Albany-Burnt Woods and Santiam-Toledo Pole Replacement Project

Preliminary Environmental Assessment

DOE/EA-1636

March 2009

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Bonneville Power Administration

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Need for and Purpose of Action

1.1 Introduction

The Bonneville Power Administration (BPA) is a federal agency that owns and operates more than 15,000 miles of high-voltage transmissions lines. The transmission lines move most of the Northwest's high-voltage power from facilities that generate the power to utility customers 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 Act directs BPA to construct improvements, additions, and replacements to its transmission system that are necessary to maintain electrical stability and reliability, and to provide service to BPA's customers (16 U.S.C. § 838b(b-d).

BPA has proposed replacing wood poles and associated structural components for two of BPA's existing transmission lines that generally share the same transmission line right-of-way – the 115-kilovolt (kV) Albany-Burnt Woods No. 1 transmission line and a portion of the 230-kV Santiam-Toledo No. 1 transmission line, both of which are located in Linn, Benton, and Lincoln counties, Oregon (see Figure 1-1). This Environmental Assessment (EA) was prepared for this proposal by BPA pursuant to regulations implementing the National Environmental Policy Act (NEPA) (42 USC 4321 et seq.), which requires Federal agencies to assess the impacts their actions may have on the environment. BPA prepared this EA to determine if the proposed action would cause effects that would warrant preparing an Environmental Impact Statement (EIS), or whether it is appropriate to prepare a Finding of No Significant Impact (FONSI).

1.2 Need for Action

BPA's 115-kV Albany-Burnt Woods No. 1 transmission line was originally built in 1946. This transmission line serves BPA's utility customer, Consumers Power, Inc., which in turn serves communities in western Oregon. No major rebuild work has been done on the Albany-Burnt Woods line since it was originally built. 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, and other deterioration. Most of the structures on the Albany-Burnt Woods line now exceed their service life and are physically worn and structurally unsound in places.

BPA's 230-kV Santiam-Toledo No. 1 transmission line was originally built in 1959. This transmission line serves Consumers Power, Inc. and Central Lincoln Public Utility District (PUD), and completes a 230-kV loop that supports electrical service to central Oregon. The portion of this line that generally shares the same right-of-way as the Albany-Burnt Woods line consists of wood pole structures. No major rebuild work has been done on this portion of the Santiam-Toledo line, other than normal maintenance, since it was originally built. The wood pole structures on the Santiam-Toledo line have passed their 55- to 60-year service life. In addition, this portion of the Santiam-Toledo line was built with Douglas-fir poles in which the center of the pole was not treated with preservative to prevent rot and decay. These types of poles, which are referred to as non-through bored poles, are experiencing a high frequency of ground line decay that makes them more prone to collapse.

Based on the current condition of these lines, there is a need for replacement of the wood pole structures and associated structure components to maintain reliable electrical service and to avoid risks to the public and worker safety.

1.3 Purposes

In considering possible ways to meet the identified need for action, BPA will consider how to best achieve the following purposes or objectives:

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

1.4 Public Involvement

BPA conducted public outreach for the proposed action through various means, including providing notice of the proposed action, the environmental process, and opportunities to comment. On July 1, 2008, BPA sent an initial letter to adjacent landowners notifying them of the proposed project and upcoming survey activities and providing contact information. On October 27, 2008, BPA sent an additional letter to people potentially interested in or affected by the proposed Albany-Burnt Woods and Santiam-Toledo pole replacement project, including adjacent landowners, public interest groups, local governments, Tribes, and state and Federal agencies. The letter explained the proposal, the environmental process, and how to comment during the Preliminary EA scoping period (which extended from October 24, 2008 to November 24, 2008). One comment letter, received on December 2, 2008, was accepted as a comment even though the scoping period had closed.

BPA also created webpages specifically for the pole replacement project where people could access information about the project and the EA process (see http://www.efw.bpa.gov/environmental_services/Document_Library/Albany/. Both letters described above were posted on this website.

BPA identified three Tribes that have a potential interest in this project, based on their historic or current use of the land within the project area. One the Tribes, the Confederated Tribes of the Grand Ronde responded to a letter sent by BPA in May 2008 with information regarding archaeological sites known to be within the project area. BPA contacted the cultural resources protection coordinator at the Grand Ronde to discuss the sites and included them in the cultural resources survey conducted as part of the proposed project.

In addition, BPA met with the U.S. Fish and Wildlife Service, the Xerces Society, and other individuals with knowledge of sensitive species populations in the area, to discuss project design and methods to minimize impacts to sensitive species.

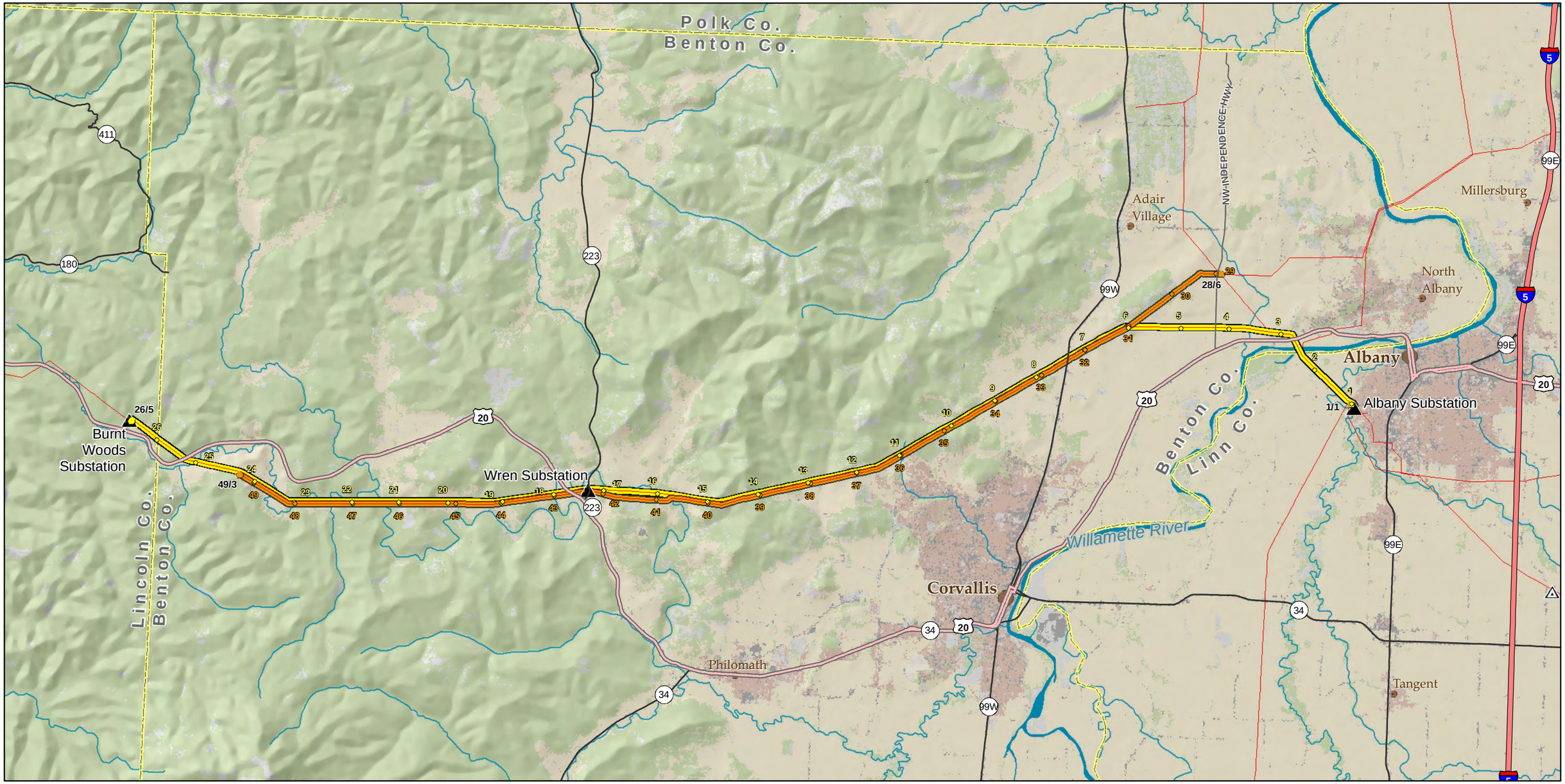

Figure 1-1 Project Location and Vicinity Map

Albany-Burnt Woods and Santiam-Toledo Pole Replacement Project

- BPA Substation
- Foreign Owned Substation
- Albany-Burnt Woods Start of Mile
- Santiam-Toledo Start of Mile
- BPA Transmission Lines
- **Albany-Burntwoods / Santiam-Toledo Project Area**
- Albany-Burnt Woods Line
- Santiam-Toledo Line

0 1 2 3 4 Miles

Data Source: Bonneville Power Administration Regional GIS Database.
All Data Is Best Available, 12/18/2008

N W E S

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Eight written comments were received about the proposed pole replacement project during the Preliminary EA scoping period. The most common comments concerned the following:

- potential effects to Fender's blue butterfly, Kincaid's lupine, and Taylor's checkerspot butterfly;
- potential effects to oak woodland habitats;
- repair of damage or effects on private property; and
- potential effects of use of treated wood poles.

All public comments can be viewed at http://www.bpa.gov/applications/publiccomments/CommentList.aspx?ID=51. Comments, both written and oral, that were received during and 8 days after the close of scoping were considered in the analysis. A list of all interested parties is included in Chapter 5.

Chapter 2
Proposed Action and Alternative

This chapter describes the proposed action, the no action alternative, and alternatives considered but eliminated from detailed study. Figure 1-1 shows the location of the proposed action. This chapter also compares the proposed action and the no action alternative to the project purposes, as well as the potential environmental effects of each of these two alternatives.

2.1 Proposed Action

The proposed action involves replacing aging and deteriorating wood pole structures and associated structural components on the existing 115-kV Albany-Burnt Woods No. 1 transmission line and along a portion of the 230-kV Santiam-Toledo No. 1 transmission line. The following discussion describes the various elements of the pole replacement project.

2.1.1 Project Location and Right-of-Way

BPA's 115-kV Albany-Burnt Woods No. 1 transmission line extends from BPA's existing Albany Substation in the City of Albany, Oregon approximately 26 miles west to BPA's existing Burnt Woods Substation near the Benton and Lincoln county line (see Figure 1-1). BPA is proposing to replace the wood pole transmission structures along the entire length of the line. Existing transmission structures that support this line are numbered from structure 1/1[1] near the Albany Substation to structure 26/5 near the Burnt Woods Substation.

BPA's 230-kV Santiam-Toledo No. 1 transmission line extends from BPA's existing Santiam Substation near the City of Stayton, Oregon approximately 67 miles west to BPA's existing Toledo Substation near the City of Toledo, Oregon. BPA is proposing to replace the transmission structures along a portion of this line that extends from a point about two miles southeast of the City of Adair Village, Oregon, approximately 21 miles west to near BPA's Burnt Woods Substation (see Figure 1-1). This portion of the line is currently supported by wood pole structures. Existing transmission structures supporting this portion are numbered from structure 28/6 near Adair Village to structure 49/3 near the Burnt Woods Substation.

From the Albany Substation approximately the first 1.5 miles of the Albany-Burnt Woods transmission line (i.e., from structure 1/1 to structure 2/4) shares a right-of-way with the Salem-Albany No. 1 and Salem-Albany No. 2 transmission lines. From structure 2/4 to 3/3 the Albany-Burnt Woods line shares a right-of-way with the Salem-Albany No 2. transmission line. From approximately structure 3/3 to 6/2, the Albany-Burnt Woods line is in its own transmission line corridor. The right-of-way width for these first six miles is generally about 150 feet. Similarly, the portion of the Santiam-Toledo transmission line proposed for pole replacement is in its own

[1] BPA transmission structures each have individual numbers (e.g., 1/1, 1/2, etc.). The first number in the pair represents the line-mile number; the second number indicates whether the structure is the first, second, third, etc. structure in that mile. In this case, the Albany-Burnt Woods line begins at line-mile 1/structure number 1 and continues on to 26/5 at the Burnt Woods Substation.

corridor for approximately its first two miles (i.e., from structure 28/6 to structure 31/2). The right-of-way width for these first two miles is generally about 125 feet.

From Albany-Burnt Woods line structure 6/2 and Santiam-Toledo line structure 31/2 to the Burnt Woods Substation, the two transmission lines share the same corridor for a distance of about 19 to 20 miles except for three segments where the lines briefly diverge from each other. The segments where the two lines are in rights-of-way separated by approximately 50 to 450 feet are the following:

- Albany-Burnt Woods structures 7/7 to 7/10, Santiam-Toledo structures32/7 to 33/1
- Albany-Burnt Woods structures 14/4 to 14/7, Santiam-Toledo 39/5 to 39/9
- Albany-Burnt Woods structures 15/5 to 17/4, Santiam-Toledo 40/5 to 42/5

The right-of-way width for the shared corridor and three separated segments varies from about 210 to 240 feet, depending on location.

BPA would use this same existing corridor and right-of-way for the transmission structures to be replaced under the proposed action. No additional transmission line right-of-way would be necessary.

2.1.2 Replacement Transmission Structures

The proposed action would replace existing deteriorating wood pole structures and components along the Albany-Burnt Woods and Santiam-Toledo transmission lines with new poles and components of essentially the same basic design. There are currently two types of structures used for these lines (see Figure 2-1):

- Suspension 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 conductor, and they are not located at the end of long spans. Suspension structures have two wood poles. There are currently 324 two-pole suspension structures supporting the two lines.
- Dead-end structures are heavier, stronger structures placed at intervals along the transmission line to independently carry the weight and tension of the conductors. Dead-end structures may either be in a straight alignment, used at angles greater than 15 degrees, or on very long spans such as canyon crossings. Dead end structures have three wood poles. There are currently 44 three-pole dead-end structures supporting the two lines.

BPA would use the same type of structure at each currently existing structure location – i.e., existing two-pole suspension structures would be replaced with new two-pole structures, and existing three-pole dead-end structures would be replaced with new three-pole structures. The new wood poles to be used would be Coast Douglas-fir wood poles that would be through bored at the ground line and pole top. In through bored poles, holes are drilled from one face of a pole completely through the cross section to the opposite face in a pre-determined

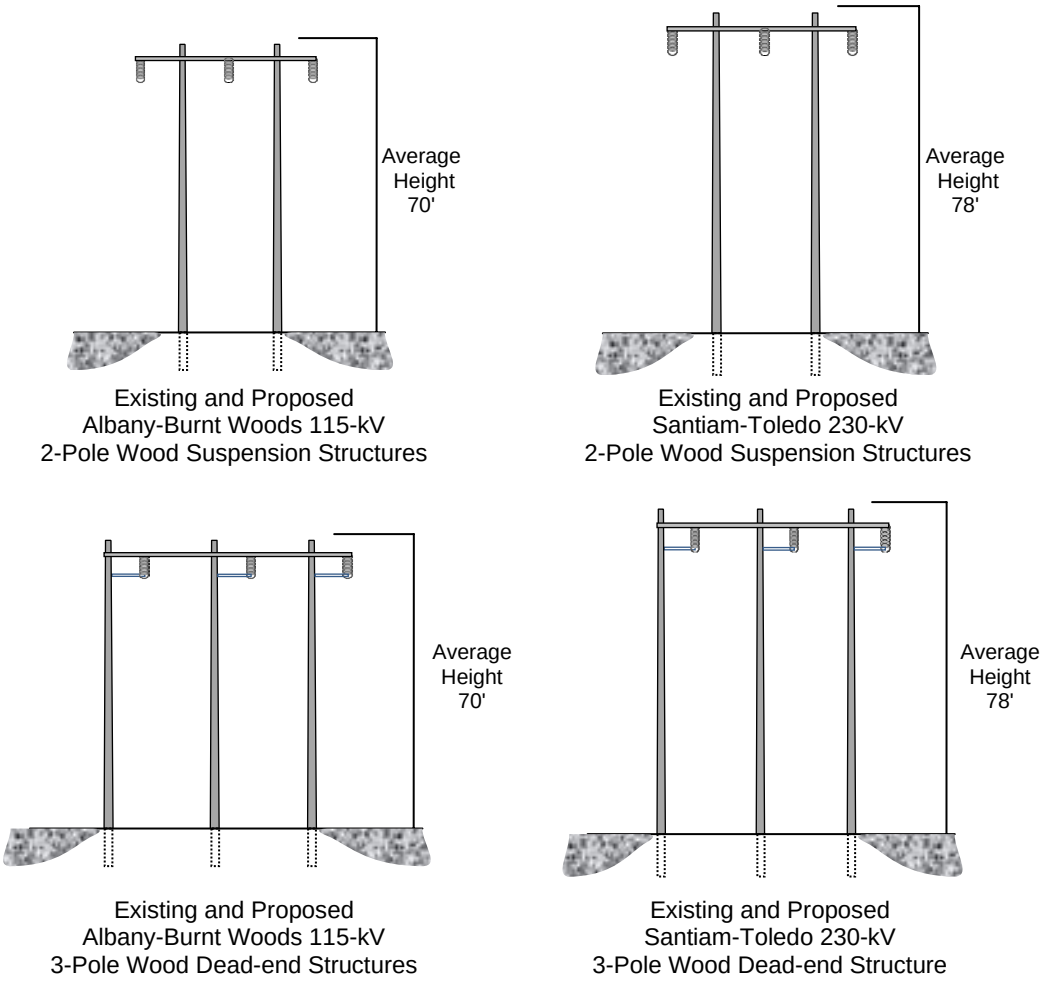

Figure 2-1. Existing and Proposed Wood Replacement Structures

pattern, density, and angle to the longitudinal axis of the pole. Transmission poles are typically through bored in the areas where rot and decay most frequently occur, which are the ground line zone of the pole (typically 2 feet above and 3 feet below the ground line) and the pole top (typically the top 10 feet of the pole). Through boring allows preservative to penetrate into the heartwood of the pole, thus significantly prolonging its life expectancy. The poles also would be pressure treated in accordance with the American Wood Protection Association Standards for 0.6 pounds per cubic foot Pentachlorophenol at the through bored zones and the sap wood (approximately the outer 1.5 inches of the pole).

In addition to pole replacement, structure crossarms, insulators, and dampers would be replaced as needed. Because the existing Albany-Burnt Woods transmission line currently does not have dampers installed, these would be installed as part of the proposed action.

The height of new structures for the two lines would vary from 45 to 105 feet above ground, with structure heights at particular locations dependent on terrain, requirements for road crossings, and clearing needs. Proposed structure heights would be the same as the height of structures

along the existing line, except for five structures on the Albany-Burnt Woods line (structures 2/5, 17/8, 20/5, 22/3 and 24/8) that would be about 10 feet taller than the existing structures.

Some of the existing structures also 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, such as dead-end structures. BPA would either use the existing guy wires at a particular structure, or would install replacement guy wires.

2.1.3 Conductors and Overhead Groundwire

Conductors are the wires on the structures that carry the electrical current. Each existing structure on the Albany-Burnt Woods line carries three conductors, as does each structure on the Santiam-Toledo line carries three conductors. Conductors would not be replaced and would be left in place during project construction (see Section 2.1.6, Construction Activities). Accordingly, conductor pulling and retensioning sites would not be required for the proposed project.

Overhead groundwire is currently installed on the Albany-Burnt Woods line for the first one half mile out of the Albany Substation to protect substation equipment from lightning strikes. The ground wire would not be replaced. There is also a series of wires and/or grounding rods (called counterpoise) buried in the ground at the Albany-Burnt Woods structure 1/2. These wires are used to establish a low resistance path to earth for lightning protection. The counterpoise at structure 1/2 may be replaced during construction depending on its condition. Overhead groundwire and counterpoise are not currently installed on the Santiam-Toledo line and none would be installed as part of the proposed project.

2.1.4 Vegetation Clearing

Vegetation within the existing Albany-Burnt Woods and Santiam-Toledo corridors consists of low-growing shrubs, small trees or agricultural crops. Because the corridors were previously cleared of tall growing vegetation, no right-of-way or access road clearing would occur during the proposed pole replacement project. The only tree removal that would occur within the project area (but not within existing rights-of-way) would be to provide open space for proposed mitigation for impacts to special status plant and wildlife species as discussed in Sections 3.3.3 and 3.4.3. During construction, low-growing plant communities would be protected as much as practicable and promoted as the basis for ongoing vegetation management following construction.

Danger tree clearing for rights-of-way or roads also would not occur as part of the proposed project. A danger tree is a tree located off the right-of-way that is a present or future hazard to the transmission line. Danger trees can be either stable or unstable. A tree would be identified as a danger tree if it would contact BPA facilities should it fall, bend, grow within a swing displacement of the conductor, or grow into the conductor.

2.1.5 Access Roads

Although access to the transmission line corridor currently exists for the length of the proposed pole replacement project, some access road improvements would be needed to allow for better access of structure sites during construction and maintenance. Road improvement would occur

on portions of the access road along the Albany-Burnt Woods right-of-way between structures 13/6 and 13/8, structures 15/5 and 15/6, and structures 17/1 to 17/3. These improvements would include grading and placement of rock on existing roads, replacement of gates, and installation of new culverts.

Five hundred feet of access road ditches between Albany-Burnt Woods structures 13/6 and 14/1 would be cleaned so that run-off can flow unobstructed through the ditches. Ditch cleaning would be done using a dozer, grader or backhoe and would re-established the grade of each ditch by cleaning out brush and weeds. Five culverts would be replaced in ditches or intermittent streams between Albany-Burnt Woods structures 16/2 and 16/5. Eleven new gates would be installed at locations where existing gates are failing.

Access rights would be acquired to twelve existing access roads.

2.1.6 Staging Areas

Temporary staging areas would be needed along or near the transmission line right-of-way to store and stockpile structure materials, trucks, and other equipment during construction. There would be one to two staging areas occupying approximately 30 acres. The staging area size is based on the area needed to accommodate new and replaced poles. These staging areas would be within about five miles of the proposed project on an existing flat, paved or graveled lot, most likely in an industrial or commercial area. BPA is in the process of identifying appropriate staging areas.

2.1.7 Construction Activities

Removal of Existing Wood Pole Structures. As discussed above, there are currently 324 two-pole suspension structures and 44 three-pole dead-end structures supporting the two lines. Each structure has been inspected to determine the precise condition of each wood pole. Based on this inspection, some poles do not appear to be in a condition requiring replacement. At this time, it is estimated that approximately 700 of the 780 total wood poles would be replaced.

For removal of individual wood poles, a line truck with a boom crane would be set under a structure, and the crane would be lifted up to support the structure's cross arm. The supported cross arm would be unbolted from the wood pole(s) to be removed. These poles then would be pulled from the ground with a second boom truck. The removed poles would be lifted with a crane onto a flatbed or other type of truck and removed from the site for recycling or disposal in an appropriate location.

Installation of Replacement Wood Pole Structures. Replacement wood poles would be brought to the structure sites from the staging areas by flatbed truck and installed in the same ground holes where the existing deteriorated wood poles were removed. To prepare for installation, each hole would first be cleaned out and re-augured approximately 2 feet deeper in order to comply with current depth of pole set standards. The replacement wood poles would then be lifted by crane into position and placed into the holes.

The holes would then be backfilled with the soil that was removed by the auger. At most structure sites, any additional soil removed by the auger that is not used for backfilling would be

spread evenly around the structure sites. Some of this soil also would be mounded at the base of each newly-installed pole to prevent erosion from occurring at the pole base. At any structure site determined to be in a sensitive habitat area, the augured soil would be removed from the site and disposed of at an approved hazardous waste disposal site.

Installation of Replacement Structure Components. During pole replacement, the existing cross arms of each structure would be inspected to determine whether they also need to be replaced. Some structures currently have the original wood cross arms still installed, while others have steel cross arms that were added at various times over the years. BPA likely would replace all wood cross arms due to their deteriorated condition while the replacement wood poles are being installed, but would not replace the steel cross arms since they are still expected to be structurally sound.

Once the replacement pole(s) are in place at a structure site, the cross arm of each structure would be reattached to the new pole(s). New insulators, which are bell-shaped devices that prevent electricity from jumping from the conductors to the structures and going to the ground, also would be installed at each structure. In addition, stockbridge dampers would be added to the Albany-Burnt Woods line since this line currently does not have these devices. The stockbridge dampers are located within 15 feet of the insulators and would dampen the vibrations on the line and help protect the conductor from wear and premature fatigue failures.

If guy wires are present at a structure site and need to be replaced, a hole would be excavated down at the location of the guy wire's anchor, and the old guy wire would be cut off and dug out. Holes for new guy anchors would be dug with either an auger or a backhoe, and a new guy anchor and wire would be placed in the same location. Guy wire anchors would be set in crushed rock, and the remainder of the hole would be backfilled with native material.

Construction Equipment and Disturbed Areas. Equipment used for removing and installing wood poles and other structure components would include flatbed trucks, line trucks with a boom crane, backhoes, augurs, and bucket trucks.

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, this area would be reduced to 50 feet by 50 feet per structure (approximately 0.06 acre) to minimize the area disturbed by replacement activities.

Access Road Improvements. Prior to and concurrent with pole replacement, access road and other improvements described in Section 2.1.4 would be implemented. Road improvements would include grading and placing rock on existing roads.

Equipment that would be used for access road work includes a dozer or road grader, dump trucks, a compactor, a backhoe for ditch cleaning and a water truck if needed. In sensitive areas (for example, wetlands or threatened or endangered species habitats), staking or flagging would be installed where needed to keep traffic to designated routes.

Anticipated Construction Schedule. The schedule for construction of the proposed pole replacement project depends on the completion of the NEPA process for the proposed project and whether there is a decision to proceed. Assuming that the NEPA process is completed and a decision to proceed is made in spring 2009, construction of the proposed project likely could begin in May 2009 or shortly thereafter. Work on the transmission line would be done in phases, with construction occurring on more than one structure at a time, in different parts of the project area. If construction begins in May 2009, it is expected that all major construction activities for the proposed pole replacement project would be completed around December 2009.

2.1.8 Operation and Maintenance

Operation and maintenance of the lines upon completion of project construction would be essentially the same as for the existing lines. The lines would continue to be operated at their current voltages, and BPA would conduct routine, periodic inspection and maintenance when necessary. The most typical maintenance usually required is replacement of insulators. BPA may also need to conduct occasional emergency repairs; however, because of the replacement project, it is expected that these activities would occur on a much less frequent basis and on a smaller scale than would be currently required.

In addition, vegetation would continue to be maintained for safe operation of the line and to allow access to the structures. Removal of danger trees could also occur during maintenance of the line. Vegetation management would continue to be guided by the program identified in BPA's *Transmission System Vegetation Management Program EIS* (BPA 2000). This program includes ongoing consultation among BPA, landowners, and others concerning vegetation and noxious weed control. A number of different vegetation management methods may be used: manual (hand-pulling, clippers, chainsaws); mechanical (roller-choppers, brush-hog); and/or chemical (herbicides).

2.2 No Action Alternative

Under this alternative, BPA would not take action to replace structures along the transmission lines or upgrade access roads, and would continue to operate and maintain the existing transmission lines in their current condition. Construction activities associated with the proposed pole replacement project would not occur. However, the reliability concerns that prompted the proposal for action would continue to be of concern. BPA would continue to attempt to maintain the existing lines as their aged and rotting wood poles and cross arms further deteriorate.

