B O N N E V I L L E   P O W E R   A D M I N I S T R A T I O N

Creston-Bell Transmission Line Rebuild Project

Preliminary Environmental Assessment

April 2012

DOE/BP-4406

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Chapter 1
Purpose of and Need for Action

1.1 INTRODUCTION

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

BPA is proposing to rebuild its Creston-Bell No. 1 transmission line. The aging, 53.8-mile-long 115-***kilovolt*** (kV)[1] wood-pole transmission line is located in a corridor with three other larger transmission lines and requires replacement of its wood poles and other components of the line.

This Environmental Assessment (EA) was prepared for this proposal by BPA pursuant to regulations implementing the National Environmental Policy Act (NEPA) (42 U.S.C. 4321 et seq.), which requires federal agencies to assess the impacts their actions may have on the environment. BPA prepared this EA to determine if the Creston-Bell Transmission Line Rebuild Project (Rebuild Project or Proposed Action) would cause effects of a magnitude that would warrant preparing an Environmental Impact Statement (EIS), or whether it is appropriate to prepare a Finding of No Significant Impact.

1.2 NEED FOR ACTION

BPA needs to take action to ensure the integrity and reliability of the existing Creston-Bell No. 1 transmission line (Figure 1-1). This transmission line is located between the BPA Creston ***Substation*** and the BPA Bell Substation in Lincoln and Spokane counties, respectively. The transmission line is old, physically worn, and structurally unsound in places. This transmission line serves BPA's utility customers, who in turn serve communities in eastern Washington.

The transmission line was originally built in 1942 by BPA. The original ***conductor*** has never been replaced and does not meet current standards. 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. Today, the existing wood-pole ***structures*** and conductors exceed their service life and show normal deterioration due to age. In addition, the bases of some structures have been undermined because the underlying soils are unstable. The poor condition of the existing transmission line creates risks to public and worker safety and may

[1] Terms defined in the glossary (Chapter 6) are shown in ***bold, italicized*** typeface the first time they are used.

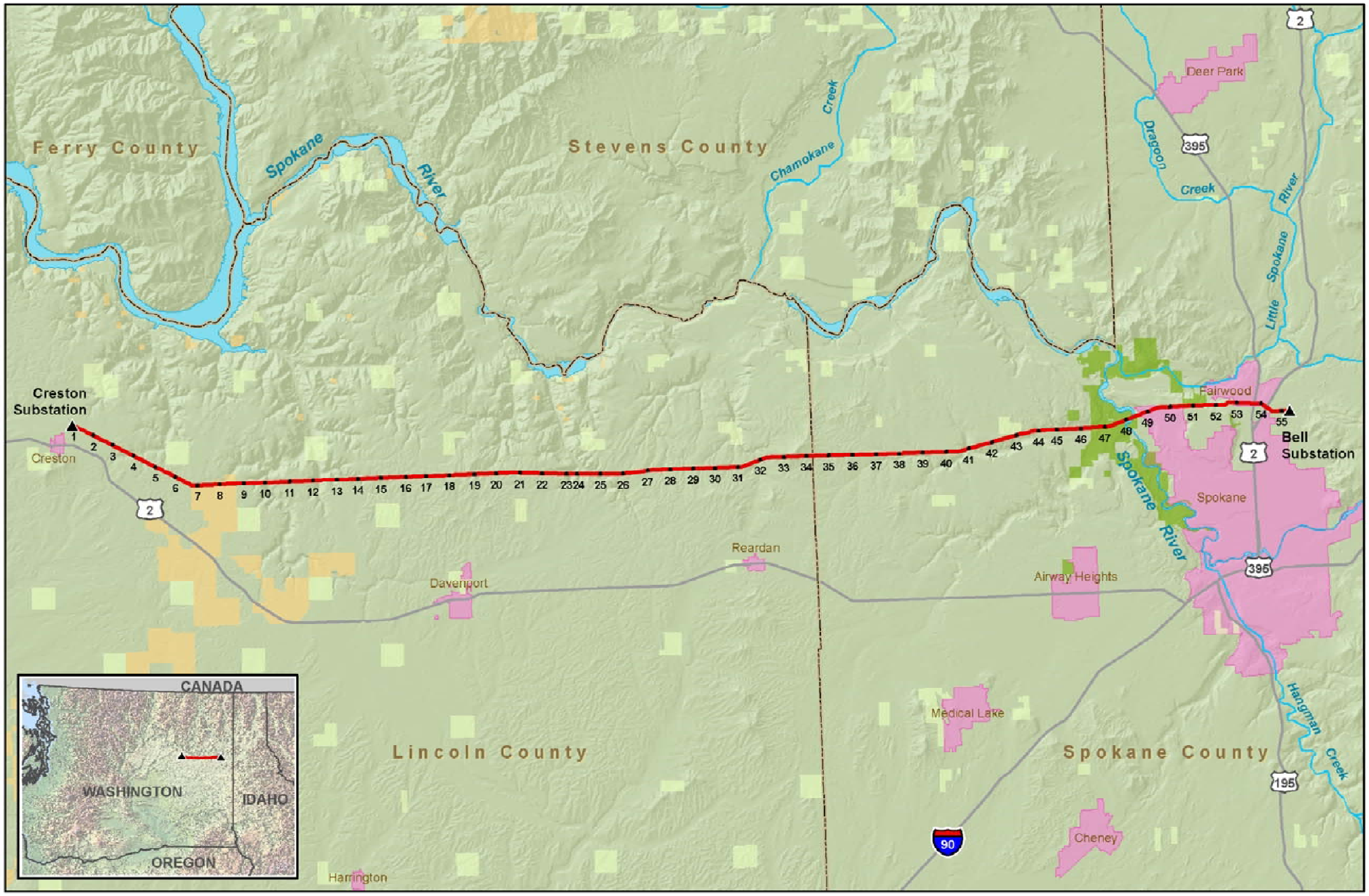

Figure 1-1. Project Location
BPA Creston-Bell Transmission Line Rebuild Project

Z:\Gdrive\Projects_2011\BPA_Creston-Bell\maps\Figures\Figure1-1_Location.mxd lead to outages that would adversely affect power deliveries to BPA's customers in eastern Washington.

In addition to these structural issues, there is a need to provide better access to the transmission line. Some structures do not have permanent ***access roads*** to reach them, which makes normal and emergency maintenance difficult and at times unsafe. Other roads need to be improved to ensure that the line can be accessed year round.

1.3 PURPOSES OF ACTION

Purposes are defined here as 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:

- Meet transmission system public safety and reliability standards set by the National Electrical Safety Code (NESC),
- Minimize environmental impacts,
- Continue to meet BPA's contractual and statutory obligations, and
- Demonstrate cost-effectiveness.

1.4 PUBLIC INVOLVEMENT

On February 3, 2010, BPA sent a letter to people potentially interested in or affected by the proposed Rebuild 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 participate. The public letter was posted on the project website at: http://efw.bpa.gov/environmental_services/Document_Library/Creston_Bell/.

BPA identified two tribes that have a potential interest in the Proposed Action, based on their historic or current use of the land in the project area: the Spokane Tribe of Indians and the Confederated Tribes of the Colville Indian Reservation. BPA requested information from the consulting tribes on ***cultural resources*** in the project area. BPA provided project information and information on cultural resources review to Tribal cultural resources specialists. BPA solicited comments from Tribal representatives, which were used to shape the cultural resource field investigation for the project.

BPA held two public scoping meetings to describe the project and to solicit comments in Davenport and Spokane, Washington, in March 2011. The Rebuild Project public comment period began on March 16, 2011, and BPA accepted comments on the project from the public until April 18, 2011.

A total of 22 people attended the public meetings; 10 attended the Davenport meeting and 12 attended the meeting in Spokane. Comments were provided during the meetings and written comments were also received from 16 individuals and agencies. Comments received during the comment period were considered in the environmental analysis and can be found in their entirety on the project website.

Comments were received on the following topics:

- **Alternatives.** A number of comments requested that the new structures be aligned with the existing steel towers rather than offset as they currently are. One comment suggested that the existing line be maintained until "robust smart grid technology" is available.
- **Land Use and Recreation.** Comments noted that the existing transmission line corridor crosses part of Riverside State Park and a portion of the corridor is adjacent to the Little Spokane River Natural Area part of the park. Comments requested that the EA address short- and long-term impacts to recreationists using the park, including potential impacts to sensitive natural and cultural resources, construction-related noise and traffic impacts, and control of illegal motorized vehicle use. Comments were also received about mountain bike use and informal trails along the transmission line corridor.
  The Bureau of Land Management (BLM) noted that if ground disturbing activities extend beyond the boundaries of the existing easements on BLM-managed land, BPA would require a new ***right-of-way*** (ROW) grant for these areas.

  Concerns were expressed about potential impacts to agricultural operations, specifically reductions in the distance between transmission line structures that would affect the ability of farm equipment to turn or navigate in the affected areas.

  Comments were expressed about potential impacts to county roads and impacts related to easement road improvements.

- **Vegetation.** A number of comments raised concerns about the potential for project-related ground disturbance to result in the spread of noxious plants and requested that the EA identify measures to control the spread of noxious plants. Comments also requested that only native seeds/plants be used for revegetation and fill (dirt or gravel) and temporary stabilization (straw or mulch), if used, be certified weed-free.
- **Fish and Wildlife.** Comments raised concerns about potential impacts to sage grouse and sharp-tailed grouse habitat and recommended that construction avoid the nesting period of sage grouse and to a lesser extent the nesting periods of other resident birds. Concern was also expressed about the potential for transmission poles to provide opportunities for raptor perches that could increase predation mortality of grouse.

  Other comments asked that the EA evaluate impacts to wildlife migration between Five Mile Prairie and the Little Spokane River Natural Area, look at quail habitat near the Fairwood area, and evaluate the transmission line corridor's possible function as an urban wildlife corridor.

- **Water Resources and Water Quality.** One comment requested that the EA evaluate site disturbance in the Hawk Creek drainage.
- **Visual Quality.** Comments expressed concerns about the potential visual impact of the project with respect to the alignment of the new poles and tree falling and brush disposal options. Comments also requested that the EA identify ***mitigation*** for potential visual impacts.
- **Socioeconomics and Public Services.** Concern was expressed about the potential for the project to affect property values.
- **Cultural Resources.** One comment requested that the transmission line be evaluated as a potential National Register of Historic Places (NRHP) eligible property.

- **Noise, Public Health and Safety.** Comments requested that the EA consider the potential impact of ***electromagnetic fields*** (EMF) on nearby residents, as well as disturbance to residents during construction.

These topics are addressed in appropriate sections in the EA.

BPA is releasing this Preliminary EA for review and comment. The Preliminary EA is posted on the project website. During the review period, BPA will accept comments orally, via e-mail, and by letter. After considering comments received during the review period, the EA will be revised if necessary and finalized, with a decision on how to proceed.

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Chapter 2
Proposed Action and Alternatives

This chapter describes the Proposed Action, the No Action Alternative, and alternatives considered but eliminated from detailed study. This chapter also compares the Proposed Action and the No Action Alternative to the project purposes, as well as the potential environmental impacts of each of these two alternatives.

2.1 PROPOSED ACTION

The Proposed Action is to rebuild the 53.8-mile-long 115-kV Creston-Bell transmission line, conduct work on some access roads, and remove some ***danger trees***. The existing transmission line extends east from the existing Creston Substation, located in Lincoln County, Washington, to the existing Bell Substation, located in the city of Spokane, Washington. The western portion of the transmission line is located in Lincoln County; the eastern portion is located in Spokane County (Figure 1-1). The existing line shares an extended ROW corridor with other larger lattice-steel transmission lines for its entire length between the Creston and Bell substations (Figure 2-1). The other transmission lines that share this corridor are the Grand Coulee-Bell No. 5 230-kV transmission line, the Grand Coulee-Bell No. 3/Grand Coulee-Westside No. 1 double-circuit 230-kV transmission line, and the Grand Coulee-Bell No. 6 500-kV transmission line.

The rebuilt transmission line would be similar to the existing Creston-Bell transmission line in design and appearance. It would be within the same transmission line corridor and would not require the acquisition of any new right-of-way. The main elements of the existing and rebuilt transmission lines are compared in Table 2-1.

Table 2-1. Existing and Rebuilt Transmission Line Elements

Project Element	Existing Transmission Line	Rebuilt Transmission Line
Operating Voltage	115 kV	115 kV
Corridor Length	53.8 miles	53.8 miles
ROW Width	100 feet	100 feet
Wood-pole structures	479	475
Two-pole wood structures	442	420
Three-pole wood structures	33	51
Steel-pole structures	3	5
Lattice-steel structures	1	1
Structure height range (above ground)		
Wood structures	55 to 95 feet	43 to 89 feet
Lattice-steel structures	90 feet	90 to 113 feet
Conductor diameter	0.68 inch	0.84 inch

The Proposed Action would involve the following activities:

- removal of existing structures and conductors;
- installation of replacement structures and associated components;

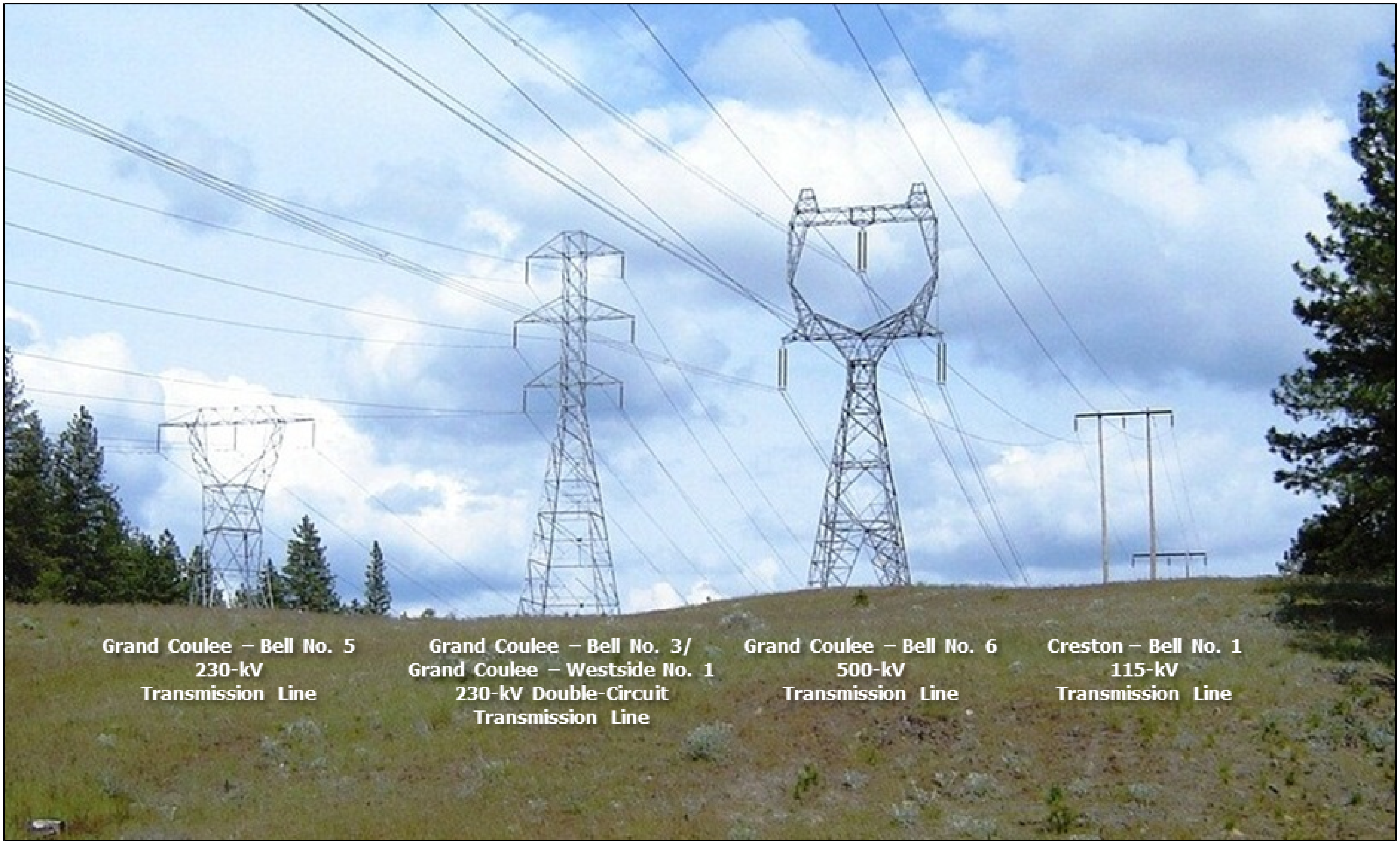

Figure 2-1. Existing Transmission Line Corridor
BPA Creston-Bell Transmission Line Rebuild Project

- installation of conductors, ***ground wire***, and ***counterpoise***;
- installation of two lattice-steel towers;
- improvement and reconstruction of some existing access roads;
- construction of permanent access roads;
- use of temporary and permanent ***travel routes***[2];
- release of some existing access roads[3];
- establishment of temporary ***staging areas*** for storage of materials;
- removal of some vegetation, including some danger trees; and
- revegetation of areas disturbed by construction activities.

Each of these activities is described in detail in the remaining portions of this chapter. The estimated project requirements are summarized in Table 2-2.

Table 2.2. Proposed Rebuild Project Activities

Proposed Activity	Quantity
Transmission line rebuild activities	
Number of wood-pole structures removed	475
Number of structures installed:	
Wood, two-pole suspension	420
Wood, three-pole angle	51
Lattice-steel structures	2
Total new structures	473
Number of structures compared to existing conditions	-2
Number of new structures outfitted with guy wires	74
Conductors	3
Access road work	
Construction	10.1 miles
Improvements and/or reconstruction	31.0 miles
Total length of access roads[1/]	**41.1 miles**
Acquire access roads/routes easement	3.7 miles
Release access roads easement	1.1 miles
Temporary travel routes	18.6 miles
Permanent travel routes	14.8 miles
Proposed culverts	20
Fords	12
Vegetation Management	
Removal of danger trees	274
Removal of vegetation within the ROW	As needed
Removal of vegetation along existing access roads	As needed

Note:
1/ This total includes all roads used by BPA exclusively for access to the transmission line. This total includes new and reconstructed roads; it does not include project-specific travel routes (33.4 miles) or public roads, such as U.S. Route 2, that may be used as the primary road for access to isolated structures. Roads released as a result of the Proposed Action (1.1 miles) are also not included in this total.

[2] Travel routes are either routes through farm fields (temporary travel route) or existing non-public roads in good condition that may require surface improvements, such as blading, grading, and aggregate surfacing (permanent travel route).

[3] Previously acquired access road easement rights that are released are returned back to the underlying fee owner. Once the release is completed, BPA has no rights to use that road in the future.

2.1.1 Existing Transmission Line and Right-of-Way

The existing transmission line consists of 475 wood-pole structures, three lattice-steel structures, and one steel pole. Each structure is designated by a unique number based on the distance from the Creston Substation (the designated start point) and the number of structures within a given mile. For example, in the first mile from the Creston Substation, there are nine wood-pole structures. The first structure is designated as Structure 1/1, the second structure is Structure 1/2, and so on, up to the ninth structure, which is designated as Structure 1/9. Numbering in line mile 2 begins with Structure 2/1 and ends with the last of eight structures, Structure 2/8.

Structure replacement would occur within the existing 100-foot-wide transmission line ROW. The majority of the existing ROW (approximately 50.86 linear miles) is located on private land. The ROW also crosses land managed by the Washington State Parks and Recreation Commission (Washington State Parks) (approximately 1.94 linear miles), and land managed by the BLM (approximately 1 linear mile).

The existing transmission line shares an extended ROW corridor with other larger transmission lines for its entire length between the Creston and Bell substations (Figure 2-1). The combined corridor is 400 feet wide, including the 100-foot-wide Creston-Bell ROW. As shown in Figure 2-1, the other lines that share this extended corridor are all supported by lattice-steel structures that are much larger than the wood-poles that comprise the existing Creston-Bell line.

2.1.2 Transmission Line Structures

A total of 471 wood-pole and two ***lattice-steel structures*** would replace the existing 475 wood-pole structures. Three existing lattice-steel towers and one steel pole would remain in place and be part of the new line. In general, the existing structures would be replaced with structures of essentially the same design—two-pole or three-pole—and with similar structural components (i.e., structure cross arms, ***insulators***, and ***dampers***). All wood structures would have the same general appearance but would vary in size depending on their function. Two new lattice-steel structures—Structures 48/2 and 48/3—would be installed on either side of the Spokane River. The lattice-steel structures are larger than the existing wood poles and would provide the height necessary for the new conductors to span the river.

Most (420) of the proposed structures would be two-pole suspension structures (Figure 2-2), which are used in straight alignments or where turning angles between structures are generally less than 15 degrees. They are constructed of two poles, because they do not have to withstand the stresses created by angles in the conductor.

Fifty-one structures would be three-pole structures, either angle or dead-end (Figure 2-2). ***Angle structures*** would be located at points where the line changes direction, generally at angles of 15 degrees or greater. ***Dead-end structures*** would be placed at intervals along the transmission line to independently carry the weight and tension of the conductors. Dead-end structures could be used on a straight alignment, at angles greater than 15 degrees, or on very long spans, such as river crossings.

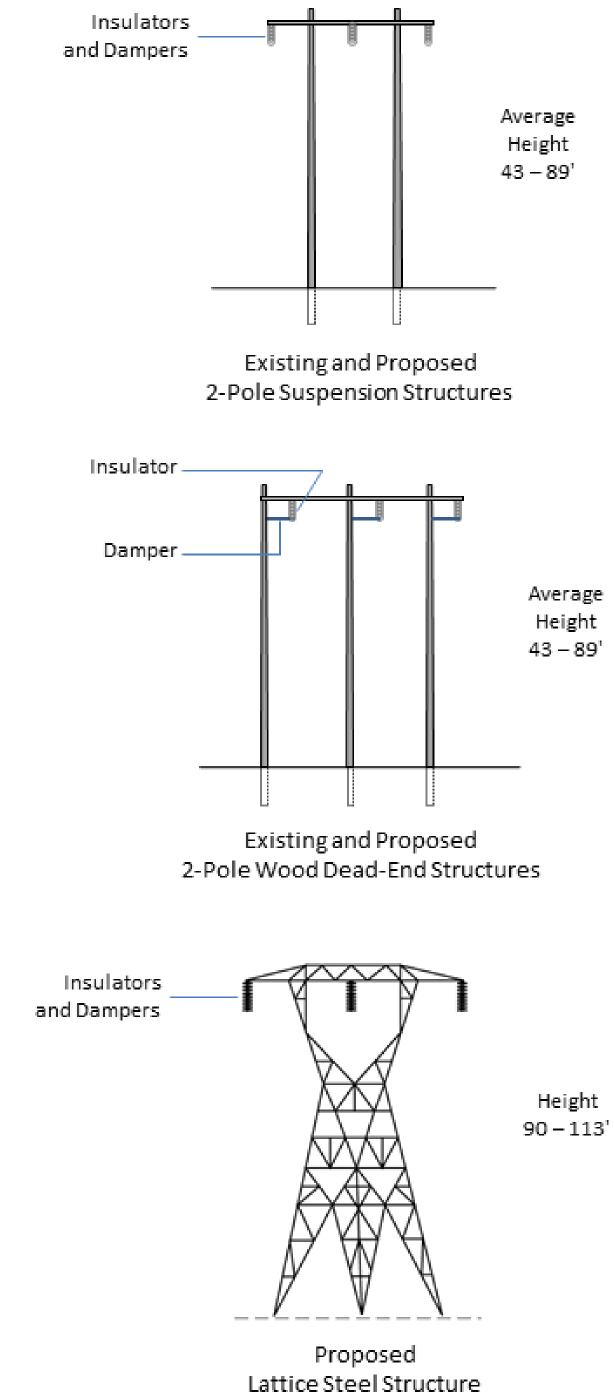

Figure 2-2. Existing and Proposed Wood and Lattice Steel Structures
BPA Creston-Bell Transmission Line Rebuild Project

The heights of the new wood-pole structures would be similar to the heights of existing structures, ranging from 43 to 89 feet above ground. The two new lattice-steel structures would be approximately 90 to 113 feet above ground. Structure heights at particular locations would depend on terrain, the length of the span, and other factors.

