

# Albany-Eugene 115-kilovolt No. 1 Transmission Line Rebuild Project

## Draft Environmental Impact Statement

January 2012



DOE/EIS-0457

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Transmission Line Rebuild Project**

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Responsible Agency: U.S. Department of Energy (DOE), Bonneville Power Administration

Title of Proposed Project: Albany-Eugene 115-kilovolt No. 1 Transmission Line Rebuild Project

State Involved: Oregon

Abstract: Bonneville Power Administration is proposing to rebuild a 32-mile section of the Albany-Eugene 115-kilovolt No. 1 Transmission Line. This line extends from the Albany Substation in the City of Albany, Linn County, Oregon, to the Alderwood Tap near Junction City in Lane County, Oregon. Many of the structures, the electric wire (conductor), and associated structural components are physically worn and structurally unsound in places. These wood transmission poles have lasted beyond their expected 55 to 60 years and now need to be replaced due to age, rot, and deterioration. As a result, there is a need to rebuild the line to maintain reliable electrical service and to avoid risks to the safety of the public and maintenance crews.

Proposed activities would include establishing access to the line, improving access roads, developing staging areas for storage of materials, removing vegetation including danger trees, removing and replacing existing wood pole structures and associated structural components and conductors, and revegetating areas disturbed by construction activities. The existing structures would be replaced with structures of similar design within or near to their existing locations. The line would continue to operate at 115 kilovolts.

The proposed project could cause impacts to the following resources: land use and recreation; geology and soils; water resources; wetlands and floodplains; vegetation; fish and wildlife; visual quality; cultural resources; socioeconomics and public services; transportation; air quality; and noise, public health, and safety. Chapter 3 of the Environmental Impact Statement describes the affected environment and potential impacts.

Public comments are being accepted through: March 05, 2012

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The EIS is also on the Internet at:

[http://efw.bpa.gov/environmental\\_services/Document\\_Library/Albany-Eugene\\_Rebuild/](http://efw.bpa.gov/environmental_services/Document_Library/Albany-Eugene_Rebuild/)

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[www.nepa.energy.gov](http://www.nepa.energy.gov).

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## Acronyms and Abbreviations

APE	area of potential effect
BMP	best management practice
BP	before the present
BPA	Bonneville Power Administration
CFR	Code of Federal Regulations
CO	carbon monoxide
CO <sub>2</sub>	carbon dioxide
Corps	U.S. Army Corps of Engineers
COTR	Contracting Officer's Technical Representative
dBA	decibels on the A-weighted scale
dbh	diameter breast height
DEQ	Oregon Department of Environmental Quality
DPS	distinct population segment
EFH	essential fish habitat
EMF	electric and magnetic fields
EPA	U.S. Environmental Protection Agency
EPRI	Electric Power Research Institute
EPUD	Emerald People's Utility District
ESA	U.S. Endangered Species Act
ESU	evolutionary significant unit
FR	<i>Federal Register</i>
GWMA	Groundwater Management Area
kV	Kilovolts
KV/m	thousands of volts per meter
mG	thousandths of a gauss
MBTA	Migratory Bird Treaty Act
NAAQS	National Ambient Air Quality Standards
NMFS	National Marine Fisheries Service
NOAA	National Oceanic and Atmospheric Administration
NOAA Fisheries Service	National Oceanic and Atmospheric Administration National Marine Fisheries Service
NRHP	National Register of Historic Places
ODA	Oregon Department of Agriculture

ODFW	Oregon Department of Fish and Wildlife
ODOT	Oregon Department of Transportation
ORNHIC	Oregon Natural Heritage Information Center
OSC	Oregon Seed Council
P&W Railroad	Portland and Western Railroad
PAB4	Palustrine, Aquatic Bed, Floating Vegetation
PCP	Pentachlorophenol
PEM1	Palustrine, Emergent, Persistent
PFO6	Palustrine, Forested, Deciduous
PM-10	particulate matter with a diameter of 10 micrometers or less
ppb	parts per billion
ppm	parts per million
PSS6	Palustrine, Scrub-Shrub, Deciduous
PUB3x	Palustrine, Unconsolidated Bottom, Mud, Excavated
R2UB1	Riverine, Lower Perennial, Unconsolidated Bottom, Cobble-Gravel
R2US1	Riverine, Lower Perennial Unconsolidated Shore Cobble-Gravel
R4SB3	Riverine, Intermittent, Stream Bed, Cobble-Gravel
R4SB5	Riverine, Intermittent, Stream Bed
R4SB5x	Riverine, Intermittent, Stream Bed, Mud, Excavated
RM	river mile
ROW	right-of-way
SHPO	Oregon State Historic Preservation Office/Officer
TMDL	total maximum daily load
UGB	Urban Growth Boundary
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
UWR	Upper Willamette River
WRD	Oregon Water Resources Department

# Summary

This summary covers the major points of the Draft Environmental Impact Statement (EIS) prepared for the Proposed Action. The Proposed Action involves replacement of wood pole structures along the 115-kilovolt (kV) Bonneville Power Administration (BPA) Albany-Eugene No. 1 transmission line.

## S.1 Purpose of and Need for Action

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BPA is a Federal agency that owns and operates transmission lines that move most of the Northwest's high-voltage power from facilities that generate the power to power users throughout the region. BPA has a statutory obligation to ensure that its transmission system has sufficient capability to serve its customers while maintaining a system that is safe and reliable. The Federal Columbia River Transmission Act directs BPA to construct improvements, additions, and replacements to its transmission system that are necessary to maintain electrical stability and reliability, as well as to provide service to BPA's customers (16 U.S.C. 838b(b-d)). BPA has proposed replacing wood poles and associated structural components for its existing 115-kV Albany-Eugene No. 1 transmission line, which is located in Linn and Lane Counties, Oregon.

BPA's 115-kV Albany-Eugene transmission line was originally built in 1940. This transmission line serves BPA's utility customers, who in turn serve communities in western Oregon. No major rebuild work has been done on the Albany-Eugene 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 forms of deterioration. Most structures on the Albany-Eugene line now exceed their service life and are physically worn and structurally unsound in places. Some of the transmission line poles are made of Douglas fir, which is more prone to decay and subsequent collapse. Therefore, replacement of the transmission line serves multiple purposes, including the following:

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

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

### S.1.1 Lead and Cooperating Agencies

BPA is the lead agency for the Albany-Eugene Transmission Line Rebuild Project EIS. BPA will coordinate with other Federal, State, and local agencies to review portions of the EIS.

## S.1.2 Public Involvement

During the development of this EIS, BPA solicited input from the public, agencies, interest groups, and others to help determine the issues that should be considered by the project. BPA conducted several outreach efforts, including an initial letter on February 25, 2010, describing the project and indicating the scoping period for the project (February 25, 2010 to March 27, 2010) and a public scoping meeting that was held on March 11, 2010. Due to a change in the project, BPA determined that significant impacts from the project may occur. Thus, the type of documentation changed from an Environmental Assessment to an EIS. BPA published a Notice of Intent to prepare an EIS for the Proposed Action on October 25, 2010, and held two additional public meetings on November 16 and 17, 2010. This public outreach effort also included mailing letters to 224 potentially interested and affected property owners, such as adjacent landowners; public interest groups; local governments; Tribes; and local, State, and Federal agencies who requested comments on the project regarding such items as the scope of the project. Scoping comments focused on the following:

- Potential loss of wildlife habitat and vegetation impacts related to native hazelnut trees
- Potential loss of trees that provide a noise and visual shield
- Potential for impacts to ongoing farming operations adjacent to the alignment
- Potential for impacts to rare and endangered plant populations

All of these issues identified during scoping were evaluated during the preparation of this EIS. In addition, BPA regularly updates the project website to provide current information on the project to the public.

## S.2 Alternatives

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BPA is considering two alternatives: the Proposed Action and the No Action Alternative. Both alternatives extend 32 miles from the Albany Substation in Albany, Oregon (structure 1/1<sup>1</sup>) to the Alderwood Tap south of the City of Junction City (structure 32/1).

### S.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-Eugene transmission line. The following discussion describes the various elements of the Proposed Action.

#### ***Proposed Location and Right-of-Way***

The right-of-way (ROW) width for the line is generally about 100 feet. The majority of the transmission line corridor is located on the Portland and Western Railroad (P&W Railroad) ROW. The only exceptions are at the Albany Substation at the northern end of the transmission

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<sup>1</sup> 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-Eugene line begins at line-mile 1/structure number 1 and continues to 40/7 at the Eugene Substation.

line corridor and where it extends through the City of Harrisburg, over the Willamette River, and through Junction City, where the ROW is on city-owned or privately-owned land. BPA would continue to use the existing corridor and ROW for the transmission structures that would be replaced.

### ***Replacement Transmission Structures***

There are currently three types of structures being used along the transmission line corridor that would be replaced:

- 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 one or two wood poles.
- 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 two or three wood poles and may also have guy wires to support the poles.
- Steel lattice structures are used at the Willamette River crossing. These structures are larger and heavier than wood pole structures to allow for the longer and higher span needed to cross the Willamette River. These structures would not be replaced.

BPA would use the same type of structure at each currently existing structure location. In addition to pole replacement, structure crossarms, insulators, and dampers would be replaced as needed. Because the existing Albany-Eugene transmission line currently does not have dampers installed, these would be installed as part of the Proposed Action. The height of new structures would be approximately 70 feet above ground.

### ***Conductors and Overhead Ground Wire***

Conductors are the wires on the structures that carry the electrical current. Each existing structure on the transmission line carries three conductors, which would be replaced. Accordingly, conductor pulling and retensioning sites would also be required.

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

### ***Vegetation Clearing***

Vegetation within the existing transmission line corridor generally consists of low-growing shrubs, small trees, or agricultural crops. Tree removal would occur within the project area for access road construction and clearing of danger trees. The total area being disturbed for access

road construction is approximately 55.5 acres. Other areas would need to be cleared because danger trees have been identified. A danger tree is a tree located off the ROW that is a present or future hazard to the transmission line. A tree is identified as a danger tree if it would contact BPA facilities should it fall, bend, grow within the swing displacement of the conductor, or grow into the conductor. Approximately 6,300 danger trees have been identified for removal. Danger tree removal would occur between August and March to minimize impacts to migratory birds. . Given the large number of danger trees to be removed for this transmission line corridor, it is likely that tree removal would need to occur over a two-year period.

### **Access Roads**

Access to the transmission line corridor is limited for the length of the proposed project; therefore new road construction, access road improvements, and access rights would be needed to allow for better access of structure sites during construction and maintenance. Temporary access roads would also be constructed to access areas for pole replacement where permanent roads could not be installed. Other improvements would include the replacement of gates and installation of new culverts. Access road improvements fall into the following categories:

- **New Construction**—This category consists of rough grading of existing soil to form roadway grades, level off depressions and rises, adjust the cross slope for drainage, and finally construct a granular drive course. To construct the new access roads a width of approximately 12 feet is required. One new permanent access road between structures 14/6 and 14/7 for a length of 450 feet would be built for the Proposed Action.
- **Access Road Improvements (also referred to as reconstruction)**—This category consists of repairs to existing roads on BPA’s easement. Some roads would only require BPA to re-gravel, while others would require minor grading to remove rutting and re-establish crown/cross slope before the gravel layer is applied.
- **Access Rights (also referred to as routes of travel)**—This category describes areas that are not currently within BPA’s easement but are necessary to provide either temporary or permanent access to existing transmission facilities. These areas would be designed to avoid depressed areas containing standing or flowing water on BPA’s easement and where construction for an all-weather access road would be cost prohibitive and/or have greater environmental impact. Since these areas would be used only for temporary and intermittent access, they do not fall under the same construction specifications as permanent roads. These routes of travel would be completely and fully restored to pre-construction conditions once the contractor’s efforts are complete.
- **Stub Roads**—Stub roads are temporary access points within BPA’s easement that may require temporary fills of wetlands or floodplains in order to reach the structures. The temporary fill materials could include timbers, ground mats, or gravel. These materials would be removed after work is completed at the structure.

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### **Staging Areas**

One or two temporary staging areas of approximately 30 acres in size would be needed along or near the transmission line easement to store and stockpile structure materials, trucks, and other equipment during construction.

### **Construction Activities**

Many of the construction activities related to the Proposed Action would occur concurrently. Access roads would be constructed or reconstructed depending on the need to access the structure being replaced. Removal of conductors, hardware, and the wood pole structure would then take place, followed by replacement with new wood pole structures and structure components. The existing poles would be pulled out of the ground by a boom truck. The existing holes would then be cleaned out and re-augered approximately 2 feet deeper. Equipment used for removing and installing wood poles and other structure components would include flatbed trucks, line trucks with a boom crane, backhoes, augers, and bucket trucks.

New conductors would be attached to the replacement structure and strung from structure to structure through pulleys. A “sock-line” (a small, very light-weight rope or cable) would be placed in the pulleys and pulled through by a helicopter. The sock-line would then be attached to the “hard-line” (small steel cable), which would be attached to the conductors and used to pull the conductors into place under tension so the conductors would not be damaged by contact with the ground or vegetation.

Access roads would be constructed or re-constructed to access the transmission line. New construction and re-construction would vary slightly, but the basic construction of both would be to grade the existing soil, level off depressions, adjust the cross slope for drainage, and construct the granular drive course. The granular drive course would be 9 inches deep and 14 to 16.5 feet wide. An area extending 10 feet beyond the width of the access roads would be required for construction, resulting in a total roadway width of ground disturbance of approximately 37 feet. The start of construction depends on completion of the National Environmental Policy Act process, but it is likely that construction of the Proposed Action could begin in May 2012 and would be completed around December 2012. Danger tree removal would occur over the summer and fall months during 2012 and 2013.

Operation and maintenance of the lines upon completion of construction would be essentially the same as for the existing lines. The lines would continue to operate at their current voltages, and BPA would conduct routine, periodic inspection and maintenance when necessary.

### **S.2.2 No Action Alternative**

Under the No Action Alternative, BPA would not take action to replace structures along the transmission line or upgrade access roads, and would continue to operate and maintain the existing transmission line in its current condition. Construction activities associated with the Proposed Action would not occur. However, the reliability concerns that prompted the need for the Proposed 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. Danger tree removal would still occur to prevent damage to the line.

### **S.2.3 Alternatives Considered but Eliminated from Detailed Study**

In developing this EIS, BPA considered but eliminated two additional alternatives: Route Alternatives and Installing Steel Poles.

#### ***Route Alternatives***

BPA considered whether to relocate all or a portion of the transmission line to avoid habitat for wetlands, vegetation, and wildlife species identified along the corridor. The environmental impacts of relocating the transmission line to a currently undeveloped corridor, versus keeping the lines in the existing developed corridor, would be substantially greater because the new ROW would have to be cleared and new access roads constructed. Because of this alternative's greater environmental impacts and higher costs, this alternative was considered but eliminated from detailed study in this EIS.

#### ***Installing Steel Poles***

BPA considered using steel pole structures, instead of wood pole structures, in sensitive habitats, such as wetlands. Steel pole structures potentially have a longer life and require less ongoing maintenance, thereby reducing the potential for future impacts to sensitive habitats. However, use of steel pole structures would increase the project's material costs for this segment of the lines by 250 percent. In addition, steel pole structures and their components still require maintenance. The potential benefits to sensitive habitats resulting from installation of steel pole structures therefore would be minimal. 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 EIS.

## **S.3 Affected Environment, Environmental Consequences, and Mitigation Measures**

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### **S.3.1 Affected Environment**

The transmission line corridor is located in Linn and Lane Counties, beginning in the City of Albany at the Albany Substation and continuing south-by-southwest across Linn County passing through the City of Harrisburg, entering Lane County, crossing the Willamette River, passing through the City of Junction City, and terminating at the Alderwood Tap. The corridor is in BPA's easement, most of which lies within the P&W Railroad ROW. Structures 1/1 and 1/2 west of the Albany Substation are outside of the P&W Railroad ROW in the BPA easement. South of Harrisburg, the corridor diverges from the P&W Railroad ROW to the southwest from structures 27/2 to 28/2 as it leaves Linn County, crosses the Willamette River, and enters Lane County. See Figure 3-1 for the location of the transmission line corridor.

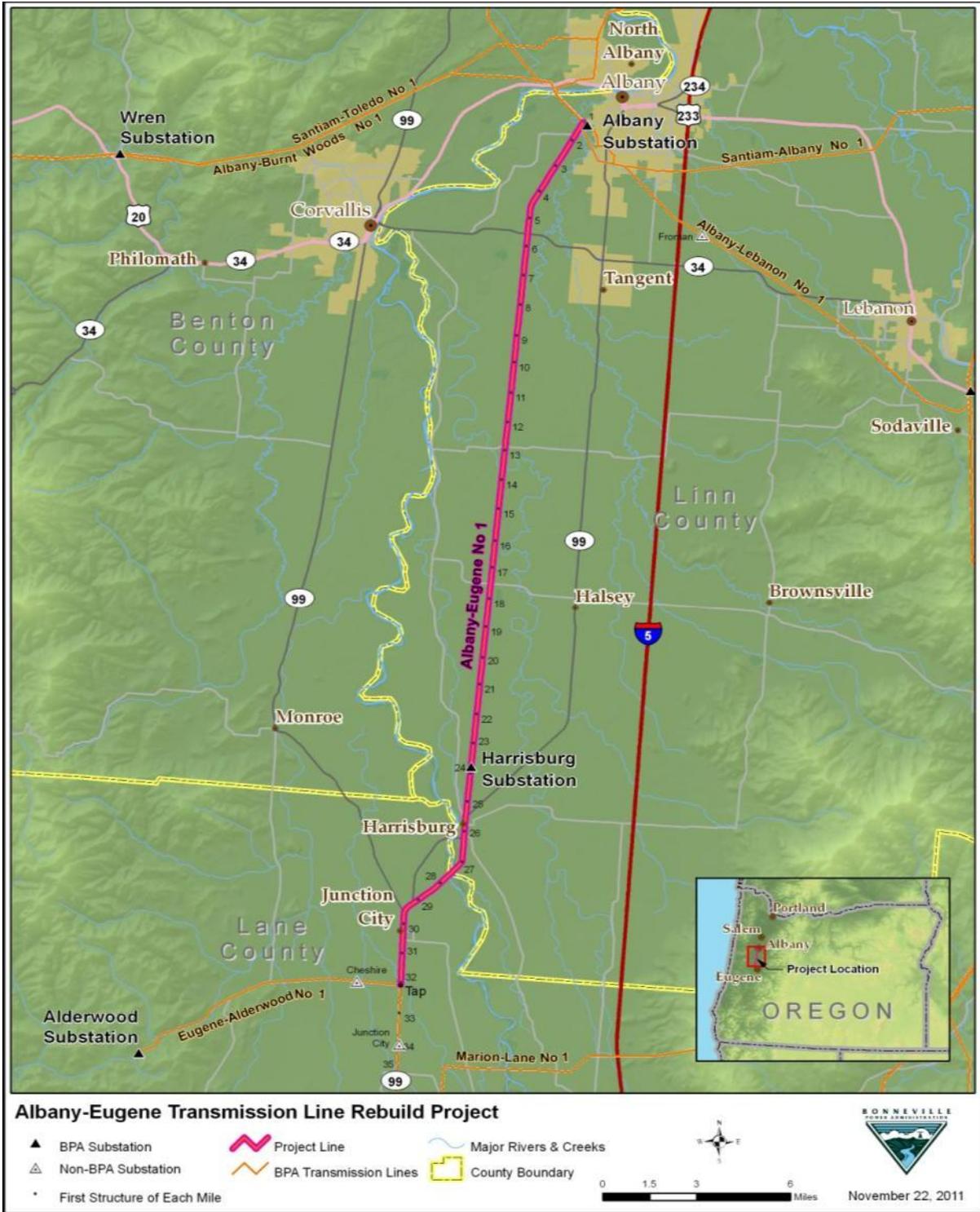


Figure S-1. Existing Land Use

Land use along most of the corridor is predominately agricultural, such as grass seed and wheat crops, with some industrial, open space, and rural residential lands. Limited sheep grazing and horse pastures are sparsely located throughout the corridor. Where the corridor lies within the urban areas of Albany, Harrisburg, and Junction City, there are industrial uses, such as auto body shops and limited manufacturing; commercial uses, such as convenience stores and restaurants; and single-family and multi-family residential uses. Land ownership along the corridor is private with easements for utilities.

Streams and rivers along the corridor include the Calapooia River, Muddy Creek, and the Willamette River. Vegetation varies along the rivers and includes disturbed wetland grass/forb/shrub communities, black cottonwood, Oregon ash, big-leaf maple, cherry, red-osier dogwood, serviceberry, Douglas' hawthorn, English hawthorn, rose, and willow.

### **S.3.2 Environmental Consequences and Mitigation Measures**

Environmental consequences from the Proposed Action and mitigation proposed for adverse impacts are summarized in Table S-1 by resource.

#### ***Cumulative Impact Analysis***

Cumulative impacts are the impacts on the environment that 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.

The Proposed Action in combination with past, present, and reasonably foreseeable future actions could result in cumulative impacts to water resources, floodplains, vegetation, fish, and wildlife. The other resources analyzed as part of the Proposed Action would not contribute to cumulative impacts.

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

Land Use and Recreation	
No Action	The Proposed Action would not be built and there would be no impact on land use.
Proposed Action Construction Impacts	Construction activities would disturb approximately 37.15 acres of agricultural land (21.90 acres of Prime Farmlands and 15.25 acres of Farmlands of Statewide Importance). Impacts would be temporary and localized, therefore, low. Wood pole structures would be replaced "in-kind" and construction would be temporary and localized; therefore impacts would be low for commercial, industrial, residential, public, and recreational uses along the transmission line corridor.
Proposed Action Permanent and Operational Maintenance Impacts	None
Mitigation	<ul style="list-style-type: none"> <li>• 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 would know when they can expect to experience construction-related disruptions</li> <li>• Maintain access during construction</li> <li>• Conduct construction activities in coordination with agricultural activities to the extent practicable</li> <li>• Instruct equipment operators and construction crews to close gates to avoid disturbances to livestock and to stay within the corridor to minimize impacts to crops</li> <li>• Coordinate with individual landowners to ensure that new and/or temporary access roads and gates, and construction and maintenance activities, would not disrupt agricultural and commercial operations</li> <li>• Compensate affected farmers for any lost crop production caused by construction of the Proposed Action</li> <li>• Coordinate with local agencies to avoid construction activities that could disrupt community events or conflict with their own construction activities</li> </ul>

**Table S-1. Comparison of the Proposed Action and No Action Alternative (continued)**

Geology and Soils	
No Action	The Proposed Action would not be built and there would be no impact on geology and soils for structure replacement. Impacts on soils due to danger tree removal would be low. Temporary soil erosion and nuisance dust could occur if soils are exposed for danger tree removal. Areas used for access would be fully restored to pre-construction conditions following danger tree removal.
Proposed Action Construction Impacts	Impacts to soils would result primarily from ground clearing and soil piling, as well as compaction from heavy equipment. Ground that has been cleared of vegetation could be susceptible to erosion. Ground compaction could degrade the soil structure and reduce the soil productivity and the soil's ability to absorb water. Construction activities would disturb approximately 55.5 acres of soil (54.4 acres would be temporary disturbances; 1.1 acres would be permanently converted to access roads). With mitigation measures applied, impacts would be low.
Proposed Action Permanent and Operational Maintenance Impacts	Conversion of soils to access roads would impact approximately 1.1 acres. With mitigation in place, impacts would be low.
Mitigation	<ul style="list-style-type: none"> <li>• Place new structures in existing structure holes to the maximum extent practicable to reduce ground disturbance</li> <li>• Conduct project construction, including danger tree removal, to the extent practicable, during the dry season when rainfall, runoff, and stream flow are low to minimize erosion, compaction, and sedimentation</li> <li>• Install sediment barriers and other appropriate erosion-control devices where needed to minimize sediment transport</li> <li>• Retain vegetative buffers where possible to prevent sediment from eroding into waterbodies</li> <li>• Control runoff and prevent erosion on access road improvements by using low grades, water bars, and drain dips</li> <li>• Properly space and size culverts on access roads</li> <li>• Use water trucks on an as-needed basis to minimize dust and reduce erosion due to wind</li> <li>• Till or scarify compacted soil at structure sites prior to reseeding</li> <li>• Reseed disturbed areas with a native seed mix as soon as work in that area is completed</li> <li>• Inspect reseeded and revegetated areas to verify adequate growth; implement contingency measures as needed</li> <li>• Conduct construction activities in coordination with agricultural activities to the extent practicable</li> <li>• Assist farm operators in restoring productivity of compacted soils for structure sites on agricultural lands</li> <li>• After construction, inspect and maintain facilities to ensure proper function and nominal erosion levels</li> </ul>

**Table S-1. Comparison of the Proposed Action and No Action Alternative (continued)**

Water Quality	
No Action	Construction-related impacts to surface and groundwater quality would be avoided. 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. Creosote could continue to leach into the soil but this is expected to diminish as the structures continue to deteriorate. Impacts on water quality due to danger tree removal would be low. Temporary soil erosion and sedimentation of waterbodies could occur if soils are exposed for danger tree removal. Areas used for access would be fully restored to pre-construction conditions following danger tree removal.
Proposed Action Construction Impacts	<p>Impacts to surface water quality would be low. Vegetation removal and soil disturbance, especially at structure locations near streams, from these activities could increase the rates of wind and water erosion, resulting in sediment deposition directly into stream channels and increased turbidity. 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 (BMPs) implemented during construction to minimize soil erosion.</p> <p>Impacts to surface water quality or groundwater quality resulting from oil and fuel spills from construction equipment used adjacent to streams are expected to be low. Any chemical spills would be of a small volume that would be contained and cleaned up. Any impacts to groundwater quality would be localized, short-term, and likely would not exceed State or Federal water quality criteria.</p> <p>Impacts on groundwater are expected to be low. The Proposed Action could directly impact groundwater flows through soil compaction, which would reduce infiltration capacity and increase surface runoff to streams.</p> <p>Impacts to wetland water quality are expected to be low. Most of the temporary impacts to wetlands would occur during periods of little to no standing water in the wetlands and wetland function would be restored as described below.</p>
Proposed Action Permanent and Operational Maintenance Impacts	<p>The new structures could leach pentachlorophenol (PCP) into surface water and adversely affect water quality. The U.S. Environmental Protection Agency (EPA) has estimated that environmental concentrations of PCP for surface water due to PCP- treated poles are less than 1 part per billion (ppb). Therefore, the impact of new structures on surface water quality and any associated drinking water is expected to be low.</p> <p>Impacts on surface water quality from herbicides used in vegetation management are expected to be low-to-moderate. BPA will avoid spraying herbicides within 35 feet of a waterbody as required by BPA's <i>Transmission System Vegetation Management Program Final EIS</i> (BPA 2000) (see Section 3.3.2).</p> <p>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.</p> <p>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. Thus, potential impacts to groundwater would likely be low.</p> <p>Some unavoidable impacts would remain after mitigation because any ground-disturbing activity, no matter how benign, would increase the risk of erosion and sedimentation of surface waters. Even with implementation of mitigation measures, there would remain a low risk of sedimentation to area streams and rivers until disturbed sites are revegetated.</p>
Mitigation	<ul style="list-style-type: none"> <li>• Prepare and implement a Storm Water Pollution Prevention Plan</li> <li>• Inspect and maintain tanks and equipment containing oil, fuel, or chemicals for drips or leaks to prevent spills onto the ground or into waterbodies</li> <li>• Maintain and repair all equipment and vehicles on impervious surfaces away from all sources of surface water</li> <li>• Refuel and maintain equipment away from natural or manmade drainage conveyances, including streams, wetlands, ditches, catch basins, ponds, and culverts; provide spill containment and cleanup; and use pumps, funnels, and absorbent pads for all equipment-fueling operations.</li> <li>• Keep, maintain, and have readily available appropriate spill containment and cleanup materials in construction equipment, in staging areas, and at work sites</li> <li>• Place sorbent materials or other impervious materials underneath individual wood poles at pole storage and staging areas to contain leaching of preservative materials</li> <li>• Install erosion control measures prior to work in or near floodplains</li> <li>• Monitor revegetation and site restoration work for adequate growth; implement contingency measures as necessary</li> <li>• Monitor erosion control BMPs to ensure proper function and nominal erosion levels</li> </ul>

**Table S-1. Comparison of the Proposed Action and No Action Alternative (continued)**

Wetlands	
No Action	Disturbance of wetlands would continue or increase due to the deterioration of structures. New access roads with little to no planning would be required to fix failed structures, which could result in moderate-to-high impacts, especially if maintenance activities occurred during the wet season. No permanent access roads are anticipated for danger tree removal. Wetlands adjacent to danger tree removal activities could experience temporary disturbance but this is expected to be a low impact.
Proposed Action Construction Impacts	Structure replacement would result in low impacts to wetlands because the wetland function would be temporarily disrupted but would return to pre-construction conditions. Construction of new temporary access roads in wetlands totaling 52,270 square feet (1.2 acres) would result in low impacts to wetlands due to post-construction restoration, including removal of wetland fill. Construction of permanent fords in wetlands totaling 870 square feet (0.02 acres) would result in low impacts due to the burying of the ford gravel under native soils and the re-establishment of wetland vegetation.
Proposed Action Permanent and Operational Maintenance Impacts	Operation and maintenance is expected to have a low impact on wetlands. Maintenance of the corridor would require incidental repairs to access roads and management of vegetation, which could disturb localized wetlands.
Mitigation	<ul style="list-style-type: none"> <li>• Obtain and comply with applicable Clean Water Act permits for all work in wetlands or streams</li> <li>• Identify and flag wetland boundaries before construction</li> <li>• Install erosion-control measures prior to work in or near wetlands, such as silt fences, straw wattles, and other soil stabilizers; reseed disturbed areas as required</li> <li>• Deposit and stabilize all excavated material not reused in an upland area outside of wetlands</li> <li>• Avoid construction within wetlands and wetland buffers to protect wetland functions and values, where possible. Avoid using these areas for construction staging, equipment or materials storage, fueling of vehicles, or related activities</li> <li>• Use existing road systems, where possible, to access structure locations</li> <li>• Remove all temporary fill and geotextile fabric, and revegetate after use of temporary roads built in wetlands</li> <li>• Bury permanent fords under a layer of native soils to allow wetland vegetation to re-establish.</li> <li>• Use herbicides to control vegetation near wetlands in accordance with BPA's <i>Transmission System Vegetation Management Program Final EIS</i> (BPA 2000) to limit impacts to water quality</li> </ul>
Floodplains	
No Action	Routine maintenance of structures in or directly adjacent to floodplains could result in minor disturbances to soils in the floodplains, which could slightly change the cut/fill balance in localized areas around the structures. This would result in low impacts to floodplains. If an emergency arises, and access is needed during the wet season, rock may need to be placed in floodplains to allow access, a moderate impact. Danger tree removal is not expected to affect floodplains as the tree stumps and roots would remain in the ground in order to minimize ground disturbance.
Proposed Action Construction Impacts	Impacts to floodplains would be low. Work within floodplains would be short-term and would not alter the floodplain ecological characteristic.
Proposed Action Permanent and Operational Maintenance Impacts	Operation and maintenance of the transmission line is expected to have a low impact on floodplains. Maintenance of the corridor would require incidental repairs to access roads and management of vegetation, which could disturb localized floodplains. Floodplain disturbance would be short-term and highly localized; therefore impacts would be low.
Mitigation	<ul style="list-style-type: none"> <li>• Deposit and stabilize all excavated material not reused in an upland area outside of floodplains</li> <li>• Install erosion-control measures prior to work in or near floodplains</li> <li>• Avoid construction within floodplains to protect floodplain function, where possible</li> </ul>

**Table S-1. Comparison of the Proposed Action and No Action Alternative (continued)**

Vegetation	
No Action	<p>Construction-related impacts to vegetation would not occur. However, current levels of disturbance to vegetation would continue or increase as the existing structures deteriorate. Vegetation clearing, crop damage, soil disturbance, and temporary access road creation for routine or emergency maintenance activities could result in short-term impacts similar to the Proposed Action.</p> <p>Construction-related impacts to rare plants would not occur. However, current levels of disturbance to vegetation would continue or increase as the existing structures deteriorate. Routine and emergency maintenance activities would require visits to structure locations and movement of personnel, materials, and vehicles along the corridor.</p> <p>Danger tree removal would be required under the No Action Alternative. Impacts to the adjacent Riparian Community would be considered high based on the removal of approximately 6,300 danger trees.</p> <p>Impacts to the Oak Woodland Community would be considered moderate based on the removal of approximately 47 danger trees.</p>
Proposed Action Construction Impacts	<p>Low impacts to the Managed Upland Grass/Forb/Shrub Community, Managed Wetland Grass/Forb/Shrub Community, and Urban/Developed Community within the corridor would occur due to clearing and vegetation removal.</p> <p>The Proposed Action would have low impacts to the adjacent Agricultural/Pastoral Community, primarily resulting from temporary access travel routes.</p> <p>Impacts to the adjacent Riparian Community would be high because of the removal of approximately 6,300 danger trees.</p> <p>Impacts to the Oak Woodland Community would be considered moderate based on the removal of approximately 47 danger trees.</p> <p>Impacts from the potential spread of noxious weeds would be considered low because noxious weed infestations already exist throughout the corridor; therefore, the Proposed Action would not be expected to cause a major effect on the productivity of adjacent vegetation communities.</p>
Proposed Action Permanent and Operational Maintenance Impacts	<p>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 further reduce native species diversity, increase non-native and invasive species, and reduce habitat quality and quantity. Continued maintenance of the corridor, including danger tree removal, would be unavoidable. Additionally, based on the prolific nature of weeds and the difficulty in controlling them, their unintentional spread throughout and adjacent to the corridor could occur and continue. Mitigation measures would reduce unavoidable impacts to vegetation communities to low-to-moderate levels.</p>

**Table S-1. Comparison of the Proposed Action and No Action Alternative (continued)**

Mitigation	<p><i>Mitigation before construction or danger tree removal</i></p> <ul style="list-style-type: none"> <li>• Prior to construction, conduct a noxious weed survey within the corridor to more specifically identify existing infestations of noxious weeds</li> <li>• Prior to construction, visit existing noxious weed infestations and conduct pre-emptive measures to minimize transport and expansion of weed occurrences during construction; flag infestations for avoidance (as practicable) during construction</li> <li>• Flag vegetation clearing limits prior to disturbance</li> <li>• Clearly mark danger trees and demarcate danger tree removal disturbance limits, log deck areas, and skid/access routes</li> <li>• Evaluate Oregon white oak trees designated as danger trees for alternative treatments (e.g., top and trim). Top and/or trim Oregon white oak trees designated as danger trees if possible</li> <li>• Identify potential onsite mitigation opportunities specific to vegetation replacement/replanting (e.g., willow planting/cutting installations)</li> <li>• Identify offsite mitigation for forested habitats during the permitting process that could replace tree removal occurring as a result of the Proposed Action</li> <li>• Coordinate with local watershed councils and land conservancies (e.g., Calapooia Watershed Council, Institute for Applied Ecology, and similar groups) regarding tree salvage for use in nearby habitat restoration projects. Determine potential for assisting with or furthering planned mitigation opportunities and priority projects</li> </ul> <p><i>Mitigation for construction or danger tree removal</i></p> <ul style="list-style-type: none"> <li>• Use existing road systems (including farm access roads), where practicable to access structure locations</li> <li>• Minimize the construction area (footprint) to the extent practicable, especially within wetlands and adjacent waterbody crossings</li> <li>• Install construction “envelopes” of silt fencing, straw wattles, or other barrier materials around construction sites to prevent vehicle turnaround, materials storage, or other disturbance outside designated construction areas</li> <li>• Place materials storage and staging areas in upland areas (away from wetland/waterbodies)</li> <li>• Minimize ground disturbance in proximity to existing noxious weed populations</li> <li>• Implement appropriate measures to minimize the introduction and broadcast of weed seeds/propagules, including inspection of vehicles before entering construction areas and appropriate equipment cleaning measures</li> <li>• Conduct as much work as possible during the dry season when stream flow, rainfall, and runoff are low to minimize erosion, sedimentation, and soil compaction</li> <li>• Cut and remove danger trees during the dry season to minimize compaction. Conduct danger tree removal in a manner that minimizes disruption to remaining trees and shrubs</li> <li>• Do not disturb existing root system of danger trees by “tipping over” danger trees with an excavator or similar machine due to potential wetland impact constraints</li> <li>• Use a feller buncher (where access allows), a “cable and winch” removal approach, or equivalent method to limit damage to remaining trees and understory vegetation during danger tree removal in sensitive areas</li> <li>• Do not allow danger trees to be chipped and left onsite</li> <li>• Top and trim Oregon white oak trees designated as danger trees if possible</li> <li>• Top, trim, and/or girdle a percentage of designated danger trees to create snags (e.g., in higher quality habitat areas) to reduce impacts to vegetation and wildlife species, such as small mammals and amphibians</li> <li>• Leave a small percentage of cut and felled danger trees as snags within the corridor as additional habitat/structure for wildlife, particularly small mammals and amphibians where appropriate</li> <li>• Use adjacent open fields for accessing and removing danger trees; exceptions may include where forested areas are significantly wide that removing danger trees would result in additional impacts, including non-danger tree removal</li> </ul>
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**Table S-1. Comparison of the Proposed Action and No Action Alternative (continued)**

	<p><i>Mitigation after construction</i></p> <ul style="list-style-type: none"> <li>• Reseed disturbed areas with native grasses and forbs to ensure appropriate vegetation coverage and soil stabilization prior to November 1 (rainy season)</li> <li>• Inspect seeded sites to verify adequate growth and implement contingency measures as needed</li> <li>• Schedule maintenance for fall or winter to avoid disturbing or destroying plants before they reproduce</li> <li>• Salvage natives where possible (especially camas) and replant after construction</li> <li>• Limit herbicide use to appropriate areas as specified in Section 3.3.2.</li> <li>• Restrict equipment access to wooden pole structures within or near the remnant native prairie areas to the edges of the ROW where possible</li> </ul>
Fish and Wildlife	
No Action	<p>Impacts to fish would be similar to the impacts described for on-going operation and maintenance of the Proposed Action. In addition, any repairs in areas near stream crossings could result in greater impacts to fish species and their habitat, especially if conducted during periods when Endangered Species Act (ESA)-listed fish species are present. Maintenance activities, such as roadway improvements, are expected to have low impacts to fish.</p> <p>Impacts to wildlife would mainly result from vegetation clearing and disturbance activities associated with on-going maintenance, operation, and emergency repairs. On-going maintenance and operation would result in low impacts to wildlife species. Other maintenance actions, including repairs, could also occur in areas or during times of year where impacts to nesting bird species may occur. Maintenance activities are expected to have low impacts on wildlife.</p> <p>Danger trees would be selectively cleared, primarily east of the railroad. Danger tree removal areas (including cottonwood-dominated habitats east of the railroad tracks) provide perching, nesting, and foraging opportunities for a variety of bird species. The amount of danger tree removal would result in a loss of most of the overstory canopy within and adjacent to the corridor. For a variety of bird species, impacts would be high without mitigation measures applied.</p>

**Table S-1. Comparison of the Proposed Action and No Action Alternative (continued)**

<p>Proposed Action Construction Impacts</p>	<p>Construction activities have the potential to impact fish, wildlife, and their habitat throughout the corridor. Most construction activities would occur away from streams where both topography and existing vegetation would reduce the ability of sediment to enter adjacent water. However, some in-water work may be required for access roads and to access certain structure locations. For wildlife, impacts would be predominantly associated with temporary construction activities and the removal of vegetation used for wildlife habitat such as danger tree removal.</p> <p>Specific construction impacts to fish species potentially present within the corridor would include:</p> <ul style="list-style-type: none"> <li>▪ Soil from access roads, cleared areas, structure excavation, stockpiles, or other construction sources might enter streams and increase sediment load and/or sediment deposition, or reduce available food organisms</li> <li>▪ Permanent access road construction could reduce infiltration while increasing runoff and erosion potential</li> <li>▪ Damage to fish (e.g. gill abrasion, clogging) could occur from construction sediments entering streams</li> <li>▪ Equipment moving across a stream might disturb the substrate and release sediments or result in compaction, thereby reducing an area's ability to support vegetation after construction</li> <li>▪ Vegetation destruction or removal within or adjacent to streams (e.g., for access road construction, culvert placement, or danger tree removal) may cause a loss of fish habitat, loss of stream shading, and a reduction in the existing vegetation's buffer capacity</li> <li>▪ Individual fish could be disturbed from equipment operating in or near streams</li> <li>▪ Petroleum fuel products, hydraulic oil, and other hazardous materials typically associated with construction activities may enter a stream, causing fish kills, aquatic invertebrate kills, and death or injury to a number of other species that fish depend on for food</li> </ul> <p>Oregon chub, Upper Willamette River (UWR) chinook, and UWR steelhead are present within various waterbodies crossing the corridor. With mitigation measures applied, impacts to these three species would be moderate. Short-term disturbance of a federally listed fish species may constitute a take. However, with mitigation (e.g., construction timing restrictions), short-term construction-related disturbances would result in moderate impacts to fish species.</p> <p>Danger trees would be selectively cleared, primarily east of the railroad. Danger tree removal areas (including cottonwood-dominated habitats east of the railroad tracks) provide perching, nesting, and foraging opportunities for a variety of bird species. The amount of danger tree removal would result in a loss of most of the overstory canopy within and adjacent to the corridor. For a variety of bird species, impacts would be high without mitigation measures applied.</p>
<p>Proposed Action Permanent and Operational Maintenance Impacts</p>	<p>Impacts to fish resulting from future maintenance and operation would remain similar to current maintenance and operation impacts, which would mainly be limited to vegetation trimming, potential increased sedimentation to streams, and maintenance of access roads. Maintenance activities, such as roadway improvements, are expected to have low impacts on fish.</p> <p>Impacts to wildlife from operation and maintenance of the corridor are generally related to the temporary disturbance of wildlife caused by maintenance equipment and human presence. Maintenance activities may include inspections conducted by people in vehicles or on foot, vegetation clearing, and other disturbances. Maintenance activities are expected to have low impacts on wildlife.</p> <p>Replacement of structures and access road work could cause long-term soil compaction and reduced soil productivity under structures and on roads that could reduce native species diversity, increase non-native and invasive species, and reduce habitat quality and quantity. Additionally, based on the prolific nature of weeds and the difficulty in controlling them, their unintentional spread throughout and adjacent to the corridor could likely occur and continue. Mitigation measures would reduce these unavoidable impacts to low levels.</p>

**Table S-1. Comparison of the Proposed Action and No Action Alternative (continued)**

Mitigation	<p><i>Mitigation for fish</i></p> <ul style="list-style-type: none"> <li>• Implement all impact minimization and mitigation measures identified in Section 7 Consultation with U.S. Fish and Wildlife Service (USFWS) and NOAA Fisheries</li> <li>• Conduct all construction activities according to Oregon Department of Fish and Wildlife (ODFW) in-water work guidelines or ODFW-approved in-water work extension for streams identified as having ESA-listed Oregon chub</li> <li>• Conduct all construction activities according to ODFW in-water work guidelines or ODFW-approved in-water work extension for all streams identified as containing ESA-listed fish species (UWR chinook/UWR steelhead)</li> <li>• Install, monitor, and maintain construction “envelopes” of silt fencing, wattles, or other barrier materials around construction sites to prevent vehicle turnaround, materials storage, or other disturbance outside designated construction areas; locate staging, turnaround, and material storage away from streams</li> <li>• Use existing road systems (including farm access roads), where practicable to access structure locations</li> <li>• Minimize the construction area (footprint) to the extent practicable, especially within wetlands and adjacent water feature crossings</li> <li>• Locate new access roads in previously disturbed areas and away from water crossings, when practicable</li> <li>• Prevent spills from entering streams and/or groundwater by developing a spill prevention and spill response plan prior to construction; carry spill kits in all construction equipment and vehicles</li> <li>• Conduct site restoration as soon as possible following construction; grade disturbed areas to their original contours and plant with suitable native vegetation during the appropriate season</li> <li>• Salvage and stockpile selected vegetation (e.g., coniferous trees) for use in nearby watershed stream enhancement/habitat restoration projects. Coordinate with local watershed councils (e.g., Calapooia Watershed Council) regarding any other tree salvage needs</li> </ul> <p><i>Mitigation for wildlife</i></p> <ul style="list-style-type: none"> <li>• Prior to initiating ground-disturbing activities, identify active raptor nest sites by consulting with ODFW and/or the USFWS and conduct raptor nesting surveys if required</li> <li>• Install bird diverters near the Calapooia and Willamette Rivers</li> <li>• Avoid disruptive construction activities within 330 feet of active bald eagle nests during their critical nesting period (January–June)</li> <li>• Schedule danger tree removal between August and March to minimize impacts to migratory birds.</li> <li>• Minimize the construction area to the extent practicable</li> <li>• In areas where cottonwoods would be removed, leave the understory layer intact (i.e., do not remove hawthorn, cherry, or willow trees)</li> <li>• Leave a small percentage of cut and felled danger trees in upland and wetland areas as additional habitat/structure for wildlife, particularly small mammals and amphibians</li> <li>• Top, trim, and/or girdle a percentage of designated danger trees to create snags (e.g., in higher quality habitat areas) to reduce impacts to vegetation and wildlife species, such as small mammals and amphibians</li> </ul>
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**Table S-1. Comparison of the Proposed Action and No Action Alternative (continued)**

Visual Resources	
No Action	Under the No Action Alternative, there would be a moderate-to-high and long-term impact on visual quality resulting from danger trees removed during continued operation and maintenance. Where vegetation removal associated with the No Action Alternative would eliminate the existing screening between the P&W Railroad and residences adjacent to the railroad, this impact to visual quality would be high.
Proposed Action Construction Impacts	The construction impacts to visual quality would be temporary and generally low for rural areas of the project corridor. For those urban portions of the corridor, visual impacts would be moderate.
Proposed Action Permanent and Operational Maintenance Impacts	The impact to visual quality and views resulting from operating and maintaining the corridor is expected to be low and similar to existing conditions. The operation and maintenance of new access roads would result in negligible to low visual impacts, and would introduce similar impacts as described for construction impacts. Upon completion of the Proposed Action, there would be a moderate-to-high long-term impact on visual quality in rural areas resulting from danger trees removal. Where vegetation removal associated with the project would eliminate existing screening between the P&W Railroad and residences adjacent to the railroad, this impact to visual quality would be high. In urban areas, removal of danger trees would result in low to moderate impacts because it would not substantially alter the character of views.
Mitigation	<ul style="list-style-type: none"> <li>• Locate construction staging and storage areas away from locations that would be clearly visible from residences and parks</li> <li>• Use non-reflective insulators (i.e., non-ceramic insulators or porcelain)</li> <li>• Focus construction lighting on work areas to minimize spillover of light and glare</li> <li>• Require that contractors maintain a clean construction site and that the corridor is kept free of litter following construction</li> </ul>
Cultural Resources	
No Action	Maintenance and emergency repairs would not alter the original design character or function of the three eligible historic properties, therefore there would be no effect to historic properties.
Proposed Action Construction Impacts	No alterations to the original design character or function of the three eligible historic properties would occur; therefore there would be no effect. No known eligible archaeological resources are present in the corridor.
Proposed Action Permanent and Operational Maintenance Impacts	No effect
Mitigation	<ul style="list-style-type: none"> <li>• Stop work immediately and notify local law enforcement officials, appropriate BPA personnel, the Oregon State Historic Preservation Office (SHPO), and interested Tribes if cultural resources (either archaeological or historical materials) are discovered during construction activities</li> <li>• Develop an Inadvertent Discovery Plan that details crew member responsibilities for reporting in the event of a discovery during construction</li> <li>• 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, the BPA archaeologist, the Oregon SHPO, and the Tribes</li> <li>• Implement any additional mitigation measures for cultural resources identified by the Oregon SHPO or Tribes through the Section 106 consultation process</li> </ul>

**Table S-1. Comparison of the Proposed Action and No Action Alternative (continued)**

Socioeconomics	
No Action	<p>Employment and income benefits of construction activities would not occur, and there would be no need for temporary housing for any construction workers. Residents and businesses along the corridor would experience no impact on noise or air quality from construction equipment.</p> <p>Other socioeconomic impacts could result as the transmission line structures have already exceeded their expected life span, and as they continue to deteriorate, the transmission line's reliability would be reduced. This could lead to negative impacts on the social and economic vitality of affected communities, including more frequent power outages and voltage fluctuations, and higher energy costs, which could adversely impact all local residents, community services, and businesses.</p>
Proposed Action Construction Impacts	<p>Short-term positive benefits could result by temporarily stimulating the economy in communities near the corridor over the short-term through the purchase of local supplies, materials, food, hotel or campground stays, and other direct or indirect spending by construction workers.</p> <p>Temporary negative impacts include limited access to businesses, public facilities, and social services along the transmission line corridor while construction activities occur. No impact is anticipated to housing and property taxes and values.</p> <p>Temporary short-term negative impacts would occur to residences, commercial uses, and industrial uses along the transmission line corridor. From an environmental justice standpoint this would affect all persons, regardless of race, age, or income; thus, no disproportionate, adverse impacts would occur to minority and low-income populations.</p>
Proposed Action Permanent and Operational Maintenance Impacts	<p>There would be no change to population, employment, income, housing, and property taxes and values.</p> <p>There would be no change to public facilities and social services; however, improved reliability of the electrical system to the people and community that it serves would be a long-term positive impact.</p> <p>All persons, regardless of race or income, would experience the same minor impacts associated with routine operations and maintenance within the transmission line corridor. Therefore, operation and maintenance would not result in long-term disproportionately high and adverse effects on minority and low-income populations.</p>
Mitigation	<ul style="list-style-type: none"> <li>• Maintain access to all businesses and residences during construction</li> <li>• Coordinate with AT&amp;T, MCI (Verizon), Pacific Power &amp; Light, Consumers Power, and the Emerald People's Utility District to determine exact locations of utilities and minimize service disruptions to other utility lines in the transmission line easement within the P&amp;W Railroad ROW</li> <li>• Compensate landowners at market value for any new land rights required to acquire new, temporary or permanent access roads on private lands</li> </ul>
Transportation	
No Action	<p>Periodic disruptions to traffic flow may occur as poles and/or equipment are replaced, or emergencies occur. Low operational and maintenance impacts would occur, similar to the existing conditions, such as equipment accessing the transmission line to conduct routine, periodic inspection and maintenance.</p>
Proposed Action Construction Impacts	<p>Construction would cause temporary and localized delays on county roads, state highways, and transmission line access roads, which would result in low impacts.</p>
Proposed Action Permanent and Operational Maintenance Impacts	<p>No impacts would result from operations and maintenance activities, which would be similar to existing conditions, such as equipment accessing the transmission line to conduct routine, periodic inspection and maintenance.</p>
Mitigation	<ul style="list-style-type: none"> <li>• Prepare a notice about construction activities and a proposed schedule for posting on the Oregon Department of Transportation (ODOT)'s traffic advisory website called Trip Check (<a href="http://www.tripcheck.com">www.tripcheck.com</a>)</li> <li>• Schedule construction activities at transmission line crossings of OR 34 and OR 99E so as to avoid lane closures during peak travel times, as determined in coordination with ODOT</li> <li>• Use traffic safety signs and flaggers to inform motorists and manage traffic during construction activities on affected roads</li> <li>• Repair damage to roads caused by construction</li> <li>• Keep construction activities and equipment clear of residential driveways as much as possible</li> </ul>

**Table S-1. Comparison of the Proposed Action and No Action Alternative (continued)**

Air Quality	
No Action	Construction-related impacts to air quality would not occur. However, routine maintenance of the existing transmission line would continue to have low impacts on air quality, primarily from fugitive dust and vehicle emissions.
Proposed Action Construction Impacts	Short-term and localized emissions from internal combustion engines, primarily from construction equipment, would occur. Similarly higher levels of particulate matter from ground-disturbing activities, such as vehicle and equipment travelling along unimproved access roads, would also occur on a temporary basis. Because of the short-term localized nature of these impacts and because these activities would not result in violations of air quality standards, the impacts would be low.
Proposed Action Permanent and Operational Maintenance Impacts	Air quality impacts during operation and maintenance would be similar to existing conditions, which include fugitive dust, emissions from maintenance vehicles, and low-level ozone and nitrogen oxide emissions from normal transmission line operation. These impacts would be low.
Mitigation	<ul style="list-style-type: none"> <li>• Use water trucks to control dust during construction</li> <li>• Keep all vehicles in good operating condition to minimize exhaust emissions</li> <li>• Turn off construction equipment during prolonged periods of non-use</li> <li>• Drive vehicles at low speeds (less than 5 miles per hour) on access roads and the BPA easement to minimize dust</li> </ul>
Greenhouse Gases	
No Action	Construction-related greenhouse gas emission impacts would not occur. There would be some vehicle trips related to danger tree removal and transport that would generate greenhouse gas emissions but the number of these trips is expected to be low as well as the amount of greenhouse gas generated. The carbon released during danger tree removal for trees at their current size would be 4,324 metric tons. Of the 6,300 trees removed, nearly 6,000 trees would not have reached full maturity or maximized carbon sequestration capacity. The No Action Alternative's impact on greenhouse gas concentrations from loss of carbon sequestration in danger trees would be approximately 40,000 metric tons of carbon dioxide equivalent, equating to 0.02 percent of the annual carbon dioxide emissions in BPA's four-state service territory. This would be a low impact.
Proposed Action Construction Impacts	<p>Construction vehicle emissions would result in an estimated 130.5 metric tons of carbon dioxide equivalent for the entire 2-year construction period. This is equivalent to the annual carbon dioxide emissions of 25 passenger vehicles.</p> <p>The carbon released during danger tree removal for trees at their current size would be 4,324 metric tons. Of the 6,300 trees removed, nearly 6,000 trees would not have reached full maturity or maximized carbon sequestration capacity. The Proposed Action's impact on greenhouse gas concentrations from loss of carbon sequestration in danger trees would be approximately 40,000 metric tons of carbon dioxide equivalent. This equates to 0.02 percent of the carbon dioxide emitted annually in BPA's four-state service territory, so overall the impact on greenhouse gases would be low.</p>
Proposed Action Permanent and Operational Maintenance Impacts	Greenhouse gas emissions associated with operations and maintenance vehicle and helicopter aircraft trips would occur; the annual estimate of greenhouse gas emissions is 1.4 metric tons of carbon dioxide equivalent. This equates to less than 0.001 percent of the annual carbon dioxide emissions in BPA's four-state service territory, so this impact would be low.