Given the current poor condition of the lines, it is reasonable to expect that the no action alternative would result in more frequent and more disruptive maintenance activities within the corridor than under the proposed project. It might be possible to plan some of this maintenance, but it is expected that the majority of repairs would occur on an emergency basis as various parts of the lines continue to deteriorate. This could result in impacts to vegetation, wildlife, soils, and water quality from emergency repair activities, and any downed lines resulting from structure failures would have a high potential for causing fires in the vicinity of the downed line. In addition, it is reasonable to expect that as the line structures continue to fail on an intermittent basis, the ability of BPA to provide generally reliable electric service to its customers in the area would be adversely affected under this alternative.

2.3 Alternatives Considered but Eliminated From Detailed Study

In developing this EA, BPA considered but eliminated two additional alternatives (other than the proposed action and the no action alternatives) that were suggested during the scoping process for this EA. These two alternatives were suggested to avoid or minimize potential impacts to special status vegetation and wildlife species that exist along the corridor, including Fender's blue butterfly, Kincaid's lupine, and Taylor's Checkerspot butterfly. The following discussion describes these two alternatives in more detail and the reasons why they were eliminated from detailed study in this EA.

2.3.1 Route Alternatives

BPA considered whether to relocate all or a portion of the transmission corridor for the two lines to avoid habitat for special status vegetation and wildlife species identified along the corridor. The environmental impacts of relocating the transmission lines to a currently undeveloped corridor, versus keeping the lines in their already developed corridor, would be substantially greater because the new right-of-way would have to be cleared and new access roads constructed. These clearing and construction activities would lead to a variety of changes in land use and habitat for the length of the line, and would result in much greater vegetation, soil erosion, and water quality impacts than the proposed action. Direct costs also would be substantially higher due to costs of the new clearing and roads, as well as the new easement rights that would need to be obtained. In addition, the current cleared right-of-way maintains prairie habitat for the three listed species; moving the right-of-way would open the possibility that these lands could be developed and prairie habitat lost. Because of this alternative's greater environmental impacts and higher costs, this alternative was considered but eliminated from detailed study in this EA.

2.3.2 Installing Steel Poles in Critical Habitat

BPA considered using steel pole structures, instead of wood pole structures, in sensitive species habitats. Steel pole structures potentially have a longer life and require less ongoing maintenance, thereby reducing the potential for future impacts to any special status species or their habitat. However, use of steel pole structures would increase the project's material costs for this segment of the lines by 250%. In addition, steel pole structures and their components still require maintenance and their lifespan may not be significantly longer than wood pole structures. The potential benefits to special status species of steel pole structures therefore would be minimal to non-existent. Because there would be no appreciable reduction in environmental impacts and significantly higher costs under this alternative, this alternative was considered but eliminated from detailed study in this EA.

2.4 Comparison of Alternatives

A comparison of the proposed action and the no action alternative to the project purposes is presented in Table 2-1. This table also compares the potential environmental effects of each of these two alternatives.

Table 2-1. Comparison of the Proposed Action and No Action Alternative

	Proposed Action	No Action
Purpose		
Maintain or improve transmission system reliability to BPA and industry standards	Improves transmission system reliability by reducing planned or unplanned outages because of a deteriorating line.	Risks public health and safety during outages.
Continue to meet BPA's contractual and statutory obligations	Maintains system reliability and subsequent power delivery to BPA's customers in western Oregon.	Deteriorating condition of the existing line threatens system reliability and subsequent power delivery.
Minimize environmental impacts	The proposed action would occur on existing ROW to reduce environmental impacts and construction impacts would be primarily short term and can be mitigated.	Avoids construction impacts but maintenance impacts would increase as existing structures and roads deteriorate.
Demonstrate cost-effectiveness	Total project costs: about $10 million.	Avoids near-term construction costs, but increases near and long-term maintenance costs related to on-going repairs needed to maintain existing deteriorating line.
Environmental Resource		
Land Use	Localized and temporary disruption of maintenance or harvest of active agricultural fields. Short-term, construction related impacts. Low impacts expected.	Impacts associated with maintenance of the existing lines would continue.
Geology and Soils	Low-to-moderate impacts expected from construction; most impacts on soils can be mitigated with erosion control measures. Heavy equipment could compact soils, reducing productivity.	No change from existing operations and maintenance; maintenance needs could increase over time.
Vegetation	Low-to-moderate impacts on vegetation expected. Spread of noxious weeds could occur. Minor vegetation clearing would occur along the project corridor except where vegetation removal would provide open space for special status species habitat creation. Moderate impacts to Kincaid's lupine would occur from access road work and pole replacement; mitigation site would offset most impacts to lupine.	No change from existing operations and maintenance; maintenance needs could increase over time.
Fish and Wildlife	Moderate to high impacts to Fender's blue butterfly expected from access road work and pole replacement; mitigation will offset most impacts. Low to moderate impacts expected to fish and wildlife and habitat during both construction and operation.	No change from existing operations and maintenance; maintenance needs could increase over time.

Table 2-1. Comparison of the Proposed Action and No Action Alternative

	Proposed Action	No Action
Water Quality	Low-to-moderate impacts expected with erosion control and vegetation management planned. Impacts would be temporary.	No change from existing conditions.
Wetlands	Low impacts expected. Impacts would be temporary.	No change from existing conditions.
Floodplains	Low impacts expected. Flood storage capacity would not change.	No change from existing conditions.
Socioeconomics	Minor positive impacts from the construction project expected.	Future transmission system reliability problems could impact the local economy and public health and safety.
Visual Resources	Temporary impacts during construction. Five structures would be raised. Low impacts expected.	No change from existing conditions.
Air Quality	Temporary impacts during construction. Low impacts expected.	No change from existing conditions.
Cultural Resources	Replacement of wood pole structures would disturb 7 known cultural sites. Mitigation measures will occur before construction, and monitoring and minimization measures would be used during construction.	No change from existing conditions.
Health and Safety	Low impacts expected.	Future transmission system reliability problems could result in loss of power required for safe locomotion and security. Residential and commercial consumers lose electricity used for heat, air conditioning, cooking, and refrigeration.
Noise	Short-term, low-to-moderate impacts expected during construction. Transmission line corona noise impacts would remain the same as the existing line. Low impacts expected.	No changes expected.
Electric and Magnetic Fields (EMF)	Maximum EMF at the edges of the ROW would be less than 21.6 milligauss and would not change from existing conditions.	No change from existing conditions.

Chapter 3
Affected Environment, Environmental Effects, and Mitigation

This chapter identifies and evaluates the potential impacts of the proposed action and no action alternative on natural, cultural, and human resources. For each resource, the chapter describes the affected environment, potential environmental impacts, and proposed mitigation.

The affected environment was identified through a combination of field surveys, consultations, and researching and reviewing existing data and information. The affected environment includes the project corridor – i.e., the corridor that includes the existing transmission lines proposed for pole replacement – and adjacent areas as appropriate for a particular resource. In each resource section, resources are described heading from east to west along the project corridor unless otherwise noted.

Based on this information, the potential direct and indirect impacts of the proposed action on each resource were identified. Mitigation measures have been developed to avoid or reduce impacts of the proposed action where possible, and to compensate for impacts where necessary. Potential impacts of the No Action alternative also are discussed for each resource.

This chapter concludes with an analysis of the potential cumulative impacts of the proposed action when combined with impacts from past, present, and reasonably foreseeable future projects in the area.

As discussed in Chapter 2, the Albany-Burnt Woods transmission line from BPA's Albany Substation to structure 6/2 (a distance of about six miles) is not in the same right-of-way corridor as the first two miles of the portion of the Santiam-Toledo transmission line proposed for pole replacement from structure 28/6 to structure 31/2. However, from the point where these two lines merge west to BPA's Burnt Wood Substation, the two transmission lines do generally share the same corridor. For ease of reference in this chapter, the first six miles of the Albany-Burnt Woods line is referred to as the "A-BW corridor", the first two miles of the Santiam-Toledo transmission line is referred to as the "S-T corridor", and the remainder of the corridor shared by both lines is referred to simply as the "shared corridor". When referring collectively to all three of these corridors, the term "project corridor" is used.

3.1 Land Use

3.1.1 Affected Environment

The project corridor is located in Linn, Benton, and Lincoln Counties in the Willamette Valley and Coast Range foothills of Oregon. In general, land use in the vicinity of the project corridor is predominately forested lands and agricultural lands, with some rural residential, low density residential development, public parks, and transportation corridors also present (see Figure 3-1).

Along the project corridor, forested lands are primarily coniferous evergreen forests dominated by Douglas-fir and mixed evergreen and deciduous forests. Some of the forested lands are used for timber production. Starker Forests, a private timber company, is a large landowner within the western section of the project corridor. Agricultural land uses along the corridor are dominated by pastures and hay fields, with a few orchards, vineyards, and row crops. Grazing also occurs on some lands on or near the project corridor.

Land use along the A-BW corridor is mainly agricultural. The beginning of this corridor at Albany Substation is on the western edge of the City of Albany, adjacent to low density residential uses. From the substation, the corridor heads northwest through Hazelwood Park and a mix of agricultural and rural residential uses before crossing the northeast portion of Bowers Rock State Park and the Willamette River. The corridor then crosses U.S. Route 20 before turning directly west. Land uses along U.S. Route 20 are a mix of rural residential and agricultural. Heading west, the corridor crosses primarily agricultural lands until the A-BW corridor line meets the S-T corridor where a mix of forested and rural residential are located.

Land use along the S-T corridor consists of a mix of agricultural, rural residential and forested lands. From structure 28/6 east of NW Independence Highway, this corridor crosses agricultural lands for about the first 1/2-mile. Heading southwest, the corridor then passes through a forested area with sparsely interspersed rural residences until the S-T corridor merges with the A-BW corridor.

Land use along the shared corridor is a mix of forested and agricultural lands with a few rural residences and commercial/industrial properties. The first three miles of the shared corridor is almost exclusively agricultural. Commercial and industrial properties are primarily located where the corridor crosses Oregon State Route 99W. About two miles west of Route 99W, the corridor transitions to predominately forested and agricultural lands. Low density residential development is located along this portion of the shared corridor near the northern edge of the City of Corvallis. A Willamette and Pacific Railroad storage yard is located at State Route 223 and the town of Wren. In addition, recreational uses exist along this portion of the corridor, including at Chip Ross Park (City of Corvallis), Fitton Green Natural Area (Benton County), and McDonald Forest (State of Oregon) (see Figure 3-1). There are also scattered rural residences throughout the eastern half of the shared corridor.

Zoning along the project corridor includes exclusive farm use (EFU), rural residential, forest conservation, and urban residential. The portion of the A-BW corridor that is within Linn County crosses lands designated as EFU.

3.1.2 Environmental Impacts – Proposed Action

All of the work for the proposed action would occur within BPA's existing rights-of-way. The footprint of the existing transmission line structures would be used for structure replacement, and about 0.5 miles of existing access road would be upgraded within the existing rights-of-way. Access rights would be acquired to twelve existing access roads, but this would not change existing use of the roads. There would be no permanent changes in land use from the proposed action, and operation and maintenance activities would continue to occur entirely within the

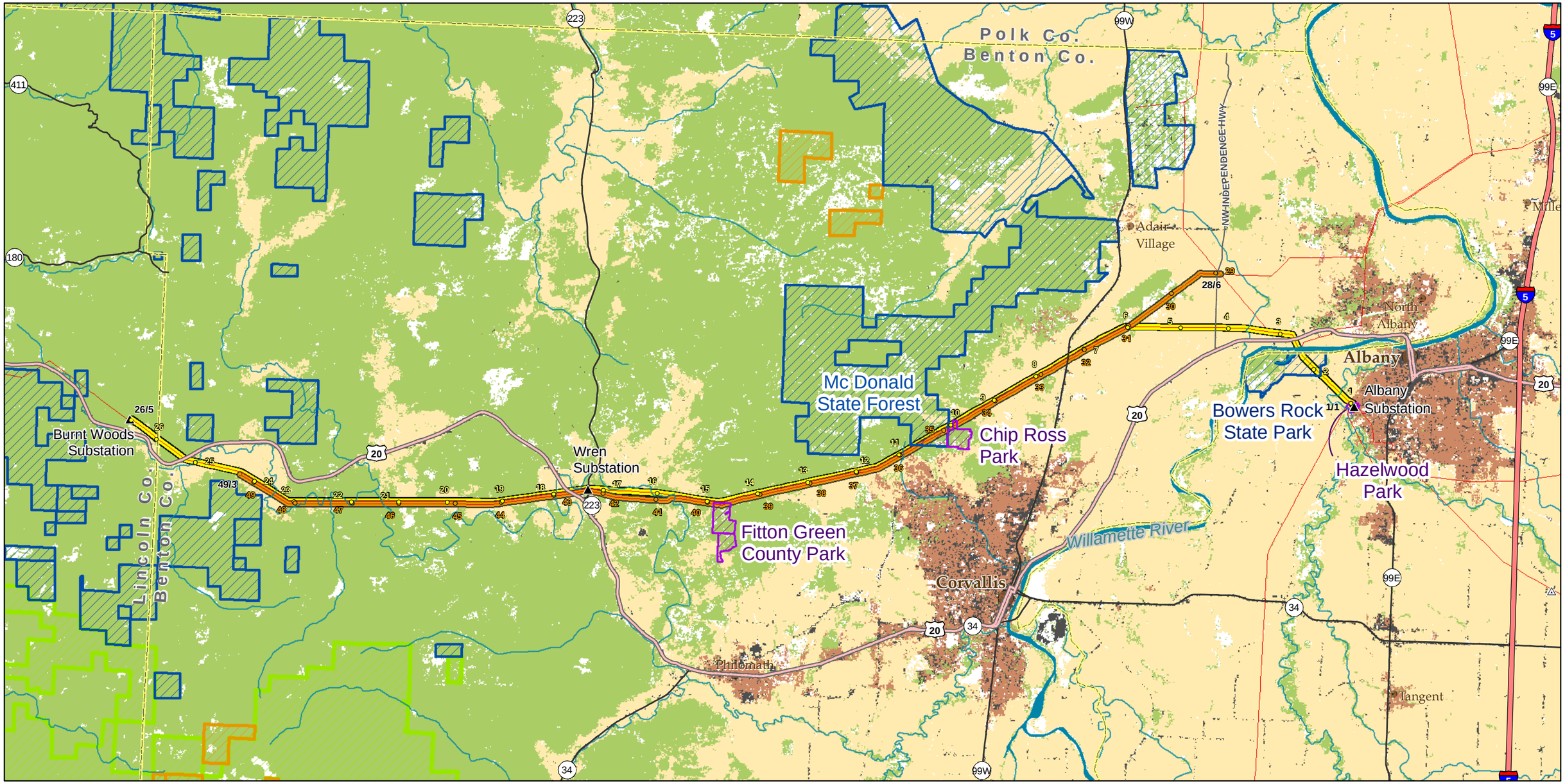

Figure 3-1 Land Use Map

Albany-Burnt Woods and Santiam-Toledo Pole Replacement Project

- ▲ BPA Substation
- ◬ Foreign Owned Substation
- BPA Transmission Lines

Land Use Catagories

- Agricultural
- Forest
- Commercial/Industrial
- Residential

Major Land Ownership

- County or City Park
- State Land
- Bureau of Land Mgmt.
- U.S. Forest Service

Albany-Burntwoods / Santiam-Toledo Project Area

- Albany-Burnt Woods Line
- Santiam-Toledo Line
- Albany-Burnt Woods Start of Mile
- Santiam-Toledo Start of Mile

N W E S

0 1 2 3 4 Miles

Data Source: Bonneville Power Administration Regional GIS Database.
All Data Is Best Available, 01/30/2009

EMA 02112009

existing rights-of-way and on existing access roads. The following describes potential impacts to specific land uses along the project corridor.

Forest Lands. Use of forested land for timber production or recreation would not change as a result of the proposed action. The existing rights-of-way have previously been cleared of all tall growing vegetation and do not require additional clearing. The only clearing that would occur within the project area (but not within existing rights-of-way) would be to provide open space for proposed mitigation for impacts to special status plant and wildlife species as discussed in Sections 3.3.3 and 3.4.3. Removal of trees within the approximately 2 acre mitigation site would change the use from forest to plant and wildlife habitat; however this would be a positive impact to surrounding plant and wildlife populations. Also ongoing maintenance activities would continue.

Danger trees also would not be removed along the edge of the corridor as part of this project. Danger trees removed during operation and maintenance of the line would not change the use of those areas as forested land; the amount of danger trees is usually less than 5 percent of the total amount of trees present along the edge a the right-of-way. Given the overall amount of forest land in the project vicinity and the minimal amount of tree removal that would occur, this would be considered a low impact of the proposed action.

Agricultural Uses. Potential short-term impacts to agriculture from construction of the proposed project could include temporary and localized disruption of maintenance and/or harvest of agricultural products in actively cultivated fields where towers are replaced. Other impacts could include potential temporary and localized increases in dust, noise, soil compaction, and erosion. Although there could be some loss of crop yield in active agricultural fields due to equipment ingress and egress and staging and construction of structures, the construction would not change existing agricultural uses in the project area.

Existing roads and right-of-way would be used to access the transmission line structures, dismantle and remove the existing structures, and install the new structures. Once each structure's site is accessed, a 100 by 100-foot area would be used temporarily for staging and construction, which is equivalent to 10,000 square feet (0.2 acres). Based on a review of aerial photographs of the transmission line corridor, there would be approximately 100 towers replaced in agricultural fields. Assuming that all of these 100 towers are in actively cultivated fields, construction could result in the temporary disturbance of approximately 23 acres of cultivated land. This amount of disturbance represents an extremely small amount of the existing agricultural land in the area. Replacement of the transmission line structures thus would have a negligible effect on overall agricultural production in the area, but might have a temporary, but noticeable effect on individual farmers whose lands would be affected.

Individual farmers would be compensated for any loss of crops and for post-construction activities necessary to return disturbed areas of agricultural fields to production. Dust abatement best management practices would also be implemented to minimize potential for erosion (see Section 3.2 Soils and Geology). Overall, the impact of the proposed project on agricultural uses would be low.

Commercial and Industrial Uses. The railroad storage yard located south of the project corridor near Wren would not be impacted by the proposed project. Materials would not be stored nor would construction activities take place within the railroad yard.

Residential Uses. Construction of the proposed project would be limited to brief, temporary disturbance because construction activities would take place on existing right-of-way and access roads. Impacts to residents near but not immediately adjacent to the corridor would be limited to temporary inconveniences associated with traffic delays and to dust and noise from, as well as the presence of, construction activity. Given their short duration, these impacts would be considered low.

Where construction activities take place within the "active" portions of private property, such as front yards or driveways, temporary and intermittent noise, dust, and interference with access to homes could have a moderate impact on homeowners. Locations most likely to experience these effects are near Albany-Burnt Woods structure 7/8 and Santiam-Toledo structure 32/10.

Recreational Uses. The potential for impacts to recreational uses from the proposed project depends largely on the location of the project corridor in a recreation area and the use levels of that area. Six structures proposed for replacement on the Albany-Burnt Woods line (structures 1/11 to 2/5) are located within Bowers Rock State Park. The structures are located within agricultural fields with no public access for recreation. Bowers Rock State Park is an undeveloped park along the Willamette River with boating access. Therefore recreational impacts at this park would be low.

Twelve structures proposed for replacement are located within McDonald State Forest (Albany-Burnt Woods structures 10/2 to 10/6 and Santiam-Toledo structures 35/1 to 35/7) and three structures are located in the adjacent Chip Ross Park (Albany Burnt Woods structure 9/7 and Santiam-Toledo structures 34/8 to 34/9). McDonald State Forest is a research forest of Oregon State University. There are usually 40 to 80 active research projects under way on the Forest at any given time. The McDonald Forest also receives at least 175,000 visits from hikers, bicyclists, equestrians, public school students, and teachers each year (OSU 2005). The corridor passes through South McDonald Forest adjacent to Chip Ross Park. Dan's Trail passes from Chip Ross Park, through the right-of-way and into McDonald Forest.

Construction in McDonald State Forest could interfere with recreational use of the park. Construction could delay or obstruct recreational use on a short-term basis (less than five days). Recreational users could easily avoid the construction area. Structures in the parks are accessed from NW Jackson Creek Road and NW Dimple Hill Road, and not from park entrances. Therefore, impacts to recreational users of McDonald State Forest and Chip Ross Park would be considered low.

Four structures would be replaced within Fitton Green County Park (Albany-Burnt Woods structure 14/7 and Santiam-Toledo structures 39/7 to 39/9). Public access to Fitton Green is limited, and the existing roads are unpaved. Cardwell Hill Road is a 60-foot public right-of-way, which is unimproved, gated for most of its distance and therefore only accessible to equestrians, bicyclists, and hikers. Construction could delay or obstruct recreational use on a short-term basis

(less than 5 days). Construction access would use the unimproved Cardwell Hill Road and therefore could impact recreational users of the road; however, given the short-term and localized nature of this potential impact, overall impacts would be low.

3.1.3 Mitigation Measures

The following mitigation measures are identified to avoid, minimize, or compensate for potential impacts to land use from the proposed project:

- Distribute the proposed schedule of construction activities to all potentially affected landowners and post in recreational areas along the corridor so landowners and recreational users know when they might experience construction related disruptions.
- Keep construction activities and equipment clear of residential driveways and access to recreational areas as much as possible.
- Consult property owners on plant selection following vegetation disturbance in residential and other populated areas.
- Conduct construction activities in coordination with agricultural activities to the extent practicable.
- Instruct equipment operators and construction crews to close gates to avoid disturbances to livestock, and to stay within the project corridor to minimize impacts to crops.
- Compensate affected farmers for any lost crop production caused by the construction of the proposed project.
- Wash construction equipment and vehicles before entering construction areas to minimize establishment and spread of noxious weeds.

3.1.4 Unavoidable Impacts Remaining After Mitigation

With implementation of the recommended mitigation measures, no unavoidable impacts to land use are expected to occur.

3.1.5 No Action Alternative

Under this alternative, construction related impacts to land use would not occur. However, because of the need for more continual maintenance of the existing transmission lines if the pole replacement project is not implemented, impacts to various land uses along the project corridor could be expected from ongoing maintenance and repair activities. These intermittent impacts could include temporary disturbance of individual structure sites and portions of the project corridor, temporary interference with access to individual properties, and temporary noise and dust impacts.

3.2 Soils and Geology

3.2.1 Affected Environment

The A-BW corridor, S-T corridor, and the first approximately seven miles of the shared corridor are located within the Willamette Valley. The remainder of the shared corridor is located in the valley foothills of the Oregon Coast Range.

Elevations in the project corridor range from approximately 200 feet for the eastern portion of the project corridor in the Willamette Valley, to about 1,100 feet for the western portion of the project corridor in the Coast Range. At the east end of the project corridor, alluvial sediments including unconsolidated and semiconsolidated clay, silt, sand, and gravel have accumulated in the Willamette Valley. Recent young alluvium (<10,000 years old) is present along the Willamette River and tributaries to depths of less than 60 feet. Older deposits of alluvium can be up to 1500 feet deep. The Coast Range on the corridor's west end consists predominantly of marine sedimentary rock such as sandstone, siltstone, and mudstone.

The A-BW corridor in Linn County crosses the Willamette River floodplain, and soils in this area are floodplain soils (USDA 1987). Soil types in the project corridor in Benton County are typically well-drained soils formed from igneous or sedimentary rocks (USDA 1975).

3.2.2 Environmental Impacts – Proposed Action

Potential impacts to soils and geology could occur from pole replacement activities, improvement of project area access roads, and operation and maintenance. The potential for these impacts would vary along the project corridor, depending on the quality of soils, the amount of moisture in the soils, the amount of surface water flowing across the soils, and the steepness of slopes.

During replacement of wood pole structures, crossarms, insulators, and dampers, impacts on soils would result mainly from ground disturbing activities such as vegetation removal and piling of soil, and from compaction of soils by heavy equipment. Ground disturbance can cause the removal of vegetation exposing soils to rain and subsequent erosion. Soil compaction can degrade soil structure, reducing soil productivity and its ability to absorb water.

At each structure (see Table 3-2 for structures where disturbance area would be about 50- by 50-foot in area), a 100- by 100-foot area (approximately 0.2 acre) would be used temporarily for staging and construction. Based on a total of 368 structures to be replaced and the full staging/construction area being used at each structure location, up to approximately 85 acres of soils could be temporarily disturbed during pole replacement. Given the temporary nature of this disturbance and the relatively small area affected, this impact would be low.

Permanent impacts to soils from pole replacement activities also would be low. Only an extremely small amount of permanent impacts would occur because existing pole holes would be used for the new poles. Any excavation of additional soil to deepen these holes for the new poles would be mounded closely at the base of the pole to minimize soil disturbance. Permanent soil compaction from heavy machinery use at each structure site would be limited to areas immediately adjacent to the structures.

Impacts on soils from erosion would be low to moderate. The risk of erosion would be lowest on portions of the project corridor located in relatively flat areas of the Willamette Valley, such as most of the A-BW corridor and the shared corridor from where it crosses Highway 99W west to the northern edges of the City of Corvallis. The risk of erosion would be highest on the steeper slopes of the portion of the project corridor located in the foothills of the Coast Range. This risk would also increase during heavy rainfall. Mulching and prompt seeding or replanting of bare soils would reduce erosion and help disturbed sites recover more quickly. In addition, the mounding of soils at the base of new poles would help prevent erosion from occurring at the pole base. Nonetheless, exposed soils would be vulnerable to transport from disturbed sites during rain and snow melt runoff both during and after construction until ground cover vegetation is established. Until vegetation is established, this impact would be moderate; after vegetation is established, this impact would be low.

Direct impacts to soils would occur from removal of encroaching vegetation along existing access roads, grading, rocking, and improving road drainage, and installing culverts. Blading and rocking would occur on some portions of access roads with steep slopes and wet areas to improve vehicle traction. These road improvements would increase the amount of non-vegetated land in the area, disturb soils, and potentially increase runoff, sediment transport/erosion, and noxious weed encroachment during construction. However, rocking access roads in the project area ultimately would help hold soil in place and reduce the potential for erosion. The impact to soils from this work is expected to be low to moderate.

Maintenance of the project corridor would require incidental repairs to access roads and management of vegetation, which could cause localized soil disturbance. In most cases, operation and maintenance would have a low direct impact on soils because the areas affected would be small, confined to the area of a particular maintenance action, and dispersed both in time and along the length of the corridor. Danger tree removal could result in low to moderate impacts due to clearing, grading, soil compaction, and erosion.

3.2.3 Mitigation Measures

The following mitigation measures are identified to avoid, minimize, or compensate for potential impacts to soils and geology from the proposed project:

- Conduct project construction during the dry season to the maximum extent practicable, when stream flow, rainfall, and runoff are low, in order to minimize erosion, sedimentation, and soil compaction.
- Space and size culverts properly.
- Install sediment barriers and other suitable erosion control devices where needed to minimize movement of sediment.
- Retain vegetative buffers where possible to prevent sediment from eroding into water bodies.
- Use water trucks on an as-needed basis to minimize dust.
- Reseed disturbed areas with native seed mix.

- Break up compacted soils at structure sites before reseeding by tilling or scarifying.
- Control runoff and prevent erosion where possible by using low grades, out sloping, intercepting dips, water bars, and ditch-outs for access road improvements.
- Inspect and maintain access roads, culverts, and other facilities to ensure proper function and nominal erosion levels following construction.
- Inspect reseeded areas to verify adequate growth, and implement contingency measures to ensure restoration as needed following construction.
- Assist farm operators in restoring productivity of compacted soils for structure sites on agricultural lands.