Guy wires and guy anchors to support new structures would be installed as required. Guy wires would connect the wood-pole structures to the ground to provide extra support and stability.

2.1.3 Conductors, Overhead Ground Wires, and Counterpoise

Conductors

Alternating-***current*** transmission lines, like the Creston–Bell transmission line, require three conductors to make a complete ***circuit***. The existing conductors would be removed and new ones attached using non-ceramic insulators. Insulators keep conductors a safe distance from other parts of the structure and prevent electricity in the conductors from moving to other conductors, the structure, or the ground. The existing conductor has a diameter of 0.68 inch; the proposed conductor would be larger, with a diameter of 0.84 inch. The new conductor would be more reflective than the existing conductor for the first few years after installation, until it naturally weathers and dulls.

Overhead Ground Wire

Overhead ground wires are used for lightning protection. If lightning strikes, the overhead ground wire takes the charge instead of the conductors. An overhead ground wire is currently attached between the Creston Substation and Structure 1/6 and between Structure 54/7 and the Bell Substation. Ground wires would be replaced in these locations.

Counterpoise

A system of underground wires, or ***counterpoise***, is attached to some structures for additional lightning protection. The counterpoise takes the lightning charge from the overhead ground wire and dissipates it into the earth. The wires are laid out horizontally from structures within the ROW and buried in the ground. Counterpoise would only be located where overhead ground wire is present (six structures in the first line mile and seven structures in the last line mile) and would be replaced as needed. Typically, at each of these 13 structures, the trench in which the counterpoise is buried would be excavated by a small backhoe and would measure approximately 30 inches deep by 24 inches wide and vary in length from 15 feet to 100 feet long.

2.1.4 Access Roads

Transmission line structures would be accessed from existing roads where possible. Roads leading to the vicinity of the transmission line are generally multiuse roads (e.g., residential access, country roads) used by a variety of individuals for various purposes. Existing access roads within the ROW were generally created for BPA use.

Access road work would, however, be needed to improve access to most of the structure sites for construction and for ongoing operation and maintenance activities. This work would include existing road improvements and/or reconstruction (31.0 miles), road construction (10.1 miles), and acquisition of easements for existing access roads/routes (3.7 miles). The road construction total (10.1 miles) includes numerous short lengths of ***spur road*** that would extend from existing roads to structure locations. Access would also involve the use of travel routes (33.4 miles), either temporary routes through farm fields (18.6 miles) or existing non-public roads (14.8 miles). BPA would acquire easements for those lengths of travel route that extend off the ROW. For temporary routes, these easements would be temporary and BPA would compensate landowners for any crop damage.

The project would also involve the release of 1.1 miles of previously acquired access road easement rights back to the underlying fee owner. Once the release is completed, BPA would have no rights to use the released road miles in the future.

The roadway system is being inventoried to determine the best location(s) for gates to discourage unauthorized access to the transmission line corridor. Approximately 10 new gates are proposed at this time. In addition, there are approximately 100 existing gates along the existing access road network. Some of these existing gates may need to be replaced as part of the project.

Approximately 20 ***culverts*** would need to be installed or replaced in locations along the proposed access roads/routes to provide better drainage during rain and snow events. New and replacement culverts would be 24 inches in diameter or smaller. All culverts not replaced would be inspected and cleared of debris. No culverts would be replaced or newly installed on any fish-bearing stream. The current construction access plan involves the use of 12 fords, mostly along existing roads that would be reconstructed/improved under the Proposed Action.

2.1.5 Construction Activities

The schedule for construction of the Proposed Action depends on the completion and outcome of the environmental review process. If the Proposed Action is implemented, construction would likely begin in May 2012 or shortly thereafter. All major construction activities would likely be completed by November 2012. Project construction activities are described below.

Up to five work crews would be working along the entire transmission line on any given day. Crews would be working up to 10 hours per day, 6 days per week, for approximately 6 to 7 months. Each crew would consist of 4 to 6 contractor employees with a small number of support trucks delivering materials (wood piles, string, or conductor) and equipment (cranes, backhoes, excavators, tensioners, or pullers) to the work site. Typically, only one crew would be working at any given site; however, up to two crews could work at the string site. As a result, up to 30 contractor employees could work along the entire corridor with up to 12 employees at a work site.

During construction, ***best management practices*** (BMPs) would be implemented to minimize construction-related ***erosion*** and the potential for introducing construction-related materials (e.g., oil, hazardous materials) into waterways and other sensitive habitats (e.g., ***wetlands*** and fish-bearing streams). All BMPs would be derived from and implemented in accordance with the *Stormwater Management Manual for Eastern Washington* (Washington State Department of Ecology [Ecology] 2004a).

Removal of Existing Structures

Removal of existing structures would involve excavating around the structure base and using a boom crane to pull the structures out of the ground. Excavated poles would be hauled off site using a line truck. Some shrubs and small trees in the ROW might need to be cleared to allow equipment and machinery to access the structures, as well as danger trees located outside the ROW (see Section 2.1.6, Vegetation Management).

The conductors and overhead ground wire would be removed by reeling the wires onto large spools using a large truck called a puller. The puller would be set up with empty reels to hold the old conductors as they are reeled in. Once removed, the old conductors would be delivered to a metal salvage location to be recycled.

Installation of Replacement Structures

A total of 473 new structures would replace the 475 existing wood-pole structures. Structure replacement would include all components of the structure (cross arms, insulators, and dampers), although components that are in good condition may be reused.

Replacement structures would be brought to the structure sites from the staging areas by flatbed truck and, generally, installed in the same ground holes from which the existing structures were removed. The existing holes would be reaugered to about 10 feet deep in the ground using an auger on a drill rig. The replacement poles would be lifted by crane into position and placed into the holes. Holes would be backfilled with excavated material and gravel, as required. At most structure sites, any additional soil removed by the auger that is not used for backfilling would be spread evenly around the structure base for stability. At structure sites in sensitive areas, the augered soil would be removed from the site and disposed of in an appropriate fill or waste disposal site.

At most structure sites (i.e., two-pole suspension structures), structure replacement could disturb an area up to 50 feet by 100 feet per structure (about 0.1 acre) within the previously disturbed ROW. The disturbance area for replacement of three-pole wood structures could be larger (approximately 100 feet by 100 feet, or 0.2 acre) because ***pulling and tensioning*** of the new conductors would generally occur near these structures. The disturbance area for the two lattice-steel towers would be approximately 100 feet by 100 feet, or 0.2 acre. In or near sensitive habitats, disturbance areas would be reduced to 50 feet by 50 feet (approximately 0.06 acre) where possible. Staking or flagging would be installed in these areas to restrict vehicle and equipment access to designated routes and areas to protect these sensitive habitats.

Guy wires and guy wire anchors to support new structures would be installed, as required. 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 anchor and the old guy wire would be cut off. Depending on the location, the underground guy wire anchor would be left or removed. Holes for new guy wire anchors would be dug with a backhoe. Depending on the height, design, and location of the new structure, a new guy wire anchor could be placed in the same location as the old anchor and set in crushed rock. The remainder of the guy wire anchor hole would be backfilled with onsite material.

Equipment used for removing and installing wood poles and other structure components would include flatbed trucks, line trucks with boom cranes, backhoes, augers, and bucket trucks. All trucks and equipment would be restricted to operating within the access roads and travel routes established for the Project.

Installation of Lattice-Steel Structures

Lattice-steel towers are anchored to the ground with footings. Four footings anchor each tower at four points. The design for each footing varies based on the soil, depth to bedrock, and quality of bedrock at each site. For a typical tower site, a hole is excavated, steel plates or a grid of crossbeams are placed in the hole, and the hole is filled up with the original material excavated or with concrete.

An area about 8 feet by 8 feet is usually needed for a footing. If no bedrock is found, a hole about 12 feet deep is excavated. If bedrock is found and is adequate for using anchor borings, holes are drilled in the bedrock and steel rods and grout are inserted. The rods are then attached to a concrete footing, or welded directly to part of the tower and covered with compacted soil. If the bedrock cannot support anchor rods, the bedrock may need to be blasted to reach an adequate footing depth.

Lattice-steel towers are either assembled at the tower site and lifted into place by a large crane or assembled at a staging area and set in place by a large sky-crane helicopter. The towers are assembled in sections. Each tower contains three components: tower legs, tower body, and bridge. The bridge is the uppermost portion of the tower and serves as the attachment point for the insulators, which in turn support the conductors. The towers are then bolted to the footings after they are set in place. Two new lattice-steel towers would be installed as part of the project.

Installation of Facilities Associated with the Egypt, Larene, and Springhill Tap Lines

Three Inland Power & Light (IPL) powerlines connect to the Creston Bell transmission line—the Egypt, Larene, and Springhill tap lines:

- The Egypt Tap is located at Structure 15/8 and extends approximately one mile to IPL's Egypt Substation.
- The Larene Tap is located at Structure 17/8 and extends approximately 100 yards to IPL's Larene Substation.
- The Springhill Tap is located at Structure 45/6 inside IPL's Springhill Substation.

These taps would remain at their current locations under the Proposed Action, with existing disconnect switches either relocated to or replaced in-kind at the new structures in these locations.

Installation of Conductors, Ground Wire, and Counterpoise

The existing conductors do not meet current standards. They are made of copper and replacement parts are no longer manufactured. The proposed conductors would be made of aluminum and steel and would have a higher electrical ***capacity*** than the existing conductors. The appearance of the conductors would, however, be similar, although the new conductors could be slightly more reflective for the first few years until they naturally weather and dull.

The conductor would be installed by setting up a pulling and tensioning site at the beginning and end of each identified pulling section. Typically, pulling sections are lengths along the ROW that are no more than 25 structures long. Conductor pulling and tensioning sites would be needed approximately every 2 to 4 miles depending on the length of each span and the terrain.

After the equipment (puller and tensioner) is set up, a ***sock line*** (usually a rope) would be strung through all the structures. This stringing would be done using a helicopter or by workers on the ground. The sock line would be connected to a hard line (typically a small stranded steel wire), which would be connected to the new conductor and pulled through the structures. Once in place, the new conductor would be tensioned and sagged in place and securely clipped into all of the structures. The tensioner is a large piece of equipment that has many drums that the new conductor is fed through to get the proper tension.

At the same time that the conductors are replaced, overhead ground wire would be removed and replaced, and counterpoise would be replaced, if needed. Overhead ground wire and counterpoise would only be found between the Creston Substation and Structure 1/6 and between Structure 54/7 and the Bell Substation. The decision to replace or retain existing counterpoise would be made during the design process. If replaced, the counterpoise wires would be buried at the base of the structure, extending between the wood poles and from 6 to 18 inches to the outside of the poles where they would connect to a 5/8-inch ground rod. Ground rods typically measure 10 feet in length and would be placed entirely underground in a vertical orientation. Generally, one wire would be buried per structure. The placement of counterpoise wires could be adjusted to avoid sensitive areas, if possible. The wires would be buried approximately 30 inches below the ground surface using a small backhoe. In areas where bedrock is at or near the surface, the wires would be laid on the surface and buried with loose aggregate.

Access Road Work

As described above, roadway improvements and reconstruction would be needed along 31 miles of existing roads to provide suitable access for transmission line equipment. Improvements to access roads could involve: blading to shape existing road surfaces and turnouts; placement of surfacing aggregate to maintain or restore existing road surfacing; cleaning existing ditches and culverts; replacing or installing culverts; and installing water bars and drain dips as needed to manage ***stormwater runoff***. Reconstruction of existing roads could involve light grading and blading to shape existing road surfaces and turnouts; placement of surfacing aggregate; installation or replacement of drainage structures such as culverts, fords, and drain dips to manage stormwater runoff; reshaping of roadway ditches, and culvert inlets and outlets; and vegetation maintenance or removal.

Work associated with the 10.1 miles of proposed road construction could include grading operations consistent with establishing a road base; removal and replacement of existing deteriorated road base; removal of vegetation within the roadway prism or along the proposed roadway; placement of road sub-base and surfacing aggregate; installation or replacement of drainage structures such as culverts, fords, and drain dips to manage stormwater runoff; and construction or reshaping of roadway ditches, and culvert inlets and outlets.

The 18.6 miles of travel routes across fields (temporary travel routes) would be used in their existing condition with the least impact necessary to allow travel during construction and facilitate restoration of the area back to the existing condition (field) after construction activity. Gates proposed along temporary travel routes would remain in place as permanent features. Installation of improvements, including drainage features, such as culverts, fords, and drain dips, and any surface improvements to facilitate travel during construction, would be determined based on conditions encountered at the time of construction and would be temporary in nature. Temporary improvements would be removed and BPA would work with the landowner to compensate and/or return area to a condition suitable to landowner.

The 14.8 miles of travel routes over existing non-public roads (permanent travel routes) may require surface improvements, such as blading, grading, and aggregate surfacing. Gates, drainage features, and surface improvements proposed along permanent travel routes would remain in place as permanent features and the roadway would be restored to meet or exceed the existing roadway condition following construction.

Road work would occur prior to and concurrent with structure replacement. Most roads would be constructed to a finished 14-foot width, although some areas would be wider to allow vehicles to negotiate curves or bends in the road and to accommodate cut and fill slopes associated with the improvements. The analysis in this EA assumes a potential disturbance width of 20 feet. Table 2-3 provides a list of equipment that could be used for access road work.

Table 2-3. Equipment Used in Access Road Work

Equipment Type	Equivalent Caterpillar Model	Fuel Type
Bulldozers	D5K	Diesel
Excavators (large and small)	328D LCR	Diesel
Dump trucks	NA	Diesel
Crane (300,000 pounds)	NA	Diesel
Road grader	12M	Diesel
Roller compacter	CP56	Diesel
Backhoe	450E	Diesel
Work trucks	NA	Diesel/gas

An excavator could be used to grub out some of the smaller shrubs growing at the immediate road surface edge. Soil disturbance and removal would be minimized as much as possible during vegetation removal. The use of an excavator is preferred to large mowers or brush cutters (e.g., brush hogs) for removing vegetation. Mowing machines are not well suited to this project because they are too large for the size of the roads and are not as precise as excavators. Any larger limbs growing into the roadway would be cut manually with a chainsaw.

Establishment of Staging Areas

Up to three temporary staging areas would be established along or near the ROW. Staging areas would be used to store and stockpile new and removed materials, as well as other construction-related equipment. The size of the staging areas would be based on the types of sites available for lease and the size needed to accommodate materials and equipment. Each staging area could be up to 30 acres in size. Staging areas would be established within 10 miles of the transmission line, if possible, to minimize travel. Staging areas are generally existing large, level, paved sites in commercial or industrial areas. If these types of areas are not available or feasible, disturbed or common habitat types outside of sensitive habitat areas would be used for staging areas. It is likely that the construction contractor would identify potential areas for lease prior to construction. BPA would complete any required site-specific environmental review of the staging areas once the locations are determined.

2.1.6 Vegetation Management

Restoration of Areas Disturbed by Construction

All areas disturbed by construction activities, except permanent road surfaces, would be reseeded with a predominantly native seed mix or a seed mix agreed upon with landowners. The original grade and drainage patterns in sensitive areas would be restored to the extent possible.

Danger Tree Removal

Some danger tree clearing would occur as part of the Proposed Action. A danger tree is a tree located along a transmission line corridor that is a current or future hazard to the transmission line. Danger trees can be either stable or unstable. A tree would be identified as a danger tree if it could make contact with BPA facilities or come close enough to cause an electrical arc should it fall, bend, or grow within the space that could be occupied by the conductor, either when at rest or when swinging as a result of winds. Vegetation removal would ensure that lines do not sag too close to vegetation and that tree limbs do not fall or bend into the conductor. When vegetation comes too close to conductors, the electricity can jump (arc) from the line to the vegetation. This can be very dangerous to any animal life in the surrounding area and can cause fires and ***outages***.

Danger trees would be felled with a chainsaw and branches would generally be lopped and either scattered or chipped. If chipped, the chips would be broadcast. How trees are felled and disposed of depends on the location of the trees and agreements with landowners. Because danger trees are the property of the landowners, they are free to dispose of the trees as they wish.

A total of 274 danger trees have been identified between 50 and 80 feet from the centerline of the transmission line ROW. Appendix A summarizes the location, species, and diameters of danger trees by line mile. BPA would discuss danger tree removal activities with landowners prior to removal.

2.1.7 Operation and Maintenance

Ongoing operation and maintenance of the rebuilt transmission line would be essentially the same as for the existing line. The transmission line would continue to be operated at the current voltage (115 kV). BPA would conduct routine, periodic inspection and maintenance. A typical maintenance activity on wood-pole structures is insulator replacement. Although emergency repairs may also be needed, the rebuilt line is anticipated to require emergency maintenance less frequently and on a smaller scale than currently required.

Vegetation would be cleared periodically during ongoing operation and maintenance to maintain access to structures, control ***noxious weeds***, and keep vegetation at a safe distance from the conductor. This vegetation management could include removal of trees determined to be danger trees as discussed above. Vegetation maintenance would be guided by the program identified in BPA's *Transmission System Vegetation Management Program Final Environmental Impact Statement* (BPA 2000). The vegetation management program includes ongoing consultation with landowners and others concerning vegetation management activities. Vegetation management methods could include manual methods (e.g., hand pulling, clipping, and using chainsaws), mechanical methods (e.g., using roller-choppers and brush hogs), and/or chemical methods (herbicide use).

2.2 NO ACTION ALTERNATIVE

Under the No Action Alternative, BPA would not rebuild the transmission line and would continue to operate and maintain the existing deteriorating transmission line. Construction activities associated with the Proposed Action would not occur. It is reasonable to expect that as the line structures continue to fail intermittently, the ability of BPA to provide reliable electric service to its customers in the area would be adversely affected and the safety concerns that prompted this proposal for action would persist.

BPA would continue to attempt to maintain the existing lines as their aged and rotting wood poles and cross arms further deteriorate. Because of the condition of the lines, it is likely that the No Action Alternative would result in more frequent 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. Emergency repair activities could affect vegetation, wildlife, soils, water quality, and other natural resources in the immediate vicinity, and any downed lines resulting from structure failures would have a high potential for causing fires in the vicinity of the downed line.

Given the poor condition of some of the roads, it is possible that the road work proposed under the Proposed Action would be funded and carried out as an operation and maintenance project in the future, independent of rebuilding the transmission line. Future operation and maintenance under the No Action Alternative would also involve removal of the danger trees identified in Appendix A.

2.3 ALTERNATIVES CONSIDERED BUT ELIMINATED FROM DETAILED STUDY

The Proposed Action would take place within the existing transmission line corridor. The basic design and function (structure design, location of poles and associated structures, and operating voltage) would not change. Constructing the transmission line in a new corridor would result in impacts outside of the existing ROW. Therefore, BPA is not considering an alternative route.

Maintaining the existing line until “robust smart grid technology” is available was suggested as a possible alternative during the public scoping process. The Proposed Action is essentially planned maintenance that is necessary to provide continued reliability and safety and avoid relying on emergency maintenance actions and the impacts associated with responding to emergencies. Over time, smart grid technology will likely slow increases in electric loads, which can in turn help decrease the need for new generation and new transmission. However, smart grid technology is not expected to eliminate the need for existing transmission infrastructure serving existing electrical loads such as the Creston-Bell Transmission line. Therefore, this alternative was eliminated from detailed study.

2.4 COMPARISON OF ALTERNATIVES

Only the Proposed Action would meet the underlying need for the project. The No Action Alternative would neither maintain reliable electrical service nor avoid risks to public and worker safety. Table 2-4 summarizes the stated purposes of the Proposed Action (see Chapter 1) and compares the potential for the Proposed Action and No Action Alternative to meet those objectives. Table 2-5 summarizes the anticipated impacts on specific resources that could result from the Proposed Action and No Action Alternative. A detailed analysis of the environmental impacts of the Proposed Action and No Action Alternative is presented in Chapter 3.

Table 2-4. Comparison of the Proposed Action and No Action Alternative

Purpose	Proposed Action	No Action Alternative
Meet transmission system public safety and reliability standards set by NESC	The rebuilt transmission line would continue to operate at 115 kV. New structures and associated equipment would provide more reliability during routine operation and severe weather. Access road work would ensure that emergency repairs are done quickly.	While the existing transmission line would continue to operate at 115 kV, outdated and physically worn structures and associated equipment would pose a greater risk for outages and unreliable service. Emergency response times could be increased by access roads that are in poor condition.
Minimize environmental impacts	Construction-related environmental impacts would be minimized by designing the project to avoid sensitive resources, where possible, and to minimize potential adverse impacts through the mitigation measures prescribed in Chapter 3 of this document.	There would be no construction-related environmental impacts; however, maintenance impacts would increase as existing structures and roads deteriorate and require additional maintenance. Impacts could occur during emergency maintenance without the benefit of planned environmental review and mitigation. Emergency repairs could impact vegetation, wildlife, soils, water quality, and other resources, and any downed lines resulting from structure failures would have a high potential for causing fires in the vicinity of the downed line.
Continue to meet BPA's contractual and statutory obligations	The rebuilt transmission line would maintain system reliability and subsequent power delivery to BPA's customers in eastern Washington.	The existing line would continue to deteriorate and threaten system reliability and subsequent power delivery.
Demonstrate cost-effectiveness	Environmental review, design and engineering, and construction costs are estimated at $10.6 million. Would reduce maintenance costs.	Would avoid construction costs. Would incur maintenance costs, which, over time, could be higher than under the Proposed Action.

Table 2-5. Summary of Impacts of the Proposed Action and No Action Alternative

Environmental Resource	Proposed Action	No Action Alternative
Land Use and Recreation	Direct impacts from constructing and maintaining structures and access roads on agricultural land, displacing crops, blocking local access or otherwise disturbing residents, interrupting recreation activities, and disrupting local traffic during construction. Most construction impacts would be temporary. Overall impacts would be ***low***.	Continued operation and maintenance would result in ***low*** impacts similar to existing conditions; however, the number of maintenance activities, and thus the level of impact, could increase as structures deteriorate.
Geology and Soils	Direct impacts from clearing, grading, vegetation removal, and soil compaction. Indirect impacts associated with soil erosion. Impacts would be ***low to moderate.***	Direct impacts from continued operation and maintenance activities, danger tree removal, and incidental use of roads. Impacts would be ***low,*** but would increase as the deteriorating structures require more maintenance.
Vegetation	Direct impacts from clearing and crushing vegetation, damaging plant roots, disturbance to high quality plant communities, danger tree removal, and spread of noxious weeds. Impacts would be ***low to moderate.***	Continued levels of vegetation removal, including danger tree removal. Operation and maintenance activities would result in ***low*** to ***moderate*** impacts because the level of maintenance would likely increase as the structures deteriorate.
Water Resources and Water Quality	Direct impacts from ground disturbance resulting in erosion and sediment transport to surface waters, installation of permeable road surfaces and suitable drainage. Indirect impacts from vegetation removal near surface waters, leading to increased exposure to solar radiation and increased water temperatures. Impacts would be ***low***.	Continued levels of operation and maintenance would result in ***low*** impacts on water resources; however, the number of maintenance activities could increase as structures deteriorate, resulting in increased potential for impacts on water resources
Fish and Wildlife	Fish and fish habitat: direct impacts from changes to water quality or quantity, riparian vegetation, or activities that result in the death of or disturbance to fish. Impacts would be ***low***. Wildlife and their habitat: direct impacts from habitat loss within the ROW and temporary disturbance caused by construction. Indirect impacts from noxious weed infestation of habitat. Impacts would be ***low*** to ***moderate***.	Continued levels of operation and maintenance, including vegetation and danger tree removal, would result in ***low*** (fish) and ***low*** to ***moderate*** (wildlife) impacts; however, the number of maintenance activities, and thus the level of impact, could increase as structures deteriorate.
Wetlands	Direct impacts from ground disturbance within a wetland or within 100 feet of a wetland affecting soils, vegetation, or hydrology. Impacts would be ***low*** to ***moderate***.	Continued levels of operation and maintenance, including danger tree removal would result in ***low*** impacts on wetlands; however, the number of maintenance activities, and thus the level of impact, could increase as structures deteriorate.