**Table S-1. Comparison of the Proposed Action and No Action Alternative (continued)**

Mitigation	<ul style="list-style-type: none"> <li>• Implement vehicle idling and equipment emission measures (see mitigation measures in Section 3.11 Air Quality)</li> <li>• Encourage carpooling and the use of shuttles vans among construction workers to minimize construction-related traffic and associated emissions</li> <li>• Locate staging areas as close to construction sites as practicable to minimize driving distances between staging areas and construction sites</li> <li>• Locate staging areas in previously disturbed or graveled areas to minimize soil and vegetation disturbance where practicable</li> <li>• Use the proper size equipment for the job to maximize energy efficiency.</li> <li>• Use alternative fuels for generators at construction sites such as propane or solar, or use electrical power where practicable</li> <li>• Reduce electricity use in the construction office by using compact fluorescent bulbs and powering off computers every night</li> <li>• Recycle or salvage non-hazardous construction and demolition debris to the maximum extent practicable</li> <li>• Submit a plan for approval to dispose of wood poles and danger trees locally where practicable</li> <li>• Use locally-sourced rock for temporary road and ford construction, if possible</li> </ul>
Health and Safety	
No Action	<p>Overall impacts to public health and safety would be moderate. The existing line is at a high risk of failure due to aging components and danger trees. Local and/or regional power outages could result from failure of this line, which could put public safety agencies, health providers, and businesses that rely on a steady source of power at risk. Any downed lines resulting from structure failures would have a high potential for causing fires in the vicinity of the downed line or electrocution as a result of accidental or inadvertent contact with a downed line while it is still energized, resulting in a potential risk to public health and safety.</p> <p>Continual deterioration of the existing structures would require more maintenance, resulting in a moderate impact to noise-sensitive land uses in the urban areas. Danger tree removal would temporarily result in a moderate noise impact in urban areas and a low impact in rural areas. Increased noise levels associated with this removal activity in any one location would be temporary.</p> <p>Ongoing maintenance and repair could disturb unknown hazardous materials and result in an unexpected release to the environment that could result in a temporary moderate impact to public health and safety in urban areas.</p>
Proposed Action Construction Impacts	There are no known occurrences of hazardous materials or reported contamination within the transmission line corridor; therefore impacts would be low-to-none as it is unlikely that there would be any risk to public health and safety from contaminated materials.
Proposed Action Permanent and Operational Maintenance Impacts	BPA's typical operation and maintenance practices may result in the release of small amounts of solvents, pesticides, paint products, motor and lubricating oils, and cleaners in the corridor. These impacts would likely be low-to-none as it is unlikely that there would be any risk to public health and safety from contaminated materials. See Water Quality section of this table for PCP discussion.
Mitigation	<ul style="list-style-type: none"> <li>• Prepare a health and safety plan that conforms to State requirements. All on-site personnel will be responsible for knowing the information included in the health and safety plan; the health and safety plan will be kept on-site and will be available for any visitors to the site</li> <li>• Hold a safety meeting to start each on-site workday to discuss potential safety concerns</li> <li>• Hold monthly meetings between BPA and the contractor to discuss safety concerns</li> <li>• Secure the site at the end of each work day to protect the public and on-site equipment</li> <li>• Notify the BPA Contracting Officer's Technical Representative immediately if a hazardous material is discovered that could pose an immediate threat to human health or the environment, and stop work in that area until given notice to proceed with work</li> </ul>

**Table S-1. Comparison of the Proposed Action and No Action Alternative (continued)**

Noise	
No Action	Construction-related impacts from noise would be low. If the Proposed Action is not implemented, the existing structures would continue to deteriorate and more continual maintenance of the existing transmission lines would impact nearby noise-sensitive land uses along the corridor. Noise levels would be temporarily higher during danger tree removal.
Proposed Action Construction Impacts	Construction noise would temporarily result in higher noise levels during structure replacement, access road improvements, danger tree removal, and conductor stringing. Because of the temporary nature of construction activities and because much of the corridor is not located in dense residential areas, the impacts would be low in rural areas of the project corridor and moderate for residences adjacent to the corridor or within the urbanized areas of Harrisburg and Junction City.
Proposed Action Permanent and Operational Maintenance Impacts	Operation and maintenance impacts would be similar to existing conditions, which includes very little noise that is audible to the human ear. Maintenance and repair of the transmission line would have temporary localized noise impacts. Both operational and maintenance impacts would be similar to that of the existing conditions and would be low.
Mitigation	<ul style="list-style-type: none"> <li>• Prior to construction, distribute the proposed schedule of construction activities to all landowners directly impacted and post the construction schedule in parks and other noise-sensitive public uses along the corridor to inform the community of when they might experience construction-related disruptions</li> <li>• Properly maintain all construction equipment, including having functioning mufflers</li> <li>• Turn off construction equipment during prolonged periods of non-use</li> <li>• Where possible, locate stationary equipment away from noise-sensitive properties</li> <li>• Limit construction to daytime hours</li> <li>• Incorporate mitigation measures discussed in this EIS into contract specifications</li> <li>• Ensure the quality of the transmission line since a properly maintained line produces less noise</li> </ul>
Electric and Magnetic Fields	
No Action	Operation-related impacts to public health and safety from electric and magnetic fields would be low. The existing line is at a high risk of failure due to aging components and danger trees. If the Proposed Action is not implemented, the existing structures would continue to deteriorate and the risk of direct contact with downed lines or exposure to sagging lines would increase.
Proposed Action Construction Impacts	No impacts as the line would be de-energized during construction.
Proposed Action Permanent and Operational Maintenance Impacts	No significant changes to the electric and magnetic field environment in the vicinity of the line are expected. Impacts resulting from operational activities would be none.
Mitigation	None

# Chapter 1. Purpose of and Need for Action

This chapter describes the need for the Bonneville Power Administration (BPA) to replace wood poles and associated structural components for the 115-kilovolt (kV) Albany-Eugene transmission line. This chapter also identifies the purposes that BPA is attempting to achieve in meeting this need, as well as the agency roles for this Environmental Impact Statement (EIS). The end of this chapter summarizes the public scoping process conducted for this EIS and includes information about the scope and organization of this EIS.

## 1.1 Background

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

BPA has proposed replacing wood poles and associated structural components for BPA's existing 115-kV Albany-Eugene No. 1 transmission line, which is located in Linn and Lane Counties, Oregon (Figure 1-1). Existing transmission structures that support this line start near the Albany Substation on the northern end to the Alderwood Tap at the southern end. This EIS 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 that their actions may have on the environment.

## 1.2 Need for Action

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BPA needs to take action to ensure the integrity and reliability of its existing 115-kV Albany-Eugene transmission line. This transmission line serves BPA's utility customers, who in turn serve communities in western Oregon. No major rebuild work has been done on the Albany-Eugene line since it was originally built in 1940. 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 forms of deterioration. Most structures on the Albany-Eugene line now exceed their service life and are physically worn and structurally unsound in places. In addition, many of the poles are made of Douglas-fir in which the center of the pole was not treated with preservative to prevent rot and decay. These 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. Collapse of these poles likely would lead to failure of the line, which

presents safety hazards to the public and BPA workers, as well as outages that would adversely affect power deliveries to BPA’s customers in western Oregon.

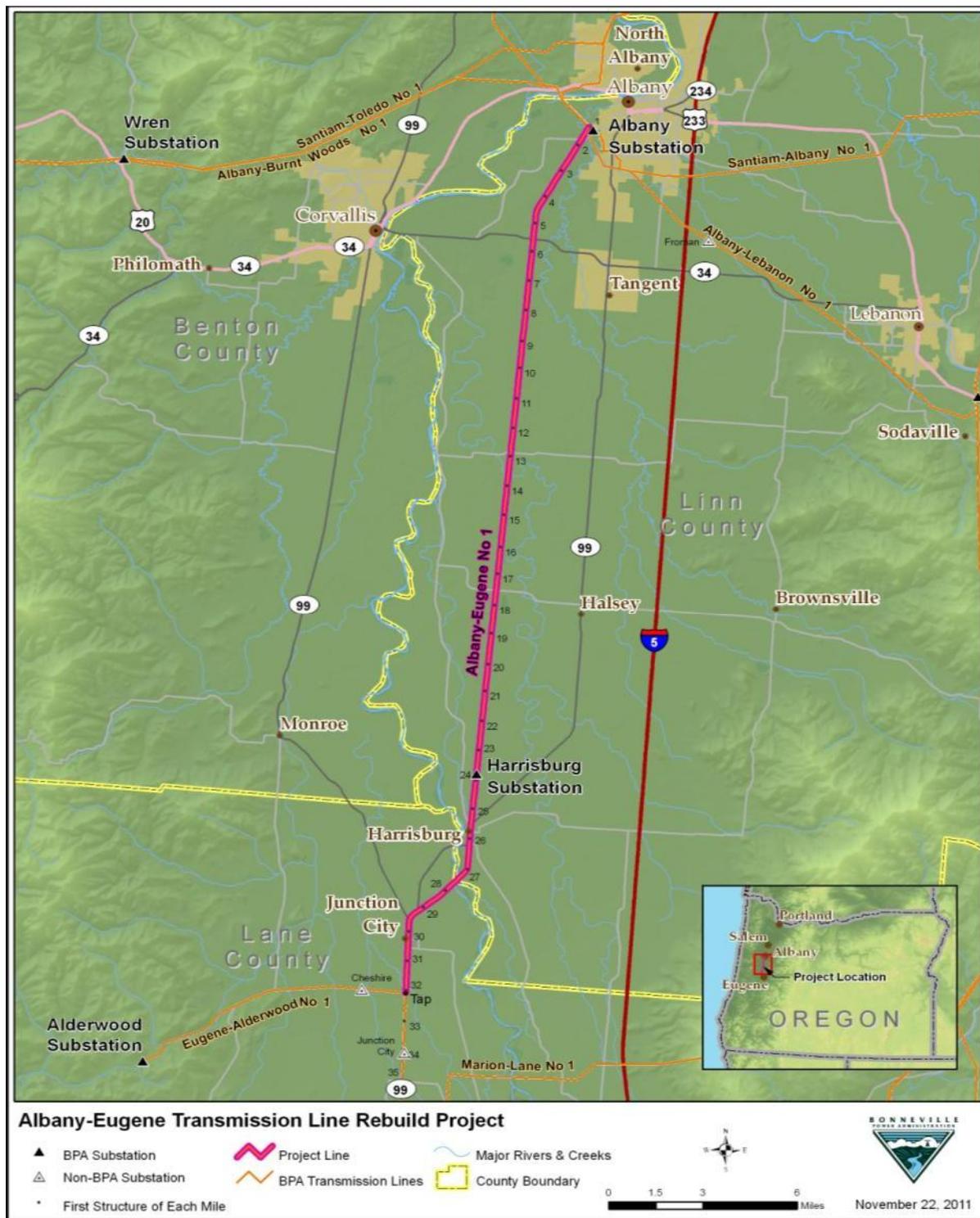


Figure 1-1. Project Vicinity Map

## 1.3 Purposes

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The purposes are goals to be achieved while meeting the need for the Proposed Action. BPA has identified the following purposes that it will use to evaluate the proposed alternatives:

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

## 1.4 Agency Roles

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### 1.4.1 Lead Agency

BPA has proposed to take action to respond to the need identified in Section 1.2 and is, therefore, the lead agency under NEPA for this EIS. As such, BPA is primarily responsible for preparing the EIS. BPA will use the EIS to decide whether to rebuild the 115-kV transmission line (see Chapter 2 for descriptions of the alternatives).

The Council on Environmental Quality regulations implementing NEPA allow for the designation of other Federal, State, and local agencies and Indian tribes as cooperating agencies for an EIS where appropriate. No other agencies were identified as needing to participate in preparation of this EIS as a cooperating agency under NEPA, and no other agencies have requested cooperating agency status.

### 1.4.2 Other Agencies that May Use this EIS

Chapter 4 of this EIS identifies other Federal, State, and local agencies that may be involved in reviewing portions of the proposed project. These agencies may use all or part of this EIS to fulfill their applicable environmental review requirements for any actions they may need to take for the proposed project. For example, the existing alignment crosses intermittent and perennial streams, ditches, ponds, and wetlands, some of which are likely waters of the U.S. and the State. It is expected that the U.S. Army Corps of Engineers (Corps) will use relevant information from this EIS to help fulfill its NEPA requirements for its actions related to the proposed project.

## 1.5 Public Involvement

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The proposed project was originally classified as requiring an Environmental Assessment (EA). The purpose of an EA is to analyze the potential impacts of the Proposed Action to human and environmental resources to determine whether or not these impacts are potentially significant. If impacts are determined to be potentially significant, then an EIS is prepared.

On February 25, 2010, BPA sent an initial letter to people potentially interested in or affected by the proposed Albany-Eugene 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 EA scoping period (which extended from February 25, 2010 to March 27, 2010). BPA held an open house scoping meeting on March 11, 2010, in Junction City, Oregon. Three comments were received during the initial scoping period and eight people attended the public meeting. Concerns expressed during scoping included the continued use of agricultural lands during construction, the removal of native hazelnut trees and wildlife habitat, and sidewalk removal and repair during construction in the City of Harrisburg.

Subsequent to the March 2010 public meeting, BPA determined that a significant number of trees that pose potential danger to the transmission line would need to be removed to prevent damage to the line. As a result, BPA changed the level of NEPA documentation to be prepared for the project and initiated an EIS due to the potential significant impacts to the environment.

To initiate the formal EIS scoping process, BPA published a Notice of Intent (NOI) to prepare an EIS for the proposed project in the *Federal Register* on October 29, 2010 (Vol. 75, No. 209). BPA also mailed letters on October 25, 2010, to about 224 potentially interested and affected persons, agencies, Tribes, and organizations. The NOI and the public letter provided information about the proposed project and gave notice of the EIS scoping period and BPA's intent to prepare an EIS. The NOI and public letter also requested public comments on issues to be addressed in the EIS and provided information on how to submit scoping comments by mail, fax, telephone, the BPA website, and at scoping meetings. Both the NOI and the public letter were posted on a project website established by BPA to provide information about the project and the EIS process ([http://efw.bpa.gov/environmental\\_services/Document\\_Library/Albany-Eugene\\_Rebuild](http://efw.bpa.gov/environmental_services/Document_Library/Albany-Eugene_Rebuild)).

The public scoping period for the EIS occurred between October 25, 2010, and November 30, 2010. Two public EIS scoping meetings were held during this scoping period, one in Harrisburg, Oregon, on November 16, 2010, and the other in Albany, Oregon, on November 17, 2010. During these meetings, attendees had the opportunity to learn more about the EIS process and the proposed project, and were able to submit EIS scoping comments at that time. About a dozen people attended these scoping meetings.

BPA received six EIS scoping comments from individuals and agencies. These commenters provided five separate comments on the proposed project. All of the scoping comments received were posted on the BPA website. The following discussion summarizes the scoping comments received by BPA.

A few comments made about the potential environmental impacts of the proposed project raised concerns about:

- Potential loss of wildlife habitat and vegetation impacts related to native hazelnut trees
- Potential loss of trees on the east side of the railroad tracks that provide a noise and visual shield
- Potential for impacts to ongoing farming operations adjacent to the alignment
- Potential for impacts to rare and endangered plant populations

A few comments made about the potential environmental impacts of ongoing maintenance of BPA's easement with the P&W Railroad raised concerns about:

- Potential invasion/introduction of invasive reed canarygrass impacting field drainage
- Potential contamination of adjacent fields of invasive reed canarygrass seed and thistle seed

The U.S. Environmental Protection Agency (EPA) Region 10 also provided an attachment to its scoping letter response that identified key Federal regulatory programs and special resources that have the potential to be affected as part of the project. EPA's concerns were grouped into the following topic areas:

- Environmental Effects
  - Water resources
  - Road use and construction issues
  - Wetlands and floodplains
  - Habitat, vegetation, and wildlife
  - Noxious weeds and invasive plants
  - Air quality
  - Cumulative effects
  - Land use
  - Climate change
  - Endangered species
- Coordination with Tribal Governments
- Environmental Justice and Public Participation
- Mitigation Monitoring

All of these concerns identified during scoping were evaluated during the preparation of this EIS.

## **1.6 Organization of this EIS**

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The remainder of this EIS is organized as follows:

- Chapter 2 describes the Proposed Action and the No Action Alternative, as well as alternatives considered but eliminated from detailed study. It summarizes and compares the differences between the Proposed Action and the No Action Alternative, in particular concerning potential environmental impacts.
- Chapter 3 describes the existing environment that could be affected by the Proposed Action and the possible environmental consequences of the Proposed Action and the No Action Alternative. An assessment of the direct, indirect, and cumulative effects on land

use and recreation; geology and soils; water resources, wetlands and floodplains; vegetation; fish and wildlife; visual resources; cultural resources; socioeconomics and environmental justice; noise, public health and safety; and air quality; is provided. Impacts can range from no or low impact to high impact.

- Chapter 4 discusses environmental consultation requirements as well as the licenses, permits, and other approvals that must be obtained to implement the proposed action.
- Chapter 5 lists the individuals, agencies, Tribes, and groups that were notified of the availability of the EIS.
- Chapters 6 and 7 provide the references used in preparation of this EIS and a glossary of terms.
- Chapter 8 lists the individuals who performed technical studies and helped prepare the EIS.
- Chapter 9 includes an index.
- Supporting information is provided in the appendices.

# Chapter 2. Proposed Action and Alternatives

This chapter describes the Proposed Action, the No Action Alternative, and alternatives considered but eliminated from detailed study. Figure 1-1 in Chapter 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 the 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-Eugene transmission line. The following discussion describes the various elements of the Proposed Action.

### 2.1.1 Project Location and Right-of-Way

BPA's 115-kV Albany-Eugene No. 1 transmission line extends from BPA's existing Albany Substation in the City of Albany, Oregon, approximately 40 miles south to BPA's existing Eugene Substation. BPA is proposing to replace the wood pole transmission structures along 32 miles of the line from Albany south to the Alderwood Tap, near the City of Junction City. Existing transmission structures that support this line are numbered from structure 1/1<sup>1</sup> near the Albany Substation to structure 32/1 at the Alderwood Tap.

From the Albany Substation approximately the first 0.25 mile of the Albany-Eugene transmission line (i.e., from structure 1/1 to structure 1/2) shares a right-of-way (ROW) with several other transmission lines. From structure 1/2 to 32/1 the Albany-Eugene line is located on the P&W Railroad ROW, except for where it extends through the City of Harrisburg (structures 25/6 through 26/12), over the Willamette River (structures 27/1 through 28/2), and through Junction City (structures 29/13 through 30/19), where it is on city-owned or private ROW. The ROW width for the line is generally about 100 feet.

BPA would use this existing corridor and ROW for the transmission structures that would be replaced under the Proposed Action. No additional transmission line ROW would be necessary.

### 2.1.2 Replacement Transmission Structures

The Proposed Action would replace existing deteriorating wood pole structures and components along the Albany-Eugene transmission line with new poles and components of essentially the same basic design. There are currently three types of structures used for this line:

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<sup>1</sup> 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-Eugene line begins at line-mile 1/structure number 1 and continues on to 40/7 at the Eugene Substation.

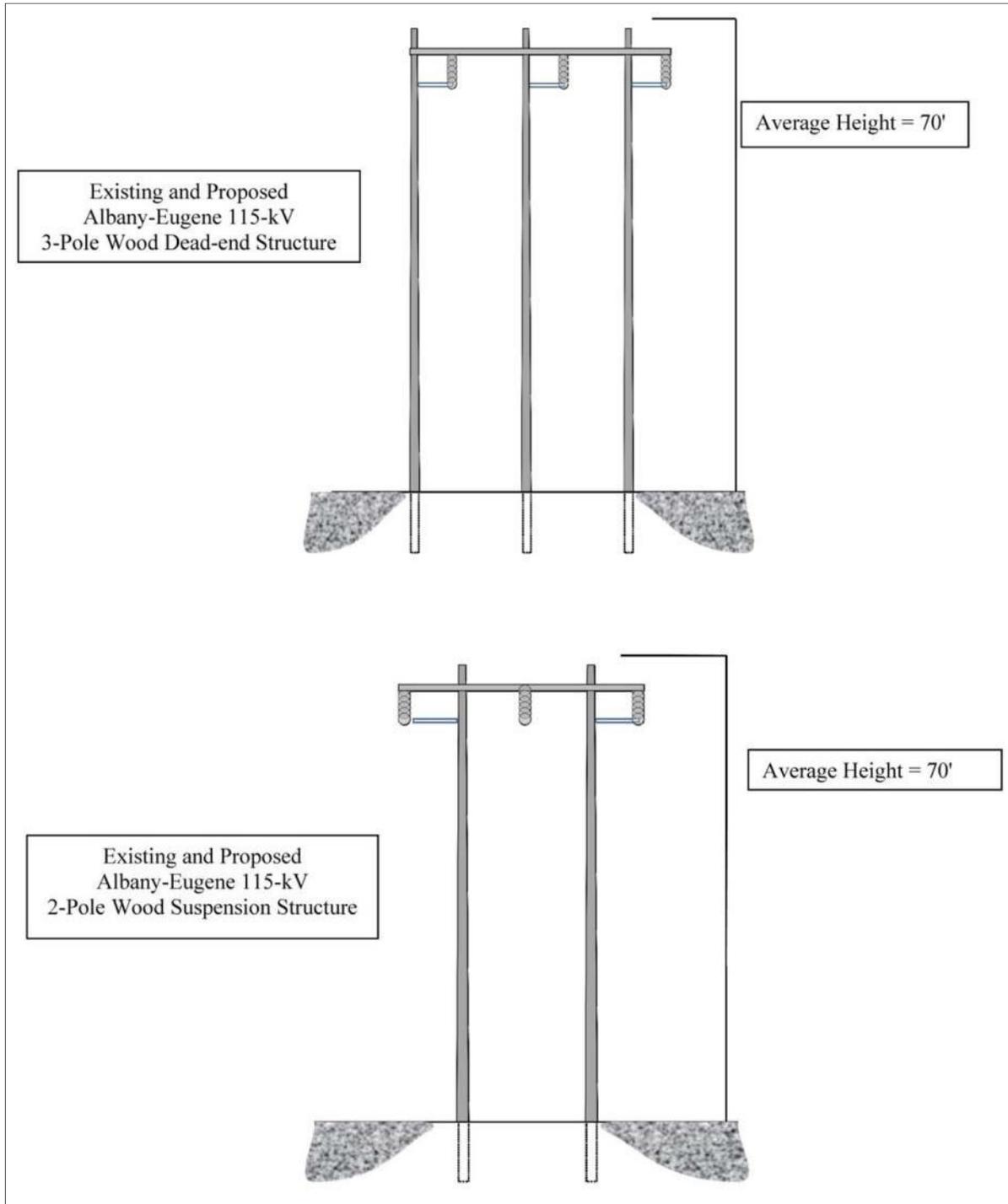
- Suspension structures are used where the structures are in a straight alignment or where turning angles are small (less than 15 degrees). They are the lightest structures because they do not have to withstand the stresses created by angles in the conductor and they are not located at the end of long spans. Suspension structures have one or two wood poles.
- 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 two or three wood poles.
- Steel lattice structures are used at the Willamette River crossing. These structures are larger and heavier than wood pole structures to allow for the longer and higher span needed to cross the Willamette River. These structures would not be replaced.

BPA would use the same type of structure at each currently existing structure location (i.e., existing single-pole structures would be replaced with new single pole structures, 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 coastal 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 pattern, density, and angle to the longitudinal axis of the pole. Transmission poles are typically through-bored in 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 a concentration of 0.6 pound 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 installed as needed. Because the existing Albany-Eugene transmission line currently does not have dampers installed, these would be installed as part of the Proposed Action.

Generally, the height of new structures would be approximately 70 feet above ground, with structure heights at particular locations dependent on terrain, requirements for road crossings, and clearing needs. Proposed structure heights would be approximately the same height as structures along the existing line (Figure 2-1).

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 in similar locations.



**Figure 2-1. Existing and Proposed Wood Replacement Structures**

### **2.1.3 Conductors and Overhead Ground Wire**

Conductors are the wires on the structures that carry the electrical current. Each existing structure on the Albany-Eugene line carries three conductors. Conductors would be replaced (see Section 2.1.7, Construction Activities). Accordingly, conductor pulling and retensioning sites would be required for the Proposed Action.

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

### **2.1.4 Vegetation Clearing**

Vegetation within the existing Albany-Eugene corridor generally consists of low-growing shrubs, trees, and agricultural crops. The total area temporarily being disturbed for access is approximately 55.5 acres. The areas being disturbed for access contain primarily grasses, low-growing shrubs, and agricultural crops abutting the project corridor.

Other areas would need to be cleared because danger trees have been identified. A danger tree is a tree located off the ROW that is a present or future hazard to the transmission line. Danger trees can be either stable or unstable. A tree is identified as a danger tree if it would contact BPA facilities should it fall, bend, grow within the swing displacement of the conductor, or grow into the conductor.

Within the Albany-Eugene corridor, approximately 6,300 danger trees have been identified for removal. Most of these trees lie along the east side of the P&W Railroad ROW and are not directly under the transmission line. The sizes of these trees are described by their diameter at breast height (dbh). The danger trees in the Albany-Eugene corridor range from less than 8 inches to 64 inches dbh with 87 percent of the trees having a dbh of 24 inches or less. Within the danger tree area, the understory of low-growing trees and shrubs (typically 10 to 30 feet high) would remain and continue to provide wildlife habitat. Danger tree removal would occur between August and March to minimize impacts to migratory birds. Given the large number of danger trees to be removed for this corridor, it is likely that tree removal would need to occur over a two-year period.

### **2.1.5 Access Roads**

Access to the transmission line corridor is limited for the length of the proposed project. Most construction access would consist of temporary access across agricultural fields. Some new road construction and access road improvements would be needed to allow for better access of structure sites during construction and maintenance. Other improvements would include the replacement of gates and installation of new culverts. Access road improvements fall into the following categories:

- **New Construction**—This category consists of rough grading of existing soil to form roadway grades, level off depressions and rises, adjust the cross slope for drainage, and finally construct a granular drive course. The granular drive course would be 9 inches thick, be above the surrounding grade, and be composed of durable gravel. If the subgrade is in poor condition, due to the presence of either excessive moisture or clayey soils, a geotextile fabric would be installed between the road section and the subgrade. The granular drive course would be 14 feet wide at the top and 16.5 feet wide at the bottom. An additional 10-foot offset from each side of the roadway has been assumed to be disturbed by construction, giving a total disturbance width of approximately 37 feet. As required by specifications, this additional disturbed area would be revegetated with a seed mixture specified by the landowner upon completion of construction. One new permanent access road between structures 14/6 and 14/7 for a length of 450 feet would be built for the Proposed Action.
- **Access Road Improvements (also referred to as reconstruction)**—This category consists of repairs to existing roads on BPA’s easement. Some roads would only require the BPA minimum of 30 tons of gravel per 100 linear feet of roadway (a 3-inch-thick layer of durable gravel over a 12-foot-wide road), while others would require minor grading to remove rutting and re-establish crown/cross slope before the gravel layer is applied. Two existing access roads between structures 1/1 and 1/4 (1,600 feet) and between structures 28/2 and 28/6 (1,800 feet) would be reconstructed.
- **Access Rights (also referred to as routes of travel)**—This category describes areas that are not currently within BPA’s easement but are necessary to provide either temporary or permanent access to existing transmission facilities. These areas would be designed to avoid depressed areas containing standing or flowing water on BPA’s easement and where construction for an all-weather access road would be cost prohibitive and/or have greater environmental impact. Since these areas would be used only for temporary and intermittent access, they do not fall under the same construction specifications as permanent roads. The only specification regarding these routes of travel is that they would be completely and fully restored to pre-construction conditions once the contractor’s efforts are complete. With the exception of the access roads listed above, the remainder of the 32-mile corridor would be accessed by routes of travel.
- **Stub Roads**—Stub roads are temporary access points within BPA’s easement that may require temporary fills of wetlands or floodplains in order to reach the structures. The temporary fill materials could include timbers, ground mats, or gravel. These materials would be removed after work is completed at the structure. Nearly all of the 324 double wood pole suspension structures and 44 triple pole wood dead-end structures would be accessed by stub roads. Assuming each stub road is approximately 50 feet in length, the total length of stub roads would be approximately 18,400 feet.

## **2.1.6 Staging Areas**

Temporary staging areas would be needed along or near the transmission line ROW to store and stockpile structure materials, trucks, and other equipment during construction. There would be one or two staging areas that would occupy approximately 30 acres. The staging area size would be based on the area needed to accommodate new and replaced poles. These staging areas would be within about 5 miles of the proposed project on an existing flat, paved, or graveled lot, most likely in an industrial or commercial area. The contractor will be responsible for identifying appropriate staging areas and obtaining all permits necessary for their use.

## **2.1.7 Construction Activities**

### ***Removal of Conductors and Hardware***

The existing transmission line would be taken out of service and existing conductor, insulators, and attachment hardware would be removed. The conductor would be collected on spools and removed for recycling or disposal.

### ***Removal of Existing Wood Pole Structures***

Currently 324 double wood pole suspension structures, 50 single wood pole structures, 44 triple wood pole dead-end structures and 2 steel lattice structures support the three conductors. The entire transmission line has been inspected to determine the precise condition of each wood pole. All of the wood poles would be replaced.

For removal of individual wood poles, a line truck with a boom crane would be set under the 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 and with jacks set up around the base of the pole. 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 at 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 at their new locations. If possible, they would be placed in the same ground holes where the existing deteriorated wood poles were removed. To prepare for installation, each existing hole would first be cleaned out and re-augered approximately 2 feet deeper (7 to 12 feet total) 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. Some new holes also would be augered to the correct depth. Any additional soil removed by the auger would be spread evenly around the structure sites.

### ***Installation of Replacement Structure Components***

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 arcing from the conductors to the structures and traveling to the ground, also would be installed at each structure. In addition, stockbridge dampers may be added to the line if design standards require them. Some factors to be considered in making that

determination are line tension and span length. This line currently does not have these devices. The stockbridge dampers would be 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 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 a backhoe, and a new guy anchor and wire would be placed. Guy wire anchors would be set in crushed rock, and the remainder of the hole would be backfilled with select backfill.

### ***Conductor Installation and Tensioning Sites***

New conductors would be attached to the structures using insulators. The proposed project would most likely use a combination of ceramic and non-ceramic polymer insulators. For safety reasons, the National Electric Safety Code (NESC) establishes minimum conductor heights. Based on its experience with issues of safety and landform variation, BPA exceeds NESC minimums of 19.5 feet for 115-kV construction; for most of the transmission line, the conductor must be at least 24 feet from the ground. Additional clearance would be provided over roadway and river crossings.

The conductor would be strung from structure to structure through pulleys on the structures. A "sock-line" (a small, light-weight rope or cable) would be placed in the pulleys and pulled through by a helicopter. The sock-line would then be attached to the "hard-line" (small steel cable), which would be attached to the conductors and used to pull the conductors into place under tension so the conductors would not be damaged by contact with the ground or vegetation.

Every two to three miles a conductor pulling and/or tensioning site would be needed, where trucks would pull the conductor to the correct tension. These temporary sites typically would disturb an area of about one acre. A relatively flat area would be needed; depending on conditions, the site could be graded and crushed rock with fines could be placed. Following construction, the area would be returned to pre-construction contours and reseeded.

### ***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, augers, 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 (e.g., wetlands or threatened or endangered species 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. Tensioning sites would avoid sensitive habitats.

### **Access Road Construction and Improvements**

Prior to and concurrent with pole replacement, access road construction and other improvements would be implemented. Permanent road construction would include grading and constructing gravel roads within BPA's easement. Road improvements would include grading and placing rock on existing roads. Temporary road construction would involve minor grading and placement of geotextile fabric and rock on the ground surface, and removal of these materials following construction. The total area that would be disturbed for access road construction and improvements is approximately 1.1 acres for permanent roads and 54.4 acres for temporary access.

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 habitat areas, staking or flagging would be installed where needed to keep traffic to designated routes.

### **Anticipated Construction Schedule**

The schedule for construction of the Proposed Action depends on completion of the NEPA process and whether there is a decision to proceed. Assuming that the NEPA process is completed and a decision to proceed is made in spring 2012, construction of the Proposed Action likely could begin in May 2012 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. Two construction seasons (late spring-early fall) will likely be needed to complete the project. If construction begins in May 2012, it is expected that all major construction activities would be completed around December 2013. Danger tree removal would occur over the summer and fall months during 2012 and 2013.

## **2.1.8 Operation and Maintenance**

Operation and maintenance of the lines upon completion of construction would be essentially the same as for the existing lines. The lines would continue to operate 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 conduct occasional emergency repairs; however, because of the replacement project, it is expected that these activities would occur much less frequently and on a smaller scale than 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 Final EIS* (BPA 2000). This program includes ongoing consultation between 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

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Under the No Action Alternative, BPA would not take action to replace structures along the transmission line or upgrade access roads, and would continue to operate and maintain the existing transmission line in its current condition. Within the Albany-Eugene corridor, approximately 6,300 danger trees have been identified for removal and would be removed as part of the No Action Alternative. Most of these trees lie along the east side of the P&W Railroad ROW and are not directly under the transmission line. Danger tree removal would likely occur during August, September, and October. Given the large number of danger trees to be removed for this corridor, it is likely that tree removal would need to occur over a two-year period.

With the exception of danger tree removal, construction activities associated with the Proposed Action would not occur. However, the reliability concerns that prompted the need for this project 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 Action. 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 line continue to deteriorate. This could impact 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 intermittently, 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

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In developing this EIS, BPA considered but eliminated two additional alternatives (other than the Proposed Action and the No Action Alternative). These two alternatives (Route Alternatives and Steel Pole Alternative) were suggested to avoid or minimize potential impacts to wetlands, vegetation, and wildlife.

### 2.3.1 Route Alternatives

BPA considered whether to relocate all or a portion of the transmission line to avoid habitat for wetlands, vegetation, and wildlife species identified along the corridor. The environmental impacts of relocating the transmission line to a currently undeveloped corridor, versus keeping the lines in their already developed corridor, would be substantially greater because the new ROW 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 the costs of new

clearing and roads, as well as the new easement rights that would need to be obtained. Because of this alternative's greater environmental impacts and higher costs, this alternative was considered but eliminated from detailed study in this EIS.

### 2.3.2 Installing Steel Poles

BPA considered using steel pole structures, instead of wood pole structures, in sensitive habitats. Steel pole structures potentially have a longer life and require less ongoing maintenance, thereby reducing the potential for future impacts to sensitive habitats. However, use of steel pole structures would increase the project's material costs for this segment of the lines by 250 percent. In addition, steel pole structures and their components still require maintenance. The potential benefits to sensitive habitats resulting from installation of steel pole structures therefore would be minimal. 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 EIS.

## 2.4 Comparison of Alternatives

Table 2-1 compares the Proposed Action and the No Action Alternative with the purposes of the project. Table 2-2 also summarizes the potential environmental impacts of each of these two alternatives described in Chapter 3.

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

Purpose	Proposed Action	No Action
Maintain or improve transmission system reliability to BPA and industry standards	Replacing wood poles would increase transmission system reliability as unplanned outages due to deteriorating components would be reduced.	Transmission line would continue to have deteriorating components, which could lead to continued unplanned outages, reduced system reliability, and non-continuous service to BPA customers.
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 could be mitigated.	Construction impacts would be avoided, but maintenance impacts would increase as existing structures and roads deteriorate and require additional maintenance.
Demonstrate cost-effectiveness	Total project costs about \$11.2 million. Use of the existing alignment reduces ROW acquisition costs.	No cost for construction would be expended, but near and long-term maintenance costs related to on-going repairs could increase to maintain the deteriorating line.

**Table 2-2. Comparison of the Proposed Action and No Action Alternative—Environmental Impacts on Resources**

Land Use and Recreation	
No Action	The Proposed Action would not be built and there would be no impact on land use.
Proposed Action Construction Impacts	Construction activities would disturb approximately 37.15 acres of agricultural land (21.90 acres of Prime Farmlands and 15.25 acres of Farmlands of Statewide Importance). Impacts would be temporary and localized, therefore, low. Wood pole structures would be replaced "in-kind" and construction would be temporary and localized; therefore impacts would be low for commercial, industrial, residential, public, and recreational uses along the transmission line corridor.
Proposed Action Permanent and Operational Maintenance Impacts	None
Geology and Soils	
No Action	The Proposed Action would not be built and there would be no impact on geology and soils for structure replacement. Impacts on soils due to danger tree removal would be low. Temporary soil erosion and nuisance dust could occur if soils are exposed for danger tree removal. Areas used for access would be fully restored to pre-construction conditions following danger tree removal.
Proposed Action Construction Impacts	Impacts to soils would result primarily from ground clearing and soil piling, as well as compaction from heavy equipment. Ground that has been cleared of vegetation could be susceptible to erosion. Ground compaction could degrade the soil structure and reduce the productivity and the soil's ability to absorb water. Construction activities would disturb approximately 55.5 acres of soil (54.4 acres would be temporary disturbances; 1.1 acres would be permanently converted to access roads). With mitigation measures applied, impacts would be low.
Proposed Action Permanent and Operational Maintenance Impacts	Conversion of soils to access roads would impact approximately 1.1 acres. With mitigation in place, impacts would be low.

**Table 2-2. Comparison of the Proposed Action and No Action Alternative—Environmental Impacts on Resources (continued)**

Water Quality	
No Action	Construction-related impacts to surface and groundwater quality would be avoided. 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. Creosote could continue to leach into the soil but this is expected to diminish as the structures continue to deteriorate. Impacts to water quality due to danger tree removal would be low. Temporary soil erosion and sedimentation of waterbodies could occur if soils are exposed for danger tree removal. Areas used for access would be fully restored to pre-construction conditions following danger tree removal.
Proposed Action Construction Impacts	<p>Impacts to surface water quality would be low. Vegetation removal and soil disturbance, especially at structure locations near streams, from these activities could increase the rates of wind and water erosion, resulting in sediment deposition directly into stream channels and increased turbidity. 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 (BMP) implemented during construction to minimize soil erosion.</p> <p>Impacts to surface water quality or groundwater quality resulting from oil and fuel spills from construction equipment used adjacent to streams are expected to be low. Any chemical spills would be of a small volume that would be contained and cleaned up. Any impacts to groundwater quality would be localized, short-term, and likely would not exceed State or Federal water quality criteria.</p> <p>Impacts on groundwater are expected to be low. The Proposed Action could directly impact groundwater flows through soil compaction, which would reduce infiltration capacity and increase surface runoff to streams.</p> <p>Impacts to wetland water quality are expected to be low. Most of the temporary impacts to wetlands would occur during periods of little to no standing water in the wetlands, and wetland function would be restored as described below.</p>
Proposed Action Permanent and Operational Maintenance Impacts	<p>The new structures could leach pentachlorophenol (PCP) into surface water and adversely affect water quality. The U.S. Environmental Protection Agency (EPA) has estimated that environmental concentrations of PCP for surface water due to PCP- treated poles are less than 1 part per billion (ppb). Therefore, the impact of new structures on surface water quality and any associated drinking water is expected to be low.</p> <p>Impacts on surface water quality from herbicides used in vegetation management are expected to be low-to-moderate. BPA will avoid spraying herbicides within 35 feet of a waterbody as required by BPA's <i>Transmission System Vegetation Management Program Final EIS</i> (BPA 2000) (see Section 3.3.2)..</p> <p>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.</p> <p>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. Thus, potential impacts to groundwater would likely be low.</p> <p>Some unavoidable impacts would remain after mitigation because any ground-disturbing activity, no matter how benign, would increase the risk of erosion and sedimentation of surface waters. Even with implementation of mitigation measures, there would remain a low risk of sedimentation to area streams and rivers until disturbed sites are revegetated.</p>

**Table 2-2. Comparison of the Proposed Action and No Action Alternative—Environmental Impacts on Resources (continued)**

Wetlands	
No Action	Disturbance of wetlands would continue or increase due to the deterioration of structures. New access roads with little to no planning would be required to fix failed structures, which could result in moderate-to-high impacts, especially if maintenance activities occurred during the wet season. No permanent access roads are anticipated for danger tree removal. Wetlands adjacent to danger tree removal areas could experience temporary disturbance but this is expected to be a low impact.
Proposed Action Construction Impacts	Structure replacement would result in low impacts to wetlands because wetland function would be temporarily disrupted but would return to pre-construction conditions. Construction of new temporary access roads in wetlands totaling 52,270 square feet (1.2 acres), would result in low impacts to wetlands due to post-construction restoration, including removal of temporary wetland fill.  Construction of permanent fords in wetlands totaling 870 square feet (0.02 acres) would result in low impacts due to the burying of the ford gravel under native soils and the re-establishment of wetland vegetation.
Proposed Action Permanent and Operational Maintenance Impacts	Operation and maintenance is expected to have a low impact on wetlands. Maintenance of the corridor would require incidental repairs to access roads and management of vegetation, which could disturb localized wetlands.
Floodplains	
No Action	Routine maintenance of structures in or directly adjacent to floodplains could result in minor disturbances to soils in the floodplains, which could slightly change the cut/fill balance in localized areas around the structures. This would result in low impacts to floodplains. If an emergency arises, and access is needed during the wet season, rock may need to be placed in floodplains to allow access, a moderate impact. Danger tree removal is not expected to affect floodplains as the tree stumps and roots would remain in the ground in order to minimize ground disturbance.
Proposed Action Construction Impacts	Impacts to floodplains would be low. Work within floodplains would be short-term and would not alter the floodplain ecological characteristic.
Proposed Action Permanent and Operational Maintenance Impacts	Operation and maintenance of the transmission line is expected to have a low impact on floodplains. Maintenance of the corridor would require incidental repairs to access roads and management of vegetation, which could disturb localized floodplains.  Floodplain disturbance would be short-term and highly localized; therefore impacts would be low.

**Table 2-2. Comparison of the Proposed Action and No Action Alternative—Environmental Impacts on Resources (continued)**

Vegetation	
No Action	<p>Construction-related impacts to vegetation would not occur. However, current levels of disturbance to vegetation would continue or increase as the existing structures deteriorate. Vegetation clearing, crop damage, soil disturbance, and temporary access road creation for routine or emergency maintenance activities could result in short-term impacts similar to the Proposed Action.</p> <p>Construction-related impacts to rare plants would not occur. However, current levels of disturbance to vegetation would continue or increase as the existing structures deteriorate. Routine and emergency maintenance activities would require visits to structure locations and movement of personnel, materials, and vehicles along the corridor.</p> <p>Danger tree removal would be required under the No Action Alternative. Impacts to the adjacent Riparian Community would be considered high based on the removal of approximately 6,300 danger trees.</p> <p>Impacts to the Oak Woodland Community would be considered moderate based on the removal of approximately 47 danger trees.</p>
Proposed Action Construction Impacts	<p>Low impacts to the Managed Upland Grass/Forb/Shrub Community, Managed Wetland Grass/Forb/Shrub Community, and Urban/Developed Community within the corridor would occur due to clearing and vegetation removal.</p> <p>The Proposed Action would have low impacts to the adjacent Agricultural/Pastoral Community, primarily resulting from temporary access road construction.</p> <p>Impacts to the adjacent Riparian Community would be high because of the removal of approximately 6,300 danger trees.</p> <p>Impacts to the Oak Woodland Community would be considered moderate based on the removal of approximately 47 danger trees.</p> <p>Impacts from the potential spread of noxious weeds would be considered low because noxious weed infestations already exist throughout the corridor; therefore, the Proposed Action would not be expected to cause a major effect on the productivity of adjacent vegetation communities.</p>
Proposed Action Permanent and Operational Maintenance Impacts	<p>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 further reduce native species diversity, increase non-native and invasive species, and reduce habitat quality and quantity. Continued maintenance of the corridor, including danger tree removal, would be unavoidable. Additionally, based on the prolific nature of weeds and the difficulty in controlling them, their unintentional spread throughout and adjacent to the corridor could occur and continue. Mitigation measures would reduce unavoidable impacts to vegetation communities to low-to-moderate levels.</p>

**Table 2-2. Comparison of the Proposed Action and No Action Alternative—Environmental Impacts on Resources (continued)**

Fish and Wildlife	
No Action	<p>Impacts to fish would be similar to the impacts described for on-going operation and maintenance of the Proposed Action. In addition, any repairs in areas near stream crossings could result in greater impacts to fish species and their habitat, especially if conducted during periods when Endangered Species Act (ESA)-listed fish species are present. Maintenance activities, such as roadway improvements, are expected to have low impacts to fish.</p> <p>Impacts to wildlife would mainly result from vegetation clearing and disturbance activities associated with on-going maintenance, operation, and emergency repairs. On-going maintenance and operation would result in low impacts to wildlife species. Other maintenance actions, including repairs, could also occur in areas or during times of year where impacts to nesting bird species may occur. Maintenance activities are expected to have low impacts on wildlife.</p> <p>Danger trees would be selectively cleared, primarily east of the railroad. Danger tree removal areas (including cottonwood-dominated habitats east of the railroad tracks) provide perching, nesting, and foraging opportunities for a variety of bird species. The amount of danger tree removal would result in a loss of most of the overstory canopy within and adjacent to the corridor. For a variety of bird species, impacts would be high without mitigation measures applied.</p>
Proposed Action Construction Impacts	<p>Construction activities have the potential to impact fish, wildlife, and their habitat throughout the corridor. Most construction activities would occur away from streams where both topography and existing vegetation would reduce the ability of sediment to enter adjacent water. However, some in-water work may be required for access roads and to access certain structure locations. For wildlife, impacts would be predominantly associated with temporary construction activities and the removal of vegetation used for wildlife habitat such as danger tree removal.</p> <p>Specific construction impacts to fish species potentially present within the corridor would include:</p> <ul style="list-style-type: none"> <li>○ Soil from access roads, cleared areas, structure excavation, stockpiles, or other construction sources might enter streams and increase sediment load and/or sediment deposition, or reduce available food organisms</li> <li>○ Permanent access road construction could reduce infiltration while increasing runoff and erosion potential</li> <li>○ Damage to fish (e.g. gill abrasion, clogging) could occur from construction sediments entering streams</li> <li>○ Equipment moving across a stream might disturb the substrate and release sediments or result in compaction, thereby reducing an area's ability to support vegetation after construction</li> <li>○ Vegetation destruction or removal within or adjacent to streams (e.g., for access road construction, culvert placement, or danger tree removal) may cause a loss of fish habitat, loss of stream shading, and a reduction in the existing vegetation's buffer capacity</li> <li>○ Individual fish could be disturbed from equipment operating in or near streams</li> <li>○ Petroleum fuel products, hydraulic oil, and other hazardous materials typically associated with construction activities may enter a stream, causing fish kills, aquatic invertebrate kills, and death or injury to a number of other species that fish depend on for food</li> </ul> <p>Oregon chub, Upper Willamette River (UWR) chinook, and UWR steelhead are present within various waterbodies crossing the corridor. With mitigation measures applied, impacts to these species would be moderate. Short-term disturbance of a federally listed fish species may constitute a take. However, with mitigation (e.g., construction timing restrictions), short-term construction-related disturbances would result in moderate impacts to fish and wildlife species.</p> <p>Danger trees would be selectively cleared, primarily east of the railroad. Danger tree removal areas (including cottonwood-dominated habitats east of the railroad tracks) provide perching, nesting, and foraging opportunities for a variety of bird species. The amount of danger tree removal would result in a loss of most of the overstory canopy within and adjacent to the corridor. For a variety of bird species, impacts would be high without mitigation measures applied.</p>

**Table 2-2. Comparison of the Proposed Action and No Action Alternative—Environmental Impacts on Resources (continued)**

Proposed Action Permanent and Operational Maintenance Impacts	<p>Impacts to fish resulting from future maintenance and operation would remain similar to current maintenance and operation impacts, which would mainly be limited to vegetation trimming, potential increased sedimentation to streams, and maintenance of new access roads. Maintenance activities, such as roadway improvements, are expected to have low impacts on fish.</p> <p>Impacts to wildlife from operation and maintenance of the corridor are generally related to the temporary disturbance of wildlife caused by maintenance equipment and human presence. Maintenance activities may include inspections conducted by people in vehicles or on foot, vegetation clearing, and other disturbances. Maintenance activities are expected to have low impacts on wildlife.</p> <p>Replacement of structures and access road work could cause long-term soil compaction and reduced soil productivity under structures and on roads that could reduce native species diversity, increase non-native and invasive species, and reduce habitat quality and quantity. Additionally, based on the prolific nature of weeds and the difficulty in controlling them, their unintentional spread throughout and adjacent to the corridor could likely occur and continue. Mitigation measures would reduce these unavoidable impacts to low levels.</p>
Visual Resources	
No Action	Under the No Action Alternative, there would be a moderate-to-high and long-term impact on visual quality resulting from danger trees removed during continued operation and maintenance. Where vegetation removal associated with the No Action Alternative would eliminate the existing screening between the P&W Railroad and residences adjacent to the railroad, this impact to visual quality would be high.
Proposed Action Construction Impacts	The construction impacts to visual quality would be temporary and generally low for rural areas of the project corridor. For those urban portions of the corridor, visual impacts would be moderate.
Proposed Action Permanent and Operational Maintenance Impacts	<p>The impact to visual quality and views resulting from operating and maintaining the corridor is expected to be low and similar to existing conditions.</p> <p>The operation and maintenance of new access roads would result in negligible to low visual impacts, and would introduce similar impacts as described for construction impacts.</p> <p>Upon completion of the Proposed Action, there would be a moderate-to-high long-term impact on visual quality in rural areas resulting from danger trees removal. Where vegetation removal associated with the Proposed Action would eliminate existing screening between the P&amp;W Railroad and residences adjacent to the railroad, this impact to visual quality would be high. In urban areas, removal of danger trees would result in low to moderate impacts because it would not substantially alter the character of views.</p>
Cultural Resources	
No Action	Maintenance and emergency repairs would not alter the original design character or function of the three eligible historic properties, therefore there would be no effect to historic properties.
Proposed Action Construction Impacts	No alterations to the original design character or function of the three eligible historic properties would occur; therefore there would be no effect. No known eligible archaeological resources are present in the corridor.
Proposed Action Permanent and Operational Maintenance Impacts	No effect

**Table 2-2. Comparison of the Proposed Action and No Action Alternative—Environmental Impacts on Resources (continued)**

Socioeconomics	
No Action	<p>Employment and income benefits of construction activities would not occur, and there would be no need for temporary housing for any construction workers. Residents and businesses along the corridor would experience no impact on noise or air quality from construction equipment.</p> <p>Other socioeconomic impacts could result as the transmission line structures have already exceeded their expected life span, and as they continue to deteriorate, the transmission line's reliability would be reduced. This could lead to negative impacts on the social and economic vitality of affected communities, including more frequent power outages, voltage fluctuations, and higher energy costs, which could adversely impact all local residents, community services, and businesses.</p>
Proposed Action Construction Impacts	<p>Short-term positive benefits could result by temporarily stimulating the economy in communities near the corridor over the short-term through the purchase of local supplies, materials, food, hotel or campground stays, and other direct or indirect spending by construction workers.</p> <p>Temporary negative impacts include limited access to businesses, public facilities, and social services along the transmission line corridor while construction activities occur.</p> <p>No impact is anticipated to housing and property taxes and values.</p> <p>Temporary short-term negative impacts would occur to residences, commercial uses, and industrial uses along the transmission line corridor. From an environmental justice standpoint this would affect all persons, regardless of race, age, or income; thus, no disproportionate, adverse impacts would occur to minority and low-income populations.</p>
Proposed Action Permanent and Operational Maintenance Impacts	<p>There would be no change to population, employment, income, housing, and property taxes and values.</p> <p>There would be no change to public facilities and social services; however, improved reliability of the electrical system to the people and community that it serves would be a long-term positive impact.</p> <p>All persons, regardless of race or income, would experience the same minor impacts associated with routine operations and maintenance within the transmission line corridor. Therefore, operation and maintenance would not result in long-term disproportionately high and adverse effects on minority and low-income populations.</p>
Transportation	
No Action	<p>Periodic disruptions to traffic flow may occur as poles and/or equipment are replaced, or emergencies occur. Low operational and maintenance impacts would occur, similar to the existing conditions, such as equipment accessing the transmission line to conduct routine, periodic inspection and maintenance.</p>
Proposed Action Construction Impacts	<p>Construction would cause temporary and localized delays on county roads, state highways, and transmission line access roads, which would result in low impacts.</p>
Proposed Action Permanent and Operational Maintenance Impacts	<p>No impacts would result from operations and maintenance activities, which would be similar to existing conditions, such as equipment accessing the transmission line to conduct routine, periodic inspection and maintenance.</p>

**Table 2-2. Comparison of the Proposed Action and No Action Alternative—Environmental Impacts on Resources (continued)**

Air Quality	
No Action	Construction-related impacts to air quality would not occur. However, routine maintenance of the existing transmission line would continue to have low impacts on air quality, primarily from fugitive dust and vehicle emissions.
Proposed Action Construction Impacts	Short-term and localized emissions from internal combustion engines, primarily from construction equipment, would occur. Similarly higher levels of particulate matter from ground-disturbing activities, such as vehicle and equipment traveling along unimproved access roads, would also occur on a temporary basis. Because of the short-term localized nature of these impacts and because these activities would not result in violations of air quality standards, the impacts would be low.
Proposed Action Permanent and Operational Maintenance Impacts	Air quality impacts during operation and maintenance would be similar to existing conditions, which include fugitive dust, emissions from maintenance vehicles, and low-level ozone and nitrogen oxide emissions from normal transmission line operation. These impacts would be low.
Greenhouse Gases	
No Action	Construction-related greenhouse gas emission impacts would not occur. There would be some vehicle trips related to danger tree removal and transport that would generate greenhouse gas emissions but the number of these trips is expected to be low as well as the amount of greenhouse gas generated. The carbon released during danger tree removal for trees at their current size would be 4,324 metric tons. Of the 6,300 trees removed, nearly 6,000 trees would not have reached full maturity or maximized carbon sequestration capacity. The No Action Alternative's impact on greenhouse gas concentrations from loss of carbon sequestration in danger trees would be approximately 40,000 metric tons of carbon dioxide equivalent, equating to 0.02 percent of the annual carbon dioxide emissions in BPA's four-state service territory. This would be a low impact.
Proposed Action Construction Impacts	Construction vehicle emissions would result in an estimated 130.5 metric tons of carbon dioxide equivalent for the entire 2-year construction period. This is equivalent to the annual carbon dioxide emissions of 25 passenger vehicles. The carbon released during danger tree removal for trees at their current size would be 4,324 metric tons. Of the 6,300 trees removed, nearly 6,000 trees would not have reached full maturity or maximized carbon sequestration capacity. The Proposed Action's impact on greenhouse gas concentrations from loss of carbon sequestration in danger trees would be approximately 40,000 metric tons of carbon dioxide equivalent. This equates to 0.02 percent of the carbon dioxide emitted annually in BPA's four-state service territory, so overall the impact on greenhouse gases would be low.
Proposed Action Permanent and Operational Maintenance Impacts	Greenhouse gas emissions associated with operations and maintenance vehicle and helicopter aircraft trips would occur; the annual estimate of greenhouse gas emissions is 1.4 metric tons of carbon dioxide equivalent. This equates to less than 0.001 percent of the annual carbon dioxide emissions in BPA's four-state service territory, so this impact would be low.

**Table 2-2. Comparison of the Proposed Action and No Action Alternative—Environmental Impacts on Resources (continued)**

Health and Safety	
No Action	<p>Overall impacts to public health and safety would be moderate. The existing line is at high risk of failure due to aging components and danger trees. Local and/or regional power outages could result from failure of this line, which could put public safety agencies, health providers, and businesses that rely on a steady source of power at risk. Any downed lines resulting from structure failures would have a high potential for causing fires in the vicinity of the downed line or electrocution as a result of accidental or inadvertent contact with a downed line while it is still energized, resulting in a potential risk to public health and safety.</p> <p>Continual deterioration of the existing structures would require more maintenance, resulting in a moderate impact to noise-sensitive land uses in the urban areas. Danger tree removal would temporarily result in a moderate noise impact in urban areas and a low impact in rural areas. Increased noise levels associated with this removal activity in any one location would be temporary.</p> <p>Ongoing maintenance and repair could disturb unknown hazardous materials and result in an unexpected release to the environment that could result in a temporary moderate impact to public health and safety in urban areas.</p>
Proposed Action Construction Impacts	There are no known occurrences of hazardous materials or reported contamination within the transmission line corridor; therefore impacts would be low-to-none as it is unlikely that there would be any risk to public health and safety from contaminated materials.
Proposed Action Permanent and Operational Maintenance Impacts	BPA's typical operation and maintenance practices may result in the release of small amounts of solvents, pesticides, paint products, motor and lubricating oils, and cleaners in the corridor. These impacts would likely be low-to-none as it is unlikely that there would be any risk to public health and safety from contaminated materials. See Water Quality section of this table for PCP discussion.
Noise	
No Action	Construction-related impacts from noise would be low. If the Proposed Action is not implemented, the existing structures would continue to deteriorate and more continual maintenance of the existing transmission lines would impact nearby noise-sensitive land uses along the corridor. Noises levels would be temporarily higher during danger tree removal.
Proposed Action Construction Impacts	Construction noise would temporarily result in higher noise levels during structure replacement, access road improvements, danger tree removal, and conductor stringing. Because of the temporary nature of construction activities and because much of the corridor is not located in dense residential areas, the impacts would be low in rural areas of the project corridor and moderate for residences adjacent to the corridor or within the urbanized areas of Harrisburg and Junction City.
Proposed Action Permanent and Operational Maintenance Impacts	Operation and maintenance impacts would be similar to existing conditions, which includes very little noise that is audible to the human ear. Maintenance and repair of the transmission line would have temporary localized noise impacts. Both operational and maintenance impacts would be similar to that of the existing conditions and would be low.