3.2.4 Unavoidable Impacts Remaining After Mitigation

Unavoidable impacts remaining after mitigation include potential for increased erosion throughout the project corridor from soil compaction, road improvement, and loss of soil productivity where vegetation is removed under replaced structures. Temporarily disturbed areas would be reseeded to avoid permanent loss of productivity. The mitigation measures described above would reduce unavoidable impacts to low levels.

3.2.5 No Action Alternative

Under this alternative, construction impacts to soils and geology would be avoided. Continued operation and maintenance of the existing transmission line would have low to moderate impacts (mainly compaction and erosion) on soils from vegetation maintenance, incidental use of access roads, and improvement of existing roads. The increasing amount of maintenance that would be likely as existing structures deteriorate could lead to more erosion and compaction than currently experienced.

3.3 Vegetation

3.3.1 Affected Environment

The vegetation in the project area is influenced by the topography, climate, soils, and current and past human activities. Elevations in the area are relatively low, ranging from about 200 feet to 1,100 feet above sea level. The climate of the Willamette Basin is a modified, maritime temperate regime that is characterized by cool, wet winters and warm, dry summers. Approximately 10 percent of the average annual precipitation of 63 inches occurs between May and September. Precipitation varies markedly with altitude and ranges from about 40 inches at lower elevations to greater than 200 inches in the mountains (USGS 1995).

The portion of the project corridor located in the Willamette Valley has been extensively modified in the last two centuries. Historically the area would probably have included open oak woodlands, coniferous forests, grasslands, shrub communities, and riparian forests. However, European colonization of the Valley resulted in the clearing of portions of the valley for agricultural uses. As discussed in Section 3.1 of this EA, today these uses along the corridor are dominated by pastures and hay fields, with a few orchards, vineyards, and row crops. In non-agricultural areas, current oak woodlands are composed primarily of Oregon white oak with

lesser numbers of Douglas-fir, big-leaf maple, and grand fir. Understory species may include serviceberry, oceanspray, black hawthorn, Indian plum, sword fern, wild rose, snowberry, thimbleberry, poison oak, trailing blackberry, bracken fern, and bedstraw. Conifer forests in the Willamette Valley are composed of Douglas fir, western hazel, vine maple, with an understory of salal (Franklin and Dyrness 1973). This portion of the project corridor also has native upland prairie remnants with plants including Kincaid's lupine, lomatium, yarrow, iris, wild strawberry and native grasses.

Vegetation along the project corridor within the Coast Range area consists of mature Douglas-fir and western hemlock forest, with red alder, salal, sword fern, vine maple, Oregon grape, and rhododendron; tanoak may be found on drier south facing slopes. Wetter slopes and riparian areas support bigleaf maple, western redcedar, grand fir, red alder, salmonberry, and oxalis, with California bay-laurel in the south. Other plants that grow in the region are Pacific madrone, salmonberry, Pacific silver fir, bracken fern, manzanita, thimble-berry, Pacific dogwood, bitter cherry, snowberry, some rose species, and cascara. Additionally, various grass, sedge, and moss species are some of the other plant life growing in the coast mountain range. As in the Willamette Valley, oak woodlands and prairie were common on the eastern slope of the Coast Range within the project area prior to European colonization.

Oak woodlands are designated a strategy habitat by the Oregon Department of Fish and Wildlife (ODFW) in the Willamette Valley and Coast Range (ODFW 2006). Oak woodlands once covered almost one million acres in the Coast Range and 400,000 acres in the Willamette Valley. However, the Coast Range now has less than four percent of its estimated historic oak woodlands and the Willamette Valley has less than seven percent. Remnant oak woodlands are found along the project corridor, primarily near the Santiam-Toledo transmission line in miles 29 to 31 and the Albany-Burnt Woods transmission line in miles 9 to 10 and 13 to 17. Oak woodlands also are found sparsely interspersed with coniferous species along the project corridor from Albany-Burnt Woods line mile 18 to Burnt Woods Substation.

Special Status Plant Species. Special status plant species are those species that have been identified for protection under federal or state laws. Six plant species listed under the federal Endangered Species Act (ESA) are known to occur in Benton and Linn counties (see Table 3-1). Of these species, only two – Kincaid's lupine and Nelson's checkermallow – have been documented in the project corridor. There are no federally listed plant species found in Lincoln County along the project corridor.

Kincaid's lupine was listed under the ESA as a threatened species in 2000, and critical habitat was designated for this species in 2006. Kincaid's lupine is found mainly in the Willamette Valley where it occupies native grassland habitats, typically in native upland prairie. The plants are low-growing, 16-30 inches tall, with flowering stems that exceed the height of the branched crown. Flowering typically occurs in May and June and the plant is dormant by mid-August.

Critical habitat for Kincaid's lupine has been designated within the project corridor near the town of Wren. BPA conducted surveys for Kincaid's lupine in the project corridor in May 2008. Twenty-five lupine patches were mapped that were either wholly or partially within the right-of-way of the existing transmission lines in this area. Patch size ranged from individual plants to

0.6-acre patches. Kincaid's lupine is also found near an access road outside the project corridor near Oak Creek Road located north of Albany-Burnt Woods structure 12/5.

Table 3-1. Special Status Plant Species potentially found in the Project Corridor

Species *(Scientific Name)*	Federal Status & Critical Habitat Designation*	Other Special Status*	Present in the Project Corridor?*
Golden paintbrush *(Castilleja levisecta)*	Threatened	State of Oregon Endangered	Extirpated in Oregon
Willamette daisy (*Erigeron decumbens* var. *decumbens*)	Endangered Critical Habitat	State of Oregon Endangered	Not documented in project corridor
Water howellia *(Howellia aquatilis)*	Threatened	State of Oregon Endangered	Not documented in project corridor
Bradshaw's lomatium (*Lomatium bradshawii*)	Endangered	State of Oregon Endangered	Not documented in project corridor
Kincaid's lupine *(Lupinus sulphureus* ssp. *Kincaidii)*	Threatened Critical Habitat	State of Oregon Threatened	Documented in project corridor; found during surveys
Nelson's checkermallow (*Sidalcea nelsoniana*)	Threatened	State of Oregon Threatened	Documented in project corridor; not found during surveys

*Data from ORNHIC and 2008 plant surveys.

Nelson's checkermallow was listed under the ESA as a threatened species without critical habitat in 1993. This species is found mainly in the Willamette Valley and portions of the Coast Range. It most frequently occurs in open areas with little or no shade, such as in Oregon ash swales and meadows with wet depressions or along streams. Nelson's checkermallow is a perennial herb in the mallow family that has tall, lavender to deep pink flowers borne in clusters 1.6 to 5 feet tall at the end of short stalks. Flowering can occur as early as mid-May and extend into September in the Willamette Valley. Coast Range populations generally flower later and produce seed earlier, probably because of the shorter growing season.

Nelson's checkermallow is documented within the project corridor near Oregon Highway 99W (ORNHIC 2008). However, project surveys in June 2008 found no Nelson's checkermallow or suitable habitat for this species within the project corridor. The one documented location had been previously sprayed and partially developed and no native plants were present.
No other special status plant species are documented within the project corridor or were identified during plant surveys for the proposed project.

Noxious Weeds. Noxious weeds are non-native plants that have been designated as undesirable plants by Federal law or noxious weeds by state law. Noxious weeds can degrade farm and rangeland, injure people and animals, and threatened native plant communities by displacing native species and decreasing species diversity.

Human actions have resulted in less diverse plant communities throughout the project corridor, and led to the spread of noxious weeds and other invasive species. Noxious weeds and invasive species found in the project corridor include Scot's broom, false brome, Canadian thistle, Himalayan blackberry, and evergreen blackberry.

3.3.2 Environmental Impacts – Proposed Action

Vegetation. Impacts to vegetation would occur from pole replacement activities, improvement of project area access roads, and operation and maintenance. Pole replacement activities could result in clearing and crushing of vegetation, damage to plant roots from compaction of soils by heavy equipment, and soil disturbance. The extent of direct impacts at any one site would depend on the quality of existing vegetation and soils, site topography, and whether guy wires would be replaced. Vegetation clearing at structures would be minimal and only around the base of the structure to provide clear access. Many wood pole structures are surrounded by patches of blackberry, which is a fairly common introduced plant species in the project vicinity. The impact on vegetation from pole replacement activities thus would likely to be low to moderate.

Vegetation impacts associated with road improvements would result from cutting back vegetation on each side of existing roads and within the existing road bed. Temporary roads would be used during construction to cross sensitive areas such as wetlands or sensitive species habitat. Temporary roads would crush existing vegetation, damage roots and compact soils, but vegetation would likely recover over time. These areas would be reseeded with native species to speed the process. The impact on vegetation from road improvements is expected to be low to moderate.

The impact on vegetation from operation and maintenance of the transmission line would be low. Maintenance of the corridor would require vegetation management activities, including periodic trimming, cutting, or clearing of trees and shrubs to allow access to transmission facilities, and removal of danger trees. The work would be conducted under BPA's Vegetation Management Program, which uses a variety of methods to keep plants from interfering with transmission lines, including manual, mechanical, herbicide, and biological methods to foster low-growing plant communities (BPA 2000). Periodic removal of danger trees would continue, causing recurring impacts on maturing trees.

During scoping, two comments were received addressing the potential impacts of the pole replacement project on oak woodlands. As discussed in Section 2.1.4, no right-of-way, road or danger tree clearing would occur during project construction. BPA's vegetation management program is mandated by the Western Electricity Coordinating Council (WECC) to follow guidelines on electrical clearances and vegetation. During operation and maintenance of the lines, oak trees that grow within or adjacent to the right-of-way may be required to be cut down or trimmed based on WECC mandates. Tree removal to provide open space for proposed special status plant and wildlife species mitigation as discussed in Sections 3.3.3 and 3.4.3 would not remove any oak trees. Because the amount of trees removed along the entire length of the corridor would be so few even throughout the life of the line, the impact to oak woodlands would be low.

Based on these potential impacts, the overall impact of the proposed project on general vegetation in the area would be considered low to moderate.

Special Status Plant Species. For the four special status plant species identified in Table 3.1 as being either extirpated or not documented in the project corridor, the proposed action would not be expected to have any impact on these species. For Nelson's checkermallow, the proposed action is not expected to impact this species since the species is no longer present in its one documented location along the project corridor. The following discussion focuses on potential impacts to Kincaid's lupine, the only special status plant species documented in the project corridor and found during project surveys.

Approximately 1.1 acre of Kincaid's lupine critical habitat would be disturbed during wood pole replacement activities due to the presence of this habitat at certain structure sites (see Table 3-2). This would result in a low to moderate impact to lupine critical habitat because disturbance would occur when lupine plants are dormant and mitigation as discussed in Section 3.3.3 would be implemented to reduce impacts to lupine.

Table 3-2. Impact of Pole Replacement on Kincaid's lupine critical habitat

Line/Structure[1]	Disturbed Habitat (acres)
Albany-Burnt Woods	
2-pole structures (structures 16/3, 16/4, 16/5, 16/6, 16/7, 16/8, and 17/1)	0.42
3-pole structures (none)	0
Santiam-Toledo	
2-pole structures (structures 41/3, 41/4, 41/5, 41/6, 41/7, 41/8, 41/10, and 42/1)	0.48
3-pole structures (structure 41/9)	0.20
Total	1.1

[1] 2-pole structures would have a disturbance area of approximately 0.06 acres (about 50- by 50-foot area) at each structure site; 3-pole structures would have a disturbance area of approximately 0.2 acres (about 100- by 100-foot area) at each structure site

Based on 2008 surveys, there are two structures where individual lupine plants grow within the 50 foot radius of the pole replacement disturbance area. One of these structures is on the Albany-Burnt Woods transmission line (structure 16/3), and the other is on the Santiam-Toledo line (structure 41/6). At the Albany-Burnt Woods structure 16/3, the lupine was found growing right up to the base of the pole. If lupine is growing this close to the poles again in 2009, it would be impossible to avoid impacts to the plants during project construction. While equipment can be staged on the other side of the structure from the lupine population, some plants may be uprooted during construction. The number of plants likely to be uprooted is less than five. Removal and temporary storage of potentially impacted lupine during construction is possible, but this has been attempted only once and was not successful (Mikki Collins, USFWS, pers. comment, 2008). In addition, due to the size and proximity of this lupine patch to the pole, it is possible that construction vehicles working in the area would compact soils and crush vegetation but would not be expected to uproot any additional lupine plants.

At Santiam-Toledo structure 41/6, a small portion of a large lupine patch is located within the 0.06 acre construction footprint. This lupine patch will be fenced off and construction equipment and personnel would be instructed to avoid the area. If disturbance does occur within this area the soil is likely to be compacted and any vegetation present crushed, but no additional plants would be uprooted. Soil compaction could affect the ability of lupine to reemerge in the next spring, increase noxious weed establishment, and negatively affect lupine growth and seed germination. The impact on lupine from pole replacement activities at these two structures would be considered low to moderate.

Access road use and work also would occur in Kincaid's lupine habitat. All lupine patches on the Albany-Burnt Woods right-of-way are located off the access roads and can be easily avoided. Five culverts would be installed to allow construction equipment to cross small ditches and intermittent streams. The areas surrounding the culverts are very wet and do not support Kincaid's lupine or other prairie species. No impacts to lupine are expected from access road use or work in the Albany-Burnt Woods right-of-way.

However, lupine was present within existing access road footprints in the Santiam-Toledo right-of-way in 2008 between structures 41/5 and 41/7. Kincaid's lupine plants and critical habitat would likely be damaged or lost along this portion of access road from road improvement and access to structures. A section of the current access road is in poor shape, vegetation is growing throughout the right-of-way, and the current path that vehicles follow is not an "established" access road. Currently, vehicles traveling down the right-of-way make their own path each season. This has lead to vehicles driving over and through lupine patches. As part of the pole replacement project, a temporary access road would be created within the right-of-way in this section of the Santiam-Toledo line. The access road would be routed as much as possible to avoid lupine patches. However, due to the high density of lupine within the right-of-way in this area it is likely that the access road would cross lupine patches or individual plants. The exact acreage of Kincaid's lupine plants and critical habitat lost would not be determined until the spring of 2009 when lupine populations are mapped and the road alignment planned. However, based on 2008 survey data, it is unlikely that this area would exceed about 0.17 acre (400 feet of access road by 18 feet disturbance width).

Creation of the temporary access road on the Santiam-Toledo right-of-way may include mowing and route staking so construction workers know which route to follow. The road would be left in place at the end of the construction season to provide maintenance access. Private landowners and BPA may continue to use this path in the future, but vegetation would likely reestablish itself as has happened in the surrounding right-of-way. Any disturbed areas would be monitored for 3 years and noxious weeds would be removed. Because of its small area and high potential for the reestablishment of vegetation, impacts to lupine from this temporary access road would be considered a low to moderate impact of the proposed project.

Vegetation management typically occurs every three to five years on the shared and individual corridors. Activities may include vegetation removal and noxious weed control. In Kincaid's lupine critical habitat, activities would be scheduled to occur after September 1 and before February 15 of each year. In the fall of 2009 following pole replacement, vegetation management activities, such as mowing of woody shrubs, would help maintain the corridors as

habitat for Kincaid's lupine. Vegetation management in the lupine critical habitat would be conducted in coordination with the USFWS.

During the life of the lines, the right-of-way would be accessed for wood pole structure maintenance when repairs are need. Because the poles and hardware are being replaced, it is likely that maintenance would not occur often in the short-term. Structure maintenance would be conducted after September 1 and before February 15 of each year similar to vegetation management. However, unforeseen events such as storms or vandalism could cause a need for emergency repairs at other times of the year. If this happens there would be low to moderate impacts to Kincaid's lupine from maintenance activities.

BPA is currently writing a management plan for the sections of the right-of-way that contain habitat for the Taylor's checkerspot butterfly, Kincaid's lupine, and the Fender's blue butterfly. The plan would address methods to minimize impacts to the species from operation and maintenance activities, and methods to manage the right-of-way vegetation to benefit the species. With the plan in place, BPA's operation and maintenance activities are expected to reduce the current level of impacts to the species to low.

Noxious Weeds. During and following construction, noxious weeds could colonize disturbed soils if these soils are left bare. Standard mulching and prompt revegetation through seeding and planting would make it less likely that noxious weeds could expand or enlarge their presence in the project corridor. During operation and maintenance, BPA's use of herbicides and other methods would reduce the growth of noxious weeds targeted for control rather than promote their spread. Overall, the impact of the proposed project related to noxious weeds is expected to be low.

3.3.3 Mitigation Measures

The following general mitigation measures are identified to avoid, minimize, or compensate for potential impacts to vegetation from the proposed project:

- Prior to construction, conduct a noxious weed survey within the project corridor to more specifically identify existing locations of noxious weeds.
- Minimize ground disturbance to prevent expansion of false brome, Scot's broom, and other noxious weeds populations.
- Implement other appropriate measures to minimize the introduction and broadcast of weed seeds, including washing equipment and vehicles before entering construction areas.
- Use existing road systems, where possible, to access structure locations.
- Limit disturbance of native plant communities to the minimum necessary.
- Reseed disturbed areas with native seed.
- Inspect seeded sites to verify adequate growth and implement contingency measures as needed.

- Monitor disturbed areas for three years after construction for spread of noxious weeds and implement appropriate measure to control any infestations.

In addition to the above measures, the following mitigation measures are identified specifically to avoid, minimize, or compensate for potential impacts to Kincaid's lupine and its habitat from the proposed project:

- Resurvey portions of the project corridor that could support Kincaid's lupine for Kincaid's lupine in spring 2009 to document any new or expanded populations. As part of this resurvey, record and map all lupine patches and individuals documented.
- Do not begin project construction work until after September 1, 2009 to avoid Kincaid's lupine May to June flowering and for the plant to become dormant in mid-August.
- Prior to construction, surround any lupine patches that are within 10 feet of access roads or 20 feet of the construction footprint at a wood pole with temporary high-visibility fencing to alert crews to avoid these areas, and place a no-construction buffer around these areas.
- In Kincaid's lupine habitat, restrict the construction footprint at each structure site to a 50- by 50-foot area (approximately 0.06 acre) for 2 pole wood structures and a 100- by 100-foot area (about 0.2 acre) for 3 pole wood structures. No work will occur outside of these construction footprints, and vehicles and equipment will not travel off access roads between wood pole structures.
- Avoid staging of equipment or vehicles in designated critical habitat and from Albany-Burnt Woods structures 14/1 to 14/4 and Santiam-Toledo structures 39/1 to 39/5.
- In coordination with the USFWS and if determined feasible, attempt to remove, either by hand or using a dozer, and temporarily store during construction the lupine plants found during 2008 surveys near the base of Albany-Burnt Woods structure 16/3, as well as any other lupine plants discovered during 2009 surveys. Upon construction completion, replant the plants in place.
- Ensure that a trained biologist is present to monitor all construction in Kincaid's lupine critical habitat to ensure that impact avoidance and minimization measures are followed and disturbance to sensitive species minimized.
- Mitigate any damage to Kincaid's lupine plants and critical habitat along the access road between Santiam-Toledo structures 41/5 to 41/7 at a 3:1 ratio on a permanently protected site. This mitigation will most likely occur adjacent to the project corridor, depending on agreements with private landowners. Based on the potential impacts in this area, the maximum amount of habitat that would be needed at a mitigation site would be 0.51 acre. At the mitigation site, BPA will fund native prairie habitat enhancement and/or restoration for a period of 10 years. Kincaid's lupine and other native prairie species will be planted as needed and BPA will fund management activities at the mitigation site which may include brushing, mowing, noxious weed eradication, and tree removal depending on site-specific characteristics.
- Reseed the approximately 1.1 acre of Kincaid's lupine critical habitat disturbed during wood pole replacement with a native species seed mix as needed. Disturbance to

Kincaid's lupine critical habitat due to pole replacement will be mitigated for at a 2:1 ratio on a permanently protected site (as described above).

- When possible, use construction equipment and vehicles with rubber track tires to reduce ground disturbance and soil compaction between Albany-Burnt Woods structures 13/2 to 17/1 and Santiam-Toledo structures 38/3 to 41.
- Minimize blading and rocking and restrict this work to areas where the Santiam-Toledo line access road within the critical habitat is impassable.
- Document the above measures in a 3-year plan for reseeding disturbed habitats with native plants and nectar source species. The plan will include site pre-treatment, seeding, and vegetation monitoring and maintenance (including noxious weed removal), as discussed above. At a minimum, sites will be restored to pre-existing conditions.

3.3.4 Unavoidable Impacts Remaining After Mitigation

Replacement of structures and access road work could cause long-term soil compaction and minor reduced soil productivity under structures and on roadbeds. Reduced soil productivity could decrease habitat for Kincaid's lupine where the shared corridor crosses through lupine critical habitat. Mitigation measures described above would reduce unavoidable impacts to lupine; however restoration of lupine habitat throughout this area is dependent on the long-term success of the proposed mitigation site. Additionally, based on the prolific nature of weeds and the difficulty in controlling them, their unintentional spread into areas such as the lupine critical habitat is likely to occur. The mitigation measures described above would reduce unavoidable impacts to low levels.

3.3.5 No Action Alternative

Under this alternative, construction related impacts to vegetation would not occur. Maintenance and operation impacts would continue, and may increase above current levels if maintenance needs increase. It is uncertain precisely where increased maintenance levels may be required, but it is likely that at some point work may be required in Kincaid's lupine habitat. Because this work may be required on an emergency basis (e.g., if a support structure collapses resulting in a downed electrical line), BPA maintenance crews potentially could adversely affect Kincaid's lupine and its habitat under this alternative. Emergency repair activities for the existing transmission lines also would increase the potential for the uncontrolled spread of noxious weeds from unplanned ground disturbance and unwashed vehicles accessing repair sites.

3.4 Fish and Wildlife

3.4.1 Affected Environment

Fish and Their Habitat. The project corridor crosses approximately 50 streams or rivers within the project area, including (from east to west) the Calapooia River, Willamette River, Bowers Slough, Frazier Creek, Mountain View Creek, Jackson Creek, Oak Creek, Alder Creek, Skunk Creek, Marys River, Scheele Creek, Tum Tum River, and Hymes Creek (Figure 3-2). Some of these rivers, such as the Tum Tum River and Marys River, are crossed multiple times by the project corridor.

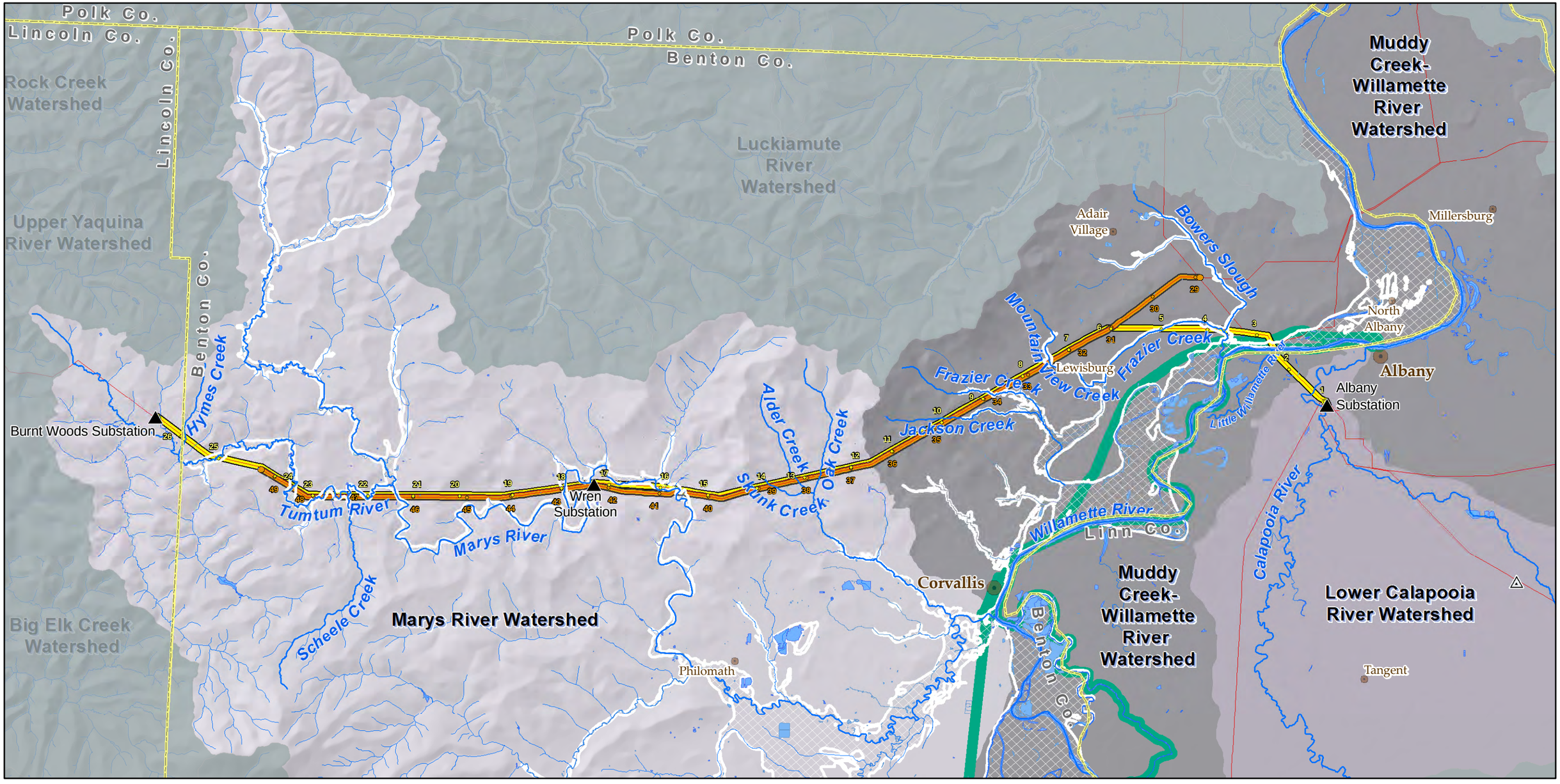

Figure 3-2 Stream, Floodplain & Groundwater Map

Albany-Burnt Woods and Santiam-Toledo Pole Replacement Project

- BPA Substation
- Foreign Owned Substation
- Albany-Burnt Woods Start of Mile
- Santiam-Toledo Start of Mile
- BPA Transmission Lines

Albany-Burntwoods / Santiam-Toledo Project Area

- Albany-Burnt Woods Line
- Santiam-Toledo Line
- Water Bodies
- Perennial Rivers & Streams
- FEMA Floodplain Boundaries in Benton County
- Southern Willamette Valley Groundwater Management Area

Miles
0 1 2 3 4

Data Source: Bonneville Power Administration Regional GIS Database.
All Data Is Best Available, 02/03/2009

EMA 03062009

The western portion of the project corridor from near Albany-Burnt Woods structure 11/4 north of Corvallis to the Burnt Woods Substation is located within the Marys River Watershed. Most of the eastern part of the project corridor is located within the Muddy Creek-Willamette River Watershed with the Albany Substation and about 1 mile of transmission line located in the Lower Calapooia River Watershed (Figure 3-2). Native fish species in these watersheds include steelhead, cutthroat trout, Chinook salmon, pacific lamprey, western brook lamprey, mountain whitefish, redside shiner, sculpin, and dace (MRWC 1999). Incidental observations suggest that lampreys are still well distributed through the Willamette Coast Range subbasins. The Willamette Basin is probably the most important production area for Pacific Lamprey in the Columbia Basin (Kostow 2002).