Table 2-5. Summary of Impacts of the Proposed Action and No Action Alternative (continued)

Environmental Resource	Proposed Action	No Action Alternative
Floodplains	Direct impacts from soil compaction that would interfere with subsurface water flow and deposition of soils on the floodplain surface. Indirect impacts from increased sedimentation resulting from erosion related to ground disturbance and vegetation removal. Impacts would be ***low*** to ***moderate.***	Continued levels of operation and maintenance would result in ***low*** impacts on floodplains; however, the number of maintenance activities, and thus the level of impact, could increase as structures deteriorate.
Visual Quality	Direct impacts from installation of new structures and from the construction of new access roads. Impacts would be ***low*** to ***moderate.***	Continued levels of operation and maintenance would result in ***low*** impacts on visual quality.
Air Quality	Direct temporary impacts from operation of construction equipment releasing emissions in localized areas. Impacts would be ***low.***	The potential for increased maintenance over time may contribute to slightly higher impacts than existing conditions, but they would still be considered ***low***.
Socioeconomics and Public Services	Direct short term impacts from economic activity associated with construction. Impacts would be ***low***.	Continued levels of operation and maintenance would result in ***no*** impacts on socioeconomics and public services; however, the potential exists for more frequent disruption of service as maintenance requirements increase over time.
Cultural Resources	Direct impacts from possible disruption of previously unrecorded cultural resources during construction or operation and maintenance activities. Impacts would be ***low*** to ***moderate***.	Continued levels of operation and maintenance would result in ***low*** to ***moderate*** impact on previously unrecorded cultural resources.
Noise, Public Health, and Safety	Temporary direct noise impacts from construction equipment, truck traffic, and occasional use of helicopters. Temporary health and safety impacts from traffic during construction. No increases in electromagnetic field exposures during operation and maintenance. Impacts would be ***low*** to ***moderate***.	Continued levels of operation and maintenance would result in ***low*** impacts on noise, public health, and safety.
Climate Change	Direct impacts from greenhouse gas (GHG) emissions from construction equipment and increased worker traffic, continued operations and maintenance, and vegetation removal. Impacts would be ***low***.	Continued levels of operation and maintenance would result in ***low*** impacts on GHG emissions and climate change.

Chapter 3
Affected Environment, Environmental Consequences, and Mitigation Measures

3.1 INTRODUCTION

This chapter includes an analysis of the potential impacts of the Proposed Action and the No Action Alternative on the human and natural environment. Each section of this chapter includes a description of the potentially affected environment for a specific resource, an analysis of the impacts on that resource, and the mitigation measures that would reduce those impacts.

To identify potential impacts on a resource area, a specific physical area must be studied. In this EA, this is referred to as the study area. The term project area is also used in this EA and is used to describe the area in the immediate vicinity of the Proposed Action. For some resources, the study area includes locations where direct physical impacts could occur as a result of the project and is the same as or very similar to the project area. However, because the project may result in impacts on resources that are geographically removed from the project area (e.g., airborne emissions may result in measurable air pollution miles downwind from a project location), the study area for some resources may be larger and removed from the immediate project area. Unless otherwise specified, the study area for the analysis includes the existing ROW, the danger tree removal area adjacent to the ROW, the access road and travel route system that extends off the ROW, and any adjacent properties that could be affected by the Proposed Action. The location of potentially affected resources may be identified based on the closest structure or structures or by line miles, which begin at the Creston Substation and increase in number going east toward the Bell Substation (see Figure 1-1).

Direct, indirect, and cumulative impacts are considered. Direct impacts are those that would occur as a direct result of construction of the Proposed Action. Indirect impacts are those that are caused by the Proposed Action, but would occur later in time and/or further away in distance. Cumulative impacts are impacts that could occur when the Proposed Action is considered along with other past, present, and reasonably foreseeable future actions. Other such actions within the project vicinity, including actions being conducted or proposed by BPA in addition to this proposed Rebuild Project, that are considered in the cumulative impact analysis are identified and discussed in Appendix B.

To evaluate the impacts associated with construction and operation and maintenance of the Proposed Action, the impact levels were characterized as high, moderate, low, or no impact. In addition, beneficial impacts are noted where applicable.

Each resource section includes the following primary subsections:

- Affected Environment
- Environmental Consequences—Proposed Action
- Mitigation—Proposed Action
- Unavoidable Impacts Remaining After Mitigation—Proposed Action

- Cumulative Impacts—Proposed Action
- Environmental Consequences—No Action Alternative

Where applicable, potential impacts are presented by project component, including the following:

- Removal and Replacement of Transmission Line Structures
- Access Roads
- Danger Tree Removal
- Staging Areas and Tensioning Sites
- Operation and Maintenance

3.2 LAND USE AND RECREATION

3.2.1 Affected Environment

The study area for land use and recreation includes the existing ROW, the danger tree removal area adjacent to the ROW, the access road and travel route system that extends off the ROW, and any adjacent properties that could be affected by the Proposed Action.

Landowners within the study area consist of private individuals, the BLM, and Washington State. The majority of the existing transmission line corridor (95 percent) crosses private land. This is also the case with the proposed access road and travel route system. The existing corridor crosses 1 mile of land managed by the BLM and 1.94 miles of land managed by Washington State Parks. The Proposed Action would also involve reconstruction of 0.2 mile of existing road on land managed by the Washington Department of Natural Resources (WDNR).

Data from the U.S. Geological Survey (USGS) National Land Cover Database (NLCD) (USGS 2001) indicate that land use and cover in the study area west of the Spokane River primarily consist of scrub/shrub, cultivated crops, and evergreen forest, with more densely developed areas located east of the river (Figure 3-1).

The existing transmission line shares an extended ROW corridor with other larger transmission lines for its entire length between the Creston and Bell substations. The other transmission lines in the corridor include one 500-kV and two 230-kV lines, all of which are supported by steel, lattice towers that are larger than the wood-pole structures that comprise the existing Creston-Bell transmission line, with longer distances (spans) between towers (Figure 2-1).

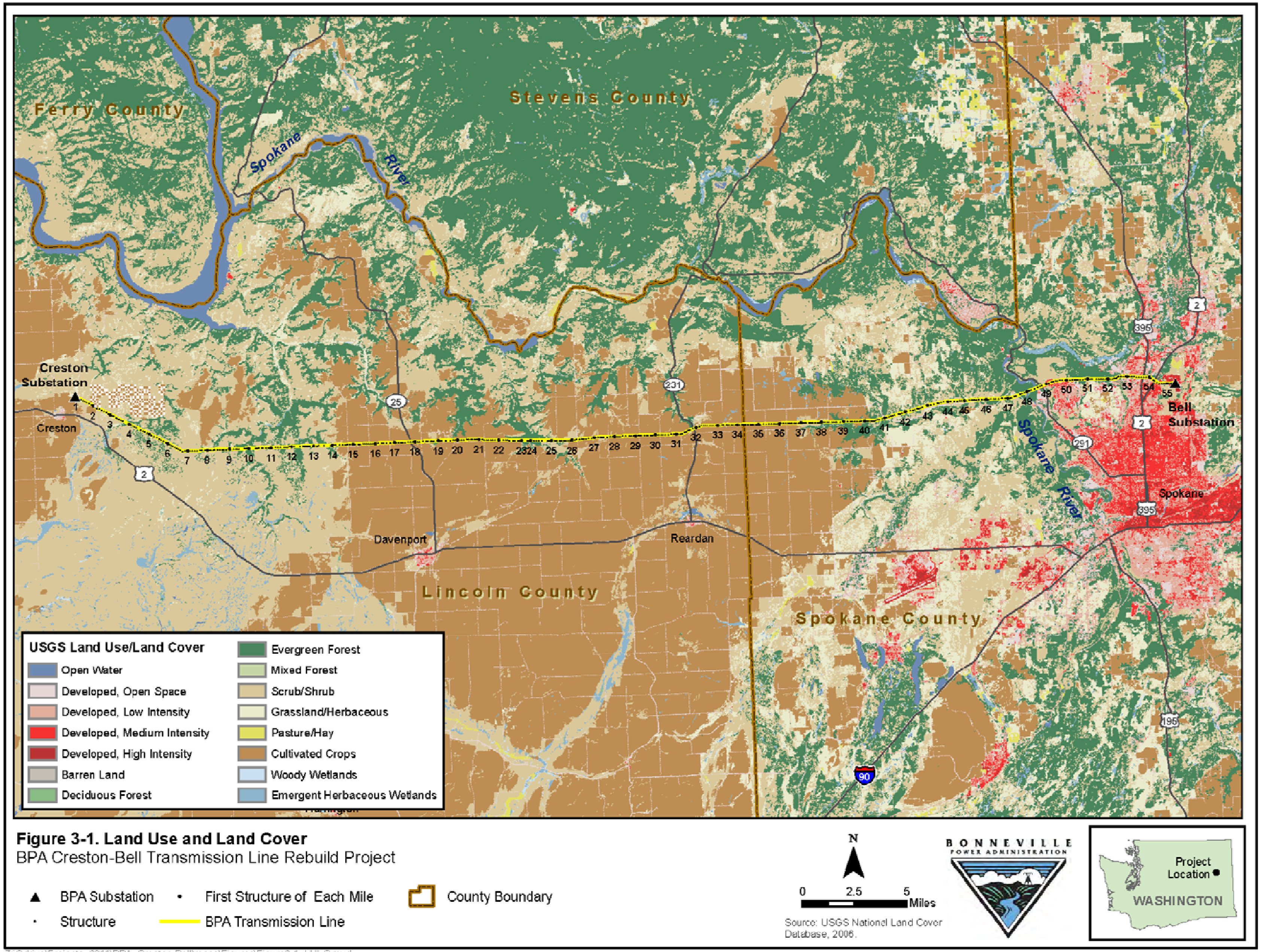

Figure 3-1. Land Use and Land Cover
BPA Creston-Bell Transmission Line Rebuild Project

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Land Uses

Agriculture

Agriculture is the primary land use in the study area, particularly in the Lincoln County portion of the study area (Figure 3-1). Almost three-quarters of the land area in Lincoln County was in farms in 2007, with more than two-thirds of farmland (743,236 acres) used for crops. More than half of the land in Spokane County was in farms, with 63 percent of that total (394,876 acres) used to cultivate crops (U.S. Census Bureau 2011; U.S. Department of Agriculture [USDA] 2009). Most agricultural land use in the study area is dry cropland used for growing cereal grains (wheat, oats, and barley), hay, and rapeseed. Farmers cultivate and tend crops within and next to the corridor, often quite close to existing transmission towers (BPA 2002). The majority of cropland in the study area is located between miles 14 and 40 of the existing transmission line ROW (Figure 3-1).

Rangeland

In Lincoln County and west Spokane County, the study area crosses open range interspersed with areas of non-commercial woodlands. Almost half (46 percent) of the existing corridor crosses land classified by the USGS (2001) NLCD as scrub-shrub, with an additional 16 percent crossing land classified as evergreen forest (Figure 3-1). Evergreen forest land in the project area is typically more woodland than dense forest, composed of scattered clumps of trees often associated with ravines and other drainage channels. Woodlands are interrupted by patches of open range, and lands cleared in past years for grazing and other agricultural uses. Rangeland in the vicinity of the project area is mainly used for cattle and horse grazing, but also provides wildlife habitat and open space for recreation (BPA 2002).

Residential Use

Rural residences are scattered throughout the study area. West of the Spokane River, these residences are primarily associated with farms and rural areas and are widely separated. A number of small communities (Creston, Davenport, and Rearden) are located along U.S. Route 2, which generally parallels the existing transmission line corridor. The closest of these communities, Creston, is located about 1 mile south of the corridor.

East of the Spokane River, the existing ROW passes through the outer edge of the Spokane urban area and more densely developed areas for approximately 7 miles. Residential, industrial, commercial, and institutional development has occurred up to the existing transmission line corridor. The corridor separates subdivisions and local residents use the corridor for recreational purposes (BPA 2002).

The largest concentrations of private residences and businesses near the corridor east of the Spokane River are located in the following areas:

- From North Nine Mile Road to North Indian trail Road (Structures 48/6-49/6)
- From North Arrowhead Road to North Fleetwood Court (Structures 49/9-50/2)
- From U.S. Route 2 to East Hawthorne Road (Structures 54/2-54/9)

In addition to these areas of concentrated development, there are other more isolated residences located west of the Spokane River and within 1,000 feet of the existing transmission line corridor. These residences include the following:

- Residence approximately 650 feet north of Structure 11/4
- Residence approximately 550 feet south of Structure 15/3
- Three residences approximately 500 to 1,600 feet north of Structure 18/4
- Residence approximately 800 feet south of Structure 27/4
- Three residences approximately 825 to 1,200 feet from Structure 31/9
- Residence approximately 1,000 feet south of Structure 35/4
- Multiple residences approximately 775 to 1,660 feet from Structures 38/5 through 38/10
- Residence approximately 800 feet south of Structure 39/7

The existing Creston-Bell transmission line was built in 1942. Much of the residential and other development in the immediate vicinity occurred with the existing line in place.

Recreation

Between Creston and the Spokane River, rural areas offer limited public outdoor recreation such as hunting and fishing. Most of the land in this area is privately owned. The open and wooded rangeland between Creston and Davenport has networks of four-wheel-drive trails and county and existing access roads that provide access to Hawk Creek, its tributaries, and surrounding lands. County roads crossing or close to the existing transmission line corridor also provide access to other streams for dispersed recreation (BPA 2002).

The Proposed Action would cross Riverside State Park between line miles 47 and 49. Riverside State Park is a 10,000-acre park along the Spokane and Little Spokane rivers located west of the City of Spokane. The park is managed by Washington State Parks and supports a wide variety of recreational activities, including bicycling, wildlife watching, boating, camping, canoeing, kayaking, rafting, fishing, off-road vehicle riding, hiking, history study, horse riding, picnicking, and rock climbing (Washington State Parks 2011; Riverside State Park Foundation 2011). The existing corridor crosses 1.94 linear miles of land in Riverside State Park. This park includes the Nine Mile Recreation Area and the Little Spokane Natural Area and Interpretive Center. Developed campsites are located at the Nine Mile Recreation Area and in the Bowl and Pitcher area of the park; neither of these areas are crossed by the transmission line corridor. Little Spokane Natural Area is located along the Little Spokane River, north of the existing corridor. Riverside State Park was visited by more than 2.3 million day and overnight users in 2010 (Burnett pers. comm.).

The Spokane River Centennial Trail runs through the park and is crossed by the existing transmission line corridor at line mile 48. The 37-mile-long Centennial Trail generally follows the Spokane River and is paved its entire length. Starting east of the city of Spokane, the trail finishes north of the study area at Nine Mile Falls. The trail allows access for many types of outdoor non-motorized recreational activities and received more than 2 million users in 2008 (Friends of the Centennial Trail 2011).

East of the Spokane River and Riverside State Park, the existing transmission line corridor passes through more densely developed areas. In Spokane at line mile 49, the existing corridor crosses 0.5 mile of Meadowglen, a 16-acre parcel of conservation land managed by City of

Spokane Parks and Recreation. Located northeast of the intersection of North Indian Trail Road and West Bedford Avenue, this conservation land area is adjacent to Meadowglen Park, a 14.3-acre "neighborhood mini-park." The existing corridor does not cross Meadowglen Park. There are no developed recreation facilities in the park or conservation land area (City of Spokane Parks and Recreation 2011a, 2011b).

Local residents in the Spokane area use the existing transmission line corridor to walk, hike, bicycle, and ride motorized vehicles (mostly motorcycles and off-road vehicles). In addition, Whitworth University is located directly south of the existing transmission line corridor between North Waikiki Road and North Whitworth Drive (line miles 52 and 54) in Spokane. The university maintains numerous trails that intersect with the corridor and are used for cross-country training, walking, jogging, and mountain biking (BPA 2002). There are also university sports fields located within the existing corridor.

Transportation

U.S. Routes 2 and 395 and State Routes 25, 231, and 291 are the primary transportation roadways providing access to the existing transmission line corridor. All of these roads cross the corridor, the majority at an approximate right angle. The exception to this occurs where the transmission line corridor runs generally parallel to U.S. Route 2 for approximately 5.7 miles extending east from the Creston Substation. In this area, the existing corridor is at least 1 mile from U.S. Route 2 at its closest point.

In 2010, the ***average daily traffic*** (ADT) volume for U.S. Route 2 was 3,000 vehicles near Creston, 2,500 vehicles near Telford, 4,700 to 5,500 vehicles around State Route 25 in Davenport, 4,700 to 6,300 vehicles around State Route 231 in Reardan, and 24,000 vehicles near Country Homes Boulevard in Spokane (WSDOT 2010).

ADT volumes in 2010 for these roads at locations close to where they are crossed by the corridor were as follows:

- State Route 25 – 1,100 vehicles (existing corridor crosses at line mile 18)
- State Route 231 – 1,400 vehicles (existing corridor crosses at line mile 32)
- State Route 291 – 9,200 to 12,000 vehicles (existing corridor crosses at line mile 49)
- U.S. Route 395 – 28,000 to 30,000 vehicles (existing corridor crosses at line mile 54)

3.2.2 Environmental Consequences—Proposed Action

Land Uses

The majority of the existing transmission line corridor (approximately 50.9 miles) crosses private land. The corridor also crosses 1 mile of land managed by the BLM that is used as a grazing allotment and 1.94 miles of Riverside State Park, which is managed by Washington State Parks and Recreation.

Under the Proposed Action, 18 existing structures on BLM-managed land (between line miles 7 and 9) would be replaced with similar structures in the same locations. Some existing roads would be improved/reconstructed (1.35 miles) and some short lengths of new spur road (0.33 mile) would be extended from the existing road network to the structures. The ground disturbance associated with these activities would not extend beyond the boundaries of BPA's existing easement on BLM-managed land.

Potential impacts to Riverside State Park are discussed below under Recreation. The Proposed Action would also involve reconstruction of 0.2 mile of existing road on land managed by WDNR.

Agriculture

Agriculture is the primary land use in the study area (Figure 3-1). In most cases, crops are planted under the transmission line within the ROW, with a small clearing required at the base of each structure. The Proposed Action would not change agricultural land use within the ROW, but would have an impact where new structures would be offset from existing structure sites and during construction activities. The majority of the existing 475 structures would be replaced with similar structures in the same locations, but some structures (24) would be relocated a short distance (offset) from their current locations. In cases where the offset structures (a total of 7) are relocated in active farmland, a small area around the base of each structure would be permanently converted from agricultural use and the existing structure locations could potentially be converted back to agricultural use. Given that the overall agricultural capacity of Lincoln and Spokane counties includes more than 1.1 million acres of cropland, impacts on agricultural production associated with new structures would be ***low***. The proposed changes in structure location in agricultural lands would slightly alter the distance between some transmission line structures, but are not expected to affect the ability of farm equipment to turn or navigate in these areas.

Construction activities associated with removal and installation of transmission lines and structures would involve drilling holes for structure footings, moving heavy equipment on site, installing support lines, and potentially replacing counterpoise wires. If conducted during the growing season, these activities would displace crops within the ROW. This displacement would be temporary, however, and all disturbed cropland not occupied by structures would be regraded and reseeded in agreement with the property owner. To determine the extent of potential temporary impacts on agricultural land use, BPA estimated each structure's acreage of impact in cultivated land as identified in the USGS (2001) NLCD. As discussed in Section 2.1.5, structure replacement (removal and installation) disturbance would range from 0.06 acre to 0.2 acre per structure, depending on location and structure type. Using these estimates, cultivated land temporarily disturbed by structure replacement would range from 19 acres to 38 acres. This amount of disturbance represents a very small amount of existing agricultural land in the vicinity of the project. Because of the temporary nature of these impacts and BPA's commitment to restore disturbed areas, agricultural impacts associated with these construction activities would be ***low***.

Access road construction would permanently remove approximately 3.0 acres of land from agricultural production. Given the small area of impact compared with the overall agricultural capacity of the Lincoln and Spokane counties, impacts on agricultural production associated with access road improvement and construction would be ***low***.

Approximately 15.7 miles of the identified travel routes would cross cultivated land. Assuming an average disturbance width of 20 feet, use of these temporary routes would result in temporary disturbance to about 38 acres of cultivated land. Travel routes across fields would be used in their existing condition with the least impact necessary to allow travel during construction and facilitate restoration of the area back to the existing condition (field) after construction activity. Impacts to agriculture associated with travel routes would, therefore, be ***low***.

Rangeland

The Proposed Action would not change rangeland use within the ROW. In those cases where replacement structures would be offset from existing structure sites, a small area around the base of the structure would be permanently converted to a developed use. The number of offset structures in rangeland is low (17), the footprint of each structure relatively small, and rangeland is a common use in the area; therefore impacts would be ***low***.

Impacts to rangeland during construction would be temporary and localized, and would affect a small share of the existing rangeland in Lincoln and Spokane counties. Construction-related impacts to rangeland are, therefore, considered ***low***. Impacts to vegetation and wildlife are discussed in Section 3.4, Vegetation and Section 3.6, Fish and Wildlife, respectively.

Residential Use

Operation, maintenance, and construction activities have the potential to affect residential land uses. Operation and maintenance activities would be similar to those already implemented along the transmission line and would not result in any new or different impacts. The majority of the existing structures would be replaced with similar structures in the same locations. Road improvements/reconstruction and road construction would mainly take place within the existing corridor and would not represent a change in land use. However, construction activities would represent new temporary activity that could affect residents.

In areas of larger concentration of residences near Spokane (line miles 48 to 50 and 54) and isolated residences within 1,000 feet of the existing corridor west of the Spokane River, construction activities associated with removal and installation of transmission lines and structures would likely be visible to residences. In some cases, construction vehicles and equipment would pass close to residences as they travel on access roads to reach the transmission line corridor. Construction could also temporarily disrupt local access to private residences and construction activities may increase localized noise and fugitive dust levels for brief periods.

Construction activities would be temporary in nature and limited in duration (on the order of hours or a few days, depending on the specific site), and the overall number of residences affected at one time is relatively small; therefore, construction impacts on residential uses would generally be ***low***.

Recreation

The existing transmission line corridor crosses Riverside State Park, which is a popular location for recreation due to its size, the availability of diverse forms of recreation, and the lack of other similar nearby parks. The corridor also crosses the Meadowglen conservation land area managed by City of Spokane Parks and Recreation and recreation facilities maintained by Whitworth University.

Operation, maintenance, and construction activities have the potential to affect recreation in Riverside State Park and elsewhere. Operation and maintenance activities would be similar to those already implemented along the transmission line and would not result in any new or different impacts. However, construction activities would represent new activities that could affect recreation within the study area. Construction activities associated with removal and installation of transmission lines and structures would involve replacing structures, clearing vegetation, moving and storing heavy equipment on site, installing support lines, and potentially replacing counterpoise wires.

The Proposed Action would involve the replacement of 15 structures in Riverside State Park. Two new lattice-steel structures—Structures 48/2 and 48/3—would be installed to span the Spokane River. On the east side of the river, in Riverside State Park, the proposed lattice tower (Structure 48/2) would replace two existing wood-pole structures: one comprised of two poles, the other comprised of three poles with guy wires. The Proposed Action would also involve 0.3 mile of road construction and 0.8 mile of road improvements/reconstruction in the park. Road construction in Riverside State Park would occur within the existing extended ROW corridor and primarily involve the addition of short spurs to existing roads. Road improvements/reconstruction would occur within the corridor, but would also include an existing access road that extends off the ROW.

Construction-related impacts to Riverside State Park would involve temporary disruption to local access and short-term increases in localized noise and fugitive dust levels, including temporary interruptions of use on the Centennial Trail. These potential impacts would be temporary in nature and limited in duration and are, therefore, considered ***low***. Replacement of two existing wood pole structures near the Spokane River with a single, lattice-steel tower would represent a change in the existing visual landscape, but given the similar existing structures already present in the extended corridor, would not be expected to affect the recreation experience in this area. Long-term impacts to recreation in Riverside State Park would, therefore, be ***low***.