**Table 2-2. Comparison of the Proposed Action and No Action Alternative—Environmental Impacts on Resources (continued)**

Electric and Magnetic Fields	
No Action	Operation-related impacts to public health and safety from electric and magnetic fields would be low. The existing line is at a high risk of failure due to aging components and danger trees. If the Proposed Action is not implemented, the existing structures would continue to deteriorate and the risk of direct contact with downed lines or exposure to sagging lines would increase.
Proposed Action Construction Impacts	No impacts as the line would be de-energized during construction.
Proposed Action Permanent and Operational Maintenance Impacts	No significant changes to the electric and magnetic field environment in the vicinity of the line are expected. Impacts resulting from operational activities would be none.

# Chapter 3. Affected Environment, Environmental Consequences, and Mitigation Measures

This chapter describes the existing environment of the project area for each resource and evaluates the environmental consequences of the Proposed Action and No Action Alternative on these resources. Mitigation measures to reduce or avoid the impacts of the Proposed Action on each resource also are identified. The chapter concludes with discussions of potential cumulative impacts, short-term use and long-term productivity, irreversible and irretrievable commitments of resources, and the potential effect of intentional destructive acts to BPA facilities.

## 3.1 Land Use and Recreation

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Additional detail on the land use and recreation analysis is provided in the Final Land Use and Recreation Technical Report (Parsons Brinckerhoff 2010), available on request.

### 3.1.1 Affected Environment

The transmission line corridor is located in Linn and Lane Counties, beginning in the City of Albany at the Albany Substation and continuing south-by-southwest across Linn County passing through the City of Harrisburg, entering Lane County, crossing the Willamette River, passing through the City of Junction City, and terminating at the Alderwood Tap. The transmission line corridor lies mostly within the P&W Railroad ROW. Structures 1/1 and 1/2 west of the Albany Substation are outside of the P&W Railroad ROW within a BPA easement on private land. South of Harrisburg, the corridor diverges from the P&W Railroad ROW to the southwest from structures 27/2 to 28/2 as it leaves Linn County, crosses the Willamette River, and enters Lane County. Within Junction City, structures 29/13 through 30/19 are located in City-owned road ROW.

Land use along most of the corridor is predominately agricultural, such as grass seed and wheat crops, with some industrial, open space, and rural residential lands. Limited sheep grazing and horse pastures are sparsely located throughout the corridor. Where the corridor lies within urban areas of Albany, Harrisburg, and Junction City, there are industrial uses, such as auto body shops and limited manufacturing; commercial uses, such as convenience stores and restaurants; and single-family and multi-family residential uses. Figure 3-1 illustrates land uses along the corridor. Figure 3-2, Figure 3-3, and Figure 3-4 show detailed land uses for the City of Harrisburg, the Willamette River crossing, and Junction City, respectively.

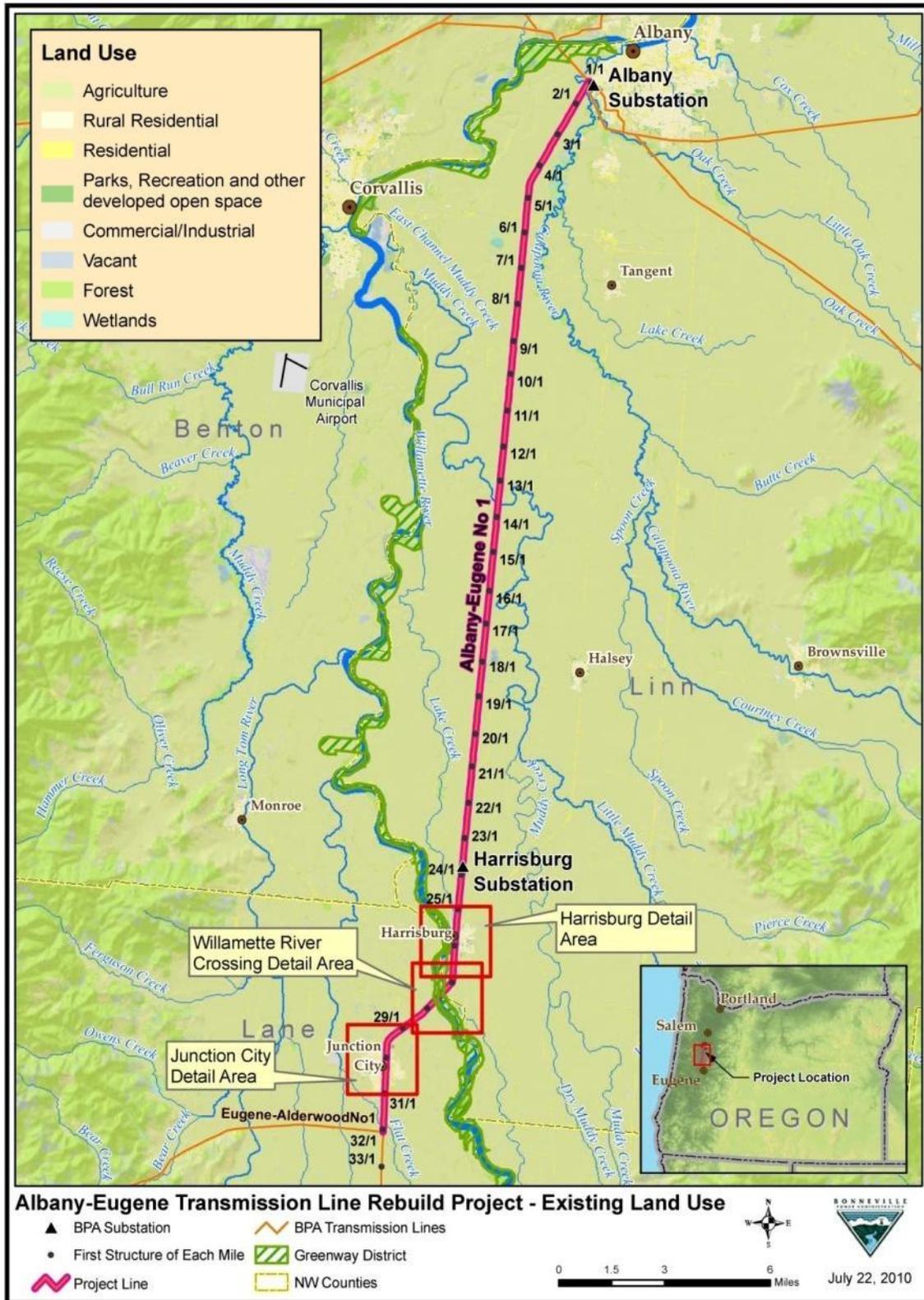


Figure 3-1. Existing Land Use

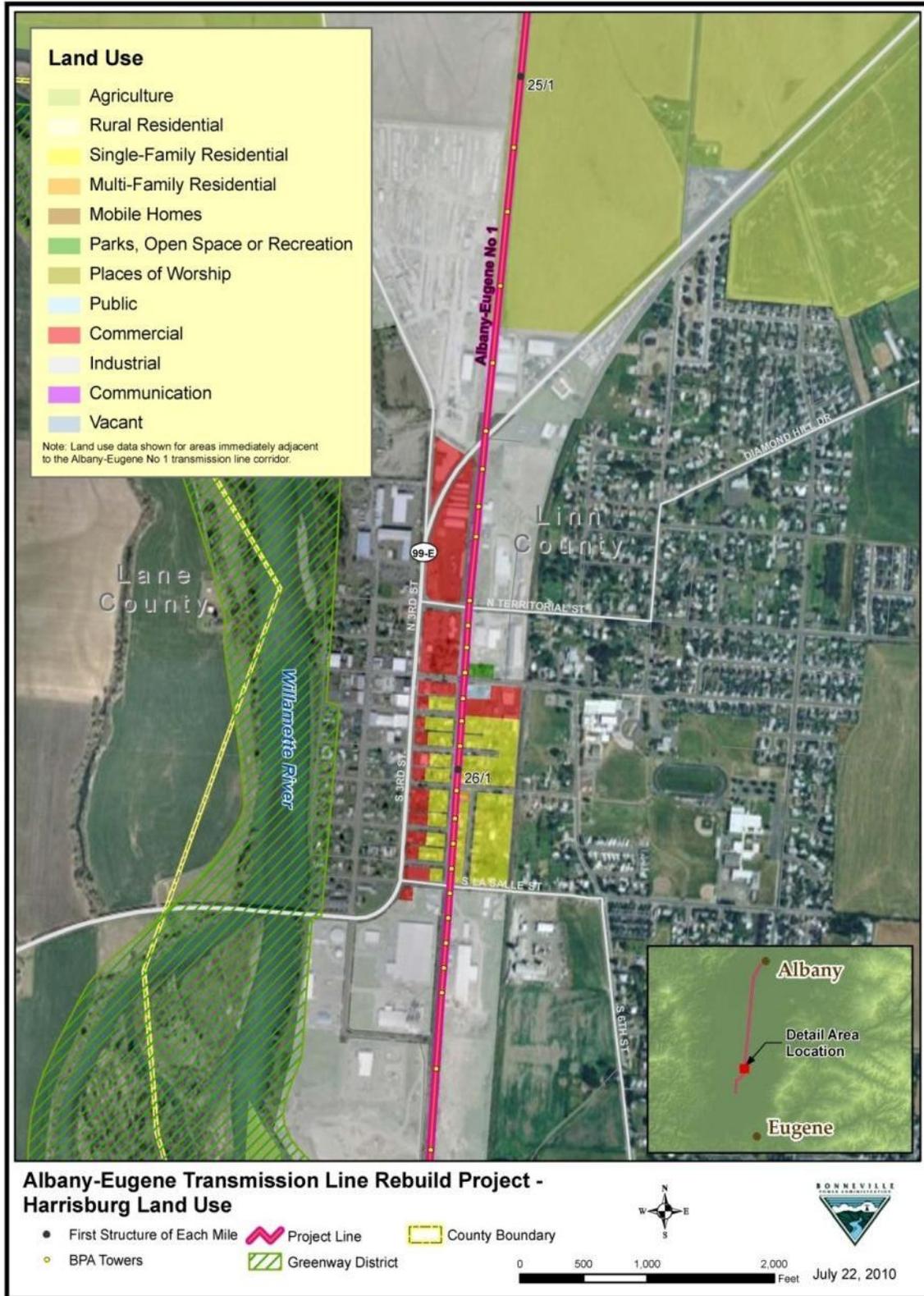


Figure 3-2. Harrisburg Land Use

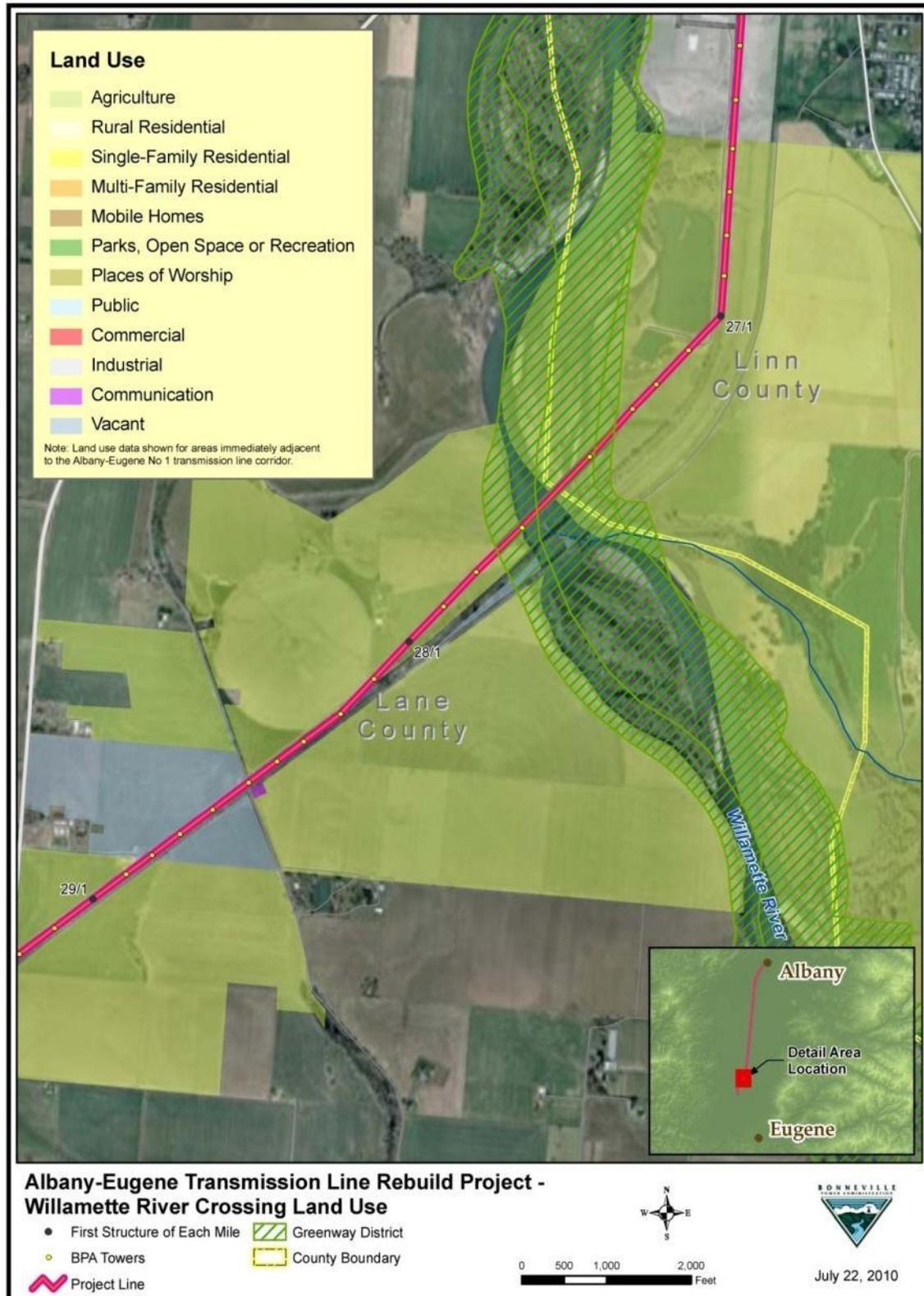


Figure 3-3. Willamette River Crossing Land Use

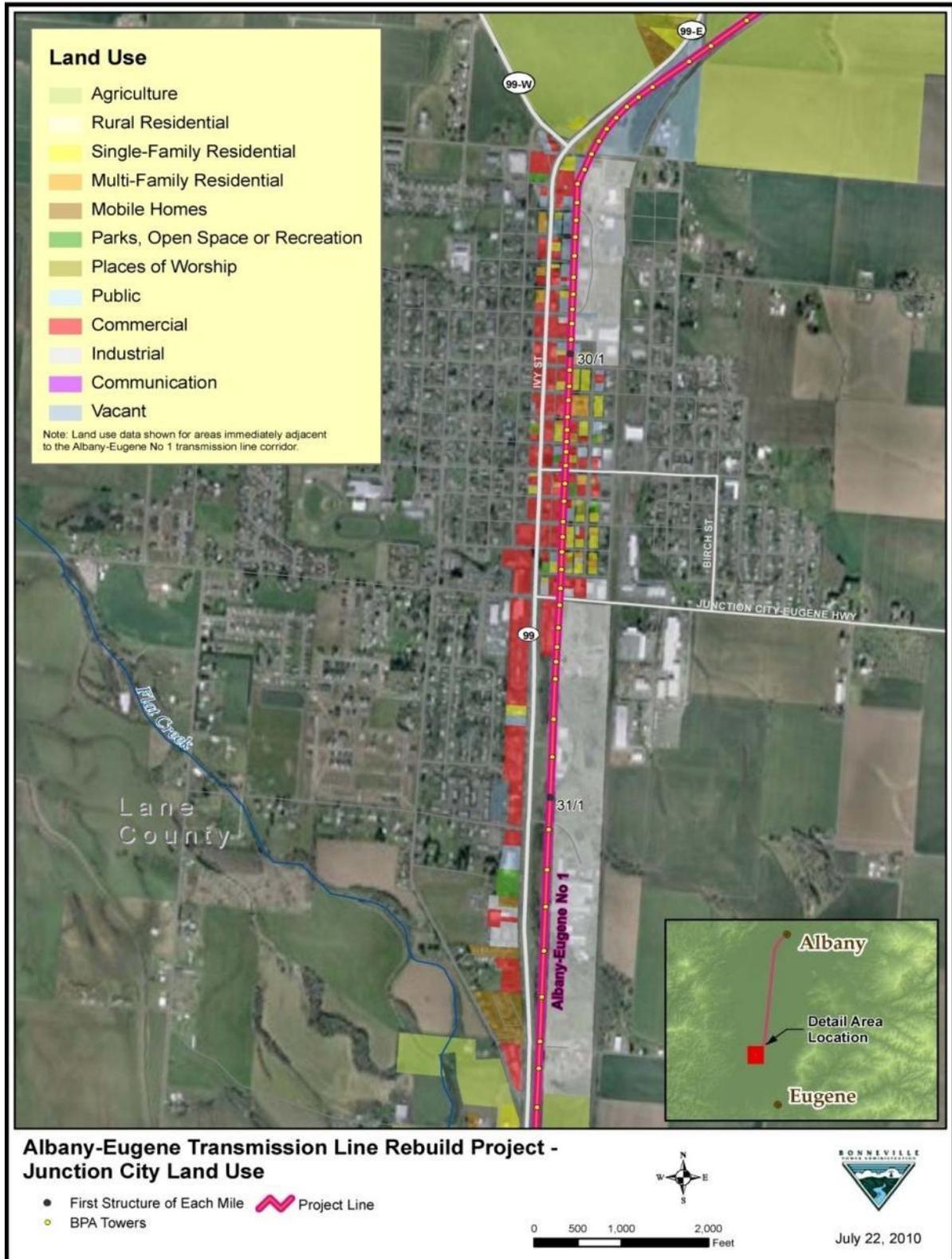


Figure 3-4. Junction City Land Use

Zoning along the corridor includes lands designated as exclusive farm use, rural residential, single and multi-family residential, commercial, industrial, open space, and urban growth management. The corridor intersects the Linn County Greenway overlay district at structure 27/5 and the Lane County Greenway overlay district at structure 27/6 where the line crosses the Willamette River. Along riparian areas, such as those found along the Willamette River, vegetation varies and includes managed wetland grass/forb/shrub communities, black cottonwood, Oregon ash, big-leaf maple, cherry, red-osier dogwood, serviceberry, Douglas’ hawthorn, English hawthorn, rose, and willow.

Land ownership along the corridor is private with easements for utilities.

There are no recreation areas located within the BPA easement or P&W Railroad ROW. However, four parks are adjacent to the corridor (Table 3-1). No trails or other recreation areas are adjacent to the corridor, and no additional recreation facilities are planned for development within or adjacent to the corridor.

**Table 3-1. Parks Adjacent to the Corridor**

Park Description	Photo
<p>Hazelwood Park is located in Albany at 1999 Queen Avenue; this park is near structures 1/1 through 1/3, is approximately 3 acres in size, and includes picnic tables and play equipment</p>	
<p>Picnic Pavilion Park is located in Harrisburg at the northeast corner of Smith Street and the P&amp;W Railroad; this park is relatively small (less than 1 acre in size) and includes a covered area with picnic tables</p>	
<p>Founders Park is located in Junction City and is adjacent to the corridor between Sixth and Seventh Avenues; it is a small park (less than 1 acre in size) that includes a covered area that houses a 1904 steam engine with benches surrounding the structure</p>	
<p>Scandinavian Festival Park is approximately 1.5 acres and is at the northeast intersection of the P&amp;W Railroad and Fifth Avenue in Junction City. It includes a public meeting area, a senior center, benches, and play structures, and is the home of the Scandinavian Festival that is held annually in Junction City</p>	

## 3.1.2 Environmental Consequences—Proposed Action

### **Construction Impacts**

#### *Agricultural Uses*

Existing roads, adjacent agricultural fields, and the BPA easement would be used to access the transmission line to dismantle and remove the existing structures and install new structures and structure components, such as the conductor, ground wire, and counterpoise, and for vegetation clearing including danger tree removal. Once each structure is accessed, an approximately 100-by-100-foot area would be temporarily used for staging and construction, which is equivalent to 10,000 square feet (0.23 acre). Potential construction impacts to agricultural lands and uses from construction of the Proposed Action could include temporary and localized disruption of crops and/or harvesting activities in actively cultivated fields.

While most structures are located on a BPA easement within the P&W Railroad ROW, from structures 27/2 to 27/4 and 27/7 to 28/2 (a total of seven structures) the corridor deviates from the P&W Railroad ROW and lies within actively cultivated fields. These seven structures would be replaced in their current locations, which could result in the temporary disturbance of approximately 1.61 acres of agricultural land. Additionally, construction of temporary access could disturb approximately 35.5 acres of agricultural land. Therefore, a total of approximately 37.15 acres (21.90 acres are Prime Farmlands and 15.25 acres are Farmlands of Statewide Importance) of agricultural land could be temporarily disturbed.

This temporary impact would represent a small amount of the existing agricultural land in Linn and Lane Counties because there are approximately 376,483 acres of farmland in Linn County and approximately 245,531 acres of farmland in Lane County (USDA 2007). The short-term disturbances from equipment ingress and egress, staging, construction, and tree removal could result in some crop yield loss on approximately 37.15 acres of active agricultural fields. None of these activities would permanently alter existing agricultural uses. Other impacts to agricultural uses adjacent to the corridor could include temporary and localized increases in dust, noise, soil compaction, and erosion. Because the construction impacts would result in short-term disturbances, the Proposed Action would have a low impact on agricultural land uses.

#### *Commercial and Industrial Uses*

No impacts to rail transportation are expected along the P&W Railroad ROW during construction. BPA would obtain appropriate permits to conduct construction activities within the railroad ROW and would comply with all permit stipulations to ensure no interruptions to rail operations would occur. Commercial uses adjacent to the corridor, such as restaurants, grocery stores, convenience stores, and shops, and industrial uses, such as auto body shops and manufacturing, may experience temporary impacts from construction activities. These impacts could include increases in noise and/or dust in the vicinity as well as access closures and reductions in on-street parking. Because the construction impacts would be short-term, and would still allow for the continued use of the land in accordance with existing land management plans, the Proposed Action would have a low impact on commercial and industrial land uses.

### *Residential Uses and Public Uses*

Construction of the Proposed Action near public uses, such as libraries and town halls, and residential uses, such as rural, single-family, and multi-family residences, would be limited to brief, temporary disturbances because construction activities would primarily occur within the BPA easement. Impacts to public uses adjacent to the corridor would be limited to temporary inconveniences associated with traffic delays, access closures, reductions of on-street parking, and dust and noise from construction activity. Because the construction impacts would be short-term, and would still allow for the continued use of the land according to existing land management plans, the Proposed Action would have a low impact on residential and public land uses.

### *Recreation*

Construction of the Proposed Action would be limited to brief, temporary disturbances to recreational uses near the corridor because construction activities would primarily occur within the BPA easement and use temporary routes of travel through agricultural fields or existing access roads. Impacts to recreational uses adjacent to the corridor would be limited to temporary inconveniences associated with traffic delays, access closures to portions of the parks, reductions of on-street parking, and dust and noise from construction activity. Given their short duration, these would be low impacts to recreational uses.

### **Operation and Maintenance Impacts**

There would be no permanent changes in land use from the Proposed Action, and operation and maintenance activities would continue to occur entirely within BPA's easement and on existing and new access roads. Therefore, there would be no anticipated operation and maintenance impacts to agricultural, commercial, industrial, residential or public land uses within and adjacent to the corridor from the Proposed Action. Similarly, operation and maintenance activities associated with the Proposed Action would not alter any recreational uses at the parks adjacent to the corridor and would, therefore, have no anticipated impacts.

### **3.1.3 Mitigation Measures**

The following mitigation measures are identified to avoid, minimize, or compensate for potential construction and/or operation and maintenance impacts to land use and recreational areas from the Proposed Action:

- 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 would know when they can expect to experience construction-related disruptions
- Maintain access during construction
- 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 corridor to minimize impacts to crops

- Coordinate with individual landowners to ensure that new and/or temporary access roads and gates, and construction and maintenance activities would not disrupt agricultural and commercial operations
- Compensate affected farmers for any lost crop production caused by construction of the Proposed Action
- Coordinate with local agencies to avoid construction activities that could disrupt community events or conflict with their own construction activities

### **3.1.4 Unavoidable Impacts Remaining After Mitigation**

With implementation of the recommended mitigation measures, no unavoidable impacts to land uses and recreational areas would be expected to occur.

### **3.1.5 Environmental Consequences—No Action Alternative**

Under the No Action Alternative, impacts to land uses and recreation associated with the construction of the new structures and structure components would not occur. However, if the Proposed Action were not implemented, then the existing structures would continue to deteriorate and continual maintenance of the existing transmission lines would be required. Temporary impacts to land uses and recreational uses along the corridor could be expected from ongoing maintenance and repair activities. These temporary impacts could include disturbance of individual structure sites and portions of the corridor, interference of access to individual properties, and noise and dust impacts. These short-term disturbances would result in low impacts. The clearing to remove danger trees could have short-term low impacts to land uses and recreation. However, the removal of danger trees is not expected to change land uses and would therefore have no permanent impact.

## **3.2 Geology and Soils**

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Additional detail on the geology and soils analysis is provided in the Final Geology and Soils Technical Report (Parsons Brinckerhoff 2010), available on request.

### **3.2.1 Affected Environment**

#### ***Geology and Topography***

The transmission line corridor is in the Willamette Valley physiographic province. The geology of the corridor is unconsolidated alluvial sediments consisting of gravel, sand, silt, and clay. It is characterized by flat and gentle topography with a minimum elevation of approximately 185 feet near the north end and a maximum elevation of approximately 330 feet at the south end (Minervini et al. 2003 and Burns et al. 2008). The steepest terrain in the corridor is at the major river/creek channels with local relief of up to 10 to 15 feet in these locations.

#### ***Soils***

Twenty-one soils are present within 50 feet of the structures within the corridor (USDA 2010). Other soils that are present in the corridor, but not within 50 feet of any structure, are not

included in this document because the likelihood of disturbance is low. The soils present and the farmland classification of these soils are provided in Table 3-2. These soils are susceptible to low-to-moderate levels of erosion when exposed to water or wind (USDA 2010).

### **Groundwater**

Groundwater levels in the corridor generally range from zero to 20 feet below the ground surface (WRD 2010).

**Table 3-2. Soils within 50 feet of Structures**

Soil Name	Farmland Classification
Amity silt loam	Prime farmland if drained
Bashaw silty clay	Farmland of statewide importance
Camas gravelly sandy loam, occasionally flooded	Farmland of statewide importance
Chapman loam	Prime farmland
Chehalis silty clay loam	Prime farmland
Cloquato silt loam	Prime farmland
Coburg-Urban land complex	Farmland of statewide importance
Concord silt loam	Farmland of statewide importance
Conser silty clay loam	Farmland of statewide importance
Dayton silt loam	Farmland of statewide importance
Fluents-Fluvaquents complex, nearly level	Not prime farmland
Holcomb silt loam	Prime farmland if drained
Malabon silty clay loam	Prime farmland
Malabon-Urban land complex	Farmland of statewide importance
McBee silty clay loam	Prime farmland
Newberg fine sandy loam	Prime farmland if irrigated
Newberg loam	Prime farmland if irrigated
Salem gravelly silt loam	Prime farmland
Wapato silty clay loam	Prime farmland if drained and either protected or not frequently flooded during the growing season
Willamette silt loam	Prime farmland
Woodburn silt loam	Prime farmland

Source: USDA 2010

## **3.2.2 Environmental Consequences—Proposed Action**

### **Construction Impacts**

During construction, impacts to soils would result primarily from ground clearing and soil piling, as well as compaction from heavy equipment. Ground that has been cleared of vegetation could be susceptible to erosion. Ground compaction could degrade the soil structure and reduce soil productivity and the soil's ability to absorb water.

At most structure sites, structure replacement activities would disturb an area approximately 100 feet by 100 feet per structure (approximately 0.2 acre). In sensitive habitats, such as wetlands, this area would be reduced to 50 feet by 50 feet per structure (approximately 0.06 acre) to minimize the area disturbed by replacement activities. Currently 418 wood pole structures would be replaced. Of these, approximately 45 are in urban locations where the ground has already been cleared of vegetation. For the other 373 wood pole structures that are located in non-urban locations, approximately 75 acres of soils could be temporarily disturbed during structure replacement activities. Separate from structure-related disturbance, access road construction for permanent roads and temporary access would disturb approximately 55.5 acres of soils. As a result of structure replacement and access road construction, approximately 130.5 acres of soils could be temporarily disturbed. Of the 130.5 acres of temporary disturbance, 1.1 acres of soils could be permanently converted to access roads.

The existing structure holes would be used where possible for the new structures, thus limiting any potential impacts. At most structure sites, any additional soil removed by the auger would be spread evenly around the structure sites. At structure sites determined to be within sensitive areas, the augered soil would be removed from the site and disposed of at an appropriate waste disposal site. Permanent soil compaction from the use of heavy machinery at each structure site would be limited to areas immediately adjacent to the structures.

The relatively flat topography of the project area helps reduce the potential for erosion, which would be highest during heavy rainfall or strong winds. Prompt mulching and seeding of exposed soils would help reduce the potential for erosion from disturbed sites. Until vegetation becomes reestablished, soil erosion could occur; however, once vegetation is established erosion would be unlikely. Erosion and compaction impacts at staging areas would also be unlikely since the area used would likely be level and already paved or graveled. Erosion resulting from the Proposed Action would be much less than what is experienced in the surrounding area due to farming practices. Because the Proposed Action would result in short-term impacts, such as erosion or nuisance dust, in the relatively small area (compared to the overall corridor) where construction-related activities would occur, the impacts to soils would be low.

Impacts on soils due to danger tree removal would be low. Access to the majority of locations for danger tree removal would be through areas not currently within BPA's easement. Temporary soil erosion and nuisance dust could occur if soils are exposed for danger tree removal. Areas used for access would be completely and fully restored to pre-construction conditions following danger tree removal. Low ground cover vegetation, including shrubs and grasses, would not be removed during danger tree removal.

No active farmland would be converted to non-agricultural uses as a result of the Proposed Action. For a more detailed discussion of agricultural land uses in the corridor, please refer to Section 3.1 (Land Use and Recreation).

### ***Operation and Maintenance Impacts***

Maintenance of the corridor would require incidental repairs to access roads and management of vegetation, which could disturb localized soils. In most cases, operation and maintenance of the Proposed Action would have a low impact on soils because the areas affected would be small,

confined to the particular maintenance action, and dispersed both in time and along the length of the corridor. Removal of trees that pose a danger could result in low impacts to soils as a result of short-term erosion or nuisance dust. Permanent impacts due to operation and maintenance activities would be low because of the localized and temporary nature of any ground disturbance.

### **3.2.3 Mitigation Measures**

Potential measures that could be applied to avoid, minimize, or mitigate impacts to geology and soils include the following:

- Place new structures in existing structure holes to the maximum extent practicable to reduce ground disturbance
- Conduct project construction, including danger tree removal, to the extent practicable, during the dry season when rainfall, runoff, and stream flow are low to minimize erosion, compaction, and sedimentation
- Install sediment barriers and other appropriate erosion-control devices where needed to minimize sediment transport
- Retain vegetative buffers where possible to prevent sediment from eroding into waterbodies
- Control runoff and prevent erosion on access road improvements by using low grades, water bars, and drain dips
- Properly space and size culverts on access roads
- Use water trucks on an as-needed basis to minimize dust and reduce erosion due to wind
- Till or scarify compacted soil at structure sites prior to reseeding
- Reseed disturbed areas with a native seed mix as soon as work in that area is completed
- Inspect reseeded and revegetated areas to verify adequate growth; implement contingency measures as needed
- Conduct construction activities in coordination with agricultural activities to the extent practicable
- Assist farm operators in restoring productivity of compacted soils for structure sites on agricultural lands
- After construction, inspect and maintain facilities to ensure proper function and nominal erosion levels

### **3.2.4 Unavoidable Impacts Remaining After Mitigation**

The mitigation measures described above would reduce unavoidable impacts to low levels. Permanent impacts remaining after mitigation may include the potential for increased erosion of formerly vegetated ground, soil compaction, and loss of soil productivity; however, any impacts

would be confined to small, localized areas along the corridor. Temporarily disturbed areas would be reseeded to avoid loss of soil productivity.

### **3.2.5 Environmental Consequences—No Action Alternative**

Under the No Action Alternative, construction would not take place and thus no construction-related impacts would occur to geology or soils. Continued operation and maintenance of the existing transmission line would have low impacts (mainly compaction and erosion) on soils from vegetation maintenance. An increasing amount of maintenance of the existing structures would likely be required as they continue to deteriorate, which could lead to more erosion and compaction than is currently experienced in the corridor, especially if emergency repairs require access to portions of the line during wet or muddy conditions. Temporary soil erosion and nuisance dust could occur if soils are exposed for danger tree removal; these impacts would be low. Areas used for access would be fully restored to pre-construction conditions following danger tree removal.

## **3.3 Water Resources**

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Additional detail on the water resources analysis is provided in the Final Water Quality and Floodplains Technical Report (Parsons Brinckerhoff 2010), available on request.

### **3.3.1 Affected Environment**

#### ***Climate***

Albany and Eugene are located within Climate Zone 2, the Willamette Valley, as established by the National Climatic Data Center (Oregon Climate Service 1993). Climate Zone 2 is characterized by cool, wet winters and warm, dry summers.

The Willamette Valley has a predominant winter rainfall climate. Typical distribution of precipitation includes about 70 percent of the annual total from November through February. July and August are the driest months and have, on average, the highest maximum temperatures. November through March are the wettest months, averaging more than 4 inches of precipitation per month. Average annual precipitation for Albany is 39.63 inches, while average annual precipitation for Eugene is 45.63 inches. December, January, and February are the coldest months with low temperatures averaging in the low-to-mid-30s (Western Regional Climate Center 2010).

#### ***Hydrology***

The transmission line corridor lies within the Upper Willamette River (UWR) Watershed (Figure 3-5). Two drainage basins within this watershed are traversed by the corridor—the Lower Calapooia River Watershed and the Muddy Creek–Willamette River Watershed. The northern portion of the corridor, from the Albany Substation to structure 10/10, is located within the Lower Calapooia River Watershed. The remainder of the corridor lies within the Muddy Creek–Willamette River Watershed, although the railroad bed appears to act as a boundary between the watersheds from structure 10/11 to structure 12/4.

The corridor crosses approximately 28 streams or rivers, including the Calapooia River, Muddy River, Camous Creek, Lake Creek, Willamette River, and Flat Creek.

#### *Lower Calapooia River Watershed*

The Calapooia River has its headwaters at Tidbits Mountain (elevation 5,185 feet). From there it flows down the Calapooia Valley, through Crawfordsville and Brownsville, and enters the Willamette River at Albany for a total distance of approximately 70 miles. It was named for the Kalapuya (also spelled Calapooia) native culture.

#### *Muddy Creek–Willamette River Watershed*

Muddy Creek has its headwaters on Coberg Ridge east of Eugene. From there it flows down the Willamette Valley through Lane and Linn Counties and enters the Willamette River east of Corvallis near the confluence of the Marys River for a total distance of approximately 50 miles.

This watershed also includes the main stem of the Willamette River, south of the Lower Calapooia River and Marys River watersheds. Mean summertime (July–September) flow in the Willamette River at Harrisburg (river mile [RM] 161.0) from 1969 to 1993 was 5,672 cubic feet per second (USGS 1995). Summer flows in the main stem are largely controlled by releases from reservoirs operated by the Corps located primarily on the McKenzie, Middle Fork Willamette, and Coast Fork Willamette Rivers, as well as on the Long Tom and Santiam Rivers (USGS 1995, 1997).

The upper reach of the Willamette River extends from Eugene to Albany, RM 187 to RM 119, and is characterized by a meandering and braided channel with many islands and sloughs. The river is shallow and the bed is composed almost entirely of cobbles and gravel which, during summer, are covered with biological growth.

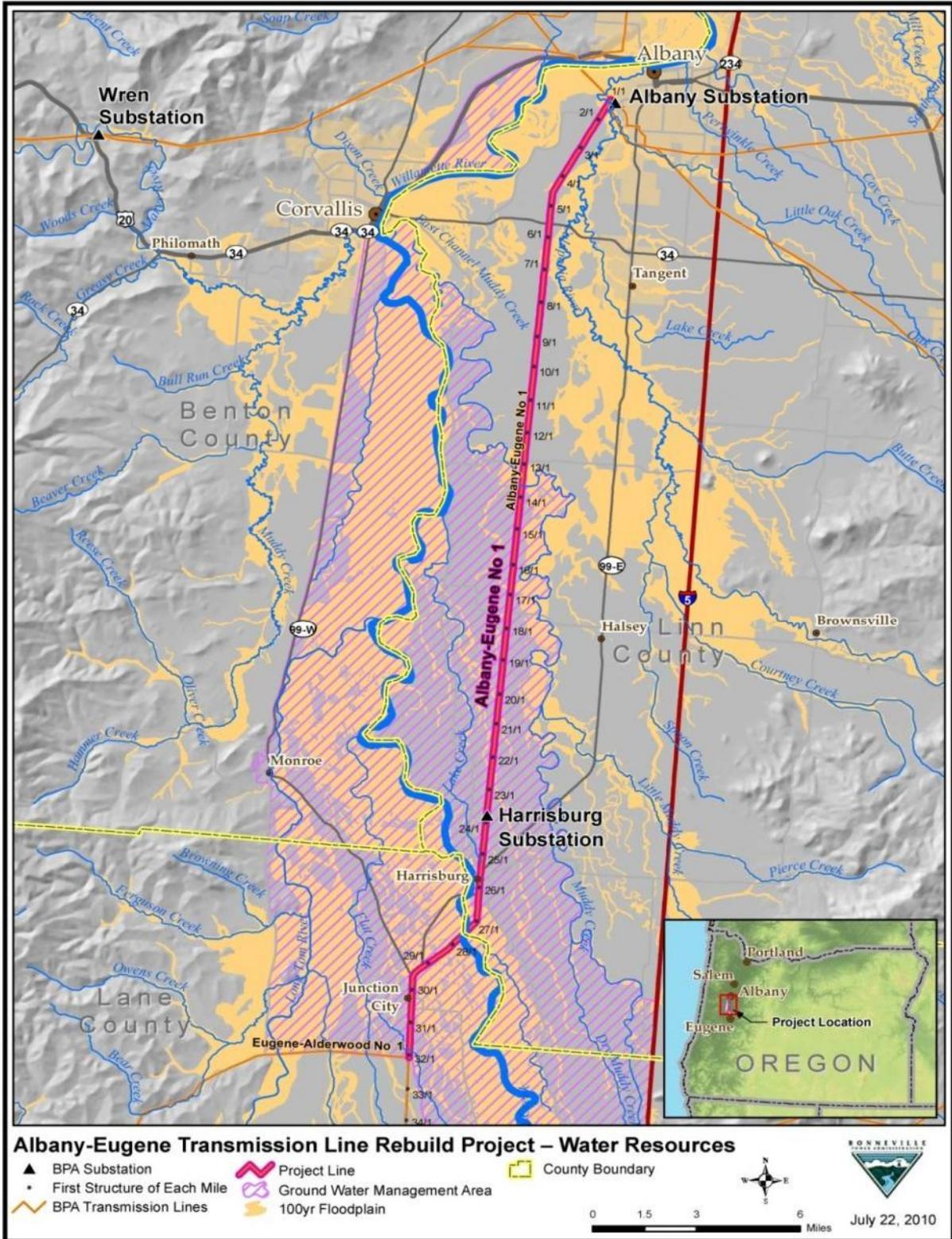


Figure 3-5. Water Resources of the Upper Willamette River Watershed

### **Water Quality and Soil Erodibility**

The Willamette River at Harrisburg does not meet Oregon Department of Environmental Quality's (DEQ) water standards (303(d) list) for temperature, dioxin, dissolved oxygen, e-coli, iron, manganese, and mercury. The Calapooia River does not meet Oregon DEQ's water standards (303(d) list) for temperature, dissolved oxygen, e-coli, fecal coliform, iron, and manganese. Muddy Creek does not meet Oregon DEQ's water standards (303(d) list) for temperature.

The EPA has approved the total maximum daily load (TMDL) limits for temperature, mercury, and fecal bacteria established for the UWR Watershed (Oregon DEQ 2006). The Willamette River, Calapooia River, and Muddy Creek are being monitored by Oregon DEQ to determine if they exceed the TMDL limits set in 2006.

Twenty-one soil types occur within 50 feet of the structures within the corridor. These soils are discussed in Section 3.2 (Geology and Soils). Soils along the corridor are susceptible to low-to-moderate levels of erosion when exposed to water or wind.

### **Groundwater Resources**

Groundwater in the Willamette Valley is an important natural resource in the basin that provides drinking water to more than 1,700 public water systems and more than 100,000 private residential systems (Oregon DEQ 2004). Several pollutants, including nitrate, bacteria, pesticides, and volatile organic compounds, have impacted the groundwater quality of the UWR Watershed (Oregon DEQ 2004). No sole-source aquifers have been designated or proposed by EPA along the corridor (EPA 2010).

The majority of the corridor lies above the Southern Willamette Valley Groundwater Management Area (GWMA), which extends generally along the Willamette Valley from Albany south to Eugene (Lane Council of Government 2006). The Oregon DEQ created this GWMA in 2004 because of elevated nitrate levels in the area. Oregon DEQ must declare a GWMA if it is confirmed that groundwater in an area contains nitrate at 7 parts per million (ppm) as a result of non-point source pollution. Nitrate is a common contaminant of shallow groundwater in areas with well-drained soils and is derived from fertilizers, septic systems, and animal manure. EPA has set 10 ppm 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.

## **3.3.2 Environmental Consequences—Proposed Action**

### **Construction Impacts**

#### *Surface Water*

Impacts to surface water, the 28 streams or rivers that the corridor crosses, due to structure replacement, access road construction, and danger tree removal are presented in Table 3-3. Vegetation removal and soil disturbance from construction of the Proposed Action could increase the rates of wind and water erosion, resulting in sediment deposition directly into

surface water (streams or rivers) and increased turbidity. Increased erosion and subsequent runoff could occur where structures are immediately adjacent to streams (see Section 3.6 (Fish and Wildlife) for a discussion of the impacts of increased turbidity on fish).

Eleven structures along the corridor are within 50 feet of surface water where erosion and runoff impacts could occur (Table 3-3). 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 (BMPs) implemented during construction to minimize soil erosion. Direct impacts from excavation in existing structure holes are expected to be low because erosion levels would be near normal during and following construction. Impacts to wetland surface water quality are expected to be low. Most of the temporary impacts to wetlands would occur during periods of little to no standing water in the wetlands, and wetland function would be restored as described below.

Impacts to surface water quality from access road work would be similar to those from structure replacement. Culvert and ford installation and replacement could disturb bank soils and shoreline vegetation. Culverts and fords may be installed in small, intermittent fish-bearing streams as described in Section 3.6 (Fish and Wildlife). No road work would occur immediately adjacent to perennial, fish-bearing stream channels.

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 because BMPs would be implemented, including setback distances from waterbodies, to minimize spills.

BMPs for the construction of new structures and for access road work would be implemented to minimize impacts to surface water quality, including turbidity and sedimentation, to state or federal standards. Further, erosion rates would likely return to their current levels once vegetation is reestablished. Therefore, impacts to surface water quality from the Proposed Action are expected to be low.

#### *Groundwater*

Impacts on groundwater are expected to be low. Impacts from the Proposed Action to groundwater flows could occur from soil compaction, which would reduce infiltration capacity and increase surface runoff to streams. However, as discussed in Section 3.2.2, soil compaction from the Proposed Action would be temporary and occur in a small area (compared to the overall corridor).

It is expected that impacts on groundwater quality from a petroleum spill would be low because the groundwater levels are deep and spill containment BMP measures would be implemented. Spills could infiltrate to the groundwater aquifer, but such an event is unlikely. Any chemical spills would be of a small volume that could easily be contained and cleaned up. Any impacts to groundwater quality would be localized, short-term, and likely would not exceed state or federal water quality criteria.

**Table 3-3. Streams and Rivers within the Transmission Line Corridor**

Within ROW SPAN (Structure Numbers)	Waterbody Name (if known)	Estimated Distance Avoided (ft)/ Distance of span (ft)	Danger Tree Removal at Crossing	Areas within Span not Avoided and Comments
1/1–1/2	Unnamed Tributary to Calapooia River	90 feet/180 feet	No	Access road with existing culvert. Access road proposed for reconstruction.
1/4–1/5	Calapooia River	40 feet/400 feet	No	Access road reconstruction near north bank of Calapooia River.
1/6–1/7	Swale to Calapooia River	0 feet/500 feet	Yes	No permanent roadwork.
4/4–4/5	Unnamed Tributary to Calapooia River	0 feet/550 feet	Yes	Ford for temporary access.
5/1–5/2	Unnamed Tributary to Calapooia River	200 feet/440 feet	Yes	Stream runs through culvert under railroad. No roadwork.
6/4–6/5	Unnamed Tributary to Calapooia River	170 feet/500 feet	Yes	No permanent roadwork.
7/3–7/4	Unnamed Tributary to Calapooia River	0 feet/550 feet	No	Structure 7/3 is very close to stream. Ford for temporary access.
7/7–7/8	Unnamed Tributary to Calapooia River	50 feet/500 feet	Yes	Same stream as at 7/3–7/4. No permanent roadwork.
7/10–7/11	Unnamed Tributary to Calapooia River	20 feet/310 feet	No	Same stream as at 7/3–7/4 and 7/7–7/8. No permanent roadwork.
13/3–13/4	Wetland Slough to Muddy Creek	0 feet/380 feet	No	Structure 13/4 is within wetland slough (former oxbow). No permanent roadwork.
13/7–13/8	Muddy Creek	80 feet/400 feet	No	No permanent roadwork.
17/1–17/2	Unnamed Tributary to Muddy Creek	110 feet/260 feet	Yes	Stream runs through culvert under railroad. No permanent roadwork.
17/6–17/7	Unnamed Tributary to Muddy Creek	190 feet/550 feet	Yes	Same stream as at 17/1–17/2. No permanent roadwork.
19/4–19/5	Unnamed Tributary to Muddy Creek	220 feet/520 feet	No	Same stream as at 17/1–17/2 and 17/6–17/7. No permanent roadwork.
20/4–20/5	Unnamed Tributary to Camous Creek	200 feet/550 feet	No	No permanent roadwork.
21/4–21/5	Camous Creek	30 feet/450 feet	No	Camous Creek also flows near the east side to the railroad between 21/7–21/8 and between 21/10–22/1. No permanent roadwork.
23/1–23/2	Unnamed Tributary to Camous Creek	0 feet/380 feet	No	No permanent roadwork.
24/6–24/7	Unnamed Tributary to Lake Creek	0 feet/440 feet	No	Ford for temporary access.
25/3–25/6	Lake Creek	0 feet/1,300 feet	Yes	Structures 25/3, 25/4, 25/5, and 25/6 are in the impoundment of Lake Creek between the Morse Bros./Knife River property and the railroad. No permanent roadwork.

**Table 3-3. Streams and Rivers within the Transmission Line Corridor (continued)**

Within ROW SPAN (Structure Numbers)	Waterbody Name (if known)	Estimated Distance Avoided (ft)/ Distance of span (ft)	Danger Tree Removal at Crossing	Areas within Span not Avoided and Comments
26/12–26/13	Wetland Slough to Willamette River	140 feet/480 feet	Yes	No permanent roadwork.
27/5–27/6	Willamette River	40 feet/900 feet	No	The steel structures at 27/5 and 27/6 are not being replaced as part of this project. No permanent roadwork.
27/7–27/8	Unnamed Tributary to Willamette River	30 feet/550 feet	No	No permanent roadwork.
28/1–28/2	Unnamed Tributary to Willamette River	55 feet/570 feet	Yes	Reconstruct road to 28/2. Ford for temporary access.
29/3–29/4	Unnamed Swale	0 feet/310 feet	No	Small amount standing water. No permanent roadwork.
29/4–29/5	Unnamed Swale	0 feet/520 feet	Yes	No visible water. No permanent roadwork.
29/16–29/17	Flat Creek	20 feet/175 feet	Yes	No permanent roadwork.
30/21–30/22	Unnamed Stream	150 feet/470 feet	Yes	Floodplain stretches from 30/17 to 30/23. No permanent roadwork.
31/11–31/12	Flat Creek Channel	0 feet/400 feet	No	Structure 31/11 likely within Ordinary High Water Mark of Flat Creek Channel. No permanent roadwork.

### **Operation and Maintenance Impacts**

#### *Surface Water*

Once constructed, the new structures could impact surface water quality by leaching pentachlorophenol (PCP), a general biocide that is commonly used as a wood preservative treatment for utility poles. PCP contains chlorinated dibenzodioxins and chlorinated dibenzofurans, which are contaminants formed during the manufacturing process. It is possible that PCP from the structures could leach into soils and surface waters at or below the ordinary high water mark.

PCP can be leached from the structures, either at the surface or from within, as the compound moves with either aqueous solution (as from rain) or with the solvent. The main mechanism for leaching of PCP and its micro-contaminants (dioxins and furans) is the downward migration of the oil carrier along the vertical axis of the pole. Subsequently, PCP and its micro-contaminants may leach from the bottom part of the pole to the soil surface, to the subsoil near the underground portion of the pole, or from surface soils to the subsoil (EPA 2008).

Literature and laboratory studies indicate that PCP applied in oil is rapidly transported from the upper portion of the structure to the underground portion for the first few years of use, and then becomes relatively constant with time (EPA 2008). PCP also has a tendency to rapidly degrade in the environment. In addition, the Electric Power and Research Institute (EPRI) has found that

PCP concentrations decreased very rapidly with distance from the wood pole (EPRI 1995). PCP concentrations decreased by as much as two orders of magnitude between three and eight inches from the wood 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, and age of pole.

The EPA has assessed the potential for PCP to occur in surface waters and impact drinking water as a result of PCP-treated poles. For adults, the calculated level of concern for acute and chronic dietary risk from PCP in drinking water is 10,465 parts per billion (ppb) of PCP. For children, this level is 2,990 ppb. Using modeling, available environmental fate data, and conservative assumptions, EPA has estimated that environmental concentrations of PCP for surface water due to PCP-treated poles are less than 1 ppb (EPA 2008). Therefore, the impact of new structures to be used for the Proposed Action on surface water quality and any associated drinking water 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 to buffer widths as specified in BPA's *Transmission System Vegetation Management Program Final Environmental Impact Statement* (BPA 2000). Impacts to surface waters could occur if herbicide residues on vegetation and soil are transported when it rains or, in the event of overspray, if herbicides are inadvertently applied directly to surface waters. However, BPA has specific restrictions regarding the distance from water that herbicides can be used, as well as which toxicity class of herbicides can be used near water (Table 3-4).

**Table 3-4. Stream Buffer Widths for Herbicide Use**

Herbicide and Adjuvant Ecological Toxicities and Characteristics	Buffer Width from Habitat Source per Application Method			
	Spot	Localized	Broadcast	Mixing, Loading, Cleaning
Practically Non-Toxic to Slightly Toxic	Up to edge	Up to edge	35 feet	100 feet
Moderately Toxic or if Label Advisory for Ground/Surface Water	25 feet	35 feet	100 feet	250 feet
Highly Toxic or Very Highly Toxic	35 feet	100 feet	Noxious weed control only. Buffer as per local ordinance	250 feet

Source: BPA 2000

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. See Section 3.6.2 for potential impacts to perennial fish-bearing streams.

### *Groundwater*

The majority of the structures along the corridor 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. Thus, potential impacts to groundwater would be low.

### **3.3.3 Mitigation Measures**

Mitigation includes construction-related BMPs for protecting water resources and preventing water quality degradation from construction activities. These construction BMPs are drawn from other governmental agency Erosion Control Manuals. Procedures to respond to hazardous material spills along the corridor are also presented.

Potential measures that could be used to avoid, minimize, or mitigate impacts to water resources include the following:

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

### **3.3.4 Unavoidable Impacts Remaining After Mitigation**

With the Proposed Action, some unavoidable impacts would remain after mitigation because any ground-disturbing activity, no matter how small, would increase the risk of erosion and sedimentation of surface waters. Even with implementation of mitigation measures, there would

remain a low impact of sedimentation from the Proposed Action to area streams and rivers until disturbed sites are revegetated.

### **3.3.5 Environmental Consequences—No Action Alternative**

Construction-related impacts to surface and groundwater quality would be avoided with the No Action Alternative. Continued operation and maintenance of the existing transmission line would have low impacts to surface water quality because soil disturbance, and therefore erosion, would be rare. However, the number of maintenance activities, and thus the level of impact, could increase as structures deteriorate. Areas where structures are in or adjacent to streams and wetlands, especially those with no access, have a greater risk of sedimentation from maintenance around these structures. Impacts on water quality due to danger tree removal would be low. Temporary soil erosion and sedimentation of waterbodies could occur as soils are exposed for danger tree removal. Areas used for access would be fully restored to pre-construction conditions following danger tree removal.

Potential impacts to groundwater, such as the leaching of PCP, from replacement poles that could be installed as part of maintenance would be similar to replacing poles for the entire corridor. Creosote could continue to leach into the soil but this is expected to diminish as the structures continue to deteriorate.

## **3.4 Wetlands and Floodplains**

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Additional detail on the wetlands and floodplains analysis is provided in the Final Water Quality and Floodplains Technical Report (Parsons Brinckerhoff 2010) and the Wetland and Waters of the U.S./State Delineation Report (Mason, Bruce & Girard 2010), available on request.

### **3.4.1 Affected Environment**

#### ***Wetlands***

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 provide 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 transmission line corridor were identified using National Wetland Inventory maps, aerial photographs, and field visits. Wetlands along the corridor 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.

Based on the results of field investigations conducted between June 14, 2010 and July 2, 2010, wetland scientists identified 67 water features that could be affected by structure replacement and access road construction. Of these, 26 intermittent and perennial streams, ditches, or ponds and 38 wetlands are likely waters of the State. Additionally, 26 intermittent and perennial streams, ditches, or ponds and 39 wetlands are likely waters of the U.S. Additional field investigations conducted between November 8, 2010 and November 11, 2010, identified likely

wetlands along virtually the entire east side of the P&W Railroad ROW that would be temporarily affected by danger tree removal.