Special Status Fish Species. Special status fish species are those species that have been identified for protection under federal or state laws. Table 3-3 identifies threatened and endangered fish species potentially found in rivers and streams in the project area. Of the listed species, only two – Upper Willamette River steelhead and Upper Willamette River spring Chinook – have been documented in rivers and streams crossed by the project corridor.

Table 3-3. Special Status Fish Species potentially found in the Project Corridor

Species *(Scientific Name)*	Federal Status & Critical Habitat Designation*	Other Special Status*	Present in the Project Corridor?*
Oregon Chub *(Oregonichthys crameri)*	Endangered	None	Not documented in project area
Bull Trout (*Salvelinus confluentus*)	Threatened Critical Habitat	None	Not documented in project area
Upper Willamette River Steelhead (*Oncorhynchus mykiss*)	Threatened	State of Oregon Sensitive-Critical	Found in Calapooia and Willamette Rivers
Upper Willamette River Chinook (spring run) *(Oncorhynchus tschawytscha)*	Threatened Critical Habitat	None	Found in Calapooia and Willamette Rivers, and Frazier Creek

*ORNHIC 2008

Upper Willamette River steelhead was listed under the ESA as a threatened species in 1999 and reaffirmed in 2006 (also a State of Oregon sensitive-critical species); critical habitat was designated for this species in 2006. Upper Willamette River steelhead typically mature at 4 years, spending 2 years in freshwater, 1 year in the ocean, and 1 year in freshwater as an adult before spawning. Anadromous forms may spend up to 7 years in freshwater and 3 years in the ocean before first spawning, with the ability to spawn more than once. Steelhead from the Upper Willamette River are genetically distinct from those in the lower river. Reproductive isolation from lower river populations may have been facilitated by Willamette Falls, which is known to be a migration barrier to some anadromous salmonids. Juvenile steelhead likely move throughout Willamette River tributaries during winter flows using the areas as refuge habitat. Within the project area, steelhead are found in the Calapooia and Willamette rivers.

Upper Willamette spring Chinook was listed under the ESA as a threatened species in 1999 and reaffirmed in 2005; critical habitat was designated for this species in 2005. Adult Chinook salmon migrate from the ocean into their natal freshwater streams to spawn and require clean, cool water and clean gravel to spawn. Females deposit their eggs in the gravel bottom in areas of relatively swift water; eggs hatch approximately 6 to 12 weeks later. Optimum rearing habitat for Chinook salmon consists of pools and wetland areas with woody debris and overhanging vegetation. Chinook salmon typically spend 2 to 4 years maturing in the ocean before returning to their natal streams to spawn. Adult spring-run Chinook salmon enter the Columbia River in March and April, but they do not ascend the Willamette Falls until May or June, which coincides with a rise in river temperatures. In general, Willamette River spring-run Chinook salmon mature in their fourth and fifth year of life, with the majority maturing at age 4. All adult Chinook salmon die after spawning. Within the project area, Chinook are found in the Calapooia and Willamette rivers and Frazier Creek. Critical habitat for Chinook is designated in the Calapooia and Willamette Rivers.

Wildlife and Their Habitat. Wildlife habitat in the proposed project area includes Westside Lowland Conifer-Hardwood Forest, Westside Riparian-Wetlands, and Westside Oak and Dry Douglasfir Forest and Woodlands (Johnson & O'Neil 2001). Trees have been mostly removed within the project corridor, leaving it dominated by shrubs and herbaceous vegetation, or agricultural habitat. Wetland and riparian habitats are present at various locations along the project corridor (see Section 3.6 of this EA); however human development has converted much of the project corridor from native habitats to agriculture.

Upland prairie and oak habitats are present within the project corridor and may support acorn woodpecker (a U.S. Fish and Wildlife Service (USFWS) species of concern) and white-breasted nuthatch. USFWS species of concern potentially occurring within the project area include Pacific pond turtle (also a State of Oregon sensitive-critical species), sharptail snake, Townsend's Western big-eared bat (State of Oregon sensitive-critical species), olive sided flycatcher, and willow flycatcher. Other species in these habitats include common garter snake, western fence lizard, black-tailed deer, American beaver, common yellowthroat, northern harrier, American kestrel, western bluebird, and western meadlowlark (ORNHIC 2008 and NHI 2008). Within the project corridor, native wildlife species are most likely to occur in riparian zones, wetlands, upland prairies, and adjacent forests.

Two osprey nests are located on adjacent transmission line structures (Salem-Albany No. 2 structures 27/5 and 27/6). These structures are located about 50 to 75 feet from the Albany-Burnt Woods structures 2/2 and 2/3.

Special Status Wildlife Species. Special status wildlife species are those species that have been identified for protection under federal or state laws. Table 3-4 identifies the Federal and state listed threatened and endangered wildlife species potentially found in the project area. Of the Federally listed species, Fender's blue butterfly and Taylor's checkerspot have been documented in the project corridor. In addition, critical habitat for marbled murrelet exists near the project corridor.

Table 3-4. Special Status Wildlife Species potentially found in the Project Corridor

Species *(Scientific Name)*	Federal Status & Critical Habitat Designation*	Other Special Status*	Present in the Project Corridor?*
Marbled Murrelet *(Brachyramphus marmoratus)*	Threatened Critical Habitat	State of Oregon Threatened	Not documented in project corridor – critical habitat located 0.1 mile from ROW
Northern Spotted Owl *(Strix occidentalis caurina)*	Threatened Critical Habitat	State of Oregon Threatened	Not documented in project corridor
Fender's Blue Butterfly *(Icaricia icarioides fenderi)*	Endangered Critical Habitat	None	Documented in project corridor – found during recent surveys
Taylor's Checkerspot Butterfly *(Delphinium pavonaceum)*	Candidate	None	Documented in project corridor – found during recent surveys
Oregon silverspot Butterfly *(Speyeria zerene hippolyta)*	Threatened	None	Not documented in project corridor

* ORNHIC 2008

Marbled Murrelet: Marbled murrelet was listed under the ESA as a threatened species in 1992, and critical habitat was designated for this species in 1996. This species is a small seabird from the North Pacific which nests in old-growth forests. Within the general project area, marbled murrelet critical habitat is located approximately 0.1 mile from the western end of the project corridor; however no marbled murrelet sightings have occurred within 1 mile of the project corridor.

Fender's Blue Butterfly: Fender's blue butterfly was listed under the ESA as a threatened species in 2000, and critical habitat was designated for this species in 2006. Fender's blue butterfly populations occur on upland prairies or oak savanna habitat characterized by native bunch grasses. The association of Fender's blue butterfly with upland prairie is mostly a result of its dependence on Kincaid's lupine, although Fender's blue butterfly often uses wet prairies for nectaring and dispersal habitat. Habitat requirements for Fender's blue butterfly include Kincaid's and other lupines for larval food and oviposition sites and native wildflowers for adult nectar food sources. Population size of Fender's blue butterfly has been found to correlate directly with the abundance of native nectar sources (Schultz et al. 2003).

The life cycle of Fender's blue butterfly may be completed in one year. An adult Fender's blue butterfly may lay approximately 350 eggs over her 10 to 15-day lifespan, of which perhaps fewer than two will survive to adulthood (Schultz 1998, Schultz *et al*. 2003). Adult butterflies emerge in May and June. Sites occupied by Fender's blue butterfly are predominantly located on the western side of the Willamette Valley, within 21 miles of the Willamette River.

Fender's blue butterfly critical habitat is located within and adjacent to one mile of the project corridor near the town of Wren. The estimated population size of Fender's in the Wren area was 1280 individuals in 2007 (USFWS 2008). The Wren site is one of only two Fender's sites with

populations over 1000 individuals. No population estimates of Fender's populations within the project corridor are available; however, based on examination of current population maps, it is estimated that the project corridor provides approximately 10 percent of currently known occupied habitat near Wren.

A small roadside population of Fender's is also found on Oak Creek Road near a BPA access road. The population was last surveyed in 2004 and 2 males were identified (Hammond 2004).

Taylor's Checkerspot Butterfly: Taylor's checkerspot butterfly was listed under the ESA as a Candidate species in 2001. Taylor's checkerspot populations occur in open habitat dominated by grassland vegetation. Larval host plants include members of the figwort or snapdragon family, including paintbrush, as well as native and nonnative plantains. Suitable habitat must also include an abundance and variety of nectar sources. Checkerspot adults appear in the spring, during April and May, to mate and lay eggs, sometimes in clusters of up to 1,200. The next spring, the larvae finish maturing, pupate, and emerge as adults from mid-April to mid-May to complete the cycle.

There are currently only two known populations of Taylor's checkerspot butterfly in Oregon, both in the vicinity of Corvallis. The Xerces Society has estimated that as many as 2,000 individuals may be detected at the Oregon sites in any year (USFWS 2007). In 2005, over 1,200 adults were detected along the project corridor about 2 miles east of Wren (Ross 2005). This population is one of the strongest remaining and was discovered in 1999 (Vaughan and Black 2002). Nectar species such as wild strawberry and mariposa lily, and the larval host plant *Plantago lanceolata* (plaintain) are found within this area of the project corridor. The proportion of Taylor's checkerspot butterfly that uses the project corridor is about 10 percent of its total known population.

3.4.2 Environmental Impacts – Proposed Action

Fish and Their Habitat. Direct impacts to fish from structure replacement are expected to be low and limited to temporary disturbances from increased noise in the vicinity of fish-bearing streams. No equipment would enter streams during pole replacement. The temporary disturbances to fish are not expected to result in injury or death.

Five structures are within 50 feet of fish-bearing streams or primary tributaries to fish-bearing streams (see Table 3-5 in Section 3.5, Water Quality). Replacing structures would have low indirect impacts on fish from potential introduction of sediment into fish-bearing streams. There is low probability of fish mortality from sediments entering fish-bearing streams during spawning and incubation periods. Increased turbidity, the suspended sediment carried by the stream, could affect fish directly by abrasion, clogging of gills, decreased feeding success due to reduced visibility, degradation of spawning gravels, increased egg and fry mortality, and reduced fry growth rates, and also could affect aquatic prey. Use of best management practices as described in Section 3.4.3 and 3.5.3 would minimize or eliminate the delivery of sediments into streams.

Direct impacts to fish from access road work would be similar to structure replacement. New culverts are proposed for 5 streams; however, these streams are not fish-bearing. Indirect

impacts to fish from road work are expected to be low and result primarily from disturbance of soils and the introduction of sediment into fish-bearing streams. Potential impacts on fish and prey organisms would depend on construction timing and whether sediment reached the stream. No riparian vegetation would be removed during structure replacement or access road work.

Direct impacts to fish from routine maintenance activities are expected to be low to moderate. Maintenance activities could include access road improvements, culvert replacement, and vegetation management. Impacts to fish would be similar to those described for pole replacement and access road work. Maintenance activities would not likely result in the injury or death of fish unless, in the future, it is necessary to replace culverts in fish streams.

Indirect impacts to fish from transmission line maintenance activities would be low to moderate. Removal of riparian vegetation, use of pesticides, changes in runoff and infiltration patterns (from upland vegetation clearing), sedimentation from cleared areas, and maintenance of access roads across streams could alter fish habitat. Implementation of best management practices during vegetation management as described in BPA's Transmission System Vegetation Management EIS (BPA 2000) would reduce impacts to fish and their habitat.

Upper Willamette River Steelhead. There would be no impacts to listed Upper Willamette River steelhead from the proposed project as no in-water work would occur. Structures to be replaced are between 80 and 350 feet from rivers that support this species. The topography between the towers and the rivers is flat which would reduce the chance for disturbed sediments from entering rivers supporting listed fish. Riparian vegetation would further reduce the ability of sediment to enter rivers supporting listed fish. No road work would occur near any waterbody supporting listed fish.

Upper Willamette River Spring Chinook. There would be no impacts to listed Upper Willamette River spring Chinook for the same reasons as described for Upper Willamette River streelhead.

Wildlife and Their Habitat. Direct impacts to wildlife from structure replacement are expected to be low to moderate. Impacts from loss of foraging and ground-nesting habitat around existing structures is expected to be low and is unlikely to result in injury or death of wildlife. The amount of habitat disturbed would be a small percentage of the habitat available to wildlife within the project corridor. A temporary increase in noise during construction activities 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.

Indirect impacts from noxious weed infestation of wildlife habitat could occur as noxious weeds establish themselves in the disturbed area surrounding structures; however vegetation management and mitigation measures specific to the spread of noxious weeds (see Section 3.3.3) within the project corridor would minimize that potential.

Direct impacts to wildlife from road work on existing access roads are expected to be low. Species are expected to use surrounding non-affected areas for foraging and ground-nesting activities. No wildlife habitat would be lost because existing access roads would be used.

Indirect impacts to wildlife from access road work is expected to be low and could include the introduction of noxious weed species, increased noise levels, and some increased human access. Increased vehicle noise during road use may cause wildlife to temporarily avoid work areas.

Impacts to migratory birds from the proposed project would be similar to those for wildlife. The osprey nests located near the Albany-Burnt Woods transmission line would be temporarily disturbed if they are active during project construction; however, disturbance would be short-term, and additionally the nests are located near urban and agricultural environments where human disturbance is frequent.

Impacts to wildlife from operation and maintenance of the transmission line would be low. Existing levels of bird mortality would be expected as a result of collisions with conductors and structures. However, it is not expected to be higher than current levels because the lines would remain in the same location with the same type of structures. Additionally, new overhead ground wire would not be installed on sections of the line other than the existing locations as discussed in Section 2.1.3. Birds tend to be more likely to strike ground wires, which are much smaller in diameter than conductors and normally span the top of the structure. Maintenance activities could remove trees and temporarily displace wildlife from work areas, but impacts are expected to be low.

Marbled Murrelet. There would be no impacts to marbled murrelets or marbled murrelet critical habitat from the proposed project. Project activities would not occur in critical habitat for this species, and this species has not been documented in the project corridor. In addition, a field survey of the nearest critical habitat showed that it currently is not suitable nesting habitat. This critical habitat area has recently been thinned and the remaining trees are not suitable nesting trees. Habitat between the project corridor and the critical habitat is young forest that also is not suitable marbled murrelet habitat. Therefore construction activities and noise would not be expected to disturb breeding marbled murrelets.

Fender's Blue Butterfly. Direct impacts to Fender's blue butterfly from structure replacement, without mitigation, would be moderate to high because the species could be present where Kincaid's lupine is growing within the 0.06 to 0.2 acre structure disturbance area. Pole replacement, use of vehicles and equipment, and movement of people during pole replacement could crush host plants and butterfly larvae. The number of larvae harmed by pole replacement would depend on the locations of lupine plants in 2009. Mitigation would be implemented to reduce mortality (see Section 3.4.3).

Because Fender's blue butterfly uses Kincaid's lupine for oviposition and larval food, loss of larval host plants would negatively affect the butterfly's reproduction and development. The impact would be most severe in the first years after project construction before lupine was able to regenerate in disturbed areas. Based on 2008 lupine patch locations, it is expected that Kincaid's lupine would be directly affected at one Albany-Burnt Woods structure (16/3). Mitigation for loss of Kincaid's lupine is described in Section 3.3.3.

Indirect impacts to Fender's blue butterfly would be moderate to high if nectar source plants, such as toughleaf iris, common lomatium, broadpetal strawberry, rose checkermallow, and Tolmie's mariposa, among others, that are used by Fender's blue butterfly are destroyed or damaged during structure replacement. Loss of nectar source plants could occur from movement of vehicles, equipment, and people during pole replacement work. Nectar source plants would be impacted if they are removed or crushed; if they are unable to set seed; if soil compaction and disturbance negatively affects the ability of the seeds to germinate in following years; and if construction disturbance causes an increase in noxious weeds. This could affect the 2010 Fender's blue population, as Fender's will be in the larval stage during 2009 construction. Loss of nectar sources also could reduce food supplies for adult Fender's blue butterfly in spring. Population size of Fender's blue butterfly has been found to correlate directly with the abundance of native nectar sources (Schultz et al. 2003). Habitat loss and encroachment by non-native invasive species are two of the primary threats for listing the species, and the proposed project could exacerbate these threats. Loss of nectar sources could cause a decline in Fender's blue butterfly populations in the project corridor where it crosses through critical habitat in the short-term; however, mitigation described in Section 3.4.3 is expected to improve the habitat in the long-term.

Portions of the project corridor east of the designated Fender's blue butterfly critical habitat do not currently support the butterfly or its host plant but provide potential stepping-stone habitat and support nectar sources. Because only a few Fender's blue butterfly use this habitat with many undisturbed nectar sources, it is anticipated that the effect to the butterfly from pole replacement in this area would be low.

Direct impacts to Fender's blue butterfly from access road work would be moderate. The type of impacts would be similar to those described above for structure replacement. Larvae mortality could occur from upgrading a portion of access road on the Santiam-Toledo right-of-way where lupine patches were found in 2008. In locations where Kincaid's lupine is found within the access road footprint, Fender's blue butterfly larvae may be crushed due to movement of construction vehicles and equipment. As with structure replacement, the number of larvae harmed by access road would depend on the locations of lupine plants in 2009. Additionally, mitigation would be implemented to reduce mortality (see Section 3.4.3). With implementation of mitigation, the impact would be low.

Indirect impacts to Fender's blue butterfly from access road work would occur where access roads overlap with nectar source populations; this impact would be moderate. Similar to impacts from structure replacement, nectar source plants could removed or crushed during road work. Mitigation such as replanting nectar species is described in Section 3.4.3.

Impacts to Fender's blue butterfly from operation and maintenance would be low to moderate. Vegetation management typically occurs every three to five years. Activities would include vegetation removal and noxious weed control. In Fender's blue butterfly critical habitat, activities would be scheduled to occur between September 1 and February 15 (the dormant season for Kincaid's lupine). In the fall of 2009, BPA may conduct vegetation management activities, in coordination with the USFWS, such as mowing woody shrubs, to help maintain the project corridor as good habitat for Fender's blue butterfly and Kincaid's lupine.

Because structure and hardware are being replaced, it is likely that maintenance would not occur in the short-term. In the long-term, structure repair would occur when possible between September 1 and February 15 of each year. However, unforeseen events such as storms or vandalism could cause a need for emergency repairs at other times of the year. If this occurs there could be moderate to high impact to Fender's blue butterfly.

As discussed in Section 3.3.2, BPA, in coordination with the USFWS, is currently developing a management plan for the portions of the project corridor that contain Kincaid's lupine, Fender's blue butterfly, and Taylor's Checkerspot (see below section) habitat.

Taylor's Checkerspot. Direct impacts to Taylor's checkerspot from structure replacement would be moderate to high without mitigation. Similar to Fender's blue butterfly, the Taylor's checkerspot could be present where host plant species (typically the non-native plantain in the project area) are growing within the 0.06 to 0.2 acre structure disturbance area. Pole replacement, use of vehicles and equipment, and movement of people during pole replacement could crush host plants and butterfly larvae. Mortality is most likely to occur where the Albany-Burnt Woods two-pole structures 13/8, 14/1, 14/2, and 14/3, the Santiam-Toledo two-pole structures 39/1, 39/2, 39/3, and 39/4, the Albany-Burnt Woods three-pole structure 14/4 and the Santiam-Toledo three-pole structure 39/5 would be replaced in prime Taylor's checkerspot habitat. The total area of prime Taylor's checkerspot habitat that would be disturbed is approximately 0.8 acre. Mitigation would be implemented to reduce impacts to low to moderate (see Section 3.4.3).

Because the host plant for Taylor's checkerspot is a very common non-native species, it is not possible to map and avoid all plantain in the project corridor. However, because plaintain is an opportunistic species, it is likely to rebound quickly from disturbance. The impact would be low.

Nectar sources in the project corridor include common lomatium and wild strawberry. Similar to Fender's blue butterfly, indirect impacts to Taylor's Checkerspot would occur if nectar source plants are removed or crushed during structure replacement. A loss of nectar sources could reduce food supplies for adult Taylor's checkerspot in the spring. Nectar sources play an important role in defining high-quality habitat for Taylor's checkerspot. When nectar is plentiful egg production increases, which is especially important for Taylor's checkerspot (Vaughn and Black 2002). Loss of nectar sources could cause a decline in Taylor's checkerspot populations in the project corridor where it crosses through suitable habitat in the short-term; however, mitigation described in Section 3.4.3 is expected to improve the habitat in the long-run. The impact would be low.

Direct impacts to Taylor's Checkerspot from access road work would be low to moderate. All access road work would occur in the footprint of existing roads. Two gates would be installed on existing access roads in Taylor's checkerspot habitat.

Impacts to Taylor's checkerspot butterfly from operation and maintenance would be low to moderate. BPA has a Right-of-Way Specialized Management Plan for the Taylor's Checkerspot

Butterfly (BPA 2005). The plan addresses best management practices that are implemented to minimize impacts to Taylor's checkerspot. BPA is currently updating the plan.

Impacts to Taylor's checkerspot from operation and maintenance would be similar to Fender's blue butterfly. Maintenance activities would be scheduled when possible to occur between September 1 and February 15 (during the period between Taylor's checkerspot life cycles). As in Fender's blue butterfly critical habitat, vegetation management activities in fall 2009 would help maintain the project corridor as good habitat for Taylor's checkerspot. With mitigation, impacts would be low.

Similar to Fender's blue butterfly, because structure and hardware are being replaced, it is likely that maintenance would not occur in the short-term. Long-term maintenance would occur within the appropriate time period as mentioned above. Emergency repair at other times of the year could result in a moderate to high impact Taylor's Checkerspot butterfly.

The same stepping-stone habitat mentioned above also supports Taylor's Checkerspot butterfly. Impacts to Taylor's would be similar in this area. Mitigation is described in Section 3.4.3.

3.4.3 Mitigation Measures

In addition to the general mitigation measures identified for vegetation in Section 3.3.3, the following mitigation measures are identified to avoid, minimize, or compensate for potential impacts to fish and wildlife and their habitat from the proposed project:

Fish and Wildlife

- Conduct pre-construction assessments with construction personnel to determine appropriate site-specific mitigation approaches to help reduce erosion and runoff, and to stabilize disturbed areas.
- Install sediment barriers and other suitable erosion and sediment control devices where needed prior to ground-disturbing activities at construction sites to minimize off-site sediment movement.
- Construct during the dry season (summer-fall) to minimize erosion, sedimentation, and soil compaction.

Fender's Blue Butterfly and Taylor's Checkerspot Butterfly

- Restrict the construction footprint in Fender's blue butterfly critical habitat and Taylor's checkerspot habitat to 0.06 acre for 2 pole wood structures and 0.2 acre for 3 pole wood structures. No work would occur outside of these construction footprints, and vehicles and equipment would not travel off access roads between wood pole structures.
- Do not begin project construction work until after September 1, 2009 to avoid impacts to butterfly habitat and adult emergence in May and June.

- Ensure that a trained biologist is present to monitor all construction in Taylor's checkerspot and Fender's blue butterfly habitat to ensure that impact avoidance and minimization measures are followed and disturbance to sensitive species minimized.
- Reseed with a native species seed mix approximately 1.1 acre of Fender's blue butterfly (and Kincaid's lupine) critical habitat following wood pole replacement. Mitigate disturbance to Fender's blue butterfly critical habitat from pole replacement at a 2:1 ratio on a permanently protected site (as described in Section 3.3.3).
- Reseed with a native species seed mix approximately 0.7 acre of Taylor's checkerspot habitat disturbed during wood pole replacement. Monitor reseeded area.
- Mitigate any damage to Taylor's checkerspot habitat by developing a mitigation plan, in conjunction with the USFWS. The plan could include protection of habitat through conservation easements, habitat enhancement and/or restoration, or funding for other recovery activities.
- Resurvey portions of the project corridor for Taylor's checkerspot butterfly in 2009 to identify all areas that are currently being used by the butterfly.

3.4.4 Unavoidable Impacts Remaining After Mitigation

Pole replacement and road work would permanently affect populations of Fender's blue and Taylor's Checkerspot butterflies by damaging or destroying host larval and nectar plants and potentially crushing butterfly larvae; however impacts remaining after implementation of mitigation would be expected to be low to moderate. Reseeding of portions of the project corridor and planting of host larval and nectar plants on a permanently protected site would most likely improve overall butterfly habitat in the long-term. As indicated above, it may not be possible to always conduct maintenance activities only between September 1 and February 15, potentially causing habitat loss and species mortality. Short-term impacts to other wildlife species would occur from loss of foraging and ground-nesting habitat around existing structures and a temporary increase in noise during construction activities. Noxious weeds could also spread as a result of the project, thereby degrading wildlife habitat.

3.4.5 No Action Alternative

Under this alternative, construction related impacts to fish and wildlife and their habitat would not occur. However the aging lines would require more frequent maintenance as poles and other components continue to age. It is uncertain precisely where increased maintenance levels may be required, but it is likely that at some point work would be required in Fender's blue butterfly and Taylor's Checkerspot butterfly habitat. Because this work may be required on an emergency basis (e.g., if a support structure collapses resulting in a downed electrical line), BPA maintenance crews potentially could adversely affect the listed butterflies and their habitat under this alternative. Emergency repair activities for the existing transmission lines also would increase the potential for the uncontrolled spread of noxious weeds from unplanned ground disturbance and unwashed vehicles accessing repair sites decreasing habitat available for host and nectar species for the butterflies.

3.5 Water Quality

3.5.1 Affected Environment

Surface Water. The project area is located within the Upper Willamette Subbasin. The project corridor crosses approximately 50 streams or rivers within the project area as discussed in Section 3.4.1 (see Figure 3-2). The only 303(d) listed waterbody within the project area is the Willamette River, which is listed for temperature, toxins, and bacteria.

Groundwater. Groundwater in the Willamette Valley is an important natural resource in the basin, providing drinking water to over 1,700 public water systems and over 100,000 private residential systems (ODEQ 2004). Willamette Basin groundwater quality studies have shown impacts from several pollutants, including nitrate, bacteria, pesticides, and volatile organic compounds (ODEQ 2004). No sole-source aquifers have been designated or proposed by the EPA in the project area (EPA 2008a).

The project corridor crosses a small portion of the northern end of the Southern Willamette Valley Groundwater Management Area (GWMA), which extends generally along the Willamette Valley from Albany, Oregon south to Eugene, Oregon (see Figure 3-2). The Oregon Department of Environmental Quality (ODEQ) created this GWMA in 2004 because of elevated nitrate levels in the area. ODEQ must declare a GWMA if it is confirmed that groundwater in an area contains nitrate at 7 ppm (parts per million) as a result of non-point source pollution. Nitrate is a common contaminant of shallow groundwater in areas with well-drained soils and derives from fertilizers, septic systems, and animal manure. The U.S. Environmental Protection Agency (EPA) has set 10 ppm (parts per million) as the maximum allowable level of nitrate in water delivered by public drinking water systems. Nitrate concentrations above the accepted background level of 2 ppm have been recorded in the Southern Willamette Valley since the 1930s, with levels above 10 ppm not uncommon.