Potential impacts to sensitive natural and cultural resources in Riverside State Park are addressed in Sections 3.4, Vegetation and 3.12, Cultural Resources, respectively. The Proposed Action is not expected to affect the Little Spokane River Natural Area, which is located north of the existing transmission line corridor, along the Little Spokane River.

Illegal motorized access to the study area is controlled by approximately 100 gates that would be maintained or replaced under the Proposed Action. In addition, the roadway system is being inventoried as part of the Proposed Action to determine the best locations for additional gates to discourage unauthorized access; approximately 10 new gates are proposed at this time.

Under the Proposed Action, the existing structures in the Meadowglen conservation land area and adjacent to Whitworth University would be replaced with similar structures in the same locations. Some existing roads would be improved/reconstructed in both areas, and some short lengths of new spur road would be constructed in the corridor near Whitworth University. Recreation activities in these locations would not be permanently affected, but would be temporarily disrupted. Maintained trails and sports fields that intersect or are within the corridor would be closed during construction. Closures are expected to last for one day and these facilities would reopen following construction. These impacts would be localized, as well as limited in duration, and are, therefore, considered ***low***. This would also be the case for local residents in the Spokane area who use the existing corridor for informal recreation activities.

Informal recreation use also occurs in the more rural part of the study area, west of the Spokane River. In addition to limited outdoor recreation, such as hunting and fishing, networks of four-wheel-drive trails and county and rural roads provide access to Hawk Creek and other streams for dispersed recreation (BPA 2002). Impacts in these areas during construction could include increased traffic from construction vehicles, short-term increases in noise and fugitive dust, and temporary closures of local roads. These impacts would be localized, temporary, and limited in duration and are, therefore, expected to be ***low***.

Transportation

The Proposed Action has the potential to result in short-term transportation impacts from construction-generated traffic. This could occur as a result of increased traffic on local roadways and from periodic short-term road closures. The increase in construction-related traffic would represent a relatively low increase in daily traffic volume when compared to the ADT volumes for the roads in the project area. Up to 30 contractor employees could be employed along the transmission line corridor during peak construction (June through November), generating up to 30 additional passenger vehicle roundtrips per day. In addition, a small number of support trucks would deliver materials (wood piles, string, or conductor) and equipment (cranes, backhoes, excavators, tensioners, or pullers) to the work sites. Lane closures would result in temporary traffic delays but are not expected to substantially degrade traffic operation at these locations because of their short duration. Therefore, construction-related transportation impacts would be ***low***. Implementation of the mitigation measures discussed in Section 3.2.3 would further minimize transportation impacts.

Operation and maintenance activities would be similar to those currently performed on the existing transmission line. Therefore, ***no*** additional operation and maintenance-related traffic is expected on highways and local roads in the study area.

3.2.3 Mitigation—Proposed Action

If the Proposed Action is implemented, the following mitigation measures would minimize impacts on land use, recreation, and transportation.

- Distribute a schedule of construction activities to all potentially affected landowners.
- Schedule construction during periods when active farms along the corridor are likely to be fallow, where possible, to minimize the potential for crop damage.
- Compensate landowners for the value of commercial crops damaged or destroyed by construction activities.
- Revegetate disturbed areas after the conclusion of construction, with the exception of those areas required to remain clear of vegetation to ensure the safety of the transmission line and access to the structures.
- Keep construction activities and equipment clear of residential driveways, to the extent possible.
- Use water trucks or other measures to minimize fugitive dust during project construction.
- Coordinate the routing and scheduling of construction traffic with WSDOT and county road staff.
- Publicize road closures and traffic delays to minimize impacts to traffic.

- Coordinate construction in Riverside State Park with the Washington State Parks Lands Program.
- Employ traffic-control flaggers and post signs warning of construction activity and merging traffic, when necessary, for short interruptions of traffic.

3.2.4 Unavoidable Impacts Remaining After Mitigation—Proposed Action

During construction, potential unavoidable impacts could consist of minor delays and interruptions to local traffic in the study area, generation of noise and dust in residential areas, and temporary interference with agricultural and recreational activities. Most of these short-term construction impacts would cease once construction was completed and are considered to be ***low***.

3.2.5 Cumulative Impacts—Proposed Action

As discussed in Appendix B, reasonably foreseeable future projects in the vicinity of the Proposed Action include two BPA projects that would take place within the existing corridor that includes the Creston-Bell transmission line. These projects, as currently proposed, would occur within the same general timeframe as the Proposed Action; however, each project is independent of the Rebuild Project and does not require that actions be taken previously or simultaneously for completion. Both of these projects would result in ground disturbance within the extended ROW and involve limited access road improvements.

Agriculture

If conducted during the growing season, these activities would temporarily displace some crops within the ROW and access road improvements could permanently remove small areas of land from agricultural production. Given the temporary nature of most of these impacts and the small area of disturbance compared with the overall agricultural capacity in Lincoln and Spokane counties, the incremental addition of the Proposed Action along with these reasonably foreseeable projects would have a ***low*** impact on agricultural land use.

Residential Use

Work activities associated with the two reasonably foreseeable future projects would be visible to residences within the vicinity of the existing ROW corridor and construction vehicles and equipment would pass close to some residences as they travel to the corridor. These activities may increase localized noise and fugitive dust levels for brief periods. These impacts would be limited in duration, ranging from hours to several days, and a relatively small number of residences would be affected at any one time. As with the Proposed Action, impacts are likely to be greater in areas where residential development is more concentrated. The three projects while occurring within the same general timeframe would proceed at different speeds, and, as a result, impacts in specific locations would likely occur at different times. The mitigation measures identified in Section 3.2.3 would reduce the incremental contribution of the Proposed Action to potential cumulative impacts on residential land uses and impacts are expected to be ***low***.

Recreation

The two reasonably foreseeable future projects would also have similar, short-term construction-related impacts on recreation, with project-related activities taking place in Riverside State Park, the Meadowglen conservation land area, the area adjacent to Whitworth University, and in areas west of the Spokane River that receive informal recreation use. The mitigation measures identified in Section 3.2.3 would reduce the incremental contribution of the Proposed Action to potential cumulative impacts on recreation and impacts are expected to be ***low***.

<u>Transportation</u>

Implementation of the two reasonably foreseeable future projects would involve work crews traveling to and from the sites, and material and equipment deliveries. This would result in short-term increases in local traffic and periodic short-term road closures. As noted above, the two other reasonably foreseeable future BPA projects would proceed at different speeds and, as a result, localized impacts to traffic would likely occur in specific locations at different times. The Proposed Action would add incrementally to cumulative transportation impacts but would represent a low increase in traffic volume in absolute terms and relative to existing volumes in the area. The mitigation measures identified in Section 3.2.3 would reduce the incremental contribution of the Proposed Action to potential cumulative impacts on recreation and impacts are expected to be ***low***.

3.2.6 Environmental Consequences—No Action Alternative

Under the No Action Alternative, construction activities would not occur. Initially, operation and maintenance activities would be similar to those currently performed on the transmission line corridor and conducted at similar intervals. However, maintenance activities would likely increase in frequency as existing structures deteriorate, which could result in new impacts on land uses and recreation.

3.3 GEOLOGY AND SOILS

3.3.1 Affected Environment

The study area for geology and soils includes the existing ROW, the danger tree removal area adjacent to the ROW, the access road and travel route system that extends off the ROW, and any adjacent properties that could be affected by the Proposed Action.

The study area is situated within the northern portion of the edge of the Columbia Basin. The Columbia River Plateau is characterized by gently rolling hills and shallow valleys mantled by fine, windborne deposits of silt that overlie Columbia River Basalt (Stockman et al. 1981). The geology of the Columbia River plateau is dominated by the Columbia River Basalt group, a series of flood basalt flows that were formed between 17.5 and 6 million years ago when massive lava flows poured out onto what are now parts of Washington, Oregon, and Idaho (USGS 2009; WDNR 2009). The topography in the study area is generally gently undulating to moderately hilly. Topographic relief is provided by riparian areas with deep, steep-sided canyons in the middle portion of the transmission line corridor. Soils in the study area are composed primarily of ***unconsolidated sediments,*** including gravel flood deposits from glacial outburst floods, loess, and alluvium (river deposits) (WDNR 2011a). Unconsolidated sediments are notably susceptible to wind and water erosion, particularly if soils are bare of vegetation.

Drainage of the study area is provided by several ***perennial*** streams that traverse the existing corridor, including the Spokane River, Welsh Creek, Hawk Creek, Spring Creek, Coulee Creek, Deep Creek, and several unnamed streams. In addition, numerous ***intermittent*** streams drain the study area (see Figure 3-2 in Section 3.5, Water Resources and Water Quality).

Geologic Hazards

Geologic hazards noted in the study area include ***liquefaction*** and flash flooding. Liquefaction occurs when soil becomes soft and liquid-like during very strong ground shaking (e.g., associated with an earthquake). Wet or low-lying areas with unconsolidated sediment are generally susceptible to liquefaction. Bedrock areas are not susceptible to liquefaction. Liquefaction mapping prepared by WDNR indicates that liquefaction susceptibility in the study area is generally low (WDNR 2011a).

Flash floods, which are characterized by a very rapid rise of the water level in a small stream, river, or dry wash, are common in areas of steep terrain and are often associated with brief, intense rainfall. Eastern Washington is prone to flash flooding. Thunderstorms, steep ravines, alluvial fans, dry or frozen ground, and light vegetation, which tends not to absorb moisture, all contribute to flash flooding (Spokane County 2007). The risk of flash flooding in the study area is greatest in the drainages and deep canyons, which are generally spanned by the existing transmission line. From a geology and soils perspective, flash flooding could affect the stability of a transmission structure, if the structure were located in the path of the floodway and not properly stabilized.

Soil Erosion Hazards

Erosion hazards include areas overlain by soils with a high or severe erosion hazard, as rated by the Natural Resources Conservation Service (NRCS), and steep slopes. The NRCS considers slope and soil properties such as cohesion, drainage, and organic content in determining soil erosion hazard classes of soils. Generally, coarse-grained soils on level to low-slope ground that are well drained have low erosion hazard potential. Conversely, fine-grained soils on steep slopes that are poorly drained have the greatest erosion hazard potential. Erosion hazard potential is described in this analysis as slight, moderate, or severe. A rating of slight indicates that little or no erosion is likely; moderate indicates that some erosion is likely, that roads or trails may require occasional maintenance, and that simple erosion-control measures are needed; and severe indicates that significant erosion could be expected, that the roads or trails require frequent maintenance, and that erosion-control measures or mitigation are needed for unsurfaced roads and trails (NRCS 2009a, 2009b). About 46 percent of the transmission line ROW is rated as having a severe erosion hazard due to the erodible nature of the loess deposits that occur in these areas (NRCS 2009a, 2009b).

Slopes in the study area are generally classified as low (less than 15 percent) to moderate (15 to 30 percent). The majority of slopes (79 percent) within the existing transmission line ROW are less than 15 percent. About 15 percent (446 acres) of slopes within the transmission line ROW have slopes between 15 and 30 percent, with the remaining 6 percent (192 acres) of transmission line ROW located on slopes greater than 30 percent. Viewed in miles, about 70 percent of the proposed access road and travel route system crosses slopes that are less than 15 percent, 21 percent crosses slopes between 15 and 30 percent, and 9 percent crosses slopes greater than 30 percent.

3.3.2 Environmental Consequences—Proposed Action

Removal of Existing Structures and Installation of New Structures

Direct impacts on soils could result from clearing of vegetation, grading, and ***compaction*** of soils by heavy equipment during removal and installation of proposed structures, including counterpoise. Clearing and grading, commonly with a bulldozer, removes both vegetation and the uppermost biologically active portion of the soil. Compaction from heavy equipment degrades soil structure, reducing the pore space needed to retain moisture and promote gas exchange. Potential indirect impacts on soils would be associated with soil erosion, either during construction (minor ***sheet erosion***) or after construction, before vegetation is able to reestablish. The risk of erosion would be highest where the unconsolidated sediments are susceptible to wind and water erosion: on steep slopes with loess deposits and after rain events. There are 14 locations where structures would either be removed and/or replaced on slopes ranging between 15 and 30 percent. Thirteen of these locations occur along moderately steep basalt canyons. Two moderately steep sites occur on glacial outburst flood deposits near Deep Creek in Riverside State Park.

The extent of impacts at any one site would depend on the quality of soils, amount of moisture in the soils, amount of ***surface water*** flowing across the site, steepness of slopes in the area, amount of time bare soils are left unvegetated, and type of structure erected, including whether guy wires would be needed to anchor the structure in place. Most existing structures would be removed by excavating around the pole base and removing the pole with a boom crane. Implementation of the mitigation measures described in Section 3.3.3 would reduce construction-related soil impacts. Mitigation measures include conducting as much work as possible during the dry season and revegetating disturbed areas to restore effective soil cover. In addition, as a result of the nature of the deposits and underlying geology, the soils most subject to erosion tend to be on the flatter, gentler terrain; steeper slopes occur on basalt, which is less susceptible to erosion. Further, steep slopes crossed by the ROW are mostly spanned. As a result, impacts on soils from the removal and installation of structures are expected to be ***low*** to ***moderate***.

Access Roads

Road construction and reconstruction/improvement and the use of temporary travel routes would result in soil compaction and temporary increases in construction-related erosion and stormwater runoff. Erosion associated with construction, reconstruction/improvement, and the subsequent use of access roads would have the greatest impact in areas associated with creeks and streams (at ford crossings) or in areas with steep slopes (greater than 30 percent). This would also be the case with temporary travel routes. Approximately 7.4 miles of the proposed access road and travel route system would be located on slopes over 30 percent. This total includes approximately 4.9 miles of reconstructed road, 0.9 mile of road construction, and 1.6 miles of travel route (0.1 mile temporary and 1.5 mile permanent travel route).

Use of fords during construction could result in some erosion along the streambed and a transient increase in ***turbidity*** levels either at the time of use in perennial streams, or the next time water flows in seasonal stream channels. The current construction access plan involves the use of 12 fords, mostly along existing roads that would be reconstructed/improved under the Proposed Action. One of these fords (between structures 24/5 and 24/6) would cross an unnamed perennial tributary to the Spokane River, with four others (three between structures 12/9 and 13/1, and one between structures 43/7 and 44/1) crossing unnamed intermittent streams.

With proper road design, use of waterbars, and BMPs, the potential for construction-related erosion and resulting impacts on soils and geology would be reduced. As such, impacts associated with access road improvements are expected to be ***low*** to ***moderate***.

Danger Tree Removal

A total of 274 danger trees would need to be removed between 50 and 80 feet from the centerline of the ROW. Direct effects to soils would be negligible during vegetation removal, as the vegetation would be cut above ground and the roots would be left in place. Indirect effects of vegetation removal on soils could include increasing soil exposure to erosive rain if adequate ground cover is not present. Impacts to soils would be ***low*** and similar to those under existing conditions from maintenance.

Staging Areas and Tensioning Sites

BPA would require the construction contractor to locate all staging areas outside sensitive areas (streams and wetlands), in level, open, and likely developed or disturbed sites. All areas temporarily disturbed during construction would be returned to preconstruction conditions and revegetated as appropriate. Potential impacts on soils at staging areas are expected to be ***low***.

Potential impacts associated with tensioning sites would include compaction from heavy equipment degrading soil structure and reducing pore space. Implementation of the mitigation measures identified in Section 3.3.3 would reduce construction-related soil impacts and impacts from tensioning sites are expected to be ***low*** to ***moderate***.

Operation and Maintenance

Operation and maintenance activities would include incidental repairs to access roads which could cause localized soil disturbance. Most vegetation management activities are non-ground disturbing and would not disturb underlying soils. In general, operation and maintenance activities would have a ***low*** direct impact on soils because they would be confined to small, localized areas dispersed along the length of the transmission line corridor.

Geologic Hazards

There are no mapped ***landslide*** risks in the project area and volcanic hazards are generally low (Lincoln County 1994; WDNR 2011a). Seismic hazards are expected to be low due to the low incidence of earthquakes in the area. Earthquakes can be expected occasionally in the general vicinity of the project area and may be felt along the proposed corridors, but there has been a low occurrence of large, damaging earthquakes in the past. In addition, BPA would design the transmission line towers using wind and ice loading criteria that would exceed earthquake induced loads. As a result, seismic hazards are expected to be ***low***.

Structures installed in unconsolidated sediments near stream channels could be located in areas with a moderate potential for liquefaction. Structures installed near streams subject to flash floods could be damaged by high flows. To assess the potential for these hazards to affect the transmission line, BPA maintenance crews would continue to conduct annual visits to survey for landslide activity or other effects associated with geologic hazards. Any impacts on the transmission line from noted events would be addressed during those surveys. Impacts from geologic hazards are expected to be ***low***.

Erosion Hazards

Construction and operation of the transmission line could increase soil erosion by removing vegetation, exposing soils, and increasing runoff in compacted areas. About 46 percent of the transmission line ROW is rated as having a severe erosion hazard (NRCS 2009a, 2009b). BPA would minimize construction-related erosion by limiting disturbance during the critical erosion period (November through March); avoiding operation of heavy equipment in wet areas to reduce soil compaction and erosion; and revegetating disturbed areas after construction is complete. These prescriptions, which are included in the mitigation measures in Section 3.3.3, would reduce the potential for construction-related erosion on highly erodible lands. As such, impacts on highly erodible lands are expected to be ***low*** to ***moderate***.

3.3.3 Mitigation—Proposed Action

If the Proposed Action is implemented, the following mitigation measures, used alone or in combination, would reduce impacts on geology and soils, landforms, and other resources:

- Locate offset replacement structures as far as possible from nearby streams and wetlands where adjustments are possible.
- Space and size culverts, cross-drains, and water bars to prevent erosion.
- Minimize erosion, sedimentation, and soil compaction by conducting as much work as possible during the dry season when streamflow, rainfall, and runoff are low.
- Prepare and implement a stormwater pollution prevention plan that addresses measures to reduce erosion and runoff and stabilize disturbed areas.
- Limit heavy equipment use to minimize soil compaction, particularly during the critical erosion period (November through March). Do not operate equipment on saturated soils.
- Revegetate disturbed, non-farmed, areas with a predominantly native seed mix or a seed mix agreed upon with landowners.
- Inspect and maintain access roads, culverts, and other facilities after construction to ensure proper function and nominal erosion levels.
- Inspect revegetation work and sites to verify adequate growth, and contingency measures as needed.

3.3.4 Unavoidable Impacts Remaining After Mitigation—Proposed Action

The mitigation measures described in Section 3.3.3 would reduce impacts to ***low*** or ***low***-to-***moderate*** levels. Although construction BMPs would reduce the potential for temporary increases in erosion, some increased levels would be expected. Long-term impacts after mitigation would be limited to soil compaction, minor erosion of formerly vegetated ground in areas where reseeding is not successful, and loss or elimination of natural biological functions in areas that were formerly undeveloped.

3.3.5 Cumulative Impacts—Proposed Action

The principal past and ongoing activities that affect soils in the vicinity of the Proposed Action are related to farming and grazing. In addition, the other BPA projects proposed within the existing corridor (see Appendix B) have the potential to result in impacts similar to those described above for the Proposed Action. Implementation of the mitigation measures described in Section 3.3.3 would ensure that the Proposed Action would not contribute significantly to cumulative soil impacts. As such, the contribution of the Proposed Action to cumulative impacts is considered ***low***. Similar mitigation measures would be employed for the two reasonably foreseeable future projects, which would further reduce total impacts.

3.3.6 Environmental Consequences—No Action Alternative

Under the No Action Alternative, the Proposed Action would not be constructed and there would be no construction-related impacts to geology and soil resources. Continued operation and maintenance of the existing transmission line would have ***low*** impacts on geology and soils resulting from line maintenance, danger tree removal, and incidental use of access roads to maintain the transmission line infrastructure. Vegetation management activities would have ***no*** to ***low*** impact, as these activities are not ground-disturbing. However, maintenance activities would likely increase over time as existing structures deteriorate, which could lead to more erosion and compaction than under existing conditions.

3.4 VEGETATION

3.4.1 Affected Environment

The study area for vegetation includes the existing ROW, the danger tree removal area adjacent to the ROW, the access road and travel route system that extends off the ROW, and any adjacent properties that could be affected by the Proposed Action. The study area lies within the Columbia River basin region province of eastern Washington. Topography is generally gently undulating to moderately hilly. Topographic relief is provided by riparian areas with deep, steep sided canyons in the middle portion of the existing transmission line corridor. The climate is arid to semiarid with low precipitation, hot, dry summers, and relatively cold winters (Franklin and Dyrness 1988). Agriculture is the dominant land use in the study area, particularly in the Lincoln County portion of the study area where much of the landscape has been altered by dryland wheat farming (see Figure 3-1). In the eastern quarter of the study area, residential and commercial development, and road and utility corridor construction have almost completely displaced natural vegetation.

Vegetation in the study area has been extensively modified by a variety of land uses, including agriculture, livestock grazing, logging and tree farming, residential and commercial development, and road and utility corridor construction, as well as by natural factors such as wildfire. In areas that have not been converted to agriculture, livestock grazing has facilitated the spread of weed species in ***upland*** and wetland areas. Livestock have extensively trampled many riparian and wetland areas. The introduction of ***nonnative*** plants such as diffuse knapweed, common St. John's-wort, annual brome grass species, and European pasture grasses have dramatically changed natural vegetation communities in some places by almost completely displacing all native plants.

Plant communities vary in quality from site to site depending on land use history, elevation, aspect, soil depth, and cover of nonnative plants. The overall quality of native plant communities in the study area ranges from very low to moderate. Although generally of low to moderate quality, the western third of the study area has extensive areas of natural vegetation, primarily shrub-steppe and coniferous forest. In the eastern portion of the transmission line corridor, especially within the coniferous forest vegetation type, weed cover is high and is sometimes greater than 90 percent. Weed cover is almost complete, particularly within close proximity to Spokane. The dominant tree species in the study area include Ponderosa pine and Douglas fir. Vegetation in the ROW is subject to periodic cutting and maintenance. As a result, natural vegetation succession processes in some portions of the ROW are not allowed to occur, resulting in managed shrublands and fields of nonnative pasture grasses.

The major vegetation types in the study area are discussed below, with the exception of wetlands, which are discussed in detail in Section 3.7, Wetlands. Common plant species in the study area noted during botanical surveys completed in 2011 (Beck 2011) are presented in Table 3-1.