Wetland and other water types identified along the transmission line corridor during field investigations include the following:

- Palustrine, Emergent, Persistent (PEM1) wetlands
- Palustrine, Scrub-Shrub, Deciduous (PSS6) wetlands
- Palustrine, Aquatic Bed, Floating Vegetation (PAB4) wetlands
- Palustrine, Forested, Deciduous (PFO6) wetlands
- Riverine, Intermittent, Stream Bed, Mud, Excavated (R4SB5x) excavated ditches
- Palustrine, Unconsolidated Bottom, Mud, Excavated (PUB3x) excavated ditches
- Riverine, Intermittent, Stream Bed, Cobble-Gravel (R4SB3) intermittent streams
- Riverine, Intermittent, Stream Bed (R4SB5) intermittent streams
- Riverine, Lower Perennial, Unconsolidated Bottom, Cobble-Gravel (R2UB1) waterway
- Riverine, Lower Perennial Unconsolidated Shore Cobble-Gravel (R2US1) waterway
- Palustrine, Aquatic Bed, Floating Vegetation (PAB4) waterway

Vegetation communities adjacent to these wetland and water features are generally consistent with the disturbed/maintained upland grass and forb community described in more detail in Section 3.5 (Vegetation). Specific vegetation communities observed and associated with some of these wetland and other water types include the following:

- PEM1—reed canarygrass, velvetgrass, creeping bentgrass, and common rush
- PSS6—willow species, rose spirea, Nootka rose, and reed canarygrass
- R2UB1—Himalayan blackberry, Pacific poison oak, willow species, and reed canarygrass
- R2US1—Himalayan blackberry, red alder, black cottonwood, and Oregon ash

### ***Floodplains***

FEMA identifies areas with a 1 percent chance of being flooded in a given year as 100-year floodplains. The corridor crosses the 100-year floodplains of the Calapooia River and its tributaries; Muddy Creek and its tributaries; Camous Creek; Lake Creek; the Willamette River; and an unnamed stream in Junction City (Table 3-5). In the corridor, 83 of the 420 existing structures (20 percent) lie within or on the boundaries of these floodplains. Existing access roads also lie within the floodplain of the Willamette River.

**Table 3-5. Floodplains within the Transmission Line Corridor**

Waterbody Name (if known)	Number of Structures in Mapped Floodplain	Structure Numbers within Mapped Floodplain
Calapooia River	27	1/1–1/8; 4/5; 5/1–5/3; 6/4–6/10; 7/3–7/11
Muddy Creek	7	13/4–13/8; 17/1; 17/6
Camous Creek	2	20/5; 21/4
Willamette River	39	26/13–29/17
Unnamed Stream	7	30/17–30/23
Flat Creek Channel	1	31/11

### 3.4.2 Environmental Consequences—Proposed Action

#### **Construction Impacts**

##### *Wetlands*

Eighteen existing structures are within wetlands; these wetlands would be temporarily disturbed during replacement with new structures. No additional removal or fill of wetland soil would occur during wood pole replacement if the same holes are used for new poles. If poles need to be relocated, wetlands will be avoided if possible. Temporary access roads (installed with either wood or rubber pads or geotextile fabric and rock) would be used during construction to access these structures. Construction equipment would drive over the wetland areas between structures in the dry season to avoid impacts. Structure replacement would result in low impacts to wetlands; the wetland function would be temporarily disrupted but would return to pre-construction conditions after mitigation and restoration are complete.

Impacts to wetlands would occur as wetland vegetation is crushed and soil is compacted by equipment near structures and while accessing danger trees for removal. Implementation of access strategies for danger tree removal and BMPs would reduce and minimize the potential for impacts to wetlands.

New temporary access road construction would affect approximately 52,270 square feet (1.2 acres) of wetlands along the corridor. Temporary access road construction would result in low impacts to wetlands because the wetlands would be restored to their former condition following the temporary disturbance. New permanent access road fords would affect 870 square feet of wetlands. Permanent access road fords would result in low impacts to wetlands because the gravel layer would be covered with existing wetland soils which would allow the wetland vegetation, typically reed canarygrass, to reestablish; therefore, the wetland function would only be temporarily disrupted.

##### *Floodplains*

New temporary access road construction would occur within 44.8 acres of floodplains along the corridor. Work within floodplains would be short-term and would not alter the floodplain function. Soil compaction and removal of vegetation could increase 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. However, the proportion of each floodplain potentially cleared or compacted would be small. In addition, implementation of BMPs would reduce and minimize the potential for impacts to floodplains. Therefore, because the Proposed Action would only have the potential to slightly decrease the existing ecological characteristics of the floodplains, the impacts to floodplains would be low.

### ***Operation and Maintenance Impacts***

Operation and maintenance activities are expected to have a low impact on wetlands and floodplains. Maintenance of the corridor would require incidental repairs to access roads and management of vegetation, which could disturb localized wetlands and floodplains. 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. In most cases, operation and maintenance would have a low impact on wetlands because the areas temporarily affected would be small, confined to the particular maintenance action, and dispersed both in time and along the length of the corridor. 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 alter floodplain functions. Removal of trees that pose a danger could result in low-to-moderate impacts to wetlands as a result of clearing (particularly if native trees in riparian areas would be removed), grading, soil compaction, and erosion. Permanent impacts due to operation and maintenance activities would be low because of the localized and temporary nature of any ground disturbance.

## **3.4.3 Mitigation Measures**

### ***Wetlands***

In addition to general mitigation measures identified for soils and geology, water resources, and vegetation in Sections 3.2.3, 3.3.3, and 3.5.3, the following mitigation measures have been identified to avoid or minimize potential impacts to wetlands from the Proposed Action:

- Obtain and comply with applicable Clean Water Act permits for all work in wetlands or streams
- Identify and flag wetland boundaries before construction
- Install erosion-control measures prior to work in or near wetlands, such as silt fences, straw wattles, and other soil stabilizers; reseed disturbed areas as required
- Deposit and stabilize all excavated material not reused in an upland area outside of wetlands
- Avoid construction within wetlands and wetland buffers to protect wetland functions and values, where possible. Avoid using 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 and geotextile fabric, and revegetate after use of temporary roads built in wetlands
- Use herbicides to control vegetation near wetlands in accordance with BPA's *Transmission System Vegetation Management Program Final Environmental Impact Statement* (BPA 2000) to limit impacts to water quality

### **Floodplains**

In addition to general mitigation measures identified for soils and geology, water resources, and vegetation in Sections 3.2.3, 3.3.3, and 3.5.3, the following mitigation measures have been identified to avoid or minimize potential impacts to floodplains from the Proposed Action:

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

#### **3.4.4 Unavoidable Impacts Remaining After Mitigation**

Wetland disturbance would be short-term and highly localized during construction, operation, and maintenance activities. In addition, wetlands would be avoided where possible. Wetlands disturbed by temporary access roads would be restored following construction. Permanent access road fords would be covered with existing wetland soil allowing for wetland vegetation to reestablish. Unavoidable impacts to wetlands would be low with implementation of identified mitigation.

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

#### **3.4.5 Environmental Consequences—No Action Alternative**

Operation and maintenance impacts to wetlands would not be avoided under the No Action Alternative. Current levels of disturbance to wetlands would continue or increase as existing structures deteriorate and need to be replaced on an emergency basis, particularly structures in wetlands with no direct access. New access roads might be needed with little or no planning in their construction due to the emergency nature of the repairs; this could result in filling a portion of a wetland area or destroying a wetland or wetland buffer area, which would be a moderate-to-high impact, especially if maintenance activities occurred during the wet season. Because failures tend to occur during inclement weather, when soils are more prone to erosion, emergency repair activities have a higher potential to affect wetlands from sediment transport, which could increase the potential to disturb wetland vegetation and hydrology. During routine maintenance BPA would continue to follow BMPs that minimize damage to wetlands. No permanent access roads are anticipated for danger tree removal. Wetlands adjacent to danger tree removal activities could experience temporary disturbance, which would be a low impact.

Few impacts on floodplains beyond those from current transmission line operation and maintenance would be expected. Routine maintenance of structures in or directly adjacent to floodplains could result in minor disturbances to soils in the floodplains, which could slightly change the cut/fill balance in localized areas around the structures. If an emergency arises, and access is needed during the wet season, rock may need to be placed in floodplains to allow access, a moderate impact. Danger tree removal is not expected to affect floodplains as the tree stumps and roots would remain in the ground in order to minimize ground disturbance.

## **3.5 Vegetation**

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Additional detail on the vegetation analysis is provided in the Vegetation, Fish, and Wildlife Resources Technical Report (Aquatic Contracting 2011) and the Rare Plant Survey Report (David, Evans and Associates 2010), available on request.

### **3.5.1 Affected Environment**

#### ***General Vegetation***

Vegetation within the corridor is influenced by the topography, climate, soils, and current and past human activities. The Willamette Valley has been extensively modified in the last two centuries. Historically, the area probably would have included native oak woodlands, coniferous forests, grasslands, and riparian forest (Franklin and Dyrness 1973). However, European colonization of the Willamette Valley resulted in clearing for agricultural uses. Currently, more than 96 percent of the Willamette Valley is under private ownership, and more than 40 percent is used for agricultural production, including more than 480,000 acres of grass seed (ODFW 2006 and OSC 2010).

Habitat conditions typically reflect the highly disturbed, intensely managed conditions within the existing corridor and the P&W Railroad ROW, actively managed agricultural lands, and rural and residential development. Vegetation cover types were determined by dominant plants and land uses. The following vegetation communities were identified within and adjacent to the transmission line corridor:

- Modified/Managed Grassland Communities (both upland and wetland) are dominant within the corridor.
- Riparian Communities are dominant within the corridor east of the railroad tracks within the P&W Railroad ROW. This community was also sporadically noted west of the railroad ROW and BPA's maintained easement, and at drainage crossings outside the corridor.
- Agricultural/Pastoral Communities are commonly located within and adjacent to the corridor.
- Oak Woodland Communities are occasionally located east of the railroad tracks and sporadically on private lands west of the railroad tracks and BPA's maintained easement.

- Urban/Developed areas are located where the corridor lies within the urban portions of Albany, Harrisburg, Junction City, and smaller unincorporated communities.

Vegetation communities observed within and adjacent to the corridor are associated with Johnson and O’Neil habitat types. Table 3-6 provides additional details about these communities and habitat types.

**Table 3-6. General Vegetative Communities**

Vegetative Community (Johnson & O’Neil habitat types)	Common Dominant Species	Description
Managed Upland Grass/Forb/Shrub (Agricultural, Pasture, and Mixed Environs)	Ryegrass ( <i>Lolium multiflorum</i> ), tall oatgrass ( <i>Arrhenatherum elatius</i> ), oats ( <i>Avena fatua</i> ), orchardgrass ( <i>Dactylis glomerata</i> ), fescues ( <i>Festuca spp.</i> ), bromes ( <i>Bromus spp.</i> ), vetches ( <i>Vicia spp.</i> ), bedstraws ( <i>Galium spp.</i> ), oxeye daisy ( <i>Chrysanthemum leucanthemum</i> ), hairy cats-ear ( <i>Hypochaeris radicata</i> ), Queen Anne’s lace ( <i>Daucus carota</i> ), poison oak ( <i>Toxicodendron diversilobum</i> ), and Armenian (Himalayan) blackberry ( <i>Rubus armeniacus</i> )	Within the corridor, this community appears to be regularly maintained via mechanical and chemical means to preclude natural succession. Areas west of the P&W Railroad (within BPA’s easement) have recently been mowed.
Managed Wetland Grass/Forb/Shrub (Herbaceous Wetland/ Agricultural, Pasture, and Mixed Environs)	Reed canarygrass ( <i>Phalaris arundinacea</i> ), meadow foxtail ( <i>Alopecurus pratensis</i> ), velvetgrass ( <i>Holcus lanatus</i> ), fescues, bluegrass ( <i>Poa spp.</i> ), bentgrass ( <i>Agrostis spp.</i> ), teasel ( <i>Dipsacus sylvestris</i> ), small-flowered forget-me-not ( <i>Myosotis laxa</i> ), poison hemlock ( <i>Conium maculatum</i> ), rose ( <i>Rosa spp.</i> ), willows ( <i>Salix spp.</i> ), Douglas’ hawthorn ( <i>Crataegus douglasii</i> ), Armenian blackberry, and poison oak	Within the corridor, this community appears to be regularly maintained via mechanical and chemical means to preclude natural succession. Areas west of the P&W Railroad (within BPA’s easement) have recently been mowed.
Riparian Community (Westside Riparian Wetland)	Black cottonwood ( <i>Populus balsamifera ssp. trichocarpa</i> ), willows, Oregon ash ( <i>Fraxinus latifolia</i> ), chokecherry ( <i>Prunus virginiana</i> ), serviceberry ( <i>Amelanchier alnifolia</i> ), snowberry ( <i>Symphoricarpos albus</i> ), hawthorn ( <i>Crataegus douglasii</i> , <i>C. monogyna</i> ), and big-leaf maple ( <i>Acer macrophyllum</i> )	Mature trees and shrubs have been systematically cleared for line maintenance within BPA’s maintained easement (west of the P&W Railroad). Riparian Community consistently observed east of railroad tracks. Riparian Community only sporadically present west of BPA’s maintained easement.
Oak Woodland (Westside oak and dry Douglas-fir forest and woodlands)	Oregon white oak ( <i>Quercus garryana</i> ), big -eaf maple, and Douglas-fir ( <i>Pseudotsuga menziesii</i> )	Oak Woodland Community occasionally observed east of railroad and west of BPA’s maintained easement on adjacent private properties.
Agricultural/Pastoral (Agricultural, Pasture, and Mixed Environs)	Ryegrass, fescues, Kentucky bluegrass ( <i>Poa pratensis</i> ), wheat ( <i>Triticum aestivum</i> ), meadowfoam ( <i>Limnanthes alba</i> ), and radish ( <i>Raphanus sp.</i> )	Adjacent areas typically cultivated for seed production, grain and oil-seed production, and/or are currently fallow or used as pasture. Minor portions within corridor are farmed.
Urban/Developed (Urban and mixed environs)	Dominant species include ornamentals as well as dominant species from the Managed Upland Grass/Forb/Shrub Community	Areas cleared for commercial, industrial, or residential structures, including associated lawns, parking lots, etc.

### *Managed Upland Grass/Forb/Shrub Community*

The Managed Upland Grass/Forb/Shrub Community within the corridor is a largely ruderal community that reflects adjacent land uses, prior disturbance, and ongoing road, railroad, and transmission line maintenance activities (e.g., mowing, spraying, and clearing). This community is managed to maintain an existing condition that prevents typical ecological succession.

Dominant species include ryegrass, tall oatgrass, orchardgrass, oats, sweet vernal grass (*Anthoxanthum odoratum*), as well as multiple fescues (*F. arundinacea*, *F. rubra*, *Festuca sp.*) and bromes (*Bromus carinatus*, *B. commutatus*, *B. diandrus (rigidus)*, *B. hordeaceus (mollis)*, *B. secalinus*, *B. sterilis*, and *Bromus sp.*). Common weed species observed included Queen Anne's lace, oxeye daisy, teasel, hairy cat's-ear, common tansy (*Tanacetum vulgare*), and wild lettuce (*Lactuca serriola*).

Noxious weeds encountered in this community included Scotch broom (*Cytisus scoparius*), Armenian (Himalayan) blackberry, St. Johnswort (*Hypericum perforatum*), bull thistle (*Cirsium vulgare*), and Canada thistle (*Cirsium arvense*). Very few occurrences of Scotch broom, and field bindweed (*Convolvulus arvensis*) are present; however, Canada thistle, bull thistle, St. Johnswort, and blackberry are present throughout the corridor.

The Managed Upland Grass/Forb/Shrub Community also includes occasional shrub thickets, primarily in the form of hedgerows at the edge of the corridor and the P&W Railroad ROW. BPA's maintenance of the easement includes mowing and mastication of these shrub thickets. Armenian blackberry and poison oak are the dominant shrubs.

### *Managed Wetland Grass/Forb/Shrub Community*

The Managed Wetland Grass/Forb/Shrub Community exists in low areas, including ditches, depressions, drainages, and on flat-to-gently sloping topography within the corridor, primarily within BPA's easement west of the railroad tracks. This community is actively managed to maintain an existing condition that prevents typical ecological succession because tall growing vegetation is sprayed, mowed, or cut to keep woody plants from interfering with the existing lines and railroad. The most dominant species in this community is reed canarygrass. The most common forb species are small-flowered forget-me-not, pennyroyal (*Mentha pulegium*), poison hemlock, cow parsnip (*Heracleum lanatum*), curly dock (*Rumex crispus*), and sheep sorrel (*Rumex acetosella*). This community also includes shrub thickets, primarily in the form of hedgerows along the edge of the corridor and the P&W Railroad ROW. Armenian blackberry, poison oak, and rose are the dominant shrubs; however, willows, Douglas' spirea (*Spiraea douglasii*), and red-osier dogwood (*Cornus stolonifera*) were occasionally noted despite BPA's mowing and mastication treatments. The corridor contains miles of wetland ditches dominated by reed canarygrass with blackberry and poison oak thickets paralleling the margins.

Four small areas within the corridor are identified as potential "remnant wet prairie" based on 50 percent or more cover of native herbaceous vegetation including native prairie species (DEA 2010). Located under the existing transmission lines west of the P&W Railroad ROW between structures 19/2-3, 19/5-6, 24/6-8, and 24/9-10, all areas are confined to the BPA easement and are bordered to the west by active agricultural land and to the east by the railroad tracks. These small areas were observed as having higher concentrations of native species.

Several additional areas within the corridor were noted as higher quality despite being actively maintained. These small areas, including drainage and swale crossings with greater ponding, were occasionally observed as having a higher diversity of native wetland grasses and forbs. However, tufted hairgrass (*Deschampsia caespitosa*) was only sporadically encountered.

Examples of areas with greater species diversity within this actively managed community appear near structure 1/1, near structure 13/4, near structure 16/5, periodically between structures 17/8-18/11 (paralleling Nicewood Lane), between structures 19/4-6, and near structures 22/9-23/2. However, the vast majority of the corridor containing this actively maintained community is fragmented and contains low concentrations of native vegetation and high concentrations of introduced species, which reflects a consistent management process that appears to include physical disturbance and herbicide application.

#### *Riparian Community*

Historic soil disturbance and vegetation removal associated with railroad and transmission line construction combined with ongoing maintenance activities have limited the presence of the tree and shrub dominated Riparian Community to areas east of the P&W Railroad ROW and small areas west of the existing transmission line. These areas retain the vertical structure lacking within BPA's easement below the existing transmission line and on most of the surrounding agricultural properties. The Riparian Community includes both wetland and upland that parallel miles of railroad ditches and swales. Despite adjacent disturbances from farms and occasional tree removal by the railroad and BPA, this community includes some of the highest quality habitat within the corridor.

Much of the corridor east of the railroad tracks within the railroad ROW supports this community. Examples of this largely forested community can also be found where many of the rivers, creeks, and drainages cross the corridor. In addition to common species noted in the Managed Wetland Grass/Forb/Shrub Community, the following tree and shrub species were commonly observed: black cottonwood, Oregon ash, big-leaf maple, cherry, red-osier dogwood, serviceberry, Douglas' hawthorn, English hawthorn, rose, and willow.

Much of the corridor east of the railroad can be described as a multi-story forested canopy consisting of cottonwood, Oregon ash, willow, and hawthorn. Typically, a cottonwood overstory (often over 80 feet tall) dominates an understory of smaller trees and shrubs ranging up to approximately 30 feet high. This community is typically bordered by active agricultural lands. Several examples of this community include higher quality habitats near the Calapooia River (structures 1/4-7), between structures 3/2 and 3/7, between structures 8/11-9/4, near the Muddy River at structures 13/7-8, near structures 17/6-7, between structures 23/1-4, and near the Willamette River at structures 27/5-6.

#### *Oak Woodland Community*

An Oak Woodland Community and scattered remnants were occasionally noted both within and adjacent to the corridor. Dominant species within these remnant communities often included a mixture of Oregon white oak, big-leaf maple, and Douglas-fir, with Armenian blackberry and poison oak being the dominant understory shrubs. Oak woodlands are designated a strategy habitat by the Oregon Department of Fish and Wildlife (ODFW) in the Willamette Valley and

once covered 400,000 acres (ODFW 2006). The Willamette Valley now has less than 7 percent remaining. The corridor includes solitary oaks interspersed with coniferous and other deciduous trees, as well as a few remnant oak stands.

Offsite but nearby examples of these stands were noted east of structure 1/1, west of structures 10/5-9, west of structures 12/8-9, west of structure 13/9, east of structure 14/1, east of structure 14/9, east of structure 15/7, and west of structure 19/10. Examples of areas within the corridor that may require trimming or selective danger tree removal due to their proximity to the existing transmission line include oaks west of structure 1/7, east and west of structures 4/6-7, west of structure 3/11, east of structures 4/2-3, west of structures 12/5-9, west of structures 14/6-7, east and west of structure 20/9, and west of structure 31/4.

#### *Agricultural/Pastoral Community*

Agricultural land use is the dominant land use adjacent to the corridor. Active farming activities include cultivation for seed production (e.g., ryegrass, fescues, bluegrass, and radish), grain production (e.g., wheat and corn), oil-seed production (e.g., white meadowfoam), and both hay and silage production. Adjacent fields, including fallow grass seed fields, are also used as pasture for livestock.

#### *Urban/Developed*

The Urban/Developed Community consists of developed areas cleared for building commercial, industrial, or residential structures and includes lawns, parking lots, and related features. This community was observed where the corridor intersects Albany, Harrisburg, Junction City, and several of the smaller unincorporated communities along the corridor.

#### *Noxious Weeds*

Noxious weeds are plant species designated by federal or state law. In Oregon, the Oregon Department of Agriculture (ODA) divides noxious weeds into three categories: A, B, and T. A-listed weeds are of known economic importance whose presence is imminent or which occur in the state in small enough infestations to make eradication or containment possible. B-listed weeds are of known economic importance and are regionally abundant. T-listed weeds are priority noxious weeds designated by the Oregon State Weed Board as a target for which the ODA will develop and implement a statewide management plan (ODA 2010). Table 3-7 provides the name, ODA classification, and general location of noxious weeds in the corridor.

**Table 3-7. Noxious Weeds**

Scientific Name	Common Name	ODA Classification	General Location
<i>Cirsium arvense</i>	Canada thistle	B	Throughout corridor
<i>Cirsium vulgare</i>	Bull thistle	B	Throughout corridor
<i>Conium maculatum</i>	Poison hemlock	B	Throughout corridor
<i>Convolvulus arvensis</i>	Field bindweed	B	Sporadically within corridor
<i>Cytisus scoparius</i>	Scotch broom	B	Calapooia River; sporadically within corridor
<i>Hedera helix</i>	English ivy	B	Sporadically within corridor; Junction City structure 29/15
<i>Hypericum perforatum</i>	St. John's wort	B	Throughout corridor
<i>Rubus discolor</i>	Armenian (Himalayan) blackberry	B	Throughout corridor; dominant species in hedgerows along corridor

### **Rare Plants**

During a rare plant survey conducted from June 10-22, 2010, none of the Federal Endangered Species Act (ESA) listed species potentially occurring within the transmission line easement west of the P&W Railroad ROW were found (Table 3-8).

**Table 3-8. ESA-Listed Species Potentially Occurring within the Transmission Line Corridor**

Common Name	Scientific Name	Observed within Transmission Line Easement West of the P&W Railroad ROW
Golden paintbrush	<i>Castilleja levisecta</i>	No
Willamette daisy	<i>Erigeron decumbens var. decumbens</i>	No
Water howellia	<i>Howellia aquatilis</i>	No
Bradshaw's desert parsley	<i>Lomatium bradshawii</i>	No
Kincaid's lupine	<i>Lupinus sulphureus ssp. kincaidii</i>	No
Nelson's checker-mallow	<i>Sidalcea nelsoniana</i>	No

## **3.5.2 Environmental Consequences—Proposed Action**

### **General Vegetation**

#### *Construction Impacts*

Construction impacts would be associated with clearing and vegetation removal and noxious weed propagation. Clearing for access to structure locations would not typically include the removal of mature trees because none are located within the existing BPA easement near structures. The Proposed Action would have low impacts to the Managed Upland

Grass/Forb/Shrub Community, Managed Wetland Grass/Forb/Shrub Community, and Urban/Developed Community within the corridor because the disturbance to common plant species in the immediate vicinity of construction would be temporary, and those temporary effects could be minimized through planning for the construction or by placing seasonal restrictions on construction activities (Table 3-9). Similarly, the Proposed Action would also have low impacts to the adjacent Agricultural/Pastoral Community, primarily resulting from temporary access road construction.

**Table 3-9. Vegetation Community Impacts**

Vegetation Community	Location (Within or Adjacent to the Corridor)	Impact Level
Managed Upland Grass/Forb/Shrub	Within corridor	Low
Managed Wetland Grass/Forb/Shrub	Within corridor	Low
Riparian Community	Within and adjacent to corridor	High (6,300 trees)
Agricultural/Pastoral	Within and adjacent to corridor (some encroachment into corridor and in areas proposed for access road construction)	Low
Oak Woodland	Within and adjacent to corridor	Moderate (47 trees)
Urban/Developed	Within corridor	Low

Impacts to the adjacent Riparian Community and the Oak Woodland Community would occur from the removal of approximately 6,300 danger trees within the corridor. Although access roads and staging areas can be located outside and away from these higher value communities, removal of these BPA-designated danger trees would be required.

Tree removal within the Riparian Community includes approximately 6,300 danger trees located primarily east of the railroad tracks. This would substantially reduce the quantity of a regional plant population and would be a high impact. Tree removal would occur in both upland and wetland portions of the overall Riparian Community along much of the 32-mile corridor. The existing community averages less than 65 feet wide (e.g., roughly the width of the P&W Railroad ROW) and typically includes an overstory of cottonwood and/or Oregon ash trees that would be removed, and an understory of willow, hawthorn, cherry, and serviceberry trees and shrubs (typically 10 to 30 feet high) that would remain. Damage to the remaining overstory trees and residual understory trees and shrubs may occur during the felling and removal of danger trees.

Within the Oak Woodland Community, approximately 47 danger trees would be removed along the 32-mile corridor. More than half of these would be removed from one stand located near structures 4/6-7; the few remaining danger trees are located sporadically in seven other areas. The size of the trees within the Oak Woodland Community that would be removed ranges from 10 inches dbh to 38 inches dbh. Trees that would be removed are typically those closest to BPA's existing mowed and maintained easement. Because the tree removal within the Oak Woodland Community would reduce the quantity and quality of local vegetation communities, the impact

would be moderate. Impact levels assume any federally listed threatened and endangered plants found during construction would be avoided.

Within the grass/forb/shrub and the agricultural/pastoral vegetation communities, impacts could occur through direct clearing or crushing for construction activities associated with replacing guy wires and guy wire anchors, as well as for construction of both temporary and permanent access roads. Additional impacts could occur from the use of heavy equipment on local soils, including compaction and physical movement of soils. Compaction of soils could inhibit precipitation from infiltrating over plant root zones. Decreases in groundcover from vegetation removal could cause increases in sheet flow during storm events and correspondingly less infiltration to support remaining plant communities. Compaction could also inhibit germination of seeds in the upper soil horizon, favor the development of bare-soil areas, or foster compaction-tolerant weedy annual grass and forb species.

Physical movement of soils and tracking of equipment could disrupt the seed bank in the upper soil horizon, inhibiting regeneration of desirable species. Additionally, it could facilitate germination of desirable and undesirable species through seed exposure, scarification, and/or altered temperature regimes. Physical movement of soils at greater depths could damage the fine root zones of shrubs and trees. Physical movement of soils could also alter site topography, including microtopography and drainage patterns. The temporary storage of soils and cleared vegetation could also compact soils beneath storage piles. Decomposition of vegetation within storage piles could generate sufficient heat to inhibit or facilitate germination of various species in the seed bank beneath the piles.

Soil disturbance resulting from structure replacement, access road construction, and related activities could eliminate plant cover and change the ability of some plant communities to reestablish. Areas cleared of vegetation could be invaded by non-native pioneer species, including noxious weeds, which could preclude growth of native vegetation.

Danger tree removal could result in altered solar radiation and wind velocities, increased soil temperatures, reduced evapotranspiration, increased periods of soil saturation, and corresponding reduced soil oxygen concentrations, all of which could affect establishment, growth, and vigor of both existing and replacement vegetation. Trees adjacent to areas being cleared could be injured if their roots were cut or damaged, if soils were excessively compacted during nearby tree removal, or if pathogens were introduced, or they could be subjected to wind throw if protective vegetation surrounding them is removed. However, the remaining canopy, understory trees, shrubs, and crown sprouts should mitigate some of these potential effects. Specifically, after danger tree removal, tree/shrub growth would accelerate due to increased availability of solar radiation, soil nutrients, and water, thereby reducing the overall impact to the Riparian Community to moderate in areas where only a few overstory trees would be removed. Residual dormant seeds in the existing soil seed bank should also contribute to subsequent shrub and tree recruitment and disturbed site revegetation.

Spills of hazardous materials (e.g., hydraulic fluids, petroleum products) could result in vegetation mortality, soil and water contamination, reduced viability for some species, and

reduced potential for successful revegetation within spill areas. Because BMPs would be implemented to reduce the possibility of spills on vegetation, the impact would be low.

#### Noxious Weeds

Construction could disrupt vegetation and disturb and relocate soils and noxious weed propagules (e.g., Canada thistle) thereby increasing the potential for noxious weeds to invade new areas. Noxious weeds could colonize disturbed soils along the road edge, and new roads can provide new avenues for the dispersal of noxious weeds. Vehicles and the materials they transport could import new species or inadvertently transport seeds/propagules from infested areas to new locations and access roads. If conditions are appropriate, these species can take advantage of disturbed soils and the lack of competing vegetation in recently cleared areas and establish new populations. The Proposed Action could have a low impact on vegetation because noxious weed infestation areas already exist throughout the corridor; therefore, the Proposed Action would not be expected to cause a major effect on the productivity of adjacent vegetation communities.

#### *Operation and Maintenance Impacts*

Maintenance of the transmission line would require incidental repairs to access roads and management of vegetation, which could cause localized vegetation and soil disturbance. Specifically, impacts associated with operation and maintenance would include continued clearing and trimming of vegetation beneath and adjacent to the transmission lines (e.g., mowing, danger tree and brush removal) and soil disturbance and compaction during maintenance activities. Vegetation within and adjacent to access roads would need to be cleared periodically to allow passage of maintenance vehicles. These activities would maintain the existing Managed Upland Grass/Forb/Shrub and Managed Wetland Grass/Forb/Shrub Communities. Operation and maintenance would have low impacts on vegetation and 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. The continued removal and/or suppression of tree/shrub growth would be a low impact.

Routine and emergency maintenance activities would require visits to structure locations and movement of personnel, materials, and vehicles along the corridor. These activities could result in the transport, introduction, or colonization of noxious weeds. Soil disturbance could also facilitate weed growth, or preclude vegetation growth entirely. Weed-control methods could include manual or mechanical methods as well as herbicide applications. Mitigation measures would reduce this to a low impact.

While driving and parking maintenance vehicles along access roads, small fuel and oil leaks could occur. Petroleum-based compounds used by machinery or transported by vehicles could spill or leak, especially on rough or uneven terrain or under heavy loads. Any spills or leaks could kill or injure vegetation in the immediate vicinity of the spill. This would be a low impact with implementation of appropriate mitigation measures.

## **Rare Plants**

### *Construction Impacts*

No federally listed threatened or endangered plants were observed within BPA's easement west of the P&W Railroad ROW. The risk of finding threatened or endangered plant species within the larger overall project corridor (including unsurveyed access roads and danger tree removal areas) appears low based on existing BPA easement survey results and discussions with regulatory agencies.

### *Operation and Maintenance Impacts*

Routine and emergency maintenance activities would require visits to structure locations and movement of personnel, materials, and vehicles along the corridor. During the life of the lines, the ROW would be accessed for vegetation management and wood pole structure maintenance when repairs are needed. Because the poles, hardware, and conductor 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 to avoid impacts to rare plants in areas that have not been surveyed. However, unforeseen events, such as storms or vandalism, could cause a need for temporary emergency repairs at other times of the year. If this happens, and rare plants are present, there could be low impacts to rare plants from maintenance activities.

## **3.5.3 Mitigation Measures**

### ***General Vegetation***

Potential measures that could be applied to avoid, minimize, or mitigate for impacts to vegetation before construction include the following:

- Prior to construction, conduct a noxious weed survey within the corridor to more specifically identify existing infestations of noxious weeds
- Prior to construction, visit existing noxious weed infestations and conduct pre-emptive measures to minimize transport and expansion of weed occurrences during construction; flag infestations for avoidance (as practicable) during construction
- Flag vegetation clearing limits prior to disturbance
- Clearly mark danger trees and demarcate danger tree removal disturbance limits, log deck areas, and skid/access routes
- Evaluate Oregon white oak trees designated as danger trees for alternative treatments (e.g., top and trim). If possible, top and/or trim Oregon white oak trees designated as danger trees
- Identify potential onsite mitigation opportunities specific to vegetation replacement/replanting (e.g., willow planting/cutting installations)

- Identify offsite mitigation for forested habitats during the permitting process that could replace tree removal occurring as a result of the Proposed Action
- Coordinate with local watershed councils and land conservancies (e.g., Calapooia Watershed Council, Institute for Applied Ecology, and similar groups) regarding tree salvage for use in nearby habitat restoration projects. Determine potential for assisting with or furthering planned mitigation opportunities and priority projects

Potential measures that could be applied to avoid, minimize, or mitigate for impacts to vegetation during construction include the following:

- Use existing road systems (including farm access roads), where practicable to access structure locations
- Minimize the construction area (footprint) to the extent practicable, especially within wetlands and adjacent waterbody crossings
- Install construction “envelopes” of silt fencing, straw wattles, or other barrier materials around construction sites to prevent vehicle turnaround, materials storage, or other disturbance outside designated construction areas
- Place materials storage and staging areas in upland areas (away from wetland/waterbodies)
- Minimize ground disturbance in proximity to existing noxious weed populations
- Implement appropriate measures to minimize the introduction and broadcast of weed seeds/propagules, including inspection of vehicles before entering construction areas and appropriate equipment cleaning measures
- Conduct as much work as possible during the dry season when stream flow, rainfall, and runoff are low to minimize erosion, sedimentation, and soil compaction
- Cut and remove danger trees during the dry season to minimize compaction. Conduct danger tree removal in a manner that minimizes disruption to remaining trees and shrubs
- Do not disturb existing root system of danger trees by “tipping over” danger trees with an excavator or similar machine due to potential wetland impact constraints
- Use a feller buncher (where access allows), a “cable and winch” removal approach, or equivalent method to limit damage to remaining trees and understory vegetation during danger tree removal in sensitive areas
- Do not allow danger trees to be chipped and left onsite
- Top and trim Oregon white oak trees designated as danger trees
- Top, trim, and/or girdle a percentage of designated danger trees to create snags (e.g., in higher quality habitat areas) to reduce impacts to vegetation and wildlife species, such as small mammals and amphibians

- Leave a small percentage of cut and felled danger trees as snags within the corridor as additional habitat/structure for wildlife, particularly small mammals and amphibians where appropriate
- Use adjacent open fields for accessing and removing danger trees. Exceptions may include where forested areas are significantly wide that removing danger trees would result in additional impacts, including non-danger tree removal

Potential measures that could be applied to avoid, minimize, or mitigate for impacts to vegetation after construction include the following:

- Reseed disturbed areas with native grasses and forbs to ensure appropriate vegetation coverage and soil stabilization prior to November 1 (rainy season)
- Inspect seeded sites to verify adequate growth and implement contingency measures as needed

### ***Rare Plants***

Recommendations for avoiding and minimizing impacts to rare plant populations and native wet prairie areas include the following:

- Schedule maintenance for fall or winter to avoid disturbing or destroying plants before they reproduce
- Salvage natives where possible (especially camas) and replant after construction
- Limit herbicide use to appropriate areas
- Restrict equipment access to wooden pole structures within or near the remnant native prairie areas to the edges of the ROW where possible

## **3.5.4 Unavoidable Impacts Remaining After Mitigation**

### ***General Vegetation***

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 further reduce native species diversity, increase non-native and invasive species, and reduce habitat quality and quantity. Continued maintenance of the corridor, including danger tree removal, would be unavoidable. Additionally, based on the prolific nature of weeds and the difficulty in controlling them, their unintentional spread throughout and adjacent to the corridor could occur and continue. The mitigation measures described above would reduce unavoidable impacts to vegetation communities to low-to-moderate.

### ***Rare Plants***

No federally listed threatened or endangered plants were observed within BPA's easement west of the P&W Railroad ROW. The risk of finding threatened or endangered plant species within the larger overall project corridor (including unsurveyed access roads and danger tree removal areas) appears low based on existing BPA easement survey results and discussions with regulatory agencies.

### **3.5.5 Environmental Consequences—No Action Alternative**

#### ***General Vegetation***

Under the No Action Alternative, construction-related impacts to vegetation would not occur. However, current levels of disturbance to vegetation would continue or increase for operation and maintenance activities as the existing structures deteriorate. Vegetation clearing, crop damage, soil disturbance, and temporary access road creation for routine or emergency maintenance activities could result in short-term impacts similar to the Proposed Action. Additionally, since timing of emergency maintenance cannot be controlled, emergency work could be required during winter when accessing structure locations and the transport of materials and supplies could result in greater impacts to vegetation, habitat, and species.

Danger tree removal would be required under the No Action Alternative and would result in impacts to vegetation communities. Impacts to the adjacent Riparian Community would be high. Tree removal within the Riparian Community includes approximately 6,300 danger trees located primarily east of the railroad tracks. Tree removal would occur in both upland and wetland portions of the overall Riparian Community along much of the 32-mile corridor. Within the Oak Woodland Community approximately 47 danger trees would be removed along the 32-mile corridor, which would be considered a moderate impact. Although access roads and staging areas could be located outside and away from these higher value communities, removing these danger trees would be necessary to protect the reliability of the transmission line.

#### ***Rare Plants***

Under the No Action Alternative, construction-related impacts to rare plants would not occur. However, current levels of disturbance to vegetation for operation and maintenance would continue or increase as the existing structures deteriorate. Routine and emergency maintenance activities would require visits to structure locations and movement of personnel, materials, and vehicles along the corridor. Unforeseen events such as storms or vandalism could cause a need for emergency repairs. If this happens, there could be impacts to rare plants from maintenance activities in areas that have not been surveyed. It is assumed any threatened or endangered plants (if found during subsequent surveys) would be avoided during danger tree removal, and thus, no impact would occur.

## 3.6 Fish and Wildlife

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Additional detail on the fish and wildlife analysis is provided in the Final Vegetation, Fish, and Wildlife Resources Technical Report (Aquatic Contracting 2010), available on request.

### 3.6.1 Affected Environment

#### ***Fish***

There are 28 watercourses that lie within or cross the corridor. Several of these waterways also cross proposed access roads or routes of travel. The majority of streams that cross the corridor are dominated by silty to muddy substrates that reflect adjacent topography and their location within the Willamette Valley. Riparian vegetation at all stream crossings within the corridor is limited as a result of adjacent land use (i.e., active agriculture) and both P&W Railroad and BPA corridor maintenance activities.

The USFWS Threatened and Endangered Species Lists for Linn and Lane Counties indicate there are three federally listed endangered, threatened, or candidate fish species with the potential for occurrence within the corridor. Database searches, Federal and state species lists, and personal communications with state and Federal agencies were used to determine whether species or habitats are present within the corridor. Table 3-10 describes each water crossing and potential fish species presence.

#### ***Threatened, Endangered, Candidate, and Special Status Fish Species***

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

The UWR Chinook salmon evolutionary significant unit (ESU) was originally listed as threatened on March 24, 1999 (64 Federal Register [FR] 14308), and its threatened status was reaffirmed on June 28, 2005 (70 FR 37160). Critical habitat was designated for UWR chinook on September 2, 2005 (70 FR 52630), with an effective date of January 2, 2006. Protected fish include all naturally spawned spring-run populations of Chinook salmon (and their progeny) residing in streams in the UWR Basin of western Oregon, upstream of Willamette Falls (64 FR 14308). This includes the main stem Willamette River and its tributaries. The National Marine Fisheries Service (NMFS) has concluded this ESU is not presently in danger of extinction, but is likely to become endangered in the foreseeable future.

##### ***Steelhead Trout (Oncorhynchus mykiss), Upper Willamette River Distinct Population Segment***

The UWR steelhead distinct population segment (DPS) was originally listed as threatened on March 25, 1999 (64 FR 14517), and its threatened status was reaffirmed on June 28, 2005 (70 FR 37160). NMFS designated critical habitat for UWR steelhead on September 2, 2005, with an effective date of January 2, 2006 (70 FR 52630). The DPS includes all naturally spawned populations of winter-run steelhead (and their progeny) in the Willamette River and its tributaries upstream from Willamette Falls to the Calapooia River, inclusive. NMFS has concluded this DPS is not presently in danger of extinction, but it is likely to become endangered in the foreseeable future.

**Table 3-10. Streams and Rivers within Right-of-Way or Easement**

Nearest Structure	Waterbody	Documented and Potential Endangered Species Act (ESA) Fish Presence <sup>1</sup>	Habitat Conditions/Comments	Designated Critical Habitat	Essential Fish Habitat (EFH) <sup>2</sup>	Essential Salmon Habitat
1/1–1/2 (includes access road)	Unnamed Tributary to Calapooia River	Potential winter steelhead, spring chinook	Narrow incised channel with muddy bottom-connects to adjacent wetland. Culvert under existing access road.	No	Unconfirmed	No
1/4–1/5	Calapooia River	Winter steelhead, spring chinook	Steep banks, muddy bottom, 100 feet wide. Lacks riparian vegetation (e.g., tree/shrub cover) within corridor.	Yes	Yes	Yes
4/4–4/5 (includes access road)	Unnamed Tributary to Calapooia River	Potential winter seasonal habitat for steelhead and chinook	Narrow crossing, muddy bottom. Lacks riparian vegetation within corridor-adjacent agricultural land use.	No	Unconfirmed	No
5/1–5/2	Unnamed Tributary to Calapooia River	Potential winter seasonal habitat for steelhead and chinook	Narrow incised channel, muddy bottom. Stream runs through culvert under railroad then parallels railroad within corridor. Lacks riparian vegetation-adjacent agricultural land use.	No	Unconfirmed	No
6/4–6/5 (includes access road outside of corridor over drainage to this crossing)	Unnamed Tributary to Calapooia River	Potential winter seasonal habitat for steelhead and chinook	Narrow water crossing, muddy bottom, lacks riparian vegetation within corridor-adjacent area grazed/pasture.	No	Unconfirmed	No
7/3–7/4; 7/7–7/8 (includes access road and fords)	Unnamed Tributary to Calapooia River	Potential winter seasonal habitat for steelhead and chinook	Narrow water crossing, muddy bottom, lacks riparian vegetation within corridor-adjacent agricultural land use.	No	Unconfirmed	No
7/10–7/11	Unnamed Tributary to Calapooia River	Potential winter seasonal habitat for steelhead and chinook	Narrow waterway through active agricultural land. Muddy bottom.	No	Unconfirmed	No
13/3–13/4	Wetland Slough to Muddy Creek	Oregon chub	Muddy bottom, 20 feet wide. Slough connects large, high quality wetland complex on east side of P&W Railroad tracks to Muddy Creek (offsite to west).	No	Unconfirmed	No
13/7–13/8	Muddy Creek	Oregon chub; Potential winter seasonal habitat for chinook	40 feet wide, deeply incised, glide with muddy bottom. Lacks riparian vegetation within corridor.	Yes	Yes	No

**Table 3-10. Streams and Rivers within Right-of-Way or Easement (continued)**

Nearest Structure	Waterbody	Documented and Potential Endangered Species Act (ESA) Fish Presence <sup>1</sup>	Habitat Conditions/Comments	Designated Critical Habitat	Essential Fish Habitat (EFH) <sup>2</sup>	Essential Salmon Habitat
17/1–17/2; 17/6–17/7; 19/4–19/5	Unnamed Tributary to Muddy Creek	Oregon chub; Potential winter seasonal habitat for chinook	Drainage meanders through active agricultural fields; 5-10 feet wide, muddy bottom, lacks riparian vegetation within corridor.	No	Yes	No
20/4–20/5	Unnamed Tributary to Camous Creek	Oregon chub; Potential winter seasonal habitat for chinook	Shallow with muddy bottom, 5-10 feet wide. Lacks riparian vegetation within corridor-adjacent agricultural land use.	No	Yes	No
21/4–21/5	Camous Creek	Oregon chub; Potential winter seasonal habitat for chinook	Camous Creek also flows along the east side of the railroad between 21/7–21/8 and between 21/10–22/1. Deeply incised, mud bottom, 10 feet wide. Lacks riparian vegetation within corridor-adjacent agricultural land use.	No	Yes	No
23/1–23/2	Unnamed Tributary to Camous Creek	Oregon chub; Potential winter seasonal habitat for chinook	Shallow with muddy bottom, 6 feet wide. Lacks riparian vegetation within corridor-adjacent agricultural land use.	No	Yes	No
24/6–24/7 (includes access road and proposed ford)	Unnamed Tributary to Lake Creek	Potential winter seasonal habitat for chinook	Shallow with muddy bottom, 4-6 feet wide. Lacks riparian vegetation within corridor-adjacent agricultural land use.	No	Unconfirmed	No
25/3–25/6	Lake Creek	Potential winter seasonal habitat for chinook	20–30 feet wide in some areas. Parallel to corridor. Culvert extends under P&W Railroad. Lacks riparian vegetation within corridor (adjacent to urban/ industrial).	No	Unconfirmed	No
27/5–27/6	Willamette River	Winter steelhead, spring chinook	Adjacent riparian community. Structures not being replaced at this location.	Yes	Yes	Yes
27/7–27/8 (includes potential route of travel)	Unnamed Tributary to Willamette River	Potential winter seasonal habitat for chinook	Narrow waterway through pasture/agricultural land. Muddy bottom.	Yes	Unconfirmed	No
28/1–28/2 (includes potential route of travel)	Unnamed Tributary to Willamette River	Potential winter seasonal habitat for chinook	Narrow waterway through pasture/agricultural land. Muddy bottom.	Yes	Unconfirmed	No
29/3–29/4	Unnamed Swale 1	Potential winter seasonal habitat for chinook	Small amount of standing water. Dominated by invasive plant species, muddy bottom.	No	Unconfirmed	No

**Table 3-10. Streams and Rivers within Right-of-Way or Easement (continued)**

Nearest Structure	Waterbody	Documented and Potential Endangered Species Act (ESA) Fish Presence <sup>1</sup>	Habitat Conditions/Comments	Designated Critical Habitat	Essential Fish Habitat (EFH) <sup>2</sup>	Essential Salmon Habitat
29/16–29/17	Flat Creek	Potential winter seasonal habitat for chinook	Within Junction City limits, 30 feet wide. Muddy bottom.	No	Unconfirmed	No
30/21–31/5 (multiple crossings)	Unnamed Stream-tributary to Flat Creek	Potential winter seasonal habitat for chinook	Within Junction City limits (across from RV sales). Muddy bottom and poor riparian zone.	No	Unconfirmed	No
31/11–31/12	Flat Creek Channel	Potential winter seasonal habitat for chinook	Structure 31/11 within 10 feet of Ordinary High Water Mark of Flat Creek Channel. Flows west. 20 feet wide. Muddy bottom; deeply incised. Lacks riparian vegetation.	No	Unconfirmed	No

Source: Field visit, 2010 and discussions with ODFW biologists

<sup>1</sup>The streams listed in this table (Willamette Valley Bottom Streams) typically provide seasonal habitat for many fish species, including juvenile Chinook salmon, native rainbow trout, cutthroat trout, Pacific lamprey, mountain whitefish, redbside shiner, sculpin, dace, large scale sucker, trout perch (sandroler), and northern pike minnow (Mamoyac 2010).

<sup>2</sup>Depends upon documented ESA fish presence. Unconfirmed indicates fish presence not known.

### *Oregon chub (Oregonichthys crameri)*

The Oregon chub is a small minnow endemic to the Willamette River basin. The species was listed as endangered under the ESA on October 18, 1993 (October 18, 1993, 58 FR 53800). Because of improvements in the population, the status of the Oregon chub was recently changed to threatened on April 23, 2010 (50 FR 11010), effective May 24, 2010. Critical habitat was designated on March 10, 2010, and was effective April 9, 2010 (50 FR 11010). Critical habitat for Oregon chub is not present within the corridor. Historically, Oregon chub were distributed throughout lowland areas of the Willamette River drainage in off-channel habitats such as sloughs, alcoves, and overflow ponds. The historical records note collections from the Clackamas River, Molalla River, Mill Creek, Luckiamute River, North Santiam River, South Santiam River, Calapooia River, Long Tom River, Muddy Creek, McKenzie River, Coast Fork Willamette River, Middle Fork Willamette River, and the main stem Willamette River (Scheerer 2002).

### *Pacific Lamprey (Entosphenus tridentatus)*

The Pacific lamprey is a Federal species of concern and is an Oregon state sensitive species. Pacific lamprey are documented in the Calapooia River (Mamoyac 2010). For additional information on the life history of the Pacific lamprey, refer to Best Management Practices for the Pacific Lamprey (USFWS 2010).

## **Wildlife**

Vegetation communities constitute the habitat within the corridor. Mature trees and tall-growing shrubs are mostly located east of the railroad. Human developments have converted much native habitat to agriculture, with higher quality wetland and riparian communities only present at various locations along and adjacent to the corridor. Wildlife species that may use the habitat types within the corridor are described below.

The USFWS Threatened and Endangered Species List for Linn and Lane Counties indicate there are Federally listed endangered, threatened, proposed, candidate, or species of concern wildlife species with the potential for occurrence within the corridor. Database searches, Federal and state species lists, and personal communications with state and Federal agency biologists were used to determine whether species or habitats are present within the corridor. The following species were found in a county-wide list or database search, but they are unlikely to occur within the corridor and will not be discussed further:

- Marbled murrelet (*Brachyramphus marmoratus*)
- Western snowy plover (*Charadrius alexandrinus nivosus*)
- Short-tailed albatross (*Phoebastria albatrus*)
- Northern spotted owl (*Strix occidentalis caurina*)
- Oregon giant earthworm (*Driloleirus macelfreshi*)
- Oregon silverspot butterfly (*Speyeria zerene hippolyta*)

### *Threatened, Endangered, Candidate, and Special Status Wildlife Species*

Data from the Oregon Natural Heritage Information Center (ORNHIC) indicates several species of wildlife potentially occur within the corridor. Table 3-11 lists these species, their habitat, and the likelihood of occurrence within the corridor.

#### *Birds*

According to the USFWS and other data base searches, only two species of birds listed as threatened, endangered, proposed, or candidate have the potential to occur within the corridor: streaked horned lark (Federal candidate) and bald eagle (state threatened). The bald eagle is also protected by the Federal Bald and Golden Eagle Protection Act and Migratory Bird Treaty Act (MBTA). In addition to these two species, many species of migratory birds (more than 200 according to Johnson and O'Neil 2001) have the potential to use the habitat types present within the corridor. Although the corridor is disturbed and degraded throughout the majority of its length, it does offer structural diversity and cover from the adjacent predominately agricultural landscape.

The vegetative communities along the corridor, especially the line of cottonwood, Oregon ash, hawthorn, and willow trees east of the railroad, provide foraging and nesting opportunities for many species of migratory birds, including those shown in Table 3-12.

The corridor also provides perching and nesting opportunities for raptor species. Adult red-tail hawks were observed hunting and perching along the corridor. In addition, a red-tail hawk nest was observed near structure 4/6 in an area of danger tree removal, as identified in Table 3-12. In areas of open water habitats (e.g., Calapooia River near the Albany Substation and near the Willamette River), osprey were observed hunting above and along the corridor. An active osprey nest was located on structure 27/6 just south of the Willamette River. An inactive partial osprey nest was also observed on structure 27/5 north of the Willamette River. Many songbird, crow, and raptor nests are located within the cottonwood, Oregon ash, willow, and hawthorn trees east of the railroad within the corridor.

Streams and rivers, wetlands, and sloughs/backwater areas provide habitat for waterfowl species. Miles of wetland ditches and swales parallel the corridor both east and west of the railroad. These areas, although often highly disturbed, provide habitat for some species, such as the green heron (observed). As noted in Table 3-12, several species of waterfowl were observed during the field investigation. Muddy Creek and its associated wetland complex near structure 13/4 provide the highest quality waterfowl habitat.

**Table 3-11. Threatened, Endangered, Candidate, and Special Status Wildlife Species**

Species	Status -- Federal/State	Habitat	Conclusion
Streaked horned lark ( <i>Eremophila alpestris</i> )	Candidate/Sensitive Critical	Associated with sparsely vegetated and bare ground habitats. Found nesting in grass fields, open pastures, mudflats, and on gravel roads. Distribution limited to Benton, Lane, Linn, Polk, Yamhill, and Jackson Counties (ORNHC 2010).	Species was not observed during field investigation. However, habitat for the streaked horned lark is present and the species may use the corridor.
Bald eagle ( <i>Haliaeetus leucocephalus</i> )	None/Threatened	Associated with many habitats, including Westside grasslands, agriculture, pastures, Westside oak and Douglas-fir forests, urban and mixed environs, open water, herbaceous wetlands, Westside riparian wetlands, etc. (Johnson and O'Neil 2001).	Several bald eagles were observed flying over and perching on structures along the corridor. Two known nests are within 2 miles of the corridor near Harrisburg. Habitat and species occur within the corridor.
Acorn woodpecker ( <i>Melanerpes formicivorus</i> )	Species of Concern/Vulnerable	This species requires oak habitat for feeding and breeding (Johnson and O'Neil 2001).	Areas of oak woodlands are located offsite and within the corridor. It is likely that acorn woodpeckers use areas within and adjacent to the corridor.
Olive-sided flycatcher ( <i>Contopus cooperi</i> )	Species of Concern/Vulnerable	Within the corridor, this species is generally associated with riparian wetland habitats (Johnson and O'Neil 2001).	Olive-sided flycatchers were observed in riparian wetland habitats at various stream crossings within the corridor. Habitat and species occur within the corridor.
Yellow-breasted chat ( <i>Icteria virens</i> )	Species of Concern/Sensitive Critical	Within the corridor, this species is generally associated with riparian wetland habitats, agriculture, pastures and mixed environs, and Westside oak and Douglas-fir forests (Johnson and O'Neil 2001).	Species likely present within the corridor. Species not observed during field investigations.
Vesper sparrow ( <i>Pooecetes gramineus</i> )	Species of Concern/Sensitive Critical	Within the corridor this species is generally associated with agriculture, pastures, and mixed environs (Johnson and O'Neil 2001).	Species likely present within the corridor. Species not observed during field investigations.
Purple martin ( <i>Progne subis</i> )	Species of Concern/Sensitive Critical	Requires nest boxes or snags with cavities for nesting (Johnson and O'Neil 2001). Association with agriculture was strong historically when competition with starlings and house sparrows was minimal and suitable nesting structures were present (Johnson and O'Neil 2001).	Several areas along the corridor could provide habitat. Competition with house sparrow, swallows, and European starlings, combined with disturbances (e.g., agriculture), make it unlikely that the purple martin is present within the corridor.
Oregon spotted frog ( <i>Rana pretiosa</i> )	Candidate/Species of Concern	Requires shallow water in wet meadows or stream/pond edges with abundant aquatic vegetation for breeding (Johnson and O'Neil 2001). Associated with Westside grasslands, agriculture, pastures, and mixed environs, urban and mixed environs, open water-lakes, rivers, and streams, herbaceous wetlands, riparian wetlands, etc. (Johnson and O'Neil 2001).	Species was not observed during field investigation. However, habitat for the Oregon spotted frog does occur within the corridor. It is possible that the species is present within the corridor; however, it is unlikely given pesticide use and degraded habitat conditions.