3.5.2 Environmental Impacts – Proposed Action

Surface Water. Impacts to surface water quality from pole replacement activities are expected to be low. Vegetation removal and soil disturbance from these activities could increase wind and water erosion rates, resulting in sediment deposition directly into stream channels and increased turbidity. Increased erosion and subsequent runoff could occur where structures are immediately adjacent to streams, especially perennial, fish-bearing streams (see Section 3.4, Fish and Wildlife, for a discussion of increased turbidity on fish). However, only 5 structures along the project corridor are within 50 feet of streams (see Table 3-5). Potential impacts to water quality at these structure sites would depend on the timing of construction, weather conditions, local topography, the erosion potential of soils, and the effectiveness of best management practices implemented during construction to minimize soil erosion. Direct impacts from excavation in existing structure holes is expected to be low because any excavated soil would not be discharged to surface waters. Best management practices as described in Section 3.5.3 would be implemented to minimize direct and indirect impacts to water quality including turbidity and sedimentation. Erosion rates would likely return to their current levels once vegetation becomes reestablished.

Table 3-5. Structures along the Project Corridor within 50 Feet of Streams

Stream	Existing Structure within 50 feet of Stream	Type of Structure
Unnamed slough	Albany-Burnt Woods 1/10	2-pole suspension
Unnamed perennial	Santiam-Toledo 33/3	2-pole suspension
Scheele Creek	Santiam-Toledo 47/5	2-pole suspension
Tum Tum River	Albany-Burnt Woods 22/5	2-pole suspension
Tum Tum River	Santiam-Toledo 47/10	2-pole suspension

Impacts to surface water quality resulting from oil and fuel spills from construction equipment used adjacent to streams or wetlands are expected to be low. Mitigation as discussed in Section 3.5.3 would reduce impacts to surface water quality from oil and fuel.

Impacts to surface water quality from access road work would be similar to those from structure replacement. Culvert installation and replacement could disturb bank soils and shoreline vegetation. Five culverts would be installed in small intermittent non fish-bearing streams. No road work would occur immediately adjacent to perennial fish-bearing stream channels.

Impacts to surface water quality from routine access road maintenance are expected to be low to moderate. Grading and rocking of roads, replacing failed culverts, and controlling vegetation could increase erosion and surface water turbidity, possibly causing water quality criteria to be exceeded temporarily in a short stretch of stream. Perennial fish-bearing streams located near maintenance activities are at greatest risk for water quality impacts.

During project operation, impacts to surface water quality could occur from leaching of pentachlorophenol (PCP), a general biocide that is commonly used as a wood preservative treatment for utility poles, from the new wood poles at each structure. PCP contains chlorinated dibenzodioxins and chlorinated dibenzofurans (CDD and CDFs) as contaminants formed during the manufacture process. Although no wood pole structures would be located in waterbodies, it is possible that PCP could leach into soils and nearby surface waters. It has been postulated that PCP-treated utility poles may release this compound through volatilization or leaching, and that leached PCP may be a possible source for PCP or its transformation products in surface waters. PCP can be leached from the poles as the compound moves with either aqueous solution (as from rain) or with the solvent down the pole, either at the surface or within the pole. The main mechanism for leaching of PCP and its micro-contaminants is the downward migration of the oil carrier along the vertical axis of the pole, with subsequent leaching from the bottom part of the pole to the soil surface or to the subsoil near the underground portion of the pole, as well as from the downward movement of PCP from the surface soils to the subsoil (EPA 2008b).

Literature and laboratory studies indicate that PCP applied in oil is rapidly transported from the upper portion of the poles to the underground portion for the first few years of use, and then becomes relatively constant with time (EPA 2008b). PCP also has a tendency to rapidly degrade in the environment. In addition, the Electric Power and Research Institute (EPRI 1995) has found that PCP concentrations decreased very rapidly with distance from the wood pole. PCP concentrations decreased by as much as two orders of magnitude between three and eight inches from the wood pole. The highest preservative concentrations remained close to the pole.

Overall, the results of the EPRI studies indicated that PCP contamination is contained in the near vicinity of the utility pole, but that migration is highly dependent on localized factors such as soil type, soil chemistry, local weather and topography, initial level of pole treatment, age of pole, and other factors.

The U.S. Environmental Protection Agency (EPA) has assessed the potential for PCP in surface waters to affect drinking water. 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, the EPA has estimated that environmental concentrations for surface water are less than 1 ppb (EPA 2008b). The impact on surface water quality, as well as any associated drinking water, of the new wood poles to be used for the pole replacement project therefore is expected to be low.

Impacts on surface water quality from herbicides used in vegetation management are expected to be low to moderate. Herbicides would be applied with buffer widths as specified in BPA's Vegetation Management Program (BPA 2000). Impacts could occur if herbicide residues on vegetation and soil are transported to surface waters when it rains or, in the event of overspray, if herbicides are inadvertently applied directly to surface waters. There are specific restrictions as to distance from water and which herbicides can be used near water.

Groundwater. Impacts on groundwater from project activities are expected to be low. The proposed project could directly affect groundwater quality through soil compaction, reducing infiltration capacity, increasing surface runoff to streams, and possibly increasing groundwater turbidity. However, the ratio of the potential impact area to the area available for groundwater recharge is extremely small. Any impacts would be localized, short-term, and likely would not exceed state or Federal water quality criteria.

It is expected that direct impacts on groundwater quality from a petroleum spill would be low. Such spills could infiltrate to the groundwater aquifer, but such an event is unlikely, given proposed mitigation (see Section 3.5.3). Any chemical spills would be of small volume, contained, and cleaned up.

Albany-Burnt Wood structures 2/6 and 2/7 are located within the Southern Willamette Valley GWMA. Because replacement of these structures would not increase concentrations of nitrate in the groundwater, there would be no impacts to this GWMA.

Because of the demonstrated tendency for PCP to absorb to soils, the moderately rapid degradation of the compound in the environment, and the localized nature of the compound, it is not likely that groundwater contamination would result from the new wood poles to be used for the pole replacement project. This would be considered a low impact of the proposed project.

3.5.3 Mitigation

In addition to general mitigation measures identified for soils and geology in Section 3.2.3, the following mitigation measures are identified to avoid, minimize, or compensate for potential impacts to water quality from the proposed project:

- Prepare and implement a Storm Water Pollution Prevention Plan.
- Inspect and maintain tanks and equipment containing oil, fuel or chemicals for drips or leaks and to prevent spills onto the ground or into state waters.
- Maintain and repair all equipment and vehicles on impervious surfaces away from all sources of surface water.
- Refuel and maintain equipment at least 200 feet from natural or manmade drainage conveyance including streams, wetlands, ditches, catch basins, ponds, and pipes, and provide spill containment and cleanup. Utilize pumps, funnels and absorbent pads for all equipment fueling operations.
- Provide spill prevention kits at designated locations on the project site and at the hazardous material storage areas.
- Place construction vehicles and equipment at least 50 feet from any stream or wetland unless there is an existing permanent or temporary road constructed for access to the site.
- Examine wood poles prior to purchase to reject poles that are leaking or dripping preservatives.
- Remove any augured soil within sensitive areas (such as wetlands or designated critical habitat) from the work site.
- 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.

3.5.4 Unavoidable Impacts Remaining After Mitigation

Some unavoidable impacts would remain after mitigation because any ground disturbing activity, no matter how benign, would by its nature increase the risk of erosion and sedimentation of surface and ground waters. Even with implementation of proposed mitigation measures, potential effects from the proposed project to area streams and rivers would remain at a low risk of sedimentation until disturbed sites are revegetated.

3.5.5 No Action Alternative

Construction related impacts to surface and groundwater quality would be avoided with this alternative. Continued operation and maintenance of the existing transmission line would have low impacts to surface water quality because soil disturbance would be rare. However, the number of maintenance activities and thus the level of impact could increase as structures deteriorate. Potential impacts to groundwater from replacement poles installed as part of maintenance would be the same as for new construction wood poles. Areas where structures are in or adjacent to streams and wetlands, especially those with no access, are at greater risk of experiencing increasing impacts to water quality from sedimentation. Low impacts to ground water are expected from this alternative.

3.6 Wetlands

3.6.1 Affected Environment

Wetlands are transitional areas between well-drained uplands and permanently flooded aquatic habitats. Many wetlands are highly productive and support numerous complex food chains that represent valuable sources of energy to plants and animals. Wetlands also provide general and specialized habitat for a wide variety of aquatic and terrestrial animals.

Wetlands within the project corridor were identified using National Wetland Inventory (NWI) maps, aerial photographs, and field visits. Project area wetlands are associated with topographic depressions or riparian areas and are dominated by herbaceous vegetation (emergent wetlands). Some wetlands also occur in agricultural fields or pastures. Seven wood pole structures are located in or near wetlands (Albany-Burnt Woods structures 2/5, 7/6, 8/2, 16/5 to 16/6 and Santiam-Toledo structures 33/3 and 33/8). Albany-Burnt Woods structure 2/5 borders a riparian wetland near the Willamette River, but is not located within in the wetland. Albany-Burnt Woods structure 7/6 is located near but not within a wetland. Albany-Burnt Woods structure 8/2 and Santiam-Toledo structure 33/3 are located within an NWI mapped wetland. A wetland is located along the Albany-Burnt Woods right-of-way between structures 16/5 and 16/6. The Santiam-Toledo structure 33/8 is located in a wetland within an agricultural field. No permanent access roads are located within wetlands along the project corridor.

3.6.2 Environmental Impacts – Proposed Action

Impacts to wetlands from replacing poles at Albany-Burnt Woods structures 2/5 and 7/6 would be low. All work would occur in the upland area near the structures and not within the adjacent wetland areas. Impacts to wetlands from pole replacement at Albany-Burnt Woods structure 8/2 and Santiam-Toledo structures 33/3 and 33/8 would be low. No removal or fill of wetland soil would occur during pole replacement because the same holes would be used for new poles and a temporary access road (installed with either rubber pads or geotextile fabric and rock) would be used during construction to access these structures. Construction equipment would drive over the wetland area located between Albany-Burnt Woods structures 16/5 and 16/6 in the dry season to avoid impacts; thus the impact to this wetland area would be low. No new access road would be constructed between these structures.

Impacts to wetlands would occur as wetland vegetation is crushed and soil is compacted by equipment near structures. Wetlands located adjacent to the seven structures have previously been disturbed by agricultural use or the original construction of the lines and so are currently not highly functioning wetlands. Implementation of best management practices (see Section 3.6.3) would reduce and minimize the potential for impacts to wetlands.

Impacts to wetlands from improving existing roads are expected to be low. Direct disturbance to vegetation or soils could result from installation of culverts. Impacts from temporary access roads are expected to be low and limited to temporary damage to wetland vegetation.

Operation and maintenance is expected to have a low impact on wetlands. Maintenance would include occasional trimming or removal of tall-growing vegetation from wetlands and adjacent uplands within the rights-of-way and road maintenance activities near wetlands. Maintenance of

structures or roads in or directly adjacent to wetlands would rarely be needed, but could result in minor disturbance of wetland or adjacent upland vegetation.

3.6.3 Mitigation

In addition to general mitigation measures identified for soils and geology, water quality and vegetation in Sections 3.2.3, 3.3.3 and 3.5.3, the following mitigation measures are identified to avoid or minimize potential impacts to wetlands from the proposed project:

- Obtain and comply with applicable Clean Water Act permits for all work in wetlands or streams.
- Identify and flag wetlands before construction for avoidance.
- Install erosion control measures prior to work in or near wetlands such as silt fences, straw mulch, straw wattles, straw bale check dams, other soil stabilizers, and reseed disturbed areas as required;
- Avoid construction within wetlands and wetland buffers to protect wetland functions and values, where possible. Do not permit use of these areas for construction staging, equipment or materials storage, fueling of vehicles, or related activities.
- Use existing road systems, where possible, to access structure locations.
- Remove all temporary fill, geotextile fabric and revegetate after use of temporary roads built in wetlands.
- Use herbicides to control vegetation near wetlands in accordance with the Transmission System Vegetation Management Program (BPA 2000), to limit impacts to water quality.

3.6.4 Unavoidable Impacts Remaining After Mitigation

Wetland vegetation and soil disturbance would be short-term during construction and maintenance activities, and wetlands would be avoided where possible. Unavoidable impacts to wetlands would be low with implementation of identified mitigation.

3.6.5 No Action Alternative

Construction related impacts to wetlands would be avoided with this alternative. Current levels of disturbance to wetlands would continue or increase as existing structures deteriorate, particularly structures in wetlands with no access. New access roads might be needed with little or no planning in their construction due to the emergency nature of the repairs, resulting in a moderate to high impact. Because failures tend to occur during inclement weather when soils are more prone to erosion and thus have a higher potential to indirectly affect wetlands from sediment transport, emergency repair activities could increase the potential to disturb wetland vegetation and hydrology. BPA would continue to follow best management practices that minimize damage to wetlands.

3.7 Floodplains

3.7.1 Affected Environment

The Federal Emergency Management Agency (FEMA) identifies areas with a one-percent chance of being flooded in a given year as 100-year floodplains. The project corridor crosses the 100-year floodplains of the Willamette River, Frazier Creek, Mountain View Creek, Marys River, and Tum Tum River (Figure 3-2). In the project corridor, there are 39 existing wood pole structures within or on the boundaries of these floodplains. Three of these structures are located in the 100-year floodplain of the Willamette River, 14 of these structures are located in the Frazier Creek floodplain, 4 of these structures are located in the Mountain View Creek floodplain, 16 of these structures are located in the Marys River floodplain, and 2 of these structures are located in the Tum Tum River floodplain.

3.7.2 Environmental Impacts – Proposed Action

Impacts to floodplains from pole replacement activities are expected to be low. Pole replacement activities within floodplains would be short-term, and not alter floodplain function. Soil compaction and removal of vegetation could result in increased erosion within the floodplain until new vegetation is established. Soil compaction may interfere with subsurface water flow in the floodplain, while vegetation removal may destroy habitat and hinder the capacity of the floodplain to dissipate water energy during floods. Both of these actions could lead to erosion. However, the proportion of each floodplain potentially affect by the proposed action would be extremely small. In addition, implementation of best management practices (see Sections 3.2.3 and 3.7.3) would reduce and minimize the potential for impacts to floodplains.

Indirect impacts to floodplains would be low and limited to incidental amounts of sediment deposition in the floodplain from soil erosion in disturbed areas. The amount of sediment deposited would not change existing flood storage capacity or alter the course of floodwaters.

No access road work would occur in the 100-year floodplains of any project area streams.

Impacts to floodplains from routine maintenance activities are expected to be low because such activities would be infrequent, short-term, and localized, and would not substantially alter floodplain functions. Routine maintenance of structures and access roads in or directly adjacent to floodplains could result in minor disturbances of floodplains. Maintenance of access roads, including activities such as grading or rocking of road surfaces, replacement of culverts, and vegetation removal, could result in minor soil compaction and erosion.

3.7.3 Mitigation

In addition to general mitigation measures identified for soils and geology, water quality and vegetation in Sections 3.2.3, 3.3.3 and 3.5.3, the following mitigation measures are identified to avoid or minimize potential impacts to floodplains from the proposed project:

- Install erosion control measures prior to work in or near floodplains.
- Avoid construction within floodplains to protect floodplain function, where possible.

3.7.4 Unavoidable Impacts Remaining After Mitigation

Floodplain disturbance would be short-term and highly localized during construction and maintenance activities, and floodplains would be avoided where possible. Unavoidable impacts to floodplains would be low with implementation of identified mitigation.

3.7.5 No Action Alternative

Construction related impacts would not occur. Few additional impacts on floodplains beyond those from current transmission line operation and maintenance would be expected, although maintenance needs could increase as structures deteriorate. Existing impacts are low because activities within or adjacent to floodplains result in only short-term, localized disturbances and only minimally affect floodplain functions. Furthermore, BPA would continue to follow best management practices that minimize damage to floodplains.

3.8 Socioeconomics and Environmental Justice

3.8.1 Affected Environment

The project corridor is almost entirely located in Linn and Benton counties, with only a small portion located in Lincoln County. In Linn County, the A-BW corridor starts near the incorporated city of Albany. In Benton County, the project corridor passes near the incorporated city of Corvallis and the towns of Lewisburg and Wren. Because about 98% of the project corridor length is located in Linn and Benton counties, this section of the EA focuses on these two counties.

Population and demographics. The population of Benton County grew from 78,153 in 2000 to 85,300 in 2007 for a growth rate of 9.1%. The average annual growth rate over this period was consistent with the overall growth rate for the state of Oregon during this same time period (9.5%). The population of Linn County grew from 103,069 in 2000 to 109,000 in 2007 for a growth rate of 6.1%, below the average growth rate for the state of Oregon (Portland State University Population Research Center 2008).

Caucasians predominate among ethnic groups in Benton and Linn Counties, with 89.8% of the population of Benton County and 95% of the population of Linn County reporting as Caucasian. In Benton County Hispanics and Asians were the second and third most predominant ethnic groups in 2006, respectively at 5.7% and 5.5% (U.S. Bureau of the Census, 2006). In Linn County Hispanics and persons reporting two or more races were the second and third most predominant ethnic groups in 2006, respectively at 5.6% and 2.0% (U.S. Census Bureau, 2006).

Employment, economy, and income. Benton County's largest employment sectors (and greatest annual earnings sectors) were government, education and health services, and manufacturing, respectively. Linn County's largest employment sectors (and greatest annual earnings sectors) were trade, transportation and utilities, manufacturing, and government, respectively (Oregon Labor Market Information System 2008).

Benton County's employment growth in 2007 of 1.4 percent did not keep pace with Oregon's statewide growth of 1.6 percent. The fastest growing sectors in Benton County during 2007

were natural resources, mining, and construction which added 150 jobs to grow 10.3 percent. The construction portion of the industry accounted for most of the growth. Between 2001 and 2007, Benton County's total nonfarm employment grew 3.3 percent (Oregon Labor Market Information System 2008).

Linn County's employment growth in 2007 of 1.2 percent also did not keep pace with Oregon's statewide growth rate. The fastest growing sectors in Linn County during 2007 were transportation, warehousing, and utilities which added 230 jobs in 2007 to grow 9.5 percent. Between 2001 and 2007 Linn County has added 2,270 jobs, growing 5.7 percent (Oregon Labor Market Information System 2008).

Based on information published in 2008, the 2007 unemployment rate in Benton County was 4.1 percent and in Linn County 6.4 percent, compared to 5.2 percent statewide (Oregon Labor Market Information System 2008). However, more recent data shows that the unemployment rate in Oregon (and likely Benton and Linn counties as well) has risen rapidly and substantially over the past few months. In February 2009, Oregon announced that the state's seasonally adjusted unemployment rate had risen to 9.9 percent in January 2009. Oregon's unemployment rate is higher than the overall U.S. seasonally adjusted unemployment rate, which rose to 7.6 percent in January 2009 (Oregon Employment Department 2009).

The estimated median household income for Benton and Linn counties in 2004 was $45,247 and $39,910, respectively, which were both close to the median income for the state of Oregon in 2004 ($42,568). The poverty level in 2004 was 12.5 percent in Benton County and 13.7 percent in Linn County, compared to 12.9 percent in the state of Oregon (U.S. Census Bureau 2006).

Housing and Accomodations. The 2007 Census showed that of the 35,206 housing units in Benton County, 93.6 percent were occupied and 6.4 percent were vacant. The rental vacancy rate in Benton County in 2007 was 5.5 percent. Of the 46,737 housing units in Linn County in 2007, 95.1 percent were occupied and 4.9 percent were vacant. The rental vacancy rate in Linn County in 2007 was 5.0 percent (U.S. Census Bureau, 2007).

Within 20 miles of Corvallis and Albany, Oregon there are about 24 motels/hotels, 13 RV parks and/or campgrounds offering utility hookups for trailers. (ePodunk Inc., Februay 24, 2009)

Property Taxes. Property taxes help support the activities of local taxing districts, such as schools and local government services, and are paid by private property owners unless in a tax exempt status. All federal, state, and local government real property is exempt from paying 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 encumbrance.

Property Values. When BPA acquires a new access road located on private land, landowners are offered fair market value for the land, as established through the appraisal process. The appraisal accounts for all factors affecting property value, including the impact the access road would have on the remaining portion of the property. Each property is appraised individually using neighborhood-specific data to determine fair market value. Where existing access roads

are used to access the project corridor, and no new acquisition would be made, no additional compensation is paid.

Environmental Justice. Executive Order (E.O.) 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income 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 Order further stipulates that the 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 purposes of E.O. 12898, minority populations include all people of the following origins: African American, Asian, American Indian and Alaskan Native, Native Hawaiian or Other Pacific Islander, and Hispanic. 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 poverty guideline).

3.8.2 Environmental Impacts – Proposed Action

Both local and non-local construction workers are expected to be needed to construct the proposed project. Assuming that BPA decides to proceed with the proposed project upon completion of the NEPA process, pole replacement activities would be expected to begin in approximately May 2009. If construction goes as planned, these activities would be completed by November 2009 for a construction period of approximately 6 months. The work force required for construction would vary over the 6-month period. At a maximum, about 30 construction workers would be required for project construction during the height of construction. Changes in local population and local employment/unemployment rates resulting from construction of the proposed project are expected to return to pre-construction levels once construction is complete.

Local workers are expected to remain in their existing lodging, creating no demand for new lodging. Non-local workers would require local lodging during project construction. Worker accommodations could include temporary housing in motels/hotels or recreational vehicles parked in RV parks or campgrounds. Existing local lodging is expected to be sufficient for both the local construction workers and the potential temporary relocation of non-local workers to the area, as result of the existing housing vacancy rates in the two counties, the number of hotels/motels throughout the two counties, and the available camping in nearby campgrounds. Construction crews would typically stay in the project area until the project is completed.

Public services and utilities (police protection, fire protection, medical services, schools, and utilities) would not be adversely affected because no long-term increase in the local population is expected to occur as a result of the proposed project.

Income earned by the project construction workers is not expected to affect the annual per capita income levels of either Benton or Linn counties. Construction of the proposed project would, however, stimulate the area's economy over the short term. Purchases of local supplies and

materials and other spending by construction workers would create positive economic impacts. Both material purchases and salary would have additional multiplier effects that would create added short-term income in the project area.

The proposed project would not affect the amount of property taxes collected by Benton, Linn or Lincoln counties. There would also be no long-term impacts on property values.

The proposed project involves replacing support structures of existing transmission lines, with the replaced structures located in the same location as the existing structures, so construction impacts would occur in an area that has already been disturbed. The percentage of minority and/or low-income populations in the project area is low. Because the majority of the project corridor is forested and agricultural land (rather than residential), minority and/or low-income populations would not be exposed to disproportionately high and adverse human health or environmental effects, so no impacts on minority or low-income populations (environmental justice impacts) are expected.

There would be no ongoing socioeconomic or environmental justice impacts during operation and maintenance of the line.

3.8.3 Mitigation

The following mitigation measure has been identified to avoid, minimize, or compensate for potential socioeconomic impacts from the proposed project:

- Compensate landowners at market value for any new land rights required to acquire new, temporary or permanent access roads on private lands.

3.8.4 Unavoidable Impacts Remaining After Mitigation

With implementation of the recommended mitigation measure, no unavoidable socioeconomic impacts are expected to occur.

3.8.5 No Action Alternative

Potential positive (e.g., income and employment) associated with construction would not occur under this alternative. However, the no action alternative could result in other negative socioeconomic impacts, primarily those associated with reduced reliability and increased maintenance access requirements. Reduced reliability could lead to higher energy costs and power outages due to the failing condition of the existing transmission line, which would have moderate, negative effects on local residents, businesses, and employees.

3.9 Visual Resources

3.9.1 Affected Environment

The project corridor travels through the western Willamette Valley and continues west to the coastal foothills of Oregon. The eastern half of the project area is characterized by generally flat agricultural lands within the Willamette River valley, while the western half is characterized by rolling, forested hills as the corridor moves toward the coast range.

The A-BW corridor and its existing transmission line are visible to residents on the outskirts of Albany as the corridor west out of the city limits from BPA's Albany Substation. From there,

A-BW corridor crosses the Calapooia River, agricultural lands and both the Willamette River (near Bowers Rock State Park) and U.S. Route 20. The A-BW corridor and line are visible from Route 20 and nearby rural homes. From Route 20, the A-BW corridor and line are visible across agricultural fields and from rural residences until the A-BW corridor meets the S-T corridor.

The S-T corridor and its existing transmission line are visible to motorists traveling on NW Independence Highway, which crosses under the eastern end of this corridor. From this point west, the corridor and its line are visible across agricultural fields for about 0.5 mile before entering vegetated areas that limit views of the corridor and line. After entering the vegetated areas, the corridor and line are visible from a few rural homes. In this area, short-duration views of the corridor and line occur until the S-T corridor meets the A-BW corridor as county roads such as NE Todd Drive, NE Logsdon Road, and Haugen Road cross under the line.

The project corridor then crosses Oregon State Route 99W and proceeds through a slightly higher density rural residential area. In this area, the existing transmission lines can be viewed from homes and some county and private roads. As the project corridor moves through Chip Ross Park, McDonald Forest, Fitton Green County Park, the town of Wren and State Route 223 and on to Burnt woods Substation, the landscape becomes more forested with fewer agricultural fields or residences. West of Wren, the project corridor is adjacent to primarily forested lands. The hilly topography and forests help to shield views of the project corridor from roads and homes.

The existing transmission lines have created visual impacts and changed the landscape quality in the project area since 1946 and 1959 when they were constructed. In general, existing impacts are most apparent where the corridor is adjacent to U.S. Route 20, State Routes 223 and 99W, near residences and businesses, and near recreation sites.

3.9.2 Environmental Impacts – Proposed Action

The impact to visual resources from the proposed project would be low throughout the project corridor. Five wood pole structures would be raised about 10 feet (Albany-Burnt Woods structures 2/5, 17/8, 22/3, and 24/8). Albany-Burnt Woods structure 2/5 is on the edge of an agricultural field and the riparian zone of the Willamette River and not easily visible from homes or roads. Structure 17/8 is in an agricultural field near U.S. Route 20. Views of the structure would be of short-duration to travelers along Route 20, thus the viewing sensitivity would be low. Structure 22/3 is visible from Tum Tum Road and a nearby residence. Structure 24/8 is surrounded by private timberlands and not visible except from the right-of-way itself. Visual impacts from changes in structure height would be low given that this is an existing line and the change in height is minor. Except for the five taller structures, few other changes would be visible because existing structures would be replaced in the same locations with the same structure types.

No additional clearing (except for mitigation as described in Sections 3.3.3 and 3.4.3) would occur along the project corridor so existing views from homes and roads would remain the same. Residents with direct views of the transmission line structures would be affected by short-term

construction activity during pole replacement. Access to structures would be from local roads, highways and existing access roads where motorists and residents would be exposed to construction activity and intermittent lane closures during construction. Construction activities would result in a low to moderate, short-term impact, because views from area roads would be brief and the effect short-term.

Impacts to viewers as the project corridor passes through recreational areas such as Bowers Rock State Park, Chip Ross Park, McDonald Forest, and Fitton Green County Park would be low as the replaced structures would look the same as existing structures. Hikers and other recreationists could view construction activities from park properties. The visual impact would be short term and only affect a small area of the above parks. Impacts on recreational use would be low.

Short-term construction activities within the corridor would introduce new shapes, lines, and elements that could be viewed as incompatible with the visual environment. Materials stockpiled within staging areas such as poles, crossarms, insulators, dampers, and culverts would add rectangular bulk and linear complexity to the existing visual landscape. The color and texture of these materials may be reflective and different compared to the backdrop of the existing landscape. Areas along the corridor that would be the most sensitive to construction activity are those near residential or recreational areas. These areas include the residential areas near Albany, between Route 99W and Wren, and the recreational areas mentioned above. Because construction activities would be short-term and all stockpiled materials would be used for the replacement of poles or removed by the end of the construction period, this impact would be considered low.

