded in past investigations, none of which have been evaluated for the NRHP, are within the APE. Four additional sites were identified during pedestrian surveys or subsurface investigations for this project. The eight sites identified within the APE are shown in Table 3-13. Additional isolated finds within the APE consist of cryptocrystalline silicate (CCS) and ***obsidian debitage***.

Historic/architectural resources

The transmission line and its three associated substations (Alvey, Reston, and Fairview), and a railroad, are within the APE:

- Constructed by BPA in 1957, the transmission line has been continuously operated by BPA and maintains its original function related to the transmission of electricity. The transmission line is recommended eligible to the NRHP as a contributing segment to the Multiple Property Documentation of the BPA Transmission System. The transmission line is recommended eligible under Criterion A, for association with themes of commerce, engineering, industry, military/defense, and government. The construction dates fall within the second period of significance for the BPA Transmission System, which is defined as System Expansion, 1946-1974.
- The Alvey Substation is recommended eligible to the NRHP as part of a larger multiple property documentation of the BPA Transmission System. The Alvey Substation lies within the second period of significance for the BPA Transmission System, the System Expansion period (1946-1974). The Alvey Substation retains integrity of materials, design, workmanship, feeling, association, location, and setting.
- The Reston Substation, like the Alvey Substation, is an integral component of the BPA Transmission system. Built in 1957, the Reston Substation features an assortment of temporary and modular buildings of varying ages. This has led to only fair integrity of materials, design, workmanship, feeling, association, and setting. However, the Reston Substation is recommended eligible to the NRHP as part of a larger multiple property documentation of the BPA Transmission System under Criterion A, for association with themes of commerce, engineering, industry, military/defense, and government. The Reston Substation lies within the second period of significance for the BPA Transmission System, the System Expansion period (1946-1974). The six buildings, specifically the two that appear to be of a historic age mentioned above, may also be eligible as contributing resources to the substation;

however, additional research would be required to determine their exact age and function at the site.

Table 3-13. Cultural resource sites within the APE

Site ID	Description
Site 35LA1156	Pre-contact ***lithic scatter*** site located on private property. During survey of the right-of-way, archaeologists did not observe any cultural materials or other evidence of the site on the ground surface. However, the area was covered in pasture grass, and surface visibility was greatly limited at the time of the survey. This site is not within the area where project-related disturbances would occur so no subsurface investigations were conducted.
Site 35LA1157	Pre-contact lithic scatter site located on private property. Archaeologists did not find any evidence of the site during their visit. The site area was found to be disturbed by clearing, road and fence construction, and residential landscaping. *Subsurface investigation results: no materials observed.*
Site 35LA1328	A historic logging camp site located on private property. Archaeologists did not observe any definitively historic cultural materials on the ground surface within the transmission line right-of-way. They did, however, note a great deal of disturbance in the area of this site, including rutting, bulldozing and debris piling. Several pieces of logging equipment and pick-up trucks were parked off of the access road. *Subsurface investigation results: no materials observed.*
Site 35CS202	A prehistoric camp located on private property. No evidence of the site was identified during the survey. Surface visibility was poor and no cultural material was observed. *Subsurface investigation results: no materials observed.*
Site 1907-201	A pre-contact lithic scatter site located on private property. Lithic cultural materials were observed in surface exposures and ruts within the field and along the fence that cuts across the northeast portion of the site. The site has been disturbed by plowing, ditch construction, fence building, and the installation of a transmission structure. The bulk of the disturbance has occurred in the northeast portion of the site. *Subsurface investigation results: CCS debitage.*
Site 1907-202	A pre-contact lithic scatter site located on private property. The cultural materials were observed within a wheat field immediately south of a structure. The wheat was newly sprouted and surface visibility was excellent. The site has a high potential for buried deposits as its alluvial setting has likely been flooded repeatedly, covering cultural remains with each occurrence. The site has been disturbed by plowing, fence and dirt road building, and the construction of a structure. *Subsurface investigation results: CCS debitage.*
Site 1907-101	A prehistoric lithic scatter site located on private property. The site is currently being used as a pasture. Surface visibility was very poor, and no artifacts were observed on the ground surface. *Subsurface investigation results: CCS and obsidian debitage.*
Site 1907-301	A prehistoric lithic scatter site located on private property. The site is currently used as a pasture and has been disturbed by erosion and livestock activity. No artifacts were observed on the ground surface. *Subsurface investigation results: CCS, obsidian, and basalt debitage.*

- The Fairview Substation, like the Alvey Substation, is an integral component of the BPA Transmission system. Built in 1957, the Fairview Substation features three historic-era buildings that speak to the various needs and functions of the property, with a few modern buildings on the property. The

modern buildings are temporary, modular storage units that have been located well away from the historic-era resources. The Fairview Substation is recommended eligible to the NRHP as part of the MPD. The Fairview Substation lies within the second period of significance for the BPA Transmission System, the System Expansion period (1946-1974). The substation retains integrity of materials, design, workmanship, feeling, association, setting and location.

- The APE crosses the current alignment of the Union Pacific Railroad's Southern Pacific Railroad line in two places: near Martin Creek south of Cottage Grove and near Cabin Creek. The railroad is currently in use, and has modern rails and ties. The alignment appears to be the historic alignment of the Oregon California Railroad (O&C), later renamed SPRR. The alignment of the O&C/SPRR represents one of the first railroads in Oregon. Though a complete evaluation of the former O&C/SPRR alignment was outside the scope of this study, the alignment may be eligible for the NRHP under Criterion A, for significant contributions to the broad patterns of history. Within the APE, the rail line has been modified over time to enable modern rail traffic, including new ties and rails. This has altered the integrity of materials, though integrity of design, workmanship, feeling, association, setting, and location appear to be intact.

3.7.2 Environmental consequences—Proposed Action

Transmission line right-of-way

Archaeological resources

The potential impacts of the Proposed Action are discussed in descriptive terms, but without the relative ratings of high, moderate, or low. In addition, any potential effects on currently undiscovered sites would be mitigated pursuant to the mitigation procedures set out in Table 2-9. An adverse effect to cultural resources is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association (36 CFR 800.5(a)(1)).

Impacts to cultural resources from the Proposed Action could result from physical ground disturbances caused by material and equipment staging; replacement of structures; access road upgrades; and vehicle and heavy equipment access to and from work areas. None of the archaeological sites have been evaluated for the NRHP. Three of the sites (35LA1156, 35LL57, 35CS202) would not be disturbed by the project, while the remaining five sites could be affected by structure and hardware replacement activities

and/or access road construction or improvements. New structures would be placed in the hole from which the existing structures would be removed, to the extent possible, and only a small amount of augering would be required. There is the potential that these activities could impact undiscovered cultural resources, if any exist. BPA would coordinate with the SHPO and tribes if any previously undiscovered cultural resources are discovered during construction.

Structure and hardware replacement construction activities would result in ground disturbance at Site 1907-201 (located in line mile 7) and Site 1907-202 (located in line mile 54). At Site 1907-201, subsurface materials could be disturbed during replacement of the structure poles, and surface materials could be disturbed by tracked vehicle activity. Archaeological deposits could also be disturbed during road construction activities at Site 1907-201 (see below for more information). At Site 1907-202, surface materials could be disturbed by tracked vehicle activity.

The potential impact on cultural resources due to tree removal would be expected to be low because there would be no tree removal in areas of known sites and only surface disturbance would occur. However, these activities could disturb undiscovered cultural resources, if any exist.

Historic/architectural resources

The Proposed Action would not alter the original design character or essential function of the transmission line, and all structure designs would remain as built in basic type and materials. Therefore, the Proposed Action would not alter the integrity of materials, design, or workmanship of the transmission line and would likely have no adverse effect on the transmission line, Alvey Substation, Reston Substation, or Fairview Substation.

The alignment of the Oregon & California/Southern Pacific Railroad may be eligible for listing on the NRHP; however, evaluation of the resource was outside the scope of this study. The railroad would not be directly altered in any way, and regardless of the railroad's eligibility to the NRHP, the Proposed Action would not alter any of the aspects of integrity that would qualify the resource for eligibility (i.e., materials, design, workmanship, feeling, association, setting, or location). Therefore the Proposed Action would likely have no adverse effect on the resource.

Access roads

Access road construction could disturb four sites: Site 35LA1328, Site 1907-101, Site 1907-201, and Site 1907-301. For these construction activities, the main impact on cultural resources would be disturbance of artifacts on or near the ground surface. Road improvements would occur to the access road running along the edge of 35LA1328. Surface and near surface artifacts would likely be disturbed during road construction activities at Site 1907-201. A direction of travel in line mile 91 would cut through Site

1907-101, and a new road would be built through Site 1907-301. Tree removal would occur along the access roads as part of the Proposed Action. The potential impact on cultural resources would be expected to be low because only surface disturbance would occur. Again, there is the potential that these activities could impact undiscovered cultural resources, if any exist, but these impacts would be minimized as described in Table 2-9.

Environmental consequences from access-rights roads on BLM land

The reconstruction and improvement of approximately 13.6 miles existing access-rights roads on BLM land would have no effect on cultural resources as the roadways are previously-disturbed areas. There would be no reconstruction or improvement on new access-rights roads on BLM land.

3.7.3 Environmental consequences—No Action Alternative

Under the No Action Alternative, no construction impacts would occur to cultural resources from the Proposed Action. Impacts to cultural resources from ongoing operation and maintenance could include alterations to the existing transmission line and emergency repairs. Emergency maintenance actions, including repairs, could occur in areas or during times of year where impacts to cultural resources may occur, if any are present.

3.8 Visual quality

3.8.1 Affected environment

The transmission line traverses three Oregon regions starting in the southern portion of the Willamette Valley, crossing a small section of Southern Oregon through the Oregon Coast Range, and ending in the eastern portion of the Coast Region. The transmission line is situated in two general visual environments: rural, pastoral areas and forested areas.

In the first visual environment the transmission line, which generally consists of two-pole suspension structures and access roads, spans a broad, mostly flat (with some rolling topography and interspersed hills), rural, pastoral landscape. Sections of the transmission line right-of-way are visible from occasional residences in the ***foreground*** and ***middle ground***.[1] Adjacent to the transmission line large, open, level pastures are mixed with areas of dense clusters of mature trees (leaf-bearing and non-leaf-bearing). In the rural, pastoral visual environment there are no substantial hills or topographic features. The sky and weather systems are visible above. The transmission line right-of-way is within BPA's easement, which results in the transmission line right-of-way and

[1] Distance definitions include: foreground (within 0.25 to 0.5 mile of the viewer), middle ground (within 0.5 to 5 miles from the viewer), and background (more than 5 miles from the viewer).

structures, when they are visible, being a linear element that extends some distance from the viewer. Existing access roads also are a linear feature against the landscape. Figure 3-6 shows photographs of some of the representative viewpoints in the rural, pastoral areas along the transmission line.

In the open, pastoral areas when viewers are more than approximately 0.5 mile from the transmission line (when the transmission line is beyond the foreground of their ***view*** and within the middle ground) the transmission line and the transmission structures are barely visible, or not visible at all, because of their narrow and slender profile. As shown in Figure 3-6, Viewpoint 2, in areas of the rural, pastoral visual environment where there are dense clusters of trees, and where vegetation has been removed from the transmission right-of-way, the transmission line right-of-way is visible in the middle ground; but the slender profile transmission structures continue to be barely visible. At more than 5 miles, when the transmission line and the transmission structures are in the ***background***, they are not visible because they are either screened by vegetation or they blend into the horizon. In a few short segments of this visual environment, the transmission line has lattice-steel towers. While these structures have greater visibility in the foreground and middle ground of a view, they, too, are barely visible at more than 5 miles in the background of a view. There is very minimal light and glare associated with the existing transmission line because it is generally only associated with lighting at the power substations.

View 1: View from Camas Swale Road, looking southwest.

View 2: View from Lynx Hollow Road, looking northeast.

View 3: View from Elkhead Road, looking northeast.

View 4: View from Metz Hill Road, looking southwest.

View 5: View from Tyee Road, looking southwest.

View 6: View of Fairview Substation, looking west from Fairview McKinley Road.

Figure 3-6. Representative viewpoints of the transmission line in rural, pastoral areas

View 7: View from Reston Road, looking west.

View 8: View from CBWR near Iverson County Memorial Park, looking west.

View 9: View of Iverson Memorial Park, looking north.

View 10: View from CBWR just north of Dave Busenbark County Park, looking east.

View 11: View of Frona County Park south of the transmission line right-of-way, looking east.

View 12: View from access road west and north of Frona County Park, looking east.

Figure 3-7. Representative viewpoints of the transmission line in the forested areas

The second visual environment generally begins at the Reston Substation where the transmission line right-of-way begins to travel west through the Oregon Coast Range. In this visual environment the topography is much more rugged and the vegetation primarily consists of dense stands of mature evergreen trees. The Alvey-Fairview transmission line, which consists of wood-pole structures, parallels the Reston-Fairview transmission line, which is comprised of lattice-steel towers, in a wider right-of-way of 250 feet. There is minimal light and glare associated with the existing transmission line. Figure 3-7 shows photographs of some of the representative viewpoints in the forested visual environment along the transmission line.

The forested visual environment is very sparsely populated and mostly unpaved roads provide access to portions of the transmission line right-of-way. In addition, the rugged topography and the dense stands of evergreen trees obscure the transmission line right-of-way for most of this segment. Because of this, the transmission line and structures are rarely visible even when they are within the foreground (0.25 to 0.5 mile) or middle ground (0.5 to 5 mile) of a view. For the short sections where the transmission line and structures are visible, it is visually prominent because it contrasts to the forested landscape and because it is located within a wider right-of-way and parallel to the Reston-Fairview transmission line's lattice-steel towers. Access roads in this visual environment wind through forested areas adjacent to or within the transmission line right-of-way. An existing gravel access road is shown in Figure 3-7, View 12.

Viewers and visually sensitive locations

Viewers along the transmission line include residents, park visitors, farm employees, motorists, bicyclists, and pedestrians. A viewer's activity typically influences sensitivity to the visual environment and visual change. For example, residential viewers and visitors to parks typically have stationary, longer duration views, and viewing nearby scenery is often an important activity to these viewers. Motorists are typically moving adjacent to the transmission line at relatively high speeds and have shorter duration views. Drivers are likely focused on driving, while passengers may be viewing scenery. Alternatively, bicyclists and pedestrians are moving at low-to-moderate speeds and have medium-duration views so part of their activity likely involves viewing scenery.

There are a greater number of residents (sensitive viewers) and residences (sensitive locations) in the rural, pastoral visual environment. There are three county parks (sensitive locations) adjacent to the transmission line right-of-way in the forested visual environment: Iverson Memorial Park and Dave Busenbark Park in Douglas County, and Frona County Park in Coos County. Iverson Memorial Park includes a short access loop road to a picnic area and a trail where park visitors (sensitive viewers) would visit the park. The transmission line is located south of Iverson Memorial Park and is not visible. Dave Busenbark Park is located slightly west of Iverson Memorial Park.

The transmission line is located along the north side of Dave Busenbark Park, which is currently undeveloped. While the transmission line and structures may be visible from portions of Dave Busenbark Park, because it is currently undeveloped, most park visitors (sensitive viewers) would not be expected to visit for an extended period of time.

Frona County Park has developed facilities including play structures and campsites where park visitors (sensitive viewers) would be expected to visit for extended periods of time. The transmission line structures are not visible from Frona County Park, as a dense stand of tall evergreen trees is located along the park's north side which blocks views of the transmission line right-of-way.

3.8.2 Environmental consequences—Proposed Action

Transmission line right-of-way

During construction, there would be temporary, short-term impacts to visual quality in both visual environments (rural, pastoral and forested), but overall these impacts would be low because the change in views would be of short duration and there would be a small number of sensitive viewers that would see the construction activities. Construction activities would be visible from visually sensitive locations (residences and parks), but these impacts would be localized at structures and short-term.

Impacts to visual quality would be associated with the presence of workers and equipment (e.g., boom cranes, backhoes, augers, and bucket trucks), material stockpiles, debris, signage, staging areas, and the removal and insertion of poles. These construction activities, and the linear, opaque, and solid forms associated with equipment and stockpiles, would be a change from the existing visual environment. Dust disturbed during construction could encroach upon views. Light and glare emanating from construction sites also could encroach upon adjacent areas. The movement of large construction vehicles could add visually distracting elements to views within both visual environments. Work platforms and machines would add linear and geometric shapes to views. Potential traffic congestion associated with work areas would also intermittently intrude upon views for short periods. Construction staging areas and equipment and material stockpiles would be removed after construction.

In some locations along the transmission line the proposed structure heights would be increased by approximately five to ten feet to provide better conductor clearance. This change in height would not be expected to be noticeable in the foreground of a view, and would be barely perceptible within the middle ground of a view.

The estimated 100 trees that could be removed along the transmission line right-of-way would not create a noticeable visual change because the tree removal would be

dispersed across the 97.5-mile transmission line and not concentrated in any one viewshed.

Upon completion of the project, the permanent construction impacts on the visual quality of both the rural, pastoral and the forested visual environment would be low. In both environments the transmission line would be visually similar to the character and dominance of the existing transmission line as a linear visual element through the landscape. Also, in both the rural, pastoral and forested visual environments the transmission line right-of-way would continue to be visible in the foreground or middle ground of the view for a small number of sensitive viewers (residents or park visitors). In the forested visual environment, because of the limited accessibility of the transmission line right-of-way, the topography, and the dense stands of evergreen trees in this area, the transmission line is not always visible.

Access roads

The visual impact of improving or reconstructing access roads would be low, because in most of these situations the road corridor already exists, and the Proposed Action would involve grading, gravelling, and minor vegetation removal within that existing corridor. Furthermore, viewers would be few because the access roads would be gated. In a few locations, new access roads would be constructed. In these cases, some mature vegetation would be removed to establish a road corridor, which would have a permanent and moderate impact on the landscape.

The visual impacts of tree removal along the access roads would be low since the trees would be removed over the entire 160.2 miles of access roads (less than 2 trees per mile). Roughly 84 percent of these trees are 16 inches in dbh (measured at 4.5 feet from the ground) or smaller. The dispersed removal of these smaller trees would not substantially change the existing visual environment.

Environmental consequences from access-rights roads on BLM land

The reconstruction and improvement of approximately 13.6 miles of existing access-rights roads on BLM land would have the same impacts to visual quality as those for access roads as discussed above. There would be no reconstruction or improvement on new access-rights roads on BLM land.

3.8.3 Environmental consequences—No Action Alternative

Under the No Action Alternative, there would be no change in the visual impacts of the transmission line at this time. Emergency repairs would likely have similar construction impacts as those described above under the short-term and permanent construction impacts.

3.9 Socioeconomics and public services

3.9.1 Affected environment

Population and community character

The transmission line runs through the unincorporated portions of Lane, Douglas, and Coos counties, where residences are spread out on large agricultural and forested parcels. There are a handful of businesses and parks, described in Section 3.1, Land use and recreation, near the transmission line that could serve as informal gathering locations. A small portion of the transmission line crosses through the city limits of Sutherlin (population 7,810 in 2010), but this land is currently undeveloped. The southern end of the line right-of-way terminates at the Fairview Substation near a small concentration of residences and businesses that are part of the unincorporated rural center of Fairview. As shown in Table 3-14, the populations of all three counties have grown since 2000.

Table 3-14. Population in Lane County, Douglas County, Coos County, and Oregon

Geographic area	Population 2000	Population 2010	Population growth rate 2000–2010
Lane County	322,959	351,715	8.9%
Douglas County	100,399	107,667	7.2%
Coos County	62,779	63,043	0.4%
Oregon	3,421,399	3,831,074	12.0%

Source: U.S. Census Bureau, 2000; U.S. Census Bureau, 2010b.

Economy, employment and income

The largest employment sectors in Lane, Douglas, and Coos counties are trade, transportation and utilities, local government and educational and health services. All three counties have seen a small decrease in non-farm employment from 2010 to 2011. Unemployment rates for the three counties in December 2011 were: 8.7 percent for Lane County, 12.2 percent for Douglas County, and 10.7 percent for Coos County, compared to 8.9 percent for the State of Oregon as a whole (Oregon Employment Department, 2012).