Table 3-1. Common Vascular Plant Species Observed in the Study Area

Common Name	Scientific Name
Trees	
Douglas-fir	*Pseudotsuga menziesii*
Quaking aspen	*Populus tremuloides*
Ponderosa pine	*Pinus ponderosa*
Shrubs	
Alder species	*Alnus spp.*
Big sagebrush	*Artemisia tridentata*
bitterbrush	*Purshia tridentata*
black hawthorn	*Crataegus douglasii*
blue elderberry	*Sambucus cerulea*
common snowberry	*Symphoricarpos albus*
gray rabbitbrush	*Ericameria (Chrysothamnus) nauseosa*
Hood's phlox	*Phlox hoodii*
mallowleaf ninebark	*Physocarpus malvaceus*
mockorange	*Philadelphus lewisii*
redstem dogwood	*Cornus stolonifera*
Serviceberry	*Amelancher alnifolia*
snow buckwheat	*Eriogonum niveum*
stiff sagebrush	*Artemisia rigida*
thyme buckwheat	*Eriogonum thymoides*
wax currant	*Ribes cereum*
wild rose	*Rosa californica*
willow species	*Salix spp.*
Wood's rose	*Rosa woodsii*
Wyeth's buckwheat	*Eriogonum heracleoides*
Forbs	
Arnica species	*Arnica spp.*
Arrowleaf balsamroot	*Balsamorhiza sagittata*
Buckwheat species	*Eriogonum spp.*
Canada thistle	*Cirsium arvense*

Table 3-1. Common Vascular Plant Species Observed in the Study Area (continued)

Common Name	Scientific Name
Cinquefoil species	*Potentilla spp.*
Common St. John's-wort	*Hypericum perforatum*
common tansy	*Tanacetum vulgare*
Dalmatian toadflax	*Linaria dalmatica*
Desert yellow fleabane	*Erigeron linearis*
desert-parsley species	*Lomatium ssp.*
feathery false-lily-of-the-valley	*Maianthemum racemosum*
Field mint	*Mentha arvensis*
Geyer's onion	*Allium geyeri*
great camas	*Camassia quamash*
hairy purslane speedwell	*Veronica peregrina* var. *xalapensis*
Hooker's balsamroot	*Balsamorhiza hookeri*
Japanese brome	*Bromus japonicas*
lupine species	*Lupinus spp.*
Meadow popcornflower	*Plagiobothrys scouleri*
Navarretia	*Navarretia species*
Nettles	*Urtica dioica*
Oregon sunshine	*Eriophorum lanatum*
Penstemon species	*Penstemon spp.*
Phlox species	*Phlox spp.*
Puccoon	*Lithospermum ruderale*
Pussytoes species	*Antennaria spp.*
Silverweed cinquefoil	*Argentina (Potentilla) anserina*
Spreading dogbane	*Apocynum androsaemifolium*
Stonecrop	*Sedum spp.*
Wild flax	*Linum perenne*
Wild onion species	*Allium spp.*
Yarrow	*Achillea millefolium*
Graminoids	
Annual hairgrass	*Deschampsia danthonioides*
basin wildrye	*Leymus (Elymus) cinereus*
bluebunch wheatgrass	*Pseudoroegneria spicata*
bulbous bluegrass	*Poa bulbosa*
Bulrush	*Schoenoplectus acutus*
Cattail	*Typha latifolia*
Cheatgrass	*Bromus tectorum*
common spikerush	*Eleocharis palustris*
diffuse knapweed	*Centaurea diffusa*
Idaho fescue	*Festuca idahoensis*
Kentucky bluegrass	*Poa pratensis*
meadow fescue	*Festuca pratensis*
Pinegrass	*Calamagrostis rubescens*
reed canarygrass	*Phalaris arundinacea*

Table 3-1. Common Vascular Plant Species Observed in the Study Area (continued)

Common Name	Scientific Name
Rush species	*Juncus spp.*
Sandberg's bluegrass	*Poa secunda (sandbergii)*
sedge species	*Carex spp.*
Smooth brome	*Bromus inermis*
squirreltail grass	*Elymus elymoides (Sitanium hystrix)*
tall oatgrass	*Arrhenatherum elatius*
threadleaf sedge	*Carex filifolia*
Thurber needlegrass	*Achnatherum (Stipa) thurberianum*
Toad rush	*Juncus bufonius*
tumble mustard	*Sisymbrium altissimum*
western needlegrass	*Achnatherum (Stipa) occidentalis*

Agricultural Lands

Agriculture is the dominant land use in the study area, with approximately half of the existing corridor in agricultural production. Dryland and irrigated farms, fallow fields, and pasturelands compose the vegetation type from line miles 14 to 23, 25 to 37, and in several scattered smaller segments. Most unplowed areas adjacent to agricultural fields are vegetated primarily with non-native species such as bulbous bluegrass, tumble mustard, and cheatgrass. These tracts of cultivated land often contain small remnants of very low quality shrub-steppe, deciduous forest, and managed shrubland vegetation that provide important connections for plants and wildlife to native habitats outside the corridor.

Lithosol

Lithosol vegetation communities are those whose soils are stony and extremely shallow to bedrock (Franklin and Dyrness 1988). Within the study area, lithosols typically range from low to moderate ecological quality. The most common vegetation association in the lithosol is stiff sagebrush/ Sandberg's bluegrass (Daubenmire 1970). Topographical highpoints where many of the existing structures are located often have lithosol vegetation communities. Within much of the study area, lithosols do not cover large contiguous areas and most are much less than an acre, forming a patchy mosaic with shrub-steppe and prairie communities. Most of the lithosol vegetation in the study area is located between line miles 1 and 14, and 37 and 40.

Shrub-steppe and Prairie

Most shrub-steppe and prairie communities occur in the eastern portion of the study area where forested vegetation communities are limited. Shrub-steppe is characterized by deep soils, a significant cover of perennial grasses, and the presence of sagebrush; typically big sagebrush (Franklin and Dyrness 1988). The most common shrub-steppe plant association in the study area is big sagebrush/bluebunch wheatgrass. Dominant shrub species include: big sagebrush, gray rabbitbrush, serviceberry, bitterbrush, and Wyeth's buckwheat. Dominant grass species include: bluebunch wheatgrass, Sandberg's bluegrass, western needlegrass, and Idaho fescue. Dominant forb species include lupine species, arrowleaf balsamroot, desert parsley species, and yarrow. Areas dominated by sagebrush often occur on south-facing slopes and hilltops. Shrub-steppe vegetation in the study area is primarily located between line miles 1 and 14, 23 and 25, and 37 and 44.

Prairies have deep soils, conspicuous (but discontinuous) layers of shrubs and a high proportion of broad-leaved forbs (Franklin and Dyrness 1988). They also have a high diversity and cover of grasses and forbs, and lack sagebrush species. The following plant associations occur within prairie areas in the study area: Idaho fescue/common snowberry herbaceous shrub vegetation and Wyeth's buckwheat/Idaho fescue shrub herbaceous vegetation. The diversity of native species in prairie is generally high. The most contiguous segment of prairie in the study area is at Bachelor Prairie between line mile 3 and line mile 8. Wildfire burned much of this area several years ago and it now has a higher cover of weed species than it did previously.

Most of the shrub-steppe and native prairie in eastern Washington has been destroyed or degraded by a number of factors including grazing, agricultural conversion, wildfire, invasion of trees and/or weed species, and fire suppression. Within the study area, the quality of shrub-steppe and prairie varies from very low to moderate quality. Much of it has been degraded by on-going livestock grazing, trampling, and recent wildfires which have encouraged the spread of weeds. In the absence of fire, Ponderosa pine is invading shrub-steppe and prairie vegetation communities and converting them to Ponderosa pine parklands. Removal of trees along the ROW has resulted in managed shrub-steppe and prairie vegetation communities in some locations.

Coniferous Forest

Long stretches of forested area occur in the easternmost thirty miles of the corridor, with coniferous forest also occurring as scattered patches within agricultural areas, along drainages and in canyons. Where the existing transmission line corridor crosses forested communities, mature trees have been removed resulting in managed shrub-steppe and prairie, and managed shrubland vegetation communities within and adjacent to the ROW. Ponderosa pine is the dominant tree species within coniferous forested areas, with Douglas fir also present at moister sites. The canopy cover of forested areas ranges from woodland to open and closed forest. Coniferous forest areas have understory vegetation that consists of a variety of shrub, grass, and forb species depending on light, moisture, slope and aspect. Coniferous forests within the study area typically range from very low to moderate ecological quality. Coniferous forest vegetation in the study area is primarily located between line miles 3 and 14, 23 and 24, and 38 and 54.

Managed shrublands are common along the existing corridor in the coniferous forested portions of the study area. Managed shrublands occur where tall vegetation in and adjacent to the existing transmission line corridor is subject to periodic cutting by BPA as part of vegetation management activities in compliance with Western Electricity Coordinating Council standards. Young trees and tall shrub species are cut while they are saplings or are removed or topped, resulting in low to medium height shrub thickets. Shrub species are typically the same as those in the adjacent forest but these communities are more vulnerable to invasion by weed species than forested areas, because they are disturbed periodically and because weed species are not eventually shaded out by tree canopy cover.

Riparian Areas

Riparian areas are common throughout the study area and display a range of size and disturbance levels. Most riparian areas are lined with dense stands of trees, shrubs and tall grasses. Many are wide with relatively low gradients, others are narrower with steeper gradients, and some may be dry much of the year. The most common tree species associated with riparian areas in the study area are Ponderosa pine and Douglas-fir. Shrub species are often dense and diverse, and commonly include black hawthorn, wild rose, blue elderberry, alder, willow species, and common snowberry. Canada thistle, nettle, and feathery false lily of the valley are common herbaceous species in riparian areas. Common ***graminoids*** include reed canarygrass, sedge species, smooth brome, Kentucky bluegrass, meadow fescue, and tall oatgrass. Reed canarygrass often forms dense, tall swards along the banks of riparian areas. The majority of forbs and grasses associated with riparian areas in the Study area are non-native species. Many riparian areas have farms, outbuildings, and roads located in close proximity.

Vernal pools

Specialized wetlands called vernal pools occur in the westernmost portion of the study area in shrub-steppe and prairie vegetation. Vernal pools are shallow, ephemeral water bodies found in depressions with impermeable bottoms that are not subject to runoff or drainage (Rocchio and Crawford 2009). They are typically located on basalt flows and have silty clay bottoms. These depressions usually fill with water during the winter and spring and are dry in summer. In the study area, vernal pools are typically small and their quality varies from low to high. Common vernal pool plant species in the study area include: great camas, Geyer onion, meadow popcornflower, navarretia, toad rush, hairy purslane speedwell, and annual hairgrass. In the study area, vernal pools occur between line miles 3 and 6.

Noxious Weeds

Noxious weeds are nonnative plants that spread quickly and can be difficult to control. In Washington State, the Washington State Department of Agriculture, Washington State Noxious Weed Control Board, and County and District Noxious Weed Control Boards are responsible for administering applicable noxious weed laws and for determining how noxious weeds should be managed.

In general, noxious weeds are classified in one of three categories:

- **Class A Noxious Weeds**. Class A noxious weeds are nonnative species whose distribution in Washington is still limited. Preventing new infestations and eradicating existing infestations are the highest priority. Eradication of all Class A plants is required by law.
- **Class B Noxious Weeds**. Class B noxious weeds are nonnative species presently limited to portions of the state. Class B-Designate species are designated for control in portions of the state where they are not yet widespread. Prevention of new infestations in these areas is a high priority. In regions where a Class B species is already abundant, control is decided at the local level, with containment as the primary goal.
- **Class C Noxious Weeds**. Class C noxious weeds are nonnative plants that are already widespread in Washington or are of special interest to the State's agricultural industry. Class C status allows counties to enforce control if locally desired. Other counties may choose to provide education or technical support for the removal or control of these weeds.

Weeds are scattered throughout the existing ROW and adjacent land. Infestations were observed to be relatively light in dryland wheat farming areas and relatively dense and diverse east of line mile 48 (Woodland Resource Services Inc. 2011). A total of 14 different species on the state noxious weed list were observed along the ROW and adjacent lands: nine on the Class B list and five on the Class C list. No Class A noxious weeds were observed in the study area. Summary information is presented for the 14 observed species in Table 3-2.

Table 3-2. Species on the State Noxious Weed List

Common Name	Scientific Name	State Classification	Occurrence in the Study Area[1/]
Kochia	*Kochia scoparia*	Class B	Moderate infestations of Kochia were observed scattered throughout the project area and adjacent lands.[2/]
Blueweed	*Echium vulgare*	Class B	Blueweed was found from 40/6 east to the Bell Substation. Infestations were observed to be moderate with some areas heavily infested.
Dalmation Toadflax	*Linaria dalmatica*	Class B	Infestations of Dalmation toadflax were scattered sporadically from 3/3 east to the Bell Substation with infestations becoming larger and more frequent closer to the east end of the line.
Houndstongue	*Cynoglossum officinale*	Class B	Sporadic infestations of Houndstongue were observed starting at 10/6 and continuing east to 52/5 and were generally very limited in scope.
Sulfur Cinquefoil	*Potentilla recta*	Class B	Two minor infestations were found, consisting of only a few scattered plants.
Rush Skeletonweed	*Chondrilla juncea*	Class B	Infestations of Rush Skeletonweed were widespread from 4/5 east to the Bell Substation, with infestations becoming larger and more frequent closer to the east end of the line.[2/]
Leafy Spurge	*Euphorbia esula*	Class B	Leafy Spurge was found from 41/2 east to 48/1. Infestations were observed to be moderate and scattered.
Spotted Knapweed	*Centaurea Stoebe*	Class B	Spotted Knapweed infestations were widespread from 4/3 east to the Bell Substation with infestations becoming larger and more frequent closer to the east end of the line.[2/]
Diffuse Knapweed	*Centaurea diffusa*	Class B	Diffuse Knapweed infestations were scattered from 8/2 east to 53/8 with infestations becoming larger and more frequent closer to the east end of the line.[2/]
Canada Thistle	*Cirsium arvense*	Class C	Infestations of Canada Thistle were observed to be moderate and scattered from the Creston Substation east to 52/2.[2/]
Bull Thistle	*Cirsium vulgare*	Class C	Infestations of individual plants and small patches were observed from 4/5 east to 52/1. Infestations were very sporadic and limited in scope.
Common St. Johnswort	*Hypericum perforatum*	Class C	Infestations of Common St. Johnswort were observed to be pervasive and heavy at times throughout the project area and adjacent lands.[2/]

Table 3-2. Species on the State Noxious Weed List (continued)

Common Name	Scientific Name	State Classification	Occurrence in the Study Area[1/]
Common Tansy	*Tanacetum vulgare*	Class C	Common tansy was found in a few small scattered infestations between 9/6 and 52/5.
Field Bindweed	*Convolvulus arvensis*	Class C	Field Bindweed was found in a few small scattered infestations between 17/7 and 45/1.

Notes:
1/ Numbers cited in these summaries refer to existing structure identification numbers.
2/ Control within the project area would be temporary at best due to the potential for reintroduction from seed sources on adjacent lands.
Source: Woodland Resource Services Inc. 2011

Special Status Plant Species

Special-status plant species are those species that have been identified for protection and/or management under the federal Endangered Species Act of 1973 (ESA) (16 U.S.C. 1531 *et seq.*), (U.S. Fish and Wildlife Service [USFWS] 2011a, 2011b) or the Washington State Natural Heritage Program (WDNR 2011b). The study area is within the potential habitat range of three federally listed plant species: water howellia (*Howellia aquatilis*), Spalding's catchfly (*Silene spaldingii*), and Ute ladies'-tresses (*Spiranthes diluvialis*) (USFWS 2011a, 2011b). All three of these species are listed as ***threatened*** under the ESA. Known occurrences of two of these species are located within one mile of the study area, including a small occurrence of Spalding's catchfly in the corridor under the adjacent Grand Coulee-Bell #5 Transmission Line (BPA 2011c).

Rare plant surveys were conducted in May, June and August 2011 for the entire length of the existing Creston-Bell ROW and for off-ROW access roads and travel routes between the Creston Substation and line mile 17. No populations of federally listed plants were found during these surveys (Beck 2011). Although potential habitat for the federally listed species water howellia and Spalding's catchfly is present in the study area, no populations of these species were located. The type of riparian area typically favored by Ute ladies'-tresses is not present in the study area. Off-ROW access roads and travel routes between line mile 17 and the Bell Substation were not included in the 2011 special status plant surveys because preliminary design/location of access roads and travel routes along this section of the study area was not completed until after the survey period. Rare plant surveys on off-ROW access roads and travel routes between line mile 17 and the Bell Substation will occur during spring and summer of 2012, prior to construction. If special status plant species are present, potential impacts would be reduced by implementation of the mitigation measures identified in Section 3.4.3.

Nine populations of five Washington State listed rare plant species were observed in the ROW during rare plant surveys of the study area in 2011 (Beck 2011). Three of these species are listed as Sensitive; the other two are listed as Review Group 1. Washington State Sensitive species are species that are vulnerable or declining and could become Endangered or Threatened without active management. Washington State Review Group 1 species are species of potential concern in need of additional field work before the state can assign them a status (WDNR 2011c).

The Sensitive species inch-high rush (*Juncus uncialis*) and the Review Group 1 species oblong bluecurls (*Trichostema oblongum*) were located in vernal pool habitat between existing structures 4/8 and 6/2. The Sensitive species Whited's penstemon (*Penstemon eriantherus var. whitedii*) and the Review Group 1 species Geyer's twinpod (*Physaria geyeri* var. *geyeri*) were located together on a steep open slope in Riverside State Park within the ROW. The Sensitive species Nuttall's pussytoes (*Antennaria parvifolia*) was observed in several populations along the ROW in and near Riverside State Park.

3.4.2 Environmental Consequences

Potential impacts to vegetation would occur from removal of existing structures and installation of new structures, access road construction and reconstruction/improvement, use of temporary travel routes, danger tree removal, staging areas and tensioning sites, and on-going operation and maintenance activities, and noxious weeds. Direct impacts on vegetation would include the removal of or disturbance to vegetation, including crushing vegetation, damage to plant roots from compaction of soils by heavy equipment, and soil disturbance. Indirect impacts could include the introduction and spread of noxious weeds species and disturbance to plant communities from erosion and sedimentation.

Removal of Existing Structures and Installation of New Structures

Structure removal and replacement would result in clearing and crushing of vegetation, damage to plant roots from compaction of soils by heavy equipment, soil disturbance, and minor reduced soil productivity. The extent of direct impacts at any particular site would depend on the quality of existing vegetation and soils, as well as site topography. Most structures and associated components would be replaced within their existing locations. Twenty-four replacement structures would be offset from existing structure locations. At most structure sites (two pole suspension structures), structure replacement activities would disturb an area approximately 50 feet by 100 feet per structure (approximately 0.1 acre) and would take place entirely within the ROW. Disturbance at three pole suspension structures would typically be larger, approximately 100 feet by 100 feet (0.2 acre). Potential impacts associated with counterpoise replacement, were it required, would include clearing and crushing of vegetation, damage to plant roots from compaction of soils by heavy equipment, and soil disturbance.

To minimize disturbance in riparian areas and areas where special status plants occur, the disturbance area would be reduced to 50 feet by 50 feet per structure (0.06 acre), if possible. Signage, fences, or flagging would be installed where needed, to restrict vehicles and equipment to designated routes outside of sensitive communities and species habitat. Because impacts on vegetation from the Proposed Action would consist mainly of disturbance to managed shrublands, nonnative grasslands, and previously disturbed habitat, impacts are expected to be ***low***. Implementation of the mitigation measures described in Section 3.4.3 would further reduce construction-related impacts of structure removal and replacement. Impacts from these activities are expected to be ***low***.

Access Roads

Road construction would require removal of existing vegetation in some locations. Road reconstruction/improvement would affect existing low quality vegetation that has grown up in or along the edges of existing road beds. The majority of vegetation temporarily affected by the Proposed Action would be associated with managed shrublands, nonnative grasslands, and previously disturbed habitat; however, in some habitats, such as lithosols and prairie, new road construction could disturb areas that currently consist of higher quality plant communities with more native species and have been subject to lower levels of disturbance in the past. Although vegetation in these areas may be of higher quality, the level of impact would be ***low***, due to the limited extent of the higher quality plant communities and the relatively small size of the disturbance area. Implementation of the mitigation measures described in Section 3.4.3 would reduce construction-related impacts on vegetation resulting from access road improvements.

Use of temporary travel routes across fields would crush existing vegetation, damage roots, and compact soils, but most vegetation would likely recover over time. In most cases, these routes would cross farm fields and would be restored to their existing condition following construction. Impacts to vegetation from temporary travel routes would be ***low***.

Impacts associated with access road construction on populations of special status plants would be avoided if possible. In the vicinity of special status plant populations, staking or flagging would be installed where needed prior to construction to restrict vehicles and equipment to designated routes. Construction would likely avoid most special status plant populations entirely; however, portions of some Nuttall's pussytoes populations may be affected, especially those located in the vicinity of existing structures 48/1 and 48/2 in Riverside State Park, and existing structure 48/5 east of the Spokane River. Nuttall's pussytoes may also be present along off-ROW access routes and travel routes in the vicinity of Riverside State Park. These areas will be surveyed for this species prior to construction in this area. As noted in the Affected Environment discussion, Nuttall's pussytoes is listed by Washington State as Sensitive; it is not federally listed or listed as Endangered or Threatened by the State. Impacts to these populations would be reduced by implementation of the mitigation measures identified in Section 3.4.3. Impacts on special status plants from the Proposed Action are expected to be ***low*** to ***moderate***.

Danger Tree Removal

Danger tree removal would constitute a direct impact on vegetation. An estimated 274 Douglas-fir and Ponderosa pine trees located between 50 and 80 feet from the centerline of the transmission line ROW would need to be removed as part of the Proposed Action, with trees ranging in size from 8 inches to more than 20 inches diameter at breast height (dbh) (Appendix A). Removing groups of danger trees could open up forested areas to light, making these areas more vulnerable to invasion by weed species, many of which require higher light levels to grow. Native understory plants that grow in shaded areas would not thrive in these forest openings. If danger trees removed comprise the outer trees in a larger group, the inner trees could become more exposed to wind and susceptible to falling over. Trees and shrubs would, however, be expected to grow quickly in any forest openings created by danger tree removal and, as a result, potential impacts to vegetation would be ***low***.

Staging Areas and Tensioning Sites

BPA would require the construction contractor to locate all staging areas outside sensitive areas (streams, wetlands, areas with special status plants), in level, open, and already developed or disturbed sites. All areas temporarily disturbed during construction would be returned to preconstruction conditions and revegetated as appropriate. Potential impacts on vegetation at staging areas are expected to be ***low***.

Potential impacts associated with tensioning sites could include clearing and crushing of vegetation, damage to plant roots from compaction of soils by heavy equipment, and soil disturbance. Implementation of the mitigation measures identified in Section 3.4.3 would reduce construction-related soil impacts. Impacts from tensioning sites are expected to be ***low***.

Operation and Maintenance

Ongoing vegetation management activities would occur under the Proposed Action, including periodic trimming, and cutting or clearing of trees and shrubs to allow access to transmission facilities and to prevent vegetation from growing too close to conductors. Vegetation maintenance would be conducted under BPA's *Transmission System Vegetation Management Program Final EIS*, which uses a variety of methods to keep plants from interfering with transmission lines, including manual, mechanical, chemical, and biological methods to foster low-growing plant communities and keep plants from interfering with transmission lines (BPA 2000). Because the Proposed Action is a rebuild, these activities are ongoing and impacts on vegetation resulting from operation and maintenance of the Proposed Action are expected to be ***low***.

Noxious Weeds

During and following construction, noxious weeds could spread and colonize disturbed areas as a result of the movement of soils and materials contaminated with weed seeds and natural weed seed dispersal. Areas where the soil is bare are particularly vulnerable to infestation by weeds. Although weeds are already widespread in the general area, the presence and abundance of weed species could increase in the study area as a result of construction. However, implementation of mitigation measures such as washing equipment before entering construction areas would reduce the spread of noxious weeds. Standard mulching and prompt revegetation through seeding and planting would make it less likely that noxious weed infestations would expand their presence in the study area. In addition, frequent weed control activities would reduce the growth and spread of noxious weeds in areas targeted for control of certain weed species. However, as indicated in Table 3-2, control for a number of the species on the state noxious weed list observed within the study area (kochia, rush skeletonweed, diffuse knapweed, Canada thistle, and common St. John's-wort) would be temporary at best due to the potential for reintroduction from seed sources on adjacent lands (Woodland Resource Services Inc. 2011). The impact associated with the spread of noxious weeds as a result of the Proposed Action is considered ***low***.

3.4.3 Mitigation

The following mitigation measures have been identified to help avoid and minimize potential adverse impacts to vegetation resulting from construction and operation of the Proposed Action:

- Assess whether noxious weeds have spread or increased in abundance as a result of construction activities using the results of the pre-construction noxious weed survey conducted for the Rebuild Project (Woodland Resource Services Inc. 2011).
- Implement measures to minimize the introduction and broadcast of weed seeds during construction. Wash equipment and vehicles before entering construction areas.
- Restrict construction activities to the area needed to work effectively to limit disturbance of native plant communities and to prevent expansion of noxious weed species.
- Mulch and reseed disturbed, non-farmed areas once construction is complete using a predominantly native seed mix or a seed mix agreed upon with landowners to make it less likely that noxious weed infestations will expand within the study area.