**Table 3-11. Threatened, Endangered, Candidate, and Special Status Wildlife Species (continued)**

Species	Status -- Federal/State	Habitat	Conclusion
Northern red-legged frog ( <i>Rana aurora</i> )	Species of Concern/ Sensitive Vulnerable	Requires cool-water ponds, lake edges, or slow-moving streams for breeding (Johnson and O'Neil 2001). Associated with Westside grasslands, agriculture, pastures, and mixed environs, urban and mixed environs, open water-lakes, rivers, and streams, herbaceous wetlands, riparian wetlands, etc. (Johnson and O'Neil 2001).	Species was not observed during field investigation. However, habitat for the northern red-legged frog does occur within the corridor.
Western (Pacific) pond turtle ( <i>Actinemys marmorata</i> )	Species of Concern/ Sensitive Critical	Nests are found in dry, well-drained soils in open areas with grass and herbaceous vegetation with trees and shrubs in close proximity. Overwintering sites are characterized as having deep leaf or needle litter and logs and shrubs (Johnson and O'Neil 2001). Generally associated with Westside lowlands, conifer hardwood forests, Westside grasslands, agriculture pastures and mixed environs, Westside oak and dry Douglas-fir forest and woodlands, urban and mixed environs, open water-lakes, rivers, and streams, herbaceous wetlands, Westside riparian wetlands, etc. (Johnson and O'Neil 2001).	Species was not observed during field investigation. However, habitat does occur for the Western pond turtle in several locations along the corridor. Species is likely present within the corridor.
Western painted turtle ( <i>Chrysemys picta bellii</i> )	None/Sensitive Critical	Nests in sandy or grassy areas near water (Johnson and O'Neil 2001). Associated with agriculture, pastures, and mixed environs, urban and mixed environs, Westside oak and dry Douglas-fir forest and woodlands, open water-lakes, rivers, and streams, herbaceous wetlands, Westside riparian wetlands etc. (Johnson and O'Neil 2001).	Species was not observed during the field investigation. However, habitat for the western painted turtle does exist within the corridor. Species is likely present within the corridor.
Fender's blue butterfly ( <i>Icaricia icariodes fenderi</i> )	Endangered/N/A	Primarily located within the upland prairies of the Willamette Valley. Associated with the Kincaid's lupine.	According to the plant survey conducted within BPA's easement, some occurrences of nectar species for the Fender's blue butterfly were located. However, Kincaid's lupine was not located. Therefore, it is unlikely that the Fender's blue butterfly uses the project corridor.

**Table 3-12. Bird Species Observed within the Transmission Line Corridor**

Common name	Scientific name	Common name	Scientific name
Red-tailed hawk	<i>Buteo jamaicensis</i>	Red-winged blackbird	<i>Agelaius phoeniceus</i>
Northern harrier	<i>Circus cyaneus</i>	House finch	<i>Carpodacus mexicanus</i>
American kestrel	<i>Falco sparverius</i>	House wren	<i>Troglodytes aedon</i>
Bald eagle	<i>Haliaeetus leucocephalus</i>	Bullock's Oriole	<i>Icterus bullockii</i>
Osprey	<i>Pandion haliaetus</i>	Mallard	<i>Anas platyrhynchos</i>
Turkey vulture	<i>Cathartes aura</i>	Violet-green swallow	<i>Tachycineta thalassina</i>
Great blue heron	<i>Ardea Herodias</i>	Barn swallow	<i>Hirundo rustica</i>
Little green heron	<i>Butorides virescens</i>	Tree swallow	<i>Tachycineta bicolor</i>
Killdeer	<i>Charadrius vociferous</i>	Spotted towhee	<i>Pipilo maculatus</i>
California quail	<i>Callipepla californica</i>	Black-headed grosbeak	<i>Pheucticus melanocephalus</i>
Chipping sparrow	<i>Spizella passerine</i>	American robin	<i>Turdus migratorius</i>
Song sparrow	<i>Melospiza melodia</i>	American goldfinch	<i>Spinus tristis</i>
Mourning dove	<i>Zenaida macroura</i>	Cedar waxwings	<i>Bombycilla cedrorum</i>
Western scrub jay	<i>Aphelocoma californica</i>	European starling	<i>Sturnus vulgaris</i>
American crow	<i>Corvus brachyrhynchos</i>	Western wood pewee	<i>Contopus sordidulus</i>
Northern flicker	<i>Colaptes auratus</i>	Olive-sided flycatcher	<i>Contopus cooperi</i>
Brewer's blackbird	<i>Euphagus cyanocephalus</i>	Bewick's wren	<i>Thryomanes bewickii</i>
Pileated woodpecker	<i>Dryocopus pileatus</i>	Downy woodpecker	<i>Picoides pubescens</i>
Black-capped chickadee	<i>Poecile atricapilla</i>	Chestnut-backed chickadee	<i>Poecile rufescens</i>
Red-breasted nuthatch	<i>Sitta canadensis</i>	Bushtit	<i>Psaltriparus minimus</i>
Dark-eyed junco	<i>Junco hyemalis</i>	Golden-crowned kinglet	<i>Regulus satrapa</i>

### Mammals

No special status mammal species are known to occur within the corridor. However, the corridor provides habitat for a variety of mammalian species. Given the surrounding agricultural, residential, urban, and industrial settings, the available habitat is limited. However, the corridor does provide some diversity and complexity in habitat structure (i.e., trees and shrubs) not present within adjacent agricultural lands. The corridor is used by a variety of species, including black-tailed deer (*Odocoileus columbianus*), beaver (*Castor canadensis*), nutria (*Myocastor coypus*), muskrat (*Ondatra zibethicus*), bat species (e.g., California myotis [*Myotis californicus*], long-eared myotis [*Myotis evotis*], and little brown bat [*Myotis lucifugus*]), coyote (*Canis latrans*), cougar (*Puma concolor*), fox (*Vulpes sp.*), raccoon (*Procyon lotor*), skunk (*Mephitis mephitis*), opossum (*Didelphis virginiana*), rabbit (*Sylvilagus sp.*), and small mammals (e.g., mice [*Mus sp.*], voles [*Microtus sp.*], moles (*Cryptomys sp.*), shrews [*Sorex sp.*], and gophers [*Thomomys sp.*]).

### Amphibians and Reptiles

In addition to the Oregon spotted frog (Federal candidate species), the corridor provides habitat for other amphibians and reptile species. Specifically riparian areas have the potential to provide

feeding and breeding grounds for a variety of amphibian and reptile species (e.g., rough-skinned newt [*Taricha granulosa*], northwest salamander [*Ambystoma gracile*], and Pacific coast aquatic garter snake [*Thamnophis atratus*]).

The Pacific tree frog (*Pseudacris regilla*), western toad (*Bufo boreas*), invasive bull frog (*Rana catesbeiana*), garter snake species (*Thamnophis* sp.), and rough-skinned newt were observed in the corridor.

#### *Invertebrates*

The only federally listed invertebrate species with the potential to occur within the project corridor is the Fender's blue butterfly (*Icaricia icariodes fenderi*). The Fender's blue butterfly is a federally endangered species regulated by the USFWS, and critical habitat for this species was designated on October 31, 2006. The Fender's blue butterfly uses upland prairies, grasslands, and wet prairies (USFWS 2010). Specifically, the primary constituent elements necessary for the Fender's blue butterfly include early seral upland prairie, wet prairie, or oak savanna habitat with a mosaic of low-growing grasses and forbs, an absence of dense canopy vegetation, and undisturbed subsoils, larval host-plants (Kincaid's lupine), and nectar sources. No larval host plants were located within the project corridor.

### **3.6.2 Environmental Consequences—Proposed Action**

#### ***Construction Impacts***

##### *Fish*

Depending on the nature and timing of construction activities, short-term construction disturbances could impact various fish species and their habitat throughout the corridor. Construction impacts to fish are categorized as short-term disturbances related to sedimentation to streams, disturbances to habitat, direct disturbances to individual fish, or potential release of hazardous materials into waterways. The extent of the impact depends upon the fish species present at the time of construction and the level of disturbance to their habitat.

Based on the location of the existing structures, most construction activities should occur away from streams where both topography and existing vegetation would reduce the ability of sediment to enter adjacent waterbodies. However, some in-water work may be required for access roads and to access certain structure locations within the corridor. Since Oregon chub, UWR chinook, and UWR steelhead are present within various waterbodies crossing the corridor, Table 3-13 outlines the mitigation measures necessary for moderate impacts specific to these threatened and endangered fish species.

**Table 3-13. Impacts to Threatened and Endangered Fish Species within the Transmission Line Corridor**

Fish Species	Impact Level	Mitigation Measures (to achieve moderate or low impacts)
Oregon chub	Moderate	Implement all impact minimization and mitigation measures identified in Section 7 Consultation with U.S. Fish and Wildlife Service (USFWS) and NOAA Fisheries Conduct all construction activities according to Oregon Department of Fish and Wildlife (ODFW) in-water work guidelines or ODFW-approved in-water work extension for streams identified as having ESA-listed Oregon chub Appropriate measures would be taken to prevent construction runoff into streams
Chinook salmon and steelhead trout	Moderate	Stream temperatures during the ODFW-defined in-water work window (June 1–October 15 for most streams crossing the corridor, except for west bank tributaries of the Willamette River which is July 1–October 15) preclude the presence of UWR chinook and UWR steelhead in waterbodies crossing the corridor (Mamoyac 2010). All work below the OHWM would be conducted during the in-water work window or ODFW-approved in-water work extension when UWR chinook and UWR steelhead are not likely to be present Implement all impact minimization and mitigation measures identified in Section 7 Consultation with U.S. Fish and Wildlife Service (USFWS) and NOAA Fisheries Conduct all construction activities according to ODFW in-water work guidelines or ODFW-approved in-water work extension for all streams identified as containing ESA-listed fish species (UWR chinook/UWR steelhead) Appropriate measures would be taken to prevent construction runoff into streams Mature tree removal would be minimized adjacent to stream crossings

Specific potential construction impacts to any fish species potentially present within the corridor would include:

- Soil from access roads, cleared areas, structure excavation, stockpiles, or other construction sources might enter streams and increase sediment load and/or sediment deposition, or reduce available food organisms
- Permanent access road construction could reduce infiltration while increasing runoff and erosion potential
- Damage to fish (e.g. gill abrasion, clogging) could occur from construction sediments entering streams
- Equipment moving across a stream might disturb the substrate and release sediments or result in compaction, thereby reducing an area’s ability to support vegetation after construction
- Vegetation destruction or removal within or adjacent to streams (e.g., for access road construction, culvert placement, or danger tree removal) may cause a loss of fish habitat, loss of stream shading, and a reduction in the existing vegetation’s buffer capacity
- Individual fish could be disturbed from equipment operating in or near streams
- Petroleum fuel products, hydraulic oil, and other hazardous materials typically associated with construction activities may enter a stream, causing fish kills, aquatic invertebrate kills, and death or injury to a number of other species that fish depend on for food

Because these potential construction impacts would be temporary, they would result in low impacts to common fish species.

#### *Wildlife*

Construction impacts to wildlife are categorized as short-term disturbances related to construction noise, dust, human intrusion; long-term physical habitat changes; or harm to individual animals.

Depending on time of year and location, short-term construction disturbances, such as construction noise, dust, and human intrusion, could impact a wide variety of species throughout the corridor, including black-tailed deer, bald eagles, passerine bird species, waterfowl, raptors, small rodents, and amphibian and reptile species. Nesting raptors (e.g., red-tail hawk and osprey) are easily disturbed by construction noise, tree removal, and human presence, and may abandon their nests if the disturbance is severe. Short-term impacts from loss of foraging and ground-nesting habitat around existing structures (due to vegetation clearing) is expected to be moderate and may result in minor injury or death of common wildlife. Species would likely use surrounding non-affected areas (outside the corridor) for foraging and ground-nesting activities. No blasting would be required for the proposed project; however, a temporary increase in noise during construction could result in moderate impacts on wildlife if noise levels reduce the foraging effectiveness of adults or cause adults to abandon nest or den sites, thus leading to mortality of their young. Short-term construction-related disturbances could result in moderate impacts to wildlife species.

Low indirect impacts from noxious weed infestation of wildlife habitat could occur if noxious weeds become established in the disturbed area surrounding structures. The majority of the corridor is occupied by non-native, weedy species. Some noxious weeds (e.g., Armenian blackberry) may benefit wildlife to some degree, but they occupy such large percentages of the corridor that they exclude the variety of native vegetation that might otherwise promote wildlife species. Shifts toward more native vegetation can be encouraged by reseeding and post-project weed treatments.

Long-term construction impacts would stem from physical habitat changes as a result of vegetation removal for access road construction as well as danger tree removal. Approximately 55.5 acres would be disturbed for access road construction. Vegetation in these areas is typically comprised of low (predominantly invasive) shrubs and herbaceous species (much of which is currently farmed or fallow). Where possible, access roads would be located in areas that have been previously disturbed, specifically avoiding further impact to the Oak Woodland and Riparian Communities adjacent to the corridor. Therefore, long-term construction impacts would result in minimal impacts to wildlife.

Construction of 450 linear feet of permanent access roads would result in a loss of mostly herbaceous vegetation and some shrub habitat under the transmission lines. In addition to access road clearing, danger trees would be selectively removed, primarily east of the railroad. Approximately 6,300 danger trees would be removed. Danger tree removal areas (including cottonwood-dominated habitats east of the railroad tracks) provide perching, nesting, and foraging opportunities for a variety of bird species. Table 3-14 outlines danger tree removal

**Table 3-14. Danger Tree Removal and Changes to Wildlife Habitat**

Structure	Number of Danger Trees to be Removed	Change in Habitat
1/10- 3/1	405 mostly cottonwood ranging from sapling to over 40-inch dbh	The mature canopy would be removed along much of this section. A larger patch would remain near structure 2/2. The willow/hawthorn understory would be retained. Habitat would change from two-story forested to single-story shrub/small tree. Area would still provide habitat for nesting songbirds, but habitat would be reduced for foraging and nesting raptors.
3/2-4/2	803 mostly cottonwood ranging from sapling to over 34-inch dbh	Pileated woodpecker was observed foraging in this area. Majority of this section is forested wetland and provides foraging and nesting habitats for many species. Danger tree removal in this area would leave some areas with sparse shrub layer.
4/3-5/2	388 mostly cottonwood ranging from sapling to over 40-inch dbh. Includes 25 mature oak trees	Oak tree removal would occur near structure 4/6. This would reduce the amount of habitat available for such species as the acorn and downy woodpecker. However, many other oaks would remain in this area. Would also remove mature cottonwood edge habitat along this section. Shrub/tree understory would remain to provide foraging and nesting habitat for songbirds.
5/3-6/1	429 mostly cottonwood ranging from sapling to over 46-inch dbh	Habitat in this segment is fragmented by Highway 34 and industrial buildings and agricultural fields. Tree removal would further fragment this habitat and would reduce the forested component of the hedgerow on the east side of the railroad tracks.
8/2-9/1	163 mostly cottonwood ranging from sapling to over 40-inch dbh	Well-established understory occurs along the hedgerow in this section (willow and hawthorn). Cottonwoods would be removed in this location, which would reduce perching and nesting habitat. However, the remaining hedgerow would still provide structure and habitat for songbirds and other species, as would the wider forested area near structures 8/11–9/4.
10/3-11/1	372 mostly cottonwood ranging from sapling to over 40-inch dbh	A well-established understory occurs along the hedgerow in this section (willow and hawthorn). Cottonwoods would be removed in this location, which would reduce the amount of perching and nesting habitat. However, the remaining hedgerow would still provide structure and habitat for songbirds and other species. Several nests were observed.
11/2-12/1	192 mostly cottonwood ranging from sapling to over 40-inch dbh	A well-established understory occurs along the hedgerow in this section (willow and hawthorn). Cottonwoods would be removed in this location, which would reduce the amount of perching and nesting habitat. However, the remaining hedgerow would still provide structure and habitat for songbirds and other species. High quality songbird habitat occurs along this section.
12/2-13/1	277 mostly cottonwood ranging from sapling to over 32-inch dbh	This area is near Muddy Creek, which provides high quality habitat outside the corridor. Riparian buffer would be maintained.
13/2-14/1	251 mostly cottonwood ranging from sapling to over 40-inch dbh	This area is near a large oxbow to Muddy Creek, which provides high quality habitat outside the corridor. Riparian buffer would be maintained.
15/3-16/1	420 mostly cottonwood ranging from sapling to over 40-inch dbh	An understory hedgerow is lacking in this area. Tree removal would result in little to no remaining hedgerow in this location. Nesting and foraging habitat would be eliminated in this area.
16/2-17/2	345 mostly cottonwood and ash ranging from sapling to over 40-inch dbh	A fairly intact understory (willow and hawthorn) occurs along the hedgerow in this section. Tree removal would reduce foraging and nesting opportunities along this section. Note lack of tree removal between structures 16/6 and 16/8.

**Table 3-14. Danger Tree Removal and Changes to Wildlife Habitat (continued)**

Structure	Number of Danger Trees to be Removed	Change in Habitat
17/3-18/1	510 mostly cottonwood and ash ranging from sapling to 36-inch dbh	Intact understory trees along this section of hedgerow (willow/hawthorn) would continue to provide nesting and foraging opportunities after the cottonwoods are removed. Tree removal would reduce nesting, perching, and foraging for raptors and habitat for other species.
20/2-21/2	329 cottonwood and ash trees ranging from sapling to 38-inch dbh	Many trees scheduled for removal are young ash. A minor understory occurs along this section of hedgerow. Removal would result in less nesting, roosting, and foraging opportunities for many species.
23/2-24/1	233 cottonwood ranging from sapling to 32-inch dbh	Intact understory trees along this section of hedgerow (willow/hawthorn) would continue to provide nesting and foraging opportunities after the cottonwood are removed. Tree removal would reduce nesting, perching, and foraging for raptors and habitat for other species.
24/2-25/1	176 cottonwood and ash ranging from sapling to over 40-inch dbh	Intact understory trees along this section of hedgerow (willow/hawthorn) would continue to provide nesting and foraging opportunities after the cottonwood are removed. Tree removal would reduce nesting, perching, and foraging for raptors and habitat for other species.
26/2-27/1	219 mixed species (oak, ash, maple, and cottonwood) ranging from sapling to 24-inch dbh	This area is fragmented by the City of Harrisburg. Habitat improves at 25/4 and south of town toward the Willamette River. Mostly smaller trees would be removed. Areas near the Willamette River provide high quality habitat that is largely undisturbed. Riparian buffer would be maintained.
30/6-31/2	193 mixed species (oak, ash, maple, and cottonwood) ranging from sapling to 34-inch dbh	This area is fragmented by Junction City and Highway 99. Habitat in this area varies. Tree removal would be mainly limited to areas around stream crossings, which are used by many species (e.g., green heron was observed) even within the limits of Junction City. Tree removal would reduce the amount of nesting, roosting, and foraging opportunities for many species.

**Table 3-15. Impacts to Threatened and Endangered Wildlife Species within the Transmission Line Corridor**

Species	Impact Level <sup>1</sup>	Mitigation Measures (to achieve moderate impacts)
Streaked-horned lark	Moderate	Clear trees and mature shrubs outside the critical nesting periods for migratory birds (March 1–September 15) Minimize the construction area to the extent practicable at individual sites
Bald eagle	Moderate	Prior to initiating ground-disturbing activities, identify active bald nest sites by consulting with ODFW and/or USFWS Avoid disruptive construction activities within 330 feet of active bald eagle nests during their critical nesting period (January–June)
Oregon spotted frog	Moderate	Minimize the construction area to the extent practicable at structure replacement sites, especially in and adjacent to wetland areas

<sup>1</sup>Moderate impacts assume mature tree removal would occur outside of the critical nesting period for migratory birds and bald eagles and impacts to wetland areas would be minimized as much as practicable.

along the project corridor and the change in habitat for wildlife. The amount of danger tree removal would result in a loss of most of the overstory canopy within and adjacent to the corridor, which would be a high impact. With the implementation of the proposed mitigation, the tree removal within the corridor would constitute a moderate impact to wildlife species.

### **Operation and Maintenance Impacts**

#### *Fish*

Impacts to fish resulting from future maintenance and operation would remain similar to current maintenance and operation impacts, and would be similar to those described for structure replacement and access road work. These impacts, which would mainly be limited to vegetation trimming, potential increased sedimentation to streams (from vegetation clearing), and maintenance of access roads and culvert replacement (if located near or across streams) would be low. Maintenance activities would not likely result in the injury or take of fish unless, in the future, it is necessary to replace culverts. Clearing or trimming of vegetation beneath and adjacent to the transmission line (including danger tree removal) could reduce shading and allochthonous inputs (organisms or organic sediments in a given ecosystem that originated in another system), while use of pesticides could alter fish habitat or directly impact fish or their prey. Spills of petroleum-based compounds from vehicles or machinery could enter the stream, causing fish kills, aquatic invertebrate kills, and death or injury to a number of other species that fish depend on for food. However, with appropriate mitigation measures, including locating new access roads in previously disturbed sites and minimizing water crossings and in-water work as much as practicable, low impacts to fish are expected from on-going maintenance and operation of the corridor.

#### *Wildlife*

Impacts to wildlife from operation and maintenance of the corridor are generally related to the temporary disturbance of wildlife caused by maintenance equipment and human presence. Maintenance activities may include inspections conducted by people in vehicles or on foot, vegetation clearing near structures, and other disturbances. Maintenance activities could impact

a wide variety of species, including black-tailed deer, raptors, waterfowl, passerine bird species, small rodents, reptiles, and amphibians. Raptors are known to use transmission line structures for nesting and perch sites.

Continued operation and maintenance of the corridor has the greatest impact on bird species because of the collision threat posed by structures, transmission lines, and guy wires. Other wildlife species would not be significantly impacted since the presence of the transmission lines, structures, and access roads do not present barriers to migration, create excessive noise, or otherwise cause major behavior changes. Since the structures, transmission lines, and guy wires would be generally in the same location as the existing corridor, low impacts to wildlife species are expected from continued operation and maintenance of the corridor.

### **3.6.3 Mitigation Measures**

Potential measures that could be applied to avoid, minimize, or mitigate for impacts to fish and wildlife during construction include the following:

#### ***Fish***

- Implement all impact minimization and mitigation measures identified in Section 7 Consultation with USFWS and NOAA Fisheries
- Conduct all construction activities according to ODFW in-water work guidelines or ODFW-approved in-water work extension for streams identified as having ESA-listed Oregon chub
- Conduct all construction activities according to ODFW in-water work guidelines or ODFW-approved in-water work extension for all remaining streams identified as containing ESA-listed fish species (UWR chinook/UWR steelhead)
- Install, monitor, and maintain construction “envelopes” of silt fencing, wattles, or other barrier materials around construction sites to prevent vehicle turnaround, materials storage, or other disturbance outside designated construction areas; locate staging, turnaround, and material storage away from streams
- Use existing road systems (including farm access roads), where practicable to access structure locations
- Minimize the construction area (footprint) to the extent practicable, especially within wetlands and adjacent water feature crossings
- Locate new access roads in previously disturbed areas and away from water crossings, when practicable
- Prevent spills from entering streams and/or groundwater by developing a spill prevention and spill response plan prior to construction; carry spill kits in all construction equipment and vehicles

- Conduct site restoration as soon as possible following construction; grade disturbed areas to their original contours and plant with suitable native vegetation during the appropriate season
- Salvage and stockpile selected vegetation (e.g., coniferous trees) for use in nearby watershed stream enhancement/habitat restoration projects. Coordinate with local watershed councils (e.g., Calapooia Watershed Council) regarding any other tree salvage needs

### **Wildlife**

- Prior to initiating ground-disturbing activities, identify active raptor nest sites by consulting with ODFW and/or USFWS and conduct raptor nesting surveys if required
- Install bird diverters where the line crosses the Calapooia and Willamette Rivers
- Avoid disruptive construction activities within 330 feet of active bald eagle nests during their critical nesting period (January–June)
- Schedule danger tree removal between August and March to minimize impacts to migratory birds.
- Minimize the construction area to the extent practicable
- In areas where cottonwoods would be removed, leave understory layer intact (i.e., do not remove hawthorn, cherry, or willow trees)
- Leave a small percentage of cut and felled danger trees as snags in upland and wetland areas within the corridor as additional habitat/structure for wildlife, particularly small mammals and amphibians
- Top, trim, and/or girdle a percentage of designated danger trees to create snags (e.g., in higher quality habitat areas) to reduce impacts to vegetation and wildlife species, such as small mammals and amphibians

### **3.6.4 Unavoidable Impacts Remaining After Mitigation**

Replacement of structures and temporary access road work could cause short-term soil compaction and minor reduced soil productivity under structures and along routes of travel. Reduced soil productivity could further reduce native species diversity, increase non-native and invasive species, and reduce habitat quality and quantity. Additionally, based on the prolific nature of weeds and the difficulty in controlling them, their unintentional spread throughout and adjacent to the corridor could occur and continue. Impacts from noxious weeds could result in adverse changes to wildlife habitat. Danger tree removal would result in the loss of most of the overstory tree canopy within and adjacent to the corridor. The overstory tree canopy is primarily the Riparian Community consisting of cottonwood trees and also includes some elements of the Oak Woodland Community. The mitigation measures described above would reduce unavoidable impacts to fish and wildlife to low or moderate.

### **3.6.5 Environmental Consequences—No Action Alternative**

#### ***Fish***

Impacts to fish resulting from the No Action Alternative would be similar to the impacts described for on-going operation and maintenance of the Proposed Action. In addition, any repairs in areas near stream crossings could result in greater impacts to fish species and their habitat, especially if conducted during periods when ESA-listed fish species are present.

#### ***Wildlife***

Impacts to wildlife resulting from the No Action Alternative would occur as a result of danger tree removal. Danger trees would be selectively cleared, primarily east of the railroad. Danger tree removal areas (including cottonwood-dominated habitats east of the railroad tracks) provide perching, nesting, and foraging opportunities for a variety of bird species. The amount of danger tree removal would result in a loss of most of the overstory canopy within and adjacent to the corridor. Considering project mitigation, the tree removal within the corridor would constitute moderate impacts to wildlife species.

Impacts to wildlife resulting from the No Action Alternative would also include vegetation clearing and disturbance activities associated with on-going maintenance, operation, and emergency repairs. On-going maintenance and operation would result in low impacts to wildlife species. Other maintenance actions, including repairs, could also occur in areas or during times of year where impacts to nesting bird species may occur.

## **3.7 Visual Quality**

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Additional detail on the visual quality analysis is provided in the Final Visual Quality Technical Report (Parsons Brinckerhoff 2010), available on request.

### **3.7.1 Affected Environment**

#### ***Existing Visual Environment***

The corridor is located in the Willamette Valley, which is between Oregon's Coast and Cascade Mountain Ranges. The corridor is situated in two general visual environments: rural, agricultural areas and urban areas. In the first, the transmission line, which generally consists of two-pole suspension structures, spans a broad, mostly flat, rural, agricultural landscape. The corridor is visible from interspersed residences and the occasional industrial building in the foreground.<sup>1</sup> Large, open, level fields of crops, such as wheat and grass seed, are occasionally interrupted by a thin strip of bushes and trees that serve as vegetated wind breaks. Occasional and moderately dense clusters of mature trees (leaf-bearing and non-leaf-bearing) stand adjacent to the corridor. There are no substantial hills or topographic features. The sky and weather systems are visible above. In this first visual environment, the corridor is within BPA's easement, which is located in the P&W Railroad ROW. As a result, it is a visible linear element that extends some

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

distance from the viewer. Figure 3-6 shows selected viewpoints in the rural, agricultural areas along the transmission line corridor (Photos of all representative views of the corridor are included in Appendix B of the Visual Quality Technical Report. The viewpoint numbering shown herein is consistent with the viewpoint numbering in the technical report, although only a subset of viewpoints is contained within this Draft EIS).

When viewers are more than approximately 0.5 mile from the corridor, the corridor and transmission structures are barely visible, or not visible at all, because of their narrow and slender profile. At more than 5 miles, when the corridor is in the background, the corridor and transmission structures would not be visible because they would either be screened by vegetation or structures, or they would blend into the horizon. There is very minimal light and glare associated with the existing corridor; it is generally only associated with lighting at the power substations.

The second visual environment includes the urban areas of Albany, Harrisburg, and Junction City, which are characterized by grid-street systems and sidewalks, concentrations of commercial and residential buildings and associated landscaping, individual or small clusters of trees or bushes, parks, vehicles, aboveground utilities, and signs. There are no substantial hills or topographic features in these cities. Light and glare typically occur from headlights, taillights, traffic signals, illuminated signs, and building lighting.

The corridor is visible from residences and businesses as it extends along streets in the center of Harrisburg and Junction City. The structures in urban areas are usually single poles that are generally located much closer than in rural, agricultural areas; this makes them slightly more evident within urban views. The linear structures and conductor are visible in the foreground of views from city streets, residences, and businesses. Because of the dense urban development close to the corridor, the structures and conductor are only occasionally visible when the viewer is 0.25 to 0.5 mile (foreground) or 0.5 to 5 mile (middle ground) away. Figure 3-7 shows viewpoints in urban areas along the transmission line corridor.

The locations of viewpoints along the transmission line corridor are mapped in Figure 3-8, Figure 3-9, and Figure 3-10.

View 3: View from Riverside Drive, looking south



View 4: View from Oakville Road, looking northeast



View 5: View from Tangent Drive, looking northwest



View 7: View from Pugh Road, looking southwest



**Figure 3-6. Representative Viewpoints of Existing Corridor in Rural, Agricultural Areas**

View 11: View from Territorial Street and 4th Street, looking south



View 12: View from 4th Street between Smith Street and Moore Street, looking south



View 20: View from 7th Avenue between Holly Street and Ivy Street, looking east



View 25: View from Highway 99 Mile Marker 111, looking north



**Figure 3-7. Representative Viewpoints of Existing Corridor in Urban Areas**

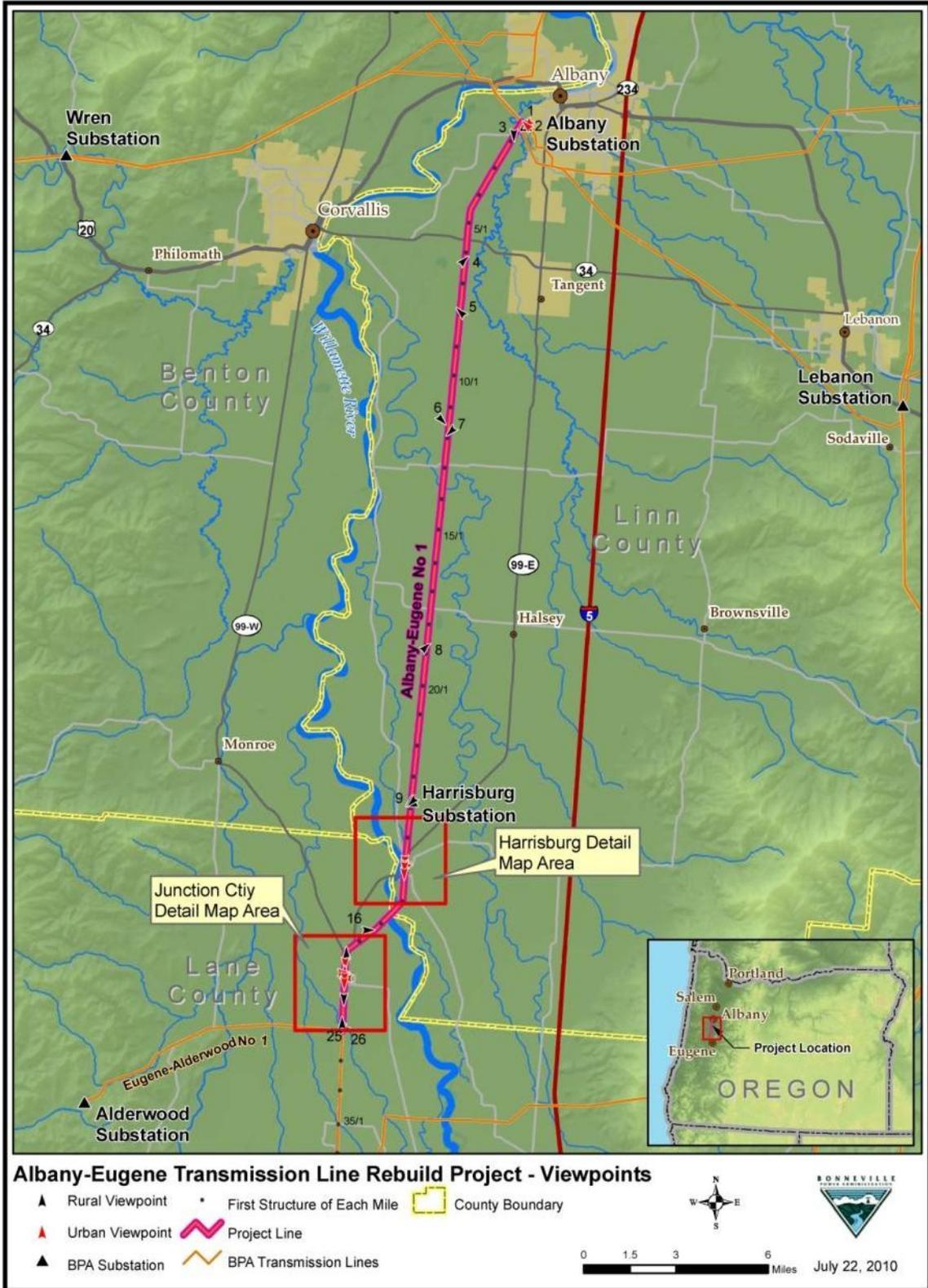
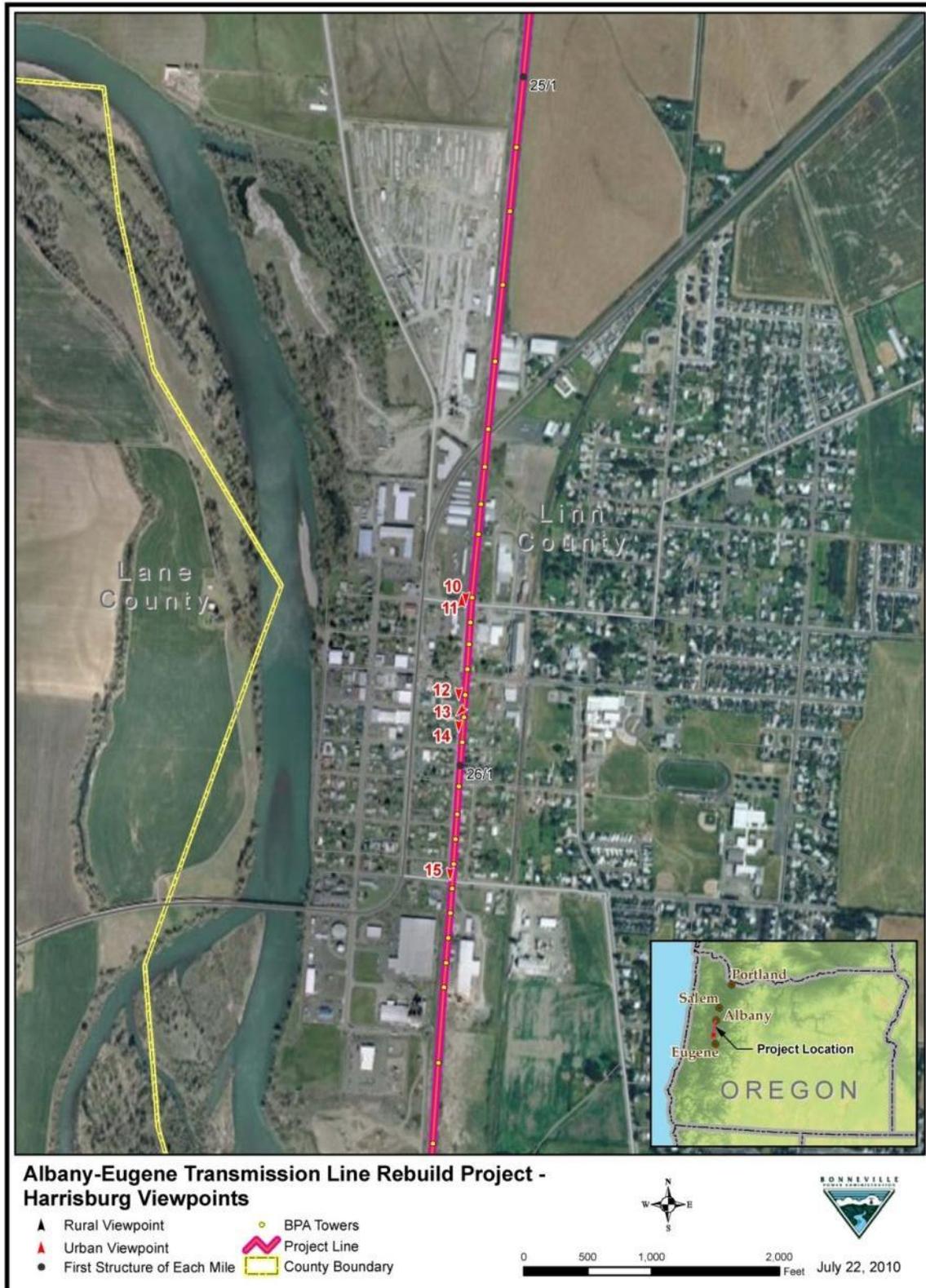


Figure 3-8. Location of Transmission Corridor Representative Viewpoints



**Figure 3-9. Location of Transmission Corridor Representative Views—Harrisburg Detail**

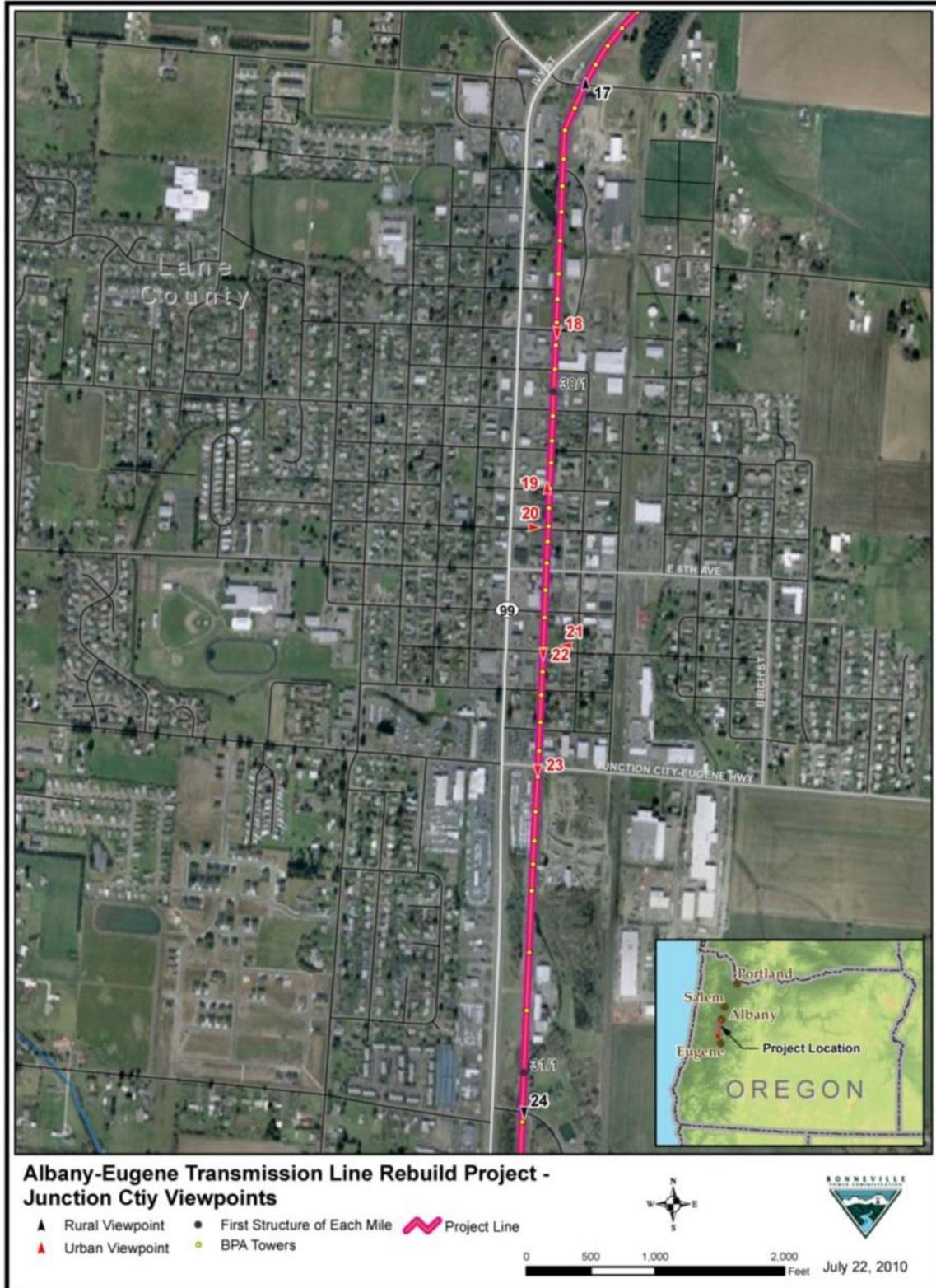


Figure 3-10. Location of Transmission Corridor Representative Views—Junction City Detail

### **Viewers and Visually Sensitive Locations**

Viewers along the corridor include residents, park visitors, employees, motorists, bicyclists, and pedestrians. A viewer's activity typically influences his or her sensitivity to the visual environment and visual change. For example, employees of businesses near the corridor have longer duration views because they are generally stationary, but their employment activities typically keep them focused on work rather than viewing scenery. Motorists and train passengers are typically moving adjacent to, across, or through the corridor at relatively high speeds and have shorter duration views. Drivers are likely focused on driving, while passengers (train or vehicle) may be viewing scenery.

Alternatively, bicyclists and pedestrians are moving at low to moderate speeds and have medium-duration views; part of their activity likely involves viewing scenery. Residential viewers and visitors to parks typically have stationary, longer duration views, and viewing nearby scenery is often an important activity to these viewers. There is a higher concentration of sensitive viewers (residents and park visitors) and visually sensitive locations (residences and parks) closer to the corridor in Albany, Harrisburg, and Junction City than in rural, agricultural areas. Recreation areas are not located in BPA's easement within the P&W Railroad ROW. However, four parks are adjacent to the easement within the urban areas: Hazelwood Park (Albany), Picnic Pavilion Park (Harrisburg), Founders Park, and Scandinavian Festival Park (both in Junction City).

## **3.7.2 Environmental Consequences—Proposed Action**

### **Construction Impacts**

Construction activities would occur for approximately eight months. During this time, there would be temporary, short-term impacts to visual quality in both visual environments (rural, agricultural and urban), but overall these impacts would be low to moderate. The visual impacts associated with construction activities would be visible from visually sensitive locations (residences and parks), but these impacts would be temporary and short-term.

Impacts to visual quality would be associated with the presence of workers and brightly colored equipment (e.g., boom cranes, backhoes, augers, and bucket trucks), material stockpiles, debris, signage, staging areas, and the removal and insertion of poles. These construction activities, and the linear, opaque and solid forms associated with equipment and stockpiles, would be somewhat visually incompatible with the existing visual environment. Dust disturbed during construction would encroach upon views. Light and glare emanating from construction sites also could encroach upon adjacent areas. The movement of large, typically bright and reflective construction vehicles could add visually distracting light and glare to views, particularly in less developed rural, agricultural areas. However, brightly colored signs or lights have an intended safety benefit. Work platforms and machines would add linear and geometric shapes to views. Traffic congestion associated with work areas would also intermittently intrude upon views for short periods.

Along the corridor, new roads would be built and some roads would be reconstructed to provide improved access for operation and maintenance activities. Numerous individual danger trees, as

well as intact stands of danger trees, would be removed during construction. The visual impacts associated with temporary access road construction and tree removal would be similar to those described above: brightly colored equipment such as backhoes, bulldozers, cranes and dump trucks, material stockpiles, and debris would temporarily encroach upon adjacent areas and add visually distracting light, glare, and movement to views. Earthwork and terrain grading would be visible. Tree felling would also be visible during construction activities. The construction impacts to visual quality would be temporary and generally low for the rural areas of the project corridor because of the short duration of these impacts and the small number of sensitive viewers that would see the construction activities in the foreground or middle ground of their views. For those urban portions of the corridor in Harrisburg and Junction City, visual impacts would be moderate during construction because the number of residences that would see the transmission line in the foreground or middle ground of their views.

Construction staging areas and equipment and material stockpiles would be removed after construction.

### ***Operation and Maintenance Impacts***

The impact to visual quality and views resulting from operating and maintaining the corridor is expected to be low and similar to existing conditions. Maintenance activities would introduce similar impacts as described for construction impacts (for example, brightly colored equipment and material stockpiles), but operation and maintenance impacts on visual quality and views would be low because they would be of short-term duration and similar to existing conditions.

The operation and maintenance of new access roads would result in negligible visual impacts, due to the short length of permanent access roads (450 linear feet) relative to the entire length of the corridor. In the rural, agricultural area the only new road would be within the existing, linear corridor and would result in no long-term, noticeable topographic changes.

Upon completion of the project, there would be a moderate to high long-term impact on visual quality in rural areas resulting from removal of stands of danger trees. Both the transmission line corridor and trains would be more visible and more visually dominant within the existing transmission line corridor due to loss of the screening currently provided by these trees. Where residents are located within 0.25 mile of the transmission line corridor, there would be new, unscreened foreground views of the transmission corridor and trains. For residents immediately adjacent to the transmission line corridor, the elimination of vegetative screening would result in a high and long-term impact on visual quality. Trees would not be replanted or allowed to regrow in those areas where the danger trees would be removed.

In urban areas, the result of having removed danger trees would be low to moderate, eliminating the only trees in some views, including views from residences and parks. However, given the dense, urban development immediately adjacent to and within the corridor, this would not substantially alter the character of views. In Harrisburg, there would be approximately 65 fewer trees in the southern portion of the city. In Junction City, there would be approximately nine fewer trees within city limits.

Furthermore, to maintain the corridor, additional vegetation management would occur if the remaining vegetation prevents access to structures, requires noxious weed control, or grows too

close to the conductor. Vegetation maintenance would continue to be guided by the program identified in BPA's *Transmission System Vegetation Management Program Final EIS* (BPA 2000). The Vegetation Management Program includes ongoing consultation with landowners, and others, concerning vegetation management activities. Different vegetation management methods could be used, including manual methods (hand pulling, clipping, and use of chainsaws), mechanical methods (use of roller-choppers and brush hog), and/or chemical methods (use of herbicides). The impact of vegetation removal would be limited to specific views.

### **3.7.3 Mitigation Measures**

Potential measures that could be applied to avoid, minimize, or mitigate for impacts to visual quality include the following:

- Locate construction staging and storage areas away from locations that would be clearly visible from residences and parks
- Use non-reflective insulators (i.e., non-ceramic insulators or porcelain)
- Focus construction lighting on work areas to minimize spillover of light and glare
- Require that contractors maintain a clean construction site and that the corridor is kept free of litter following construction

### **3.7.4 Unavoidable Impacts Remaining After Mitigation**

With implementation of the recommended mitigation measures, no unavoidable impacts on visual quality are expected to occur, except the long-term impact of danger tree removal. Stands of trees would be removed throughout the corridor creating open views toward the transmission structures. Vegetative screening between residences and the corridor would be lessened or removed. The removal of danger trees would have a low impact on visual quality for viewers farther than 0.5 mile from the transmission corridor because the corridor would be minimally visible or not visible at all. For those viewers closer to the transmission corridor, within 0.5 mile, danger tree removal would have a moderate to high impact on visual quality.

### **3.7.5 Environmental Consequences—No Action Alternative**

Under the No Action Alternative, there would be a moderate-to-high and long-term impact on visual quality resulting from danger tree removal during continued operation and maintenance of the line. Where vegetation removal associated with the No Action Alternative would eliminate the existing screening between the P&W Railroad and residences adjacent to the railroad, this impact to visual quality would be high.

## **3.8 Cultural Resources**

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Cultural resources are nonrenewable places of human occupation or activity related to American history, architecture, anthropology, and engineering. 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. Cultural resources are evaluated for eligibility to the National Register of Historic Places (NRHP) using four criteria commonly known as Criterion A, B, C, and D as identified in 36 CFR Part 60.4 (a – d). These criteria include an examination of the cultural resource’s age, integrity, and significance in American culture, among other things. A cultural resource must meet at least one criterion to be eligible for listing.

### **3.8.1 Affected Environment**

For cultural resources the area of potential effect (APE) is the geographic area where the character or use of cultural resources may be directly or indirectly altered due to a project. The APE for this project consists of the BPA easement within the P&W Railroad (leased from Burlington Northern Santa Fe Railway) ROW, Albany Substation, and Harrisburg Substation. It measures 100 feet wide and extends from structure 1/1 at the Albany Substation to structure 32/2 just south of Junction City, for a total of 370.5 acres. Access roads, staging areas, and danger tree removal areas have not been surveyed for archaeological resources at this time; these areas will be surveyed prior to construction.

#### **Context**

##### *Cultural*

Prehistory in the Willamette Valley is usually divided into the Paleo-Indian and Archaic periods. However, there is little evidence of Paleo-Indian use of the Willamette Valley. The Willamette Valley was occupied by human populations during the Archaic period, which is subdivided into Early (8,000 to 6,000 years before the present [BP]), Middle (6,000 to 1,750 BP), and Late (1,750 to 200 BP) periods. The Archaic period refers to a subsistence tradition used by local or regional groups.

##### *Ethnographic*

The APE falls within the traditional territory of the Kalapuya, who were comprised of approximately 13 bands or tribes. The Kalapuya were an inland people who subsisted on the vegetal and faunal resources of the valley and adjacent uplands. Due to the diversity of their food sources, the Kalapuya lived in permanent villages during the winter and in temporary, transitory camps during drier times of the year. They were generally mobile from April through November.

##### *Historic*

Euro-American trappers and traders began exploring western Oregon in the early 19th century. In December 1811, John Jacob Astor’s Pacific Fur Company dispatched a party from its post at the mouth of the Columbia River to explore the Willamette Valley. Euro-American settlement of the Willamette Valley began in the early 1840s.

##### *Bonneville Power Administration Background*

BPA was created in 1937 as a temporary entity to oversee pending operations at Grand Coulee and Bonneville Dams. To deliver power from the dams, BPA developed the Master Grid, a complex transmission system whose design drew heavily from the existing power systems in the

eastern US, Britain, and Canada. After World War II, BPA expanded its transmission system to incorporate and serve new generation facilities on the Columbia River and its tributaries. Post-war growth in the Pacific Northwest led to an increase in public utilities and solidified BPA's role in the nation's first fully interconnected public-private electrical transmission grid. Today, BPA operates more than 15,000 circuit miles of transmission lines extending into seven states, and provides over 50 percent of the electrical energy consumed within its service region.

### **Archaeological Resources**

A review of the records on file at the Oregon State Historic Preservation Office (SHPO) revealed that 32 archaeological studies have been conducted within one mile of the project's APE. Three of the 32 surveys overlap at least partially with the project's APE. During these previous studies no resources were identified within the project's APE.

Taking into account the information gathered for the cultural context and the previous archaeological surveys, high, medium, and low probability areas were identified within the project's APE where archaeological resources may be encountered. Eighteen high and four medium probability areas were identified within the project's APE. The remainder of the APE was determined to have a low probability for archaeological resources.

A pedestrian survey was completed for all of the high and medium probability areas and for some of the low probability areas. During the pedestrian survey soil exposures were examined for sediment characteristics and the presence of cultural materials. The field investigations also included subsurface surveys within each high probability area where the project would disturb the ground.

One historic archaeological site and one prehistoric isolated find were identified and recorded within the project's APE. A second isolated find was identified outside of the APE and was thus not fully investigated. The historic archaeological site consists of a concrete foundation and wooden platform that are the remains of a warehouse and shipping depot dating from the early to mid-20th century. Although the foundation itself is in good condition, the site is in poor condition as the majority of the structure is missing. Based on an evaluation of the NRHP listing criteria, the historic archaeological site is recommended as not eligible for listing because the site lacks integrity of materials, design, workmanship, and association. In addition, while the site's location has not been altered, the feeling and setting have changed.

The isolated find consisted of four obsidian flakes. Isolated finds do not meet the minimum threshold for consideration to the NRHP because they are not sites, buildings, structures, objects, or districts as defined by state or federal standards.

### **Historic/Architectural Resources**

For historic/architectural resources, research materials provided by BPA were reviewed and a visit was made to each of the substations and to portions of the transmission line corridor and P&W Railroad ROW. At each location, observations were noted and photographs were taken. The Albany-Eugene No. 1 Transmission Line, the Albany Substation, the Harrisburg Substation, and the P&W Railroad between Albany and Eugene were recorded and evaluated for NRHP eligibility.

The Albany-Eugene No. 1 Transmission Line, the Albany Substation, and the Harrisburg Substation are recommended eligible to the NRHP as a contributing part of the Multiple Property Documentation of the BPA Transmission System. These three properties are eligible under Criterion A for association with themes of commerce, engineering, industry, military/defense, and government. At the Albany Substation, the materials of the maintenance building have been altered, which has led to a loss of integrity. Therefore, the maintenance building is recommended as a non-contributing building to the Albany Substation. The control house, oil house, and switchyard retain integrity and all are recommended as contributing resources to the Albany Substation. The P&W Railroad between Albany and Eugene is recommended not eligible to the NRHP due to a loss of integrity of materials, design, workmanship, feeling, and association.

### **3.8.2 Environmental Consequences—Proposed Action**

Because cultural resources are considered invaluable, any impact to them would be considered important. For this reason, potential impacts are discussed in general terms without the relative ratings of high, moderate, or low. An adverse effect to cultural resources is found when an undertaking may alter, directly or indirectly, any of the characteristics of a historic property that qualify the property for inclusion in the NRHP in a manner that would diminish the integrity of the property's location, design, setting, materials, workmanship, feeling, or association (36 CFR Part 800.5(a)(1)).

Impacts to cultural resources from the Proposed Action could result from physical ground disturbances caused by material and equipment staging; replacement of structures; access road upgrades; and vehicle and heavy equipment access to and from project work areas. Within the APE, there are no archaeological resources that are recommended eligible for the NRHP. Therefore, 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 augering (up to an additional two feet) of each pole hole would be required to comply with current depth-of-pole set standards. No documented cultural resources exist in areas of proposed pole replacement activities; however, there is the potential that these activities could impact undiscovered cultural resources.

For most of the 32-mile alignment the transmission line is located in BPA's easement, which is primarily within the P&W Railroad's west side ROW. Access road construction and danger tree removal would occur within the corridor, both inside and adjacent to BPA's easement, the P&W Railroad ROW, and on adjacent private properties. For these construction activities, the potential impact on cultural resources would be expected to be minimal because only surface disturbance would occur. Again, there is the potential that these activities could impact undiscovered cultural resources.

For the three historic properties within the APE that are recommended eligible for the NRHP, the Proposed Action consists of removing and replacing various components of the Albany-Eugene No. 1 Transmission Line with like components; specifically, replacing wood poles with new wood poles that are anticipated to be the same size and scale as the original poles. No

alterations are anticipated at either the Albany or Harrisburg Substations; therefore, no effect would occur.

The Multiple Property Documentation Form for the BPA Transmission System specifies the character-defining elements of named lines as (Kramer 2010a):

- Towers
- Setting (corridor character)
- Conductor mounting and insulators
- Identifying markers (standardized BPA signage located on the tower leg)

For the Albany-Eugene No. 1 Transmission Line, the Proposed Action would not affect the setting. The Proposed Action would affect the tower structures, specifically the poles that the structures are constructed of, by replacing existing poles with new poles of the same material, size, and configuration. According to the BPA Transmission System Multiple Property Documentation form, to maintain integrity of design, materials, and workmanship (Kramer 2010a):

- The named line must substantially retain its original design character. Changes made to continue or improve the essential original function—the efficient transmission of energy—may acquire significance in their own right. Such changes do not necessarily constitute a loss of integrity of design.
- Tower design must remain as built, in basic type and material (e.g., lattice/pole, steel/wood), and general design (e.g., H-poles, suspension towers, etc.). Minor modifications in design do not adversely impact integrity. Entire replacement of one type of tower for another diminishes integrity and reduces or eliminates eligibility depending upon visual impact and the percentage of the whole that is affected. Replacing a major percentage of the line with a different pole design or material so adversely impacts character as to make the line not eligible.