The ***median household income***, ***per capita income***, and percent of families and individuals living in poverty in Lane, Douglas and Coos counties is shown in Table 3-15.

Table 3-15. Income and poverty in Lane County, Douglas County, Coos County, and Oregon

Geographic area	Median household income	Per capita income	Families below poverty level	Individuals below poverty level
Lane County	$42,923	$23,869	10.0%	16.7%
Douglas County	$39,711	$21,342	10.6%	15.6%
Coos County	$37,491	$21,981	11.5%	16.4%
Oregon	$49,260	$26,171	9.6%	14.0%

Source: U.S. Census Bureau, 2010a.
Note: The poverty level threshold varies by household size and the age of household members. In 2010, the poverty level for a single individual under 65 years of age was $11,344 (U.S. Census Bureau, 2010a). For a household of four (2 adults and 2 children), the 2010 poverty level was $22,113 (U.S. Census Bureau, 2012).

The O&C Lands Act provided that revenues from the sale of O&C timber would be distributed to counties with O&C and CBWR lands, including Lane, Douglas, and Coos counties. Since 2000, these payments have been made under the Secure Rural Schools and Community Self-Determination Act (Public Law 06-393) (BLM, 2012b). In 2011, Lane County received $5.78 million in O&C land payments; Douglas County received approximately $10.77 million in O&C land payments and $53,000 in CBWR land payments; and Coos County received approximately $2.28 million in O&C land payments and $293,000 in CBWR land payments (BLM, 2012c).

Public services and lodging

Lane, Douglas, and Coos counties are the primary providers of public facilities and services near the transmission line, including roads, parks, police protection, fire protection, medical services, and libraries. Public water is provided by a variety of water districts, utility boards, and municipalities. Electricity is provided by a number of utility districts, cooperatives, utility boards, municipalities, and electrical companies. Northwest Natural Gas and Avista Utilities provide natural gas (Avista, 2008). The Eugene, Springfield, Creswell, South Lane, North Douglas, Yoncalla, Oakland, Sutherlin, Douglas, Winston-Dillard, Myrtle Point, and Coquille School Districts provide public school services (Oregon Department of Education, 2012).

There is a fiber optic cable attached for the length of the transmission line. In addition, underground utilities share the BPA right-of-way in some locations, including telephone lines and natural gas lines (Parsons Brinckerhoff, 2012).

Several hotels, recreational vehicle (RV) parks, and campgrounds are scattered throughout the three counties (ePodunk, 2012; RV Clubs U.S., 2012; RV Park Hunter, 2012).

Property taxes and values

All federal, state and local government real property is exempt from paying state and local property taxes. When BPA acquires an easement across private property, the

landowner continues to pay property taxes, but often at a lesser value, based on any limitation of use created by the easement.

If BPA acquires new easements on private land, landowners are offered fair market value for the land as established through an appraisal process. The appraisal for each property accounts for all factors affecting property value, including the impact the transmission line easement or access road would have on the remaining portion of the property. Where existing easements accommodate new structure locations or access roads, no additional compensation is paid.

Environmental justice

Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations* and Low-Income Populations (collectively, ***environmental justice populations***), states that each federal agency shall identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority and low-income populations. The Executive Order further stipulates that agencies conduct their programs and activities in a manner that does not have the effect of excluding persons from participation in, denying persons the benefits of, or subjecting persons to discrimination because of their race, color, or national origin.

For the purpose of Executive Order 12898, minority populations include all people of the following origins: African-American, American Indian and Alaskan Native, Native Hawaiian or Other Pacific Islander, and ***Hispanic*** (of any race). Low-income populations are populations that are at or below the poverty line, as established by the U.S. Department of Health and Human Services.

The U.S. Department of Energy (DOE) issued an updated Environmental Justice Strategy in May 2008 (DOE, 2008). The strategy integrates the requirements of Executive Order 12898 into the DOE's operations. The four goals set forth in the strategy are:

- Identify and address programs, policies and activities that may have disproportionately high and adverse human health or environmental effects on minority, low-income, and tribal populations.
- Enhance the credibility and public trust of the DOE by further making public participation a fundamental component of all program operations, planning activities, and decision-making processes.
- Improve research and data collection methods relating to human health and the environment of minority, low-income, and tribal populations.
- Further Departmental leadership by integrating environmental justice with activities and processes related to human health and the environment.

The 2010 U.S. Census shows that all three counties that intersect the transmission line right-of-way have a higher percentage of Caucasians than the state as a whole and a lower percentage of people that report being of Hispanic ethnicity regardless of race than the statewide averages, as shown in Table 3-16 (U.S. Census Bureau, 2010b). For all three counties, there are a higher proportion of families and individuals living in poverty than the state representation, as shown earlier in Table 3-15.

Table 3-16. Race and ethnicity in Lane, Douglas, and Coos counties, and Oregon

Geographic Area	Race							Ethnicity
	Caucasian (White)	Black or African-American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Other race	Two or more races	Hispanic/Latino (of any race)
Lane County	88.3%	1.0%	1.2%	2.4%	0.2%	2.8%	4.2%	7.4%
Douglas County	92.4%	0.3%	1.8%	1.0%	0.1%	1.2%	3.2%	4.7%
Coos County	89.8%	0.4%	2.5%	1.0%	0.2%	1.7%	4.3%	5.4%
Oregon	83.6%	1.8%	1.4%	3.7%	0.3%	5.3%	3.8%	11.7%

Source: U.S. Census Bureau, 2010b.

3.9.2 Environmental consequences—Proposed Action

Transmission line right-of-way

Population, community character, economy, and employment

The work force required for construction in 2014 and 2015 would vary over the construction period. At a maximum, about 50 to 80 construction workers would be required for project construction at a given time. These minor changes in the local population and employment/unemployment rates during construction would not be anticipated to return to pre-construction levels upon completion of the project.

Income earned by project construction workers would not be expected to increase the annual per capita or median household income levels in Lane, Douglas, and Coos counties. Construction of the Proposed Action would, however, create a short-term positive impact to the economic vitality of the communities near the transmission line, such as Cottage Grove and Creswell, by temporarily stimulating their economy over the short-term through the purchase of local supplies, materials, food, hotel or campground stays and other direct or indirect spending by construction workers. Both material purchases and construction workers' salaries would add short-term income.

Public services and lodging

Access to all properties, including public services and lodging would be maintained during construction, and local agencies, residences, and businesses near the transmission line would be notified of upcoming construction activities and potential disruptions associated with the Proposed Action.

The fiber optic cable attached for the length of the line, along with its associated hardware (e.g., risers, junction boxes, etc.), would be transferred to the replaced structures. Prior to construction the underground telephone lines and natural gas lines would need to be located and coordination with utility companies would occur to avoid impacts to these lines.

Based on existing housing vacancy rates, as well as the number of hotels and RV parks/campgrounds located throughout Lane, Douglas, and Coos counties, existing local lodging would be expected to be sufficient to accommodate non-local workers during construction.

Property taxes and values

Replacement of structures would not require the acquisition of new easements or land from private property owners as all structures are located within BPA's existing right-of-way and would be replaced within the right-of-way. Therefore, there would be no change in property tax revenues resulting from construction of the Proposed Action.

Environmental justice

All persons, regardless of race or income, would experience the same low impacts associated with construction within the transmission line right-of-way. These impacts would be expected to be low because there are few residences and businesses located adjacent to the transmission line right-of-way. Therefore, construction of the Proposed Action would not result in long-term disproportionately high and adverse effects on environmental justice populations.

Access roads

Construction of new access roads, and reconstruction or improvement of existing access roads would have the same impacts on population, employment, income, public facilities, lodging, and environmental justice populations as the construction activities associated with structure replacement as described above.

BPA would need to acquire some easements for new and temporary access roads that would be built outside of the existing access road right-of-way and outside of BPA's existing easements. Payments for new easements would go to the landowner. Easements would not change the land ownership.

Environmental consequences from access-rights roads on BLM land

The reconstruction and improvement of approximately 13.6 miles of existing access-rights roads would have the same effect on population, employment, income, public facilities, lodging, and environmental justice populations as the construction activities associated with structure replacement as described above. There would be no reconstruction or improvement on new access-rights roads on BLM land.

3.9.3 Environmental consequences—No Action Alternative

Under the No Action Alternative, the employment and income benefits of construction activities would not occur, and there would be no need for temporary housing for construction workers. Residents and businesses along the transmission line right-of-way would experience noise or air quality impacts from construction equipment as structures deteriorate and operation and maintenance activities are needed on a more frequent basis.

The No Action Alternative could also result in other socioeconomic impacts. The structures have already exceeded their expected life span, and as they continue to deteriorate, the transmission line's reliability would be reduced. This could lead to negative impacts on the social and economic vitality of communities that rely on power supplied by the transmission line. Adverse impacts to all local residents, public facilities, community services, and businesses could include power outages, and voltage fluctuations.

3.10 Noise, public health, and safety

3.10.1 Affected environment

Transmission lines provide electricity for heating, lighting, and other services essential for public health and safety. These same facilities can potentially harm humans. Contact with transmission lines or any electrical line can kill or seriously injure people and damage or destroy equipment. This section describes public health and safety concerns such as noise, hazardous materials, and electric and magnetic fields (EMFs) related to transmission lines or construction activities associated with the Proposed Action.

Noise

The main sources of noise associated with the transmission line include maintenance of the equipment, transmission line ***corona***, and the hum generated by electrical transformers. Transmission line corona generally occurs when water causes the partial breakdown of the insulating properties around transmission conductors; corona-generated noise is normally only audible from transmission lines with voltages of 230-kV or greater. The Alvey-Fairview transmission line operates at 230-kV.

Existing noise levels in the transmission line right-of-way are characteristic of rural lands with limited areas influenced by urban activities, as well as in localized areas where Interstate 5, Oregon Route 99, and local streets cross the transmission line. Noise-sensitive land uses located in the vicinity of the transmission line include residences, parks and cemeteries. The majority of the transmission line right-of-way is located in rural and/or undeveloped areas characterized by low noise levels.

Environmental noise is commonly measured in decibels on the A-weighted scale (dBA or ***A-weighted decibels***). The A-weighted scale corresponds to the sound that humans are able to hear. Typical A-weighted sound levels from various sources are presented in Table 3-17. BPA has established a 50 dBA design criterion for corona-generated audible noise at the edge of the transmission line right-of-way.

Table 3-17. Typical sound levels

Sound level (dBA)	Noise source
120	Jet takeoff (at 200 feet)
100	Shout (0.5 feet)
80	Truck (at 50 feet)
70	Gas lawnmower (at 100 feet)
60	Normal conversation (at 10 feet)
50	Traffic (at 50 feet)
40	Library
30	Soft whisper (at 15 feet)

Source: EPA, 1971; EPA, 1974.

Hazardous materials

Government environmental databases that record the handling, storage, and release of hazardous materials to the environment were reviewed to document existing conditions in the transmission line right-of-way. No areas of hazardous material contamination within the transmission line right-of-way or access road system were identified during the database review. No areas of obvious hazardous material contamination were observed during a site visit or reviews of recent, high-resolution aerial photos of the transmission line right-of-way. Creosote-treated wood poles are used throughout the transmission line right-of-way.

Electric and magnetic fields

Transmission lines, like all electric devices and equipment, produce EMFs. Voltage, the force that drives the current, is the source of the electric field. Current, the flow of electric charge in a wire, produces the magnetic field. The strength of EMF depends on the design of the line and the distance from the line; field strength decreases rapidly with distance.

EMFs are found around any electrical wiring, including household wiring and electrical appliances and equipment. Electric fields are measured in units of volts per meter (V/m) or thousands of volts per meter (kV/m). Magnetic fields are measured in units of ***gauss*** (G) or milligauss (mG), which are thousandths of a gauss.

Throughout a home, the electric field strength from wiring and appliances is usually less than 0.01 kV/m. However, fields of 0.1 kV/m and higher can be found very close to electrical appliances.

There are no national guidelines or standards for electric fields from transmission lines. For siting transmission lines under its jurisdiction, the State of Oregon, through the Oregon Energy Facility Siting Council, requires that a proposed transmission line be designed and operated so that its electric fields do not exceed 9 kV/m at roughly 3 feet above ground surface in areas accessible to the public (Oregon Administrative Rule 345-024-0090). BPA designs transmission lines to meet the electric-field guideline of 9 kV/m maximum on the transmission line right-of-way and 5 kV/m maximum at the edge of the transmission line right-of-way.

Average magnetic field strength in most homes (away from electrical appliances and home wiring, etc.) is typically less than 2 mG. Fields of tens or hundreds mG are present very close to appliances carrying high current. Unlike electric fields, magnetic fields from outside power lines are not reduced in strength by trees and building material. Transmission lines and distribution lines (the lines feeding a neighborhood or home) can be a major source of magnetic field exposure throughout a home located close to the line.

There are no national guidelines or standards for magnetic fields. Oregon does not have a limit for magnetic fields from transmission lines. BPA does not have a guideline for magnetic field exposures. The guidelines that do exist for public and occupational magnetic-field exposures are intended for measuring short-term magnetic field exposures and are not applicable to determining the effects of long-term exposures.

3.10.2 Environmental consequences—Proposed Action

Transmission line right-of-way

Noise

Construction noise would temporarily result in higher noise levels during structure replacement and danger tree removal. Typical construction equipment used for the Proposed Action and the associated noise levels by equipment type are presented in Table 3-18.

Table 3-18. Typical construction noise levels

Type of equipment	Maximum noise level (dBA) at 50 feet
Road grader	80-92
Bulldozer	80-92
Heavy truck	78-90
Backhoe	72-92
Pneumatic tools	82-87
Concrete pump	81-83
Crane	85-88

Source: EPA, 1971.

Construction noise may be bothersome to those in the immediate vicinity of the Proposed Action. Construction activity noise levels would range from 70 to 95 dBA. Construction would be limited to daytime hours and at any one location would be temporary, lasting only a matter of days. Unlike similar projects, helicopters are not planned for use during construction of the Proposed Action.

The transmission line right-of-way is characterized by agricultural practices that include machinery similar to construction equipment. Machinery used for agricultural purposes operates at similar sound levels and during similar daytime hours as construction equipment planned for use for the Proposed Action.

Noise impacts due to construction would be low because they would be temporary and noise-sensitive land uses are similar to machinery noise from regular agricultural practices, and corona noise from the transmission line would not change from current levels.

Hazardous materials

BPA would dispose of creosote-treated wood poles in accordance with federal and state laws, so impacts would be low. Unknown hazardous materials could potentially be disturbed during construction of the Proposed Action, resulting in an unexpected release to the environment and likely a temporary impact to public health and safety of nearby residents. Construction activities associated with the Proposed Action could involve the use of small amounts of solvents, pesticides, paint products, motor and lubricating oils, and cleaners, which could be released into the environment. If any of these materials are spilled, BPA would immediately contain and clean up the spill and dispose of all regulated materials in accordance with federal and state laws. Impacts resulting from a hazardous materials release to soil or groundwater during construction would likely be low because of the implementation of mitigation measures discussed in Table 2-9.

Electric and magnetic fields

The primary parameters that affect the EMF levels produced by a power line are line voltage, current loading, line configuration, and line routing. The Proposed Action would not appreciably change any of these parameters. Therefore, no impacts to the EMF levels in the vicinity of the transmission line would occur except in a few isolated cases where structure heights would be raised slightly to increase the conductor-to-ground clearances. In these areas, ground-level EMF would decrease slightly within the transmission line right-of-way. No changes would occur beyond the transmission line right-of-way. BPA would continue to meet the State of Oregon's electric field regulations for transmission lines.

EMF levels for the Proposed Action are shown in Table 3-19 and Table 3-20. The data illustrate that the Proposed Action would not change either the electric or magnetic field environment on the right-of-way.

Radio and television interference from high voltage power lines can be produced from two general sources: conductor corona activity and ***spark-discharge activity*** on connecting hardware. Conductor corona activity is primarily a function of the operating line voltage, while spark-discharge activity on connecting hardware is usually associated with the aging condition of hardware (e.g., over time, hardware connections can become loose and corroded causing small spark-gaps). However, BPA rarely receives public complaints of radio and television interference from BPA transmission lines operating at this voltage.

Table 3-19. Transmission line right-of-way electric field values (kV/m)

	Northern right-of-way edge	Maximum on right-of-way	Southern right-of-way edge
Right-of-Way Section A: 1 Line			
Existing Conditions	0.9	3.4	0.9
Proposed Action	0.9	3.4	0.9
Right-of-Way Section B: 2 Lines			
Existing Conditions	0.9	3.5	0.9
Proposed Action	0.9	3.5	0.9

Notes:
1. Values developed from BPA modeling programs. This is based upon a 125-foot right-of-way with 230-kV line(s).
2. Section A represents the 68-mile section of right-of-way (125-feet wide) with only the single Alvey-Fairview transmission line from the Alvey Substation to the Reston Substation.
3. Section B represents the 29.5 mile section of right-of-way (125-feet wide) that parallels the Reston-Fairview 230-kV line from the Reston Substation to the Fairview Substation.

Table 3-20. Transmission line right-of-way magnetic field values

	Northern right-of-way edge		Maximum on right-of-way		Southern right-of-way edge	
	Annual Average (mG)	Annual Peak (mG)	Annual Average (mG)	Annual Peak (mG)	Annual Average (mG)	Annual Peak (mG)
Right-of-Way Section A: 1 Line						
Existing Conditions	10.3	13.4	45.1	58.4	10.3	13.4
Proposed Action	10.3	13.4	45.1	58.4	10.3	13.4
Right-of-Way Section B: 2 Lines						
Existing Conditions	11.2	14.8	43.5	62.0	10.1	16.1
Proposed Action	11.2	14.8	43.5	62.0	10.1	16.1

Notes:
1. mG based on 2011-2012 line load statistics.
2. Values developed from BPA modeling programs. Based upon a 125-foot right-of-way with 230-kV line(s).
3. Section A represents the 68-mile section of right-of-way (125-feet wide) with only the single Alvey-Fairview transmission line from the Alvey Substation to the Reston Substation.
4. Section B represents the 29.5 mile section of right-of-way (125-feet wide) that parallels the Reston-Fairview 230-kV line from the Reston Substation to the Fairview Substation.

The operating voltage of the Proposed Action would be the same as the existing operating line voltage. Additionally, the Proposed Action would add new, properly-installed connecting hardware that would reduce any risk associated with aging hardware spark-discharge activity. Thus, the Proposed Action would either not change or possibly reduce the potential for radio and television interference along the transmission line. Nevertheless, any radio or television interference complaint received by BPA would be investigated. If BPA facilities are determined to be the cause of the interference, BPA would take corrective action to eliminate the interference.

Access roads

Construction noise associated with new, reconstructed, improved, and temporary access roads and associated tree removal would be temporary. Like construction noise for structure replacement, noise from access road work would be similar to noise from machinery used for agricultural purposes, and nearby residents regularly experience machinery noises from agricultural activities.

Access road construction activities could involve the use of small amounts of solvents, pesticides, paint products, motor and lubricating oils, and cleaners, which could be released into the environment. If any of these materials are spilled, BPA would immediately contain and clean up the spill and dispose of all regulated materials in accordance with federal and state laws. Impacts resulting from a hazardous materials release to soil or groundwater during construction would likely be low because of the BMPs that BPA would implement (Table 2-9).

Environmental consequences from access-rights roads on BLM land

The reconstruction and improvement of approximately 13.6 miles of existing access-rights roads on BLM land would have the same effect on noise, public health, and safety as those for access roads discussed above. There would be no reconstruction or improvement on new access-rights roads on BLM land.

3.10.3 Environmental consequences—No Action Alternative

Under the No Action Alternative, there would no construction impacts (e.g., noise, potential releases of hazardous materials, etc.); however, impacts to public health and safety would be moderate. The existing line is at high risk of failure due to aging components and deteriorating wood-pole structures. Local and regional power outages could result from failure of this line, which could put public safety agencies, health providers and businesses that rely on a steady source of power at risk. Any downed lines resulting from structure failures would have a high potential for causing fires in the vicinity of the downed line or electrocution as a result of accidental or inadvertent contact with an energized, downed line.