- Periodically inspect reseeded sites to verify adequate growth. If necessary, implement contingency measures to ensure adequate growth and vegetation cover.
- Conduct surveys for federally and state-listed plant species along proposed off-ROW access roads and travel routes between line mile 17 and the Bell Substation prior to construction-related use of these access roads and travel routes.
- Install stakes or flagging in sensitive areas such as the vicinity of special status plant species populations (including those identified during pre-construction surveys) prior to construction, where needed to minimize disturbance and to restrict vehicles and equipment to designated routes.
- Minimize chip, sawdust, or brush accumulation in the ROW and haul these materials out, if possible.
- Continue to implement weed control efforts in the ROW as part of ongoing vegetation management efforts.

3.4.4 Unavoidable Impacts Remaining After Mitigation

Although agriculture is the dominant land use in the study area, the Proposed Action could result in the loss of mature native plants, habitat complexity, and species diversity. Replacement of structures and access road work could cause long-term soil compaction and reduced soil productivity around structures and on and along roadbeds. Access road construction, improvement, and reconstruction would further reduce vegetation cover, temporarily or permanently. In addition, it is not possible to entirely avoid impacts to riparian areas and special status plant populations, even though potential impacts would be reduced through implementation of the mitigation measures identified in Section 3.4.3. Because of the prolific nature of noxious weeds and the difficulty of controlling them, their unintentional spread into some areas that are not currently infested is likely to occur. Implementation of the weed control measures identified in Section 3.4.3 would decrease the level of impact to ***moderate***. Because replacement of existing structures and the construction of new structures would occur entirely within the existing ROW, and because most access road improvements would occur within a previously disturbed corridor, unavoidable impacts remaining after mitigation are expected to be ***low*** to ***moderate***.

3.4.5 Cumulative Impacts

Agricultural activities, livestock grazing, silvicultural activities, vegetation control along roads and utility corridors, and commercial and residential development are responsible for most of the past and ongoing impacts on vegetation in the vicinity of the study area. Presently occurring activities and projects and those that occur in the future will cumulatively impact vegetation. If substantial development occurs on private lands in the study area, a more extensive shift away from native vegetation communities could occur.

Agricultural activities, predominantly dryland wheat production, have substantially altered the vegetation in the region by completely removing native vegetation communities. Livestock grazing occurs in much of the region around the study area and typically results in the introduction and spread of weed species and the degradation of native vegetation communities. Riparian and wetland areas are frequently trampled by livestock. Vegetation control routinely occurs along local highways, county roads, residential roads, and utility corridors in the vicinity of the study area, including the corridor that the existing Creston-Bell transmission line shares with three other transmission lines. Vegetation control activities generally include herbicide applications to control vegetation and noxious weeds, and mechanical cutting of vegetation.

The Proposed Action is expected to have a minimal contribution to cumulative impacts on vegetation, compared to the combined impacts of past, ongoing, and future vegetation-altering activities in the study area. The amount of vegetation that would be affected by the Proposed Action is small compared to the area affected by agricultural activities, livestock grazing, wildfire, vegetation control along roads and other utility corridors, and commercial and residential development in the area. This is also the case with the two other reasonably foreseeable future BPA projects identified in Appendix B of this EA. One exception is the potential effect of the proposed work within the existing transmission line corridor on weed-infested areas. Because corridors act as a path for the movement of weed species and because of the difficulty of controlling many weed species, the Proposed Action would have a ***low*** to ***moderate*** cumulative impact on the spread of noxious weeds.

3.4.6 Environmental Consequences—No Action Alternative

Under the No Action Alternative, the Proposed Action would not be constructed and construction-related impacts on vegetation would not occur. Continued operation and maintenance of the existing transmission line, including danger tree removal, would have ***low*** to ***moderate*** impacts on vegetation, primarily through implementation of BPA’s vegetation management program (BPA 2000). However, maintenance activities would likely increase as existing structures deteriorate, which could lead to more impacts on vegetation than under existing conditions.

3.5 WATER RESOURCES AND WATER QUALITY

3.5.1 Affected Environment

Surface Water

The study area for water resources and water quality includes all surface waters crossed by the existing transmission line ROW and the proposed off-ROW access road and travel route system, as well as surface waters located within 300 feet of any existing or proposed infrastructure. This distance (300 feet) was selected because it is a reasonable maximum distance within which project actions relating to land disturbance could potentially cause some increase in sediment runoff to streams (Knutson and Naef 1997). Nearly half of the streams within the study area are part of the Deep Creek-Spokane River watershed. Other watersheds partially included in the study area are the Hawk Creek-Franklin D. Roosevelt Lake watershed, the Little Chamokane Creek-Spokane River watershed, and to a lesser extent, the Lower Little Spokane River and the Sand Creek-Spokane River watersheds (Table 3-3). Table 3-3 identifies the number of mapped streams in the study area by watershed and subwatershed.

Table 3-3. Study Area Watersheds

Watershed (5th field)[1/]	Subwatershed (6th Field)[1/]	Number of Streams[2/]
Deep Creek-Spokane River	Coulee Creek	26
	Deep Creek	3
	Nine Mile Reservoir-Spokane River	9
	Total	**38**
Hawk Creek-Franklin D. Roosevelt Lake	Indiana Creek	3
	Upper Hawk Creek	10
	Welsh Creek	4
	Total	**17**
Little Chamokane Creek-Spokane River	Mill Creek	7
	Spring Creek	12
	Tamarack Creek	4
	Total	**23**
Lower Little Spokane River	Dartford Creek-Little Spokane River	5
	Total	**6**
Sand Creek-Spokane River	Harker Canyon-Spokane River	6
	Total	**6**
Study Area Total		**89**

Note:
1/ The USGS organizes watersheds by dividing hydrologic units into successively smaller hydrologic units. Each hydrologic unit is given a unique identifier known as a hydrologic unit code (HUC). 5th field and 6th field refer to the fifth and sixth levels of this classification, respectively.
2/ Streams were identified in the field as part of the wetlands surveys conducted for this project. A total of 45 streams with a defined channel and flow most likely for greater than 3 months of the year were observed in the study area (see Appendix C). As this lower number suggests, many of the 89 streams identified in the WDNR map layer were not present. This was particularly common in wheat fields (Tetra Tech 2011).

According to the WDNR stream typing system, the 53.8-mile-long ROW and associated access roads/travel routes either cross or are within 300 feet of streams in 89 different locations. A complete list of these streams is presented as Appendix C, which identifies the water body name, the next named downstream water body, water type, and flow type, as well the nearest transmission line structures.[4] Water types are identified based on the WDNR stream typing system (Washington Administrative Code [WAC] 222-16-030), as follows:

- Type S: shorelines of the state
- Type F: fish-bearing waters
- Type N: non-fish-bearing waters
  - Type Np: perennial, non-fish-bearing waters
  - Type Ns: seasonal, non-fish-bearing waters
- Type U: unidentified water

[4] Streams were identified in the field as part of the wetlands surveys conducted for this project. A total of 45 streams with a defined channel and flow most likely for greater than 3 months of the year were observed in the study area,approximately half the number identified in the WDNR map layer. As this lower number suggests, many of the streams identified in the WDNR map layer were not present. This was particularly common in wheat fields and may, in part, be the result of decades of tilling and recontouring during farming activities (Tetra Tech 2011).

Impaired Water bodies

Section 303(d) of the federal Clean Water Act (33 U.S.C. 1251 *et seq*.) requires Washington State to periodically prepare a list (commonly known as the 303(d) list) of all surface waters in the state for which beneficial uses, such as drinking, recreation, aquatic habitat, and industrial use, are impaired by pollutants. This list encompasses water quality limited estuaries, lakes, and streams that fall short of state surface water quality standards, and are not expected to improve within the next 2 years (Ecology 2009).

Ecology completed and submitted Washington State's Water Quality Assessment for 2006/2008 to the U.S. Environmental Protection Agency (EPA) in June 2008 as an "integrated report" to meet the Clean Water Act requirements of sections 305(b) and 303(d). EPA approved the Water Quality Assessment in January 2009. Review of this list indicates that the stretch of the Spokane River crossed by the existing transmission line is listed as impaired for elevated levels of polychlorinated biphenyls (PCBs) and dissolved oxygen. PCBs can be toxic to fish and wildlife that use a contaminated water body. Although the manufacture of PCBs was banned in the U.S. in 1977, they were used in the past as coolants and lubricants in electrical equipment such as transformers and capacitors. PCBs can build up in the environment and can be harmful to humans and wildlife (Ecology 2011a).

In February 2010, Ecology released the Spokane River Dissolved Oxygen ***Total Maximum Daily Load***. Dissolved oxygen is necessary for aquatic organisms, aiding organic matter decomposition, and for other biological and chemical processes. Dissolved oxygen levels can be affected by stream temperature and flow, elimination of rapids and riffles, and pollution. Stormwater runoff can carry pollutants (excess nutrients and organic matter or other chemicals) that require oxygen for decomposition or chemical reactions. Excess nutrients can stimulate algae growth, which can further decrease dissolved oxygen levels when dying algae decomposes in the sediment. (Ecology 2012)

Shorelines of the State

The Spokane River in Spokane County is designated as a Shoreline of the State under the Washington Shoreline Management Act, which was enacted in 1971 as chapter 90.58 of the Revised Code of Washington. Local shoreline regulations apply to activities within designated shorelines of the Spokane River.

Perennial Streams

The study area is drained by several perennial streams that cross or are within 300 feet of the transmission line ROW and access road system. Named mapped streams moving west to east include Welsh Creek, Hawk Creek, Spring Creek, Coulee Creek, Deep Creek, and the Spokane River, as well as several unnamed streams (Figure 3-2). In addition, numerous intermittent streams drain the study area. The following sections briefly describe the named streams in the study area. Additional detail is provided for each stream in Section 3.6, Fish and Wildlife.

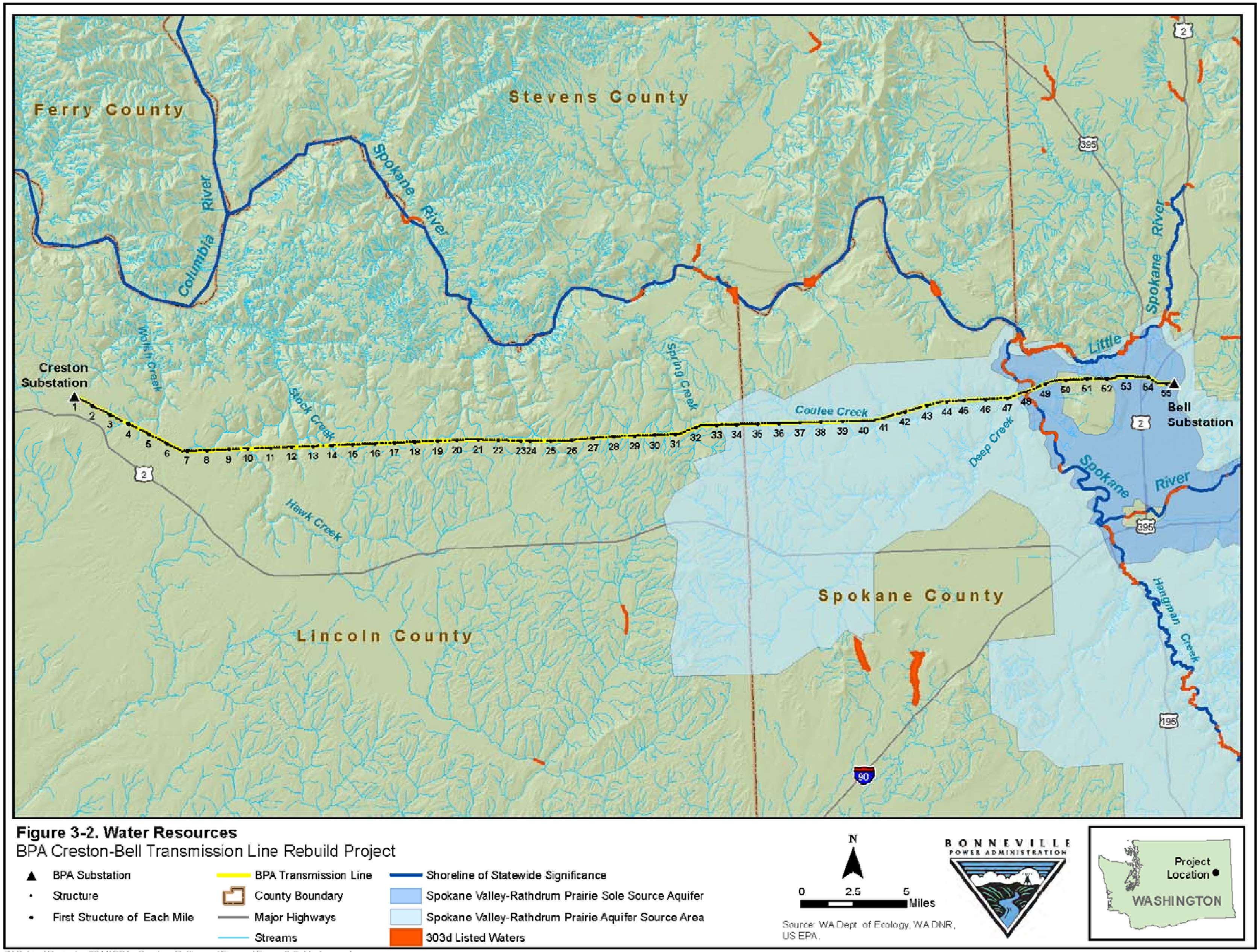

Figure 3-2. Water Resources
BPA Creston-Bell Transmission Line Rebuild Project

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Welsh Creek
Welsh Creek crosses the ROW between structures 3/8 and 3/9 near the western extent of the project in Lincoln County. This is a perennial non-fish-bearing stream (Type N) that flows into the Columbia River.

Hawk Creek
Hawk Creek crosses the ROW between structures 10/1 and 10/2. This is a perennial non-fish-bearing stream (Type N) that flows into the Columbia River in Lincoln County.

Spring Creek
Spring Creek crosses the ROW between structures 31/8 and 31/9, adjacent to Highway 231, north of Reardan, Washington, in Lincoln County. This is a perennial fish-bearing stream that flows into the Spokane River.

Coulee Creek
Coulee Creek generally follows the ROW east from about line mile 37, but is outside of the ROW until it crosses the ROW near structure 46/6 in Riverside State Park, near Spokane, Washington, in Spokane County. This is a perennial fish-bearing stream that flows into Deep Creek and ultimately drains into the Spokane River.

Deep Creek
Deep Creek crosses the ROW in Riverside State Park between structures 46/9 and 47/2. This is a perennial fish-bearing stream that flows into the Spokane River.

Spokane River
The Spokane River crosses the ROW between structures 49/3 and 49/4, adjacent to Riverside State Park near Spokane, Washington. This is a perennial fish bearing stream (Type F) and is a Shoreline of the State. At the location of the ROW, it is currently listed as impaired by Ecology due to PCB contamination and low dissolved oxygen. The crossing location is within Spokane County.

In addition, review of the WDNR stream database indicates that there are two structures within 50 feet of a natural water body: an unnamed stream that passes through the ROW between structures 14/3 and 14/8, coming within 50 feet of structures 14/5 and 14/6.

Groundwater

The study area for the ***groundwater*** analysis includes regional ***aquifer*** systems that underlie the transmission line ROW and access road and travel route system; namely, the Spokane Valley-Rathdrum Prairie Aquifer (SVRPA) and the unnamed, regional aquifer in ***Pliocene*** and younger basaltic rock.

Groundwater is a major water source for public water supplies, irrigation, and industrial uses. The study area is situated upon aquifers in Pliocene and younger basaltic rocks. These rocks generally occur in thin, basaltic lava flows and beds of volcanic materials. Numerous extensive flows of basaltic lava have spread out from vents in and near the Snake River Plain. Most of the interconnected open space in which groundwater passes occurs in interflow zones (between individual lava flows). The zones at the tops and the bottoms of these flows can yield large volumes of water to irrigation wells (Whitehead 1994).

Over 1,300 acres of the eastern portion of the ROW overlie the SVRPA (Figure 3-2). The EPA has designated the SVRPA as a sole source aquifer. The EPA (2012) defines a sole source aquifer as an underground water source that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer. The SVRPA is the major source of domestic water for Spokane County residents. EPA may review construction projects that receive federal financial assistance and have the potential to pollute the aquifer to ensure contamination does not occur. In some cases, EPA may require additional pollution prevention measures as a condition of federal funding.

Review of GIS data provided by the Washington State Department of Health (2011) indicated that there are no Surface Water Protection areas in the study area; the closest identified Surface Water Protection area is located approximately 15 miles south of the study area.

3.5.2 Environmental Consequences—Proposed Action

Removal of Existing and Installation of New Structures

Clearing of vegetation and grading associated with the removal and installation of structures, including counterpoise replacement, if required, would expose soils and make them more susceptible to erosion. This could degrade water bodies if eroded sediment were to reach a water body. However, all but two structures are at least 50 feet from water bodies. The exceptions are structures 14/5 and 14/6, which are both located within 50 feet of an unnamed, intermittent tributary to Stock Creek. Compaction from heavy equipment degrades soil structure, reducing pore space, which could lead to increased erosion if erosion control measures are not implemented. The risk of erosion would be highest where unconsolidated sediments are susceptible to wind and water erosion: on steep slopes with erodible soils and after rain events.

Each structure site would have a small area of exposed bare soil for a few weeks that could, if not maintained, erode and be a source of sediment to nearby streams. However, this would generally fall within the range of current conditions, as many of the existing and proposed structures are located in cultivated fields that are frequently laid bare for plowing and planting. In addition, implementation of the mitigation measures in Section 3.5.3 would reduce these potential construction-related water quality impacts.

Replacement of the existing structures is not expected to affect infiltration of surface water to groundwater, because the new structures would result in no or a very small net gain in impervious surfaces. Spill prevention and response plans would be developed to reduce the potential for spills within the SVRPA and provide for swift responses. There would be no effect on 303d listed water quality impairments in the Spokane River.

Impacts on water quality and water resources from the removal of existing and installation of new structures are expected to be ***low***.

Access Roads

Access road construction would require clearing and grading that would temporarily expose soil to potential erosion and the subsequent transport of sediment to surface waters. Implementation of the mitigation measures in Section 3.5.3 would reduce the potential for erosion and adverse water quality impacts associated with access road construction. In addition, new, improved, and reconstructed access roads would be composed of a compacted gravel surface to minimize erosion. Roads would also be constructed with drainage ditches, culverts, and/or water bars, as necessary, to prevent potential surface erosion or other road failure. Access road construction, improvement and reconstruction would not require in-water construction. The Proposed Action would involve an estimated 20 culvert installations or replacements, mainly associated with existing roads that would be reconstructed/improved. Four of these proposed culverts cross unnamed intermittent streams. All culvert installations or replacements in streams would occur in the dry to avoid potential turbidity impacts on water quality during installation. This work would occur when there is no flow or, if that is not possible, flow would be diverted from the stream culvert location during installation/replacement, as necessary.

Review of the WDNR stream database (Appendix C) indicates that 24 water bodies (all intermittent) would be crossed by travel routes through farm fields (temporary travel routes), with travel routes over existing non-public roads (permanent travel routes) crossing another 6 water bodies (5 intermittent; 1 perennial).[5] Travel routes across fields would be used in their existing condition with the least impact necessary to allow travel during construction and facilitate restoration of the area back to the existing condition (field) after construction activity. Existing roads may require improvements such as blading, grading, and rock work. Construction and maintenance of these roads may have short term, localized effects on crossed water bodies. Drainage control features such as culverts, fords, and drain dips would be used, as needed to control runoff and erosion and limit impacts to water quality. Three proposed culverts are associated with existing non-public roads. None of these culverts cross water bodies identified in the WDNR stream database.

Some access roads include fordable crossings of water bodies. The current construction access plan involves the use of 12 fords, mostly along existing roads that would be reconstructed/improved under the Proposed Action. One of these fords (between structures 24/5 and 24/6) would cross an unnamed perennial tributary to the Spokane River, with four others (three between structures 12/9 and 13/1, and one between structures 43/7 and 44/1) crossing unnamed intermittent streams. Use of fords along access roads during construction may result in some erosion along the streambed and a transient increase in turbidity levels either at the time of use in the perennial stream, or the next time water flows in seasonal stream channels. Implementation of the mitigation measures described in Section 3.5.3 would reduce the potential for construction-related erosion entering water bodies in these areas.

Although composed of a compacted gravel surface, new and reconstructed access roads would decrease groundwater infiltration rates within their direct footprint, but would not be expected to have a noticeable effect on overall infiltration rates in the study area.

Impacts on water resources and water quality from the construction, improvement, and reconstruction of access roads in the study area would likely be ***low***.

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[5] Based on the streams observed in the field (Tetra Tech 2011), temporary travel routes would cross nine water bodies, not 24 as indicated by the WDNR database, with permanent travel routes crossing another five water bodies.

Danger Tree Removal

Riparian vegetation is an important factor in maintaining cool temperature in water bodies in the Pacific Northwest. Natural riparian vegetation, especially large trees, is limited in the study area due to the arid environment. For smaller streams, shorter riparian vegetation is generally adequate to maintain stream temperature and the smaller tributaries in the study area are either well shaded with low-growing vegetation, or are not shaded at all.

BPA estimates that a total of 274 danger trees would be removed as part of the Proposed Action. These trees are distributed along the ROW and identified by structure location in Appendix A. Approximately 70 of the identified trees are near structures in the vicinity of a stream, but not necessarily located within a riparian area. In cases where danger trees are located within riparian areas, the potential reduction in tree cover from tree removal would be small relative to the amount of cover along a particular stream corridor. Further, the Proposed Action involves rebuilding an existing transmission in an area already maintained with low vegetation for safety purposes and, as a result, very little or no change would occur to stream shade and temperature from current conditions. Therefore, impacts on water resources and water quality, including temperature, from danger tree removal are expected to be ***low***.

Staging Areas and Tensioning Sites

BPA would require the construction contractor to locate all staging areas outside stream channels in level, open, and already developed or disturbed sites. ***No*** impacts on water resources and water quality are anticipated as a result of staging areas for the Proposed Action.

Disturbance associated with tensioning sites would be temporary and localized, mainly occurring nearby or in conjunction with the removal of existing structures and the installation of new structures. Implementation of the mitigation measures described in Section 3.5.3 would reduce impacts and, as a result, impacts to water resources and water quality from tensioning sites would likely be ***low***.

Operation and Maintenance

Operation and maintenance activities would not change from existing conditions. Generally, these activities would have ***no*** or a ***low*** impact on surface waters. Maintenance activities would require access by vehicles during line inspections a few times each year. Occasionally, equipment such as insulators may need replacement. Current vegetation management activities would continue, including removal or pruning of danger trees and control of noxious weeds in the ROW.

Water quality could be directly affected by increased turbidity from erosion and sedimentation associated with danger tree removal as part of maintenance activities. Increased sedimentation could disturb and resuspend fine sediment within the active channel and potentially expose bank soils to erosive hydraulic forces. However, this type of disturbance would be infrequent and impacts would be temporary and localized.

Emergency line repair following accidental downing of wires could require unplanned travel across streams or riparian areas. The resulting disruption could have short term adverse effects on water quality from localized increases in sediment and a loss of riparian trees and function (shade, organic input). This type of occurrence is, however, expected to be rare if the line is rebuilt and would involve a limited disturbance area.

Only approved herbicides would be used by a licensed applicator and only in quantities that would degrade in the surface soil or plant surfaces in accordance with BPA's *Transmission System Vegetation Management Program Final EIS* (BPA 2000). Based on these application procedures, there would likely be no measureable transmission of these substances to groundwater and no related impact to groundwater during operation and maintenance.

Impacts on water resources and water quality from operation and maintenance of the Proposed Action would likely be ***low***.

3.5.3 Mitigation—Proposed Action

Standard BMPs, in accordance with the *Stormwater Management Manual for Eastern Washington* (Ecology 2004a), would be implemented as part of the Proposed Action to manage stormwater from construction sites and minimize potential water quality impacts. BMPs would include, but would not be limited to, the following measures applied wherever they are applicable.