Short-term localized impacts could result from operation and maintenance of the line, but would most likely not change from current conditions.

3.9.3 Mitigation

The following mitigation measures have been identified to avoid, minimize, or compensate for potential impacts to visual resources from the proposed project:

- Locate construction staging and storage areas away from locations that would be clearly visible from state highways.
- Use non-reflective insulators (i.e., non-ceramic insulators or porcelain).
- Require that contractors maintain a clean construction site and that the corridor is kept free of litter after construction.

3.9.4 Unavoidable Impacts Remaining After Mitigation

With implementation of the recommended mitigation measures, no unavoidable impacts on visual resources are expected to occur.

3.9.5 No Action Alternative

No visual impacts are expected to occur beyond those already occurring from the existing transmission line. Motorists, residents, and recreationists would continue to experience visual impacts from the existing transmission lines.

3.10 Air Quality

3.10.1 Affected Environment

ODEQ and the U.S. EPA regulate air quality in Linn, Benton, and Lincoln counties. The EPA has established air quality standards for six "criteria" air pollutants: ozone, carbon monoxide (CO), lead, nitrogen dioxide, particulate matter (PM-10), and sulfur dioxide. For each of the six criteria pollutants, the EPA has determined a maximum concentration above which adverse effects on human health may occur. These threshold concentrations are called National Ambient Air Quality Standards (NAAQS), and when an area exceeds these standards it is designated a non-attainment area. None of the project area is within a designated non-attainment area.

Global warming is an increase in the average temperature of the Earth's surface. A majority of scientists who study climate have concluded that human activities are responsible for most of this warming primarily through emission of certain gases that enhance Earth's natural greenhouse effect. In addition, the clearing of large areas of vegetation from the Earth's surface is believed to contribute to global warming because trees and other plants remove carbon dioxide from the air during photosynthesis, the process they use to produce food. Removal of vegetation contributes to the buildup of carbon dioxide by reducing the rate at which the gas is removed from the atmosphere and by the decomposition of dead vegetation.

3.10.2 Environmental Impacts – Proposed Action

Air quality for this project would be primarily impacted during the project construction period, which would last for an estimated six months. Air quality also could be slightly affected during operation and maintenance of the transmission lines. Of the six "criteria" air pollutants, particulate matter is the main concern from transmission line construction activity. Fugitive dust could be created during project site preparation including access road work, on-site travel on unpaved surfaces, and soil disrupting operations. Activities could increase dust and particulate levels on a temporary basis in a localized area. Water trucks would be used to control dust. Overall, the air quality impacts would be low and no violations of air quality standards would be expected.

The operation of heavy equipment during construction also could impact air quality. Heavy equipment and vehicles emit pollutants such as carbon monoxide, carbon dioxide, sulfur oxides, particulates, oxides of nitrogen, and volatile organic hydrocarbons. Vehicle emissions would be short-term and localized, and thus would be expected to have a low impact on air quality. Vehicle and equipment emissions would be relatively small and comparable to current conditions in agricultural and urban areas.

During operation, the transmission lines would emit limited amounts of ozone and nitrogen oxides as a result of the corona effect. However, these substances would be released in

quantities generally too small to be measured or to have any adverse effect on humans, animals, or plants. In addition, there would be occasional vehicle emissions during maintenance activities. Impacts on air quality during operation and maintenance would be low.

The proposed project would emit very little greenhouse gases during its short-term construction phase, primarily in the form of vehicle emissions. During operation and maintenance, greenhouse gas emissions would be even less. In addition, no tree or vegetation clearing would occur during construction except in the proposed mitigation site, and only occasional, infrequent removal of individual danger trees and tall-growing vegetation would occur during operation and maintenance. Low-growing vegetated areas that are disturbed during construction would be reseeded and would be expected to revegetate relatively quickly. The proposed project's potential contribution to global warming therefore would be extremely minor.

3.10.3 Mitigation

The following mitigation measures have been identified to avoid, minimize, or compensate for potential impacts to air quality from the proposed project:

- Use water trucks on as-needed basis to minimize dust during construction.
- Drive all construction vehicles at low speeds (5 mph) on access roads to minimize dust.
- Keep off-road vehicles good operating condition to minimize exhaust emissions.

3.10.4 Unavoidable Impacts Remaining After Mitigation

Some particulate matter in the form of dust and exhaust emissions would be emitted during construction and later during routine maintenance of the lines, though the impacts would not violate air quality standards and would be considered low.

3.10.5 No Action Alternative

Impacts to air quality from construction activities would be avoided. Low impacts on air quality would continue during line maintenance activities, mainly in the form of dust and air emissions from vehicles accessing the lines for these activities.

3.11 Cultural Resources

3.11.1 Affected Environment

Cultural resources are nonrenewable evidence of human occupation or activity related to American history, architecture, 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. Historic properties include "prehistoric" resources that pre-date European settlement.

For cultural resources, the area of potential effect, or APE, is the geographic area where the character or use of historic properties may directly or indirectly be altered because of a project undertaking (36 CFR 800.16). A cultural resource is "significant" if it is found to meet criteria for eligibility to local, state and national registers, and if it possesses integrity of its original

historical features and characteristics. The APE for the proposed project includes proposed areas of ground disturbance and subsurface construction, as well as construction staging areas. The APE for the two lines includes the A-BW corridor (150 feet wide), the S-T corridor (125 feet wide), the shared corridor (212 to 238 feet wide), construction staging areas, and access roads located outside the above corridors.

In addition to literature reviews and background research, archaeologists conducted a cultural resources survey of the project APE in summer 2008. The purpose of the research and survey was to document the presence or absence of potentially significant cultural resources located within the APE. Background research showed at least seven archaeological sites had been previously recorded within one mile of the APE. Field work during the visual above ground pedestrian survey included excavation of 189 shovel test probes. Ten prehistoric sites and seven prehistoric isolated finds (locales containing fewer than 10 artifacts) were found as a result of the survey. Nine of the ten archaeological sites and five of the seven isolates were found on the floor of the Willamette Valley. Table 3-6 summarizes these resources and their National Register of Historic Places (NRHP) eligibility status and general location. Consultation with the Oregon State Historic Preservation Office (SHPO) regarding NRHP eligibility is ongoing.

Table 3-6. Summary of Cultural Resources in the Project APE

Site #	Site Type and Historic Themes	NRHP Eligibility Determination/Recommendation	Location
731-1	Prehistoric lithic scatter	Recommended Eligible	Private Land in Benton County
731-2	Prehistoric lithic scatter	Recommended Eligible	Private Land in Benton County
731-3	Prehistoric lithic scatter	Recommended Eligible	Private Land in Benton County
731-4	Prehistoric lithic scatter	Recommended Eligible	Private Land in Benton County
731-5	Prehistoric lithic scatter	Recommended Eligible	Private Land in Benton County
731-6	Prehistoric lithic scatter	Recommended Not Eligible	Private Land in Benton County
731-7	Prehistoric lithic scatter	Recommended Eligible	Private Land in Benton County
731-8	Prehistoric lithic scatter	Recommended Eligible	Private Land in Benton County
731-9	Prehistoric lithic scatter	Recommended Not Eligible	Private Land in Benton County
731-10	Prehistoric lithic scatter	Recommended Not Eligible	Private Land in Benton County
731-1I	Isolate	Recommended Not Eligible	Private Land in Benton County
731-2I	Isolate	Recommended Not Eligible	Private Land in Benton County
731-3I	Isolate	Recommended Not Eligible	Private Land in

Table 3-6. Summary of Cultural Resources in the Project APE

Site #	Site Type and Historic Themes	NRHP Eligibility Determination/Recommendation	Location
			Benton County
731-4I	Isolate	Recommended Not Eligible	Private Land in Benton County
731-5I	Isolate	Recommended Not Eligible	Private Land in Benton County
731-6I	Isolate	Recommended Not Eligible	Private Land in Benton County
731-7I	Isolate	Recommended Not Eligible	Private Land in Benton County
NA	Albany-Burnt Woods 115-kV Transmission Line	Recommended Not Eligible	State, County, City, and Private Land
NA	Santiam-Toledo 230-kV Transmission Line	Recommended Not Eligible	State, County, City, and Private Land

3.11.2 Environmental Impacts – Proposed Action

Impacts to cultural resources from the proposed project could potentially 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 project work areas. For pole replacement activities, only minimal potential effects to cultural resources would be expected to occur along the majority of the project corridor. New poles would be placed in the same ground holes as the existing poles to be removed, and only a small amount of auguring (up to an additional two feet) of each pole hole would be required to comply with current depth of pole set standards. However, five known cultural resources sites are located along the Albany-Burnt Woods transmission line in miles 3 and 4 where pole replacement would occur (see Table 3-7). Although the same holes would be used, some ground disturbance would occur resulting in a moderate impact to these sites. Mitigation measures as described Section 3.11.3 would reduce impacts to low to moderate.

For access road improvements, activities such as road grading and rocking would have the greatest potential to impact cultural resources. No documented cultural resources exist in areas of proposed access road improvements, so these activities would not affect any documented resources. However, there is the potential that these activities could impact undiscovered cultural resources.

For other project construction activities, the potential impact on cultural resources would be expected to be minimal because only surface disturbance would occur, and identified cultural resource sites would be avoided where possible.

Table 3-7 lists BPA's project Determination of Effect for sites for which the Oregon SHPO has concurred with NRHP Eligibility. This information, along with the cultural resource technical report, was sent to the SHPO for review and concurrence. Consultation with the Advisory Council on Historic Preservation and the Tribes on these findings is also ongoing. The report

mentioned above was also sent to the Tribes for review. No comments or communications have been received from the Tribes with regard to the survey report or findings. Overall, the proposed project would be expected to have a low to moderate impact on cultural resources.

Table 3-7. BPA Effect Determinations for Cultural and Historic Sites

Temporary Site Number	Smithsonian Site Number	BPA Effect Determination	Notes
731-1	Not Applicable	No Effect	Pole at or near site is not being replaced.
731-2	35BE117	Adverse Effect	
731-3	35BE118	Adverse Effect	
731-4	Not Applicable	No Effect	Pole at or near site is not being replaced.
731-5	35BE120	Adverse Effect	
731-7	35BE122	Adverse Effect	
731-8	35BE123	Adverse Effect	

3.11.3 Mitigation

SHPO recommends complete avoidance of all sites eligible or potentially eligible for listing on the NRHP. If complete avoidance is not possible, mitigation measures would be implemented for affected sites. Mitigation measures identified at this time for sites that would be adversely impacted by this project include:

- Flag culturally sensitive areas so that these areas may be avoided by project personnel.
- Stop work immediately and notify local law enforcement officials, appropriate BPA personnel, the Oregon 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 and/or burials be encountered. Secure the area, placing it off limits for anyone but authorized personnel and immediately notify proper law enforcement, BPA archaeologist, the Oregon SHPO, and the Tribes.
- Prevent unauthorized collection of cultural materials by ensuring a professional archaeologist and tribal monitor are present during excavation within known sites.
- Implement any additional mitigation measures for cultural resources identified by the Oregon SHPO through the Section 106 consultation process.

3.11.4 Unavoidable Impacts Remaining After Mitigation

Implementation of the recommended mitigation measures would reduce unavoidable impacts to the cultural resource sites located in the Albany-Burnt Woods corridor. However, pole replacement could cause long-term disturbance to these sites if pole replacement is required in the future.

3.11.5 No Action Alternative

Impacts to cultural resources within the APE from construction activities would be avoided. However, impacts to cultural resources could occur during operation and maintenance of the existing transmission lines especially if replacement of individual poles on an emergency basis were necessary. Before maintenance activities on the existing lines were to occur, and if they had the potential to affect cultural resources, a cultural resources survey would be done at that time before the action took place. However, this likely would not be possible for emergency repairs, which could result in impacts to cultural resources from access and activities associated with these repairs.

3.12 Public Health and Safety

3.12.1 Affected Environment

Vehicle Travel and Aircraft. The existing environment includes persons who live, work, or recreate near the existing transmission lines, as well as travelers on U.S. Route 20, State Routes 99W and 223, and county and private roads. Many of the county and private roads are gravel or dirt.

Transmission facilities can potentially harm humans through contact. The Federal Aviation Administration (FAA) establishes requirements for towers and other tall structures that would potentially interfere with aircraft safety. Typically, structures taller than 200 feet would require flashing warning lights for aircraft safety.

Electric and Magnetic Fields. The existing environment that should be considered for effect of electric and magnetic fields (EMF) is the public living in proximity to or traveling along the route of the proposed project. There are about 15 homes in proximity (within 75 feet) to the transmission line corridors. Transmission lines, like all electric devices and equipment, produce EMF. Current (the flow of electric charge in a wire) produces the magnetic field. Voltage (the force that drives the current) is the source of the electric field. The strength of electric and magnetic fields depends on the design of the line and on the distance from the line. Field strength decreases rapidly with distance.

Electric fields from high-voltage transmission lines can cause nuisance shocks when a grounded person touches an ungrounded object under a line or when an ungrounded person touches a grounded object. Transmission lines are designed so that the electric field would be below levels where primary shocks could occur from even the largest (ungrounded) vehicles expected under the line.

Electric and magnetic fields are found around any electrical wiring, including household wiring and electrical appliances and equipment. Throughout a home, the electric field strength from wiring and appliances is typically less than 0.01 kVs per meter (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 except for the 5-milliampere criterion for maximum permissible shock current from vehicles. For siting transmission lines under its jurisdiction, the State of Oregon, through the Oregon 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 one meter above the ground surface in areas that are accessible to the public (OAR 345-024-0090). BPA designs new transmission lines to meet its own electric-field guideline of 9-kV/m maximum on the right-of-way and 5-kV/m maximum at the edge of the right-of-way.

Average magnetic field strength in most homes (away from electrical appliances and home wiring, etc.) is typically less than 2 milligauss (mG). Very close to appliances carrying high current, fields of tens or hundreds of milligauss are present. Typical magnetic field strengths for some common electrical appliances found in the home are given in Table 3-8. Unlike electric fields, magnetic fields from outside power lines are not reduced in strength by trees and building materials. 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 nor does the state of Oregon have magnetic field limits. BPA also does not have a guideline for magnetic field exposures.

Table 3-8. Typical Magnetic Field Strengths (1 foot from common appliances)

Appliance	Magnetic Fields (mG)[a]
Coffee maker	1-1.5
Electric range	4-40
Hair dryer	0.1-70
Television	0.4-20
Vacuum cleaner	20-200
Electric blanket[b]	15-100

mG = milligauss

[a] The magnetic field from appliances usually decreases to less than 1 mG at 3 to 5 feet from appliances.

[b] Values are for distance from blanket in normal use (less than 1 foot away).
Source: Miler 1974; Gauger 1985

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 recent 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 existing 115-kV Albany-Burnt Woods and 230-kV Santiam-Toledo transmission lines are comprised of many components. 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. The Albany and Burnt Woods substations are both fenced to restrict access to authorized workers. Security cameras and other specialized equipment are in place to safeguard the areas.

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.

3.12.2 Environmental Impacts – Proposed Action

Vehicle Travel and Aircraft. Potential health and safety impacts of the proposed project would include construction activity hazards, heavy equipment safety, potential fuel spills, traffic entering and traveling across the project corridor, and potential aircraft hazards. The presence of the existing transmission line with replaced poles, could pose a hazard to any low-flying aircraft. However, given the relatively low height of the proposed structures, the risk associated with this potential hazard would be considered extremely low, and would not change from current conditions.

The risk of fire and injury is associated with the use of heavy equipment, working near high-voltage lines, and hazardous materials such as fuels during access road construction and replacement of structures. Fuel spills may occur where vehicles that are not highway authorized are fueled. There would be potential safety issues with more traffic on the highways and roads in the general vicinity of project corridor during construction. Impacts would be low with implementation of mitigation.

Electric and Magnetic Fields. The primary parameters that impact the EMF produced by a power line are line voltage, current loading, line configuration, and line routing. With the exception of five structure locations where existing poles would be replaced with new taller poles, the pole replacement project would not appreciably change any of these parameters. Therefore, there generally would be no changes to the electric and magnetic field environment in the vicinity of the line as a result of the proposed project.

At the five structure locations mentioned above, pole heights would be increased slightly to raise the conductor-to-ground clearances. In these areas, ground-level electric and magnetic fields actually would decrease slightly from existing levels within the right-of-way. No changes are expected for electric and magnetic fields outside of the rights-of-way.

Existing and expected electric fields are shown in Table 3-9, with certain values noted, such as maximums and at edges of the right-of-way. All electric field values along the edge of right-of-way are less than 1 kV/m—a level at which no nuisance shocks are expected to occur. Existing right-of-way electric fields would not be changed by the pole replacement project. Electric field levels, including the maximum of 2.8 kV/m, are far below BPA electric-field guidelines of 9 kV/m maximum on the right-of-way and 5 kV/m at the edge of the right-of-way. These levels

also would be consistent with the Oregon Facility Siting Council's regulations concerning electric fields for new transmission lines.

Table 3-9. Project Corridor Right-of-Way (ROW) ElectricField Values (kV/m)

ROW Section Description		Southern ROW edge (kV/m)	Maximum on ROW (kV/m)	Northern ROW edge (kV/m)
ROW Section A:				
200 ft. ROW with 3 Lines - Albany-BurntWoods 115-kV, Salem-Albany No.2 115-kV, Salem-Albany No.1 115-kV.	Before Action	0.8	1.3	0.4
	After Action	0.8	1.3	0.4
ROW Section B:				
150 ft. ROW with 2 Lines - Albany-BurntWoods 115-kV, Salem-Albany No.2 115-kV.	Before Action	0.8	1.3	0.4
	After Action	0.8	1.3	0.4
ROW Section C:				
100 ft. ROW with 1 Line - Albany-BurntWoods 115-kV.	Before Action	0.4	1.2	0.4
	After Action	0.4	1.2	0.4
ROW Section D:				
125 ft. ROW with 1 Line - Samtiam-Toledo 230-kV.	Before Action	0.8	2.8	0.8
	After Action	0.8	2.8	0.8
ROW Section E:				
212.5 ft. ROW with 2 Lines - Albany-BurntWoods 115-kV, Santiam-Toledo 230-kV.	Before Action	0.8	2.8	0.5
	After Action	0.8	2.8	0.5
ROW Section F:				
237.5 ft. ROW with 2 Lines - Albany-BurntWoods 115-kV, Santiam-Toledo 230-kV.	Before Action	0.8	2.8	0.4
	After Action	0.8	2.8	0.4

* Values developed from BPA modeling programs

Magnetic fields are subject to controversy. After decades of research, the issue of whether there are long-term health effects associated with transmission-line fields remains controversial. Magnetic fields are most in question as possible sources of long-term effects, although studies sometimes lump the two (electric and magnetic) fields together. For the latest information, BPA looks to the determinations of the National Institute of Environmental Health Science (NIEHS) and to the related web site denoted by EMFRAPID (http://www.niehs.nih.gov/emfrapid/home.htm). Scientific reviews of the research on EMF health effects have found that there is insufficient evidence to conclude that EMF exposures lead to long-term health effects. However, some uncertainties remain for childhood exposures at levels above 4 mG.

An increase in public exposure to magnetic fields could occur if field levels increased or if residences or other structures draw people to these areas. The predicted field levels are only

indicators of how the proposed project may affect the magnetic-field environment. They are not measures of risk or impacts on health.

Existing and expected magnetic fields along the project corridor are shown in Table 3-10. Long term magnetic field exposure is related to average levels. Actual magnetic fields at any particular time may be higher or lower depending on line loading at that time. Loading varies throughout the day and year.

Maximum annual peak magnetic fields at the edges of the right-of-way after pole replacement would be less than 21.6 milligauss, and maximum average annual magnetic fields at the right-of-way edge would be 11.6 milligauss. These levels would represent no change from the existing field strength. The proposed project would not change the magnetic field environment in the right-of-way.

Magnetic fields up to about 10 milligauss can affect the pictures of standard television tubes and computer monitors. Pictures may appear "wavy." Liquid crystal displays (LCDs) are immune to these effects. LCD screens are common in laptop computers and can be obtained to replace desktop computer monitors. Should these effects occur, BPA would investigate them on a case-by-case basis.

Table 3-10. Project Corridor Right-of-Way (ROW) Magnetic Field (milligauss, based on annual 2008 line load statistics)

ROW Section Description		Southern ROW edge (milligauss)		Maximum on ROW (milligauss)		Northern ROW edge (milligauss)	
		Annual Average	Annual Peak	Annual Average	Annual Peak	Annual Average	Annual Peak
ROW Section A:							
200 ft. ROW with 3 Lines - Albany-BurntWoods 115-kV, Salem-Albany No.2 115-kV, Salem-Albany No.1 115-kV.	Before Action	1.0	4.5	7.8	48.6	2.3	14.2
	After Action	1.0	4.5	7.8	48.6	2.3	14.2
ROW Section B:							
150 ft. ROW with 2 Lines - Albany-BurntWoods 115-kV, Salem-Albany No.2 115-kV.	Before Action	0.8	3.1	6.7	39.0	1.6	9.0
	After Action	0.8	3.1	6.7	39.0	1.6	9.0
ROW Section C:							
100 ft. ROW with 1 Line - Albany-BurntWoods 115-kV.	Before Action	0.2	0.4	1.0	1.9	0.2	0.4
	After Action	0.2	0.4	1.0	1.9	0.2	0.4
ROW Section D:							
125 ft. ROW with 1 Line - Samtiam-Toledo 230-kV.	Before Action	11.5	21.6	47.7	89.4	11.5	21.6
	After Action	11.5	21.6	47.7	89.4	11.5	21.6
ROW Section E:							
212.5 ft. ROW with 2 Lines - Albany-BurntWoods 115-kV, Santiam-Toledo 230-kV.	Before Action	11.6	21.6	47.7	89.2	2.5	4.7
	After Action	11.6	21.6	47.7	89.2	2.5	4.7
ROW Section F:							
237.5 ft. ROW with 2 Lines - Albany-BurntWoods 115-kV, Santiam-Toledo 230-kV.	Before Action	11.6	21.6	47.7	89.3	1.9	3.5
	After Action	11.6	21.6	47.7	89.3	1.9	3.5

* Values developed from BPA modeling programs

Intentional Destructive Acts. 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.

Acts of sabotage or terrorism on electrical facilities in the Pacific Northwest are rare, though 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. 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. Sewage transportation and treatment can be disrupted. A special problem is the loss of industrial continuous process heat. 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.

While the likelihood for sabotage or terrorist acts related to the proposed action is difficult to predict given the characteristics of the project, it is unlikely that such acts would occur. Even if such an act did occur, any impacts from sabotage or terrorist acts likely could be quickly isolated. The Department of Energy, public and private utilities, and energy resource developers include the security measures mentioned above and others to help prevent such acts and to respond quickly if human or natural disasters occur.

3.12.3 Mitigation

The following mitigation measures would help avoid or minimize potential health and safety risks to workers and the public:

- Prior to starting construction, require the contractor to prepare and maintain a safety plan in compliance with State Oregon requirements. This plan would detail how to manage

hazardous materials such as fuel, and how to respond to emergency situations. It would be kept onsite at all times.

- During construction, require the contractors to hold crew safety meetings at the start of each workday to review potential safety issues and concerns.
- At the end of each workday, require the contractor and subcontractors to secure the site to protect equipment and the general public.
- Fuel all highway-authorized vehicles offsite to minimize the risk of fire. Fueling of construction equipment would be done in accordance with regulated construction practices and state and federal laws.
- Comply with all fire safety laws, rules, and regulations of the State of Oregon. The contractor would be required to prepare a Fire Prevention and Suppression Plan that would meet BPA, local authority, and land manager requirements.
- Provide notice to the public of construction activities.
- Ensure transmission structures minimize EMF, corona and electric fields through implementation of standard BPA design and construction practices. All BPA lines are designed and constructed in accordance with the National Electrical Safety Code (NESC). NESC specifies the minimum allowable distance between the lines and the ground or other objects. These requirements determine the edge of the right-of-way and the height of the line, that is, the closest point that houses, other buildings, and vehicles are allowed to the line.
- Ground fences and other metal structures on and near the project corridor during construction to limit the potential for nuisance shocks.

3.12.4 Unavoidable Impacts Remaining After Mitigation

Potential unavoidable public health and safety risks include accidental release of fuels or oils, accidental injury to construction workers, and possible collisions between construction vehicles and vehicles driven by the public. Nuisance shocks may occur infrequently under the proposed project; the risk is low.

3.12.5 No Action Alternative

Under the no action alternative, the proposed pole replacement would not occur and the potential health and safety risks associated with construction traffic would not occur. Existing electric and magnetic fields would remain as they are now, as shown in Tables 3-8 and 3-9. A failed structure, which is an unplanned event, could cause the line to go out of service, resulting in impacts to residential and commercial customers who depend on this transmission line for power. When a loss of electricity occurs, all services provided by electrical energy cease. Lighting used by residential, commercial, industrial, and municipal customers for safe locomotion and security is affected. Residential and commercial consumers lose electricity used for heat, air conditioning, cooking, and refrigeration. Failed structures, or failure of structure components such as cross arms or insulators, also can result in downed power lines. The flowing electricity from downed lines can pose a hazard to people in the vicinity of the downed line,

whether on foot or in vehicles. Downed lines also can start wildfires, particularly in grassland or forested areas.

3.13 Transportation/Traffic

3.13.1 Affected Environment

The project corridor generally passes through more rural areas where existing traffic volumes tend to be relatively low. The road network crossed by the eastern half of the project corridor is primarily local rural and neighborhood roads, with a few major arterials such as Bryant Way, NW Independence Highway, NW Lewisburg Avenue, and NW Highland Drive. This portion of the corridor also crosses U.S. Route 20 near Albany and State Route 99W near Lewisburg (see Figure 3-1).

The road network crossed by the western half of the project corridor is comprised primarily of rural and unimproved roads through the forested areas of the Coast Range foothills. This portion of the corridor also crosses U.S. Route 20 twice (once near Wren and again near BPA's Burnt Woods Substation) and State Route 223.

Of project area roads, U.S. Route 20 is perhaps the most travelled. This highway is known as the Albany-Corvallis Highway between Albany and Corvallis; for the remainder of this highway west to the Oregon Coast, it is known as the Corvallis-Newport Highway. U.S. Route 20 between Albany and Corvallis is classified as a Regional Highway by the State of Oregon. U.S. Route 20 is a primary route for commuters from Philomath and Albany to Corvallis and for shopping trips from Philomath and Corvallis to Albany. The highway also serves as a primary link from those cities to Interstate Highway 5 (I-5) east of Albany, as well as from I-5 west to the Oregon Coast.

Traffic volumes on roads in the vicinity of the project corridor tend be lower in winter and early spring, and higher during the summer and early fall. This is due mainly to the presence of additional vehicles associated with tourists and recreationists during the summer and early fall. Of project area roads, traffic volumes are likely highest on U.S. Route 20. Existing annual traffic volumes on the Albany-Corvallis portion of U.S. Route 20 range from about 7,000 vehicles in Corvallis near State Route 34 to about 32,600 in Albany at the bridge over the Willamette River near the Benton-Linn County Line (ODOT 2007).