If the Proposed Action is not implemented, the existing structures would continue to deteriorate and require continual maintenance, which would impact nearby noise-sensitive land uses. Higher noise levels produced during normal maintenance activities would temporarily result in a moderate impact in areas where residents are present. Increased noise levels associated with these activities in any one location would be temporary.

3.11 Transportation

3.11.1 Affected environment

The transmission line is accessed by a series of gravel and paved county roads where existing traffic volumes are generally low. Larger state highways that experience higher traffic volumes in the vicinity of the transmission line are limited to Interstate 5, which the transmission line crosses twice, and Oregon Route 99 south of Alvey and just north of Green Valley. The transmission line right-of-way also crosses Oregon Route 126 in Alvey, Oregon Route 38 in the vicinity of Martin Creek, and Oregon Route 138 in the city of Sutherlin.

The transmission line runs through the unincorporated portions of Lane, Douglas, and Coos counties. Streets in these areas are generally low volume rural roadways. Within the city of Sutherlin, the transmission line right-of-way crosses through an area that is currently undeveloped.

Several county roads provide limited access to the transmission line right-of-way from Alvey to Fairview. City streets in Sutherlin, Green Valley, and Martin Creek provide widespread access to the transmission line, while county roads provide only a few access points. In addition, BPA maintains more than 100 miles of access roads across public and private lands so that maintenance crews can get to the transmission line right-of-way in areas where state and local roads do not provide access.

3.11.2 Environmental consequences—Proposed Action

Transmission line right-of-way

During structure replacement there would be a temporary increase in traffic on nearby roads from construction vehicles delivering equipment and materials. Deliveries of equipment and materials to construction areas would cause short-term traffic delays along nearby roads and state highways. However, due to the rural and generally undeveloped nature of the area near the transmission line corridor, impacts to roadway users due to construction of the Proposed Action would be low. Traffic delays could also be experienced at roads near construction staging areas, but these would be temporary and limited to the vicinity of staging areas.

At roadway crossings, structure replacement could temporarily affect traffic flow through lane closures. Replacement of structures near Interstate 5and Oregon Route 99 could require closure of one traffic lane for short periods (one to three hours) while structures are being replaced.

Access roads

The improvement or reconstruction of access roads, and construction of a few new access roads, would result in short-term impacts to transportation from construction related delays and detours. However, the impacts would be low as most access roads are currently gated and not used by the general public, or would be gated if requested by the underlying landowner. Construction equipment would be parked adjacent to local roads and highways to avoid blocking access, where feasible.

Environmental consequences from access-rights roads on BLM land

The reconstruction and improvement of approximately 13.6 miles of existing access-rights roads on BLM land would have the same effect on transportation as those for access roads discussed above. There would be no reconstruction or improvement on new access-rights roads on BLM land.

3.11.3 Environmental consequences—No Action Alternative

Under the No Action Alternative, the transmission line components, including structures and other existing equipment, would not be replaced resulting in no construction traffic

at this time. However, due to the need for continued maintenance under the No Action Alternative, intermittent traffic increases may occur from maintenance vehicles accessing areas of the transmission line in need of repair. Temporary closures and periodic disruptions to traffic flow from continued maintenance of the line would occur as additional maintenance requirements are needed or when emergency repairs would be needed.

3.12 Air quality

3.12.1 Affected environment

The EPA has identified several air pollutants as a concern nationwide. These pollutants, known as "criteria pollutants," are carbon monoxide (CO), particulate matter (PM) with a diameter of 10 micrometers or less (***PM-10***), ozone, sulfur dioxide, lead, and nitrogen dioxide. Under the Clean Air Act (42 USC § 7401 *et seq*.), EPA has established ***National Ambient Air Quality Standards (NAAQS)*** that specify maximum allowable concentrations for each of the six criteria pollutants. An area that fails to meet the standards established by EPA for any criteria pollutant is designated a ***nonattainment area***. If a nonattainment area meets the EPA promulgated standards for the criteria pollutant in question, then the area is designated a ***maintenance area*** after a maintenance plan has been established to keep the area within the standards approved by EPA.

The northern limit of the transmission line is located approximately one mile south and east of the Eugene-Springfield UGB, which is designated as a nonattainment area for PM-10 and a maintenance area for carbon monoxide. The Lane Regional Air Protection Agency oversees air quality conditions and enhancement programs in the cities of Eugene, Springfield, Cottage Grove, and Oakridge, and the Eugene-Springfield UGB (Lane Regional Air Protection Agency, 2012). The Lane Regional Air Protection Agency recently approved the re-designation of the Eugene PM-10 maintenance area as in "attainment" with the PM-10 air quality health standard. The Lane Regional Air Protection Agency and DEQ submitted the re-designation request to EPA on January 13, 2012 for consideration. EPA approved the re-designation request on April 11, 2013, effective June 10, 2013 (78 FR 21547).

A contingency plan is in place for the Eugene-Springfield UGB for PM-10 that restricts emissions from uses such as wood-waste boilers, kraft pulp mills, and open burning. Air quality issues related to the operation of the transmission line are generally only affected by low levels of ozone and nitrogen oxides, which are created during normal operations. Of the six criteria pollutants, PM generated by maintenance vehicles during routine maintenance is of primary concern, with carbon monoxide and ozone of lesser concern.

3.12.2 Environmental consequences—Proposed Action

Transmission line right-of-way

Construction of the Proposed Action would result in temporary higher levels of PM during structure replacement, conductor stringing, and other ground-disturbing activities. Dust could be created in localized areas for short durations. Construction equipment would disturb dirt on roads and during structure replacement and emit pollutants, resulting in low-level impacts to local air quality and visibility for short durations. The Proposed Action would result in short-term and localized emissions from internal combustion engines during construction. Low-growing vegetated areas that are disturbed during construction would be reseeded and would be expected to revegetate.

Overall, air quality impacts resulting from construction would be low because these impacts would be limited to the construction site, would be temporary in nature, and would not produce enough dust and contaminants to result in violations of air quality standards.

Access roads

Access road construction would result in the same overall impacts to air quality as those associated with the transmission line right-of-way. There may be temporary higher levels of PM during access road construction and improvements. Dust could be created in localized areas for short durations. Construction equipment would disturb dirt on roads and emit pollutants, resulting in low-level impacts to local air quality and visibility for short durations.

Environmental consequences from access-rights roads on BLM land

The reconstruction and improvement of 13.6 miles of existing access-rights roads on BLM land would have the same effect on air quality as those for access roads discussed above. There would be no reconstruction or improvement on new access-rights roads on BLM land.

3.12.3 Environmental consequences—No Action Alternative

Under the No Action Alternative, construction-related impacts to air quality would not occur at this time. However, routine maintenance of the existing transmission line would continue to have low-level impacts on air quality, primarily from dust and vehicle emissions as these impacts would be localized, temporary in nature, and would not result in violations of air quality standards. Short-term generation of dust and vehicle and equipment emissions would occur along the transmission line during routine maintenance activities.

3.13 Greenhouse gases

3.13.1 Affected environment

Greenhouse gases are chemical compounds found in the earth's atmosphere that absorb and trap infrared radiation, or heat, re-radiated from the surface of the earth. The trapping and build-up of heat in the atmosphere increases the earth's temperature, warming the planet and creating a greenhouse-like effect (U.S. Energy Information Administration [EIA], 2009b). ***Anthropogenic*** activities (activities caused or produced by humans) are increasing atmospheric concentrations to levels that could increase the earth's temperature up to 7.2 degrees Fahrenheit (degrees F) by the end of the twenty-first century (EPA, 2010b).

The principal greenhouse gases emitted into the atmosphere through human activities are carbon dioxide, methane (CH_4), nitrous oxide (N_2O), and fluorinated gases (EPA, 2010b). Of these four gases, carbon dioxide (CO_2) is the major greenhouse gas emitted (EPA, 2010b; Houghton, 2010). For example, CO_2 emissions from the combustion of coal, oil, and gas constitute 81 percent of all U.S. greenhouse gas emissions (EIA, 2009a). Carbon dioxide enters the atmosphere primarily through the burning of fossil fuels such as coal, natural gas and oil, and wood products; as a result of land use changes; and the manufacturing of cement. Prior to the industrial revolution, concentrations were roughly stable at 280 parts per million (ppm), but have increased 36 percent to 379 ppm in 2005, all of which is attributed to human activities (Intergovernmental Panel on Climate Change [IPCC], 2007).

Of the remaining three principal greenhouse gases, methane is emitted during the production and transport of fossil fuels, through intensive animal farming, and by the decay of organic waste in landfills. Methane concentrations have increased 148 percent above pre-industrial levels (EPA, 2010b). Nitrous oxide is emitted during agricultural and industrial activities, and during the combustion of fossil fuels and solid waste. Nitrous oxide atmospheric levels have increased 18 percent since the beginning of industrial activities (EPA, 2010b). Fluorinated gases, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF6) are synthetic compounds emitted through industrial processes and now are being used to replace ozone-depleting compounds such as chlorofluorocarbons in insulating foams, refrigeration, and air conditioning. Although they are emitted in small quantities, these gases have the ability to trap more heat than carbon dioxide and are considered high global-warming potential gases. Atmospheric concentrations of fluorinated gases have been increasing over the last two decades and are expected to continue to increase (EPA, 2010b).

The Clean Air Act is a federal law that establishes regulations to control emissions from large generation sources such as power plants. The EPA has issued a Final Mandatory

Reporting of Greenhouse Gases Rule (40 CFR 98) that requires reporting of greenhouse gas emissions from large sources. Under the rule, suppliers of fossil fuels or industrial greenhouse gases, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of greenhouse gases, are required to submit annual reports to the EPA (EPA, 2010a). For federal agencies such as BPA, Executive Orders 13423 and 13514 require agencies to measure, manage, and reduce greenhouse gas emissions by agency-defined target amounts and dates.

In the State of Oregon, House Bill 3543 from 2007 (codified at Oregon Revised Statutes 468A.205), directs state and local governments, businesses, nonprofit organizations and individual residents to reduce greenhouse gas emissions in Oregon. This statute sets several reduction targets: 1) by 2010, arrest growth of greenhouse gas emissions; 2) by 2020 begin to reduce greenhouse gas levels to 10 percent below 1990 levels; and 3) by 2050 achieve greenhouse gas levels at least 75 percent below 1990 levels (Oregon Global Warming Commission, 2010).

Global atmospheric greenhouse gas concentrations are a product of emissions and removal over time. Soils store carbon in the form of decomposing plant materials and constitute the largest carbon reservoir on land. Through the process of photosynthesis, atmospheric carbon is also captured and stored as ***biomass*** in vegetation, especially forests. Vegetation removal can impact the carbon cycle. The carbon cycle consists of two phases: gaseous carbon (carbon dioxide) and solid carbon (sugars). Photosynthesis is the process plants such as trees use to sequester carbon dioxide from the air and subsequently manufacture solid, organic mass. Consequently, as trees grow and increase in mass, carbon is removed from the atmosphere. Inversely, as trees decay or are burned, carbon is emitted into the atmosphere.

Based on the carbon cycle, trees act as temporary carbon reservoirs. In a natural environment, a tree seed would grow (sequester carbon), the tree would die and decay (release gaseous carbon), and subsequently a new tree would presumably grow in its place. Essentially, the quantity of carbon stored in solid, organic mass is dependent on the current phase of the carbon cycle. Peak solid carbon storage occurs when a tree is fully mature, and minimum solid carbon storage occurs immediately after the tree has decomposed or burned. Alternatively, minimum solid carbon storage may occur when a forested area is permanently converted to a non-forested area, such as grasslands.

Stored carbon can be released back into the atmosphere when biomass is burned (EPA, 2008). In addition, carbon dioxide, nitrous oxide, and methane emissions increase in areas where soil disturbance occurs (Kessavalou et al., 1998). Models predict atmospheric concentrations of all greenhouse gases would increase over the next century, but the extent and rate of change is difficult to predict, especially on a global scale.

3.13.2 Environmental consequences—Proposed Action

Transmission line right-of-way

Implementation of the Proposed Action would contribute to greenhouse gas concentrations in several different ways. Carbon dioxide, methane, and nitrous oxide emission levels would incrementally increase as vegetation and soils are removed or disturbed during construction of the transmission line and through the operation of construction-related vehicles during the construction period.

Emissions from construction, operations, and maintenance-related vehicles on and off the transmission line right-of-way also would impact atmospheric greenhouse gas concentrations incrementally because construction equipment and vehicles would be fueled by gasoline and diesel combustion motors.

The total amount of greenhouse gas emission from the Proposed Action, including construction equipment, danger tree removal, and tree removal for access road work, would be low at approximately 3,128 metric tons of carbon dioxide equivalent. This equates to less than 0.002 percent of the 167,470,000 metric tons of carbon dioxide emitted annually in BPA's four-state service territory (EPA, 2011) and is below EPA's 25,000 metric tons reporting threshold. The individual components of the total greenhouse gas emissions are described below.

Greenhouse gas emissions were estimated for the Proposed Action based on the approximate number of vehicles to be used during project construction and the approximate distance those vehicles would travel during the construction period. For the Proposed Action, an estimated eight vehicle round trips per day would occur during the peak construction periods for the Proposed Action. Construction would take about 440 days, with peak construction activity likely occurring during the 4-month period between July 1 and October 31 in both 2014 and 2015.

To provide a conservative analysis and ensure that the Proposed Action's potential contribution to greenhouse gas concentrations are adequately considered, greenhouse gas emissions were calculated for the entire project duration using the estimate of eight vehicle round trips per day. A round trip for the Proposed Action was considered to be from Roseburg to the midpoint of the transmission line between the Reston and Fairview Substations and back to Roseburg (about 48 miles) for the first construction season and between the Reston and Alvey Substations and back to Roseburg (about 56 miles) for the second construction season.

As shown in Table 3-21, construction vehicle emissions would result in an estimated 240 metric tons of carbon dioxide emissions and an estimated 242.8 metric tons of carbon dioxide equivalent for the entire 2-year construction period. The Proposed

Action's estimated carbon dioxide equivalent emissions translate roughly to the annual carbon dioxide emissions of 44 passenger vehicles.

Table 3-21. Estimated greenhouse gas emissions from construction vehicle emissions for the Proposed Action

Activity	CO_2 emissions in metric tons	CH_4 (CO_2 equivalent emissions) in metric tons	N_2O (CO_2 equivalent emissions) in metric tons	Total CO_2 equivalent emissions in metric tons
Construction Vehicle Emissions	240.0	0.2	2.6	242.8

Measuring emissions from soil disturbances is difficult because these emissions are short-lived and return to background levels within several hours (Kessavalou et al., 1998). Based on the conservative methodology used to estimate construction vehicle emissions, the emissions related to soil disruption and annual vegetation decay are accounted for in the overall construction emission rates. Carbon that would be stored in removed vegetation would be offset in time by the growth and accumulation of carbon in soils and new vegetation.

Structure replacement could require removal of an estimated 100 danger trees. Removal of the danger trees could occur either during or after structure replacement. The nature of tree removal is to permanently convert land within the BPA easement to a non-forested area. Therefore, this action can be characterized as permanently maintaining the existing BPA easement at the minimum level of carbon storage.

The greenhouse gas emissions from tree removal can be broken down further into three segments: 1) carbon that has the potential to be released from the existing trees; 2) loss of future carbon sequestration that would have occurred if each tree continued to grow to full maturity; and 3) energy consumed while removing the trees from the soil.

For the tree removal carbon estimation, BPA assumes:

- All of the danger trees are mixed hardwoods.
- The average moisture content of a green tree is assumed to be 30 percent.
- About 50 percent of a tree's dry-mass is comprised of carbon.
- All of the carbon would eventually be oxidized into carbon dioxide and emitted into the atmosphere.
- The above ground biomass of the tree increases with increasing size as expressed a measurement of the tree's dbh.
- Eighty-four (84) percent of the trees are 16 inches dbh or smaller.

Due to the wide variety of sizes of trees along the transmission line (less than six inches to forty inches), biomass was estimated for a number of different sized trees. Table 3-22 presents the biomass and total carbon dioxide equivalent for the various sized trees proposed for removal.

Table 3-22. Carbon dioxide equivalent released from tree removal for construction of the Proposed Action

dbh	Total aboveground tree biomass for an individual mixed hardwood tree (kilograms)	Number of trees per dbh proposed for removal	CO_2 equivalent released by decomposition of existing trees in metric tons	CO_2 equivalent of future sequestration at final size—40 inches dbh in metric tons
6"	73	20	1	207
8"	148	25	3	259
10"	258	20	4	207
12"	406	8	2	83
14"	595	5	2	52
16"	829	2	3	62
18"	1,111	2	2	21
20"	1,444	4	4	41
22"	1,829	2	3	21
24"	2,270	1	2	10
26"	2,770	1	2	10
28"	3,329	3	7	31
36"	6,215	2	9	21
40”	8,074	1	6	0
Total	N/A	100	42	1,026

Tree growth and future carbon sequestration rates are highly variable and depend on several factors including the species of tree, age of the tree, climate, forest density, and soil conditions. As an alternative to estimating tree growth rates, mass balance may be estimated. As shown in Table 3-22, the existing biomass of trees along the transmission line varies considerably. Most of the trees along the transmission line right-of-way are 40 inches or less in dbh; consequently, BPA assumed each tree would reach 40 inches dbh at full maturity and that the trees already at 40 inches dbh are at full maturity and would not sequester additional carbon. This is a conservative estimate because some trees may not reach full maturity due to natural attrition. Using the same assumptions listed above, each remaining tree that reaches 40 inches dbh would have a mass of 8,074 kilograms and would sequester approximately six metric tons of carbon dioxide equivalent. The estimated 100 danger trees that have not reached full maturity would

have sequestered approximately 1,026 metric tons of carbon dioxide equivalent. This equates to less than 0.001 percent of the 167,470,000 metric tons of carbon dioxide emitted annually in BPA's four-state service territory (EPA, 2011) and is below EPA's 25,000 metric tons reporting threshold. Therefore, the overall impact on greenhouse gases would be low. Calculations in Table 3-22 considered both the decomposition of the existing trees that would be removed as well as the future carbon sequestration that the removed trees would have provided.

Removal and disposal of each tree is an energy-consuming process that results in greenhouse gas emissions via fuel combustion. This component of greenhouse gas emissions, however, was considered negligible when compared to transmission line construction.

Access roads

The construction of new access roads and reconstruction or improvement of existing access roads would require the clearing of additional trees and vegetation where new roads would be built or existing roads reconstructed or improved. Using the same assumptions for calculating biomass that were used for danger trees, the total carbon dioxide equivalent associated with the tree removal for access road work is presented in Table 3-23.

The 180 trees that would be removed for access road work that have not reached full maturity would have sequestered approximately 1,855 metric tons of carbon dioxide equivalent. This equates to 0.001 percent of the 167,470,000 metric tons of carbon dioxide emitted annually in BPA's four-state service territory (EPA, 2011) and is below EPA's 25,000 metric tons reporting threshold.

Table 3-23. Carbon dioxide equivalent released from tree removal for construction of access roads for the Proposed Action

dbh	Total aboveground tree biomass for an individual mixed hardwood tree (kilograms)	Number of trees per dbh proposed for removal	CO_2 equivalent released by decomposition of existing trees in metric tons	CO_2 equivalent of future sequestration at final size—40" dbh in metric tons
6"	73	40	2	414
8"	148	47	5	487
10"	258	26	5	269
12"	406	17	5	176
14"	595	10	4	104
16"	829	12	7	124
18"	1,111	9	7	93
20"	1,444	5	5	52
22"	1,829	8	10	83
24"	2,270	2	3	21
26"	2,770	0	0	0
28"	3,329	1	2	10
36"	6,215	2	9	21
40"	8,074	1	6	0
Total	N/A	180	70	1,855

Environmental consequences from access-rights roads on BLM land

The reconstruction and improvement of approximately 13.6 miles of existing access-rights roads on BLM land would have the same effect on greenhouse gases as those for access roads discussed above. There would be no reconstruction or improvement on new access-rights roads on BLM land.