The Proposed Action would not alter the original design character or essential function of the Albany-Eugene No. 1 Transmission Line, and all tower structure designs would remain as built in basic type and materials. Therefore, the Proposed Action would not alter the integrity of materials, design, or workmanship of the Albany-Eugene No 1 Transmission Line and there would be no effect to historic resources in the APE.

### **3.8.3 Mitigation Measures**

The Proposed Action is not expected to affect cultural resources. The following mitigation measures are recommended for inadvertent discoveries of cultural resources that may occur during construction:

- 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, the BPA archaeologist, the Oregon SHPO, and the Tribes.
- Implement any additional mitigation measures for cultural resources identified by the Oregon SHPO through the Section 106 consultation process.

### 3.8.4 Unavoidable Impacts Remaining After Mitigation

With the implementation of the recommended mitigation measures, there would be no remaining unavoidable impacts with the Proposed Action.

### 3.8.5 Environmental Consequences—No Action Alternative

With the No Action Alternative, maintenance and emergency repairs would not alter the original design character or function of the three eligible historic properties, therefore there would be no impacts to cultural resources. Danger tree removal activities would likely require the same mitigation measures for inadvertent discoveries of cultural resources as listed above for the Proposed Action.

## 3.9 Socioeconomics and Public Services

Additional detail on the socioeconomic analysis is provided in the Final Socioeconomic and Public Services Technical Report (Parsons Brinckerhoff 2010), available on request.

### 3.9.1 Affected Environment

#### *Population*

Along the transmission line corridor, in the unincorporated portions of Linn and Lane Counties, residences are very spread out on large agricultural parcels. In the urban areas of Harrisburg and Junction City, residences are concentrated on smaller parcels. As shown in Table 3-16, the populations of Linn and Lane Counties have increased since 2000, with similar growth rates of 7.6 percent and 7.7 percent, respectively.

**Table 3-16. Population in Linn County, Lane County, and Oregon**

Geographic Area	Population		Growth Rate 2000-2009
	2000	2009	
Linn County	103,069	110,865	7.6%
Lane County	322,959	347,690	7.7%
Oregon	3,421,399	3,823,465	11.8%

Sources: US Census Bureau 2000, PSU Population Research Center 2010

Both Linn County and Lane County have experienced slight growth in aging populations since 2000. In Linn County, the percentage of elderly residents, those 65 and older, increased from 14.5 percent in 2000 to 15.2 percent between 2006 and 2008. During this same period, the percentage of elderly residents increased from 13.3 percent to 14.1 percent in Lane County. Both counties exceed the 2006-2008 estimates for the state (13.1 percent) (US Census Bureau 2000, US Census Bureau 2008a).

### **Race and Ethnicity**

Caucasians are the largest racial group in both Linn and Lane Counties with 92.3 percent and 89.5 percent, respectively (Table 3-17). This representation exceeds the state representation of Caucasians. The proportions of all other racial groups in these counties are below the state proportions. In both counties, persons reporting two or more races were the second most predominant group, followed by “other race” in Linn County and Asian in Lane County (US Census Bureau 2008a).

**Table 3-17. Race and Ethnicity in Linn County, Lane County, and Oregon**

Geographic Area	Race				Ethnicity			
	Caucasian (White)	Black or African-American	American Indian and Alaska Native	Asian	Native Hawaiian and Other Pacific Islander	Other race	Two or more races	Hispanic (any race)
Linn County	92.3%	0.3%	1.5%	0.9%	0.1%	2.2%	2.6%	6.1%
Lane County	89.5%	1.0%	1.6%	2.7%	0.2%	1.8%	3.2%	6.2%
Oregon	86.2%	1.7%	1.8%	3.5%	0.3%	3.2%	3.3%	10.6%

Source: US Census Bureau 2008a

Both Linn and Lane Counties have just over 6 percent of their population that report being of Hispanic ethnicity regardless of race (Table 3-17). This falls well below the state representation of Hispanics, which is 10.6 percent (US Census Bureau 2008a).

### **Employment**

The largest employment sectors in Linn County are trade, transportation and utilities, government, and manufacturing. As shown in Table 3-18, Linn County has seen a decrease in nonfarm employment over the last year, with the number of jobs decreasing 4.5 percent from 39,630 in April 2009 to 37,860 in April 2010, a loss of 1,770 jobs. Proportionally, this loss exceeds those of the state, which saw a loss of 1.7 percent of jobs during the same period (Oregon Employment Department 2010).

**Table 3-18. Employment in Linn County, Lane County, and Oregon**

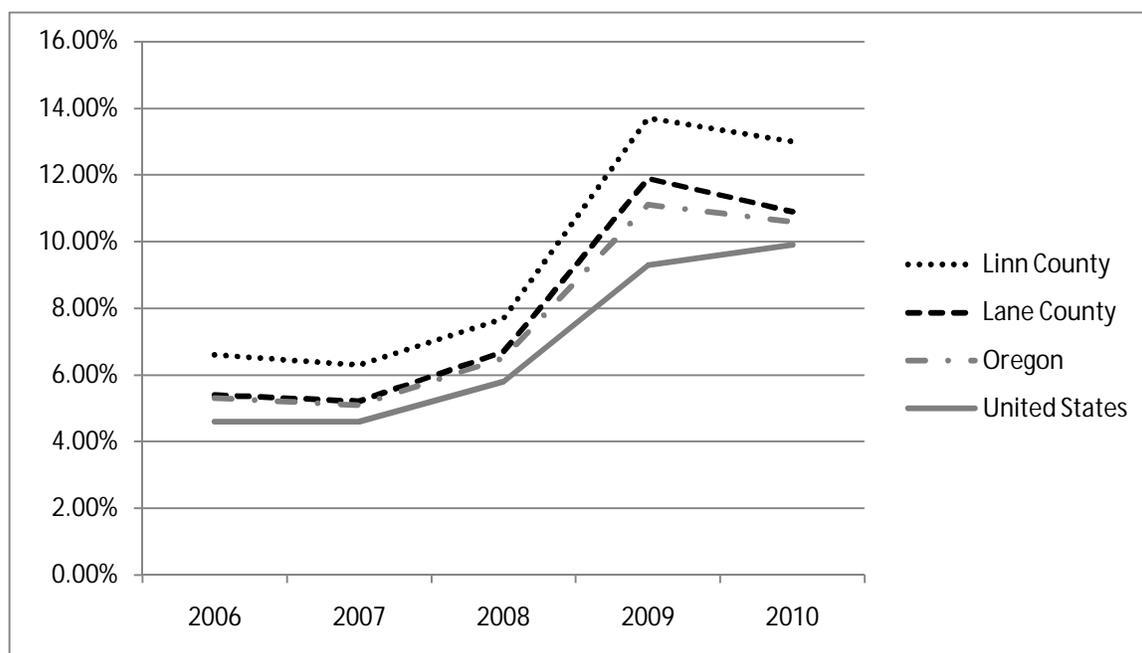
Geographic Area	Number of Jobs		Change 2009-2010	
	April 2009	April 2010	Number of Jobs	Percent
Linn County	39,630	37,860	-1,770	-4.5%
Lane County	142,700	141,300	-700	-1.0%
Oregon	1,615,400	1,587,500	-27,900	-1.7%

Source: Oregon Employment Department 2010

The largest employment sectors in Lane County are government, trade, transportation and utilities, and education and health services. Lane County also saw a decrease in nonfarm employment over the last year. However, Lane County lost a lower percentage of jobs than Linn County and the state, decreasing only 1.0 percent from 142,700 in April 2009 to 141,300 in April 2010, a loss of 700 jobs (Table 3-18).

Unemployment in Linn County was approximately 13.0 percent in April 2010, a slight decrease from 13.7 percent in 2009; however, this represents a sharp increase since 2007 when the county's unemployment was only 6.3 percent. As shown in Figure 3-11, Linn County's unemployment exceeds the national unemployment rate of 9.9 percent and Oregon's current unemployment rate of 10.6 percent (Oregon Employment Department 2010).

Lane County's unemployment rate of 10.9 percent in April 2010 is similar to the state's unemployment rate (10.6 percent). Like Linn County, Lane County's unemployment rate represents a drop in unemployment since 2009 when it was 11.9 percent; however, unemployment was more than double the 2007 level of 5.2 percent (Figure 3-11).



Source: Oregon Employment Department 2010. Bureau of Labor Statistics 2010.  
 Note: Data for 2010 is through the month of April.

**Figure 3-11. Unemployment in Linn County, Lane County, Oregon, and US**

### **Income and Poverty**

Both the median household income and per capita income in Linn County and Lane County are lower than the statewide income level (Table 3-19). In Linn County, 11.3 percent of families are living below the poverty level, which is higher than the percentage statewide (9.3 percent). The percent of individuals living below the poverty level in Linn County also exceeds the state percentage (US Census Bureau 2008a). The poverty level threshold varies by size of the household and the age of household members. In 2008, the poverty level for a single individual under 65 years of age was \$11,201. For a household of four (2 adults, 2 children), the 2008 poverty level was \$21,834 (U.S. Census Bureau 2010).

**Table 3-19. Income and Poverty in Linn County, Lane County, and Oregon**

Geographic Area	Median Household Income	Per Capita Income	Below Poverty Level	
			Families	Individuals
Linn County	\$44,977	\$22,380	11.3%	15.0%
Lane County	\$44,180	\$24,010	9.1%	15.7%
Oregon	\$49,863	\$26,326	9.3%	13.4%

Source: US Census Bureau 2008a

In Lane County, 9.1 percent of families are living below the poverty level, which is less than the state percentage. However, the percentage of individuals (15.7 percent) living below the poverty level exceeds the state rate.

**Housing and Accommodations**

The 2006-2008 American Community Survey data show that 92.4 percent of Linn County’s 46,882 housing units are occupied; of those, approximately 66.9 percent (28,975) are owner-occupied, while the remaining 33.1 percent (14,357) are renter-occupied. As shown in Table 3-20, the county’s overall occupancy rate, as well its owner-occupancy rate exceeds that of the state (US Census Bureau 2008a).

**Table 3-20. Housing Occupancy and Vacancy in Linn County, Lane County, and Oregon**

Geographic Area	Total Housing Units	Occupancy		
		Occupancy	Owner-Occupied	Renter Occupied
Linn County	46,882	92.4%	66.9%	33.1%
Lane County	149,383	93.5%	61.4%	38.6%
Oregon	1,609,297	91.0%	64.4%	35.6%

Source: US Census Bureau 2008a

The 2006-2008 estimates show that approximately 93.5 percent of Lane County’s 149,383 housing units are occupied, of which 61.4 percent (85,701) are owner-occupied, while 38.6 percent (53,914) are renter-occupied. While the county’s overall occupancy rate exceeds that of the state, its owner-occupancy rate is lower than the state rate. The higher renter occupancy rate in Lane County may be attributable to the many rental units used by students attending the University of Oregon in Eugene. The housing data presented above, however, do not reflect the recent housing decline since 2008, which likely means that current occupancy rates are lower than those reflected by the 2006-2008 estimates.

Eight hotels in Linn County and 33 hotels in Lane County provide accommodations to those visiting from out of town (ePodunk 2010a and 2010b). In addition, there are approximately 10 RV parks in Linn County and 20 RV parks/campgrounds in Lane County (Oregon RV Parks 2010a and 2010b, RV-Clubs US 2010).

**Public Facilities and Social Services**

Linn and Counties and the Cities of Albany, Harrisburg, and Junction City are the primary providers of public facilities and services within the corridor, including roads, parks, police protection, fire protection, medical services, and libraries. The Greater Albany Public School District 8J, Harrisburg School District #7, and the Junction City School District provide public school services within the corridor. Utility providers in urban areas along the corridor are listed in Table 3-21.

**Table 3-21. Utility Providers in Albany, Harrisburg, and Junction City**

Geographic Area	Utility Providers					
	Water and Sewer	Electric	Garbage/ Recycling	Natural Gas	Phone	Cable
Albany	City of Albany	Pacific Power & Light Consumers Power	Allied Waste Services of Albany-Lebanon	Northwest Natural Gas	Qwest	Comcast AT&T Broadband
Harrisburg	City of Harrisburg	Pacific Power & Light Consumers Power	Allied Waste Services of Albany-Lebanon	Northwest Natural Gas	Qwest	Comcast
Junction City	City of Junction City	Emerald People's Utility District (EPUD) Pacific Power & Light	City of Junction City	Northwest Natural Gas	Qwest	Comcast

Source: *Business Oregon 2010, City of Albany 2010, City of Junction City 2010b, City of Junction City Planning Department 2010.*

The transmission line is located in BPA's easement, which is primarily located within the P&W Railroad ROW. This ROW is shared with public streets in urban areas, 4th Street in Harrisburg, and Holly Street in Junction City. Structures associated with the corridor are located in the sidewalk, roadway, and vegetated area adjacent to 4th Street in Harrisburg and in the sidewalk and planter strip adjacent to Holly Street in Junction City. Other utilities co-located with the corridor in the P&W Railroad and public street ROW include fiber optic cable (AT&T, MCI (now Verizon)) and electric lines (Pacific Power & Light, Consumers Power, and Emerald People's Utility District [EPUD]). The AT&T and MCI (Verizon) fiber optic cable is underground and spans the length of the corridor. Local electric lines share portions of the P&W Railroad and public street ROW in Harrisburg and Junction City. These lines are generally on the opposite side of the railroad tracks and cross under the transmission line where they cross at intersections or to provide service to individual homes and businesses (Field Visit 2010b).

A variety of agencies and non-profit organizations provide social services to communities along the corridor. Examples include a YMCA, a community center, Meals on Wheels, vocational rehabilitation programs, and child welfare offices in Albany; a senior center and a family resource center in Harrisburg; and Habitat for Humanity, a senior center, a local aid center, and a family resource network in Junction City.

### **Property Taxes and Values**

State and local 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.

If BPA acquires new easements or new access roads 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 transmission line easement or 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 easements accommodate new transmission facilities and/or 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 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 Executive Order further stipulates that agencies conduct their programs and activities in a manner that does not have the effect of excluding persons from participation in, denying persons the benefits of, or subjecting persons to discrimination because of their race, color, or national origin.

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

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

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

## 3.9.2 Environmental Consequences—Proposed Action

### ***Construction Impacts***

#### *Population, Employment, and Income*

Construction activities for the Proposed Action would be expected to begin in May 2012. Rebuilding activities would be completed around December 2012 for a construction period of approximately 8 months. Danger tree removal would occur over the summer and fall months during 2012 and 2013. The work force required for construction would vary over the eight-month period. At a maximum, about 30 construction workers would be required for project construction at a given time. These minor changes in the local population and employment/unemployment rates during construction are anticipated to return to pre-construction levels upon completion of the project.

Income earned by project construction workers is not expected to increase the annual per capita or median household income levels in Linn or Lane Counties. Construction of the Proposed Action would, however, create a short-term positive impact to the economic vitality of the communities near the corridor by temporarily stimulating the economy in these communities over the short-term through the purchase of local supplies, materials, food, hotel or campground stays, and other direct or indirect spending by construction workers. Both material purchases and construction workers' salaries would have an economic multiplier effect that would add short-term income in the project area.

Access to all businesses and residences would be maintained during construction, but some could be temporarily disrupted by construction activities.

#### *Housing*

Both local and non-local construction workers are expected to be needed to construct the Proposed Action. Local workers are expected to remain in their existing housing and create no additional demand. Non-local workers would require local housing during construction. Worker accommodations could include temporary housing in hotels or recreational vehicles parked in RV parks/campgrounds. Based on existing housing vacancy rates, as well as the number of hotels and RV parks/campgrounds located throughout Linn and Lane Counties, existing local lodging is expected to be sufficient to accommodate non-local workers during construction.

#### *Public Facilities and Social Services*

During construction there could be minor negative impacts to the social and economic vitality of the affected communities resulting from temporary lane closures and/or traffic delays. There also could be increased roadside parking hazards during this time. However, access to all properties, including public facilities and social service agencies, would be maintained during construction, and local agencies, residents, and businesses would be notified of upcoming construction activities and potential disruptions to transportation facilities. The underground fiber optic lines would need to be located, and coordination with AT&T, MCI (Verizon), Pacific Power & Light, Consumers Power, and EPUD would be needed prior to construction.

### *Property Taxes and Values*

There would be no construction impacts on property taxes and values resulting from the Proposed Action.

### *Environmental Justice*

During construction, the area adjacent to the corridor would experience short-term disturbances, including noise and exhaust from construction equipment and activities, temporary changes in travel routes due to lane closures, and potential roadside parking hazards from construction vehicles and work areas. While these impacts are unlikely to affect residents and businesses in rural portions of the corridor, the commercial, industrial, and residential uses near the corridor in Harrisburg and Junction City would experience these short-term negative impacts.

In rural areas of the corridor, construction activities are unlikely to affect environmental justice populations because very few residents and businesses are located adjacent to the corridor. Similarly, in Albany, the corridor begins at the edge of the city at the Albany Substation and only passes behind approximately three single-family residences.

All persons, regardless of race or income, would experience the same minor negative impacts associated with construction within the transmission line corridor. Therefore, construction of the Proposed Action would not result in long-term disproportionately high and adverse effects on minority and low-income populations.

### ***Operation and Maintenance Impacts***

There would be no ongoing socioeconomic or public services impacts during maintenance of the line because access to all properties would be maintained and all properties could continue their current uses.

### *Population, Employment, and Income*

There would be no change in long-term impacts to population, employment, or income levels resulting from the Proposed Action. The corridor would continue to be operated and maintained in the same manner it is today after completion of construction. The Proposed Action would not result in any long-term disruptions to community character, traditions, and travel patterns because there would be no property acquisitions and therefore no displacement of residences, businesses, or other community facilities.

### *Housing*

The Proposed Action would not displace any residences, so no long-term impacts to housing in Linn and Lane Counties would occur.

### *Public Facilities and Social Services*

The Proposed Action would not result in a long-term increase in the local population that would require changes to public facilities and social services. The Proposed Action would not displace or otherwise negatively affect any agencies or organizations that provide social services to communities near the corridor; therefore no long-term impacts to social services would occur.

The Proposed Action would have a positive impact on public facilities and social services, as well as the communities they serve. Rebuilding the transmission line would improve the reliability of the electrical system and avoid potential disruptions that could occur if the structures were to continue to deteriorate.

#### *Property Taxes and Values*

The Proposed Action would not change the amount of property taxes collected by Linn and Lane Counties because BPA would not acquire any new easements or access roads. Property owners would continue to pay property taxes in accordance with existing valuations; no property devaluations are expected.

No acquisition of property for BPA easements or new permanent access roads would occur under the Proposed Action; therefore there would be no long-term impacts to property values.

#### *Environmental Justice*

All persons, regardless of race or income, would experience the same minor impacts associated with routine operations and maintenance within the transmission line corridor. Therefore, operation and maintenance of the Proposed Action would not result in long-term disproportionately high and adverse effects on minority and low-income populations.

### **3.9.3 Mitigation Measures**

Potential measures that could be applied to avoid, minimize, or mitigate impacts to socioeconomic resources and public services include the following:

- Maintain access to all businesses and residences during construction
- Coordinate with AT&T, MCI (Verizon), Pacific Power & Light, Consumers Power, and EPUD to determine exact locations of utilities and minimize service disruptions to other utility lines in the transmission line easement within the P&W Railroad ROW
- Compensate landowners at market value for any new land rights required to acquire new, temporary or permanent access roads on private lands

### **3.9.4 Unavoidable Impacts Remaining After Mitigation**

There would be no unavoidable long-term impacts resulting from the Proposed Action. During construction, however, temporary noise disruptions to residents and businesses immediately adjacent to the corridor would be unavoidable.

### **3.9.5 Environmental Consequences—No Action Alternative**

Under the No Action Alternative, the employment and income benefits of construction activities would not occur, and there would be no need for temporary housing for any construction workers. Residents and businesses along the corridor would not experience noise or air quality impacts from construction equipment. Short-term disruption along the corridor would occur for those residents and businesses in proximity to danger tree removal.

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

## **3.10 Transportation**

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### **3.10.1 Affected Environment**

#### ***Roads***

The transmission line corridor is accessed by a series of gravel and paved county roads where existing traffic volumes are generally low. Larger state highways that experience higher traffic volumes in the project corridor are limited to Oregon Route 34 (OR 34, Corvallis-Lebanon Highway) south of Albany and Oregon Route 99E (OR 99E, Albany-Junction City Highway) in Harrisburg. Average annual daily traffic volumes along OR 34 south of Albany ranged from 20,000 to 30,000 in 2009 (ODOT 2009). Average annual daily traffic on OR 99E from Harrison to Junction City ranged from 3,100 to 5,500 in 2009 (ODOT 2009).

Within the City of Harrisburg, the transmission line corridor is located within the ROW of 4th Street and crosses several lower volume urban streets from Territorial Street in the north to Lasalle Street in the south. South of Harrisburg, the corridor crosses low volume local access roads before entering Junction City. Within the City of Junction City, the transmission line corridor is located within the ROW of Holly Street and crosses several city streets from West 18th Avenue in the north to West 1st Avenue in the south before crossing Flat Creek. Street parking occurs along city streets within the transmission line corridor in Harrisburg and Junction City.

Several county roads provide limited access to the transmission line corridor from Albany to Harrisburg. City streets in Harrisburg and Junction City provide widespread access to the corridor, while county roads provide only a few access points between Harrisburg and Junction City.

#### ***Railroads***

The transmission line corridor is located within P&W Railroad ROW. This active railroad line provides service between Eugene and Albany. One train runs from Eugene to Albany and back to Eugene each day. The transmission line corridor runs parallel to Union Pacific Railroad lines between Harrisburg and Junction City; however no railroad crossings occur along the corridor.

### **3.10.2 Environmental Consequences—Proposed Action**

During construction there would be a temporary increase in traffic on nearby roads from construction vehicles delivering construction equipment and materials. Deliveries of equipment and materials to construction areas would cause short-term traffic delays along nearby city and county roads, state highways, and transmission line access roads. Temporary traffic impacts are

anticipated along 4th Street in Harrisburg and Holly Street in Junction City due to the transmission line corridor running within the ROW of both city streets. An increase in traffic could increase roadside parking hazards. Traffic delays could also be experienced at roads near construction staging areas.

At roadway crossings, pole replacement could temporarily affect traffic flow through lane closures. Replacement of structures near OR 34 and OR 99E could require closure of one traffic lane for short periods (one to three hours) while structures are being replaced. Construction-related traffic would not be expected to decrease the level of service on roadways.

No adverse transportation impacts would be expected during operation of the transmission line because there would be only minimal traffic associated with the line's operation and maintenance. The traffic associated with operation and maintenance of the transmission line, such as equipment accessing the transmission line to conduct routine periodic inspection and maintenance, would not result in appreciatively different traffic levels from existing conditions.

No impacts to rail transportation are expected along the P&W Railroad ROW during construction. BPA would obtain appropriate permits to conduct construction activities within the railroad ROW and would comply with all permit stipulations to ensure no interruptions to rail operations would occur. Similarly, during operations and maintenance activities, no impacts to the railroad are expected.

Overall, impacts on transportation would be low because these impacts would be temporary in nature and traffic delays would generally be localized to the construction area on local streets during construction.

### **3.10.3 Mitigation Measures**

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

- Prepare a notice about construction activities and a proposed schedule for posting on the Oregon Department of Transportation's (ODOT) traffic advisory web site called Trip Check ([www.tripcheck.com](http://www.tripcheck.com))
- Schedule construction activities at transmission line crossings of OR 34 and OR 99E so as to avoid lane closures during peak travel times, as determined in coordination with ODOT
- Use traffic safety signs and flaggers to inform motorists and manage traffic during construction activities on affected roads
- Repair damage to roads caused by construction
- Keep construction activities and equipment clear of residential driveways as much as possible

### **3.10.4 Unavoidable Impacts Remaining After Mitigation**

Implementation of the recommended mitigation measures would result in only minor traffic delays along nearby county roads, city streets, and state highways OR 34 and OR 99E. Minor traffic delays would be experienced during pole replacement activities at structures adjacent to these roadways.

### **3.10.5 Environmental Consequences—No Action Alternative**

Under the No Action Alternative, the transmission line components, including poles and other existing equipment, would not be replaced resulting in no construction traffic from pole replacement activities. Due to the need for continued maintenance under the No Action Alternative, intermittent traffic increases may occur from maintenance vehicles accessing areas of the transmission line corridor in need of repair. Temporary closures and periodic disruptions to traffic flow from continued maintenance of the line are expected as additional maintenance requirements are needed, or emergencies occur.

## **3.11 Air Quality**

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Additional detail on the air quality analysis is provided in the Final Air Quality Technical Report (Parsons Brinckerhoff 2010), available on request.

### **3.11.1 Affected Environment**

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

The corridor includes the Eugene-Springfield Urban Growth Boundary (UGB), which is designated a nonattainment area for PM-10 and a maintenance area for CO. A contingency plan is in place for the Eugene-Springfield UGB for PM-10 that restricts emissions from uses such as wood-waste boilers, veneer dryers, kraft pulp mills, air conveyance systems, and open burning. Air quality issues related to the operation of the transmission line are generally only affected by low levels of ozone and nitrogen oxides, which are created during normal operations. During routine maintenance, particulate matter generated by maintenance vehicles is of primary concern of the six criteria pollutants, with CO and ozone of lesser concern.

### **3.11.2 Environmental Consequences—Proposed Action**

#### ***Construction Impacts***

Construction of the Proposed Action would result in temporary higher levels of particulate matter during structure replacement, vegetation removal, access road construction and improvements, conductor stringing, and other ground-disturbing activities. Fugitive dust could be created in localized areas for short durations. Construction equipment would disturb dirt on roads and during structure replacement and emit pollutants, resulting in low-level impacts to local air quality and visibility for short durations. Contaminants of concern include CO, carbon dioxide, volatile organic hydrocarbons, sulfur oxides, particulates, and oxides of nitrogen.

The Proposed Action would result in short-term and localized emissions from internal combustion engines during construction, primarily in the form of vehicle emissions and emissions from equipment used in danger tree removal. Approximately 6,300 danger trees have been identified within the transmission line corridor for removal during construction. Given the large number of danger trees to be removed, removal would likely occur over two years. Low-growing vegetated areas that are disturbed during construction would be reseeded and would be expected to revegetate relatively quickly.

Overall, air quality and visibility impacts resulting from construction would be low because these impacts would occur near the construction site, would be temporary in nature, and would not result in violations of air quality standards.

#### ***Operation and Maintenance Impacts***

Operation and maintenance activities would occur within the BPA easement, which is primarily located within the P&W Railroad ROW. Air quality impacts during operation and maintenance would be similar to existing conditions. Fugitive dust, emissions from maintenance vehicles, and low-level ozone and nitrogen oxide emissions from normal transmission line operation would result in low impacts to air quality and visibility because these impacts would occur near the construction site, would be temporary in nature, and would not result in violations of air quality standards.

### **3.11.3 Mitigation Measures**

The following mitigation measures are identified to avoid, minimize, or compensate for potential impacts to air quality from the Proposed Action:

- Use water trucks to control dust during construction
- Keep all vehicles in good operating condition to minimize exhaust emissions
- Turn off construction equipment during prolonged periods of non-use
- Drive vehicles at low speeds (less than 5 mph) on access roads and the BPA easement to minimize dust

### **3.11.4 Unavoidable Impacts Remaining After Mitigation**

With implementation of the recommended mitigation measures, no unavoidable impacts to air quality would occur.

### **3.11.5 Environmental Consequences—No Action Alternative**

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

## **3.12 Greenhouse Gases**

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### **3.12.1 Affected Environment**

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

The principal greenhouse gases emitted into the atmosphere through human activities are carbon dioxide (CO<sub>2</sub>), methane (CH<sub>4</sub>), nitrous oxide (N<sub>2</sub>O), and fluorinated gases (EPA 2010b). Of these four gases, carbon dioxide is the major greenhouse gas emitted (EPA 2010b; Houghton 2010). For example, carbon dioxide emissions from the combustion of coal, oil, and gas constitute 81 percent of all U.S. greenhouse gas emissions (EIA 2009a). Carbon dioxide enters the atmosphere primarily through the burning of fossil fuels such as coal, natural gas and oil, and wood products; as a result of land use changes; and the manufacturing of cement. Prior to the industrial revolution, concentrations were roughly stable at 280 parts per million (ppm), but have increased 36 percent to 379 ppm in 2005, all of which is attributed to human activities ([IPCC 2007]).

Of the remaining three principal greenhouse gases, methane is emitted during the production and transport of fossil fuels, through intensive animal farming, and by the decay of organic waste in landfills. Methane concentrations have increased 148 percent above pre-industrial levels (EPA 2010b). Nitrous oxide is emitted during agricultural and industrial activities, and during the combustion of fossil fuels and solid waste. Nitrous oxide atmospheric levels have increased 18 percent since the beginning of industrial activities (EPA 2010b). Fluorinated gases, hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF<sub>6</sub>), are synthetic compounds emitted through industrial processes and now are being used to replace ozone-depleting compounds such as chlorofluorocarbons in insulating foams, refrigeration, and air conditioning. Although they are emitted in small quantities, these gases have the ability to

trap more heat than carbon dioxide and are considered high global-warming potential gases. Atmospheric concentrations of fluorinated gases have been increasing over the last two decades and are expected to continue to increase (EPA 2010b).

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

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

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

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

Stored carbon can be released back into the atmosphere when biomass is burned (ESA 2008). In addition, carbon dioxide, nitrous oxide, and methane emissions increase in areas where soil disturbance occurs (Kessavalou et al. 1998). Models predict atmospheric concentrations of all

greenhouse gases are to increase over the next century, but the extent and rate of change is difficult to predict, especially on a global scale.

### 3.12.2 Environmental Consequences—Proposed Action

Potential impacts related to greenhouse gases would generally be the same under both the Proposed Action and the No Action Alternative. Implementation of the Proposed Action would contribute to greenhouse gas concentrations in several different ways. Carbon dioxide, methane, and nitrous oxide emission levels would incrementally increase as vegetation and soils are removed and/or disturbed during construction of the transmission line (Kessavalou et al. 1998) and through the operation of construction-related vehicles during the construction period. Emissions would also occur during operation and maintenance of the transmission line. The loss of carbon storage due to danger tree removal would occur for both alternatives.

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

#### **Construction Impacts**

Greenhouse gas emissions were estimated for the Proposed Action based on the approximate number of vehicles to be used during project construction and the approximate distance those vehicles would travel during the construction period. For the Proposed Action, an estimated eight vehicle round trips per day would occur during the peak construction periods for the Proposed Action. Construction would take about 220 days, with peak construction activity occurring during the 4-month period between July 1 and October 31 in both 2012 and 2013.

To provide a conservative analysis and ensure that the Proposed Action’s potential contribution to greenhouse gas concentrations are adequately considered, greenhouse gas emissions were calculated for the entire project duration using the estimate of eight vehicle round trips per day. A round trip for the Proposed Action on the proposed project was considered to be from Eugene to the midpoint of the corridor and back to Eugene (about 56 miles).

As shown in Table 3-22, construction vehicle emissions would result in an estimated 129 metric tons of carbon dioxide emissions and an estimated 130.5 metric tons of carbon dioxide equivalent for the entire 2-year construction period. The Proposed Action’s estimated carbon dioxide equivalent emissions translate roughly to the annual carbon dioxide emissions of 25 passenger vehicles.

**Table 3-22. Estimated Greenhouse Gas Emissions from Construction Vehicle Emissions for the Proposed Action**

Activity	CO <sub>2</sub> Emissions in Metric Tons	CH <sub>4</sub> (CO <sub>2</sub> Equivalent Emissions) in Metric Tons	N <sub>2</sub> O (CO <sub>2</sub> Equivalent Emissions) in Metric Tons	Total CO <sub>2</sub> Equivalent Emissions in Metric Tons
Construction Vehicle Emissions	129.0	0.1	1.4	130.5

Though recognized as a contribution to overall greenhouse gas emissions, measurement of emissions from soil disturbances is difficult. However, research has shown that emissions as a result of soil disturbance are short-lived and return to background levels within several hours (Kessavalou et al. 1998). Based on the conservative methodology used to estimate construction vehicle emissions, the emissions related to soil disruption and annual vegetation decay are accounted for in the overall construction emission rates. Carbon that would be stored in removed vegetation would be offset in time by the growth and accumulation of carbon in soils and new vegetation.

Danger trees would be removed as part of the Proposed Action and the No Action Alternative. The total number of trees to be removed is approximately 6,300 trees. Removal of the trees would occur generally at the same time as structure replacement with the majority of tree removal during the 4-month (July through October) period during 2012 and 2013.

The nature of tree removal is to permanently convert land within the BPA easement to a non-forested area. Therefore, this action can be characterized as permanently maintaining the existing BPA easement at the minimum level of carbon storage. It is the objective of this analysis to fully account for the loss of potential solid carbon storage in the context of greenhouse gas emissions.

The greenhouse gas emissions from tree removal can be broken down further into three segments: the carbon that has the potential to be released from the existing trees, the loss of future carbon sequestration that would have occurred if each tree continued to grow to full maturity, and the energy consumed while removing the trees from the soil. The intention of this analysis was to quantify the maximum potential of greenhouse gas emissions associated with the tree removal. Within subsequent quantitative analysis, this conservative estimation can serve as a baseline to compare with other greenhouse gas emitting processes.

The estimation of the amount of carbon that may be released after removing a tree requires some assumptions:

- All of the danger trees are cottonwoods
- The average moisture content of a green tree is assumed to be 30 percent
- About 50 percent of a tree's dry-mass is comprised of carbon
- All of the carbon will eventually be oxidized into carbon dioxide and emitted into the atmosphere
- The above ground biomass of the tree increases with increasing size as expressed a measurement of the tree's dbh.

Due to the wide variety of sizes of trees along the corridor (less than 8 inches to over 36 inches), this analysis evaluated the biomass for a number of different sized trees along the corridor. Table 3-23 presents the biomass and total carbon dioxide equivalent for the various sized danger trees proposed for removal.

Tree growth and future carbon sequestration rates are highly variable and depend on several factors including the species of tree, age of the tree, climate, forest density, and soil conditions.

As an alternative to estimating tree growth rates, a simple method to estimate the loss of future carbon sequestration is via mass balance. As shown in Table 3-23, the existing biomass of trees along the corridor varies considerably. Most of the trees in the corridor are 36 inches or less in dbh; consequently, it was assumed that each tree would reach 36 inches dbh at full maturity and that the trees already at 36 inches dbh are at full maturity and would not sequester additional carbon. This is a very conservative estimate because some trees may not reach full maturity due to natural attrition. Using the same assumptions listed above, each remaining tree that reaches 36 inches dbh would have a mass of 5,262 kg and would sequester approximately 6.75 metric tons of carbon dioxide equivalent. The 5,937 trees that have not reached full maturity would have sequestered approximately 40,000 metric tons of carbon dioxide equivalent. This equates to 0.02 percent of the 167,470,000 metric tons of carbon dioxide emitted annually in BPA’s four-state service territory (EPA 2011); therefore, the overall the impact on greenhouse gases would be low. Calculations in Table 3-23 considered both the decomposition of the existing trees that would be removed as well as the future carbon sequestration that the removed trees would have provided.

Removal and disposal of each tree is an energy-consuming process that results in greenhouse gas emissions via fuel combustion. This component of greenhouse gas emissions, however, was accounted for above in terms of transmission line construction.

**Table 3-23. Carbon Dioxide Equivalent Released from Danger Tree Removal**

dbh	Total Aboveground Tree Biomass (kg) for an Individual Cottonwood Tree	Number of Trees per dbh Proposed for Removal	CO <sub>2</sub> Equivalent Released by Decomposition of Existing Trees in Metric Tons	CO <sub>2</sub> Equivalent of Future Sequestration at Final Size – 36” dbh in Metric Tons
6"	73	1,666	85	11,250
8"	145	476	48	3,214
10"	247	451	78	3,046
12"	382	513	137	3,464
14"	552	589	228	3,977
16"	760	458	244	3,093
18"	1,006	379	267	2,559
20"	1,294	400	362	2,701
22"	1,624	270	307	1,823
24"	1,999	305	427	2,060
26"	2,420	246	417	1,661
28"	2,888	184	372	1,243
36"	5,262	367	1,352	N/A
Total	N/A	6,304	4,324	40,092

### Operation and Maintenance Impacts

During operation and maintenance of the transmission line, a helicopter would be used once a year for aerial inspection and about one vehicle would travel round trip per year. Emergency trips were estimated at about two per year. The helicopter would most likely access the transmission line corridor from Portland while the vehicle trips would access the line from Eugene.

Table 3-24 presents the estimated annual greenhouse gas emission that would be expected during operation and maintenance of the transmission line. The 1.4 metric tons of carbon dioxide emissions resulting from operations and maintenance would equate to less than 0.001 percent of the 167,470,000 metric tons of the annual carbon dioxide emissions in BPA’s four-state service territory (EPA 2011); therefore, this impact would be low.

**Table 3-24. Estimated Greenhouse Gas Emissions from Vehicle Emissions for the Operations and Maintenance**

Activity	CO <sub>2</sub> Emissions in Metric Tons	CH <sub>4</sub> (CO <sub>2</sub> Equivalent Emissions) in Metric Tons	N <sub>2</sub> O (CO <sub>2</sub> Equivalent Emissions) in Metric Tons	Total CO <sub>2</sub> Equivalent Emissions in Metric Tons
Operations and Maintenance Vehicle Emissions	0.7	<0.01	<0.01	0.7
Helicopter Inspection Flight Emissions	0.7	<0.01	<0.01	0.7

### 3.12.3 Mitigation Measures

The following mitigation measures have been identified to reduce or eliminate greenhouse gas emissions. All mitigation measures would be implemented prior to, during, or immediately after construction of the Proposed Action unless otherwise noted.

- Implement vehicle idling and equipment emission measures (see mitigation measures in Section 3.11 Air Quality)
- Encourage carpooling and the use of shuttles vans among construction workers to minimize construction-related traffic and associated emissions
- Locate staging areas as close to construction sites as practicable to minimize driving distances between staging areas and construction sites
- Locate staging areas in previously disturbed or graveled areas to minimize soil and vegetation disturbance where practicable
- Use the proper size equipment for the job to maximize energy efficiency
- Use alternative fuels for generators at construction sites such as propane or solar, or use electrical power where practicable

- Reduce electricity use in the construction office by using compact fluorescent bulbs and powering off computers every night
- Recycle or salvage non-hazardous construction and demolition debris to the maximum extent practicable
- Submit a plan for approval to dispose of wood poles and danger trees locally where practicable
- Use locally-sourced rock for temporary road and ford construction, if possible

### **3.12.4 Unavoidable Impacts Remaining After Mitigation**

The removal of danger trees, together with the loss of long-term carbon sequestration, are impacts that cannot be mitigated to remove the same amount of greenhouse gases using the mitigation measures described above. In order to completely offset all greenhouse gas emissions related to the Proposed Action, BPA would need to plant almost 500,000 6-inch dbh cottonwood trees and maintain their viability on land that is currently not under BPA's control. BPA does not plan to plant and maintain 500,000 cottonwood trees; thus, the Proposed Action would have unavoidable impacts remaining after mitigation.

### **3.12.5 Environmental Consequences—No Action Alternative**

Construction-related greenhouse gas emission impacts would not occur under the No Action Alternative. Greenhouse gas emissions related to construction vehicle trips would be avoided. Since danger tree removal is part of the No Action Alternative, there would still be some vehicle trips related to tree removal and transport. The carbon released during danger tree removal for trees at their current size would be approximately 4,324 metric tons. Of the total 6,300 trees removed, nearly 6,000 trees would not have reached full maturity or maximized carbon sequestration capacity. The No Action Alternative's impact on greenhouse gas concentrations from loss of carbon sequestration in danger trees would be approximately 40,000 metric tons of carbon dioxide equivalent (see Table 3-23), equating to 0.02 percent of the 167,470,000 metric tons of carbon dioxide emitted annually in BPA's four-state service territory (EPA 2011). Vehicle emissions for operation and maintenance activities would likely be greater than what was presented for the Proposed Action as a result of more frequent trips to maintain the deteriorating structures. Overall, the impact on greenhouse gases would be low.

## **3.13 Noise, Public Health, and Safety**

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Additional detail on the noise, public health, and safety analysis is provided in the Final Noise, Public Health, and Safety Technical Report (Parsons Brinckerhoff 2010), available on request.

### **3.13.1 Affected Environment**

Transmission facilities provide electricity for heating, lighting, and other services essential for public health and safety. These same facilities can potentially harm humans. Contact with transmission lines or any electrical line can kill or seriously injure people and damage aircraft.

This section describes public health and safety concerns such as noise, hazardous materials, and electric and magnetic fields related to transmission facilities or construction activities.

### **Noise**

The main sources of noise associated with the transmission line corridor include maintenance of the equipment, transmission line corona, and the hum generated by electrical transformers. Transmission line corona generally occurs when water causes the partial breakdown of the insulating properties around transmission conductors; however, corona-generated noise is normally only audible from transmission lines with voltages of 230 kilovolts (kV) or greater. This corridor includes transmission lines with voltages of 115 kV.

Land use in the vicinity of the corridor in rural areas is predominately agricultural, with some industrial, open space, and rural-residential lands. Industrial, commercial, and residential development occurs where the corridor lies within the urban areas of Albany, Harrisburg, and Junction City.

Existing noise levels in the corridor are influenced by urban activities in Albany, Harrisburg, and Junction City, as well as in localized areas where OR 99E, OR 34, and local streets cross the corridor. Common noise-sensitive land uses in the corridor include residences, parks, schools, and churches. The majority of the corridor is located in rural and/or undeveloped areas characterized by low noise levels.

Environmental noise is commonly measured in decibels on the A-weighted scale (dBA). The A-weighted scale corresponds to the sound that humans are able to hear. Typical A-weighted sound levels from various sources are presented in Table 3-25.

**Table 3-25. Typical Sound Levels**

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

Source: EPA 1971 and 1974.

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

### **Hazardous Materials**

A review of government environmental databases that record the handling, storage, and release of hazardous materials to the environment were reviewed to document existing conditions in the corridor. No areas of hazardous material contamination within the corridor were identified

during the database review. No areas of obvious hazardous material contamination were observed during site reviews conducted at publically assessable locations throughout the corridor.

### ***Electric and Magnetic Fields***

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

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

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

There are no national guidelines or standards for electric fields from transmission lines. For siting transmission lines under its jurisdiction, the State of Oregon, through the Oregon 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 1 meter above ground surface in areas accessible to the public (OAR 345-024-0090). BPA designs transmission lines to meet its electric-field guideline of 9 kV/m maximum on the ROW and 5 kV/m maximum at the edge of the ROW.

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

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

### 3.13.2 Environmental Consequences—Proposed Action

#### **Construction Impacts**

##### *Noise*

Construction noise would temporarily result in higher noise levels during structure replacement, access road improvements, danger tree removal, and conductor stringing. Typical construction equipment used for this work and the associated noise levels by equipment type are presented in Table 3-26.

**Table 3-26. Typical Construction Noise Levels**

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

Source: EPA 1971.

Construction noise may be bothersome to those in the immediate vicinity of the corridor. Construction activity noise levels would range from 70 to 95 dBA. Construction would be limited to daytime hours and at any one location would be temporary, lasting only a matter of days. If helicopters are used for conductor stringing, their presence would result in noise levels that may exceed 100 dBA for a duration of only a few seconds. Helicopter noise levels are about 106 dBA when operating at 50 feet above ground surface.

Danger tree removal would likely occur over two years given the approximately 6,300 danger trees identified for removal within the transmission line corridor. Increased noise levels associated with this removal activity in any one location would be temporary. Construction noise associated with improvements to access roads would also be temporary.

The corridor is characterized by agricultural practices that include machinery similar in nature to construction equipment. Machinery used for agricultural purposes currently operates at similar sound levels and during similar daytime hours as construction equipment planned for use along the corridor.

Noise impacts of the Proposed Action would be low for the rural portions of the corridor because these areas are located away from noise-sensitive uses and regularly include machinery noise from agricultural practices, so it is unlikely that there would be a perceived change in overall noise levels. The portion of the Proposed Action that would be constructed adjacent to residences adjacent to the corridor and in the urban areas of Junction City and Harrisburg would have moderate impacts because residents are present in these areas and noise levels during construction would exceed ambient noise levels.

### *Hazardous Materials*

There are no known occurrences of hazardous materials or reported contamination within the corridor. BPA's typical construction practices of using small amounts of solvents, pesticides, paint products, motor and lubricating oils, and cleaners could result in a release within the corridor. If any of these materials are spilled, BPA would immediately contain and clean up the spill, and dispose of all regulated materials in accordance with state and federal laws. Impacts resulting from a hazardous materials release to soil or groundwater during construction would likely be low-to-none as it is unlikely that there would be any risk to public health and safety from contaminated materials.

### *Electric and Magnetic Fields*

During construction, the existing transmission line would be de-energized and there would be no electric and magnetic fields until the line is re-energized at the end of construction. Thus, there would be no impact to public health and safety resulting from electric and magnetic fields.

## **Operation and Maintenance Impacts**

### *Noise*

Operation and maintenance impacts would be similar to existing conditions. Operational noise includes very little noise that is audible to the human ear during normal weather conditions. During extreme weather conditions, noise would be generated by the conductors similar to the existing transmission line. Maintenance noise would be occasional and temporary as is the case with current maintenance and repair practices. Noise levels generated by maintenance activities would be similar to the construction noise levels presented in Table 3-26 depending on the nature of the repair activity.

Given the short duration and infrequent occurrence of audible operation noise and maintenance activities in the corridor and the similarities of these activities to existing practices, the noise impacts during operation and maintenance would be low as there would be no perceived change in overall noise levels.

### *Hazardous Materials*

BPA's typical operation and maintenance practices may result in the release of small amounts of solvents, pesticides, paint products, motor and lubricating oils, and cleaners in the corridor. If any of these materials are spilled, BPA would immediately contain and clean up the spill, and dispose of all regulated materials in accordance with state and federal laws. Impacts resulting from a hazardous materials release to soil or groundwater during maintenance activities would likely be low-to-none as it is unlikely that there would be any risk to public health and safety from contaminated materials.

PCP, a general biocide commonly used for wood treatment for utility poles, may be contained in new structures throughout the corridor. PCP can be leached from the structures, either at the surface or from within, as the compound moves with either aqueous solution (as from rain) or with the solvent. PCP, from the bottom part of the structure, could be leached into the soil surface or to the subsoil near the underground portion of the structure. The Electric Power and Research Institute has found that PCP concentrations decreased very rapidly with distance from

the structure (EPRI 1995); therefore, if present, the leaching of PCP into soils would result in low impacts in the immediate area (see Section 3.3, Water Quality, for additional detail) as it is unlikely that there would be any risk to public health and safety from contaminated materials.

Impacts resulting from hazardous materials used or encountered during operation and maintenance of the Proposed Action would be low as it is unlikely that there would be any risk to public health and safety from contaminated materials.

#### *Electric and Magnetic Fields*

The primary parameters that affect the electric and magnetic field levels produced by a power line are line voltage, current loading, line configuration, and line routing. The Proposed Action would not appreciably change any of these parameters. Therefore, no significant changes to the electric and magnetic field environment in the vicinity of the transmission line are expected. In a few isolated cases, pole heights would need to be increased slightly to raise the conductor-to-ground clearances. In these areas, ground-level electric and magnetic fields would decrease slightly within the ROW. No changes are expected beyond the ROW. Compliance with the State of Oregon’s electric field regulations for transmission lines would continue.

Electric and magnetic field levels for the Proposed Action are shown in Table 3-27 and Table 3-28. The data illustrate that the Proposed Action would not significantly change either the electric or magnetic field environment on the ROW.

**Table 3-27. Project Corridor Right-of-Way Electric Field Values (kV/m)**

	Eastern ROW Edge	Maximum on ROW	Western ROW Edge
Before Action	0.4	1.5	0.4
After Action	0.4	1.5	0.4

Note: Values developed from BPA modeling programs. Based upon a 100-foot ROW with one 115-kV line.

**Table 3-28. Project Corridor Right-of-Way Magnetic Field Values (milligauss, based on annual 2010 line load statistics)**

	Eastern ROW Edge		Maximum on ROW		Western ROW Edge	
	Annual Average	Annual Peak	Annual Average	Annual Peak	Annual Average	Annual Peak
Before Action	10.5	13.9	51.7	68.3	10.5	13.9
After Action	10.5	13.9	51.7	68.3	10.5	13.9

Note: Values developed from BPA modeling programs. Based upon a 100-foot ROW with one 115-kV line.

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

For the Proposed Action, no changes are expected to the operating line voltage. Additionally, the Proposed Action 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 Action is expected to either not change or possibly slightly improve radio and television interference performance along the impacted line sections and, based on past performance, interference complaints are not expected. Nevertheless, any legitimate radio or television interference complaint received by BPA will be investigated. If BPA facilities are determined to be the cause of the interference, BPA will take corrective action to eliminate the interference.

### **3.13.3 Mitigation Measures**

The mitigation measures described below are identified to avoid, minimize, or compensate for potential impacts to noise, public health, and safety from the Proposed Action.

#### **Noise**

- Prior to construction, distribute the proposed schedule of construction activities to all landowners directly impacted and post the construction schedule in parks and other noise-sensitive public uses along the corridor to inform the community of when they might experience construction-related disruptions
- Properly maintain all construction equipment, including having functioning mufflers
- Turn off construction equipment during prolonged periods of non-use
- Where possible, locate stationary equipment away from noise-sensitive properties
- Limit construction to daytime hours
- Incorporate mitigation measures discussed in this EIS into contract specifications
- Ensure the quality of the transmission line since a properly maintained line produces less noise

#### **Hazardous Materials**

- Prepare a health and safety plan that conforms to State of Oregon requirements. All on-site personnel will be responsible for knowing the information included in the health and safety plan; the health and safety plan will be kept on-site and will be available for any visitors to the site
- Hold a safety meeting to start each on-site workday to discuss potential safety concerns
- Hold monthly meetings between BPA and the contractor to discuss safety concerns
- Secure the site at the end of each work day to protect the public and on-site equipment
- Notify the BPA Contracting Officer's Technical Representative (COTR) immediately if a hazardous material is discovered that could pose an immediate threat to human health or the environment, and stop work in that area until given notice to proceed with work

### **Electric and Magnetic Fields**

No mitigation is proposed because the Proposed Action would not significantly change either the electric or magnetic field environment along the ROW.

#### **3.13.4 Unavoidable Impacts Remaining After Mitigation**

With implementation of the recommended mitigation measures, no unavoidable impacts to noise, public health, and safety are expected to occur.

#### **3.13.5 Environmental Consequences—No Action Alternative**

Under the No Action Alternative, overall impacts to public health and safety would be moderate. The existing line is at high risk of failure due to aging components and danger trees. Local and/or regional power outages could result from failure of this line, which could put public safety agencies, health providers, and businesses that rely on a steady source of power at risk. Any downed lines resulting from structure failures would have a high potential for causing fires in the vicinity of the downed line or electrocution as a result of accidental or inadvertent contact with a downed line while it is still energized, resulting in a potential risk to public health and safety.

If the structure replacement project is not implemented, the existing structures would continue to deteriorate and the increase in continual maintenance of the existing transmission lines would impact nearby noise-sensitive land uses in the urban areas along the corridor, resulting in a moderate impact in these areas. Higher noise levels produced during danger tree removal would temporarily result in a moderate impact in urban areas where residents are present. Danger tree removal would result in a low impact in rural areas that are located away from noise-sensitive uses and regularly include machinery noise from agricultural practices, so it is unlikely that there would be a perceived change in overall noise levels. Increased noise levels associated with this removal activity in any one location would be temporary.

Ongoing maintenance and repair could potentially disturb unknown hazardous materials and result in an unexpected release to the environment that could result in a temporary impact to public health and safety in the urban areas where residents are located, resulting in a moderate impact. Impacts to public health and safety in the rural areas would be low because it is unlikely that unidentified contaminated materials would cause a risk to public health and safety.

## **3.14 Cumulative Impact Analysis**

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This section describes the potential cumulative impacts associated with the Proposed Action. Cumulative impacts are the impacts on the environment that 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 Action, 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 Action.

### **3.14.1 Cumulative Development**

The nature and extent of existing development due to past and present actions in the vicinity of the Proposed Action is largely described in the “Affected Environment” sections for each environmental resource that appear in Sections 3.1 through 3.12 of this chapter. In addition to BPA’s access road and vegetation management work for the existing transmission line in the project corridor, past actions that have adversely affected natural and human resources in the project area include agricultural activities; highway and railroad construction; and commercial, industrial, and residential development. Reasonably foreseeable future actions include the following:

- ODOT is planning improvements to US Highway 20 (US 20) from Corvallis to Albany. The north terminus of the US 20 project is approximately one-half-mile north of the Albany Substation.
- Linn County is working with ODOT to improve capacity on OR 34, including where the transmission line corridor crosses OR 34. Proposed OR 34 improvements include items such as additional lanes, interchange modifications, and related changes to frontage and county roads (Linn County, Transportation Plan, 2005).
- Lane County has several projects planned in the project area to improve county roads, such as modernization of 18th Avenue East, River Road, and Prairie Road in Junction City, which are adjacent to and/or cross the transmission line corridor (Lane County Transportation System Plan, 2007).
- Other state and county road maintenance activities, such as paving and culvert replacement, could also occur in the project area.
- P&W Railroad improvements, such as track replacement, would occur in the project area.
- BPA would continue to operate and maintain the transmission line. 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, adjacent to the transmission line corridor would continue into the foreseeable future.
- The State of Oregon is planning to construct a new Oregon State Hospital and state prison on a 90-acre parcel southeast of the intersection of OR 99E and Milliron Road, about two miles south of Junction City and within the Junction City UGB. The new hospital is being planned as a 174-bed psychiatric care facility that the state estimates

will generate up to 1,500 new jobs in the area. The state is currently planning to complete construction and open the hospital in 2014. The new prison is being planned as an approximately 530-bed minimum security facility and an approximately 1,260-bed medium security facility. The prison is currently scheduled to be constructed and open in two steps; the minimum security facility may open in 2014 and the medium security facility in 2019. When fully occupied, the prison is expected to result in approximately 500 new jobs in the area. Work to date has largely focused on site preparation activities, such as extending pipelines, building new water towers, a ground water storage reservoir, and a new pump station, as well as constructing sewer force mains and making improvements to a sewer pump station.

- The Proposed Action would cross through the UGBs of Albany, Harrisburg, and Junction City. Outside of the UGBs, limited rural-residential development is expected to occur adjacent to the transmission line corridor in areas zoned for residential use outside of the UGBs. Higher-density residential and other urbanized uses are expected to continue to be developed within the Albany, Harrisburg, and Junction City UGBs.
- The Calapooia Watershed Council is currently involved with habitat restoration projects for streams in this watershed.

### **3.14.2 Cumulative Impacts**

The Proposed Action, in combination with past, present, and reasonably foreseeable actions, could result in cumulative impacts to the natural, physical, and socioeconomic resources described in Sections 3.1 through 3.12 of this EIS. The following analysis describes these potential cumulative impacts, in the order that the resources are previously presented in this chapter.

#### ***Land Use***

Land use and recreation in the corridor has incrementally changed due to past and present development, and this trend is expected to continue. Because the Proposed Action would merely rebuild the existing transmission line in its current location with similar structures and conductor, it would not contribute to cumulative land use impacts.

#### ***Geology and Soils***

The principal past and ongoing activities that affect geology and soils in the vicinity of the corridor are related to agricultural production and, to a lesser extent, residential and commercial development. The Proposed Action would not contribute to cumulative impacts to geology and soils in the corridor.