In addition to project area roads, the project corridor crosses over existing railroad tracks at three locations. The A-BW corridor crosses a Union Pacific railroad line at structures 2/7 and 2/8 near where this corridor crosses U.S. Route 20 near Albany. The project corridor also crosses railroad tracks from Santiam-Toledo structures 40/7 to 40/8 and 42/2 to 42/3 near Wren and from Albany-Burnt Woods structures 21/2 to 21/3 and Santiam-Toledo structures 46/3 to 46/4 near the community of Blodgett.

3.13.2 Environmental Impacts – Proposed Action

During construction of the proposed action, there would be a temporary increase in traffic on project area roads from worker vehicles and construction vehicles delivering construction equipment and materials to the project corridor. Construction equipment and material deliveries would occur throughout the estimated six-month construction period. These construction-related vehicle trips could temporarily affect the transportation system by creating minor, short-term

traffic congestion on local roads leading to the project corridor, and potentially increasing roadside parking hazards. The delivery of construction equipment and materials to staging area(s) also may result in temporary and periodic traffic congestion in the local area. However, these activities would not be expected to result in a decrease in the level of service of project area roadways.

Construction activities near roads in the vicinity of the project corridor also may cause brief traffic delays on these roads, as materials are delivered and construction equipment is moved into place. In addition, at a few of the corridor crossings of local highways, pole replacement activities would temporarily affect traffic flow through lane closures. Replacement of structures near State Route 99W, State Route 223, and the three U.S. Route 20 crossings could require one-lane traffic closures in short sections for the short period of time (1-3 hours) while the poles are being replaced at a particular location. While these closures would result in temporary traffic delays, they would not be expected to result in a decrease in the level of service of project area roadways because of their very short duration.

No adverse transportation impacts would be expected during operation of the transmission line because there would be only minimal traffic associated with line operation and maintenance that would not result in appreciatively different traffic levels from existing conditions. These activities therefore would not result in a decrease in the level of service of project area roadways or increase any roadside parking hazards.

Accordingly, the overall impact of project construction would be low because of its temporary and limited nature, and there would be no impacts during operation.

3.13.3 Mitigation Measures

The following mitigation measures are identified to avoid, minimize, or compensate for potential transportation-related impacts from the proposed project:

- BPA will prepare a notice about construction activities and a proposed schedule for posting on the Oregon Department of Transportation (ODOT) Traffic Advisory.
- Schedule construction activities at transmission line crossings of U.S. Route 20, State Route 99W, and State Route 223 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.
- Keep construction activities and equipment clear of residential driveways as much as possible.

3.13.4 Unavoidable Impacts Remaining After Mitigation

With implementation of the recommended mitigation measures, the only unavoidable adverse impacts on transportation would be minor traffic delays where along Routes 20, 99W, and 223 during pole replacement activities at structures adjacent to these roadways.

3.13.5 No Action Alternative

Under the no action alternative, the poles and other equipment on the existing transmission lines would not be replaced, and construction traffic associated with the proposed replacement activities would not occur. However, because of the increased need for ongoing maintenance under this alternative, it is expected that intermittent traffic increases could occur from maintenance trucks and other vehicles accessing portions of the line in need of repair. Depending on the location and nature of these repairs, temporary closures of roads in the vicinity of the project corridor might occur during these more frequent repairs.

3.14 Noise

3.14.1 Affected Environment

Noise is commonly defined as unwanted sound that disrupts normal human activities or diminishes the quality of the human environment. Sources of noise associated with electrical transmission systems include construction and maintenance equipment, transmission line corona, and electrical transformer "hum." Corona-generated noise, characterized as a hissing, crackling sound, is generally only of concern for transmission lines with voltages of 230-kV or greater.

Along the project corridor, existing noise levels vary with the proximity of the corridor to highways and other noise-generating activities. Most of the project corridor is located in rural, undeveloped areas where noise levels generally are very low. In the more developed areas, traffic and noise associated with human activity are major contributors to background noise. During foul weather, noise from the existing line can be a source of background noise, along with wind and rain hitting vegetation.

Audible noise is measured in decibels (dBA) on the A weighted scale. The A weighted scale describes sound that corresponds to human perception. Table 3-11 contains examples of common activities and the associated noise level in dBA.

Table 3-11. Common Activities and Associated Noise Levels

Sound Level (dBA)	Noise Source
110	Rock and roll band
80	Truck at 50 feet
70	Gas Lawnmower at 100 feet
60	Normal conversation indoors
50	Moderate rainfall on foliage
40	Refrigerator
25	Bedroom at night

BPA has established a 50-dBA design criterion for corona-generated audible noise from transmission lines at the edge of the rights-of-way.

Corona on transmission line conductors can also generate electromagnetic noise in the frequency bands used for radio and television signals. The noise can cause radio and television interference. In certain circumstances, corona-generated electromagnetic interference (EMI) can also affect communications systems and other sensitive receivers. Interference with

electromagnetic signals by corona-generated noise is generally associated with lines operating at voltages of 345-kV or higher. This is especially true of interference with television signals. BPA is not aware of any instances where the existing transmission line has caused radio and television interference of any significant magnitude.

3.14.2 Environmental Impacts – Proposed Action

The potential noise impacts of the proposed project would include construction activity noise, maintenance activity noise, corona noise, and radio and television interference.

Construction Noise. Short-term noise impacts would occur during access road work and pole replacement with the use of conventional construction equipment, including heavy equipment operation and truck traffic. Table 3-12 summarizes noise levels produced by typical construction equipment that would likely be used for the pole replacement project.

Table 3-12. Typical Construction Noise Levels

Type of Equipment	Maximum Noise Level (dBA_{max}) at 50 Feet
Road grader	85
Bulldozer	85
Heavy truck	88
Backhoe	80
Pneumatic tools	85
Concrete pump	82
Crane	85
Combined equipment	89

Construction would involve replacing 324 two-pole suspension structures and 44 three-pole dead-end structures and some access road improvement. Noise levels in the immediate vicinity of construction activity would range from 80 to 90-dBA and would only occur during the day. Because the impacts would be temporary and consistent with typical construction activity noise, this impact would be considered low.

Maintenance Noise. Periodic noise impacts would occur during maintenance activities. Maintenance noise would involve noise generated by occasional maintenance and repair activities for the transmission line, similar to the maintenance noise that currently occurs for the existing transmission line. In addition, during periodic vegetation maintenance activities, noise could be generated by various cutting devices such as chainsaws to remove vegetation from the project corridor. Line maintenance using pickup trucks and off-road vehicles would generate occasional noise levels in the range of 70 to 85-dBA. Given the short-term nature of this noise, this impact would be considered low.

Although not part of the proposed project, BPA also conducts routine helicopter inspection patrols of the federal transmission system in the Pacific Northwest, including the transmission lines in the project corridor. As part of these routine patrols, BPA would continue to use helicopters to fly the line to look for any problems or repair needs. These patrols typically occur two or three times a year, generally in March, July, and/or October. Any noise experienced by receptors on the ground during these flyovers thus would be extremely infrequent, as well as

very short-term (that is, only for the few seconds it would take for the helicopter to pass over the receptor).

Corona Noise. Because the conductors of the transmission lines would not be replaced under the proposed action, no changes in corona noise from existing conditions would be expected. During fair weather, the transmission lines would continue to generate very little noise, similar to the existing lines. Noise from the conductors thus would be unlikely to be perceived beyond the edge of the rights-of-way along the corridor under these conditions. However, during certain weather conditions, usually high humidity or foul weather, the transmission lines could create corona noise. Table 3-13 presents computed corona noise levels. These levels are very low, with the highest level being less than 50-dBA, a level which can barely be heard even during wet weather. These levels are barely discernible by most humans, and based on Table 3-13, the levels can be categorized as below the sound of a refrigerator running and would be below the 50-dBA BPA criterion. Accordingly, the audible noise environment along the project corridor is not expected to change as a result of the proposed action.

Radio and Television Interference. There would be no changes to the operating line voltage of either the Albany-Burnt Wood 115-kV or Santiam-Toledo 230-kV lines as part of the proposed project. The project would result in new, properly installed connecting hardware that would reduce any risk associated with aging hardware spark-discharge activity. As a result, the proposed project is expected to either not change or possibly slightly improve radio and television interference performance in the project area and, based on past performance, interference complaints are not expected. If the transmission lines were found to be the source of radio or television interference in areas with reasonably good reception, measures would be taken to restore the reception to a quality as good as or better than before the interference.

Table 3-13. Rights-of-Way Audible Noise, (dBA, wet conditions).

ROW Section Description		Southern ROW edge (dBA)	Maximum on ROW (dBA)	Northern ROW edge (dBA)
ROW Section A:				
200 ft. ROW with 3 Lines - Albany-BurntWoods 115-kV, Salem-Albany No.2 115-kV, Salem-Albany No.1 115-kV.	Before Action	29.2	32.6	28.4
	After Action	29.2	32.6	28.4
ROW Section B:				
150 ft. ROW with 2 Lines - Albany-BurntWoods 115-kV, Salem-Albany No.2 115-kV.	Before Action	28.3	31.1	27.1
	After Action	28.3	31.1	27.1
ROW Section C:				
100 ft. ROW with 1 Line - Albany-BurntWoods 115-kV.	Before Action	25.5	29.7	25.5
	After Action	25.5	29.7	25.5
ROW Section D:				
125 ft. ROW with 1 Line - Samtiam-Toledo 230-kV.	Before Action	44.3	48.6	44.3
	After Action	44.3	48.6	44.3
ROW Section E:				
212.5 ft. ROW with 2 Lines - Albany-BurntWoods 115-kV, Santiam-Toledo 230-kV.	Before Action	44.3	48.6	40.5
	After Action	44.3	48.6	40.5
ROW Section F:				
237.5 ft. ROW with 2 Lines - Albany-BurntWoods 115-kV, Santiam-Toledo 230-kV.	Before Action	44.3	48.6	39.7
	After Action	44.3	48.6	39.7

* Values developed from BPA modeling programs

3.14.3 Mitigation

The following mitigation measures are identified to avoid, minimize, or compensate for potential noise impacts from the proposed project:

- Use mufflers on all construction equipment and vehicles with exhaust.
- Conduct noise-generating construction activities within 1,000 feet of residential structures only during normal daytime hours (that is between 7 a.m. and 7 p.m.).
- Restore radio or television to a quality as good or better than before the project, if the pole replacement project was found to be the source of interference.

3.14.4 Unavoidable Impacts Remaining After Mitigation

Unavoidable noise impacts would include noise that would be experienced by residents during construction activities and the very low permanent corona-generated noise of the transmission

lines during inclement weather. With implementation of mitigation, noise impacts in the short-term would be low to moderate, and in the long-term would be low.

3.14.5 No Action Alternative

Under this alternative, noise associated with construction activities would not occur. Noise associated with maintenance would continue as in the past and could occur more often than under the proposed project. This is because the deteriorated condition of the existing lines would require more frequent and longer duration maintenance. The existing lines would continue to generate low levels of corona noise.

3.15 Cumulative Impact Analysis

This section describes the potential cumulative impacts associated with the pole replacement project. Cumulative impacts are the impacts on the environment which result from the incremental impact of the proposed action when added to other past, present, and reasonably foreseeable future actions, regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.

This section first describes existing development in the vicinity of the proposed project, as well as current and reasonably foreseeable future development planned for the area. Potential cumulative impacts are then analyzed and described. The past, present, and reasonably foreseeable future actions provide the context in which to assess the cumulative impacts of these actions in combination with the proposed project.

3.15.1 Cumulative Development

The nature and extent of existing development due to past and present actions in the vicinity of the proposed project 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 lines in the project corridor, past actions that have adversely affected natural and human resources in the project area include agricultural activities, logging activities on private lands, highway and railroad construction, and commercial and residential development. Reasonably foreseeable future actions include:

- Oregon 99W Locke Creek Bridge Replacement: The ODOT plans to replace the Locke Creek Bridge located approximately 500 feet north of Lewisburg Road on Oregon 99W and approximately 700 feet south of the project corridor. The project would replace the current bridge with a new structure with two travel lanes, a 16 foot turn lane, and 8 foot shoulders. Construction is planned to occur in the spring, summer, and fall of 2009.
- Other state and county road maintenance activities such as paving and culvert replacement could also occur in the project area.
- BPA would continue to operate and maintain the transmission lines in the project corridor. Routine work may include hardware replacement, vegetation management, danger tree removal, and minor access road work.

- Agricultural activities such as grass seed farming and grazing would continue into the foreseeable future.
- Forest management and timber harvest activities on private forest lands adjacent to the project corridor would be expected to continue into the foreseeable future.
- The project corridor is located outside the Urban Growth Boundaries (UGBs) of Albany and Corvallis, except for a small portion of the eastern end of the A-BW corridor near BPA's Albany Substation that is located in the Albany UGB, and about three miles of the shared corridor from about State Route 99 west to Chip Ross Park that is located in the Corvallis UGB. Limited rural residential development is expected to occur adjacent to the project corridor in areas zoned for residential growth outside of the UGBs. Higher density residential and other urbanized uses are expected to continue to be developed within the Albany and Corvallis UGBs.
- Benton County Habitat Conservation Plan: In 2006, Benton County received a grant from the USFWS to develop a Habitat Conservation Plan (HCP). The HCP would allow the County to expand upon current conservation efforts by increasing restoration opportunities on County and other private lands, provide long-term protection of sensitive species and habitats, and develop a more economical and ecological approach to species conservation and mitigation. The HCP would allow economic development within the county to continue, while at the same time conserving several listed and candidate upland and wet prairie species. The HCP would cover eight endangered, threatened, or rare species that occur in the prairie ecosystems of the county including Fender's blue butterfly, Taylor's checkerspot butterfly and Kincaid's lupine. The habitat conservation plan would describe those activities that are likely to affect the species, the steps that would be taken to avoid, minimize and mitigate for such impacts, the funding that would be available to implement the conservation measures, and implementation of the HCP, including monitoring and adaptive management.
- BPA is currently writing a Management Plan and consulting with the USFWS for Fender's blue butterfly, Taylor's checkerspot butterfly, and Kincaid's lupine, along with other listed species found in BPA's rights-of-way, to address BPA's vegetation management and transmission line maintenance. The Management Plan would describe Best Management Practices and other impact avoidance measures to reduce BPA's impact on the species, and would also identify mitigation actions.

3.15.2 Cumulative Impacts

The pole replacement 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 Section 3.1 through 3.14 of this EA. The following analysis describes these potential cumulative impacts, in the order that the resources are presented in Section 3.1 through 3.14 of this EA.

Land Use

Land use in the project vicinity has incrementally changed due to past and present development, and this trend would be expected to continue with the cumulative future development identified in Section 3.15.1. Because the proposed action would merely replace poles along an existing

transmission line in an already existing transmission line corridor, the proposed action would not contribute to cumulative land use impacts.

Geology and Soils
Past and present cumulative actions in the project vicinity have adversely affected soils through soil disturbance, compaction, and increased erosion. Reasonably foreseeable future projects likely would result in additional impacts on soils such as reduced soil productivity, compaction, rutting, and erosion. The major cumulative impacts to soils in the project area would continue to be from agriculture, grazing, and forest management along with commercial and residential development. The proposed project would add an insignificant impact to the cumulative soil changes that have been and will continue to be caused by other development.

Vegetation
Past and present transmission line corridor clearing and danger tree removal, access road construction and maintenance, agriculture, grazing, timber harvest, and development have resulted in a cumulatively significant change in the composition of vegetation in the project area. Reasonably foreseeable future actions, such as BPA's vegetation management and danger tree removal, ongoing agriculture, timber harvest, and development would continue this trend. By removing some vegetation along the existing transmission line corridor, development of the proposed action would contribute incrementally, though in a relatively minor way, to these cumulative impacts.

Past and present development has cumulatively decreased prairie habitat for Kincaid's lupine in the project area, and throughout the Willamette Valley. The proposed project would likely temporarily negatively impact Kincaid's lupine, and therefore increase cumulative impacts to the species and its habitat. However, BPA's mitigation plan for the proposed project and overall Management Plan, along with the Benton County HCP, would reduce the cumulative impacts of development in the project vicinity.

Past and present activities in the project vicinity have led to a spread of noxious weeds in the vicinity, and noxious weed spread 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 due to the proposed action. The proposed action thus would contribute incrementally, though in a relatively minor way, to this cumulative impact.

Fish and Wildlife
Past and present development and other activities have had a cumulative adverse impact on wildlife species and their habitat in the project vicinity. The clearing and conversion of land for urban development, agriculture, utility infrastructure (such as the existing transmission line corridor), timber harvest, and other uses since approximately the 19th century has resulted in the cumulative loss of wildlife habitat. This habitat loss and modification has resulted in the displacement of wildlife species. Reasonably foreseeable future actions involving development would be expected to incrementally add to these cumulative impacts.

The proposed project would impact wildlife and wildlife habitat through construction disturbance and some vegetation removal. The proposed action would thus contribute incrementally, though in a relatively minor way, to the cumulative impact on wildlife species and wildlife habitat.

Fish: Cumulative impacts to fish in the project area include past and current effects of agriculture, erosion and increased input of fine sediments, road-building activities, grazing, timber harvest, and poor water quality due to human development. These activities and many other reasonably foreseeable future actions would be expected to continue to affect fish habitat and populations. However, fish recovery programs implemented by the National Marine Fisheries Service (NMFS) and other federal agencies, and the Oregon Department of Fish and Wildlife, would be expected to generally maintain the existing level of cumulative effects on fish, and may even reduce these cumulative impacts as habitat conditions improve due to these cumulative actions. The proposed project would result in only small localized impacts to streams in the project area, primarily during the project's construction period and thus would contribute only slightly and for a short time to cumulative impacts on fish in the project vicinity.

Special Status Species: Past and present development has cumulatively decreased prairie habitat for Fender's blue and Taylor's Checkerspot butterflies in the project area, and throughout the Willamette Valley. The proposed project would likely negatively impact Fender's blue butterfly by crushing larvae with construction equipment and temporarily damaging host plants and nectar species, and therefore increase cumulative impacts to Fender's blue butterfly. However, BPA's mitigation plan for the proposed project and overall Management Plan, along with the Benton County HCP, would reduce the cumulative impacts of development in the project vicinity.

Migratory birds: Clearing of vegetation as a result of agriculture, timber harvest, development, and transmission line corridor clearing has removed trees and other native vegetation used by migratory birds, thereby cumulatively affecting habitat for these species. The proposed project would contribute incrementally, though in a relatively minor way, to the cumulative impact on migratory birds as a result of construction disturbance and some vegetation clearing.

Water Quality

Past and present cumulative actions in the project vicinity have adversely affected water quality through soil disturbance, increased erosion, and sedimentation transport to project vicinity streams. Reasonably foreseeable future projects likely would result in additional impacts on water quality. The major cumulative impacts to streams in the project area would continue to be from agriculture, forest management, road and urban development. However, improvements to streams would be made through habitat improvement projects in the project vicinity as stream enhancement projects are implemented and as stream barriers are removed. The proposed project would have a negligible impact to the cumulative water quality changes that have been and will continue to be caused by other development.

Wetlands

Incremental losses and degradation of wetlands over time have cumulatively depleted wetland resources in the United States. In the project area, some wetlands likely were previously impacted by construction of the existing line from access road construction and placement of

structures in wetlands, agricultural activities, past timber harvest, and development. The reasonably foreseeable future actions may also affect wetlands in the project vicinity, but it is expected that these future projects would be required to avoid, minimize, and compensate for any potential impacts to wetlands from filling or other activities as part of project Section 404 permitting requirements. Accordingly, it is expected that the current approximate acreage of wetlands and mix of wetland function and values would be maintained. Therefore, the proposed project would not be expected to contribute to cumulative impacts to wetlands.

Floodplains
Past and present cumulative actions in the project vicinity have adversely affected floodplains through development of and disturbance in floodplains. Benton County has a Floodplain Management Overlay zone, and Linn County has a Floodplain Management Code, both which regulate development in floodplains. The extent to which cumulative development may impact floodplain function in unknown, but is expected to be low due to floodplain protections. Construction of the proposed project would not change floodplain function as existing structures would just be replaced in-kind. Therefore, the cumulative impact of the proposed project and other cumulative projects on floodplains would be low.

Socioeconomics
Because the proposed project would not be expected to result in any changes in population, there would not be a contribution to cumulative population levels. In addition, because the proposed project would not be expected to disproportionately affect any low-income populations, it would not cumulatively contribute to any such impacts.

Because of its short-term nature, BPA's proposed pole replacement project would not add noticeable long-term benefits or impacts to employment, housing, or tax revenues in the area. During construction, the proposed project may contribute incrementally to a positive cumulative impact on the economy of the local community by providing additional employment and increased need for goods and services.

Visual Quality
Past and present development and activities have changed the visual landscape in the immediate project vicinity by introducing manmade features and altering natural forms. These features include urbanized uses in the Cities of Albany and Corvallis, rural residential uses scattered throughout the project vicinity, and project area roads and utility infrastructure (such as the existing transmission line corridor). Areas cleared for agriculture and timber harvest also have changed the visual quality within the project vicinity. Reasonably foreseeable future actions involving development would be expected to continue this trend.

The raising of five wood pole structures would alter the visual landscape slightly and construction activities would have a temporary impact on visual quality. The proposed project would thus contribute incrementally, though in a relatively minor way, to this cumulative impact.

Air Quality
Agricultural activities, vehicle traffic, industrial emissions, logging activities, and residential wood burning cumulatively affect air quality year-round in the region. Occasional wildfires on

forested lands also result in emissions that can contribute to cumulative air quality impacts in the region.

Air emissions from the proposed project would occur during project construction from construction and vegetation removal activities, as well as use of vehicles and heavy equipment. These emissions would result in a minor and short-term contribution to cumulative impacts on air quality from pollutants generated by agricultural uses, logging, urban centers, and other sources in the region. During construction, the proposed project also would contribute incrementally, though in a relatively minor way, to cumulative impacts related to particulate matter emissions. Emissions generated during the above activities and project construction would result in very minor contributions to global warming.

Cultural Resources

Cultural resources in the project vicinity have been and are being affected because of past, present, and current development and activities. These cumulative impacts include disturbance of cultural sites, reduction of the cultural integrity of certain sites, and removal of cultural artifacts. Because the proposed project would impact prehistoric sites, the project would contribute incrementally to these cumulative impacts. Mitigation measures are identified in Section 3.11 Cultural Resources to lessen or avoid the potential for this impact. However, if the proposed project does impact previously undiscovered cultural resources or artifacts, it also would contribute incrementally to the adverse cumulative impact to cultural resources in the area.

Health and Safety

The proposed project would not cumulatively increase the overall level of EMF exposure along the corridor. The transmission lines with new poles would have similar EMF levels to those of the existing lines. There are no known plans to construct additional transmission lines in the project area, so cumulative levels of EMF would not increase above the existing levels.

Transportation/Traffic

Past and present cumulative actions have resulted in the development of numerous roads in the project corridor, including highways, rural roads, other paved and graveled roads, and unimproved access roads. The existing transmission lines and access roads have been in the project corridor for over 50 years, and the existing access roads have been used primarily for maintaining the lines and by several private landowners. The proposed action would result in only temporary impacts to transportation/traffic after the implementation of recommended mitigation measures, and would not contribute to long-term cumulative traffic impacts in project area.

Noise

Implementation of past and present actions in the project vicinity has generally not resulted in lasting noise effects. Cumulative noise impacts in the project vicinity typically occur when noise receptors are exposed to noise from sources at approximately the same time, such as from vehicles, farm equipment, and train noise. For the reasonably foreseeable future actions, there could be cumulative noise impacts if these actions are undertaken simultaneously and in relative

close relation to each other. However, it is expected that these actions would not result in cumulative noise impacts due to spatial or temporal separation.

Chapter 4
Environmental Consultation, Review, and Permit Requirements

This chapter addresses Federal statutes, implementing regulations, and Executive Orders potentially applicable to the proposed project. This Environmental Assessment (EA) will be sent to Tribes, Federal agencies, and state and local governments as part of the consultation process for this project.

4.1 National Environmental Policy Act

This EA was prepared in accordance with regulations implementing the National Environmental Policy Act (NEPA) (42 USC 4321 et seq.), which requires Federal agencies to assess the impacts that their actions may have on the environment. NEPA requires preparation of an Environmental Impact Statement (EIS) for major Federal actions significantly affecting the quality of the human environment. BPA prepared this Preliminary EA to determine if the proposed action would create any significant environmental impacts that would warrant preparing an EIS, or if a Finding of No Significant Impact (FONSI) is justified.

4.2 Vegetation, Wildlife, and Fish

The Endangered Species Act of 1973 (16 U.S.C. 1536), as amended in 1988, establishes 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 Act is administered by the USFWS and, for salmon and other marine species, by the National Oceanic and Atmospheric Administration (NOAA). Section (7a) requires federal agencies to ensure that the actions they authorize, fund, and carry out do not jeopardize endangered or threatened species or their critical habitats.

In order to determine the potential for the proposed action to effect threatened and endangered species listed under the ESA, BPA obtained information on these species from the USFWS and NOAA. Species lists for Linn, Benton and Lincoln counties were downloaded from the USFWS web site (http://www.fws.gov/oregonfwo/Species/Lists/) on October 1, 2008. Additionally, a species list was downloaded from the NOAA website (http:www.nwr.noaa.gov/Species-Lists.cfm) on October 3, 2008.

In December 2008, BPA submitted a Biological Assessment (BA) to the USFWS that assessed potential project effects to all identified listed plant and animal species in the project corridor, based on the same analysis of these species contained in this EA (see Sections 3.3 and 3.4). This BA also made effects determinations for each listed species as shown in Table 4-1. As shown in this table, it is expected that there would be no effect from the proposed action on most listed species in the area, such as marbled murrelet, northern spotted owl, bull trout, Oregon chub, Willamette daisy, Nelson's checkermallow, Bradshaw's lomatium, water howellia, golden paintbrush, Oregon silverspot butterfly, Upper Willamette River Chinook, and Upper Willamette River steelhead. For three species – Kincaid's lupine, Fender's blue butterfly, and Taylor's checkerspot – the proposed action may affect, and is likely to adversely affect these species.

Table 4-1. Federally Protected Species Potentially Found in the Project Corridor

Species *(Scientific Name)*	Status & Critical Habitat Designation	Determination
Upper Willamette River Chinook salmon *(Onchorhynchus tshawytscha))*	Threatened Critical Habitat	No Effect
Upper Willamette River Steelhead *(Onchorhynchus mykiss)*	Threatened Critical Habitat	No Effect
Marbled murrelet (*Brachyramphus marmoratus*)	Threatened Critical Habitat	No Effect
Bull trout, Columbia River DPS *(Salvelinus confluentus)*	Threatened Critical Habitat	No Effect
Northern spotted owl (*Strix occidentalis caurina*)	Threatened Critical Habitat	No effect.
Oregon chub (*Oregonichthys crameri*)	Endangered	No Effect
Fender's blue butterfly (*Icaricia icarioides fenderi*)	Endangered Critical Habitat	May Affect, and is Likely to Adversely Affect
Golden paintbrush *(Castilleja levisecta)*	Threatened	No effect
Willamette daisy (*Erigeron decumbens* var. *decumbens*)	Endangered Critical Habitat	No effect
Water howellia *(Howellia aquatilis)*	Threatened	No effect
Bradshaw's desert parsley *(Lomatium bradshawii)*	Endangered	No effect
Kincaid's lupine *(Lupinus sulphureus* ssp. *Kincaidii)*	Threatened Critical Habitat	May Affect, and is Likely to Adversely Affect
Nelson's checkermallow *(Sidalcea nelsoniana)*	Threatened	No effect
Oregon Silverspot butterfly *(Speyeria zerene hippolyta)*	Threatened	No effect
Whulge (=Taylor's) checkerspot butterfly *(Euphydryas editha taylori)*	Candidate	May Affect, and is Likely to Adversely Affect

The USFWS concurred with BPA's determination of effects to listed species as described in the BA. BPA expects the USFWS to issue a Biological Opinion in summer 2009 for the proposed project. All terms and conditions included in the Biological Opinion will be followed during project construction.