3.13.3 Environmental consequences—No Action Alternative

Under the No Action Alternative, construction-related greenhouse gas emission impacts would not occur at this time. Greenhouse gas emissions related to construction vehicle trips would be avoided. However, vehicle emissions for operation and maintenance activities would likely be greater than what was presented for the Proposed Action because BPA would likely make more frequent trips to maintain the deteriorating structures. Overall, the impact on greenhouse gases would be low.

3.14 Cumulative impact analysis

The Council on Environmental Quality provided guidance on the extent to which agencies of the Federal Government are required to analyze the environmental effects of past actions when describing the cumulative environmental effect of a proposed action under NEPA (CEQ, 2005). The council noted the "[e]nvironmental analysis required under NEPA is forward-looking" and "[r]eview of past actions is only required to the extent that this review informs agency decision making regarding the proposed action." This is because a description of the current state of the environment inherently includes effects of past actions." Guidance further states that "[g]enerally, agencies can conduct an adequate cumulative effects analysis by focusing on the current aggregate effects of past actions without delving into historic details of individual past actions."

The cumulative effects analysis of this Proposed does not include an exhaustive list of individual past actions and instead, focuses on the impacts of existing projects, including the past impacts of those projects.

The nature and extent of existing development due to past and present actions in the vicinity of the Proposed Action is largely described earlier in this chapter in the "Affected environment" sections for each environmental resource. In addition to BPA's access road and vegetation management work for the existing transmission line, past actions that have adversely affected natural and human resources in the transmission line right-of-way include agricultural activities, highway and railroad construction, and commercial, industrial, and residential development. Reasonably foreseeable future actions include:

- The BLM Districts that intersect the transmission line (Eugene, Roseburg, and Coos Bay) are currently managing public lands under their control through sustainable harvesting and thinning of forest lands, invasive vegetation treatments, habitat restoration, and maintenance of recreational lands. These BLM Districts would continue these public land management activities in the future, with the number and size of future projects subject to federal funding levels.
- ODOT is planning improvements to Oregon Route 99 at 4th Street and Main Street in Cottage Grove. The project is a combination of an ODOT signal improvement project and a city of Cottage Grove project to enhance and improve the bicycle/pedestrian facilities in the area near Oregon Route 99 (9th Street) and East Main Street in Cottage Grove.
- ODOT is preparing the Oregon Route 42 Expressway Management Plan. This is a planning study of the Oregon Route 42 Expressway from the Lookingglass Road intersection east to Interstate 5 Exit 119 (Green Interchange). Over the

next year, ODOT would inventory the existing conditions, identify highway deficiencies and make recommendations for improving safety and operations. Some of the items that may be examined include access (driveway) management/consolidation, capacity improvements, intersection safety and improvements to the local road network.

- Lane County has several projects and programs planned in the transmission line right-of-way to improve county roads including London Road Culvert at Cedar Creek, which is a fish passage enhancement project as well as a program to address county-wide embankment failures.
- Douglas County has several projects and programs planned in the transmission line right-of-way to improve county roads including the reconstruction of Old Highway 99 between Oregon Route 42 and Happy Valley Road in Green; the Glendale Valley Road/Azalea-Glen Road Overlay in Glendale; and chip seal and slurry seal projects throughout the county.
- Other state and county road maintenance activities, such as paving, slope stabilization, and culvert replacement could also occur in the transmission line right-of-way.
- BPA would continue to operate and maintain transmission lines in and near the transmission line right-of-way. Routine work may include hardware replacement, vegetation management, danger tree removal, and minor access road work.
- Agricultural activities on private lands, such as grass seed farming, grazing, and forest management adjacent to the transmission line corridor would continue into the foreseeable future.
- An application by Pacific Connector Gas Pipeline, L.P. to construct a 234-mile, 36-inch diameter natural gas transmission pipeline has been submitted to Federal Energy Regulatory Commission. The proposed Pacific Connector Gas Pipeline would extend from existing natural gas transmission facilities in Malin to Coos Bay and would traverse portions of Klamath, Jackson, Douglas, and Coos counties. This would be a new utility corridor in the transmission line right-of-way and would be within 5 miles of the Reston to Fairview segment of the Proposed Action.
- The proposed Pacific Connector Gas Pipeline would provide natural gas supply to the proposed Jordan Cove liquefied natural gas export terminal and the proposed South Dunes Power Plant facilities in Coos Bay. Both the Jordan Cove terminal and the South Dunes power facility would be wholly-owned by Veresen, Inc. The South Dunes power facility is a proposed natural gas fueled,

combined-cycle power plant with a base-load capacity of 420 megawatts and would be dedicated to the operation of the Jordan Cove terminal. The Jordon Cove terminal is being permitted through the Federal Energy Regulatory Commission and the South Dunes power facility is being permitted through the Oregon Energy Facility Siting Council.

- The Proposed Action would cross outside of the UGBs of Eugene and Roseburg. Outside of the UGBs, limited rural residential development is expected to occur adjacent to the transmission line corridor in areas zoned for residential use outside of UGBs.
- The Coast Fork Willamette Watershed Council, the Partners for the Umpqua River, and the Coquille Watershed Association are currently involved with habitat restoration projects for rivers and streams in their watersheds and within the Umpqua Basin.

3.14.1 Cumulative impacts

This project, in combination with past, present, and reasonably foreseeable actions, could potentially result in cumulative impacts to the natural, physical, and socioeconomic resources described in this EA. The following analysis describes these potential cumulative impacts, in the order that the resources are previously presented in this chapter.

Land use and recreation

Land use and recreation along the transmission line has incrementally changed due to past and present development, and this trend is expected to continue. Wood-pole structure replacement would have a low cumulative impact on recreation because construction impacts, such traffic delays, noise, and dust, would be temporary and no structures would be replaced on park lands.

Conversion of approximately 7 acres of land from existing land uses (primarily agricultural) to 1.6 miles of new access roads outside of BPA's existing right-of-way in combination with other past, present, and reasonably foreseeable development projects would have a low cumulative impact on land use because new access road segments would be relatively short (0.2 mile or less) and would not prohibit the remainder of the property from continuing to be used for agriculture. Further, many of these road segments would be located near the perimeter of the property, so they would not bisect existing agricultural activities.

Geology and soils

The principal past and ongoing activities that affect geology and soils in the vicinity of the corridor are related to agricultural production and forest management, and to a

lesser extent, residential and commercial development. The area of geology and soils impacted by the Proposed Action is relatively small compared to the area affected by other ongoing activities in the area such as forestry and agriculture. Therefore, the Proposed Action would have a low cumulative impact on geology and soils.

Vegetation

Past and present transmission line clearing and tree removal, access road construction and maintenance, agriculture, grazing, forestry, and development have resulted in changes in the composition of vegetation in the corridor. Reasonably foreseeable future actions, such as BPA's vegetation management and danger tree removal, ongoing agriculture and forest management, and development, would continue impacting vegetation.

The Proposed Action would have moderate impacts to vegetation, both in uplands and wetlands, modifying existing vegetation species cover, distribution, and dominance. Anticipated post-construction conditions within the transmission line right-of-way would include reductions in the adjacent overstory canopy and altered succession profiles that would result from removal of selected trees along the corridor and at specific locations along the access roads. Following removal of selected trees, the remaining trees and shrubs within and adjacent to the corridor would be released (i.e., experience accelerated growth into the newly available crown habitat).

Past and present activities in the corridor have led to a spread of noxious weeds in the vicinity, and this could continue with reasonably foreseeable future actions. Although mitigation measures have been identified to minimize the spread of noxious weeds by the Proposed Action, it is possible that noxious weed impacts would still occur. Thus, the Proposed Action could contribute to a low cumulative impact on vegetation through the spread of noxious weeds as well as the modification of existing vegetation.

Streams and fish

Activities other than the Proposed Action in the vicinity of the corridor have the potential to impact water quality and fish through erosion and overland transport of suspended sediments to streams downstream of these operations. These activities include past, present, and future rural residential and commercial development; agricultural operations, including farming and the raising of livestock (primarily cattle and sheep); forest management; ongoing road and bridge maintenance; and BPA's danger tree removal program.

Reasonably foreseeable future projects likely would result in additional impacts on water quality. The major cumulative impacts to streams in the vicinity of the corridor would continue to be from agriculture, forest management, and proposed utility corridor development. However, improvements to streams would be made through

habitat improvement projects in the watersheds crossed by the corridor as stream enhancement projects are implemented and as stream barriers are removed as part of the Proposed Action and other projects.

The Coast Fork Willamette Watershed Council is currently involved with habitat restoration projects for streams within the Coast Fork Willamette Watershed and the Partners for the Umpqua Rivers is currently involved in habitat restoration for the rivers and streams within the Umpqua Basin. The Coquille Watershed Association also is involved with habitat restoration projects within the Coquille Watershed. Because the anticipated post-construction conditions within the corridor would be similar to existing conditions, the Proposed Action would have low impacts on streams from ground-disturbing activities, as discussed in Section 3.5, Wetlands, floodplains, and groundwater. These impacts would be mitigated through the implementation of mitigation measures described in Table 2-9.

Cumulative impacts to fish and fish habitat in and along the transmission ROW include past and current impacts from agriculture, road-building activities, culvert installation, grazing, forest management, altered flow regimes, and reduced water quality as a result of human development. Stream and habitat alteration, including short-term localized sediment inputs to steams, would continue to occur because of ongoing harvest, road-related activities, and the other above-mentioned activities. However, long-term sediment reduction due to the proposed road and drainage improvements, including culvert replacements would benefit localized stream conditions, fish habitat, and upstream access to additional habitat.

These activities and other reasonably foreseeable future actions would likely continue to affect fish. The Proposed Action would have low-to-moderate impacts to fish through in-water work, temporary and permanent access road construction (including culverts), temporary construction disturbance, and both general vegetation and tree removal within the corridor. These impacts from the Proposed Action and ongoing past, present, and reasonably foreseeable future actions would contribute to low-to-moderate cumulative impacts on fish.

Wetlands, floodplains, and groundwater

Incremental losses and degradation of wetlands over time have reduced wetland resources in Oregon and throughout the U.S. In the transmission line right-of-way, some wetlands likely were previously impacted by construction of the existing line, access roads, and placement of structures in wetlands. Wetland impacts also occurred and could be expected to continue to occur from agricultural activities and development. Future projects in the vicinity would be required to avoid, minimize, and compensate for any potential impacts to wetlands under federal and state laws, but could still contribute to a cumulative loss of function or value at the local level. The Proposed Action would

result in some temporary disturbance to wetlands and waters; however, temporary disturbance would be mitigated as described in Table 2-9.

Of the total permanent impacts to wetlands/waters (7.16 acres), most (6.08 acres) would be mitigated by either purchasing wetland mitigation bank credits or in-lieu fee credits. The remaining impacts (approximately 1.08 acres) do not require mitigation at either the federal or state level and would therefore represent a cumulative loss. Impacts in the Coquille River watershed would be mitigated in an adjacent watershed, because of the lack of mitigation instruments and could contribute to a local cumulative loss at the watershed level. The Proposed Action would contribute incrementally to cumulative impacts to wetlands on a regional and local scale.

Past and present cumulative actions in the vicinity of the corridor have impacted floodplains through development and disturbances. Lane County has a Floodplain Combining Zone (Lane County Land Use and Development Code, Section 16.244), Douglas County has a Floodplain Overlay (Douglas County Land Use and Development Code, Article 30), and Coos County has a Floodplain Overlay Zone (Coos County Land Use Ordinance, Article 4.6) all of which regulate development in floodplains. Lane County is currently reviewing its floodplain development regulations that could further limit development within floodplains. Despite these regulations, impacts to floodplain functions could be expected to continue at a low-to-moderate level through continued development. Replacement of the wood poles would not change floodplain function as existing structures would be replaced by new structures using the same approximate footing locations. Access road improvements and construction would contribute to a cumulative impact on floodplain function through the introduction of fill, removal of vegetation and potential sedimentation. The cumulative impact of the Proposed Action and other past, present, and reasonably foreseeable projects on floodplains would be low-to-moderate depending on the size of the floodplain and the scale of activity.

Wildlife

Past and present development and other activities have had a cumulative impact on wildlife and their habitat in and along the transmission line right-of-way. The clearing and conversion of land for forest management, agriculture, utility infrastructure (such as the existing facility), and other uses have resulted in the loss of wildlife habitat. The Proposed Action would have moderate impacts to wildlife and wildlife habitat through temporary and permanent access road construction, temporary construction disturbance, and vegetation removal.

New roads and utility corridors often reduce the quality and quantity of interior forest, which has high value for wildlife. The Proposed Action is located entirely within an existing utility corridor, on existing roads, or on new roads that do not require creating interior disturbances. The Proposed Action would slightly reduce the overall available

perching, foraging, and nesting habitat available for wildlife species. Therefore, the Proposed Action would contribute a low cumulative impact on wildlife.

Cultural resources

Cultural resources in the project vicinity have likely been cumulatively affected by past, present, and current development activities. Most impacts have likely occurred as a result of inadvertent disturbance or destruction from ground-disturbing activities such as road work, farming, site development, and forestry operations. Like the Proposed Action, other reasonably foreseeable future projects in the vicinity of the study area have the potential to disturb previously undiscovered cultural resources.

Implementation of the mitigation measures described in Table 2-9 would minimize potential proposed project impacts and would reduce the potential for construction activities to contribute incrementally to the adverse cumulative impact on cultural resources in the APE. In the event that previously undiscovered historic properties are encountered, potential impacts could occur, depending on the level and amount of disturbance and the eligibility of the resource for listing on the NRHP. The impacts of the Proposed Action combined with other past, present and reasonably foreseeable future projects on cultural resources would likely be low because the majority of the area affected by the Proposed Action is previously disturbed and would be limited to surface disturbances, Furthermore, BPA would mitigate disturbance to any previously unknown sites as described in Table 2-9, and through coordination with the SHPO and tribes.

Visual quality

The visual quality of the transmission line right-of-way has changed due to past and present development, and this trend is expected to continue. The impact to visual quality and views resulting from the Proposed Action would be expected to be a low long-term impact on the rural, pastoral, and the forested visual environment because the rebuilt transmission line would be similar in character to the existing line. Thus, the Proposed Action would have a low cumulative impact on visual quality.

Socioeconomics and public services

The Proposed Action would likely not result in any changes in population. Thus, there would be no cumulative impact on population levels, public facilities, and social services. In addition, because the Proposed Action would not be expected to disproportionately affect any low-income or minority populations, there would be no cumulative impact on environmental justice populations. Any employment and income associated with rebuilding the transmission line would be temporary and limited in duration; therefore, the Proposed Action is not anticipated to contribute to noticeable long-term economic benefits (employment, income, tax revenue) or demand for housing in communities along the right-of-way. If other large construction projects occurred simultaneously with

the transmission line rebuild, such as the development of the Pacific Connector Gas Pipeline, the proposed Jordan Cove liquefied natural gas export terminal, and the proposed South Dunes Power Plant, the Proposed Action would likely contribute to a low cumulative impact on employment, income, tax revenue, and housing demand.

Noise, public health, and safety

Noise, public health, and safety in the corridor have incrementally changed as a result of past and present developments; this trend would be expected to continue. The noise effects from these projects combined with the Proposed Action would have a low cumulative impact on noise because noise from the Proposed Action would temporary, localized and substantially decrease after construction.

Past and ongoing activities along the transmission line right-of-way include timber harvest, agriculture, and some residential and industrial development and these activities all have the potential for risks to public health and safety from operating heavy machinery and exposure to hazardous materials. Since the effects of the Proposed Action would be mitigated through safety and mitigation measures aimed at reducing the risks from operating heavy equipment and vehicles and exposure to hazardous materials, the cumulative impacts on public health and safety would be expected to be low.

Transportation

Past and present actions resulted in the development of numerous roads near the transmission line right-of-way, including state highways, rural roads, and other paved and graveled roads. The Proposed Action would result in temporary impacts to transportation and traffic, such as traffic delays, temporary lane closures, and of the construction of 7.8 miles of new access roads. Thus, the Proposed Action would have a low cumulative impact on transportation.

Air quality

Air quality in the transmission line right-of-way has incrementally changed as a result of past and present development, vehicles traveling on local roads, and periodic residential and agricultural burning. This trend would be expected to continue. The Proposed Action would result in temporary impacts to air quality, such as temporary increases in PM, dust, and vehicle emissions, so the contribution of the Proposed Action to cumulative impacts on air quality is expected to be low.

Greenhouse gases

Given the nature and extent of greenhouse gas emissions and their contribution to climate change, the appropriate area of impact evaluation is global. For consideration of reasonably foreseeable future actions, the life of the project (approximately 50 years) is

deemed appropriate. However, it is recognized that greenhouse gases have been accumulating, and would continue to accumulate, in the atmosphere.

Greenhouse gas concentrations in the atmosphere and corresponding climate change occurring over the past 50 years have been primarily caused by anthropogenic contributions. Greenhouse gas emissions have largely originated from the burning of fossil fuels and the clearing of forests around the world from many and varied sources during this time, as well as for a significant period of time before that (U.S. Global Research Program, 2009). Therefore, unlike the cumulative impacts analyses for other resources that are discussed in this section, the global nature of greenhouse gases makes cataloguing past, present, and reasonably foreseeable future actions for this resource impossible.

Nonetheless, in a general sense, it can be assumed that any action where fossil fuels have been or are being burned contributes to greenhouse gas concentrations. Examples of such actions include home heating, automobile and other vehicle use, electricity generation, processing and manufacturing of goods and wood-burning activities among others. In addition, actions that result in the disturbance of soil or loss of vegetation can also increase greenhouse gas concentrations. Vegetation can affect concentrations in two ways. First, if vegetation is removed prior to maturation, the carbon storing potential is lost and carbon dioxide can no longer be sequestered in that vegetation. Second, if that vegetation is burned, it would release all of the carbon it has sequestered back into the atmosphere as carbon dioxide. These actions, as described above, that have occurred in the past are likely still occurring and would continue to occur in the future at some unknown level.

To analyze the cumulative impact of the Proposed Action, global, national, and regional greenhouse gas emissions were considered. In 2006, the EIA estimated global greenhouse gas emissions at 29,017,000,000 metric tons of carbon dioxide equivalent (EIA, 2009b). In 2008, the total U.S. greenhouse gas emissions were estimated at 6,956,800,000 metric tons of carbon dioxide equivalent. Overall, total U.S. emissions rose approximately 17 percent from 1990 to 2008. In 2009, the four states within BPA's service territory emitted roughly 167,470,000 metric tons of carbon dioxide (Table 3-24).

Table 3-24. Estimated annual carbon dioxide emissions for the BPA service territory

State	Carbon Dioxide (CO_2) emissions only in metric tons (2009)
Idaho	15,360,000
Montana	32,460,000
Oregon	41,270,000
Washington	78,380,000
Total	167,470,000

Source: EPA, 2011.

As a result of increased greenhouse gas concentrations, the earth's temperature has increased between 1.1 and 1.6 degrees F over the last century as determined by the IPCC (IPCC, 2009). Models predict that the warming of the planet would continue and could be as much as 11.5 degrees F warmer by 2100 with the current level of emissions. The effect of increased temperatures include sea level rise due to shrinking glaciers, changes in biodiversity as species attempt to move into more optimal temperature ranges, early initiation of phenological events, lengthening of growing seasons, and thawing of permafrost (U.S. Global Research Program, 2009).

In the Northwest region of the U.S., statistical data indicate that the annual average temperature has risen approximately one-and-a-half degrees F over the past century, with some areas experiencing increases up to four degrees F. Many experts believe that this temperature rise is a major contributing factor to the 25 percent reduction in average snowpack in the Northwest over the past 40 to 70 years. A continued decline in snowpack in the mountains would decrease the amount of water available during the warm season. A 25- to 30-day shift in the timing of runoff has been observed in some places, and the trend is expected to continue as the region's average temperature is projected to rise another three to ten degrees F in the 21st century (U.S. Global Research Program, 2009).