#### ***Water Resources***

Activities other than those of the Proposed Action in the vicinity of the corridor have the potential to impact water quality through erosion and overland transport of suspended sediments to streams downstream of these operations. These activities include past, present, and future residential, commercial, and state facilities development; agricultural operations,

including farming and the raising of livestock (primarily sheep and horses); ongoing road, railroad, and bridge maintenance; and BPA's danger tree removal program.

Reasonably foreseeable future projects likely would result in additional impacts on water quality. The major cumulative impacts to streams in the vicinity of the corridor would continue to be from agriculture and road and urban development. However, improvements to streams would be made through habitat improvement projects in the watersheds crossed by the corridor as stream enhancement projects are implemented and as stream barriers are removed. The Calapooia Watershed Council is currently involved with habitat restoration projects for streams in this watershed. Because the anticipated post-construction conditions within the corridor would be essentially the same as the existing baseline conditions, it is expected that the Proposed Action would result in few adverse impacts to the aquatic environment associated with ground-disturbing activities, as discussed in Section 3.3. These few adverse impacts are not expected to contribute to significant cumulative impacts.

### ***Wetlands and Floodplains***

Past and present cumulative actions in the vicinity of the corridor have impacted floodplains through development and disturbances. Linn County has a Floodplain Management Code (Linn County Title 8 Building Code, Chapter 870), and Lane County has a Floodplain Combining Zone (Lane County Land Use and Development Code, Section 16.244), both of which regulate development in floodplains. Lane County is currently reviewing its floodplain development regulations that could further limit development within floodplains. The extent to which cumulative development may impact floodplain function is unknown, but is expected to be low due to floodplain protections. Construction of the Proposed Action would not change floodplain function as existing structures would just be replaced by new structures using the same approximate footing locations. Therefore, the cumulative impact of the Proposed Action and other past, present, and reasonably foreseeable projects on floodplains would be low.

Incremental losses and degradation of wetlands over time have cumulatively depleted wetland resources in Oregon and throughout the U.S. 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. Wetland impacts also likely occurred from construction of the P&W Railroad, 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 a project's Section 404 permitting requirements. The Proposed Action would result in the temporary disturbance to approximately 1.4 acres of wetlands, which would be mitigated by wetland restoration at the same location as the disturbance. Therefore, the Proposed Action would not be expected to contribute to cumulative impacts to wetlands.

### ***Vegetation***

Past and present corridor clearing and danger tree removal, access road construction and maintenance, agriculture, grazing, and development have resulted in a cumulatively significant change in the composition of vegetation in the corridor. Reasonably foreseeable future actions,

such as BPA's vegetation management and danger tree removal, P&W Railroad track maintenance, ongoing agriculture, and development, would continue this trend.

Anticipated post-construction conditions within the corridor would include reductions in the adjacent overstory canopy and altered succession profiles that would result from removal of approximately 6,300 danger trees along much of the 32-mile corridor. Specifically, danger trees would be selectively cleared, primarily east of the railroad tracks. Following selected removals, the remaining trees and shrubs within and adjacent to the corridor would be released (i.e., experience accelerated growth into the newly available crown habitat). However, given the requirements and cyclical nature of BPA's danger tree removal program, it is unlikely that the corridor would return to current overstory tree heights and densities. Anticipated post-construction conditions within the portions of the corridor, including BPA's maintained/mowed easement, include removal of vegetation for construction of temporary and permanent access roads as well as improvement of existing access roads totaling approximately 55.5 acres.

The Proposed Action as described above would have moderate impacts to vegetation, both in uplands and wetlands, modifying existing vegetation species cover, distribution, and dominance. These moderate impacts would contribute to the cumulative impacts on vegetation.

Past and present activities in the corridor have led to a spread of noxious weeds in the vicinity, and this could continue with reasonably foreseeable future actions. Although mitigation measures have been identified to minimize the spread of noxious weeds by the Proposed Action, it is possible that noxious weed impacts would still occur. The Proposed Action thus could contribute incrementally to cumulative impacts on noxious weeds.

### ***Fish and Wildlife***

Cumulative impacts to fish in the corridor include past and current impacts from agriculture, erosion and increased inputs of fine sediments, road-building activities, grazing, altered flow regimes, and reduced water quality as a result of human development. These activities and other reasonably foreseeable future actions would continue to affect fish habitat and populations. The Proposed Action would have low-to-moderate impacts to fish through in-water work, temporary and permanent access road construction (including fords/culverts), temporary construction disturbance, and both general vegetation and danger tree removal within the corridor. These impacts from the Proposed Action would contribute to cumulative impacts on fish.

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 corridor), and other uses have resulted in the cumulative loss of wildlife habitat. The Proposed Action would have moderate impacts to wildlife and wildlife habitat through temporary and permanent access road construction, temporary construction disturbance, and vegetation removal. The Proposed Action would reduce the overall available perching, foraging, and nesting habitat available for wildlife species. Therefore, impacts from the Proposed Action would contribute to cumulative impacts on wildlife species and wildlife habitat.

### ***Visual Quality***

Danger tree removal would result in a moderate to high long-term impact on visual quality in rural areas where both the transmission line corridor and trains would be more visually dominant as a result of the tree removal. In urban areas, danger tree removal would result in low to moderate impacts because this would not substantially change the views given the dense urban development already present. Trees would not be replanted or allowed to regrow in the project corridor, resulting in a long-term change to visual quality. Other projects likely to contribute to changes in visual quality include roadway improvements, P&W Railroad improvements, and construction of the Oregon State Hospital and prison. The impacts of the Proposed Action would contribute to the cumulative impacts on visual quality.

### ***Cultural Resources***

The Proposed Action would not affect cultural resources, so it is unlikely that it would contribute to other past, present, or reasonably foreseeable projects to result in cumulative impacts on cultural resources.

### ***Socioeconomics and Public Services***

The Proposed Action would likely not result in any changes in population, and thus there would not be a contribution to cumulative population levels. In addition, because the Proposed Action would not be expected to disproportionately affect any low-income populations, it would not cumulatively contribute to any impacts on low income populations.

Because the employment and income associated with rebuilding the transmission line would be temporary and limited in duration, the Proposed Action is not anticipated to contribute to noticeable long-term economic benefits (employment, income, tax revenue) or demand for housing in communities along the corridor. If other construction projects occurred simultaneously with the transmission line rebuild, such as the development of the Oregon State Hospital and/or state prison near Junction City, the Proposed Action would contribute to a cumulative temporary increase in employment, tax revenue, and housing demand.

### ***Transportation***

Past and present cumulative actions have resulted in the development of numerous roads in the project corridor, including state highways, rural roads, and other paved and graveled roads. The existing transmission lines have been in the project corridor for over 50 years, and the existing roadway network has been used primarily for maintaining the lines. The existing transmission corridor has also used the P&W Railroad ROW for over 50 years. The Proposed Action would result in only temporary impacts to transportation and traffic, such as traffic delays and temporary lane closures, and would not contribute to long-term cumulative vehicle or rail traffic impacts in the project area.

### ***Air Quality***

Air quality in the corridor has incrementally changed as a result of past and present development, vehicles traveling on local roads, and periodic residential and agricultural burning. This trend would be expected to continue. The Proposed Action would result in only temporary

impacts to air quality, such as temporary increases in particulate matter, fugitive dust, and disturbance of dirt, so it would not contribute to cumulative impacts on air quality.

### **Noise, Public Health, and Safety**

Noise, public health, and safety in the corridor have incrementally changed as a result of past and present developments and associated noise and hazardous materials; this trend would be expected to continue. Because the Proposed Action would result in low impacts, with moderate impacts occurring temporarily in the urban areas during construction, it would likely not contribute to cumulative impacts related to noise, public health, and safety.

## **3.15 Relationship between Short Term Uses of the Environment and Long-term Productivity**

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The Proposed Action does not pose impacts that would significantly alter the long-term productivity of the affected environment. Soils and vegetation within the affected environment that were disturbed in the 1940s during construction of the existing transmission line have largely recovered. While there is never complete recovery, long-term productivity of the affected environment has not been significantly altered because revegetation of grasslands and crop production continues to occur. Similar impacts followed by recovery of productivity are expected to occur as a result of the Proposed Action.

## **3.16 Irreversible and Irrecoverable Commitment of Resources**

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Irreversible commitment of resources is the use of nonrenewable resources such as minerals or petroleum-based fuels. Irrecoverable commitments of resources cause the lost production or use of renewable resources such as timber or farmland.

The Proposed Action would consume aluminum, steel, other metals, wood, gravel, sand, plastics, and various forms of petroleum products in the construction of the transmission line and development and improvement of access roads. Most of these materials are not renewable and could be an irreversible commitment of resources if not recycled (metals and glass) or reused (sand and gravel) at the end of the life of the project. Development of the transmission line would also cause commitments that result in the loss of wildlife habitat for certain species. The use of these nonrenewable resources would be irreversible.

There are no anticipated irrecoverable commitments as a result of the Proposed Action.

## **3.17 Intentional Destructive Acts**

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Intentional destructive acts, that is, acts of sabotage, terrorism, vandalism, and theft, sometimes occur at power utility facilities. Vandalism and thefts are most common, and recent increases in the prices of metal and other materials have accelerated thefts and destruction of Federal, state and local utility property. BPA has seen a significant increase in metal theft from its facilities in past years due in large part to the high price of metals on the salvage market. There were more

than 50 burglaries at BPA substations in 2006. The conservative estimate of damages for these crimes is \$150,000, but the actual amount is likely much higher since this number does not factor in all the labor-related costs associated with repairing the damage.

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

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

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

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

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

In addition, roadways experience gridlock where traffic signals fail to operate. Mass transit that depends on electricity, such as light rail systems, can be impacted. Sewage transportation and treatment can also be disrupted.

Electricity loss also affects alarm systems, communication systems, cash registers, and equipment for fire and police departments. Loss of power to hospitals and people on life-support systems can be life threatening.

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

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

# Chapter 4. Environmental Consultation, Review, and Permit Requirements

This chapter addresses Federal statutes, implementing regulations, and Executive Orders requiring consultation, review, and/or permits or approvals, and discusses the applicability of these requirements to the Proposed Action. This Draft EIS is being 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

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

## 4.2 Vegetation, Wildlife, and Fish

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### 4.2.1 Endangered Species Act

The ESA of 1973 (16 USC 1531 *et seq.*), 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 ESA is administered by the USFWS for wildlife and freshwater species, and by the National Oceanic and Atmospheric Administration (NOAA) National Marine Fisheries Service (NOAA Fisheries Service) for marine and anadromous species. The ESA defines procedures for listing species, designating critical habitat for listed species, and preparing recovery plans. It also specifies prohibited actions and exceptions.

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

A Section 7 Consultation under the ESA will be required to address potential impacts to listed fish, wildlife, or plant species, including Chinook salmon, steelhead trout, and Oregon chub (Table 4-1). Surveys of additional portions of the project corridor (e.g., access roads and danger tree removal areas) may be required. The likely outcome of the consultation would be an

incidental take permit authorized by Section 10(a)(1)(B) for impacts related to listed fish, wildlife, or plant species during construction, operation, and maintenance activities.

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

Species (Scientific Name)	Status and Critical Habitat Designation	Preliminary Determination*
Upper Willamette River Chinook salmon ( <i>Onchorhynchus tshawytscha</i> )	Threatened Critical Habitat Designated	May Affect, Likely to Adversely Affect
Upper Willamette River steelhead ( <i>Onchorhynchus mykiss</i> )	Threatened Critical Habitat Designated	May Affect, Likely to Adversely Affect
Oregon chub ( <i>Oregonichthys crameri</i> )	Threatened	May Affect, Likely to Adversely Affect
Fender's blue butterfly ( <i>Icaricia icarioides fenderi</i> )	Endangered Critical Habitat Designated	No Effect
Golden paintbrush ( <i>Castilleja levisecta</i> )	Threatened	No Effect
Willamette daisy ( <i>Erigeron decumbens</i> var. <i>decumbens</i> )	Endangered Critical Habitat Designated	No Effect
Water howellia ( <i>Howellia aquatilis</i> )	Threatened	No Effect
Bradshaw's desert parsley ( <i>Lomatium bradshawii</i> )	Endangered	May Affect, Not Likely to Adversely Affect
Kincaid's lupine ( <i>Lupinus sulphureus</i> ssp. <i>Kincaidii</i> )	Threatened Critical Habitat Designated	No Effect
Nelson's checkermallow ( <i>Sidalcea nelsoniana</i> )	Threatened	May Affect, Not Likely to Adversely Affect

\*Determinations will be finalized after consultation with USFWS and NOAA Fisheries Service is completed and before the Record of Decision is issued.

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

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

BPA has consulted with the ODFW and incorporated recommendations to avoid and minimize potential impacts to fish and wildlife resources. The Proposed Action would have moderate to low impacts on fish as shown in Section 3.6 (Fish and Wildlife) of this EIS. Mitigation designed to avoid and minimize impacts to fish and wildlife and their habitat is identified in Sections 3.3 (Water Resources) and 3.6 (Fish and Wildlife) of this EIS.

### **4.2.3 Magnuson-Stevens Fishery Conservation and Management Act**

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

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

Chinook salmon (*Oncorhynchus tshawytscha*) UWR ESU is administered under the amended Magnuson-Stevens Act and is found within seven rivers and streams crossing the corridor. Compliance with the Magnuson-Stevens Act is typically handled by incorporating an impact analysis of the EFH within the biological assessment prepared in compliance with Section 7 of the ESA.

### **4.2.4 Migratory Bird Treaty Act**

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

Forty-two species of birds protected under the Act were observed within the corridor. Compliance with the MBTA may be required and will be accomplished by working with USFWS to determine impacts and any required mitigation measures.

### **4.2.5 Executive Order 13186, Responsibilities of Federal Agencies to Protect Migratory Birds**

Executive Order 13186, issued on January 17, 2001, directs each Federal agency undertaking actions that may negatively impact migratory bird populations to work with the USFWS to develop an agreement to conserve those birds. The protocols developed by this consultation are intended to guide future agency regulatory actions and policy decisions; renewal of permits, contracts, or other agreements; and the creation of or revisions to land management plans. This order also requires that the environmental analysis process include effects of Federal actions on

migratory birds. On August 3, 2006, the USFWS and the U.S. Department of Energy signed a Memorandum of Understanding (MOU) to complement the Executive Order. BPA, as part of the Department of Energy, will work cooperatively in accordance with the protocols of the MOU.

#### **4.2.6 Bald and Golden Eagle Protection Act**

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

Potential occurrence of bald eagles in the project vicinity and potential impacts from the Proposed Action are discussed in Section 3.6 (Fish and Wildlife) of this EIS. Compliance with the Bald and Golden Eagle Protection Act would be required to address potential impacts to bald eagles since they are known to nest within 2 miles of the corridor. Mitigation measures to avoid and minimize impacts to bald eagles are also identified.

#### **4.2.7 Oregon Fish Passage Law**

Since August 2001, the owner or operator of an artificial obstruction located in waters in which native migratory fish are currently or were historically present must address fish passage requirements prior to certain trigger events. Laws regarding fish passage may be found in Oregon Revised Statutes 509.580 through 509.910 and in Oregon Administrative Rules 635, Division 412. A fish passage plan is anticipated since structures such as culverts or fords would be placed within fish-bearing streams. BPA may need to complete a Fish Passage Plan for a Road-Stream Crossing, as part of the State’s Removal/Fill Program (discussed in Section 4.3), and submit plan sheets to ODFW. BPA intends to meet the requirements of these regulations as part of this project, although it would not obtain the written approval that the Proposed Action complies with the fish passage law. As a Federal agency, BPA is not required to comply with state and local stream habitat approvals or permits; however, BPA strives to meet or exceed these substantive standards and policies of state and local plans and programs to the maximum extent practical.

### **4.3 Water Resources**

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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(a)(1) of the Clean Water Act requires that applicants for Federal permits and licenses obtain certification from the state where the discharge into waters of the U.S. occurs that the discharge will comply with state water quality standards. A Federal permit to conduct an activity that results in discharges into waters of the U.S., including wetlands, is issued only after the affected state certifies that existing water quality standards would not be violated if the permit were issued. For this project, Oregon DEQ would review necessary permits for compliance with state water quality standards.

Section 402 of the Clean Water Act authorizes stormwater discharges associated with industrial activities under the National Pollutant Discharge Elimination System (NPDES). BPA, as a Federal

agency, holds and maintains an agency NPDES General Storm Water 1200-CA Permit from Oregon DEQ. BPA has been instructed by Oregon DEQ to comply with the Federal General Construction permit (January 8, 2009) until the state revises the 1200-CA permit. BPA will prepare and implement a Storm Water Pollution Prevention Plan (SWPPP) involving the installation of appropriate BMPs, monitoring of any discharges, hazardous materials management, and site restoration. This plan helps ensure that erosion control measures are implemented and maintained during construction. It also addresses BMPs for stabilization and stormwater management. Within the city limits of Albany, Oregon, the city has been given regulatory authority to issue NPDES permits for construction that disturbs greater than 2,000 square feet in area.

Section 404 of the Clean Water Act establishes a permitting program to regulate the discharge of dredged or fill material into waters of the U.S., including wetlands. This includes excavation activities that result in the discharge of dredged material into waters of the U.S. Dredge and fill activities are controlled by a Section 404 permit process that is administered by the Corps in conjunction with state agencies that have been delegated this authority. In Oregon, the Oregon Department of State Lands (DSL) is the state agency with permitting authority over discharges of dredged or fill materials. Through its Removal-Fill Law (ORS 196.795-990), 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 Sections 3.3 (Water Resources) and 3.4 (Wetlands and Floodplains) of this EIS, proposed replacement of wood pole structures and operation and maintenance would impact waters of the U.S., including wetlands. Mitigation measures have been identified in this EIS to avoid, minimize, and compensate for any impacts to streams and rivers, 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**

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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 evaluation of project impacts on floodplains and wetlands is included in Section 3.4 (Wetlands and Floodplains) of this EIS. This evaluation serves as the notice of floodplain/wetlands involvement for this project.

## **4.5 Cultural and Historic Resources**

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

under these laws when their aboriginal territory falls within a Proposed Action area. Laws and other directives for the management of cultural resources include the following:

- Antiquities Act of 1906 (16 U.S.C. 431-433)
- Historic Sites Act of 1935 (16 U.S.C. 461-467)
- National Historic Preservation Act (NHPA) of 1966 (16 U.S.C. 470 *et seq.*), as amended, inclusive of Section 106
- Archaeological Data Preservation Act 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.*)
- Executive Order 13007 Indian Sacred Sites
- American Indian Religious Freedom Act of 1978 (PL 95-341, 92 Stat. 469, 42 U.S.C. 1996, 1996a).

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

Section 101(d)(6) of the NHPA specifies that properties of traditional religious and cultural importance to a Native American Tribe (also known as Traditional Cultural Properties [TCPs]) may be determined to be eligible for inclusion on the NRHP. In carrying out its responsibilities under Section 106, a Federal agency is required to consult with any Native American Tribe that attaches religious or cultural significance to any such properties. NAGPRA requires consultation with appropriate Native American Tribal authorities prior to the excavation of human remains or cultural items (including funerary objects, sacred objects, and objects of cultural patrimony) on Federal or tribal lands. NAGPRA recognizes Native American ownership interests in some human remains and cultural items found on Federal lands and makes illegal the sale or purchase of Native American human remains, whether or not they derive from Federal or Indian land. Repatriation, on request, to the culturally affiliated tribe is required for human remains.

Executive Order 13007 addresses "Indian sacred sites" on Federal and tribal land. Section 1(b)(iii) defines sacred site as "any specific, discrete, narrowly delineated location on Federal land that is identified by an Indian tribe, or Indian individual determined to be an appropriately authoritative representative of an Indian religion, as sacred by virtue of its established religious significance to, or ceremonial use by, an Indian religion; provided that the tribe or appropriately

authoritative representative of an Indian religion has informed the agency of the existence of such a site.” Section 1 (a)(1-2) requires agencies where appropriate to avoid adversely affecting the physical integrity to such sites, accommodate access to and ceremonial use of Indian sacred sites by Indian religious practitioners. Section 2 requires agencies to develop procedures to facilitate consultation with appropriate Native American Tribes and religious leaders, and to expedite resolution of disputes relating to agency action on Federal lands.

The American Indian Religious Freedom Act established a national policy that protects and preserves to American Indians their inherent right of freedom to believe, express, and exercise traditional religions.

BPA has begun the Section 106 consultation process for this project with the Confederated Tribes of the Grand Ronde, the Confederated Tribes of the Warm Springs Reservation, the Confederated Tribes of Siletz, the Klamath Indian Tribe, and the Cow Creek Band of the Umpqua Tribe of Indians. BPA also met with the Confederated Tribes of the Grand Ronde at their request to discuss the project and potential impacts to cultural resources.

The transmission line and substations are recommended eligible to the NRHP as a contributing segment of the Multiple Property Documentation of the Bonneville Power Administration Transmission System (Kramer 2010a). The project would consist of replacing the poles with like components (i.e., replacing poles with wood poles) with no alterations at either of the substations. The project would not affect any of the other character-defining elements of the transmission line. It would not alter the original design character or essential function of the transmission line and therefore would not alter their integrity of materials, design, or workmanship. BPA recommends a finding of no adverse effect to the transmission line and two substations. Additional cultural resources investigations were conducted along the transmission line corridor and the results are being sent to the SHPO and tribes for concurrence (see Section 3.8, Cultural Resources of this EIS).

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

## 4.6 Farmland Protection Policy Act

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The Farmland Protection Policy Act (7 U.S.C. 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 Action 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 comply with the Act and would have little or no impact on area farmlands. Approximately 37 acres of agricultural land would be temporarily impacted, primarily for temporary access roads. These 37 acres are designated as Prime Farmlands (22 acres) and Farmlands of Statewide Importance (15 acres). No permanent conversion of farmlands would occur as a result of the Proposed Action.

## 4.7 State and Local Plan and Program Consistency

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

Table 4-2 identifies state and local land use plans that guide development in the project area.

Three typically applicable local permits for actions similar to BPA's Proposed Action are Linn and Lane Counties' Greenway District permits and the City of Harrisburg's ROW permit. Structure 27/4 approaches the Linn County Greenway District; structure 27/5 lies within the Linn County Greenway District; and structure 27/6 is within the Lane County Greenway District. Replacement of the conductor would typically require the Linn County Willamette River Greenway Conditional Use Permit but would not trigger the Lane County Greenway Development Permit because BPA does not intend to replace structure 27/6. Structure 27/6 is a steel structure that is in good condition. The City of Harrisburg typically requires its ROW permit to ensure the replacement structures, associated conductor, and other Proposed Action elements are safe. BPA intends to meet the requirements of these regulations.

**Table 4-2. Local Land Use Plans in the Project Area**

State		
Oregon Department of Land Conservation and Development (DLCD)	Oregon Statewide Planning Goals	These goals constitute the framework of Oregon's statewide program of land use planning. Construction of the transmission line outside of urban growth areas may need to be evaluated for compliance with these goals, specifically for Goal 15, Willamette River Greenway.
Oregon Parks and Recreation Department (OPRD)	2005-2014 Oregon Statewide Trails Plan	Oregon's official plan for recreational trail management for the next 10 years, serving as a statewide and regional information and planning tool to assist Oregon recreation providers (local, state, Federal, and private) in providing trail opportunities and promoting access to Oregon's trails and waterways.
	2008-2012 Oregon Statewide Comprehensive Outdoor Recreation Plan (SCORP)	Oregon's basic five-year plan for outdoor recreation. It provides information and recommendations to guide Federal, state, and local units of government, as well as the private sector, in making policy and planning decisions.
State of Oregon	Oregon Revised Statutes (ORS)	The ORS establishes priorities for including land inside urban growth boundaries (UGBs); goal exceptions would need to demonstrate consistency with ORS 197.298.
County		
Linn County	Linn County Land Development Code	Subtitle 2, Land Development Code, regulates land uses and development standards for the County zoning districts.
	Linn County Land Development Code Comprehensive Plan	Subtitle 1, Comprehensive Plan, Linn County's long-range policy document that guides growth and development outside of cities' urban growth boundaries.
Lane County	Lane County Code	Chapter 10, Zoning, regulates land uses and development standards for County zoning districts.
	Lane County Comprehensive Plan	Lane County's long-range policy document that guides growth and development outside of cities' UGBs.
Regional		
Lane Council of Governments (LCOG)	Rivers to Ridges Vision and Strategies	Broad regional perspective guide to the development of a parks and open space vision for the Eugene-Springfield Metropolitan Area.
	Junction City Downtown Plan	A vision for Junction City's downtown and the basis for future transportation-related capital improvements.
City		
City of Albany	Albany Comprehensive Plan	The City of Albany's comprehensive plan is a long-range policy document that guides growth and development in Albany.
	Albany Zoning Code	The City of Albany's zoning code regulates development throughout the City.
City of Harrisburg	Harrisburg Comprehensive Plan	The City of Harrisburg's comprehensive plan is a long-range policy document that guides growth and development in Harrisburg.
	Harrisburg Zoning Code	The City of Harrisburg's zoning code regulates development throughout the City.
Junction City	Junction City Comprehensive Plan	The Junction City comprehensive plan is a long-range policy document that guides growth and development in Junction City.
	Junction City Zoning Code	Junction City's zoning code regulates development throughout the City.

## 4.8 Environmental Justice

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In February 1994, Executive Order 12898, Federal Actions to Address Environmental Justice in Minority and Low-Income Populations, was released to Federal agencies. This order states that Federal agencies shall identify and address as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations. Minority populations are considered members of the following groups: American Indian or Alaskan 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 Action has been evaluated for potential disproportionately high environmental effects on minority and low-income populations and none were identified (see Section 3.9, Socioeconomics and Environmental Justice, in this EIS).

## 4.9 Public Health and Safety

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

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

If a hazardous material, toxic substance, or petroleum product is discovered that may pose an immediate threat to human health or the environment, BPA requires the contractor to notify the 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 (42 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 Action would not affect any sole source aquifers or other critical aquifers, or adversely affect any surface water supplies.

## 4.10 Noise

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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 3.12 (Noise, Public Health, and Safety) of this EIS, the Proposed Action would have primarily temporary low to moderate noise impacts, and mitigation measures are identified to further reduce noise impacts.

## 4.11 Air Quality

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The Clean Air Act, as amended (42 USC 7401 *et seq.*), requires the EPA and individual states to carry out a wide range of regulatory programs intended to ensure attainment of the NAAQS. Air quality impacts of the Proposed Action would be low, localized, and temporary, as discussed in Section 3.11 (Air Quality) in this EIS.

## 4.12 Greenhouse Gases

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Given the nature and extent of greenhouse gas emissions and their contribution to climate change, the appropriate area of impact evaluation is global. For consideration of reasonably foreseeable future actions, the life of the project (approximately 50 years) is deemed appropriate. However, it is recognized that greenhouse gases have been accumulating, and will continue to accumulate, in the atmosphere.

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

Nonetheless, in a general sense, it can be assumed that any action where fossil fuels have been or are being burned contributes to greenhouse gas concentrations. Examples of such actions include home heating, automobile and other vehicle use, electricity generation, processing and manufacturing of goods, and wood-burning activities among others. In addition, actions that

result in the disturbance of soil or loss of vegetation can also increase greenhouse gas concentrations. Vegetation can affect concentrations in two ways. First, if vegetation is removed prior to maturation, the carbon storing potential is lost and carbon dioxide can no longer be sequestered in that vegetation. Second, if that vegetation is burned, it will release all of the carbon it has sequestered back into the atmosphere as carbon dioxide. These past actions are likely still occurring and will continue to occur in the future at some unknown level.

To analyze the cumulative impact of the Proposed Action, global, national, and regional greenhouse gas emissions were considered. In 2006, the U.S. Energy Information Administration (EIA) estimated global greenhouse gases emissions at 29,017,000,000 metric tons of carbon dioxide equivalent (EIA 2009b). In 2008, total U.S. greenhouse gas emissions were estimated at 6,956,800,000 metric tons of carbon dioxide equivalent. Overall, total U.S. emissions rose approximately 14 percent from 1990 to 2008. In 2009, the four states within BPA’s service territory emitted roughly 167,470,000 metric tons of carbon dioxide (see Table 4-3) (EPA 2011).

**Table 4-3. Estimated Annual CO<sub>2</sub> Emissions for the BPA Service Territory**

State	CO <sub>2</sub> Emissions Only in Metric Tons (2009)
Idaho	15,360,000
Montana	32,460,000
Oregon	41,270,000
Washington	78,380,000
Total	167,470,000

Source: EPA 2011

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

In the Northwest region of the U.S., statistical data indicate that the annual average temperature has risen approximately 1.5 degrees F over the past century, with some areas experiencing increases up to 4 degrees F. Many experts believe that this temperature rise is a major contributing factor to the 25 percent reduction in average snowpack in the Northwest over the past 40 to 70 years. A continued decline in snowpack in the mountains will decrease the amount of water available during the warm season. A 25- to 30-day shift in the timing of runoff has been observed in some places, and the trend is expected to continue as the region’s average temperature is projected to rise another 3 to 10 degrees F in the 21st century (U.S. Global Research Program 2009).

In terms of cumulative impacts to the atmospheric levels of greenhouse gases, any addition, when considered globally, could contribute to long-term significant effects in terms of climate change. However, the concentrations estimated for the Proposed Action and No Action Alternative (approximately 45,000 metric tons of carbon dioxide equivalent), when compared to the regional (0.025 percent), national, and global rates, are negligible and comparatively insignificant. In addition, the potential ability of the Proposed Action to assist in the transmission and distribution of renewable (non-fossil fuel burning) energy, such as wind power, would help offset the Proposed Action's contribution to cumulative greenhouse gas impacts. As of August 2010, wind, solar, and hydro accounted for 49 percent of the generation capacity transmitted by BPA. By September 2013, the wind, solar, and hydro components are forecasted to be 56 percent of the generation capacity transmitted by BPA (BPA 2010).

### **4.13 Federal Communications Commission**

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Federal Communications Commission (FCC) regulations require that transmission lines be operated so that radio and television reception are not seriously degraded or repeatedly interrupted. Further, the 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 Action (see Section 3.11, Public Health and Safety, of this EIS). BPA would comply with FCC requirements relating to radio and television interference from the Proposed Action if any such interference occurs.

### **4.14 Federal Aviation Administration**

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

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# Chapter 5. Persons, Tribes, and Agencies Consulted

The project mailing list contains over 300 stakeholders, including potentially interested or affected landowners; tribes; local, state, and Federal agencies; public officials; interest groups; businesses; and libraries. They have directly received or have been given instructions on how to receive all project information made available so far, and they will have an opportunity to review the Draft and Final EISs.

## 5.1 Federal Agencies and Officials

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

## 5.2 Tribes and Tribal Groups

Confederated Tribes of the Grand Ronde	Klamath Indian Tribe
Confederated Tribes of Siletz	Cow Creek Band of the Umpqua Tribe of Indians
Confederated Tribes of the Warm Springs Reservation	

## 5.3 State Agencies and Officials

Oregon Department of Agriculture	Oregon State Representative Lane Shetterly
Oregon Department of Fish and Wildlife	Oregon State Representative Val Hoyle
Oregon Department of State Lands	Oregon State Representative Wayne Krieger
Oregon Department of Transportation	Oregon State Senator Brian Boquist
Oregon Parks and Recreation Department	Oregon State Senator Chris Edwards
Oregon State Governor's Office	Oregon State Senator Frank Morse
Oregon State Historic Preservation Office	Oregon State Senator Gary George
Oregon State Representative Andy Olson	Oregon State Senator Vicky Walker (former)
Oregon State Representative Jim Thompson	Oregon Watershed Enhancement Board

## 5.4 Local Governments

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### **Cities**

Albany  
Albany Planning Commission  
Harrisburg  
Junction City  
Junction City Planning Commission

### **County**

Lane County Board of Commissioners  
Lane County Planning and Building  
Department  
Linn County Board of Commissioners  
Linn County Planning and Building  
Department

## 5.5 Businesses

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1220 Ivy LLC  
Acta Limited Partnership  
Aoyama Holdings Inc  
Balkovich Farms Inc.  
Burlington Northern Santa Fe Railway, Co.  
Cascade Warehouse Co Inc  
Del Corporation  
Eagle Veneer Inc.  
Fort James Operating Company Inc./Georgia  
Pacific Corporation Tax Department  
G4 Limited Partnership  
Gibson Motor Company  
Golden Arch Realty Operation Inc.  
Hayworth Seed Warehouse Inc.  
HDR Inc.  
Homes Handcrafted Inc.  
Hunton Warehouse LLC  
Huntons Farm  
Ivy Street LLC

Junction City Medical Properties Llc  
Keller Development Company  
Key Trust Company  
Lindsay Bros Farms  
Lochmead Dairy Inc.  
Mclagan Farms LLC  
Oregon Electric Railway Co  
Pacific Continental Bank Inc.  
Polen Development LLC  
Porter Family Farm LLC  
Roy A Bowers & Sons Inc.  
Ruth Kropf & Sons Inc.  
S&G Investments Inc  
Scandia Square Inc  
Smith Seed Services LLC  
Sunset Investments LLC  
Sunshine Administrator LLC  
Wells Rentals  
Willamette AG Inc.

## 5.6 Libraries

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Albany Downtown Carnegie Library  
Albany Public Library  
Alvadore Community Library  
Harrisburg Public Library  
Junction City Public Library

Oregon State University Federal Depository,  
Kerr Library Division of Documents  
University of Oregon, Knight Library –  
Document Center

## 5.7 Interest Groups

Coast Range Natural Resources Educational Association	Linn County Historical Society
Emerald Trail Riders Association	Native Plant Society of Oregon
Exotic Bird Rescue	Network of Oregon Watershed Councils
Housing Authority & Community Service Agency of Lane County	Oregon Sierra Club
Junction City Historical Society	Oregon Watershed Enhancement board
Junction City Scandinavian	The Nature Conservancy of Oregon
Lane County Audubon Society	Wetlands Conservancy
	Willamette Riverkeeper
	Workers for a Livable Oregon

## 5.8 Individual Property Owners

Abraham, Woodrow L.	Cherry, James L.	Gilbert, Robert Wayne
Adams, Jack M.	Cherry, Loretta F.	Glaser, Brian E.
Albertson, Lyle Glen	Chudzik, Christine	Glaser, John S.
Allen, Barry Lee	Cleland, Alverna H.	Glaser, Steve
Allen, Deboer S	Cleland, Charles A.	Halsey, Steven D.
Allen, Peggy J.	Cleland-Jensen, Marlene	Harrel, Debra D.
Ayres, Roger A.	Coon, Donald A.	Harrell, Kenneth L
Bachmeier, Kandis K.	Coon, Maryann Hellen	Hartmeier, Melvin H
Bachmeier, Kenneth D.	Coon, Michael	Hartmeier, Paula M.
Balkovic, Joanne N.	Coon, Patricia L.	Hayworth Family Ltd.
Balkovic, Michael E.	Coon, Tamara	Heins, Arlene
Balkovic, Robert D.	Crenshaw, Laurel E.	Higbee, Deborah E
Balkovic, Todd	Davidson, Joshua H.	Hill, Lester R
Banton, C. Wayne	Davidson, Karrian T.	Hitson, Lois A
Banton, Jean V.	Davis, Carole J.	Hitson, Shannon E.
Barden, Cynthia K.	Davis, Lloyd C.	Holifield, Giford Bascomb
Barden, Gregory T.	Deboer, Allen S.	Holifield, Jerry Rex
Bergstrom, Barbara A.	Dickman Family Llc	Holifield, Robert Dale
Birk, Tim	Dodd, Jack	Huffman, Christopher M.
Birky, David	Doty, Jack Clark	Huffman, Kristi A.
Boardman, Barbara J.	Elmblade, Darbie G.	Humpert, Andrea R.
Boardman, Eric S.	Elmblade, Mark T.	Humpert, Frank E.
Bowers, Roy A	Fiske, Doris K.	Humphrey, Jack R.
Britton, Wesley H	Franklin, Rozelle, James	Ingalls, Nellie S.
Brown, Lindy	Freeman, Judith A.	Isom, Wade E
Byers, Patricia M.	Freese, Gary A.	Jack, Dodd
Callahan, Amy	Gannon, Cleta K.	Jackson, Evelyn S.
Cate, Robert W	Gannon, G.W.	Jackson, James W.
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## Chapter 7. Glossary

303(d), water quality limited waters	This is a Clean Water Act classification for waters where application of best management practices or technology-based controls are not sufficient to achieve designated water quality standards. Under Section 303(d) of the 1972 Clean Water Act, states, territories, and authorized tribes are required to develop a list of water quality limited segments. Waters on the 303(d) list do not meet water quality standards, even after the minimum required levels of pollution control technology have been installed at the point sources of pollution.
Access road	Roads and road spurs that provide vehicular access to the corridor and structure sites. Where county roads, logging roads, driveways, or other access is already established, access roads are built as short spurs to the structure site. Access roads are maintained even after construction, except for temporary access roads. Temporary access roads are laid down on geotextile in sensitive areas, such as wetlands or yards, so that they can be removed after use and the site restored.
Alluvial	Deposited by a stream or running water.
Anadromous	Fish species that breed in fresh water but live their adult life in the sea.
Background	More than 5 miles from the viewer.
Bald and Golden Eagle Protection Act	Act that prohibits anyone, without a permit issued by the Secretary of the Interior, from "taking" bald eagles, including their parts, nests, or eggs. The Act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof."
Best Management Practice(s)	Typically state-of-the-art technology designed to prevent or reduce impacts. They represent physical, institutional, or strategic approaches to environmental problems.
Biomass	Biological material from a living or recently living organism.
Blackout	The disconnection of the source of electricity from all the electrical loads in a certain geographical area. Brought about by an emergency forced outage or other fault in the generation, transmission, or distribution system serving the area.
Candidate species	Plants and animals native to the United States for which the US Fish and Wildlife Service or the National Marine Fisheries Service has derived from sufficient information on biological vulnerability and threats to justify proposing to add them to the threatened and endangered species list, but cannot do so immediately because other species have a higher priority for listing.

Carbon sequestration	The process through which agricultural and forestry practices remove carbon dioxide from the atmosphere and store it as sugars in trees, plants, and other vegetation.
Census	The US Census Bureau takes the census of population and housing in years ending in zero. The census includes both a short form (100% survey) and a long form (sample survey of one in six households).
Census block groups	Census block groups are a collection of census blocks within a census tract, sharing the same first digit of their four-digit identification numbers.
Census tracts	Census tracts are small statistical subdivisions of counties, generally having stable boundaries and, when first established, were designed to have relatively homogeneous demographic characteristics.
Compaction	The squeezing or compression of a soil mass.
Comprehensive plan	An official document adopted by a local government setting forth its general policies regarding the long-term physical development of a city or other area.
Conductor	The wire cable strung between transmission structures through which electric current flows.
Critical habitat	Habitat essential to the conservation of an endangered or threatened species that has been designated as critical by the US Fish and Wildlife Service or the National Marine Fisheries Service.
Cumulative impacts	Cumulative impacts are the result of incremental impacts of an action, when added to other past, present, and reasonably foreseeable future actions, regardless of which agency (federal or nonfederal) or person undertakes such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time.
Danger tree	Trees (or high-growing brush) in or alongside the ROW that are hazardous to the transmission line. These trees are identified by special crews and must be removed to prevent tree-fall into the line or other interference with the conductors. BPA's Construction Clearing Policy requires that trees be removed that meet either one of two technical categories: Category A is any tree that within 15 years will grow to within about 18 feet of conductors when the conductor is at maximum sag (212°F) and swung by 6 lb per sq feet of wind (58 mph); Category B is any tree or high-growing brush that after a year of growth will fall within about 8 feet of the conductor at maximum sag (176°F) and in a static position.
Direct impacts	Direct impacts are caused by an action and occur at the same time and place as the action.

Disproportionate adverse effect	An adverse effect that: (a) is predominantly borne by a minority population and/or a low-income population; or (b) is suffered by the minority population and/or low-income population and is appreciably more severe or greater in magnitude than the adverse effect that will be suffered by the non-minority population and/or non-low-income population. Cultural differences need to be considered when doing the analysis.
Easement	The right, privilege, or interest obtained by BPA through negotiated contract or condemnation to construct, maintain, and operate transmission facilities within a ROW.
Endangered species	Plants or animals that are in danger of extinction through all or a significant portion of their ranges and that have been listed as endangered by the US Fish and Wildlife Service or the National Marine Fisheries Service.
Environmental Assessment (EA)	A concise public document that a federal agency prepares under the National Environmental Policy Act (NEPA) to provide sufficient evidence and analysis to determine whether a proposed agency action would require preparation of an Environmental Impact Statement (EIS) or a Finding of No Significant Impact. A federal agency may also prepare an EA to aid its compliance with NEPA when no EIS is necessary or to facilitate preparation of an EIS when one is necessary. An EA must include brief discussions of the need for the proposal, alternatives, environmental impacts of the Proposed Action and alternatives, and a list of agencies and persons consulted.
Environmental justice	Refers to the process of identifying and addressing, as appropriate, disproportionately high and adverse human health and/or environmental effects on minority and/or low-income populations.
Erosion	The wearing away of soil or rock due to weather or the action of wind and water.
Essential Fish Habitat	EFH is defined in the Magnuson-Stevens Act as “...those waters and substrate necessary to fish for spawning, breeding, feeding, or growth to maturity.” The rules promulgated by the NMFS in 1997 and 2002 further clarify EFH with the following definitions: waters— aquatic areas and their associated physical, chemical, and biological properties that are used by fish and may include aquatic areas historically used by fish where appropriate; substrate—sediment, hard bottom, structures underlying the waters, and associated biological communities; necessary—the habitat required to support a sustainable fishery and the managed species’ contribution to a healthy ecosystem; and spawning, breeding, feeding, or growth to maturity—stages representing a species’ full life cycle.
Essential Salmonid Habitat	Habitat necessary to prevent the depletion of native salmon species (chum, sockeye, chinook, and coho salmon, and steelhead and cutthroat trout) during their life history stages of spawning and rearing.

Evapotranspiration	Refers to the sum of evaporation and plant transpiration from the earth's land surface to the atmosphere.
Feller buncher	Type of harvester used in logging. It is a motorized vehicle with an attachment that can rapidly cut and gather several trees before felling them.
Fiber optic cable	A cable made of optical fibers that can transmit large amounts of information at the speed of light.
Finding of No Significant Impact (FONSI)	A public document issued by a federal agency briefly presenting the reasons why an action for which the agency has prepared an Environmental Assessment has no potential to have a significant impact on the human environment and, thus, will not require preparation of an Environmental Impact Statement.
Forb	Non-grass-like herbaceous plant.
Foreground	Within 0.25 to 0.5 mile of the viewer.
Grass	Any of various plants having slender leaves characteristic of the grass family (for this report includes graminoids [grasses, sedges, and rushes]).
Ground wire	A protective wire strung above the conductors on a transmission line to shield the conductors from lightning; also called shield wire or overhead ground wire.
Guy wire	Steel wire used to support or strengthen a structure.
Guy wire	Steel wire used to support or strengthen a structure.
Hazardous materials	Any substance or material that could adversely affect the safety of the public, handlers, or carriers. Hazardous materials can be in many forms, including explosives, compressed gases, flammable liquids and solids, oxidizers and organic peroxides, toxics, radioactive material, and corrosives.
Hispanic/Latino	A self-designated classification for people whose origins are from Spain, the Spanish-speaking countries of Central or South America, the Caribbean, or those identifying themselves generally as Spanish, Spanish-American, etc. Origin is viewed as ancestry, nationality, or country of birth of the person or person's parents or ancestors. Hispanic/Latino persons may be of any race, White and non-White.
Indirect impacts	Impacts on the environment that are caused by the action and occur later in time or farther removed in distance but are still reasonably foreseeable.
Insulators	A ceramic or other non-conducting material used to keep electrical circuits from jumping over to ground.
Kilovolt (kV)	One thousand volts.
Low-income	Low-income persons are defined as residing in households with an income between the federal poverty guidelines and an amount two times greater than those guidelines.

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Maintenance Area	A former nonattainment area that meets EPA’s promulgated standards for the same air quality criteria pollutant.
Mastication	Operation of reducing vegetation by grinding, shredding, or chopping.
Median household income	Household income that is in the middle of the range of total household incomes. It is not the average.
Metric ton	A unit of mass equivalent to 1,000 kilograms or about 2,200 pounds.
Microtopography	Surface features of the earth on a small or microscopic scale.
Middle ground	Within 0.5 to 5 miles from the viewer.
Migratory Bird Treaty Act (MBTA)	The MBTA made it illegal for people to "take" migratory birds, their eggs, feathers, or nests. “Take” is defined in the MBTA to include by any means or in any manner, any attempt at hunting, pursuing, wounding, killing, possessing, or transporting any migratory bird, nest, egg, or part thereof.
Minorities	Minorities are defined as Black (or African-American, having origins in any of the black racial groups of Africa); Hispanic (of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race); Asian-American (having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands); or American Indian and Alaskan Native.
Mitigation	Steps or measures taken to lessen the potential impacts predicted for a resource. They may include reducing the impact, avoiding it completely, or compensating for the impact. Some mitigation, such as adjusting the location of a structure to avoid a special resource, is taken during the design and location process. Other mitigation may be done during construction, such as measures to reduce noise, or after construction, such as reseeding access roads with desirable grasses to help prevent the proliferation of weeds.
Multiplier effect	The total increase in income and employment that occurs in the local economy for each dollar of local project expenditure.
National Ambient Air Quality Standards (NAAQS)	Under the Clean Air Act, EPA, specifies maximum allowable concentrations for each of the six criteria pollutants.
National Environmental Policy Act of 1969 (NEPA)	NEPA is the basic national charter for protection of the environment. It establishes policy, sets goals (in Section 101), and provides means (in Section 102) for carrying out the policy. Section 102(2) contains Action-forcing provisions to ensure that federal agencies follow the letter and spirit of the Act. For major federal actions significantly affecting the quality of the human environment, Section 102(2)(C) of NEPA requires federal agencies to prepare a detailed statement that includes the environmental impacts of the Proposed Action and other specified information.

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National Register of Historic Places Eligibility Criteria	<p>The quality of significance in American history, architecture, archaeology, engineering, and culture is present in districts, sites, buildings, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and:</p> <p>Criterion A: That are associated with events that have made a significant contribution to the broad patterns of our history; or</p> <p>Criterion B: That are associated with the lives of significant persons in our past; or</p> <p>Criterion C: That embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or that represent a significant and distinguishable entity whose components may lack individual distinction; or</p> <p>Criterion D: That have yielded, or may be likely to yield, information important in history or prehistory.</p>
Noise-sensitive land use	Common noise-sensitive land uses include residences, parks, schools, and churches.
Nonattainment Area	An area that fails to meet the standards established by EPA for an air quality criteria pollutant.
Outage	Events caused by a disturbance on the electrical system that requires BPA to remove a piece of equipment or a portion or all of a line from service. The disturbances can be either natural or human-caused.
Overlay zone	A mapped zone that imposes a set of requirements in addition to those laid out by the underlying zoning regulations. Overlay zones typically address special features or conditions that may pertain to several districts, such as historic areas, wetlands, and downtown residential enclaves.
Per capita income	Average income per person obtained by dividing aggregate income (sum of the income of all households in a given geographic area) by the total population of an area.
Personal income	Labor earnings (proprietors income and wages and salaries); dividends, interest, and rent; and transfer payments.
PM-10	Particulate Matter of 10 micrometers in diameter or smaller is one of the six criteria pollutants regulated by EPA.
Poverty	The US Census Bureau uses a set of money income thresholds that vary by family size and composition to determine who is in poverty. If a family's total income is less than the family's threshold, then that family and every individual in it is considered in poverty.
Propagule	A plant part that becomes detached from the rest of the plant and grows into a new plant.

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Proposed species	Candidate species that were found to warrant listing as either threatened or endangered and were officially proposed as such in a Federal Register notice after the completion of a status review and consideration of other protective conservation measures. Public comment is always sought on a proposal to list species under the ESA. NMFS generally has one year after a species is proposed for listing under the ESA to make a final determination whether to list a species as threatened or endangered.
Race	Race is a self-identification characteristic of population and in 2000 included: White and non-White races. The non-White races included Black or African-American alone, American Indian or Alaska Native alone, Asian alone, Native Hawaiian or other Pacific Islander alone, some other race alone, or a mixture of two or more races.
Right-of-way (ROW)	The privilege to pass over land belonging to an entity for a certain purpose over the land of another, such as a strip of land used for a road, electric transmission line, pipeline, etc.
Riparian	Riparian areas have distinctive soil and vegetation between a stream or other body of water and the adjacent upland, including wetlands.
Ruderal	Weedy vegetation growing on compacted, plowed, or otherwise disturbed ground and showing a preference for this type of habitat (e.g., roadsides, waste areas).
Scarify	The act of breaking up soil that has been compacted.
Seral	Refers to the stage of ecological succession. For example early refers to the vegetation community found soon after disturbance events.
Shrub	A woody plant usually less than 15 feet tall with multiple stems. Some plants can be either trees or shrubs depending on growing conditions.
Somatic growth	Growth of the body.
Structure	Refers to a type of support used to hold up transmission or substation equipment. Structures can be made of wood or steel, depending on the size of the line or equipment.
Substation	The fenced site that contains the terminal switching and transformation equipment needed at the end of a transmission line.
Succession(al)	Replacement of one kind of community by another kind; the progressive changes in vegetation and animal life that may culminate in the climax.
System reliability	The ability of a power system to provide uninterrupted service, even while that system is under stress.

Take	To harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect or attempt to engage in any such conduct. Harm is further defined to include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing behavioral patterns such as breeding, feeding, or sheltering. Harass is defined as actions that create the likelihood of injury to listed species to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding or sheltering.
Tap	To tie a substation into an existing line by running a new single-circuit line from the substation to the line.
Threatened species	Any plants or animals that are likely to become endangered species within the foreseeable future throughout all or a significant portion of their ranges and which have been listed as threatened by the US Fish and Wildlife Service or the National Marine Fisheries Service.
Transmission line	The structures, insulators, conductors, and other equipment used to transmit electrical power from one point to another.
Vegetation management	BPA's policies and protocols that guide methods of controlling vegetation within and near electric power facilities. Vegetation that is controlled includes tall-growing species that pose a hazard to power lines, as well as noxious weeds. It also includes methods to encourage the growth of low-growing, desirable species that resist noxious weed invasion.
View	A scene observed from a given vantage point.
Viewer activity	The extent of viewers' ability to perceive the landscape and its detail may be heightened or decreased by the visual requirements of their current activity and their past experience of the landscape.
Viewers	Viewers include those people who have views of the corridor. For this project, they include residents, park visitors, employees, motorists (drivers and passengers), rail passengers, bicyclists, and pedestrians.
Viewshed	All the surface areas visible from an observer's viewpoint. This is the area normally visible from an observer's viewpoint, including the screening effects of intermediate vegetation and structures.
Visually sensitive locations	Visually sensitive locations have been identified based on their visual quality, uniqueness, cultural significance, or viewer characteristics (Sevi 1986). For this project, visually sensitive locations include residences and parks.
Volatile organic compounds (VOC)	VOCs are often found in manmade chemicals such as fuels, solvents, hydraulic fluids, paint thinners, and dry cleaning agents. Many are or may be human carcinogens that can contaminate soil or groundwater.
Voltage	The driving force that causes a current to flow in an electric circuit. Voltage and volt are often used interchangeably.

Wetland	Wetlands, for the purposes of the Clean Water Act, must meet a three-parameter approach that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils subject to saturation/inundation). All three parameters must be present, under normal circumstances, and the wetland must be connected to or have a significant nexus with one of the other waters of the US for an area to be designated as a jurisdictional wetland under the Clean Water Act.
Zoning	Dividing mapped areas into zones or sections reserved for different purposes, such as residences, businesses, manufacturing, etc.

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# Chapter 8. List of Preparers

## BPA

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Douglas F. Corkran, Contracting Officer's Technical Representative. Mr. Corkran is a fish and wildlife biologist with 20 years of experience. He was responsible for environmental impact statement coordination and development. Education: M.A. Environmental Planning; B.A. Biology.

Israel N. Duran, Contract Environmental Protection Specialist. Mr. Duran, a specialist in invertebrate zoology with two years experience, was responsible for assisting with environmental impact statement coordination and development. Education: M.A. Entomology; B.A. Zoology.

Erich T. Orth, PE, Senior Project Manager. Mr. Orth is a civil engineer with 11 years of experience and is responsible for delivering assigned projects within cost, scope and schedule for Transmission Services at BPA. As the senior project manager, he led the design team for the environmental impact statement. Education: M.S. Civil Engineering; B.S. Civil Engineering.

## Parsons Brinckerhoff

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Angela Findley, EIS Lead. Ms. Findley is a senior supervising environmental planner and multidisciplinary project manager. She has over 17 years of demonstrated leadership to manage full project delivery of environmental impact statements and environmental assessments in accordance with the National Environmental Policy Act and compliance with Section 106 of the National Historic Preservation Act, Endangered Species Act, and various applicable federal and state regulations. Education: MS, Forest Resources; BA, Mathematics.

Evan Garich, PE, Soils and Geology Lead. Mr. Garich is a registered Professional Engineer in the State of Oregon with four years experience. As a Geotechnical Engineer, his experience includes design work for bridges, tunnels, port facilities, and other infrastructure improvements in addition to acting as technical lead for soils and geology technical reports for environmental assessments and environmental impact statements. Education: MS, Civil Engineering; BS, Civil Engineering.

Peter Geiger, Water Resources and Greenhouse Gases Lead. Mr. Geiger is a supervising environmental scientist with over 23 years of experience in environmental assessment and regulatory compliance for transportation and energy projects throughout the western United States. He prepared the water resources, wetlands, and floodplains technical reports and analyses for this environmental impact statement. Education: MSc, Physics; BS, Physics.

Larissa King Rawlins, AICP, Quality Control. Ms. Rawlins is an environmental planner with over 11 years experience in environmental and land use planning projects. She prepares and provides review of technical studies for NEPA environmental impact statements, environmental assessments, and documented categorical exclusions for state and federal agencies. She served

in a quality assurance role for this project's technical reports and prepared the cultural resource section for this environmental impact statement. Education: BA, Environmental Planning.

Scott Noel, AICP, Land Use and GIS Lead. Mr. Noel is a senior environmental planner and project manager specializing in NEPA compliance. Scott's primary areas of technical expertise include noise, air quality, and land use assessments in support of NEPA documentation such as environmental impact statements, environmental assessments, and categorical exclusions. Scott has over 10 years experience in NEPA, noise, air quality, land use, and GIS. Education: BA, Geography and Environmental Planning.

Jennifer Rabby, AICP, Socioeconomic Lead. Ms. Rabby is a senior environmental planner, experienced in land use planning, socioeconomic analysis, and environmental planning. She is well-versed in NEPA documents, environmental resource analysis, preparation of regulatory permits, and support of public involvement activities and agency coordination. Education: MCRP, Community and Regional Planning; BA, Biology and Environmental Studies.

Ed Reynolds, Technical Editor. Mr. Reynolds is an experienced technical editor, having specialized in the environmental consulting field for the past 20 years. As a technical editor, he works with engineers, land use and transportation planners, and environmental and natural resource scientists to ensure readability and comprehension of reports while checking for grammar, punctuation, format, and style. He has line-edited the work of multiple authors to create consistent documents with a unified voice. Education: BA, Journalism.

Patrick Romero, Noise, Public Health, and Air Quality Lead. Mr. Romero is an environmental planner with over 12 years experience in environmental and regulatory support for transportation, utility corridor, and construction projects. He prepares and provides review of public health, air quality, and noise technical studies for NEPA/SEPA environmental impact statements, environmental assessments, categorical exclusions, and Brownsfield documentation. Education: MS, Environmental Policy & Management, BS, Environmental Science.