- Conduct all culvert installation/replacement work in the dry, either when there is no flow or by diverting flow from the stream culvert location during installation/replacement, as necessary, to avoid impacts on water quality.
- Keep disturbance to the minimum necessary when working in or near water bodies, and install stakes or flagging to restrict vehicles and equipment to designated routes and areas.
- Prepare and implement a stormwater pollution prevention plan that addresses measures to reduce erosion and runoff and stabilize disturbed areas.
- Retain vegetative buffers, where possible, to prevent sedimentation into water bodies.
- Minimize erosion, sedimentation, and soil compaction by conducting as much work as possible during the dry season when stream flow, rainfall, and runoff are low.
- Install sediment barriers and other suitable erosion- and runoff-control devices, where needed, prior to ground-disturbing activities at construction sites to minimize offsite sediment movement.
- Place construction vehicles or equipment at least 50 feet from any stream or wetland unless authorized by a permit or on an existing road.
- Locate tensioning sites at least 50 feet from streams or floodplains.
- Design and construct roads to minimize drainage from the road surface directly into water features.
- Prepare and implement spill prevention and response plans to minimize the potential for spills of hazardous material.
- Keep spill prevention materials on site and with equipment.
- Maintain vehicles and equipment in good working order to prevent oil and fuel leaks.
- Cover approaches to streams and crossings of streams in clean cobble rock to minimize erosion and sedimentation from BPA and landowner use, where appropriate. Steel plates and/or grates may also be used for driving surfaces across streams to minimize erosion and sedimentation, where appropriate.

3.5.4 Unavoidable Impacts Remaining After Mitigation—Proposed Action

Implementation of the Proposed Action would generally result in ***low***, temporary impacts on water resources and water quality; however, because of the nature of the construction activities, these impacts would be unavoidable. Implementation of the mitigation measures described above would reduce impacts to ***low*** impacts.

3.5.5 Cumulative Impacts—Proposed Action

The Proposed Action would result in some construction-related water quality impacts (e.g., increased turbidity or sedimentation) and a reduction in stream shading that could affect stream temperatures. Other projects, including the two reasonably foreseeable future BPA projects discussed in Appendix B, have the potential to result in impacts similar to those described above for the Proposed Action. Implementation of the mitigation measures described in Section 3.5.3 would ensure that the incremental contribution of the Proposed Action to cumulative impacts to water resources and quality would be ***low***. Similar mitigation measures would be employed for the two reasonably foreseeable future projects, which would further reduce total impacts.

3.5.6 Environmental Consequences—No Action Alternative

Under the No Action Alternative, no construction or construction-related impacts on surface waters would occur. Operation and maintenance impacts, including danger tree removal, would be similar to those associated with the Proposed Action and ***low***. However, as the existing line ages, the frequency of maintenance activity would likely be increased, as would the potential for unplanned emergency maintenance activities. Increased frequencies of transmission line maintenance may result in increased use of ford crossings, increasing the potential for impacts on water resources.

3.6 FISH AND WILDLIFE

3.6.1 Affected Environment

Fish and Fish Habitat

The study area for the fish analysis includes all surface waters crossed by the existing transmission line ROW or proposed access roads and travel routes, as well as surface waters located within 300 feet of any existing or proposed infrastructure. This distance was selected because it is a reasonable maximum distance within which project actions relating to land disturbance could potentially cause some increase in sediment runoff to streams (Knutson and Naef 1997). The study area is located in parts of three (4th field) ***watersheds***: the Franklin D. Roosevelt Lake, Lower Spokane, and Little Spokane watersheds.[6] These watersheds are part of two major subbasin areas: the Upper Columbia subbasin and the Spokane subbasin. All streams in the study area drain directly to Lake Roosevelt, the Spokane River, or the Little Spokane River.

[6] The USGS organizes watersheds by dividing hydrologic units into successively smaller hydrologic units. Each hydrologic unit is given a unique identifier known as a hydrologic unit code (HUC). 4th field refers to the fourth level of this classification.

According to the WDNR stream typing system, the 53.8-mile-long ROW and associated access roads/travel routes either cross or are within 300 feet of streams in 89 different locations. A complete list of these streams is presented as Appendix C.[7] Water types are identified based on the WDNR stream typing system (Washington Administrative Code [WAC] 222-16-030).

A total of 26 of the identified streams are perennial; the remaining 63 are classified as intermittent streams. According to WDNR, 24 of the streams in the study area are considered fish-bearing. These streams drain to either Lake Roosevelt or the Spokane River. There are no fish-bearing streams present in the Little Spokane watershed. The major fish-bearing streams that have sufficient flow for year-round fisheries in the study area are Hawk Creek in the Franklin D. Roosevelt Lake watershed, and Coulee Creek, Deep Creek, and the Spokane River in the Lower Spokane watershed.

Hawk Creek and the Spokane River may have the Columbia River ***distinct population segment*** (DPS) of bull trout (*Salvelinus confluentus*) (federally listed as threatened) in their drainages. The likelihood that bull trout are present in the study area is discussed further below under Federally Threatened and Endangered Fish Species.

There is no ***essential fish habitat*** (EFH) for any Pacific salmon species protected under the Magnuson-Stevens Fisheries Conservation and Management Act in or near the study area because all the streams in the area are well upstream of anadromous fish accessible areas. Summary information is provided for named fish-bearing streams in the study area in Table 3-4. Several other unnamed streams also contain fish. These streams are all tributaries to the named streams identified in Table 3-4 and are discussed by named stream in the following sections.

[7] Streams were identified in the field as part of the wetlands surveys conducted for this project. A total of 45 streams with a defined channel and flow most likely for greater than 3 months of the year were observed in the study area, approximately half the number identified in the WDNR map layer. As this lower number suggests, many of the streams identified in the WDNR map layer were not present. This was particularly common in wheat fields and may, in part, be the result of decades of tilling and recontouring during farming activities (Tetra Tech 2011).

Table 3-4. Major Fisheries Resources in the Study Area

Nearest Existing Structures (Line Mile/ Structure Number)		Water Body Name	Next Named Water Body Downstream	Known Species
West	East			
3/8	3/9	Welsh Creek	Lake Roosevelt	Rainbow trout/redband trout, Unknown[1/]
10/1	10/2	Hawk Creek	Lake Roosevelt	Bull trout (not at crossing area), brook trout, rainbow trout/redband trout
13/4	13/5	Stock Creek	Hawk Creek	Rainbow trout, Unknown[1/]
16/5	16/6	Indian Creek	Hawk Creek	Unknown[2/]
31/8	31/9	Spring Creek	Spokane River	Rainbow trout, Unknown[1/]
46/6	46/7	Coulee Creek[3/]	Deep Creek	Rainbow trout, Unknown[1/]
47/1	47/2	Deep Creek[3/]	Spokane River	Rainbow trout, Unknown[1/]
48/3	48/4	Spokane River	Lake Roosevelt	Bull trout, rainbow trout, brown trout, mountain whitefish, burbot, northern pike minnow, largescale sucker, largemouth bass, black crappie, and many others

1/ Limited specific stream data exists for these streams. The identified species are known or suspected to be in the drainage. Other trout species may be present, although poor habitat conditions, including temperature, intermittent flow, and riparian conditions, may limit all trout species presence in the study area.

2/ Indian Creek is identified by WDNR as non-fish bearing in the vicinity of the proposed crossing, This crossing location was observed to be dry during field surveys conducted in Spring 2011.

3/ Although WDNR identifies these streams as fish-bearing in the crossing areas, they were observed to be dry at these locations during field surveys conducted in Spring 2011.

Source: Northwest Power and Conservation Council (NPCC) 2004

The following sections provide an overview of selected major streams and their tributaries.

Welsh Creek

Welsh Creek is a small stream that flows north to Lake Roosevelt, which is located about 7 miles downstream from the study area. Welsh Creek likely contains rainbow or redband trout and may support kokanee spawning in the lower reaches (NPCC 2004). The transmission line ROW crosses this stream between structures 3/8 and 3/9. The stream is also crossed in this location by an existing access road that would be reconstructed as part of the project. The stream is small at the crossing area, about 5 feet bankfull width, with cobble substrate, and passes through an existing large culvert where the access road crosses the stream. The ***riparian*** area in this location is mostly shrubs with a few deciduous trees. The relative quality of the rainbow trout/redband trout habitat in the stream was noted in the NPCC's Subbasin Plan to be generally of lower quality in terms of habitat diversity, quantity of fine sediment, and pollutants, relative to other subbasin streams (NPCC 2004). Three other small intermittent tributaries to Welsh Creek area are crossed between structures 2/8 and 4/6. All three are designated as Type N, non-fish-bearing streams and have no fish habitat near project crossings.

Hawk Creek, Stock Creek, and Indian Creek

Hawk Creek proper is a perennial stream that flows north to Lake Roosevelt, which is located about 8 miles downstream from the study area. The transmission line ROW crosses this stream between structures 10/1 and 10/2. The stream is also crossed by an existing road at this location.

Near the crossing area the stream is moderately wide ranging from about 10 to 20 feet bankfull width.

Although StreamNet[8] indicates that bull trout may enter the lower portions of this creek, bull trout are not considered to actively reside in Lake Roosevelt (NPCC 2004; StreamNet 2011). Hawk Creek falls, present just upstream from the reservoir, block any potential upstream movement of fish from the reservoir. Therefore no bull trout would be present in the stretch of Hawk Creek that could be potentially affected by project actions.

Hawk Creek has been designated by the Washington Department of Fish and Wildlife (WDFW) (2011) as ***priority habitat*** for rainbow trout in the study area. Rainbow trout/redband trout habitat quality in this area is rated fairly typical of other upper Columbia subbasin streams (NPCC 2004), with passage obstructions, pollutants, fine sediments in the channel, and high flows noted as relatively poor habitat components.

Two named tributaries to Hawk Creek—Stock Creek and Indian Creek—and another 10 unnamed tributaries to these three streams are crossed by the transmission line ROW within the Hawk Creek drainage. These crossings all occur between structures 9/6 and 17/3. Stock Creek and one of its tributaries are indicated as Type F, fish-bearing streams, while the remaining tributaries are all designated by the WDNR as Type N, non-fish-bearing streams. The portions of these streams in the study area are all small with estimated bank full widths of 5 feet or less and intermittent flow (Appendix C). Indian Creek and three of the unnamed tributaries were observed to be dry during field surveys conducted in spring 2011 (Tetra Tech 2011).

Spring Creek

Spring Creek drains to the Spokane River and may have rainbow trout present (NPCC 2004). Spring Creek is a perennial stream, designated by the WDNR as Type F, fish-bearing. Habitat for rainbow trout near the study area is lower quality than the habitat available in the lower portion of this stream, but typical of rainbow trout habitat available in most streams in the Spokane River subbasin (NPCC 2004). The rainbow trout habitat categories in the study area that are least similar to streams in this subbasin and generally of lower quality are habitat diversity, riparian conditions, quantity of fine sediment, and pollutants (NPCC 2004). The transmission line ROW crosses this stream between structures 31/8 and 31/9. There are no existing or proposed road crossings in this location. The study area also crosses 15 tributaries to Spring Creek. Three of these tributaries are classified by WDNR as Type F, fish-bearing; the other 12 are classified as Type N, non-fish-bearing streams. These tributaries are all crossed between structures 27/6 and 33/10. The three fish-bearing tributaries are all crossed by Old Williams Road East.

Coulee Creek and Deep Creek

The transmission line ROW and study area parallels Coulee Creek for much of its length and crosses the creek between structures 46/6 and 46/7, about 0.6 mile upstream of its junction with Deep Creek. Deep Creek, which is crossed twice by the ROW between structures 47/1 and 47/2, drains to the reservoir pool area behind Nine Mile Dam on the Spokane River, about 1.3 miles

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8 StreamNet is a cooperative project focused on fisheries and aquatic related data and data related services in the Pacific Northwest. StreamNet is funded through the NPPC's Fish and Wildlife Program by BPA and administered by the Pacific States Marine Fisheries Commission.

downstream. All three crossing locations were observed to be dry during field surveys conducted in spring 2011 (Tetra Tech 2011).

Coulee Creek, classified by WDNR as Type F, fish-bearing, may have rainbow trout in the upper part of its drainage but the lower portion where the transmission line crosses the creek is not considered to be historical habitat for this species (NPCC 2004). Lower Coulee Creek is considered to have riparian conditions, channel stability, habitat diversity, and fine sediment that represent more adverse limiting conditions for rainbow trout habitat than other stretches of the Coulee Creek (NPCC 2004). The stretch of Lower Deep Creek that is crossed by the ROW has similar habitat conditions for rainbow trout as Coulee Creek.

About a third of all the ROW-stream intersections in the study area (approximately 30) occur in the Coulee and Deep Creek drainages. Many of the channels crossed are typically dry in the summer limiting their use as fish streams. In addition to the two named streams, nine of these streams are classified by WDNR as Type F, fish-bearing. Coulee Creek has been designated by WDFW (2011) as priority habitat for rainbow trout in the study area.

Spokane River

The Spokane River is the largest water body crossed by the existing transmission line corridor. This crossing occurs between structures 48/3 and 48/4, in the reservoir pool area upstream of Nine Mile Dam. The fish resources in this reach are varied and include both native cold water species (e.g. rainbow trout, mountain whitefish, northern pikeminnow, and largescale sucker), as well as many non-native cool and warmwater species (e.g., largemouth bass, black crappie, and yellow perch) (NPCC 2004). Warm water conditions and altered habitat are a limiting factor for ***salmonids*** in this reach. Bull trout were historically present in low numbers but are currently undetectable in the Spokane River subbasin (NPCC 2004). Some may rarely pass downstream from the Coeur D’Alene basin, but bull trout populations even upstream in this basin are greatly depressed. The habitat conditions for rainbow trout in the Spokane River are affected by different limiting factors than those in other streams in the Spokane River subbasin. These factors include more fish passage obstructions, higher accumulation of fine sediment, and lower habitat diversity. Riparian habitat along the Spokane River in the study area has been designated as priority habitat for rainbow trout by WDFW (2011).

State Priority Habitat and Species of Concern

A search of the WDFW Priority Habitats and Species (PHS) database was performed to identify special-status wildlife species and priority habitats in the study area (WDFW 2011). As noted above, priority habitat is identified as present for rainbow trout in Hawk Creek, Coulee Creek, and the Spokane River along the project route. The state establishes species under three categories:

- Criterion 1: State-listed and Candidate Species
- Criterion 2: Vulnerable Aggregations
- Criterion 3: Species of Recreational, Commercial, and/or Tribal Importance

Priority habitat for rainbow trout is classified under Criterion 3. No other fish species habitat designations noted by WDFW are present in the study area.

Federally Threatened and Endangered Fish Species

The USFWS provided BPA with lists of fish and wildlife species protected under the ESA that may occur in Spokane and Lincoln counties. As noted above, one fish species under USFWS jurisdiction, the Columbia River DPS of bull trout (*Salvelinus confluentus*), is federally listed as threatened and may occur in these counties. Bull trout require very clean cold water systems that are generally colder than would occur in any of the study area water bodies under current conditions. While some bull trout may occasionally be present in Lake Roosevelt, the one project area tributary stream where they have been suspected to possibly be present, Hawk Creek has a barrier falls near the mouth. These falls are over 7 miles downstream of where project-related actions may occur. Also bull trout in Lake Roosevelt are likely fish that have strayed from the tributaries where they normally spend their entire lives and do not have a normal or frequent presence in the reservoir (NPCC 2004).

As noted earlier, bull trout have not been detected recently in the Spokane River subbasin, but some may stray downstream over 40 miles from the Coeur D'Alene subbasin. Coeur D'Alene Lake is considered to have a total bull trout population between 50 to 250 fish (USFWS 2008) so the chance of any bull trout successfully moving downstream from this area, past several dams, reservoirs, falls, and marginal habitat into the stretch of the Spokane River crossed by the ROW, is very remote. Also the river is too warm (commonly over 15 degrees Celsius [59 degrees Fahrenheit]) in this region for these fish to successfully reside or reproduce. In addition, neither Lake Roosevelt nor this region of the Spokane River is designated as critical habitat for bull trout. Therefore, it is unlikely that bull trout would be in an area that could be affected by any project actions.

Wildlife and Their Habitat

The study area for wildlife includes all areas within 2 miles of the existing ROW and the access road and travel route system that extends off the ROW. Wide-ranging species such as carnivores and ungulates may utilize any of the habitats found within the project area; however, 2 miles was selected to capture potential impacts to species that may be more sensitive to construction related-activities. Potential direct impacts on wildlife are assumed to occur in areas within 300 feet of the ROW and the access and travel route system that extends off the ROW.

The study area encompasses a variety of habitats, most of which have been disturbed, degraded, and/or altered by human activities. Much of the study area west of the Spokane River is used for agriculture, with patches of grassland, Ponderosa pine-Douglas fir forest, riparian corridors, wetlands and impoundments, and shrub-steppe also present (see Figure 3-1). Varied geology, along with hydrologic forces, are largely responsible for this habitat diversity by shaping the topographical features and causing a patchy distribution of hills, perennial and seasonal drainages, open plains, exposed bedrock and rock faces, and riverine canyons. Although some habitat in the proposed project area is moderately high in quality, the already existing access road system that spans the majority of the ROW results in most of the area being at least moderately degraded. Highly altered and degraded urban/rural land is also present within the study area, particularly east of the Spokane River where the existing transmission line corridor enters the Spokane urban area.

The variety of habitats found in the proposed project area host a diversity of wildlife species. Areas of agricultural land (including agricultural fields, irrigation drainages, and farm structures) provide marginal habitat suitable for human-adapted species such as red-tailed hawk (*Buteo jamaicensis*), American kestrel (*Falco sparverius*), great-horned and barn owls (*Bubo virginianus* and *Tyto alba*, respectively), mourning dove (*Zenaida macroura*), kingbirds (*Tyrannus* sp.), savanna and song sparrows (*Passerculus sandwichensis* and *Melospiza melodia*, respectively), American robin (*Turdus migratorius*), brown-headed cowbird (*Molothrus ater*), western meadowlark (*Sturnella neglecta*), red-winged blackbird (*Agelaius phoeniceus*), California quail (*Callipepla californica),* and mammals such as mule deer (*Odocoileus hemionus*), coyote (*Canis latrans*), northern raccoon (*Procyon lotor*), various rodents (*order rodentia*), and rabbits (*Lepus* spp. and *Sylvilagus* spp.). Agricultural land is primarily located between line miles 14 and 23, 25 and 37, and in several scattered smaller segments

Natural-type grasslands and shrub-steppe host additional species such as gopher snake (*Pituophis melanoleucus*), western rattlesnake (*Crotalus viridis*), western fence lizard (*Sceloporus occidentalisa*), Swainson's hawk (*Buteo swainsoni*), horned lark (*Eremophila alpestris*), vesper sparrow (*Pooecetes gramineus*), chipping sparrow (*Spizella illiGaus*), grasshopper sparrow (*Ammodramus savannarum*), and lark sparrow (*Chondestes grammacus*), as well as game birds including ring-necked pheasant (*Phasianus colchicus*), wild turkey (*Meleagris gallopavo*), and California quail (*Callipepla californica)* (all three are introduced species). Shrub-steppe vegetation in the study area is primarily located between line miles 1 and 14, 23 and 25, and 37 and 44.

Ponderosa pine-Douglas fir forest, which often surrounds riparian corridors, wetlands, and impoundments, hosts common species such as Pacific chorus frog (*Hyla regilla*), western toad (*Bufo boreas*), garter snake (*Thamsophis* spp.), common raven (*Corvus corax*), black-capped chickadee (*Poecile atricapillus*), warblers (e.g., *Dendroica* spp.), accipiters (*Accipiters* spp.), osprey (*Pandion haliaetus*), bald eagle (*Haliaeetus leucocephalus*), and white-tailed deer (*Odocoileus virginianus*). Coniferous forest vegetation in the study area is primarily located between line miles 3 and 14, 23 and 24, and 38 and 54. Highly altered and degraded urban/rural land provides little habitat beyond corridors for movements between higher quality patches.

Federally Threatened and Endangered Wildlife Species

The USFWS prepares lists of wildlife species protected under the ESA that may occur in Lincoln and Spokane counties (USFWS 2010a, 2011c). Review of these lists indicates that five wildlife species under USFWS jurisdiction may occur in Lincoln and Spokane counties: the pygmy rabbit (*Brachylagus idahoensis*) – Columbia Basin DPS, the greater sage grouse (*Centrocercus urophasianus*) – Columbia Basin DPS, North American wolverine (*Gulo gulo luteus*) – contiguous U.S. DPS, Washington ground squirrel (*Spermophilus washingtoni*), and yellow-billed cuckoo (*Coccyzus americanus*). These species are listed in Table 3-5 along with their likelihood of occurrence in the study area, required habitat features, and summary of present known distribution.

Table 3-5. Sensitive Wildlife Species and Habitats

Common Name (Scientific name)	Status (Federal / State)	County Listed	Potential of Occurrence	Supporting Habitat Features
Endangered				
Pygmy rabbit (*Brachylagus idahoensis*) – Columbia Basin DPS[1]	Endangered / Endangered	Lincoln	Unlikely	Less than 30 Columbia Basin pygmy rabbits are believed to remain in the wild. They are dependent on sage brush plant communities (i.e., shrub-steppe habitat) associated with extensive (mature) stands of sage brush (*Artemisia tridentate).* They may have formally occupied shrub-steppe in the general vicinity of the study area but are currently not present (McAllister 1995; Hays 2003; USFWS 2003; WDFW 2011).
Candidate				
Greater sage grouse (*Centrocercus urophasianus*) – Columbia Basin DPS[1]	Candidate / Threatened	Lincoln	Potentially	Found in remnant patches of shrub-steppe where rocky soil and rugged terrain have precluded agricultural conversion, associated with native plants (e.g., not found in areas degraded by exotics) in large undisturbed patches. Only two populations remain in WA; one in Douglas and Grant counties; the other in Kittitas and Yakima counties. Other observations of this species have been made in Lincoln County, however, not within the study area (Stinson et al. 2004; Spokane Audubon Society 2011; WDFW 2011).
North American wolverine (*Gulo gulo luteus*) – contiguous U.S. DPS[1]	Candidate / NL	Lincoln	Unlikely	Generally found in forest and tundra particularly at altitude and in mountainous areas. They occur within a wide variety of alpine, boreal, and arctic habitats. In the coterminous U.S., they are associated to high-elevation alpine portions of their range and are unlikely to ever have regularly occupied the study area (USFWS 2010b; WDFW 2011).
Washington ground squirrel (*Spermophilus washingtoni*) [1]	Candidate / NL	Lincoln	Unlikely	Found in grassland and shrubland habitats of the Columbia Plateau east and south of the Columbia River in Washington and Oregon; associated with open areas, grasslands, low sage areas, cultivated fields, and hillsides that occur over silty loam soils. May have formally occupied shrub-steppe and grasslands in the study area but are currently absent (Finger et al. 2007; Watson et al. 2009; USFWS 2010a; WDFW 2011).

Table 3-5. Sensitive Wildlife Species and Habitats (continued)

Common Name (Scientific name)	Status (Federal / State)	County Listed	Potential of Occurrence	Supporting Habitat Features
Yellow-billed cuckoo (*Coccyzus americanus*) [1,2]	Candidate / Candidate	Lincoln, Spokane	Unlikely	Found in moist thickets, overgrown pastures, open woods, orchards, and streamside willow and alder groves, largely in areas with little disturbance. Require large blocks of riparian habitats (particularly woodlands dominated by *Populus* sp. And *Salix* sp.). Dense understory foliage appears to be important. May have formally occupied riparian corridors in the study area but are currently absent (USFWS 2010c; Spokane Audubon Society 2011; WDFW 2011).
Species of Concern				
Sharp-tailed Grouse (*Tympanuchus phasianellus*) [1,2,3]	Species of Concern / Threatened	Lincoln	Potentially	Found distributed in shrub-steppe, steppe, and meadow-steppe habitats. Current range is restricted to eight small, isolated populations in north central WA–one of the largest being near the Swanson Lakes Wildlife Area in Lincoln County. Sporadic sightings reported in Lincoln, Douglas, Okanogan and Asotin counties. One lek is documented within 1 mile north of the western end of the study area.