In terms of cumulative impacts to the atmospheric levels of greenhouse gases, any addition, when considered globally, could contribute to long-term impacts to climate change. However, the concentrations estimated for the Proposed Action (approximately 3,125 metric tons of carbon dioxide equivalent), when compared to the regional (less than 0.002 percent), national, and global rates, are low. In addition, the potential ability of the Proposed Action to assist in the transmission and distribution of renewable (non-fossil fuel burning) energy, such as wind power, would help offset the Proposed Action's contribution to cumulative greenhouse gas impacts. As of October 2013, wind, solar, and hydro accounted for 53 percent of the generation capacity transmitted by BPA (BPA, 2010).

3.15 Intentional destructive acts

Intentional destructive acts, that is, acts of sabotage, terrorism, vandalism, and theft, sometimes occur at power utility facilities. Vandalism and thefts are most common, and recent increases in the prices of metal and other materials have accelerated thefts and destruction of federal, state and local utility property. BPA has seen a significant increase in metal theft from its facilities in past years due in large part to the high price of metals on the salvage market. There were more than 50 burglaries at BPA substations in 2006. The conservative estimate of damages for these crimes is $150,000, but the actual amount is likely much higher since this number does not factor in all the labor-related costs associated with repairing the damage.

The impacts from vandalism and theft, though expensive, do not generally cause a disruption of service to the area. Stealing equipment from electrical substations, however, can be extremely dangerous. In fact, nationwide, many would-be thieves have been electrocuted while attempting to steal equipment from energized facilities. On October 11, 2006, a man in La Center, Washington, was electrocuted while apparently attempting to steal copper from an electrical substation.

Federal and other utilities use physical deterrents, such as fencing, cameras, and warning signs, to help prevent theft, vandalism, and unauthorized access to facilities. In addition, through its Crime Witness Program, BPA offers up to $25,000 for information that leads to the arrest and conviction of individuals committing crimes against BPA facilities. Anyone having such information can call BPA's Crime Witness Hotline at (800) 437-2744. The line is confidential, and rewards are issued in such a way that the caller's identity remains confidential.

Acts of sabotage or terrorism on electrical facilities in the Pacific Northwest are rare, although some have occurred. These acts generally focused on attempts to destroy large transmission line steel towers. For example, in 1999 a large transmission line steel tower in Bend, Oregon, was toppled.

Depending on the size and voltage of the line, destroying towers or other equipment could cause electrical service to be disrupted to utility customers and end users. The effects of these acts would be as varied as those from the occasional sudden storm, accident, or ***blackout*** and would depend on the particular configuration of the transmission system in the area. Loss of industrial continuous process heat in manufacturing industries can cause shut downs or delays in production and wasted materials. While in some situations these acts would have no noticeable effect on electrical service, in other situations, service could be disrupted in the local area, or if the damaged equipment was part of the main transmission system, a much larger area could be left without power.

When a loss of electricity occurs, all services provided by electrical energy cease. Illumination is lost. Lighting used by residential, commercial, industrial, and municipal customers for safe movement and security is affected. Residential consumers lose heat. Electricity for cooking and refrigeration is also lost, so residential, commercial, and industrial customers cannot prepare or preserve food and perishables. Residential, commercial, and industrial customers experience comfort/safety and temperature impacts, increases in smoke and pollen, and changes in humidity due to loss of ventilation. Mechanical drives stop, causing impacts as elevators, food preparation machines, and appliances for cleaning, hygiene, and grooming are unavailable to residential customers. Commercial and industrial customers also lose service for elevators, food preparation, cleaning, office equipment, heavy equipment, and fuel pumps.

In addition, roadways experience gridlock where traffic signals fail to operate. Mass transit that depends on electricity, such as light rail systems, can be impacted. Sewage transportation and treatment can also be disrupted. Electricity loss also affects alarm systems, communication systems, cash registers, and equipment for fire and police departments. Loss of power to hospitals and people on life-support systems can be life threatening.

Overhead transmission conductors and the structures that carry them are mostly on unfenced utility rights-of-way. The conductors use the air as insulation. The structures and tension between conductors make sure they are high enough above ground to meet safety standards. Structures are constructed on footings in the ground and are difficult to dislodge.

While the likelihood for sabotage or terrorist acts on the Proposed Action is difficult to predict, it is unlikely that such acts would occur. If such an act did occur, it could have a significant impact on the transmission system or electrical service because the transmission line would be an integral part of BPA's transmission system. However, any impacts from sabotage or terrorist acts likely could be quickly isolated. The DOE, public and private utilities, and energy resource developers include the security measures discussed above, as well as other measures, to help prevent such acts and to respond quickly if human-caused damage or natural disasters occur.

Chapter 4. Environmental consultation, review, and permit requirements

4.1 National Environmental Policy Act

This EA was prepared by BPA pursuant to regulations implementing NEPA (42 USC § 4321 *et seq.*), which requires federal agencies to assess, consider and disclose the impacts that their actions may have on the environment before decisions are made or actions are taken. BPA would consider the project's potential environmental consequences and comments from agencies, tribes and the public when making decisions regarding the Proposed Action.

4.2 Vegetation, wildlife, and fish

4.2.1 Endangered Species Act

The ESA of 1973 (16 USC § 1531 *et seq.*) established a national program for the conservation of threatened and endangered species of fish, wildlife, and plants, and the preservation of the ecosystems on which they depend.

The ESA is administered by the USFWS for wildlife and freshwater species, and by the National Oceanic and Atmospheric Administration's National Marine Fisheries Service (NOAA Fisheries Service) for marine and anadromous species. The ESA defines procedures for listing species, designating critical habitat for listed species, and preparing recovery plans. It also specifies prohibited actions and exceptions.

Section 7(a)(2) of the ESA requires federal agencies to ensure that the actions they authorize, fund, and carry out do not jeopardize the continued existence of endangered or ***threatened species*** or result in the destruction or adverse modification of their critical habitat. Section7(c)(1) of the ESA and other federal regulations require that federal agencies prepare BAs addressing the potential effects of major construction actions on listed or endangered or threatened species.

BPA prepared three BAs to address potential impacts to listed fish, wildlife, and plant species, including northern spotted owl, marbled murrelet, Fender's blue butterfly, Chinook salmon, Coho salmon, and Oregon chub Table 4-1. As a result, biological opinions would likely be developed by the NOAA Fisheries Service (NMFS) and the USFWS where incidental take authorization is necessary. The likely outcome of the consultation would be an incidental take permit authorized by Section 10(a)(1)(B) for impacts related to listed fish, wildlife, or plant species during construction, operation, and maintenance activities.

Table 4-1. Federally protected species potentially found in the transmission line

Species (*Scientific Name*)	Status and critical habitat designation	Preliminary determination*
Upper Willamette River Chinook salmon (*Onchorhynchus tshawytscha*)	Threatened Critical habitat designated	May affect, likely to adversely affect
Coho Salmon (*Onchorhynchus kisutch*)	Threatened Critical habitat designated	May affect, likely to adversely affect
Oregon chub (*Oregonichthys crameri*)	Threatened Critical habitat designated	May affect, not likely to adversely affect
Marbled murrelet (*Brachyramphus marmoratus)*	Threatened Critical habitat designated	May affect, likely to adversely affect
Northern spotted owl (*Strix occidentalis caurina)*	Threatened Critical habitat designated	May affect, not likely to adversely affect
Fender's blue butterfly (*Icaricia icarioides fenderi*)	Endangered Critical habitat designated	May affect, not likely to adversely affect
Willamette daisy (*Erigeron decumbens var. decumbens*)	Endangered Critical habitat designated	May affect, not likely to adversely affect
Gentner's fritillary (*Fritillaria gentneri*)	Endangered	No effect
Bradshaw's desert parsley (*Lomatium bradshawii*)	Endangered	May affect, not likely to adversely affect
Kincaid's lupine (*Lupinus sulphureus ssp. Kincaidii*)	Threatened Critical habitat designated	May affect, not likely to adversely affect
Rough popcornflower (*Plagiobothrys hirtus*)	Endangered	May affect, not likely to adversely affect

*Determinations would be finalized after consultation with USFWS and NOAA Fisheries Service is completed and before the FONSI is issued.

4.2.2 Fish and Wildlife Conservation Act and Fish and Wildlife Coordination Act

The Fish and Wildlife Conservation Act of 1980 (16 USC § 2901 *et seq.*) encourages federal agencies to conserve and promote conservation of non-game fish and wildlife species and their habitats. In addition, the Fish and Wildlife Coordination Act (16 USC § 661 *et seq.*) requires federal agencies undertaking projects affecting water resources to consult with the USFWS and the state agency responsible for fish and wildlife resources.

BPA has consulted with the USFWS and ODFW and incorporated recommendations to avoid and minimize potential impacts to fish and wildlife resources. The Proposed Action would have low-to-moderate impacts on fish, as described in Section 3.4 and wildlife as described in Section 3.6. Mitigation designed to avoid and minimize impacts to fish and wildlife and their habitat is identified in Table 2-9 of this EA.

4.2.3 Magnuson-Stevens Fishery Conservation and Management Act

NOAA Fisheries Service is responsible for ensuring compliance with the Magnuson-Stevens Fishery Conservation and Management Act of 1976 (Magnuson-Stevens Act [16 USC § 1801 *et seq.*]). In the exclusive economic zone, except as provided in Section 102, the U.S. claims, and would exercise, sovereign rights and exclusive fishery management authority over all fish and all continental shelf fishery resources. Beyond the exclusive economic zone, the U.S. claims, and would exercise, exclusive fishery management authority over all anadromous species throughout the migratory range of each such species, except when in a foreign nation's waters, and over all continental shelf fishery resources.

Public Law 104-297, the Sustainable Fisheries Act of 1996, amended the Magnuson-Stevens Act to establish requirements for ***Essential Fish Habitat (EFH)*** descriptions in federal fishery management plans, and to require federal agencies to consult with NOAA Fisheries Services on activities that may adversely affect EFH (Pub. L. No. 104-297). EFH can include all streams, lakes, ponds, wetlands, and other viable waterbodies, and most of the habitat historically accessible to salmon necessary to fish for spawning, breeding, feeding or growth to maturity. Activities above impassible barriers are subject to consultation provisions of the Magnuson-Stevens Act.

Compliance with the Magnuson-Stevens Act for Upper Willamette River Chinook salmon (*Oncorhynchus tshawytscha*) and Oregon Coast Coho salmon (*Oncorhynchus kisutch*) has been satisfied by incorporating an impact analysis of the EFH into the BA prepared for this project (Section 7 Consultation).

4.2.4 Migratory Bird Treaty Act and Federal Memorandum of Understanding

The Migratory Bird Treaty Act implements various treaties and conventions between the U.S. and other countries, including Canada, Japan, Mexico and the former Soviet Union, for the protection of migratory birds (16 USC § 703-712). Under the Act, taking, killing, or possessing migratory birds or their eggs or nests is unlawful. Most species of birds are classified as migratory under the Act, except for upland and nonnative birds.

Sixty-eight (68) species of birds protected under the Act were observed within the transmission line right-of-way during field surveys for other resources. BPA would meet its responsibilities under the MBTA by including bird strike diverters on conductor spans where a high risk of bird strikes might exist (e.g., river or wetland crossings) and where technically feasible.

BPA (through DOE) and USFWS have a memorandum of understanding (MOU) to address migratory bird conservation in accordance with Executive Order 13186 (Responsibilities to Federal Agencies to Protect Migratory Birds), which directs each

federal agency that is taking actions possibly negatively affecting migratory bird populations to work with the USFWS to develop an agreement to conserve those birds (DOE and USFWS, 2013). The MOU addresses how both agencies can work cooperatively to address migratory bird conservation and includes specific measures to consider implementing during project planning and implementation.

4.2.5 Bald Eagle and Golden Eagle Protection Act

The Bald Eagle and Golden Eagle Protection Act of 1940 (16 USC § 668-668d) prohibits the taking or possessing of and commerce in bald and golden eagles, with limited exceptions. The Act only covers intentional acts or acts in "wanton disregard" of the safety of bald or golden eagles.

Potential occurrence of bald eagles in the project vicinity and potential impacts from the Proposed Action are discussed in Section 3.6, Wildlife of this EA. Compliance with the Bald and Golden Eagle Protection Act would be required to address potential impacts to bald eagles since seven bald eagle management areas, designated due to proximity to known or potential bald eagle nesting habitat or winter roosting areas, are known to exist within two miles of the transmission line; one is within 0.25 mile of the transmission line.

4.2.6 Oregon Fish Passage Law

Since August 2001, the owner or operator of an artificial obstruction located in waters in which native migratory fish are currently or were historically present must address fish passage requirements prior to certain trigger events. Laws regarding fish passage may be found in Oregon Revised Statutes 509.580 through 509.910 and in Oregon Administrative Rules 635, Division 412. Fish passage plans are being prepared for culverts placed within fish-bearing streams. BPA is in the process of completing a Fish Passage Plan for a Road-Stream Crossing, as part of the State's Removal/Fill Program (discussed in Section 3.4, Streams and fish), and would submit plan sheets to ODFW. BPA intends to meet the requirements of these regulations as part of this project although it would not obtain the written approval that the Proposed Action complies with fish passage laws. As a federal agency, BPA is not required to comply with state and local stream habitat approvals or permits; however, BPA strives to meet or exceed these substantive standards and policies of state and local plans and programs to the maximum extent practicable.

4.2.7 Oregon Fish and Wildlife Habitat Mitigation Policy

ODFW's fish and wildlife habitat mitigation policy (OAR 635-415-0000) requires or recommends mitigation for losses of fish and wildlife habitat resulting from development actions. Specific mitigation depends upon the habitat protection and mitigation opportunities provided by specific statutes. Rules for the fish and wildlife

habitat mitigation policy are in Oregon Administrative Rules 635, Division 415. The purpose of these rules is to further the Wildlife Policy (ORS 496.012) and the Food Fish Management Policy (ORS 506.109) of the State of Oregon through the application of consistent goals and standards to mitigate impacts to fish and wildlife habitat caused by land and water development actions.

BPA has consulted with the ODFW and incorporated its biologist's recommendations to avoid and minimize potential impacts to fish and wildlife resources, as well as provide offsetting mitigation. Fourteen (14) culverts and seven bridges would be reconstructed to be fish passable as part of the Proposed Action. Also, BPA has agreed to provide additional funding for local watershed council restoration activities as part of its mitigation for the Proposed Action.

As a federal agency, BPA is not required to comply with state and local approvals or permits; however, BPA strives to meet or exceed these substantive standards and policies of state and local plans and programs to the maximum extent practicable. Based on initial ODFW biologist input, the mitigation proposed by BPA would be consistent with ODFW's fish and wildlife habitat mitigation policy.

4.3 Water resources

The Clean Water Act (33 USC § 1251 et seq.) regulates discharges into waters of the U.S. Section 401 of the Clean Water Act requires that states certify compliance of federal permits and licenses with state water quality standards. A federal permit to conduct an activity that results in discharges into waters of the U.S., including wetlands, is issued only after the affected state certifies that existing water quality standards would not be violated if the permit were issued.

Section 402 of the Clean Water Act authorizes discharges of pollutants, such as stormwater from point sources into waters of the U.S. through the National Pollutant Discharge Elimination System (NPDES) permitting program. The U.S. EPA and delegated states administer the NPDES permitting program. As part of this program, General NPDES permits would be issued to BPA to regulate stormwater discharges associated with construction activities. Under the Stormwater Phase II Final Rule, all construction activities that disturb one or more acres of land are being regulated. "Disturbance" refers to exposed soil resulting from activities such as clearing, grading, and excavating. Construction activities can include road building and demolition.

For federal facilities in the State of Oregon, EPA has delegated enforcement and permitting authority to the DEQ. DEQ regulates stormwater runoff from construction sites through a series of general and individual permits. BPA, being a federal agency, has obtained and maintains an agency NPDES General Storm Water 1200-CA Permit from DEQ (File No.: 111769; EPA No.: ORR10-4145). The General NPDES Permit requires

permitees to notify the issuing agency of proposed construction activities, prepare and implement Stormwater Pollution Prevention Plans to control stormwater pollution associated with construction activities, and to notify the issuing agency once construction ceases and the site has been stabilized.

BPA would prepare a Stormwater Pollution Prevention Plan to meet the requirements of the EPA Construction General Permit (CGP February 16, 2012) at the direction of DEQ, which is in the process of revising the 1200-CA permits. The EPA Construction General Permit also requires that BPA construction projects comply with water quality standards set by the state in Oregon Administrative Rule 340 Division-41. The purpose of this plan is to ensure that non-point source pollution does not contaminate waters of the U.S., both during and after construction.

Section 404 of the Clean Water Act established a program to regulate the discharge of dredged or fill material into waters of the U.S., including wetlands. This includes excavation activities that result in the discharge of dredged material that could destroy or degrade waters of the U.S. Dredge and fill activities are controlled by a Section 404 permit process that is administered by the Corps in conjunction with state agencies that have been delegated this authority. In Oregon, the Oregon Department of State Lands (DSL) is the state agency with permitting authority over discharges of dredged or fill materials into waters of the state. Through its Removal-Fill Law, DSL requires a permit for removal, fill or alteration involving 50 cubic yards or more of material in any water of the state, including wetlands.

Oregon DSL looks at impacts for the entire project in determining mitigation requirements. In DSL's Removal-Fill Guide (Oregon DSL 2013), DSL acknowledges that creating numerous small mitigation sites along a linear corridor is impracticable and not necessarily ecologically desirable. Therefore, the State developed Oregon Administrative Rule 141-085-690 (12) to address the challenges of providing mitigation for linear projects that cross multiple watersheds. This administrative rule allows projects to be reviewed/ approved on a case-by-case basis, and establishes mitigation requirements.

BPA is in the process of preparing a joint permit application for this project, which would be reviewed by the Corps and DSL. BPA would not begin construction until after the application is approved by the Corps and DSL.

4.4 Wetlands and floodplains protection

The U.S. DOE mandates that impacts to floodplains and wetlands be assessed and alternatives for protection of these resources be evaluated in accordance with Compliance with Floodplain/Wetlands Environmental Review Requirements (10 CFR 1022.12) and Federal Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands). An evaluation of project impacts on floodplains and wetlands

is included in Section 3.5, Wetlands, floodplains, and groundwater of this EA. This EA serves as the notice of floodplain and wetlands actions as required under 10 CFR 1022.12(b).

4.5 Cultural and historic resources

Preserving cultural resources allows Americans to have an understanding and appreciation of their origins and history. A cultural resource is an object, structure, building, site or district that provides irreplaceable evidence of natural or human history of national, state or local significance. Cultural resources include National Landmarks, archaeological sites and properties listed (or eligible for listing) on the NRHP. In addition, American Indian Tribes are afforded special rights under certain laws, as well as the opportunity to voice concerns about issues under these laws when their aboriginal territory falls within a Proposed Action area. Laws and other directives for the management of cultural resources include the following:

- Antiquities Act of 1906 (16 USC § 431-433)
- Historic Sites Act of 1935 (16 USC § 461-467)
- NHPA (16 USC § 470 *et seq.*), as amended, inclusive of Section 106
- Archaeological Data Preservation Act of 1974 (16 USC § 469 a-c)
- Archaeological Resources Protection Act (ARPA) of 1979 (16 USC § 470 aa-mm), as amended
- Native American Graves Protection and Repatriation Act (NAGPRA) (25 USC § 3001 *et seq.*)
- Executive Order 13007, Indian Sacred Sites
- American Indian Religious Freedom Act of 1978 (42 USC § 1996, 1996a).

Section 106 of the NHPA requires federal agencies to consider the effects of their undertakings on historic properties and afford the Advisory Council on Historic Preservation a reasonable opportunity to comment. Historic properties are properties that are included in or that meet the criteria for the NRHP. If a federal agency plans to undertake a type of activity that could affect historic properties, it must consult with the appropriate State Historic Preservation Officer (SHPO) or Tribal Historic Preservation Officer to make an assessment of adverse effects on identified historic properties. BPA's 1996 government-to government agreement with 13 federally-recognized Native American Tribes of the Columbia River Basin provides guidance for the Section 106 consultation process with the Tribes.