BPA is developing a mitigation plan, in conjunction with the USFWS, for impacts to Kincaid's lupine, Fender's blue butterfly, and Taylor's checkerspot. For impacts to Kincaid's lupine, Fender's blue butterfly and their designated critical habitat, a plan is being developing to place a permanent conservation easement on about two acres of land adjacent to the project corridor in Kincaid's lupine and Fender's blue butterfly critical habitat. This habitat would be enhanced or restored to support native prairie species, including Kincaid's lupine and Fender's blue butterfly. Negotiations with a private landowner are currently ongoing.

There is currently no private land suitable for Taylor's checkerspot available for mitigation. BPA is working with USFWS to develop an alternative plan that may include putting money aside for future recovery activities for Taylor's checkerspot.

In addition to the ESA, there are several other federal laws designed to protect vegetation, wildlife, and/or fish species. The Magnuson-Stevens Fishery Conservation and Management Act designates Essential Fish Habitat (EFH) for Chinook and coho salmon. These species occupy streams in the vicinity of the proposed project. The project is located within the Upper Willamette River hydrologic unit, which is generally described as EFH for Chinook and coho salmon. As discussed in Section 3.4 of this EA, the proposed project would generally avoid habitat for these species, and impacts to these species would be low to none.

The Fish and Wildlife Conservation Act of 1980 (16 U.S.C. 2901 et seq.) encourages federal agencies to conserve and promote the conservation of nongame fish and wildlife species and their habitats. Mitigation measures designed to conserve fish and wildlife and their habitat are listed in Chapter 3 in the Vegetation and Fish and Wildlife sections.

The Migratory Bird Treaty Act implements various treaties and conventions between the United States and other countries, including Canada, Japan, Mexico, and the former Soviet Union, for the protection of migratory birds (16 U.S.C. 703-712, July 3, 1918, as amended 1936, 1960, 1968, 1969, 1974, 1978, 1986, and 1989). 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. In 2006, the Department of Energy signed a memorandum of agreement with the U.S. Fish and Wildlife Service to help conserve migratory bird populations as described in Executive Order 13186. The proposed action could potentially impact migratory birds through temporary habitat disturbance. Potential impacts to birds are discussed in the Fish and Wildlife Section in Chapter 3.

4.3 Water Resources

The Clean Water Act (33 U.S.C. 1251 et seq.) regulates discharges into waters of the U.S. The various sections of the act applicable to this project are discussed below.

Section 401 of the Clean Water Act, the Water Quality Certification Program, 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 water of the United States, including wetlands, is issued only after the affected state certifies that existing water quality standards would not be violated if the permit were issued. For this project, ODEQ would review necessary permits for compliance with state water quality standards. No permits are anticipated to be required for the proposed project.

Section 402 of the Clean Water Act authorizes stormwater discharges associated with industrial activities under the National Pollutant Discharge Elimination System (NPDES). For Oregon, the EPA has a general permit authorizing federal facilities to discharge stormwater from construction activities disturbing land of 5 or more acres into water of the United States, in accordance with various set conditions. BPA would comply with the appropriate conditions for this project and,

if applicable, would prepare a Storm Water Pollution and Prevention (SWPP) Plan. The plan helps ensure that erosion control measures would be implemented and maintained during construction. It also addresses best management practices for stabilization, stormwater management, and other controls.

Section 404 of the Clean Water Act establishes a program to regulate the discharge of dredged or fill material is discharged into water of the United States, including wetlands. This includes excavation activities that result in the discharge of dredged material that could destroy or degrade waters of the United States. Dredge and fill activities are controlled by a Section 404 permit process that is administered by the U.S. Army Corps of Engineers in conjunction with state agencies that have been delegated this authority. In Oregon, the Oregon Division of State Lands (DSL) is the state agency with permitting authority over discharges of dredged or fill materials. 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.

As discussed in Section 3.5 of this EA, proposed replacement of wood pole structures, upgrade of access roads, and operation and maintenance could potentially impact waters of the United States including wetlands. Mitigation measures have been identified in this EA to avoid, minimize, and compensate for any impacts to wetlands, and BPA is coordinating with the Corps and DSL to determine necessary permits and required authorizations under Section 404.

4.4 Floodplains and Wetlands Protection

The U.S. Department of Energy 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 and 11990. An assessment of wetland impacts is provided in Section 3.6 and floodplain impacts in Section 3.7.

4.5 Cultural and Historic Resources

Regulations established for the management of cultural resources include the following:

- Antiquities Act of 1906 (16 U.S.C. 431-433);
- Historic Sites Act of 1935 (16 U.S.C. 461-467);
- Section 106 of the National Historic Preservation Act (NHPA) of 1966 (16 U.S.C. 470 et seq.), as amended
- Archaeological Data Preservation Act (ADPA) of 1974 (16 U.S.C. 469 a-c);
- Archaeological Resources Protection Act (ARPA) of 1979 (16 U.S.C. 470 et seq.), as amended;
- Native American Graves Protection and Repatriation Act (NAGPRA) (25 U.S.C. 3001 et seq.); and
- Executive Order 13007 Indian Sacred Sites.

For this project BPA has undertaken Section 106 consultation with the State Historic Preservation Officer for Oregon, the Advisory Council on Historic Preservation (ACHP), and the affected Native American tribes. These tribes include the Confederated Tribes of the Grand Ronde, the Confederated Tribes of the Warm Springs Reservation, and the Confederated Tribes of Siletz.

On May 16, 2008, a letter was sent to the Tribes initiating consultation under Section 106. The Confederated Tribes of the Grand Ronde responded with information regarding archaeological sites within the project area. BPA contacted tribal cultural resources representatives at the Grand Ronde to discuss the sites. The sites were then included in the cultural resources survey and background research conducted as part of the proposed project. On September 2, 2008, the cultural resource survey report was sent to the SHPO for review and concurrence and the Tribes for review. No comments or communications have been received from the Tribes with regard to the survey report.

The Cultural Resources Section in Chapter 3 describes historic and cultural resources that were found along the existing project corridor and access roads. It also includes BPA's determinations of effect for each site and recommendations for treatment of several sites.

The Oregon SHPO concurred with BPA's determination of eligibility findings for the cultural resources documented for this project. The SHPO recommends complete avoidance of all sites eligible or potentially eligible for listing on the NRHP. Since complete avoidance is not possible for all sites, mitigation measures would be implemented for affected sites. Consultation with SHPO, ACHP, and the Tribes is ongoing.

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.

Most of the project area is located in or adjacent to agricultural land. The proposed project would occur entirely in an existing corridor, and within existing structure footprints. Evaluation of the project according to the criteria set forth in the Act indicates the proposed action would be in compliance with the Act and would have little or no impact on area farmlands.

4.7 State, Areawide, and Local Plan and Program Consistency

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

4.7.1 Land Use Planning Framework

The following local land use plans guide development in the project area:

- Linn County's Comprehensive Plan was adopted in September 1980 and revised in 2002. The County's plan specifically addresses transmission lines of 69-kV or greater. The plan encourages utility companies and state and federal agencies to: limit impacts on land owners by following property lines where feasible; utilize or parallel existing rights-of-way in so far as safety and reliability permit; maintain productive use of the land in so far as possible; and mitigate adverse environmental impacts.
- Benton County's Comprehensive Plan was adopted in 1985 and revised in 2006. The County's plan specifically addresses BPA lines within Benton County's boundaries. The plan encourages maintenance and rehabilitation of existing utility systems and facilities and the use of existing transmission corridors. The plan also encourages multiple uses in utility corridors where practical.
- Lincoln County's Comprehensive Plan was adopted in 1994 and updated in 2004. The County's plan specifically addresses transmission lines and states that transmission lines and other utilities be located along common corridors where feasible.
- The City of Corvallis has a Comprehensive Plan that was adopted in December 1998 and approved in 2000. The City's Comprehensive Plan addresses future utility needs. Also addressed are risks from prolonged exposure to electromagnetic fields (EMFs). The City of Corvallis will place reasonable restrictions on the future placement of electrical substations and other sources of EMFs within close proximity to facilities such as schools, playgrounds, and child care facilities.
- The City of Albany adopted its comprehensive plan in December 1980 which was last updated in 2007. The City's Comprehensive Plan addresses future utility needs. The area next to Albany Substation where BPA would replace structures is within Albany's Urban Growth Area.

The proposed project would use an existing corridor and would be consistent with these land use plans to the extent practicable.

4.8 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 population. Minority populations are considered members of the following groups: American Indian or Alsakan Native; Asian or Pacific Islander; Black, not of Hispanic origin; or Hispanic if the minority population of the affected area exceeds 50 percent, or is meaningfully greater than the minority population in the project area.

The proposed project has been evaluated for potential disproportionately high environmental effects on minority and low-income populations and none were identified (see the Socioeconomics Section in Chapter 3).

4.9 Public Health and Safety

Several federal laws related to hazardous materials and toxic substances potentially apply to the proposed project. Various provisions of the Spill Prevention Control and Countermeasures Act (SPCCA), Title III of the Superfund Amendments and Reauthorization Act (SARA), and the Resource Conservation and Recovery Act (RCRA) may apply to the proposed project, 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 project. Typical construction wastes may include motor and lubricating oils, and cleaners. 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 (FIFRA) 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; also BPA only uses EPA-approved herbicides .

If a hazardous material, toxic substance, or petroleum product is discovered, and may pose an immediate threat to human health or the environment, BPA requires the contractor to notify the 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 will coordinate with the appropriate personnel within BPA. In addition, the contractor will not be allowed to disturb such conditions until the COTR has given the notice to proceed.

The Safe Drinking Water Act (41 U.S.C. Section 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 project would not affect any sole source aquifers or other critical aquifers, or adversely affect any surface water supplies.

4.10 Noise

The Noise Control Act of 1972, as amended (42 U.S.C. 4901 et seq.) 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 3.14, Noise, the proposed project would have primarily temporary low to moderate noise impacts, and mitigation measures are identified to further reduce noise impacts.

4.11 Air Quality

The Clean Air Act, as revised in 1990 (PL 101-542 (42 USC 4701)), requires the EPA and individual states to carry out a wide range of regulatory programs intended to assure attainment

of the NAAQS. Air quality impacts of the proposed project would be low, localized, and temporary, as discussed in the Air Quality Section in Chapter 3.

4.12 Global Warming

Global warming is an increase in the average temperature of the Earth's surface. Since the late 1800s, data shows that the global average temperature has increased about 0.7 to 1.4 degrees F (0.4 to 0.8 degrees C), and some projections estimate that the average temperature will rise an additional 2.5 to 10.4 degrees F (1.4 to 5.8 degrees C) by 2100 (NASA 2009).

A majority of scientists who study climate have concluded that human activities are responsible for most of this warming primarily through emission of certain gases that enhance Earth's natural greenhouse effect. Gases that absorb infrared radiation and prevent heat loss to space are called greenhouse gases. These gases include water vapor, carbon dioxide, methane, nitrous oxide, nitrogen oxides, non-methane volatile organic compounds, and stratospheric ozone-depleting substances such as chlorofluorocarbons.

The clearing of large areas of vegetation from the Earth's surface is also believed to contribute to global warming because trees and other plants remove carbon dioxide from the air during photosynthesis, the process they use to produce food. Removal of vegetation contributes to the buildup of carbon dioxide by reducing the rate at which the gas is removed from the atmosphere and by the decomposition of dead vegetation. The proposed project would emit very little greenhouse gases during its short-term construction phase, primarily in the form of vehicle emissions. During operation and maintenance, greenhouse gas emissions would be even less.

4.13 Federal Communications Commission

Federal Communications Commission (FCC) regulations require that transmission lines be operated so that radio and television reception would not be seriously degraded or repeatedly interrupted. Further, the FCC regulations require that the operators of these devices mitigate such interference. It is expected that there would be no interference with radio, television, or other reception as a result of the proposed project (see Section 3.14, Noise). BPA would comply with FCC requirements relating to radio and television interference from the proposed project if any such interference occurs.

4.14 Federal Aviation Administration

As part of transmission line design, BPA seeks to comply with FAA procedures. Final locations, structures, and structure heights would not be submitted to FAA for the project because no structures are taller than 200 feet above ground, and they are located outside the prescribed distances of airports listed in the FAA airport directory.

Chapter 5
Persons and Agencies Consulted

The project mailing list contains about 213 interested or affected landowners; tribes; local, state, and federal agencies; utilities; public officials; interest groups; businesses; special districts; libraries and the media. They have directly received or have been given instructions on how to receive all project information made available so far, and they will have an opportunity to review the EA.

Federal Agencies
U.S. House and Senate Members for districts encompassing the project area
U.S. Army Corps of Engineers
U.S. Fish and Wildlife Service

Tribes
Confederated Tribes of the Grand Ronde
Confederated Tribes of Siletz
Confederated Tribes of the Warm Springs Reservation

State Agencies
State of Oregon House and Senate members for Districts encompassing the project area
Oregon State Governor's Office
Oregon Department of Fish and Wildlife
Oregon Department of Agriculture
Oregon Department of State Lands
Oregon Parks and Recreation Department
Oregon State Historic Preservation Office
Oregon Department of Transportation

Local Agencies
Linn County Commissioners
Linn County Planning and Building Department
Benton County Commissioners
Benton County Natural Areas and Parks
Benton County Planning Commission

Utilities
Consumers Power Inc.
Central Lincoln Public Utility District
Douglas Electric Cooperative

Libraries
Brownsville Community Library

Albany Downtown Carnegie Library
Albany Public Library
Corvallis-Benton County Library
Lebanon Public Library
Harrisburg Public Library
Monroe Community Library

Depository Libraries
Oregon State University Library

Media
Albany Democrat Herald

Interest Groups
Marys River Watershed Council
Institute for Applied Ecology
Xerxes Society

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Chapter 6
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Appendix A
Public Involvement

Department of Energy

Bonneville Power Administration
P.O. Box 61409
Vancouver, WA 98666-1409

TRANSMISSION SERVICES

July 1, 2008

In reply refer to: TEP-TPP-3

Dear neighbor,

The Bonneville Power Administration (BPA) owns and operates two high-voltage transmission lines located near your property, Santiam-Toledo No. 1 and Albany-Burnt Woods No. 1. Both of these lines are important components of BPA's transmission system in the mid-Willamette Valley. They enable BPA to meet its commitment to provide reliable, low cost and safe transmission products and services to its customer utilities in the area, including Consumer Power Inc., Central Lincoln PUD, and PacifiCorp.

We are writing to neighbors and other parties interested in the two lines because sections of each are in need of pole replacements and other upgrades that will maintain their reliability and safety. In addition, we plan to make improvements to the access roads for these lines to ensure that we are able to maintain the lines appropriately in the future.

This letter briefly describes the project, pre-construction activities, provides a construction schedule, and explains how you can contact at BPA if you have any questions or concerns.

Schedule and environmental review
The purpose of this project is to maintain the reliability and safety of the lines by replacing the wood poles that have gradually deteriorated due to exposure to the elements and normal wear and tear.

BPA is currently conducting surveys along the rights-of-way for these two lines. You may see BPA employees or contractors along the rights-of-way. In addition, BPA will begin analyzing any potential environmental impacts access road upgrades beginning this summer, and will analyze potential environmental impacts of the pole replacement activities beginning this fall.

BPA is aware that the federally threatened Kincaid's lupine, endangered Fender's blue butterfly, and candidate species Taylor's checkerspot exist along the transmission lines. BPA is coordinating with the U.S. Fish and Wildlife Service to ensure that impacts from the pole replacements are minimized and that habitat is restored after construction.

Construction schedule
Once environmental review is complete, the associated project activities can begin. Maintenance and construction of the access roads is scheduled to begin this summer. The pole replacements would not begin until 2009 after the review of potential impacts is complete.

For more information
Please understand that BPA does everything possible to mitigate the negative impact of its work on surrounding property. In addition, BPA and its representatives respect the private property rights of its neighbors along its rights-of-way. If you have questions about this project or how it may impact your property, you may call BPA toll free at (800) 622-4519 or our realty specialist Dustin Smith at (541) 988-7432. Additional project information is available on BPA's Web site at *www.transmission.bpa.gov/PlanProj/Transmission_Projects/*. Thank you for your interest.

Sincerely,

/s/ Gary O. Beck, 7/1/2008

Gary O. Beck
Project Manager

Department of Energy

Bonneville Power Administration
P.O. Box 61409
Vancouver, WA 98666-1409

TRANSMISSION SERVICES

October 24, 2008

In reply refer to: TEP-TPP-3 – Albany-Burnt Woods/Santiam-Toledo pole replacement

Dear neighbors and interested parties:
Bonneville Power Administration is proposing to rebuild the wood pole sections of the Albany-Burnt Woods and Santiam-Toledo transmission lines. BPA is seeking your comments on the potential environmental impacts of these construction activities. Both the Santiam-Toledo No. 1 and Albany-Burnt Woods No. 1 lines are important components of BPA's transmission system in the mid-Willamette Valley. This letter briefly explains what work is proposed, explains the environmental process, and explains how to comment on the project.

Project description
This project will maintain the safe and reliable operation of the lines by replacing wood poles that have gradually deteriorated due to exposure to the elements and normal wear and tear. BPA will upgrade existing roads and acquire new roads so that crews can safely access the wood poles. BPA does everything possible to mitigate the impacts of its work on surrounding property, and respects the private property rights of our rights-of-way neighbors.

Environmental process
BPA will analyze the potential impacts of the proposed relocation and alternatives in an environmental assessment. In the EA, we will study potential impacts on the natural and built environment from each alternative. The two alternatives are to rebuild the line within the existing right-of-way and a no-action alternative. The EA will describe any mitigation measures that we incorporate into the proposed project.

Schedule
This fall we will begin our analysis using your comments to help determine potential impacts. You may see survey crews and environmental specialists in the area as they begin preliminary design and analysis for the proposal. A preliminary EA will be available for review and comment this winter. By spring 2009, BPA will display the expected impacts of the proposal and decide whether or how to proceed with the project. If BPA decides to proceed, construction could begin in late spring or summer of 2009.

How to comment
BPA is accepting comments on impacts of pole replacement activities through **November 24, 2008**. You may submit comments online at: *www.bpa.gov/comment*, via mail to: Bonneville Power Administration, Public Affairs Office - DKE-7, P.O. Box 14428, Portland, OR, 97293-4428, or by fax to (503) 230-3285. You also may call us with your comment toll free at (800) 622-4519. Please reference "Albany-Burnt Woods/Santiam-Toledo pole replacement project" with your comments. BPA will post all comment letters in their entirety on BPA's Web site at *www.bpa.gov/comment*.

For more information
If you have questions about this project, you may call BPA toll free at (800) 622-4519 or call our realty specialist Dustin Smith at (541) 988-7432. You may also visit the project Web site at *www.transmission.bpa.gov/PlanProj/Transmission_Projects/*. Thank you for your interest.

Sincerely,

Erich T. Orth
Project Manager

Enclosure:
Comment form

ABW080001

- ABW080001 - Al Kitzman/Benton County Natural Areas and Parks
  The power line section between Oak Creek Road in Corvallis and Hwy 223 in Wren, has high resource value for Fender's Blue and Taylor's Checkerspot butterflies. Consider working in this area in fall, during diapause to minimize larval impacts. Also, any cultural practices to increase the abundance of nectar and host plants for the butterflies, including, control of invasives such as scotch broom, false-brome, and tall grasses, would advance survival of the butterflies. The power line sites have been identified as significant dispersal corridors for Fender's and Taylor's within Benton County's draft Habitat Conservation Plan. Developing strategies to enhance habitat for these species will help move them towards delisting, as well as, create sustainable landscapes requiring less maintenance over time for BPA. hhhhhhopportunity for the butterflies and BPA.

e

ABW080004

- ABW080004 - Mary Jo Wevers and Bob Wisseman
  A portion of our property north west of Corvallis is a BPA designated wetland. Past BPA activities on our property have resulted in destruction of riparian vegetation, tree plantings, and BPA vehicles sinking and becoming stuck in wetland soils. Our recommendation is to keep vehicles on existing paved roads to access BPA wood poles. Notify land owners when BPA will be working on or near their property. Train BPA employees in techniques to prevent damage to sensitive habitats. Schedule BPA activities in or around wetlands during the dry season.

ABW080005

BONNEVILLE POWER ADMINISTRATION

Proposed Albany-Burnt Woods/Santiam-Toledo pole replacement

1. Please have your environmental studies look at:

Poles SH TO1
36
6
A and B lie west of a small creek lined with oak woodland. The trees and their mistletoe are active habitat for Western Bluebirds. Please consider replacing these two poles with ones that are 10' taller, to delay having to shear the oak canopy.

2. I need more information about:

3. I have these other comments:

Name ELLEN WATROUS

Address [illegible]

City CORVALLIS State OR Zip 97330

Please mail your comments by **Nov. 24, 2008** to
BPA Public Affairs DKE-7
PO Box 14428
Portland, OR 97293-4428

BPA posts all comments online with the name of the commenter at *www.bpa.gov/comment*, no addresses will be posted unless comment is submit by a business.

ABN080006

BONNEVILLE POWER ADMINISTRATION

Proposed Albany-Burnt Woods/Santiam-Toledo pole replacement

1. Please have your environmental studies look at:

A. Leaving old powerline poles (intact or in pieces) lying on the ground – leaching tars, creosote, etc. into the soil. Ditto for stumps of old poles left in the ground when new poles are placed nearby. Only once have BPA crews come back to retrieve a pole left along our field adjacent to Bowers's Slough (at our insistence) when it was obvious that winter rains and flooding would have floated it downstream, likely causing a logjam either at the Hwy 20 bridge or the old Hwy 20 bridge (our property). Most poles are just left lying on the ground in our pastures or alongside our fields, either intact or cut into sections — They take decades to rot away.

2. I need more information about:

Timing of the proposed work. The pole line work through our property should be delayed until after the crops are off the fields (late in July and August) and before the soil becomes sodden ~~with~~ by the fall rains.

3. I have these other comments:

A. BPA people drove a Caterpillar over our fence and through a planting of Douglas fir trees to reach poles on our property, then left an old pole lying there (now largely covered by blackberry vines). No attempt was ever made by BPA to replace trees, repair the fence (even though we have pastured cattle and sheep there)

B. Field drainage tiles crushed by BPA's heavy equipment. These are not detectible until the following winter rainy season, although BPA should be responsible even if not immediately detected.

Name Stanley P. Snyder

Address [redacted]

City Albany State OR Zip 97321

Please mail your comments by **Nov. 24, 2008** to
BPA Public Affairs DKE-7
PO Box 14428
Portland, OR 97293-4428

BPA posts all comments online with the name of the commenter at *www.bpa.gov/comment*, no addresses will be posted unless comment is submit by a business.

ABN 080007

PROPOSED ALBANY BURNT WOODS/SANTIAM TOLEDO POLE REPLACEMENT

In response to the proposed Albany-Burnt Woods/Santiam-Toledo pole replacement, please consider the following.

1. This is animal habitat. This has been their home longer than it has housed electrical power poles.

2. Slow growing hardwood trees, such as oak, do not seem to be an infringement on your wires. Clear cutting from 62' from center of your power poles appears to be overly aggressive. Each area should be given individual consideration. One size does not fit all.

3. Please consider the possibility of discontinuing the use of treated wood. If you used metal poles, the life expectancy of the structure would be greater and the harmful chemical residue would not seep into the land and the water. This would lessen contamination of well water, land contamination, and harmful run off into streams and waterways.

4. Finally, Land is a valuable asset. My property is paid for by hard work, long hours of work, and yearly property taxes. It should be treated with respect. The people who visit my property are just that, visitors. They should act like guest, polite guest, and should leave the property without signs of being trashed and litter. This year, the gentlemen who were here lived up to my expectations. Previously, others left debris, and broken glass.

Thank you for giving me the opportunity to express my opinions. I hope the views and opinions of the public are given consideration and credence.

Sincerely,

Sue Cutsforth

Sue Cutsforth
7630 NE Logsdon Rd.
Corvallis, OR 97330

ABW080008

BONNEVILLE POWER ADMINISTRATION

Proposed Albany-Burnt Woods/Santiam-Toledo pole replacement

1. Please have your environmental studies look at:

2. I need more information about:

(1) Type of Equipment (size/weight) you will need to replace poles.

(2) How will you dispose of the old poles.

3. I have these other comments:

If weight is to great you might need to wait until crops are off the field.

Name Joseph Fazio

Address

City Albany State OR Zip 97321

Please mail your comments by **Nov. 24, 2008** to
BPA Public Affairs DKE-7
PO Box 14428
Portland, OR 97293-4428

BPA posts all comments online with the name of the commenter at *www.bpa.gov/comment*, no addresses will be posted unless comment is submit by a business.

Rounds,Rachel A - KEC-4

From: Asgharian,Maryam A - DKE-7
Sent: Tuesday, November 18, 2008 8:13 AM
To: Orth,Erich T - TEP-TPP-3; Smith,Dustin T - TERR-ALVEY; Rounds,Rachel A - KEC-4
Subject: question on A-BW

I believe this individual is along the A-BW line. I think the questions are directed more toward Rachel. FYI for Erich and Dustin.

Thank you,

Maryam Asgharian
Public Affairs Specialist
(503) 230-4413

From: commenter@somewhere.gov [mailto:commenter@somewhere.gov]
Sent: Thursday, November 13, 2008 2:16 PM
To: WebFeedback
Subject: Web Site Comment

ABW080009

Comment was initiated from http://www.transmission.bpa.gov/PlanProj/Transmission_Projects/default.cfm?page=ABWST

I am a landowner near Wren, Oregon, where the BPA power lines run through my property. Some of this is native prairie inhabited by endangered species. Please tell me specifically what you plan to do on along the power lines east of Wren, before they cross the Marys River. Have you consulted with the US Fish and Wildlife Service about ESA listed species? I would like to see your detailed work plans before any work begins.

Please Contact Me
W.G. Pearcy
wgpearcy@coas.oregonstate
541 929-4041

ABW080010

- ABW080010 - Karen Fleck Harding
  RE Albany Burnt Woods Santiam Toledo pole replacement project. The project is located within native prairie and provides a corridor for prairie associated wildlife. The proposed project has the potential for significant impact on listed species, Kincaids lupine and Fenders blue butterfly, from ground disturbance, road building, and vegetation management practices. Care should be taken to minimize impacts. Required mitigation should occur within close proximity to existing high quality prairie. Management of invasive vegetation, such as scotch broom, false brome, Meadow knapweed and Himalayan blackberry should receive increased attention, particularly where it has potential to impact prairie sites within or adjacent to the powerline easement. Many neighboring landowners are voluntarily working on invasive control and prairie restoration and appreciate BPA's participation in the effort.

BONNEVILLE POWER ADMINISTRATION
DOE/BP-3999 March 2009 250