Dorothy Skans, Document Production Specialist. Ms. Skans has over four decades of experience as a document designer, desktop publisher, word processor, and technical editor. She has responsibility for the design, production, and accuracy of a variety of document types—including environmental impact statements and assessments and technical reports, ranging in size from a few pages up to 1,000 pages in both MS Word and Adobe InDesign. Education: BA, Visual and Speech Communications.

Stephanie Sprague, AICP, Visual Lead. Ms. Sprague is a lead environmental planner and project manager specializing in NEPA compliance. Her primary areas of technical expertise include social, environmental justice, and visual quality impact assessments for categorical exclusions, environmental assessments, and environmental impact statements. She has over 9 years experience in NEPA project delivery and natural resources management. Education: MS, Natural Resource Policy; MMarSci, Marine Science; BS, Environmental Microbiology.

## **Aquatic Contracting**

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David Isle, Botanist. Mr. Isle was the Mendocino National Forest Botanist for over 12 years prior to retiring from the U.S. Forest Service in 2006. He was responsible for botanical surveys and the management of Forest Sensitive, Threatened, and Survey and Manage plant species. During his career, he also coordinated rare plant ecological studies and post-wildfire emergency rehabilitation and revegetation projects. His responsibilities at Aquatic Contracting include botanical surveys, wetland delineation, and reporting. Education: BA, Biological Science; Standard Secondary Teaching Credential.

Justin Isle, Vegetation Biology Lead. Mr. Isle is a biologist and professional wetland scientist with 12 years experience assisting clients with Endangered Species Act, Clean Water Act, Oregon Removal/Fill, and NEPA compliance and permitting. His responsibilities at Aquatic Contracting include conducting wetland delineations, performing rare plant surveys, preparing biological assessments, as well as designing and constructing wetland, stream and riparian restoration and mitigation projects. Education: BS, Environmental Science and Business Economics; Post Graduate coursework in Wetland and Stream Ecology, Planning, and Real Estate Development.

Fran Cafferata Coe, Wildlife Biology Lead. Fran has over 10 years of experience providing wildlife management expertise. Fran is experienced in species surveys, botanical surveys, wetland delineations, and permitting. Her responsibilities at Aquatic Contracting include fish and wildlife surveys, reporting, and permitting. Education: BS, Fisheries and Wildlife Science.

## **David Evans and Associates**

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Kevin O'Hara, Rare Plant Survey Manager. Mr. O'Hara is a senior project manager and ecologist with over 16 years of project management experience in NEPA and Endangered Species Act compliance. His expertise includes feasibility studies, landscape ecology, watershed analyses, and wetlands management planning. He serves as the natural resources task lead for major infrastructure projects throughout the northwest responsible for alternatives development, impact assessment, permitting and mitigation strategies development, and securing environmental permits. Education: MS, Forest Management; BS, Horticulture.

Phil Rickus, Rare Plant Botanist. Mr. Rickus is an ecologist with more than 17 years experience in conducting wetland, wildlife, fish, and plant surveys and documentation. He has led habitat corridor mapping and wildlife survey efforts for projects throughout the northwest. He has worked successfully with multidisciplinary teams to craft NEPA documents for large projects involving close public scrutiny. Education: BS, Biology.

## **Mason, Bruce & Girard**

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Brian Cook, Wetland Biologist. Mr. Cook is a wetland biologist with 13 years experience leading wetland delineations and botanical inventories, wetland mitigation construction, monitoring and maintenance, wildlife habitat assessments, and native plant propagation. He is also responsible for assimilating field data into a variety of document types, including wetland

delineation and botanical clearance technical reports. Education: ATA, Environmental Conservation; BS, Environmental Science and Resource Management.

Justin Moffett, Wetland Delineation Lead. Mr. Moffett is a regulatory compliance specialist with 11 years experience managing wetland delineations for individual, nationwide, and general authorization permits; mitigation planning; and Clean Water Act Section 401 and 404 permitting for both public and private sector clients. He has experience negotiating permit conditions, preparing detailed environmental impact assessments, and conducting alternative analyses. He also has experience preparing Endangered Species Act compliance documentation for wildlife and fisheries, and has led surveys for threatened and endangered plant and animal species. Education: BS, Forestry and Natural Resources.

### **Historical Research Associates**

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Emily K. Ragsdale, Archaeological Lead. Ms. Ragsdale began practicing archaeology in 2001 and has five years experience as a professional archaeologist in Oregon and Washington. Her specialties include GIS data management and Section 106 consultation. She has authored over 25 technical reports and is responsible for project implementation and supervision. Education: MA, Anthropology; BA, Anthropology

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# Appendix A. Public Notices





## Department of Energy

Bonneville Power Administration  
P.O. Box 491  
Vancouver, Washington 98666-0491

TRANSMISSION SERVICES

February 25, 2010

In reply refer to: TEP-TPP-3

### **To: Parties Interested in the Albany-Eugene Transmission Line Rebuild Project**

Bonneville Power Administration (BPA) is proposing to rebuild a transmission line in your area. This letter briefly explains what is being proposed, outlines our environmental review process and schedule, and invites you to a meeting where you can learn more and comment on the proposal.

**Proposal** - BPA proposes to rebuild a 32-mile section of the Albany-Eugene 115-kilovolt No. 1 Transmission Line. No major work has been done on the line since it was originally built in 1940. Many of the structures, the electric wire (conductor), and associated structural components (cross arms, insulators, and dampers) are physically worn and structurally unsound in places. These wood transmission poles have lasted beyond the expected 55 to 60 years, and now need to be replaced due to age, rot, and deterioration. Based on the deteriorated condition of this line, there is a need to rebuild the line to maintain reliable electrical service and to avoid risks to the safety of the public and maintenance crews.

Proposed activities would include establishing temporary access to the line, improving some access roads developing staging areas for storage of materials, removing some vegetation, removing and replacing existing wood pole structures and associated structural components and conductor, and revegetating areas disturbed by construction activities. The existing structures would be replaced with structures of similar design within or near to their existing locations. The line would continue to operate at 115-kilovolts.

To understand the potential environmental impacts of this proposal, BPA will prepare an Environmental Assessment (EA). As a federal agency, we follow procedures of the National Environmental Policy Act. Two alternatives will be studied: rebuild the line, or do not rebuild it and continue with current operation and maintenance practices. The EA will describe anticipated impacts to natural and human resources and include mitigation measures that would enable BPA to avoid or minimize impacts. During this process, BPA will be working with federal, state and local agencies, landowners, interest groups, and tribes.

**Public Meetings** - We will soon start to assess the potential environmental impacts of the proposed alternatives and would like to hear from you. What questions do you have? What resources should we analyze? Do you have information or concerns about specific areas? BPA is seeking public input and comments through March 27, 2010. We have scheduled an open house scoping meeting in Junction City, OR.

Thursday, March 11, 2010  
4 p.m. to 7 p.m.  
Junction City Community Services Center  
175 West Seventh Avenue  
Junction City, OR 97448

We do not plan to give a formal presentation, so you may come any time during the meeting. Several members of the project team will be available to answer your questions and listen to your ideas.

**Other Ways to Comment** - If you cannot attend the meeting, you can still comment. You may submit comments to BPA online at: [www.bpa.gov/comment](http://www.bpa.gov/comment), return the enclosed comment form or other written correspondence in the postage-paid envelope provided, or fax your comments to (503) 230-3285. You also may call us with your comments toll free at (800) 622-4519. Please submit comments to us by **March 27, 2010** and reference “Albany-Eugene Transmission Line Rebuild Project” with your comments. We will post all comments we receive on our Web site at [www.bpa.gov/comment](http://www.bpa.gov/comment).

**Process and Schedule** - Starting this spring and summer you may see BPA staff or contractors in the area as they conduct engineering and environmental surveys. If we need to enter property where we do not have existing access rights, we will contact property owners for permission through a separate mailing.

BPA will produce a Preliminary EA that will be available for review and comment in the fall of 2010. If you would like to receive a copy of the Preliminary EA, please indicate on the enclosed postcard whether you would like to receive it by regular or electronic mail. If you would like to be taken off the project mailing list, please mark the box on the form. If you do not return the form, you will still receive notice when the Preliminary EA is available.

BPA will produce a Final EA in the spring of 2011. Based on the analysis in the Final EA, BPA will either prepare a Finding of No Significant Impact and decide whether to proceed with the project, or will prepare an Environmental Impact Statement if there is the potential for significant environmental impacts.

**For More Information** - To find out more about the project please go to BPA’s project Web site at: [http://www.efw.bpa.gov/environmental\\_services/Document\\_Library/Albany-Eugene\\_Transmission\\_Line\\_Rebuild\\_Project](http://www.efw.bpa.gov/environmental_services/Document_Library/Albany-Eugene_Transmission_Line_Rebuild_Project).

If you have questions regarding the environmental process, please contact the environmental project lead, Douglas F. Corkran, toll-free at (800) 282-3713, directly at (503) 230-7646 or e-mail [dfcorkran@bpa.gov](mailto:dfcorkran@bpa.gov). If you have other questions or would like more project information, please contact me at the toll-free number, directly at (360) 619-6559 or e-mail [etorth@bpa.gov](mailto:etorth@bpa.gov).

Thank you for your interest in this project.

Sincerely,

*/s/ Erich Orth*

Erich Orth  
Project Manager

Enclosures:  
Project Map  
Comment Form  
Return Envelope  
Reply Postcard



## Department of Energy

Bonneville Power Administration  
P.O. Box 491  
Vancouver, Washington 98666-0491

TRANSMISSION SERVICES

October 25, 2010

In reply refer to: TEP-TPP-3

**To: Parties Interested in the Albany-Eugene Transmission Line Rebuild Project**

Bonneville Power Administration (BPA) is proposing to rebuild a transmission line in your area. This letter briefly explains what is being proposed, outlines our environmental review process and schedule, and invites you to public meetings where you can learn more and comment on the proposal.

BPA previously held a public meeting in March, 2010 in Junction City, Oregon. Since that time BPA has determined that a significant number of danger trees would need to be removed to prevent damage to the line and that a different kind of National Environmental Policy Act document- an Environmental Impact Statement (EIS) rather than an Environmental Assessment- will be required because of it.

**Public Meetings** - We will soon start to assess the potential environmental impacts of the proposed alternatives and would like to hear from you. What questions do you have? What resources should we analyze? Do you have information or concerns about specific areas? BPA is seeking public input and comments through November 30, 2010. We have scheduled two open house scoping meetings in Harrisburg and Albany, OR:

**November 16, 2010**  
**4:30-7:00 p.m.**  
**Harrisburg High School**  
**400 South 9<sup>th</sup> Street**  
**Harrisburg, OR 97446**

**November 17, 2010**  
**4:30-7:00pm**  
**Albany Public Library**  
**450 14<sup>th</sup> Avenue S.E.**  
**Albany, OR 97322**

We do not plan to give a formal presentation, so you may come any time during the meeting. Members of the project team will be available to answer your questions and listen to your ideas.

**Proposal** - BPA proposes to rebuild a 32-mile section of the Albany-Eugene 115-kilovolt No. 1 Transmission Line. No major work has been done on the line since it was originally built in 1940. Many of the structures, the electric wire (conductor), and associated structural components (cross arms, insulators, and dampers) are physically worn and structurally unsound in places. These wood transmission poles have lasted beyond the expected 55 to 60 years, and now need to be replaced due to age, rot, and deterioration. Based on the deteriorated condition of this line, there is a need to rebuild the line to maintain reliable electrical service and to avoid risks to the safety of the public and maintenance crews.

Proposed activities would include establishing temporary access to the line, improving some access roads developing staging areas for storage of materials, removing and replacing existing wood pole structures and associated structural components and conductor, and revegetating areas disturbed by construction activities. The existing structures would be replaced with structures of

similar design within or near to their existing locations. The line would continue to operate at 115-kilovolts. The project would also remove danger trees and brush located off the existing ROW. 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 is 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. Danger tree removal would take place concurrently with project construction.

To understand the potential environmental impacts of this proposal, BPA will prepare an EIS. As a federal agency, we follow procedures of the National Environmental Policy Act. Two alternatives will be studied: rebuild the line, or do not rebuild it and continue with current operation and maintenance practices. The EIS will describe anticipated impacts to natural and human resources. During this process, BPA will be working with federal, state and local agencies, landowners, interest groups, and tribes.

**Other Ways to Comment** - If you cannot attend the meeting, you can still comment. You may submit comments to BPA online at: [www.bpa.gov/comment](http://www.bpa.gov/comment), return the enclosed comment form or other written correspondence in the postage-paid envelope provided, or fax your comments to (503) 230-3285. You also may call us with your comments toll free at (800) 622-4519. Please submit comments to us by **November 30, 2010** and reference "Albany-Eugene Transmission Line Rebuild Project" with your comments. We will post all comments we receive on our Web site at [www.bpa.gov/comment](http://www.bpa.gov/comment).

**Process and Schedule** - BPA staff and contractors have already been in the area conducting engineering and environmental surveys. Additional surveys may be needed. If we need to enter property where we do not have existing access rights, we will contact property owners for permission through a separate mailing.

BPA will produce a Draft EIS that will be available for review and comment in the summer of 2011. If you would like to receive a copy of the Draft EIS, please indicate on the enclosed postcard whether you would like to receive it by regular or electronic mail. If you would like to be taken off the project mailing list, please mark the box on the form. If you do not return the form, you will still receive notice when the Draft EIS is available.

BPA will produce a Final EIS in the winter of 2011/2012 that responds to the issues raised in the draft EIS review. Based on the final EIS findings and public input throughout the process, BPA will make a decision whether to proceed with the project. That decision is scheduled for the winter of 2011/2012.

**For More Information** - To find out more about the project please go to BPA's project Web site at: [http://efw.bpa.gov/environmental\\_services/Document\\_Library/Albany-Eugene\\_Rebuild/](http://efw.bpa.gov/environmental_services/Document_Library/Albany-Eugene_Rebuild/).

If you have questions regarding the EIS process, please contact the environmental project lead, Douglas F. Corkran, toll-free at (800) 282-3713, directly at (503) 230-7646 or e-mail [dfcorkran@bpa.gov](mailto:dfcorkran@bpa.gov). If you have other questions or would like more project information, please contact me at the toll-free number, directly at (360) 619-6559 or e-mail [etorth@bpa.gov](mailto:etorth@bpa.gov).

Thank you for your interest in this project.

Sincerely,

/s/ Erich T. Orth  
Erich T. Orth  
Project Manager

Enclosures:  
Project Map  
Comment Form  
Return Envelope  
Reply Postcard



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# **Appendix B. Living Safely and Working Around High-Voltage Power Lines**



# LIVING AND WORKING SAFELY

## AROUND HIGH-VOLTAGE POWER LINES



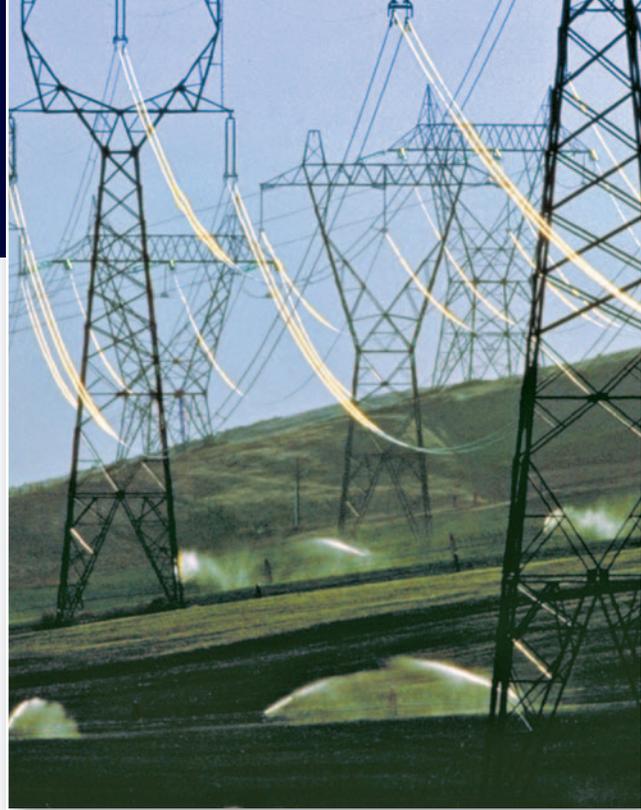


**H**igh-voltage power lines can be just as safe as the electrical wiring in our homes — or just as dangerous. The key is learning to act safely around them.

This booklet is a basic safety guide for those who live and work around power lines. It deals primarily with nuisance shocks caused by induced voltages and with possible electric shock hazards from contact with high-voltage lines.

In preparing this booklet, the Bonneville Power Administration has drawn on more than 70 years of experience with high-voltage power lines. BPA operates one of the world's largest networks of long-distance, high-voltage lines, ranging from 69,000 volts to 500,000 volts. This system has more than 200 substations and more than 15,000 miles of power lines.

BPA's lines make up the main electrical grid for the Pacific Northwest. The grid delivers large blocks of power to substations located near load centers. Public and investor-owned utilities and



rural cooperatives take delivery of the power at these points and deliver it to the ultimate customers.

BPA's lines cross all types of property: residential, agricultural, industrial, commercial and recreational.

**If you have questions about safe practices near power lines, call BPA.**

Due to safety considerations many of the practices suggested in this booklet are restrictive. This is because they attempt to cover all possible situations, and the worst conditions are assumed. In certain circumstances, the restrictions can be re-evaluated. To determine what practices are applicable to your case, contact BPA at 1-800-836-6619 or find the contact information for the local BPA office at [www.transmission.bpa.gov/LanCom/Real\\_Property.cfm](http://www.transmission.bpa.gov/LanCom/Real_Property.cfm).

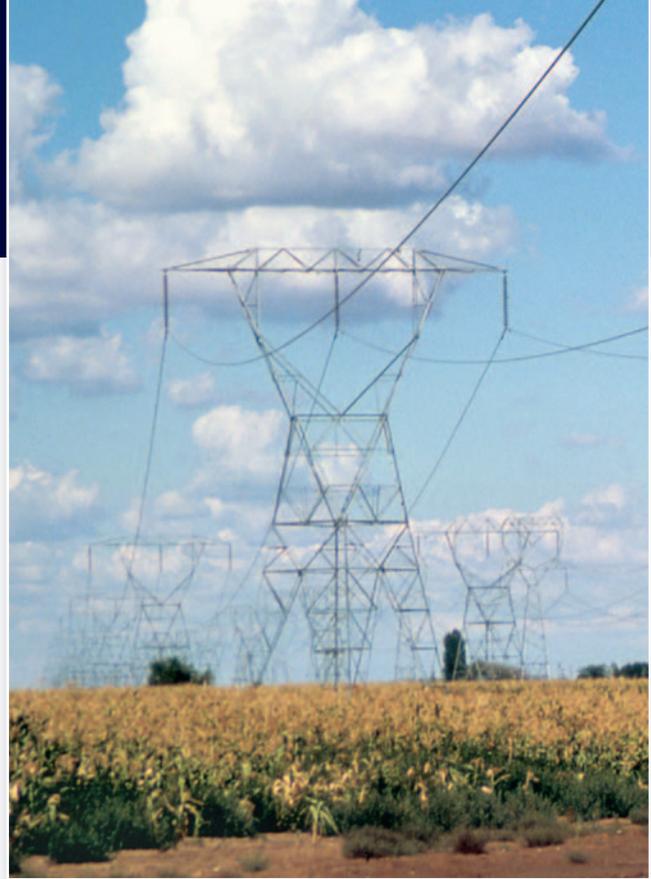
## USING THE RIGHT-OF-WAY

Before a power line is built, BPA negotiates with the landowner for the right to cross the land as required for the construction, operation and maintenance of the line. Usually, BPA acquires right-of-way rights to construct, operate and maintain a power line and the right to keep the right-of-way clear of all structures, fire hazards, vegetation and any other use that may interfere with the operation or maintenance of the line. Most crops, less than 10 feet in height, can be grown safely under power lines. Orchards, Christmas trees and structure-supported crops (i.e., trellises) require special consideration.

Call BPA if you plan to use the right-of-way for any use.

BPA's "Landowner's Guide for Compatible Use of BPA Rights-of-Way" explains how to apply for permission to use a portion of a BPA right-of-way for approved purposes. This document can be found online at [www.transmission.bpa.gov/LanCom/Real\\_Property.cfm](http://www.transmission.bpa.gov/LanCom/Real_Property.cfm) or by contacting BPA at 1-800-836-6619.

Construction and maintenance of any structures are specifically prohibited within a BPA right-of-way. Coordinating with BPA early in your planning process can keep you safe and avoid wasting time and money.



Most crops, less than 10 feet in height, can be grown safely under power lines.

## GENERAL SAFE PRACTICES

BPA designs and maintains its facilities to meet or exceed the rules set forth in the National Electrical Safety Code. BPA provides information on safe practices because serious accidents involving power lines can be avoided if simple precautions are taken. Every kind of electrical installation — from the 110-volt wiring in your home to a 500,000-volt power line — must be treated with respect.

The most significant risk of injury from a power line is the danger of electrical contact. Electrical contact between an object on the ground and an energized wire can occur even though the two do not actually touch. In the case of high-voltage lines, electricity can arc across an air gap. The gap distance varies with the voltage at which the line is

operated. Unlike the wiring in a home, the wires of overhead power lines are not enclosed by electrical insulating material.

The most important safe practice is this:

**Avoid bringing yourself, or any object you are holding, too close to an overhead power line.**

In other words, do not lift, elevate, build or pass under a power line with any object, equipment, facility or vehicle that could come close to the energized wires.

BPA does not recommend that anyone attempt to calculate how close they can come to a power line. As a general precaution, when under a line, never put yourself or any object any higher than 14 feet above the ground.

The National Electrical Safety Code specifies a minimum safe clearance for each operating voltage. BPA builds its lines so the clearance between the wires of a power line and the ground meets or exceeds the minimum safe clearance set forth in the code. Therefore, do not alter the ground elevation; without first applying to BPA, call 1-800-836-6619 to ensure safe distances are maintained.

Vehicles and large equipment that do not extend more than 14 feet in height, such as harvesting combines, cranes, derricks and booms, can be operated safely under all BPA lines that pass over

roads, driveways, parking lots, cultivated fields or grazing lands.

For your safety, coordinate with BPA if you need to exceed the 14-foot limitation.

## POSSIBLE SHOCK HAZARDS

The previous section discussed dangerous electrical contact conditions that can occur when getting too close to the high-voltage wires. This section

Farm equipment or large machinery 14 feet or less in height may be operated safely under all BPA lines in cultivated fields.

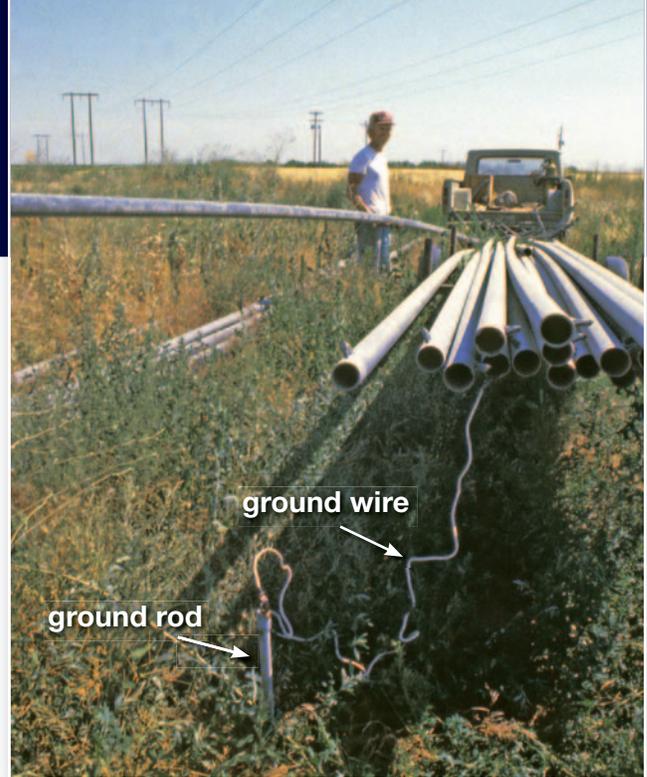


will discuss the possible electrical shock hazards that can occur when touching transmission towers or metallic objects near the power line but away from the high-voltage wires.

These types of shocks are caused by a voltage induced from the power line into the nearby metallic objects. Typically the shocks can be avoided when the nearby metallic objects are grounded or connected to earth. The severity of these shocks depends on the operating voltage of the power line, the distance from the conductor, the size or length of the object, its orientation to the line and how well the object is grounded.

Normally, shocks do not occur when BPA's guidance is followed (see the following sections). However, under certain conditions, non-hazardous nuisance shocks can still occur and possibly cause discomfort.

The severity of nuisance shocks can vary in sensation from something similar to a shock you might receive when you cross a carpet and then touch a door knob to touching the spark-plug ignition wires on your lawnmower or car. The nuisance shock, however, would be continuous as long as you are touching the metallic object. Such objects include vehicles, fences, metal buildings or roofs and irrigation systems that are near the line or parallel the line for some distance.



The possibility of nuisance shocks can be eliminated by grounding metal pipe when unloading near BPA lines.

## IRRIGATION SYSTEMS

All types of irrigation systems have been operated safely near BPA power lines for years. Nonetheless, caution should be used in storing, handling and installing irrigation pipe, and in operating spray irrigation systems near power lines.

To avoid electrical contact with power lines, two very important safety practices should be observed at all times:

1. While moving irrigation pipe under or near power lines, keep the equipment in a horizontal position to keep it away from overhead wires.
2. Electricity can be conducted through water so never allow the irrigation system to spray a continuous stream onto power lines or towers.

In addition, central pivot circular irrigation systems installed near or under power lines can develop hazardous shock potentials during operation and maintenance. To eliminate these hazards:

- Provide a good electrical ground for the pivot point.
- Do not touch the sprinkler pipe or its supporting structures when the system is operating under or parallel to and near a power line.
- Perform repairs/maintenance of the system with the sprinkler pipe perpendicular to the power line.



For more information on storing, handling, installing or operating an irrigation system on BPA rights-of-way and to apply to use BPA's right-of-way please contact BPA at 1-800-836-6619. A copy of "Guidelines for Installation and Operation of Irrigation Systems" will be provided when you contact BPA for approval. This document describes methods for safely installing and operating an irrigation system under high-voltage power lines. This document also can be obtained at [www.transmission.bpa.gov/LanCom/Real\\_Property.cfm](http://www.transmission.bpa.gov/LanCom/Real_Property.cfm).

Irrigation pipe should be moved in a horizontal position under and near all power lines to keep it away from the lines overhead.



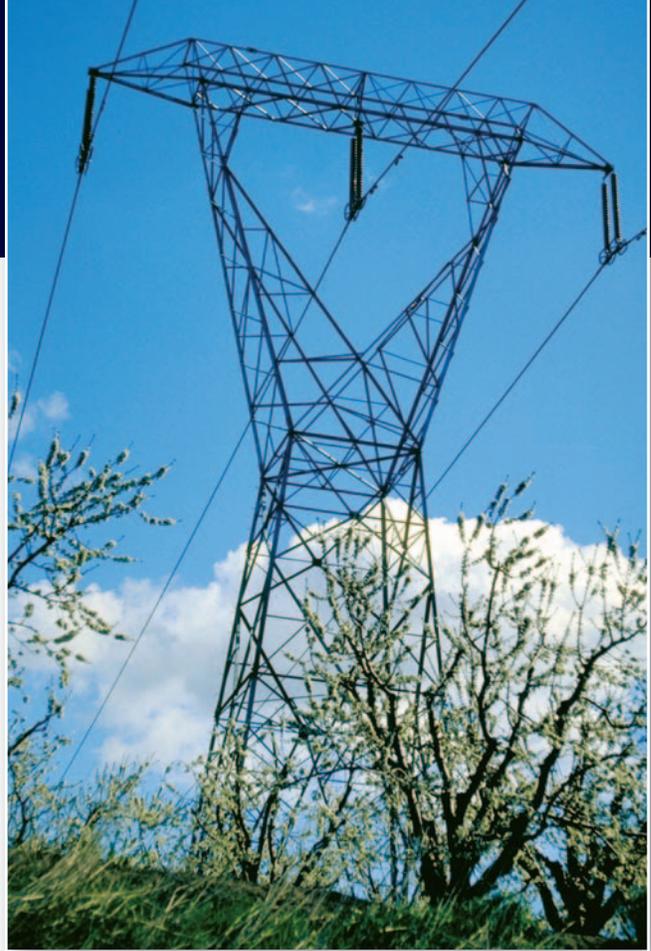
## UNDERGROUND PIPES, TELEPHONE CABLES AND ELECTRIC CABLES

Underground pipes and cables may be compatible with power lines provided installation and maintenance are done properly. Pipes and cables should not be installed closer than 50 feet to a BPA tower, any associated guy wires or grounding systems. These grounding systems are long, buried wires that are sometimes attached to the structures and can run up to 300 feet along the right-of-way. These grounding systems are not visible above ground and must be located before installing any underground utilities.

Proper positioning of underground utilities is required to prevent an accident in an extreme case when an unusual condition might cause electricity to arc from the high-voltage wire to the tower and then to ground. This could produce a dangerous voltage on underground piping or cable system. Contact BPA at 1-800-836-6619 to apply before installing any underground utilities within a BPA power line right-of-way.

## FENCES

BPA strongly discourages locating fences within the right-of-way as they can cause a potential safety hazard and an access problem (particularly in high-density subdivisions). Contact BPA at 1-800-836-6619 if you are interested in submitting an application to place a fence on the right-of-way using the guideline that the location must be a



minimum of 50 feet from BPA structures as well as other considerations discussed below.

## WIRE FENCES

Barbed wire and woven wire fences insulated from ground on wood posts can assume an induced voltage when located near power lines. If you are having a shock-related problem, call BPA for an investigation. The fence may need to be grounded if:

- it is located within the right-of-way;
- it parallels the line within 125 feet of the outside wire and is longer than 150 feet; or
- it parallels the line 125 to 250 feet from the outside wire and is longer than 6,000 feet.

These fences should be grounded at each end and every 200 feet with a metal post driven at least 2 feet into the ground. Attach all wire strands of the fence to the metal post. Install the ground-

ing posts at least 50 feet from the nearest transmission tower. If shocks are experienced when contacting a fence or gate, or if you have any questions about the need for grounding, call BPA at 1-800-836-6619.

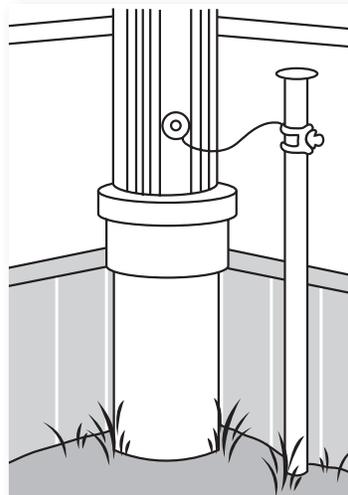
## ELECTRIC FENCES

In situations where a fence cannot be grounded (electric fences, for example), a filter may be installed to remove voltages induced by the power lines. BPA may provide this filter after an investigation has been conducted. Do not use fence chargers that are not approved by Underwriters' Laboratories, Inc. They may carry voltages and currents that are hazardous to anyone touching the fence — even if power lines are not present. For more information about fences, fence chargers or filters, call BPA at 1-800-836-6619.

## BUILDINGS

This section applies to buildings outside BPA's rights-of-way, since BPA prohibits buildings within a right-of-way.

Buildings located off BPA's rights-of-way may collect an induced voltage. This voltage is often drained through the building's plumbing, electrical service, metal sheeting or metal frame. If the



Example of grounding a metal building at a down spout.

voltage does not drain through the systems described above, then it can result in a nuisance shock situation.

BPA recommends grounding metallic components on buildings near a power line when:

- the building is within 100 feet of the outside wire;
- the building has more than 2,000 square feet of metal surface and is within 100 to 150 feet of the outside wire; or
- the building is used to store flammable materials and is within 250 feet of the outside wire.

BPA will assist in grounding metallic objects after receiving a request and an investigation has been conducted. Call BPA at 1-800-836-6619 if you are having shock-related problems or if you have any question on grounding a building.

## VEHICLES

Under some high-voltage lines, vehicles can collect an induced voltage. This is particularly true if the vehicle is parked on a nonconductive surface such as asphalt or dry rock. You can drain the voltage from your vehicle to the ground by attaching a chain that reaches the ground or by leaning a metal bar against your vehicle. The only way to be sure you won't get shocked is to park your car away from the high-voltage power line.

BPA has specific restrictions for parking and roads within the right-of-way to keep possible shocks at a low level. Contact BPA at 1-800-836-6619 to apply before locating roads and parking areas within the BPA right-of-way.

Refueling vehicles is not allowed on BPA rights-of-way because there is a chance that a spark from an induced voltage could ignite the fuel.

## LIGHTNING

Lightning will usually strike the highest nearby object, which might be a power line tower or wire. Transmission facilities are designed to withstand lightning strikes by channeling them to ground at the tower.

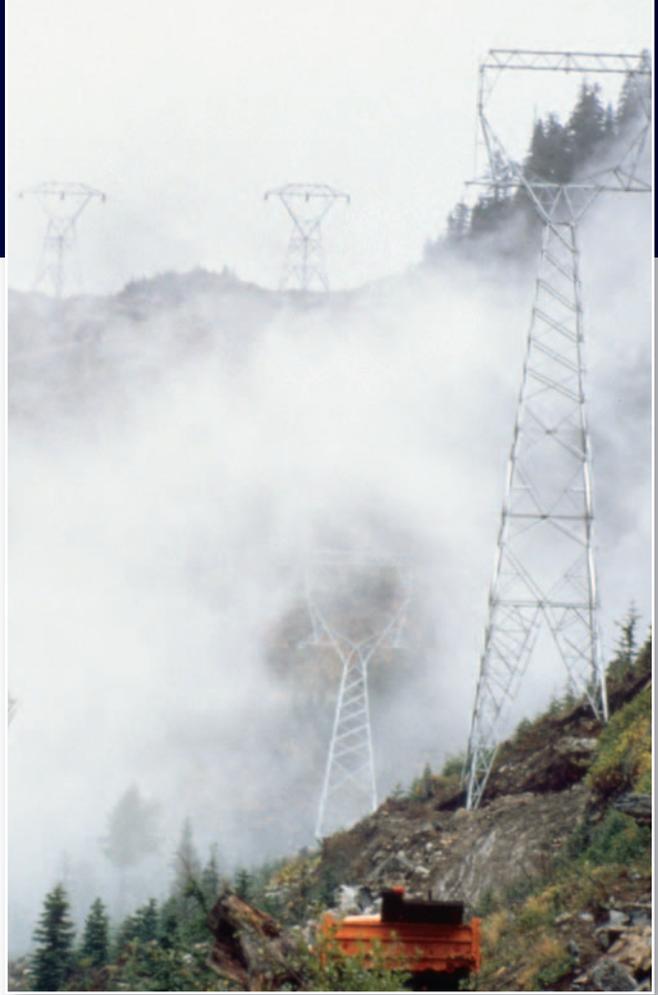
Play it safe. Stay away from power lines and other tall objects during electrical storms. Lightning is dangerous if you are standing near where it enters the ground.

## FIRES

Smoke and hot gases from a large fire can create a conductive path for electricity. When a fire is burning under a power line, electricity could arc from the wire, through the smoke and to the ground, endangering people and objects near the arc. BPA does not permit burning within the right-of-way.

Field burning and other large fires in and around power lines can damage power lines and cause power outages. Water and other chemicals used to extinguish those fires should never be directed toward a power line.

Contact BPA at 1-800-836-6619 if you need to burn near a BPA right-of-way.



A fire burning under a power line can create a dangerous situation. Stay away from lines if a fire is nearby.

## KITE FLYING AND MODEL AIRPLANES

BPA strongly discourages anyone from flying a kite or model airplane anywhere near a power line. The electricity from the line can travel through the string or hand line and electrocute a person on the other end. If your kite or model airplane is about to touch a power line, drop the string or hand line instantly, before it touches the line. Do not try to pull the kite or airplane down or climb up after it. Call the nearest electric utility.

## VANDALISM, SHOOTING AND TRESPASSING

People entering high-voltage electrical facilities, such as substations and power line rights-of-way,

for the purpose of vandalism or theft, run the risk of serious injury or death. For example, when hunting, do not shoot at transmission facilities. Gunshot damage can cause flashovers or may cause the wire to fall to the ground. This could be a serious hazard to anyone close to the power line. It could also cause a power outage and a fire.

Removal of equipment from substations or power line facilities can result in unsafe operating conditions and put people nearby at risk of serious injury or death. Those who cause willful damage to BPA transmission facilities or associated property can be prosecuted by the federal government, the property owner, or both.

Please report damage to transmission facilities to BPA's Crime Witness Program at 1-800-437-2744. The Crime Witness Program allows you to confidentially report an illegal activity that you witness against BPA's transmission system, property or personnel. This includes:

- Shooting at power lines, transmission towers or substation equipment.



- Dumping any waste or material on BPA property.
- Vandalism to BPA property, buildings and vehicles.
- Theft of BPA equipment, supplies, tools or materials.

This program offers rewards of up to \$25,000 for information leading to the arrest and conviction of the perpetrator(s).

## TALL OBJECTS

### Facilities

Temporary or permanent facilities within the right-of-way such as, light standards, signs, above-ground utilities, etc., can create unsafe situations when constructed too close to BPA power lines and structures. Permissible heights for such facilities can vary depending on site specific conditions. Call BPA at 1-800-836-6619 to apply for these uses.

### Activities

As a precautionary practice, do not raise any metal object more than 14 feet in the air underneath a power line. For example, when you mount an antenna on a vehicle that you plan to operate on a BPA right-of-way, do not let it extend more than 14 feet above the ground.

Before you sail a boat on a lake or river, check the allowable clearance under any power line. We recommend that all masts or guy wires above the deck be connected electrically to an underwater metallic part such as the keel or centerboard.

This precaution, which protects against lightning or accidental contact with a power line, may save your life.

Remember, if you plant, dig or build within the right-of-way an application is required. Any activities or use with a reach capacity greater than 14 feet (eg. cranes, dump trucks, irrigation systems, etc.) may cause safety concerns. Please specifically identify these uses and equipment in your application. Contact BPA to apply at 1-800-836-6619.

## POOLS

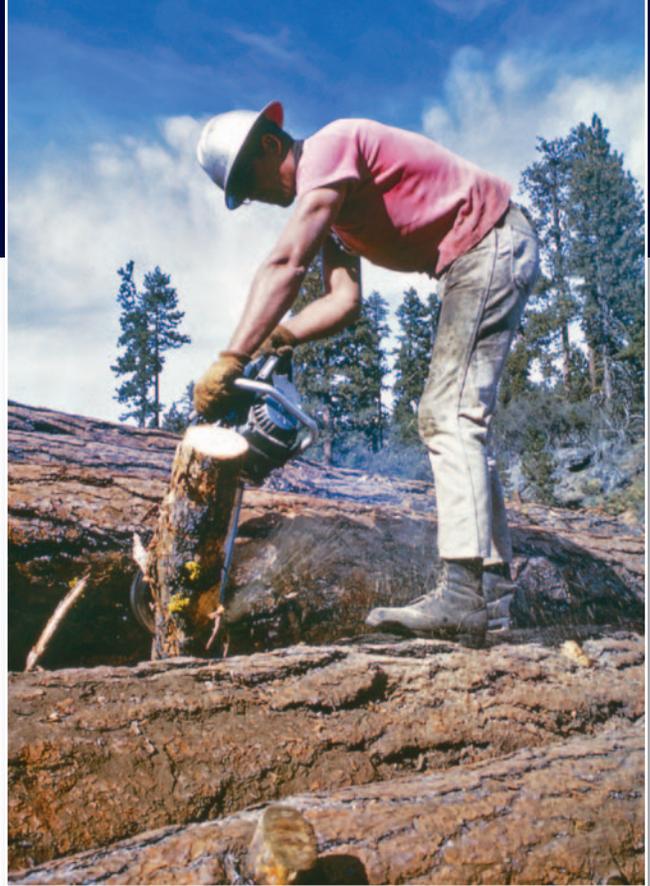
BPA does not permit the building of swimming pools within BPA rights-of-way because it impedes our ability to operate and maintain the power line and presents a potential safety hazard to the public. Hazards range from possible electrical contact with the wires (with pool skimmers or rescue poles, for example) to dangers that can be encountered during and after lightning strikes on transmission facilities.

## CLIMBING

Climbing on power line towers or guy wires can be extremely hazardous. Do not do it under any circumstance. It is dangerous and illegal.

## PACEMAKERS

Under some circumstances, voltages and currents from power lines and electrical devices can interfere with the operation of some implanted cardiac



Cutting trees within power line rights-of-way can be dangerous. It is safer to have BPA do it for you.

pacemakers. However, we know of no case where a BPA line has harmed a pacemaker patient.

As a precaution, people who may have reason to be very near high-voltage facilities should consult with a physician to determine whether their particular implant may be susceptible to power line interference.

If a person with a pacemaker is in an electrical environment and the pacemaker begins to produce a regularly spaced pulse that is not related to a normal heartbeat, the person should leave the environment and consult a physician.

## TREES AND LOGGING

No logging or tree cutting should be done within BPA's right-of-way without first contacting BPA at 1-800-836-6619 to apply. In many cases, BPA owns the timber within its rights-of-way.

Additionally, logging or tree cutting near power lines can be very hazardous and requires special caution. Since trees conduct electricity, if one should fall into or close to a power line, the current could follow the tree trunk to the ground and endanger anyone standing near its base. Here are two simple rules:

1. If you come upon a tree that has fallen into a power line, stay away from it.
2. If you accidentally cause a tree to fall into a power line, run for your life! Do not go back to retrieve your saw or equipment. Call BPA or your local utility immediately.

If you have trees either on or close to the right-of-way that need to be cut, contact BPA at 1-800-836-6619. It is unsafe to do it yourself.

Since power line rights-of-way usually are not owned by BPA but are acquired through easements from landowners, trees or logs stacked within or alongside the rights-of-way are not public property. People removing trees and logs without permission are stealing and can be prosecuted.

## EXPLOSIVES

If you plan to detonate explosives near a BPA power line, apply to BPA well in advance by calling 1-800-836-6619 or find the contact information for your local office at [www.transmission.bpa.gov/LanCom/Real\\_Property.cfm](http://www.transmission.bpa.gov/LanCom/Real_Property.cfm). BPA will tell you if any special precautionary measures must be taken at a particular blasting site.

Any blasting near or within BPA rights-of-way must not damage any BPA facilities or permitted uses within the rights-of-way. Do not use electric detonating devices when blasting within 1,000 feet of a power line. Use of non-electric methods of detonation will avoid the danger of accidentally discharging an electric blasting cap due to induced voltages from energized transmission facilities.

## TOWERS AND WIRES

- Do not climb towers.
- Do not shoot or otherwise damage transmission facilities.
- Never touch a fallen wire.
- Do not attempt to dismantle towers.
- Do not attach anything to towers.
- Stay away from towers and lines during extreme windstorms, thunderstorms, ice storms or under other extreme conditions.





Preventive measures include:

- Report any suspicious activities to BPA at 1-800-437-2744 or to your nearest electrical utility.
- Stay away from and report damage to transmission facilities to BPA at 1-800-437-2744 or your nearest electrical utility.
- Stay away from and report broken, damaged or abnormally low-hanging wires to BPA at 1-800-437-2744 or your nearest electrical utility.

## CONCLUSION

We live in an age of electric power. Almost everything we do requires it. Consequently, high-voltage power lines have become about as commonplace as the wiring in our homes. Nevertheless, every year people are killed or seriously injured by power lines and home wiring. In almost every case, lives could have been saved and injuries avoided if the basic safety practices outlined in this booklet had been followed. BPA and your local utilities make every effort to design and build power lines that are safe to live and work around. Ultimately, however, the safety of high-voltage lines depends on people behaving safely around them. No line can practicably be made safe from a person who,

through ignorance or foolishness, violates the basic principles of safety. Please take time now to learn the practices outlined in this booklet and share your knowledge with your family, friends and colleagues. Your own life, or that of a loved one, might well hang in the balance.

## RELATED BPA PUBLICATIONS AND GUIDELINES

For more information, call BPA at 1-800-836-6619 for the following publications:

1. **“Landowner’s Guide for Compatible Use of BPA Rights-of-Way”** (DOE/BP-3657)
2. **“Landowner’s Guide to Trees and Transmission Lines”** (DOE/BP-3076)
3. **“Keeping the Way Clear for Better Service”** (DOE/BP-2816)
4. **“Guidelines for Installation and Operation of Irrigation Systems”**

These documents also can be found at [www.transmission.bpa.gov/LanCom/Real\\_Property.cfm](http://www.transmission.bpa.gov/LanCom/Real_Property.cfm).



BONNEVILLE POWER ADMINISTRATION

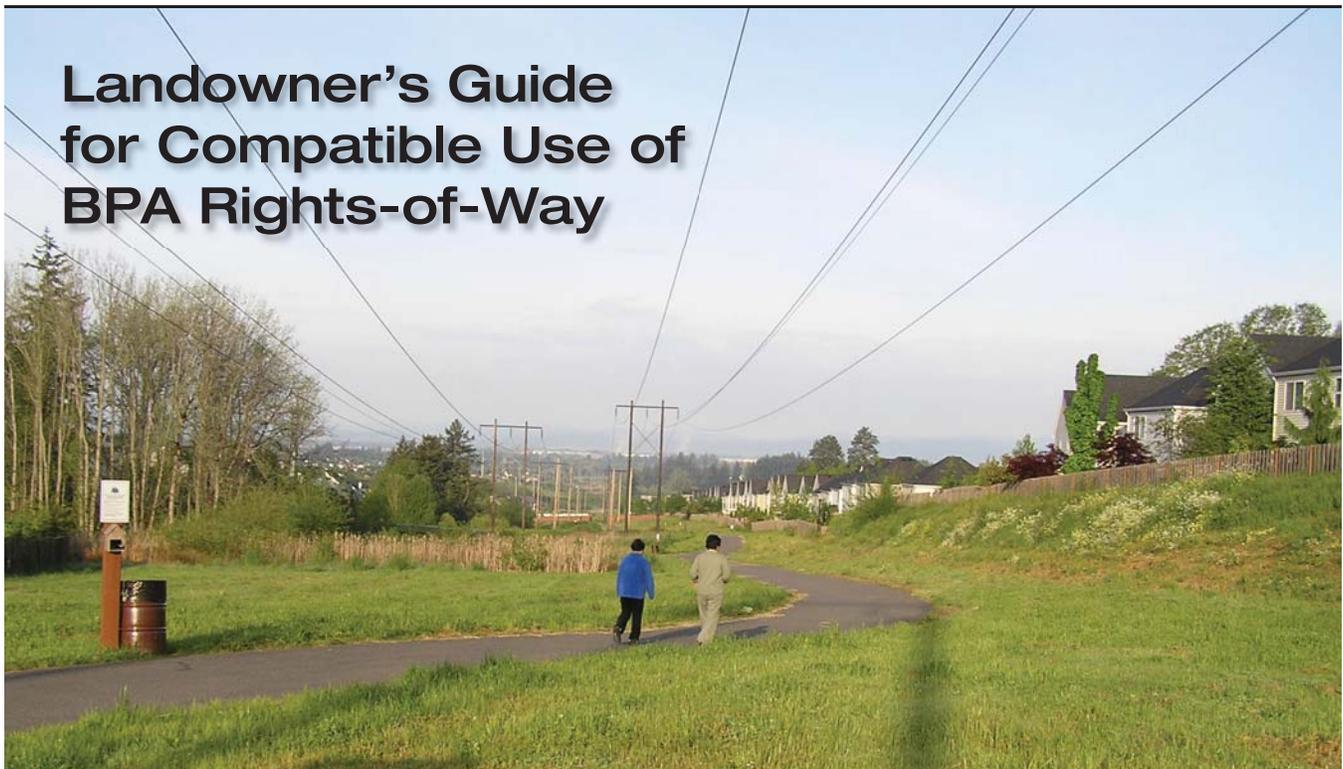
PO Box 3621 Portland, Oregon 97208-3621

DOE/BP-3804 • October 2007 • 3M

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# **Appendix C. Landowner's Guide for Compatible Use of BPA Rights-of- Way**





# Landowner's Guide for Compatible Use of BPA Rights-of-Way

July 2007

## We need your help to keep the way clear for safe and reliable service

Keeping transmission lines safe and reliable is a critical priority for the Bonneville Power Administration. The key element in achieving those objectives is BPA's ability to construct, operate and maintain its transmission lines and rights-of-way — the area under and around the lines.

You can help BPA keep these rights-of-way clear of trees, brush and structures that could affect the safety or reliability of the transmission system.

Prior to planting, digging, or constructing within BPA's rights-of-way, fill out BPA's Land Use

Application Form. The information you provide on the application helps BPA understand your proposed use and the potential impacts to public safety, and the safety of our crews. BPA also reviews the application to determine whether a proposed use of land is compatible with the construction, operation and maintenance of BPA transmission lines. Coordinating with BPA early in your planning process can keep you safe and avoid wasting time and money.

## Coordination of land uses

BPA's rights-of-way can sometimes be available for other, compatible, uses. BPA wants to help you carry out your plans in ways that are safe and satisfactory for everyone. Therefore, you are encouraged to make prior arrangements with BPA through the Land Use Application process.

BPA takes several factors into consideration when applications for use of the right-of-way are reviewed. Our transmission lines were designed



to take topography, physical features, environmental and cultural constraints into consideration. BPA's land rights as they relate to the location of your proposed use are also reviewed. If your project is not compatible with BPA's transmission lines, you may be asked to modify your design. In extreme cases, BPA may be able to modify its transmission facilities; however, you would be required to pay for the modifications.

Please consider the following guidelines when preparing your application:

- Maintain at least 50 feet of clearance from BPA's poles, structures or guy wires, whether it be vegetation, roads, fences, utilities, pipelines, or any other improvements.
- Maintain at least 30 feet of clearance from the top of any vegetation and the lowest point of BPA's wires. Do not attempt to measure this distance yourself! You only need to identify the species of the vegetation you propose to plant in the right-of-way so that BPA can consider the mature height of the vegetation.
- Design underground utilities to withstand HS-20 loadings (a federal highway standard).

## Who we are

The Bonneville Power Administration is a federal agency headquartered in Portland, Ore., that markets wholesale electricity and transmission services to the Pacific Northwest's public and private utilities as well as to some large industries.

BPA provides about 40 percent of the electricity used in the Northwest and operates more than 15,000 circuit miles of transmission lines. To deliver power, BPA operates and maintains a transmission network throughout Oregon, Washington, Idaho and Montana with small portions into Wyoming, Nevada, Utah and California.

- Design roads, utilities and pipelines to cross BPA's rights-of-way, rather than a long, linear alignment.
- Ensure concurrence of underlying property owner when not BPA.

## Three important steps

There are three important steps that you can take to keep safe and avoid wasting time and money:

1. Call BPA before you plant, dig or construct: 1-800-836-6619.
2. Fill out BPA's Land Use Application: [www.transmission.bpa.gov/LanCom/Real\\_Property.cfm](http://www.transmission.bpa.gov/LanCom/Real_Property.cfm).
3. Obtain a permit from BPA before proceeding with your project.

## Location surveys

You are encouraged to have a licensed surveyor determine the location of the BPA easement before beginning any construction activities. Unfortunately, many people inadvertently build structures on BPA easements because they believe they know the boundaries of their property, and believe measuring off the conductor or centerline of the towers is sufficient to fix the location of the easement. Without survey instruments, knowledge of survey law and an understanding of BPA's right-of-ways, it is impossible to accurately locate property boundaries. By having your surveyor coordinate with the BPA Survey Section, we can prevent many of the encroachment problems that BPA experiences (call 1-800-836-6619 and ask to be connected to BPA's Survey Section).

## Danger trees

BPA must identify and arrange to cut trees that, although outside the right-of-way, may threaten the transmission line because they could fall into the conductor (wires) or structures. Trees that are unstable, diseased, dead or leaning toward the transmission facilities don't need to touch power lines to be dangerous. Electricity can "arc" or

**Never cut or trim a tree near a power line.  
Call BPA!**

“flashover” from wires, through the air, to trees or equipment, where it can cause fires, injuries or even fatalities to anyone near the tree or equipment. BPA will arrange to remove these trees.

## Available uses of BPA-owned land

Although BPA acquired most of its transmission line rights-of-way as easements, some of BPA’s transmission lines are constructed on property BPA owns in fee. BPA also has fee ownership of most of its substation sites as well as other properties BPA acquired to meet its responsibilities. There are three possible options if you wish to use land that BPA owns in fee. You will need

to fill out BPA’s Land Use Application so that we can determine whether your proposed use interferes with BPA’s use. Easements may be granted for permanent uses such as private road crossings or utilities. Leases may be granted primarily for agricultural purposes on occupied or vacant BPA property. Nontransferrable Land Use Agreements may also be granted for use of BPA’s fee owned property. Current market value of the land is the basis for the consideration for these transactions.

## Information resources

For more information, including regional realty specialist contacts, or access to BPA’s electronic Land Use Application form visit BPA’s Web site at: [www.transmission.bpa.gov/LanCom/Real\\_Property.cfm](http://www.transmission.bpa.gov/LanCom/Real_Property.cfm)

Should you have any questions or would like assistance in completing the application, please call 1-800-836-6619. A BPA realty representative will return your call within two business days.

## DOs and DON'Ts

BPA does not permit any use of rights-of-way that are unsafe or might interfere with constructing, operating or maintaining our facilities. These restrictions are part of the legal rights BPA acquires for its rights-of-way. Even when no transmission line has been constructed on the easement area, BPA’s rights are maintained for future use. You can avoid or minimize incurring redesign or removal costs and benefit from developing reasonable construction schedules by being aware of the prohibited uses and by applying early in your planning process to BPA for concurrence.

**DO** call BPA before planting, digging or constructing.

**DO** check your property and review your property records for transmission right-of-way easements.

**DO** take the time to plan projects that conform to proper use of the rights-of-way which includes submitting a BPA Land Use Application form for approval.

**DO** comply with the terms and conditions of the agreement provided by BPA for your safety.

**DO** consult with BPA when planning subdivisions. Backyards and BPA rights-of-way are not compatible.

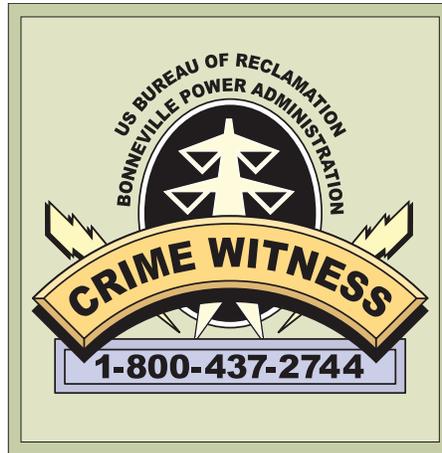
**DO** report criminal or suspicious activities to local authorities and to BPA’s federal Crime Witness Hotline at 1-800-437-2744.

**DON'T** cut or trim a tree near a power line. Call BPA!

**DON'T** plant, dig or construct in BPA’s rights-of-way without first contacting BPA and submit a BPA Land Use Application for approval.

**DON'T** store equipment, materials, waste, flammable material or anything that would cause a fire hazard or other safety issue or impede access by line crews to towers and lines.

**DON'T** assume the location of BPA’s fee-owned or easement boundaries without first contacting a licensed surveyor and having them coordinate with BPA’s surveyors by calling 1-800 836-6619.



## Vandalizing BPA property is a crime.

Please report any vandalism or theft to BPA property by calling BPA's 24-hour toll-free hotline at 1-800-437-2744. All information reported through the Crime Witness Program is kept confidential. Cash rewards of up to \$25,000 will be paid to those providing information that leads to the arrest and conviction of persons committing the crime.

Bonneville Power Administration

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