The NHPA specifies that properties of traditional religious and cultural importance to a Native American Tribe (also known as Traditional Cultural Properties) may be determined to be eligible for inclusion on the NRHP. In carrying out its responsibilities under Section 106, a federal agency is required to consult with any Native American Tribe that attaches religious or cultural significance to any such properties. NAGPRA requires consultation with appropriate Native American Tribal authorities prior to the excavation of human remains or cultural items (including funerary objects, sacred objects, and cultural patrimony) on federal or tribal lands. NAGPRA recognizes Native American ownership interests in some human remains and cultural items found on federal lands and makes illegal the sale or purchase of Native American human remains, whether or not they derive from federal or Indian land. Repatriation, on request, to the culturally affiliated tribe is required for human remains.

To this end, BPA provided information about the Proposed Action and requested input on cultural resources from the following tribes: Confederated Tribes of Coos, Lower Umpqua and Siuslaw Indians, Confederated Tribes of the Grand Ronde, Confederated Tribes of the Siletz, the Coquille Indian Tribe, and the Cow Creek Band of Umpqua Tribe of Indians. BPA also conducted field surveys of the APE to identify potential impacts to cultural resources from the Proposed Action (see Section 3.7).

Cultural resource surveys were conducted along the entire transmission line right-of-way and the access road system as described in Section 3.7, Cultural resources. BPA is working with the Oregon SHPO to determine the appropriate mitigation measures at any sites that could be affected by the Proposed Action. Mitigation measures would likely include additional site characterization before construction, and on-site monitoring during construction.

If, during construction, previously unidentified cultural resources that would be adversely affected by the Proposed Action are found, BPA would follow all required procedures set forth in the NHPA, NAGPRA, ARPA, and the American Indian Religious Freedom Act.

4.6 Farmland Protection Policy Act

The Farmland Protection Policy Act (7 USC § 4201 *et seq*.) directs federal agencies to identify and quantify adverse impacts of federal programs on farmlands. The Act's purpose is to minimize the number of federal programs that contribute to the unnecessary and irreversible conversion of agricultural land to non-agricultural uses.

A large portion of the transmission line is located in or adjacent to agricultural land. The Proposed Action would occur almost entirely along the existing transmission line right-of-way (with the exception of new access roads) and within existing structure areas or access road rights-of-way. Evaluation of the project according to the criteria set forth in

the Act indicates the Proposed Action would comply with the Act and would have little long-term impact on area farmlands. As described in Section 3.1, Land use and recreation, approximately 225 acres of agricultural land would be temporarily impacted, primarily for temporary access roads. Of the affected acreage, 16.8 acres are designated as Prime Farmlands and 103.9 acres are designated as Farmlands of Statewide Importance. In addition, approximately 7 acres of land (primarily agricultural) would be permanently converted from existing land uses to new access roads, and 2 acres would be temporarily disturbed for temporary access roads. In the context of the total existing agricultural land in the three counties (788,190 acres), these impacts are low comparatively.

4.7 Coastal Zone Management Act

As an agency of the federal government, BPA would follow the guidelines of the CZMA (16 USC § 1451-1464) to ensure that the construction and operation and maintenance activities associated with the Proposed Action are, to the maximum extent practicable, consistent with the enforceable policies of the state management programs. Because the Proposed Action is within Oregon's coastal zone, which includes Coos, Curry, and Lane counties, BPA is subject to the coordination and consistency requirements of the CZMA.

The State of Oregon has an approved Coastal Zone Management Program, Oregon Coastal Management Program, which is implemented by the Oregon Department of Land Conservation and Development. The CZMA requires that "each federal agency activity within or outside the coastal zone that affects any land or water use or natural resource of the coastal zone shall be carried out in a manner which is consistent to the maximum extent practicable with the enforceable policies of approved state management programs" (16 USC 1456c(1)(A)). Oregon Coastal Management Program policies include the statewide planning goals, county and city comprehensive plans, and state natural resource laws.

BPA is designing and planning to implement the Proposed Action so that it would be consistent to the maximum extent practicable with the Oregon Coastal Management Program. BPA has notified Coos County, Curry County, Lane County, and the Oregon Department of Land Conservation and Development about the Proposed Action. BPA has requested signatures from Coos County, Curry County, and Lane County planning staff acknowledging consistency of the Proposed Action with local planning regulations. BPA has submitted a consistency statement to Oregon Department of Land Conservation and Development for review with the wetland joint permit application.

4.8 State and local plan and program consistency

As a federal agency, BPA is not required to comply with state and local land-use approvals or permits; however, BPA strives to meet or exceed these substantive standards and policies to the maximum extent practical.

Table 4-2 identifies state and local land use plans that guide development in and along the transmission line right-of-way. BPA would coordinate with state and local agencies to obtain the necessary access and alert them of potential impacts from the Proposed Action, such as to utilities or floodplains. BPA would also coordinate with ODOT for modification to or any new access roads requiring access off an ODOT-managed state roadway.

Table 4-2. State and local land use plans in the transmission line right-of-way

State		
Oregon Department of Land Conservation and Development	Oregon Statewide Planning Goals	These goals constitute the framework of Oregon's statewide program of land use planning. Construction of the transmission line outside of urban growth areas may need to be evaluated for compliance with these goals, specifically for Goal 15, Willamette River Greenway.
Oregon Parks and Recreation Department	2005-2014 Oregon Statewide Trails Plan	Oregon's official plan for recreational trail management for the next 10 years, serving as a statewide and regional information and planning tool to assist Oregon recreation providers (local, state, federal, and private) in providing trail opportunities and promoting access to Oregon´s trails and waterways.
	2008-2012 Oregon Statewide Comprehensive Outdoor Recreation Plan	Oregon's basic five-year plan for outdoor recreation. It provides information and recommendations to guide federal, state, and local units of government, as well as the private sector, in making policy and planning decisions.
State of Oregon	Oregon Revised Statutes (ORS)	The ORS establishes priorities for including land inside urban growth boundaries (UGBs); goal exceptions would need to demonstrate consistency with ORS 197.298.
County		
Coos County	Coos County Zoning and Land Development Ordinance	The zoning and land development ordinance regulates land uses and development standards for County zoning districts.
	Coos County Comprehensive Plan	Coos County's long-range policy document that guides growth and development outside of cities' UGBs.
Douglas County	Douglas County Land Use and Development Ordinance	The land use and development ordinance regulates land uses and development standards for County zoning districts.
	Douglas County Comprehensive Plan	Douglas County's long-range policy document that guides growth and development outside of cities' UGBs.
Lane County	Lane County Code	Chapter 10, Zoning, regulates land uses and development standards for County zoning districts.
	Lane County Comprehensive Plan	Lane County's long-range policy document that guides growth and development outside of cities' UGBs.
Regional		
Lane Council of Governments	Rivers to Ridges Vision and Strategies	Broad regional perspective guide to the development of a parks and open space vision for the Eugene-Springfield Metropolitan Area.
City		
City of Sutherlin	Sutherlin Comprehensive Plan	The comprehensive plan is a long-range policy document that guides growth and development in the City.
	Sutherlin Development Code	The development code regulates development throughout the City.
	Sutherlin Parks and Open Space Plan	The parks and open space plan outlines the City's vision for a comprehensive network of parks, open spaces, and multi-use pathways in the City.

4.9 Environmental justice

In February 1994, Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations, was released to federal agencies. This order states that federal agencies shall identify and address as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies and activities on minority populations and low-income populations.

The Proposed Action has been evaluated for potential disproportionately high environmental effects on minority and low-income populations and none were identified, as discussed in Section 3.9, Socioeconomics and public services.

4.10 Public health and safety

Several federal laws related to hazardous materials and toxic substances potentially apply to the Proposed Action. Various provisions of the Spill Prevention Control and Countermeasures Rule (40 CFR 112), the Comprehensive Environmental Response, Compensation, and Liability Act (42 USC § 9601 *et seq*.), and the Resource Conservation and Recovery Act (RCRA [42 USC § 6901 *et seq*.]) may apply to the Proposed Action, depending upon the exact quantities and types of hazardous materials stored on-site. RCRA, in particular, is designed to provide a program for managing and controlling hazardous waste by imposing requirements on generators and transporters of this waste. Small amounts of hazardous waste may be generated by the Proposed Action. Typical construction wastes may include motor and lubricating oils and cleaners. If wood poles are temporarily stored on site, approval of landing areas must be obtained, and compliance with federal, state, and local requirements for environmental protection, cleanup, and restoration of landing areas is required. These materials would be disposed of according to state law and RCRA. Solid wastes would be disposed of at an approved landfill or recycled.

The Federal Insecticide, Fungicide and Rodenticide Act (7 USC § 136 (a-y)) registers and regulates pesticides. BPA uses herbicides, a kind of pesticide, only in a limited fashion and under controlled circumstances. Herbicides are used on transmission line rights-of-way to control vegetation, including noxious weeds. When BPA uses herbicides, the date, dose, and chemical used are recorded and reported to state government officials. Herbicide containers are disposed of according to RCRA standards and consistent with BPA's *Transmission System Vegetation Management EIS/Record of Decision* (BPA, 2000); also BPA only uses EPA-approved herbicides.

If a hazardous material, toxic substance or petroleum product is discovered that may pose an immediate threat to human health or the environment, BPA requires the contractor to notify BPA's Contracting Officer's Technical Representative (COTR)

immediately. Other conditions, such as large dump sites, drums of unknown substances, suspicious odors, stained soil, etc., must also be reported immediately to the COTR. The COTR would coordinate with the appropriate personnel within BPA. In addition, the contractor would not be allowed to disturb such conditions until the COTR has given the notice to proceed.

The Safe Drinking Water Act (41 USC § 300f *et seq*.) is designed to protect the quality of public drinking water and its sources. BPA would comply with state and local public drinking water regulations. The Proposed Action would not affect any sole source aquifers or other critical aquifers, or adversely affect any surface water supplies.

4.11 Noise

The Noise Control Act of 1972 (42 USC § 4901 *et seq.*), as amended, sets forth a broad goal of protecting all people from noise that jeopardizes their health or welfare. The Act further states that federal agencies are authorized and directed, to the fullest extent consistent with their authority under federal laws administered by them, to carry out the programs within their control in such a manner as to further this policy. As described in Section 3.10, Noise, public health, and safety of this EA, the Proposed Action would have primarily temporary and low noise impacts, and mitigation measures are identified to further reduce noise impacts.

4.12 Air quality

The Clean Air Act, as revised in 1990 (42 USC § 4701), requires the EPA and delegated states to carry out a wide range of regulatory programs intended to ensure attainment of the NAAQS. Air quality impacts of the Proposed Action would be low, localized, and temporary, as discussed in Section 3.12, Air quality.

4.13 Greenhouse gases

Various federal and state mandates address the need to reduce greenhouse gas emissions:

- The Clean Air Act (as described in Section 3.13 and Section 4.12) is a federal law that establishes regulations to control emissions from large generation sources such as power plants; limited regulation of GHG emissions occurs through New Source Review permitting program.
- EPA has issued the Final Mandatory Reporting of Greenhouse Gases Rule (40 CFR 98) that requires reporting of GHG emissions from large sources. Under the rule, suppliers of fossil fuels or industrial GHGs, manufacturers of

vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHGs are required to submit annual reports to EPA (EPA, 2010b).

- Executive Orders 13423 and 13514 require federal agencies to measure, manage, and reduce GHG emissions by agency-defined target amounts and dates.

GHG emissions were calculated for activities that would produce GHG emissions as part of the Proposed Action: construction of the transmission line and ongoing annual operations and maintenance for the estimated 50-year operational life of the transmission line. GHG emissions would be below EPA's mandatory reporting threshold. The impact of the Proposed Action on greenhouse gases is discussed in Section 3.13, Greenhouse gases.

4.14 Federal Communications Commission

Federal Communications Commission (FCC) regulations require that transmission lines be operated so that radio and television reception are not seriously degraded or repeatedly interrupted. Further, the Commission regulations require that the operators of these devices mitigate such interference. There would likely be no interference with radio, television, or other reception as a result of the Proposed Action (see Section 3.10, Noise, public health, and safety). BPA would comply with FCC requirements relating to radio and television interference from the Proposed Action if any such interference occurs.

4.15 Federal Aviation Administration

As part of transmission line design, BPA seeks to comply with Federal Aviation Administration (FAA) procedures. The Administration requires BPA to submit its designs for approval if a proposed structure is taller than 200 feet from the ground, if a conductor is 200 feet above the ground or if any part of the proposed transmission line or its structure is within the approach path of an airport. Final locations of structures, structure heights, and conductor heights would be submitted to the FAA for approval.

Chapter 5. Persons, tribes, and agencies receiving the EA

The project mailing list contains over 400 stakeholders, including potentially interested or affected landowners; tribes; local, state, and federal agencies; public officials; interest groups; businesses; and libraries. They have directly received or have been given instructions on how to receive all project information made available so far, and they would have an opportunity to review the Draft and Final EAs. Specific entities (other than private persons) receiving this EA are listed below by category.

5.1 Federal agencies and officials

Bureau of Land Management
National Oceanic and Atmospheric Administration, National Marine Fisheries Service (NMFS)
U.S. Army Corps of Engineers
U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service
U.S. Representative Peter DeFazio
U.S. Senator Jeff Merkley
U.S. Senator Ron Wyden

5.2 Tribes and tribal groups

Confederated Tribes of Coos, Lower Umpqua and Siuslaw Indians
Confederated Tribes of the Grand Ronde
Confederated Tribes of the Siletz
Coquille Indian Tribe
Cow Creek Band of Umpqua Tribe of Indians

5.3 State agencies and officials

Oregon Department of Agriculture
Oregon Department of Fish and Wildlife
Oregon Department of Land Conservation and Development, Coastal Zone Management Program
Oregon Department of State Lands
Oregon Department of Transportation
Oregon Parks and Recreation Department
Oregon State Governor's Office
Oregon State Historic Preservation Office
Oregon State Representative Andy Olson
Oregon State Representative Bruce Hanna
Oregon State Representative Wayne Krieger
Oregon State Representative Tim Freen
Oregon State Representative Paul Holvey
Oregon State Representative Caddy McKeown
Oregon State Representative Phil Barnhart
Oregon State Representative John Lively
Oregon State Representative Nancy Nathanson

Oregon State Representative Val Hoyle
Oregon State Senator Jeff Kruse
Oregon State Senator Floyd Prozanski
Oregon State Senator Arnie Roblan
Oregon State Senator Lee Beyer
Oregon State Senator Chris Edwards
Oregon Watershed Enhancement Board
Oregon Water Resources Department

5.4 Local governments and utilities

Cities

City of Coquille, City Manager
City of Coquille, Public Works
City of Cottage Grove, City Manager
City of Cottage Grove, Community Development Director
City of Creswell, Planning Director
City of Eugene, Public Works Director
City of Eugene, City Manager
City of Eugene Councilor, George Brown
City of Eugene Councilor, Mike Clark
City of Eugene Councilor, Pat Farr
City of Eugene Councilor, Andrea Ortiz
City of Eugene Councilor, Alan Zalenka
City of Eugene Councilor, Betty Taylor
City of Eugene, Mayor's Office
City of Eugene, Water and Electric Board
City of Sutherlin, Mayor's Office
City of Sutherlin, Community Development Director

Utilities

Northwest Pipeline Corporation
Level 3 Communications, LLC
Emerald People's Utility District
Coos Curry Electric Cooperative, Inc.

Counties

Coos County, Administrator
Coos County, Department of Parks and Recreation
Coos County, Department of Planning
Coos County, Forester
Coos County, Road Department
Coos County, Water Resources
Coos County Commissioner, Robert Main
Coos County Commissioner, Fred Messerle
Coos County Commissioner, Cam Perry
Douglas County, Department of Parks
Douglas County, Department of Planning
Douglas County, Land Department
Douglas County, Public Works
Douglas County Commissioner, Doug Robertson
Douglas County Commissioner, Susan Morgan
Douglas County Commissioner, Douglas Laurance
Lane County Commissioner, Jay Bozievich
Lane County Commissioner, Rob Handy
Lane County Commissioner, Sid Leiken
Lane County Commissioner, Peter Sorenson
Lane County Commissioner, Faye Stewart
Lane County, Department of Public Works

5.5 Libraries

Bandon Public Library
Canyonville Public Library
Coos Bay Public Library
Coquille Public Library
Cottage Grove Public Library
Douglas County Library
Dora Public Library
Drain Public Library
Eugene Public Library
Fern Ridge Community Library
Flora M. Laird Memorial Library
Glendale Public Library
Hazel M. Lewis Library
Junction City Public Library
Lakeside Public Library
Lane County Library
Mapleton Public Library
Myrtle Point Public Library
Myrtle Creek Library
North Bend Public Library
Oakland Public Library
Reedsport Public Library
Southern Oregon University Library
Springfield Public Library
Sutherlin Library
Winston Public Library
Yoncalla Public Library

Chapter 6. Glossary

303(d), water quality limited waters	Under Section 303(d) of the Clean Water Act, states, territories, and authorized tribes are required to develop a list of water quality limited segments. Waters on the 303(d) list do not meet water quality standards, even after the minimum required levels of pollution control technology have been installed at the point sources of pollution.
A-weighted decibel (dBA)	A logarithmic measurement of sound based on the decibel but weighted to approximate the human perception of sound. Commonly used for measuring environmental and industrial noise levels.
Activity center	The nest tree or the location best describing the focal point of the activity for a northern spotted owl or pair of owls when the nest location is not known.
Alcove	Backwater or inlet associated with a stream channel.
Alluvial	Deposited by a stream or running water.
Anadromous	Fish species that breed in fresh water but live their adult life in the sea.
Anthropogenic	Of, relating to, or resulting from the influence of human beings on nature.
Background	More than 5 miles from the viewer.
Best Management Practice(s) (BMP[s])	Typically state-of-the-art technology designed to prevent or reduce impacts. They represent physical, institutional, or strategic approaches to environmental problems.
Biomass	Biological material from a living or recently living organism.
Bird diverter	Device placed on the transmission line to help birds see power lines and avoid potentially fatal collisions.
Blackout	The disconnection of the source of electricity from all the electrical loads in a certain geographical area. Brought about by an emergency forced outage or other fault in the generation, transmission, or distribution system serving the area.
Candidate species	Plants and animals native to the U.S. for which the USFWS or the NMFS has derived from sufficient information on biological vulnerability and threats to justify proposing to add them to the threatened and endangered species list, but the species has not yet been listed.
Candlestick circuit switcher	A candlestick circuit switcher brings circuit breaker capabilities into a circuit switcher.

Carbon dioxide equivalent	A measurement used to compare the global warming potential of a typical greenhouse gas, based on concentrations of carbon dioxide; global warming potential is defined as the relative measure of how much heat a greenhouse gas traps in the atmosphere by comparing the amount of heat trapped by a certain mass of the gas in question to the amount of heat trapped by a similar mass of carbon dioxide.
Carbon sequestration	The process through which agricultural and forestry practices remove carbon dioxide from the atmosphere and store it as sugars in trees, plants, and other vegetation.
Chaparral	An ecological community composed of shrubby plants adapted to dry summers and moist winters.
Compaction	The squeezing or compression of a soil mass.
Compensatory mitigation	Compensating for the impact by replacing or providing substitute resources away from the site of disturbance.
Comprehensive plan	An official document adopted by a local government setting forth its general policies regarding the long-term physical development of a city or other area.
Conductor	The wire cable strung between transmission structures through which electric current flows.
Corona	An electrical field around the surface of a conductor, insulator, or hardware caused by ionization of the surrounding air.
Counterpoise	A type of electrical ground that is not connected to earth. It is used when a normal earth ground cannot be used because of high soil resistance. It consists of a network of wires or cables (or a metal screen) parallel to the ground, suspended from a few centimeters to several meters above the ground. The counterpoise functions as one plate of a large capacitor, with the conductive layers of the earth acting as the other.
Critical habitat	Habitat essential to the conservation of an endangered or threatened species listed under the ESA that has been designated by the USFWS or the NMFS.
Cross arm	A high quality piece of wood mounted on a utility pole used to hold up power lines or other equipment.
Culvert down pipe	A pipe that directs water into a culvert.
Dampers	Devices attached to insulators in order to minimize vibration of the conductors in windy conditions.

Danger tree	Trees (or high-growing brush) in or alongside the transmission line right-of-way that are hazardous to the transmission line. These trees are identified by special crews and must be removed to prevent tree-fall into the line or other interference with the conductors. BPA's Construction Clearing Policy requires that trees be removed that meet either one of two technical categories: Category A is any tree that within 15 years will grow to within about 18 feet of conductors when the conductor is at maximum sag (212ºF) and swung by 6 pounds per square feet of wind (58 miles per hour); Category B is any tree or high-growing brush that after a year of growth will fall within about 8 feet of the conductor at maximum sag (176ºF) and in a static position.
Debitage	All waste material produced during lithic (i.e., stone) reduction and the production of chipped stone tools.
Drainage dip	A form of grading used to reverse grade to force water off a road or trail without the need for any other structure.
Easement	The property interest obtained by BPA to use land owned by another, for example, to construct, maintain, and operate a transmission line.
Ecoregion	An area defined by its geology, physiography, vegetation, climate, soils, land use, wildlife, and hydrology.
Endangered species	Plants or animals that are in danger of extinction through all or a significant portion of their ranges and that have been listed as endangered by the USFWS or the NMFS.
Environmental Justice Populations	Environmental Justice Populations are low-income and minority populations protected under Executive Order 12898 from disproportionate adverse effects of federal projects.
Erosion	The wearing away of soil or rock due to weather or the action of wind and water.
Essential Fish Habitat (EFH)	EFH is defined in the Magnuson-Stevens Act as "...those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity." The rules promulgated by the NMFS in 1997 and 2002 further clarify EFH with the following definitions: waters—aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate—sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary—the habitat required to support a sustainable fishery and the managed species' contribution to a healthy ecosystem; and spawning, breeding, feeding, or growth to maturity—stages representing a species' full life cycle.

Evolutionary Significant Unit (ESU)	A Pacific salmon population or group of populations that is substantially reproductively isolated from other salmon populations and that represents an important component of the evolutionary legacy of the species.
Farmlands of Statewide Importance	Farmland of statewide importance, or of local importance, is land other than prime farmland or unique farmland but that is also highly productive.
Fiber optic cable	A cable made of optical fibers that can transmit large amounts of information at the speed of light.
Finding of No Significant Impact (FONSI)	A document issued by a federal agency briefly presenting the reasons why an action for which the agency has prepared an EA has no potential to have a significant impact on the human environment and, thus, would not require preparation of an EIS.
Fluvial	Of, relating to, or inhabiting a river or stream.
Forb	Non-grass-like herbaceous plant.
Foreground	Within 0.25 to 0.5 mile of the viewer.
Gauss	A unit of measurement of a magnetic field B, which is also known as the "magnetic flux density" or the "magnetic induction".
Grass	Any of various plants having slender leaves characteristic of the grass family including grasses, sedges, and rushes.
Greenhouse gas	Greenhouse gases are chemical compounds found in the Earth's atmosphere that absorb and trap infrared radiation as heat.
Ground wire	A protective wire strung above the conductors on a transmission line to shield the conductors from lightning; also called shield wire or overhead ground wire.
Guy wire	Steel wire used to support or strengthen a structure.
Habitat	Habitat is an ecological or environmental area that is inhabited by a particular species of animal, plant, or other type of organism. It is the natural environment in which an organism lives, or the physical environment that surrounds a species population.
Hispanic/Latino	A self-designated classification for people whose origins are from Spain, the Spanish-speaking countries of Central or South America, the Caribbean, or those identifying themselves generally as Spanish, Spanish-American, etc. Origin is viewed as ancestry, nationality, or country of birth of the person or person's parents or ancestors. Hispanic/Latino persons may be of any race, White and non-White

Hog fuel	An unprocessed mix of coarse chips of bark and wood fiber. Pieces run between a coarse grade of less than 5" to a fine grade of less than 2".
In-Lieu Fee Program	This state run program is similar to a mitigation bank but may involve several projects and can accept funds prior to the work being completed. If a project results in impacts to wetlands and waters, the project can pay into the in-lieu fee program to mitigate for their impacts. The state then undertakes projects that replace lost wetlands and waters functions through restoration, creation or enhancement. The State of Oregon has set up an In-Lieu Fee Program for the Umpqua Foothills.
Insulators	A bell-shaped device, made of ceramic or other non-conducting material, used to prevent electricity from arcing from the conductors to the structures and traveling to the ground.
Junction box	A container for electrical connections, usually intended to conceal them from sight and deter tampering.
Jurisdictional wetlands and waters	Jurisdictional wetlands and waters are those wetlands and water bodies that are protected either under the federal Clean Water Act Section 404 or under state or local regulations.
Kilovolt (kV)	One thousand volts.
Line mile	The number of miles of transmission line.
Lithic scatter	A surface scatter of cultural artifacts and debris that consists entirely of lithic (i.e., stone) tools and chipped stone debris.
Maintenance Area	A former nonattainment area that meets EPA's promulgated standards for the same air quality criteria pollutant.
Median household income	Household income that is in the middle of the range of total household incomes. It is not the average.
Metric ton	A unit of mass equivalent to 1,000 kilograms or about 2,200 pounds.
Middle ground	Within 0.5 to 5 miles from the viewer.
Mitigation	Steps or measures taken to lessen the potential impacts predicted for a resource. They may include reducing the impact, avoiding it completely, or compensating for the impact. Some mitigation, such as adjusting the location of a structure to avoid a special resource, is taken during the design and location process. Other mitigation may be done during construction, such as measures to reduce noise, or after construction, such as reseeding access roads with desirable grasses to help prevent the proliferation of weeds.

Mitigation bank	A mitigation bank is an area formally established for the restoration, creation, enhancement, or preservation of a wetland, stream, or habitat conservation area, and which is designed to offset expected adverse impacts to similar nearby ecosystems. The goal is to replace the exact function and value of the specific wetland habitats that would be adversely affected by a proposed project. Mitigation Credits (see below) can be purchased at the bank to offset impacts.
Mitigation credit	Mitigation Credits are the units of exchange and are defined as the ecological value associated with 1-acre of a wetland or ecosystem and the linear distance of a stream functioning at the highest possible capacity within the service area of the bank. Credits are evaluated by a Mitigation Bank Review Team.
Mustelid	A member of Mustelidae, a family of carnivorous mammals, such as weasels.
National Ambient Air Quality Standards (NAAQS)	Under the Clean Air Act, EPA specifies maximum allowable concentrations for each of the six criteria pollutants (carbon monoxide, particulate matter, ozone, sulfur dioxide, lead, and nitrogen dioxide). For each of the six criteria pollutants, the NAAQS represent a maximum concentration above which adverse effects on human health may occur.
Neotropical	Of or denoting a zoogeographical region consisting of South America and North America south of the tropic of Cancer.
Noise-sensitive land use	Common noise-sensitive land uses include residences, parks, schools, and churches.
Nonattainment Area	An area that fails to meet the standards established by EPA for an air quality criteria pollutant.
Obsidian debitage	Obsidian is a naturally formed volcanic glass that was an important part of the material culture of Pre-Columbian Mesoamerica. Debitage is all waste material produced during lithic (i.e., stone) reduction and the production of chipped stone tools.
Oregon State Sensitive Species	This term refers to naturally-reproducing fish and wildlife species, subspecies, or populations which are facing one or more threats to their populations and habitats.
Outage	Events caused by a disturbance on the electrical system that requires BPA to remove a piece of equipment or a portion or all of a transmission line from service. The disturbances can be either natural or human-caused.

Palustrine	Palustrine systems include any inland wetland which lacks flowing water, contains ocean-derived salts in concentrations of less than 0.05%, and is non-tidal. Palustrine wetlands are further divided into palustrine emergent (dominated by herbaceous plants), palustrine scrub-shrub (dominated by shrubs and saplings), palustrine forested (dominated by trees) or palustrine open water (little if any vegetation).
Particulate matter (PM)	A criteria air pollutant regulated under the Clean Air Act. Particulate matter includes dust, soot, and other tiny bits of solid materials that are released into and move around in the air.
Passerine	A bird of the order Passeriformes, known as perching birds or songbirds.
Payment-In-Lieu Program	The State of Oregon manages a Payment-in-lieu program for small wetlands and waters impacts where self-performed mitigation is not practical. The State uses the funds from the sale of Mitigation Credits to fund small restoration, creation, or enhancement projects. This program cannot be used to satisfy Corps of Engineers mitigation requirements.
Per capita income	Average income per person obtained by dividing aggregate income (sum of the income of all households in a given geographic area) by the total population of an area.
Physiographic province	A geographic region in which climate and geology have given rise to an array of landforms different from those of surrounding regions.
PM-10	A measure of particles in the atmosphere with a diameter of less than or equal to 10 micrometers. PM-10 is one of the six criteria pollutants regulated under the Clean Air Act.
Potential transformer	Potential transformers are electronic devices that are used to measure current and voltage circulating in electrical power systems. They are designed to control circuitry of high voltages by making use of a highly accurate transformation ratio between magnitude and phase.
Primary constituent elements	The physical and biological features needed for life and successful reproduction of the species.
Prime Farmlands	A designation assigned by U.S. Department of Agriculture defining land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops.
Propagule	A plant part that becomes detached from the rest of the plant and grows into a new plant.

Recruitment habitat	Habitat (for example, a stand of trees) that is capable of becoming, within a specified period of time, an ecological or environmental area that is inhabited by a particular species of animal, plant, or other type of organism.
Right-of-way	The ability to pass over land belonging to another entity for a certain purpose, such as land used for a road, electric transmission line, pipeline, etc.
Riparian	Riparian areas have distinctive soil and vegetation between a stream or other body of water and the adjacent upland, including wetlands.
Riser	A tube, rack, shaft, or conduit used for protection and routing of electrical wiring.
Salmonids	Of, or belonging to, or characteristic of the family Salmonidae which includes salmon, trout, and whitefish.
Scarify	The act of breaking up soil that has been compacted.
Shrub	A woody plant usually less than 15 feet tall with multiple stems. Some plants can be either trees or shrubs depending on growing conditions.
Slough	A stagnant swamp, march, bog, or pond, especially as part of a bayou, inlet, or backwater.
Spark-discharge activity	Electric sparks between electrical separations (gaps) in the metal parts of a transmission line. Spark discharges can create noise and possible electromagnetic interference. Spark-discharge activity with transmission lines is often associated aging connecting hardware.
Special-status species	Plant or animal species in any of the following categories: threatened or endangered species, proposed threatened or endangered species, candidate species, state listed species, BLM sensitive species, BLM assessment species
Species of Concern (SOC)	An informal term not defined in the federal Endangered Species Act that refers to taxa which the USFWS is reviewing for consideration as Candidates for listing under the ESA. This term commonly refers to species that are declining or appear to be in need of conservation.
State critical	State critical sensitive species are imperiled with extirpation from a specific geographic area of the state because of small population sizes, habitat loss or degradation, and/or immediate threats. Critical species may decline to point of qualifying for threatened or endangered status if conservation actions are not taken.

State vulnerable	State vulnerable sensitive species are facing one or more threats to their populations and/or habitats. Vulnerable species are not currently imperiled with extirpation from a specific geographic area or the state but could become so with continued or increased threats to populations and/or habitats.
Structure	Refers to a type of support used to hold up transmission or substation equipment. Structures can be made of wood or steel, depending on the size of the line or equipment. In this EA, the term structure refers to wood-pole structures.
Substation	The fenced site that contains the terminal switching and transformation equipment needed at the end of a transmission line so that energy can be supplied to customers.
Succession(al)	Replacement of one kind of community by another kind; the progressive changes in vegetation and animal life that may culminate in the climax.
System reliability	The ability of a power system to provide uninterrupted service, even while that system is under stress.
Take	Under the ESA, take means to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering.
Tensioning sites	Tensioning sites are used for pulling and tightening the conductor and fiber optic cable to the correct tension once they are mounted on the transmission structures. Tensioning sites are located within the right-of-way where possible or just outside of the right-of-way where the line makes a turn or angle.
Threatened species	Any plants or animals that are likely to become endangered species within the foreseeable future throughout all or a significant portion of their ranges and which have been listed as threatened by the USFWS or the NMFS.
Transmission line	The structures, insulators, conductors, and other equipment used to transmit electrical power from one point to another. In this document, the term transmission line also includes the associated access roads.

Travel route	Either a route through farm fields (temporary travel route) or existing non-public roads in good condition that may require improvement for use (permanent travel route).
Vegetation management	BPA's policies and protocols, including the *Transmission System Vegetation Management Program Final EIS/Record of Decision* (BPA 2000), that guide methods of controlling vegetation within and near electric power facilities. Vegetation that is controlled includes tall-growing species that pose a hazard to power lines, as well as noxious weeds. It also includes methods to encourage the growth of low-growing, desirable species that resist noxious weed invasion.
View	A scene observed from a given vantage point.
Viewers	Viewers include those people who have views of the transmission line. For this project, they include residents, park visitors, employees, motorists (drivers and passengers), rail passengers, bicyclists, and pedestrians.
Visually sensitive locations	Visually sensitive locations have been identified based on their visual quality, uniqueness, cultural significance, or viewer characteristics (Sevi, 1986). For this project, visually sensitive locations include residences and parks.
Voltage (or volt)	The driving force that causes a current to flow in an electric circuit. Voltage and volt are often used interchangeably.
Wetland	Wetlands, for the purposes of the Clean Water Act, must meet a three-parameter approach that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils subject to saturation/inundation). All three parameters must be present, under normal circumstances, and the wetland must be connected to or have a significant nexus with "waters of the U.S." for an area to be designated as a jurisdictional wetland under the Clean Water Act.
Zoning	Dividing mapped areas into zones or sections reserved for different purposes, such as residences, businesses, manufacturing, etc.

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Appendix A. Supplemental wildlife information

Table 1. Common wildlife species observed in vicinity of transmission line

Scientific name	Common name
Amphibian	
Rana aurora	Red-legged frog[††]
Hyla regilla	Pacific treefrog[†]
Dicamptodon ensatus	Pacific giant salamander[††]
Bird	
Accipiter cooperii	Cooper's hawk[††]
Accipiter striatus	Sharp-shinned hawk[††]
Aegolius acadicus	Northern saw-whet owl[††]
Aix sponsa	Wood duck[††]
Anas platyrhynchos	Mallard[††]
Ardea herodias	Great blue heron[††]
Bombycilla cedrorum	Cedar waxwing[††]
Bubo virginianus	Great horned owl[††]
Buteo jamaicensis	Red-tailed hawk[†]
Carduelis tristis	American goldfinch[††]
Carpodacus purpureus	Purple finch[††]
Cathartes aura	Turkey vulture[††]
Catharus guttatus	Hermit thrush[††]
Catharus ustulatus	Swainson's thrush[††]
Certhia americana	Brown creeper[††]
Chaetura vauxi	Vaux's swift[††]
Chamaea fasciata	Wrentit[††]
Chordeiles minor	Common nighthawk[††]
Coccothraustes vespertinus	Evening grosbeak[††]
Colaptes auratus	Northern flicker[††]
Columba fasciata	Band-tailed pigeon[††]
Contopus cooperi	Olive-sided flycatcher[††]
Corvus brachyrhynchos	American crow[†]
Corvus corax	Common raven[†]
Cyanocitta stelleri	Steller's jay[†]
Dendroica nigrescens	Black-throated gray warbler[††]
Dendroica occidentalis	Hermit warbler[††]
Dendroica petechia	Yellow warbler[††]
Dryocopus pileatus	Pileated woodpecker[††]
Empidonax difficilis	Pacific-slope flycatcher[††]
Empidonax hammondii	Hammond's flycatcher[††]
Empidonax traillii adastus	Willow flycatcher[††]
Falco peregrinus	Peregrine falcon[††]

Scientific name	Common name
Glaucidium gnoma	Northern pygmy-owl[†]
Haliaeetus leucocephalus	Bald eagle[††]
Hirundo rustica	Barn swallow[††]
Ixoreus naevius	Varied thrush[†]
Junco hyemalis	Dark-eyed junco[†]
Lophodytes cucullatus	Hooded merganser[††]
Loxia curvirostra	Red crossbill[††]
Melospiza melodia	Song sparrow[†]
Mergus merganser	Common merganser[††]
Oreortyx pictus	Mountain quail[††]
Otus kennicottii	Western screech-owl[††]
Pandion haliaetus	Osprey[††]
Parus atricapillus	Black-capped chickadee[†]
Parus rufescens	Chestnut-backed chickadee[††]
Perisoreus canadensis	Gray jay[†]
Pheucticus melanocephalus	Black-headed grosbeak[††]
Picoides villosus	Hairy woodpecker[††]
Pipilo maculates	Spotted towhee[††]
Piranga ludoviciana	Western tanager[††]
Psaltriparus minimus	Bushtit[††]
Regulus satrapa	Golden-crowned kinglet[††]
Selasphorus rufus	Rufous hummingbird[†]
Sialia Mexicana	Western bluebird[††]
Sitta Canadensis	Red-breasted nuthatch[††]
Sphyrapicus ruber	Red-breasted sapsucker[††]
Strix varia	Barred owl[†]
Tachycineta bicolor	Tree swallow[††]
Tachycineta thalassina	Violet-green swallow[††]
Troglodytes troglodytes	Winter wren[†]
Turdus migratorius	American robin[†]
Vermivora celata	Orange-crowned warbler[††]
Vireo gilvus	Warbling vireo[††]
Vireo huttoni	Hutton's vireo[††]
Wilsonia pusilla	Wilson's warbler[††]
Zonotrichia leucophrys	White-crowned sparrow[††]

Scientific name	Common name
Mammal	
Canis latrans	Coyote††
Castor canadensis	American beaver††
Cervus elaphus roosevelti	Roosevelt elk††
Felis concolor	Mountain lion††
Felis rufus	Bobcat††
Martes americana	American marten††
Mustela vison	Mink††
Myotis evotis	Long-eared myotis
Myotis thysanodes	Fringed myotis
Myotis yumanensis	Yuma myotis††
Neotoma cinerea	Bushy-tailed woodrat††
Neotoma fuscipes	Dusky-footed woodrat††
Odocoileus hemionus columbianus	Columbian black-tailed deer††
Tamias townsendii	Townsend's chipmunk††
Tamiasciurus douglasii	Douglas' squirrel†
Urocyon cinereoargenteus	Common gray fox††
Ursus americanus	Black bear††
Mollusk	
Megomphix hemphilli	Oregon megomphix††
Prophysaon coeruleum	Blue-gray taildropper††
Prophysaon dubium	Papillose taildropper
Reptile	
Sceloporus occidentalis	Western fence lizard††

Source: Compiled from field observations "†" (Turnstone, 2012) and the BLM GeoBOB database "††" (BLM, 2008b).

Table 2. Threatened, endangered, candidate, and special-status wildlife species in Coos, Douglas and Lane counties

Species	Federal and state status[1]	Habitat	Likelihood of occurrence in the transmission line
Bat Species			
Pallid bat (*Antrozous pallidus pacificus*)	FSOC, SV	Cliffs and structures provide roosting habitat.	Species was not observed during field investigation and there are no documented occurrences within 5 miles of the transmission line; potential foraging habitat exists and the species may use transmission line.
Townsend's western big-eared bat (*Corynorhinus townsendii townsendii*)	FSOC, SCr	Nest and roost under ridges and in old buildings.	No documented occurrences within the transmission line; however, four documented sites are located within 2 miles of the transmission line, found nesting under bridges and in a church; therefore, species is likely to use the transmission line as foraging habitat.
Silver-haired bat (*Lasionycteris noctivagans*)	FSOC, SV	Nest and roost under tree bark in conifer and mixed conifer/hardwood forests; forage above the canopy, over open meadows, and in the riparian zone along water courses.	Species was not observed during field investigation and there are no documented occurrences within 5 miles of the transmission line; however, forests provide potential roosting habitat and foraging habitat is present within transmission line. Species is likely present within the transmission line.
Fringed myotis bat (*Myotis thysanodes*)	FSOC, SV	Roost in crevices in buildings, rocks, cliff faces, bridges, and in decadent trees and snags; forage within forest interior and along forest edges.	No documented occurrences in transmission line; however three populations exist within 2 miles of the transmission line; likely to use the transmission line as foraging and roosting habitat.
Long-legged myotis bat (*Myotis volans*)	FSOC, SV	Roost in trees, rock crevices, under bark, stream banks, and buildings; forage near trees and cliffs, over water, and in wooded openings.	No documented occurrences in transmission line; however, there is one documented observation of one male and five females within 2 miles of the transmission line; likely to use the transmission line as foraging habitat.
Other Mammal Species			
Red tree vole (*Arborimus longicaudus*)	FC, SV	Mature conifer forests provide potential habitat; uncommon, lives only in conifers.	Species was not observed during field investigation and there are no documented occurrences within 5 miles of the transmission line; however, potential habitat exists and the species may use transmission line.
North American wolverine (*Gulo gulo luscus*)	FC	Restricted to high elevations.	Species was not observed during field investigation, and there are no documented occurrences within 5 miles of the transmission line. Species is unlikely to use the transmission line.
Fisher (*Martes pennant; West Coast DPS2*)	FC, SCr	Associated with areas of high cover and structural complexity in large tracts of mature and old-growth forests.	Species was not observed during field investigation and there are no documented occurrences within 5 miles of the transmission line. Species may be present within the transmission line within Douglas County.

Species	Federal and state status[1]	Habitat	Likelihood of occurrence in the transmission line
Bird Species			
Northern goshawk (*Accipiter gentilis*)	FSOC, SV	Nest in various forest types; preys on large birds, squirrels, rabbits, and hares.	Species was not observed during field investigation, and there are no documented occurrences within 5 miles of the transmission line; however, mature conifer or mixed conifer stands provide potential nesting habitat and foraging habitat occurs in transmission line, and migration through transmission line may occur in spring and fall.
Western burrowing owl (*Athene cunicularia hypugaea*)	FSOC, SCa	Breed and forage in open, well-drained areas, such as native prairie, pastures, hayfields, and fallow fields; preys on arthropods, small mammals, birds, amphibians and reptiles.	Species was not observed during field investigation, and there are no documented occurrences within 5 miles of the transmission line. Suitable breeding and foraging habitat is present within the transmission line.
Upland sandpiper (*Bartramia longicauda*)	FSOC, SCr	Nest and forage in native prairie and dry grasslands	Species was not observed during field investigation, and there are no documented occurrences within 5 miles of the transmission line; however, suitable habitat is present within the transmission line in Coos County.
Marbled murrelet (*Brachyramphus marmoratus*)	FT	Nest in older conifer stands of the coast range; forage at sea. Designated critical habitat within the transmission line.	Species was not observed during field investigation, and no documented occurrences are within in transmission line; however, 29 forest stands within 1/4 mile of the transmission line have been identified as suitable habitat. 10 of the 29 stands are documented as occupied. Species is likely present within the transmission line.
Aleutian cackling goose (*Branta canadensis leucopareia*)	FDL	Forage in floodplains and other open areas.	Species was not observed during field investigation. Flocks may use the floodplains area along transmission line; floodplains and wetland areas provide potential habitat during spring and fall migrations. Species is likely present within the transmission line in Coos County.
Olive-sided flycatcher (*Contopus cooperi*)	FSOC, SV	Open woodland and riparian areas provide potential habitat.	Species was not observed during field investigation, and there are no documented occurrences in the transmission line; however, nine observations have been verified over four sites located within 2 miles north of the transmission line in Coos County. Species likely to use the transmission line.
Snowy egret (*Egretta thula*)	SV	Forage in small ponds on fish, crustaceans, insects and small reptiles.	Species was not observed during field investigation, and there are no documented occurrences within 5 miles of the transmission line. Suitable habitat is present within the transmission line.
Streaked horned lark (*Eremophila alpestris strigata*)	FC, SCr	Nest and forage in sparsely vegetated and bare ground habitats, such as grass fields, open pastures, mudflats, and on gravel roads.	Species was not observed during field investigation, and there are no documented occurrences in transmission line. Suitable habitat is present within the transmission line.

Species	Federal and state status[1]	Habitat	Likelihood of occurrence in the transmission line
American peregrine falcon (*Falco peregrinus anatum*)	SV	Nest on cliff scrapes or less commonly in large tree hollows; hunt on the wing in all habitat types	No known nesting sites within the transmission line; however, three observations have been documented within 2 miles of the transmission line along the East Fork Coquille River; likely to forage in open areas in transmission line.
Bald eagle (*Haliaeetus leucocephalus*)	FDL	Associated with many habitats, including Westside grasslands, agriculture, pastures, Westside oak and Douglas-fir forests, urban and mixed environs, open water, herbaceous wetlands, Westside riparian wetlands, etc. (Johnson and O'Neil, 2001).	Nine documented observations and seven ***bald eagle management areas*** are located within 2 miles of the transmission line; one management area is within 0.25 mile of the transmission line; it is very likely that bald eagles use the transmission line year round.
Harlequin duck (*Histrionicus histrionicus*)	FSOC	Breed along fast-moving mountain streams within closed forest canopy; forage in stream.	Species was not observed during field investigation and there are no documented occurrences within 5 miles of the transmission line. Breeding is unlikely to occur in transmission line; however, they are likely to occur in transmission line.
Yellow-breasted chat (*Icteria virens*)	FSOC, SCr	Associated with riparian wetland habitats, agriculture, pastures, oak and Douglas-fir forests (Johnson and O'Neil, 2001).	Species was not observed during field investigation, and there are no documented occurrences within 5 miles of the transmission line; however, the species is likely to breed in dense riparian areas in transmission line.
Acorn woodpecker (*Melanerpes formicivorus*)	FSOC, SV	Nest and forage in oak habitat.	Species was observed during field investigations and oak savanna and woodlands may provide potential habitat in transmission line. Species likely to be year-round residents of the transmission line.
Lewis' woodpecker (*Melanerpes lewis*)	FSOC, SCr	Nest in decayed tree or snag cavities; forage in open forests with brushy understories.	Species was not observed during field investigation, and there are no documented occurrences within 5 miles of the transmission line; however, breeding habitat includes riparian woodlands and would most likely be found nesting in cavities in cottonwoods. Species is likely to use transmission line.
White-headed woodpecker (*Plcoides albolarvatus*)	FSOC, SCr	Forage and excavate cavity nests in Ponderosa pine forests.	Species was not observed during field investigation, and there are no documented occurrences within 5 miles of the transmission line; however, species is likely to use Ponderosa stands within transmission line in Douglas County.
Oregon vesper sparrow (*Pooecetes gramineus affinis*)	FSOC, SCr	Nest and forage in upland prairie, grasslands, and savannah habitat types with vegetation less than 18" tall.	One documented observation of one individual singing in a tree within 2 miles of the transmission line near Creswell. Suitable habitat exists within the transmission line; therefore, species is likely to use transmission line.

Species	Federal and state status[1]	Habitat	Likelihood of occurrence in the transmission line
Purple martin (*Progne truei*)	FSOC, SCr	Nest in tree cavities or nesting boxes; forage in open areas near water.	One observation within 2 miles of transmission line was recorded in 1971 (ORBIC, 2012). Potential nesting and foraging habitat exist within transmission line; therefore, species likely to be present year-round within transmission line.
Northern spotted owl (*Strix occidentalis caurina*)	FT	Nest and forage in large expanses of contiguous mature conifer forests with dense canopy.	Twenty-five activity centers are located within one home range of the transmission line. Species likely to be using forested stands adjacent to the transmission line. The transmission line intersect designated critical habitat.
Reptiles and Amphibians			
Northern Pacific pond turtle (*Actinemys marmorata marmorata*)	FSOC, SCr	Nest in dry, well-drained soils in open areas with grass and herbaceous vegetation with trees and shrubs in close proximity. Associated with conifer hardwood forests, grasslands, pastures, oak and dry Douglas-fir forest and woodlands, open water, rivers, and streams, and herbaceous wetlands.	One documented occurrence within the transmission line and 14 documented populations have been recorded near but outside of the transmission line. Ponds and low-to-moderate energy streams provide potential habitat in the transmission line; therefore, species is likely to use the transmission line.
Coastal tailed frog (*Ascaphus truei*)	FSOC, SV	Inhabits cold, clear, rocky streams in wet forests, and not inhabit ponds or lakes.	Species was not observed during field investigation, and no documented occurrences within 5 miles of the transmission line; however, cold, high gradient streams in forested areas in the transmission line provide potential habitat. Species likely to use transmission line.
Oregon slender salamander (*Batrachoseps wrighti*)	FSOC, SV	Inhabit moist Douglas fir and mixed maple, hemlock and red cedar woodlands on the western slopes of the Cascade Mountains; dependent on mature and old-growth stands, commonly in large downed logs.	Species was not observed during field investigation, and there are no documented occurrences within 5 miles of the transmission line. Suitable habitat may be present within the transmission line; however, the species is unlikely to occur within the transmission line because it is located outside of its range.
Painted turtle (*Chrysemys picta*)	SCr	Nest in sandy or grassy areas near water. Associated with agriculture, pastures, oak and dry Douglas fir forest and woodlands, open water, rivers, and streams, and herbaceous wetlands.	No documented occurrences in transmission line, but one population documented within 2 miles east of Alvey Substation. Species likely to use transmission line.

Species	Federal and state status[1]	Habitat	Likelihood of occurrence in the transmission line
Common kingsnake (*Lampropeltis getula*)	FSOC, SV	Inhabits a wide variety of habitats, including forest, woodland, chaparral, grassland, marshes, and farmland.	Species was not observed during field investigation, and there are no documented occurrences in transmission line, but one population is documented over 1 mile east of the transmission line in Douglas County. Species likely to use transmission line in Douglas County.
California mountain kingsnake (*Lampropeltis zonata*)	SV	Inhabits diverse habitats including coniferous forest, oak-pine woodlands, riparian woodland, and chaparral.	Species was not observed during field investigation, and there are no documented occurrences within 5 miles of the transmission line. Suitable habitat is present within the transmission line in Douglas County, and populations may occur within the transmission line.
Del Norte salamander (*Plethodon elongates*)	FSOC, SV	Associated with ***talus*** or rocky substrates and with downed woody debris in areas with nearby rock substrates in forested stands with high canopy closure (≥60%).	Species was not observed during field investigation, and there are no documented occurrences within 5 miles of the transmission line. Suitable habitat is present within the transmission line and the species may be present in the transmission line.
Northern red-legged frog (*Rana aurora aurora*)	FSOC, SV	Breed in cool-water ponds, lake edges, or slow-moving streams; associated with grasslands, agriculture, and pastures.	Species was not observed during field investigation, and there are no documented occurrences in transmission line. Northern red-legged frogs are documented within 2 miles of the transmission line in valley and coastal foothills; therefore, lakes, ponds, and low energy streams provide potential habitat in transmission line. Species likely to use transmission line.
Foothill yellow-legged frog *(Rana boylii)*	FSOC, SCr	Inhabit small, ephemeral streams to large rivers and within many types of plant communities, including valley-foothill hardwood, coastal scrub, chaparral, valley-foothill riparian, hardwood-conifer, ponderosa pine, and wet meadow.	Species was not observed during field investigation, and there are no documented occurrences in the transmission line. One historical population within 0.25 mile of the transmission line in Coos County last documented in 1956 (ORBIC, 2012). Small to large streams in the transmission line provide potential habitat. Species likely to use transmission line.
Cascades frog (*Rana cascadae)*	FSOC, SV	Inhabit wet mountain areas in open coniferous forests to near timberline, including small streams, small pools in meadows, lakes, bogs, ponds, and marshy areas near streams with no predatory fishes.	Species was not observed during field investigation, and there are no documented occurrences within 5 miles of the transmission line. Suitable habitat may be present within the transmission line; however, the species is unlikely to use the transmission line because it is outside the species range.

Species	Federal and state status[1]	Habitat	Likelihood of occurrence in the transmission line
Oregon spotted frog (*Rana pretiosa)*	FC, SC	Inhabit shallow water in wet meadows or stream/pond edges with abundant aquatic vegetation for breeding; associated with grasslands, agriculture, and pastures.	Species was not observed during field investigation, and there are no documented occurrences within 5 miles of the transmission line. Suitable habitat may be present within the transmission line; however, the transmission line is located outside the known range of the species.
Southern torrent salamander *(Rhyacotriton variegates)*	FSOC, SV	Inhabits cold, clear streams, seepages, or waterfalls and their corresponding slash zones.	No documented occurrences in transmission line, but found within 2 miles of the transmission line in seeps and talus slopes. Well-shaded, cold, small streams that may provide habitat occur in transmission line. Species likely to use transmission line.
Invertebrates			
Taylor's checkerspot (*Euphydrays editha taylori*)	FC	Inhabit open grasslands and *oak balds* where food plants for larvae and nectar sources for adults are available.	Species was not observed during field investigation, and there are no documented occurrences within 5 miles of the transmission line. Suitable habitat may be present within the transmission line; however, the species is unlikely to use the transmission line.
Fender's blue butterfly (*Icaricia icarioides fender*)	FE	Inhabit upland prairies of the Willamette Valley; breeding areas associated with Kincaid's lupine.	No individuals were observed in within the transmission line during field investigations. Species likely to use the upland and wet prairies of the Willamette Valley as foraging habitat in Lane County within Line Miles 1&2, which are located on the margin of the southern-most current population distribution.
Mardon skipper (*Polites mardon*)	FC	Inhabit native, fescue-dominated grasslands.	Species was not observed during field investigation, and there are no documented occurrences within 5 miles of the transmission line. Suitable habitat is present within the transmission line; therefore, mardon skippers may use the transmission line.
Oregon silverspot butterfly (*Speyeria zerene hippolyta*)	FT	Inhabit one of three types of grasslands: coastal salt spray meadows, stabilized dunes, and montane meadows.	Species was not observed during field investigation, and there are no documented occurrences within 5 miles of the transmission line; furthermore, suitable habitat is not present within the transmission line.

1. FC = Federal candidate species; FDL = Federal delisted; FE = Federal endangered species; FSOC = Federal species of concern; FT = Federal threatened species; SCa = State candidate species; SCr = State critical; SV = State vulnerable
2. DPS = distinct population segment

Table 3. Impacts from the Proposed Action to threatened, endangered, candidate, and special-status wildlife species in Coos, Douglas, and Lane counties

Species	Federal and State Status[1]	Impacts from Proposed Action	Reason for Impact Status
Bats			
Pallid bat (*Antrozous pallidus pacificus*)	Federal SOC, State vulnerable	Low	A,B,F,G (D)
Townsend's western big-eared bat (*Corynorhinus townsendii townsendii*)	Federal SOC, State critical	Low	A,C,F,G (D)
Silver-haired bat (*Lasionycteris noctivagans*)	Federal SOC, State vulnerable	Low	A,B,F,G (D)
Fringed myotis bat (*Myotis thysanodes*)	Federal SOC, State vulnerable	Low	A,C,F,G (D)
Long-legged myotis bat (*Myotis volans*)	Federal SOC, State vulnerable	Low	A,C,F,G (D)
Other Mammals			
Red tree vole (*Arborimus longicaudus*)	Federal candidate, State vulnerable	Low	A,B,F,G (D)
Fisher (*Martes pennant; West Coast DPS2*)	Federal candidate, State Critical	Low	A,B,E,F,G
Birds			
Northern goshawk (*Accipiter gentilis*)	Federal SOC, State vulnerable	Low	A,B,F,G (D)
Western burrowing owl (*Athene cunicularia hypugaea*)	Federal SOC, State candidate	Low	A,B,F,G (D)
Upland sandpiper (*Bartramia longicauda*)	Federal SOC, State critical	Low	A,B,F,G (D)
Marbled murrelet (*Brachyramphus marmoratus*)	Federal threatened	Moderate	F,G (D)
Aleutian cackling goose (*Branta canadensis leucopareia*)	Federal DL	Low	A,B,F,G (D)
Olive-sided flycatcher (*Contopus cooperi*)	Federal SOC, State vulnerable	Low	A,C,F,G (D)
Snowy egret (*Egretta thula*)	State vulnerable	Low	A,B,F,G (D)
Streaked horned lark (*Eremophila alpestris strigata*)	Federal candidate, State critical	Low	A,B,F,G (D)
American peregrine falcon (*Falco peregrinus anatum*)	State vulnerable	Low	A,C,F,G (D)
Bald eagle (*Haliaeetus leucocephalus*)	Federal DL	Low	A,F,G (D)
Harlequin duck (*Histrionicus histrionicus*)	Federal SOC	Low	A,C,F,G (D)
Yellow-breasted chat (*Icteria virens*)	Federal SOC, State critical	Low	A,C,F,G (D)
Acorn woodpecker (*Melanerpes formicivorus*)	Federal SOC, State vulnerable	Low	A,B,F,G (D)
Lewis' woodpecker (*Melanerpes lewis*)	Federal SOC, State critical	Low	A,B,F,G (D)
White-headed woodpecker (*Plcoides albolarvatus*)	Federal SOC, State critical	Low	A,B,F,G (D)

Species	Federal and State Status[1]	Impacts from Proposed Action	Reason for Impact Status
Oregon vesper sparrow (*Pooecetes gramineus affinis*)	Federal SOC, State critical	Low	A,C,F,G (D)
Purple martin (*Progne truei*)	Federal SOC, State critical	Low	A,C,F,G (D)
Northern spotted owl (*Strix occidentalis caurina*)	Federal threatened	Low	Habitat not impacted, A,F,G (D)
Reptiles and Amphibians			
Northern Pacific pond turtle (*Actinemys marmorata marmorata*)	Federal SOC, State critical	Low	A,F,G (D)
Coastal tailed frog (*Ascaphus truei*)	Federal SOC, State vulnerable	Low	A,B,F,G (D)
Painted turtle (*Chrysemys picta*)	State critical	Low	A,C,F,G (D)
Common kingsnake (*Lampropeltis getula*)	Federal SOC, State vulnerable	Low	A,F,G (D)
California mountain kingsnake (*Lampropeltis zonata*)	State vulnerable	Low	A,B,F,G (D)
Del Norte salamander (*Plethodon elongates*)	Federal SOC, State vulnerable	Low	A,B,F,G (D)
Northern red-legged frog (*Rana aurora aurora*)	Federal SOC, State vulnerable	Low	A,C,F,G (D)
Foothill yellow-legged frog (*Rana boylii*)	Federal SOC, State critical	Low	A,C,F,G (D)
Cascades frog (*Rana cascadae*)	Federal SOC, State vulnerable	Low	A,B,E
Southern torrent salamander (*Rhyacotriton variegates*)	Federal SOC, State vulnerable	Low	A,C,F,G (D)
Invertebrates			
Fender's blue butterfly (*Icaricia icarioides fender*)	Federal endangered	Low	No critical habitat in ROW, F,G (D)
Mardon skipper (*Polites mardon*)	Federal candidate	Low	A,B (D)

Reason for Impact Status:

A. Not observed during field investigation.
B. No documented occurrences within 5 miles.
C. No documented occurrences in transmission line right-of-way, but occurs within 2 miles of transmission line.
D. Species may use/likely to use/possibly uses/may be present/likely present/suitable habitat exists in transmission line right-of-way.
E. Species unlikely to use/be present in transmission line right-of-way.
F. Impacts are temporary.
G. Impacts minimized by mitigation measures.

1. See Chapter 6, Glossary, for definitions.
2. DPS = distinct population segment.

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BONNEVILLE POWER ADMINISTRATION

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