NL = Not Listed

Sources: [1] USFWS 2010d

[2] USFWS 2011c

[3] WDFW 2008, 2011

Four of these species–the pygmy rabbit, North American wolverine, Washington ground squirrel, and yellow-billed cuckoo—are highly unlikely to occur in the study area. Habitat features that would support these species are currently rare or absent, and few historical occurrences of these species in the study area have been documented. Although the yellow-billed cuckoo, Washington ground squirrel, and pygmy rabbit are likely to have occurred in at least some portion of the study area in the past, they are currently likely to be extirpated from the area (WDFW 2011) (see Table 3-5). The North American wolverine is unlikely to have ever occurred in the study area with any regularity (USFWS 2010b; WDFW 2011). These species are not discussed further in this document.

The other listed species—the greater sage grouse—has limited potential to occur in the general vicinity of the study area (Table 3-5). Some observations have been made in Lincoln County, approximately 50 miles south of the existing transmission line corridor in an area of relatively undisturbed, contiguous shrub-steppe habitat (Stinson et al. 2004; Spokane Audubon Society 2011; WDFW 2011), but there is very little or no habitat suitable to host this species present in the study area.

State Priority Habitat and Species of Concern

The WDFW PHS list of species and program database were reviewed to identify special-status wildlife species and priority habitats in the proposed project area (WDFW 2008, 2011). Special status wildlife species listed by WDFW with the potential to occur in the study area are identified in Table 3-5. These species include the pygmy rabbit, greater sage grouse, yellow-billed cuckoo, and the sharp-tailed grouse (*Tympanuchus phasianellus*). As with the greater sage grouse (discussed above), the sharp-tailed grouse has limited potential to occur in the proposed project area. Although little or no suitable habitat for this species is present, ***lek*** sites have been identified in Lincoln County. One sharp-tailed grouse lek is documented within 1 mile north along the western portion of the existing transmission line corridor (WDFW 2011). The current status of this lek site (i.e., whether it is still being used as a lek) is unknown.

3.6.2 Environmental Consequences—Proposed Action

Fish and Fish Habitat

Proposed Action activities that have the potential to affect fish and fish habitat are those activities that result in changes to water quality or quantity (see Section 3.5, Water Resources and Water Quality); changes in riparian vegetation that affect shade, cover, and recruitment of wood and terrestrial insects into streams; or activities that directly result in death of or disturbance to fish.

Removal of Existing and Installation of New Structures

Removal and replacement of structures, including counterpoise replacement, if required, would require temporary ground disturbance. None of the existing or proposed structures are located in streams and direct impacts to fish would be unlikely. Indirect impacts could occur from erosion of exposed soil causing sediment movement into adjacent streams. Increased sediment to streams can indirectly affect fish by affecting the suitability of spawning areas as elevated sediment can reduce fish egg survival. Soil runoff could also elevate turbidly which both reduces feeding success and affects food supply in streams. In addition, hazardous spills from construction equipment (oils, gas) could have a toxic effect to fish and their food sources should they enter streams. However, the potential for associated water quality impacts and subsequent injury to fish or fish habitat would be ***low*** with the implementation of the mitigation measures identified in Section 3.6.3, which include erosion control BMPs, such as the use of silt fences and geotextile fabric, and maintaining proper vehicle fueling and fuel storage distance from water bodies.

Loss of riparian vegetation could have adverse effects on streams by reducing shade, future ***large woody debris*** supply, and organic input in the form of leaf litter and terrestrial insects. However, this would rarely occur because the existing and replacement structures are mostly located away from stream riparian areas and most of the existing ROW corridor has limited riparian resources. Nine of the 475 existing structures that would be replaced are within 100 feet of a stream, with four of those within 100 feet of a stream that is fish-bearing (one near an unnamed tributary to the Spokane River, two near the Spokane River, and one near Deep Creep [Appendix C]). In addition, the existing ROW in these areas is already cleared. As a result, limited vegetation would be removed from riparian areas and potential impacts due to the loss of riparian vegetation are expected to be ***low***.

Access Roads

Reconstructing and improving existing access roads would be unlikely to directly affect fish or fish habitat. Impacts are more likely to be indirect and occur from new road construction, which could result in an increase in the potential for sediment to reach streams. However, road construction in the vicinity of fish-bearing streams would be limited. Review of the WDNR stream database (Appendix C) indicates that the access road system required to construct the project includes about 60 stream channel crossings, with road construction accounting for five of these crossings.[9] The proposed travel route system includes an existing road that crosses Hawk Creek, which may support federally listed Columbia River bull trout.

The use of fords to cross streams has the potential to directly affect fish that may be present at the crossing. It also has the potential to indirectly affect fish through localized increases in sediment caused by vehicles crossing the streams. The current construction access plan involves the use of 12 fords. One of these fords (between structures 43/7 and 44/1) would be on a known fish-bearing stream, an intermittent tributary to Coulee Creek that could contain resident rainbow trout. This stream area was dry during surveys in 2011 (Tetra Tech 2011) and would likely be dry during late spring and summer construction. The use of fords during construction would be infrequent and of short duration. Further, use of the ford at this crossing would be limited to periods when the stream is dry or when flows are likely to be low reducing the chance for increased turbidity and fish being present.

Culvert replacements and new culvert installations would be done in the dry to avoid potential impacts on water quality during installation. This work would occur when there is no flow or flow would be diverted from the stream culvert location during installation/replacement, as necessary. The Proposed Action would involve an estimated 20 culvert installations or replacements, mainly associated with existing roads that would be reconstructed/improved. Four of these proposed culverts cross unnamed intermittent streams. None of these are fish-bearing streams, greatly reducing any potential impacts to fish from this action.

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[9] Based on the streams observed in the field (Tetra Tech 2011), this total is closer to 37 crossings, including the five crossings associated with road construction.

New, reconstructed, and improved access roads and use of travel routes would result in a small incremental increase in precipitation runoff and the potential for road-related sediment to enter surface waters. However, new/reconstructed access roads and travel routes would be pervious, allowing stormwater infiltration. Erosion control BMPs, as described in Section 3.6.3, would be used to minimize impacts on water quality and fish habitat.

The impact on fish and fish habitat from access roads is considered ***low***.

Danger Tree Removal

Shade created by riparian vegetation, especially trees, is an important factor in maintaining cool temperatures in streams in the Pacific Northwest. Riparian trees are also the major source of large woody debris to streams. Large woody debris is an important component of fish habitat serving as a source of pool formation and habitat diversity; it's also important for stream ecology, especially in salmonid streams. Removal of large trees from the riparian area has the potential to reduce both shade and future instream habitat.

For smaller streams, shorter riparian vegetation is generally adequate to maintain stream temperature and small wood sizes can be effective at forming habitat in small stream channels so that the loss of future sources of wood is less critical. Natural riparian vegetation, especially large trees, is limited in the study area due to the arid environment. The smaller tributaries in the study area are either well shaded with low-growing vegetation, or are not shaded at all and, thus, the potential for danger tree removal to affect the shading of small streams is ***low***.

BPA estimates that a total of 274 danger trees would be removed as part of the Proposed Action. These trees are distributed along the ROW and identified by structure location in Appendix A. Approximately 70 of the identified trees are near structures in the vicinity of a stream, with 17 of those near structures in the vicinity of a fish-bearing stream. In cases where these trees are located within riparian areas, the potential reduction in tree cover from danger tree removal would be small relative to the amount of cover along a particular stream corridor. Further, the Proposed Action involves rebuilding an existing transmission in an area already maintained with low vegetation for safety purposes and, as a result, very little or no change would occur to riparian function from current conditions and impacts are expected to be ***low***.

Work associated with danger tree removal activities that would occur in or near fish-bearing streams has the potential to result in increased erosion and potentially affect fish habitat. Impacts resulting from the removal of these danger trees would be minimized through mitigation measures to reduce disturbance, erosion, and sedimentation and are expected to be ***low***.

Staging Areas and Tensioning Sites

Staging areas would be located outside stream channels in level, open, and already developed or disturbed sites. As a result, ***no*** impacts on fish, including federally listed fish species, or fish habitat are anticipated as a result of staging areas for the Proposed Action.

Disturbance associated with tensioning sites would be temporary and localized, mainly occurring nearby or in conjunction with the removal of existing and the installation of new structures. Implementation of the mitigation measures described in Section 3.6.3 would reduce impacts and, as a result, impacts to fish and fish habitat from tensioning sites and counterpoise are expected to be ***low***.

Operation and Maintenance

Maintenance activities would require access by vehicles during line inspections a few times each year. Occasionally, equipment such as insulators may need replacement. Vegetation management activities, including removal or pruning of danger trees and control of noxious weeds in the ROW, would continue. Weed control would include the use of herbicides by an individual licensed to apply these chemicals and in compliance with all legal requirements and herbicide manufacturers' recommendations. Only approved herbicides would be applied near streams or wetlands, and buffer distances would be observed in accordance with BPA's *Transmission System Vegetation Management Program Final EIS* (BPA 2000).

Emergency line repair following accidental downing of wires could require unplanned travel across streams or riparian areas. The resulting disruption could have short term adverse effects on fish and fish habitat from localized increases in sediment and loss of riparian function (shade, organic input). However, this type of occurrence is expected to be rare if the line is rebuilt and the disturbance area would be limited to the extent possible.

Impacts on fish and fish habitat from operation and maintenance of the Proposed Action are expected to be ***low***.

Wildlife and Their Habitat

Removal of Existing and Installation of New Structures

Noise and activity associated with construction work would likely result in some short-term behavior modification by area wildlife. Habitat loss associated with structure footprints would only occur within the existing ROW and would result in a temporary loss of vegetation already subject to ongoing vegetation management activities. Clearing would occur before the nesting season, so no active nests would be lost. Wildlife would be temporarily displaced during construction under the Proposed Action. All temporary disturbance areas would be revegetated using predominantly native seed mix or a seed mix agreed upon with landowners, and once restored, would provide similar or enhanced habitat.

Potential concerns identified during public scoping for the project (see Section 1.4) related to wildlife included impacts to wildlife migration between Five Mile Prairie and the Little Spokane River Natural Area, quail habitat near the Fairwood area, and the possible function of the existing transmission line corridor as an urban wildlife corridor. Construction activities would be completed prior to winter migration and are not expected to affect wildlife migration between Five Mile Prairie and the Little Spokane River Natural Area. Impacts to quail near the Fairwood area would be limited to direct disturbance to possible existing habitat within the current ROW, low likelihood of mortality associated with vehicle collisions, and temporary displacement during construction activities. Areas would be restored following construction and overall impacts to quail are expected to be ***low***. Impacts during construction to any existing use of the extended ROW as a wildlife corridor would be temporary and localized, with potential impacts further reduced through implementation of the mitigation measures described in Section 3.6.3. As the preceding discussion indicates, these impacts are expected to be ***low***.

Indirect impacts from noxious weed infestation of wildlife habitat could occur as noxious weeds establish themselves in the disturbed area surrounding structures; however vegetation management and mitigation measures specific to the spread of noxious weeds (see Section 3.4, Vegetation) within the study area would minimize that impact. As such, impacts on wildlife and their habitat associated with removal of existing and installation of new structures, including counterpoise replacement, if required, are considered ***low***.

Impacts on ESA-listed threatened and endangered wildlife and state PHS species of concern (Table 3-5) would be similar to those for wildlife species in general. If the greater sage grouse and sharp-tailed grouse were present during construction they could be directly impacted through disturbance from construction activities. However, the lack of observations of the greater sage grouse in the vicinity of the existing transmission line corridor, along with the absence of suitable habitat suggests that the potential for direct impacts to these species would likely be ***low***. Although little or no sharp-tailed grouse habitat is present in the study area, one sharp-tailed grouse lek is documented within 1 mile north of the existing transmission line corridor. Construction activities would be limited so that they occur outside of the lekking/nesting season for the sharp-tailed grouse (March 1-April 30) and the potential for direct impacts to this species would also likely be ***low***.

Indirect effects to the greater sage grouse and sharp-tailed grouse could occur if predators of these species, namely hawks and other raptors, use the new transmission structures as hunting perches. Under the Proposed Action, 471 wood-pole and two lattice-steel structures would replace the existing 475 wood-pole structures. The majority of the existing structures would be replaced with similar structures in the same locations and there would be no net increase in the number of available hunting perches. Implementation of the mitigation measures identified in Section 3.6.3, including restrictions on construction timing within suitable grouse habitat (e.g., shrub-steppe, shrubland), would further reduce potential impacts to greater sage grouse and sharp-tailed grouse. Indirect impacts to these species are, therefore, expected to be ***low***.

Access Roads

Use of existing roads during construction would result in a slight increase in noise and activity levels compared to current conditions. However, no appreciable wildlife response to construction activities would be expected. On roads requiring construction, improvement, or reconstruction, both construction and subsequent use would involve noise and activity levels substantially higher than existing conditions. This would likely result in some short-term behavior modifications by area wildlife. This effect would be considered low with respect to common wildlife species, all of which may be minimally affected by the temporary and localized construction activities associated with the proposed project. Impacts on wildlife and their habitat from road construction or reconstruction/improvement are considered ***low*** because they would be temporary and localized.

Danger Tree Removal

BPA estimates that a total of 274 danger trees would be removed as part of the Proposed Action. Approximately half (53 percent) of the trees are greater than 15 inches dbh; the majority of which are ponderosa pine. Approximately 55 trees (20 percent) are estimated to be 20 inches dbh or greater. Nearly three-quarters (74 percent) of the potential hazard trees are located along the first 19 miles of the corridor (starting at Creston Substation), with the remaining potential danger trees scattered between line miles 24 and 53 (see Appendix A).

These trees are typically located where the ROW crosses forested and/or riparian areas. Wildlife, especially nesting birds, could be harmed during tree felling or could be temporarily displaced by the removal of the trees. Indirect impacts could occur as a result of habitat loss and modification, including habitat degradation. Some of the larger trees that would be removed may contain nesting cavities. However, given the small number of trees likely to be removed relative to the length of the corridor (54 miles), and their location, generally scattered along the corridor, it is unlikely that wildlife habitat would be limited by danger tree removal activities. Implementation of the mitigation measures described in Section 3.6.3, including pre-construction inspections for nesting birds and timing restrictions for danger tree removal if large stick nests are present, would further reduce potential impacts to wildlife species. Impacts on wildlife and their habitat from danger tree removal activities are considered ***low*** to ***moderate***.

Staging Areas and Tensioning Sites

Potential impacts associated with staging areas would be similar to those associated with removal of existing and installation of new structures but would differ slightly in magnitude because the affected staging areas would be larger. Nonetheless, this impact would be ***low*** because BPA would attempt to locate staging areas in industrial or paved areas. If these areas are not feasible for the location of staging areas, disturbed or common habitat types outside of sensitive habitat areas would be used for staging areas. These areas would be restored to existing conditions after construction has been completed.

Potential impacts associated with tensioning sites would be the same as those associated with removal of existing and installation of new structures. These impacts would be ***low*** because disturbance related to tensioning sites would only occur within the existing ROW and the affected areas would be allowed to return to their previous condition.

Operation and Maintenance

The rebuilt transmission line would likely require less maintenance work, compared with the existing transmission line, due to the newer condition of the facilities and structures once they are installed. The types of activities would be the same as those that currently occur; however, the frequency would likely be less. Future maintenance activities could involve tree removal, which would temporarily displace wildlife from work areas but impacts are expected to be ***low***.

Certain bird species are relatively more prone to collisions with power lines, especially the ground wires located at the top of the structures (Meyer 1978, James and Haak 1979, Beaulaurier 1981, Faanes 1987). Migratory waterfowl have the highest incidence of mortality from collision with transmission lines, particularly near wetlands, feeding areas, or open water (Stout and Cornwell 1976). These collisions often occur in low visibility conditions (Fannes 1987). Smaller migratory birds are also at risk but are generally not as prone to collision because of their small size, their ability to quickly maneuver away from obstacles, and because they often migrate at high enough altitudes to avoid transmission lines. Raptor species are less likely to collide with power lines, possibly because they have excellent eyesight and tend to not fly at dusk or in low visibility weather conditions (Olendorff and Lehman 1986).

Bird mortality as a result of collisions with conductors and structures would remain at current levels because the lines would remain in the same location with the same type of structures (a net reduction of two structures is slated as a result of the proposed project). Initially, however, the potential for collisions may be reduced due to the new conductors being slightly larger and more reflective than those currently deployed, but it is likely that any benefit will decrease over time as the reflectors weather and dull. Birds generally tend to be more likely to strike ground wires, which are much smaller in diameter than conductors and normally span the top of the structure. An overhead ground wire is currently attached between the Creston Substation and Structure 1/6 and between Structure 54/7 and the Bell Substation. These wires would be reinstalled under the Proposed Action and would result in same ***low*** impact as current conditions.

Overall, operation and maintenance impacts on wildlife are considered ***low***.

3.6.3 Mitigation—Proposed Action

The following mitigation measures and BMPs would be implemented to minimize potential construction-related impacts to fish and wildlife and their habitat.

- Minimize potential impacts on salmonids by avoiding the use of fords wherever an alternative route is available. Alternately a temporary fish and water passage structure could be installed if water is present when the ford is in use.
- Conduct all culvert installation/replacement work in the dry, either when there is no flow or by diverting flow from the stream culvert location during installation/replacement, as necessary, to avoid impacts on fish species.
- Limit disturbance to the minimum necessary when working in or near water bodies and wetlands or their buffers. Install stakes or flagging to restrict vehicles and equipment to designated routes and areas.
- Mark the transmission line with bird flight diverters over any major water body that may be a potential flyway for migratory bird species (water fowl) where appropriate.
- Inspect danger trees for the presence of nesting avian species—cavity nesters, small and large stick nests—prior to removal to minimize impacts to nesting birds. Large stick nests (raptors) would be documented to species to determine whether they can be removed. No trees containing large stick nests would be removed during the nesting season, typically February 1 (owls) through July 30 (cavity nesters and raptors).
- Top and leave tall dead trees (snags) in place for wildlife habitat, where possible and appropriate, in accordance with BPA's *Transmission System Vegetation Management Program Final Environmental Impact Statement* (BPA 2000).
- Avoid construction activities within high-use native habitats, especially riparian, shrub-steppe, and pine forest habitat, during spring to reduce the potential for impacting reproduction of various wildlife taxa, wherever possible.
- Gate and lock access and restrict vehicle traffic in areas where the ROW crosses habitats heavily used by wildlife.
- Avoid construction-related disturbances within 1.2 miles (2 km) of known active leks between 05:00 and 09:00 from March 1 through April 30 to reduce potential impacts to Columbian sharp-tailed grouse during mating season (Stinson and Schroeder 2010).
- Prepare and implement a stormwater pollution prevention plan that addresses measures to reduce erosion and runoff and stabilize disturbed areas.
- Retain vegetative buffers, where possible, to prevent sedimentation into water bodies.
- Minimize erosion, sedimentation, and soil compaction by conducting as much work as possible during the dry season when streamflow, rainfall, and runoff are low.

- Install sediment barriers and other suitable erosion- and runoff-control devices, where needed, prior to ground-disturbing activities at construction sites to minimize offsite sediment movement.
- Place construction vehicles or equipment at least 50 feet from any stream or wetland unless authorized by a permit or on an existing road.
- Locate tensioning sites at least 50 feet from streams or floodplains.
- Design and construct roads to minimize drainage from the road surface directly into water features.
- Prepare and implement spill prevention and response plans to minimize the potential for spills of hazardous material.
- Keep spill prevention materials on site and with equipment.
- Maintain vehicles and equipment in good working order to prevent oil and fuel leaks.

3.6.4 Unavoidable Impacts Remaining After Mitigation—Proposed Action

Unavoidable impacts on fish and wildlife resources in the study area would be associated with construction noise and activity, temporary and permanent loss of vegetation associated with construction and maintenance work, and temporary impacts on aquatic habitat associated with road work and erosion from unvegetated surfaces. The design of the Proposed Action and implementation of the mitigation measures described in Section 3.6.3 would minimize these potential impacts.

3.6.5 Cumulative Impacts—Proposed Action

Biodiversity has been reduced in the Columbia River Basin ecosystem by loss and fragmentation of native habitat, especially shrub-steppe habitat and dependent wildlife communities. Species dependent on shrub-steppe habitat such as greater sage grouse, pygmy rabbits, and Washington ground squirrels have declined dramatically in the region since conversion of shrub-steppe to agricultural land. WDFW has declared the shrub-steppe habitat-type as a Priority Habitat (WDFW 2008) and recognizes that preserving large tracts of high quality shrub-steppe habitat is important for maintaining populations of these species.

Agriculture, primarily dryland wheat farming, urbanization, and hydroelectric development are responsible for most of the past and ongoing impacts on wildlife and fish habitat and resources in the study area. Other activities that have affected and continue to affect habitat include livestock grazing and vegetation control along roads and utility corridors, as well as wildfire. Current and likely future activities and projects are expected to cumulatively affect habitat.

Vegetation control routinely occurs along highways, county roads, residential roads, and utility corridors in the study area. Vegetation control activities typically include herbicide applications to control vegetation and noxious weeds, and mechanical vegetation removal. BPA performs similar vegetation control activities along its transmission line ROW.

As discussed in Appendix B, reasonably foreseeable future projects in the vicinity of the Proposed Action include two BPA projects that would take place within the existing extended ROW corridor that includes the Creston-Bell transmission line ROW. However, each project is independent of the Rebuild Project and does not require that actions be taken previously or simultaneously for completion. These projects are expected to have similar impacts to fish and wildlife as the Proposed Action. Impacts would primarily occur within the existing extended ROW and similar mitigation measures to those proposed for the Proposed Action in Section 3.6.3 would be employed to further reduce potential impacts.

Impacts on fish and wildlife habitat from the Proposed Action are expected to be ***low*** compared to the combined cumulative impacts of past, ongoing, and future habitat alteration in the study area. The acreage of habitat affected within the ROW is small compared to the area affected by agricultural activities, livestock grazing, wildfire, and vegetation control along roads and other transmission lines. This is also the case with the two other reasonably foreseeable BPA projects identified in Appendix B of this EA. As such, the incremental contribution of the Proposed Action to cumulative impacts on fish and wildlife and their habitat is considered ***low***.

3.6.6 Environmental Consequences—No Action Alternative

Under the No Action Alternative, operation and maintenance of the existing transmission line including the removal of danger trees and other tall vegetation would continue to have impacts on fish and wildlife similar to those described for the Proposed Action and would be ***low*** to ***moderate***. The frequency of maintenance events and the level of associated impact would likely increase under the No Action Alternative as structures deteriorate over time and more substantial maintenance activities are required. If it were necessary to perform repairs on an emergency basis, it would likely not be possible to plan or time them to minimize impacts to fish and wildlife and their habitat.

3.7 WETLANDS

3.7.1 Affected Environment

The study area for the purposes of wetland delineations and assessments included the 100-foot-wide Creston-Bell ROW and the proposed access roads and travel routes that extend off the ROW. A 50-foot-wide corridor was surveyed for off-ROW roads and travel routes, where access was available. Wetlands outside of these areas but adjacent to the ROW or access roads/travel routes were visually assessed and their locations were approximated based on observations from the study area (i.e., the adjacent ROW or access road/travel route) (Tetra Tech 2011).

Wetlands in the study area were identified based on the methodology and guidelines in the U.S. Army Corps of Engineers (Corps) Wetland Delineation Manual (Environmental Laboratory 1987) and the Regional Supplement to the Corps' Wetland Delineation Manual: Arid West (Environmental Laboratory 2008). Wetlands were rated according to the Washington State Wetland Rating System for Eastern Washington (Ecology 2004b). This rating system assigns wetlands point values based on their ability to perform three broad categories of commonly recognized wetland functions: water quality improvement, hydrologic function, and wildlife habitat. The total score from all three categories is then used to classify the wetlands as Categories I, II, II or IV. These categories are defined as follows:

- Category I wetlands are the most uncommon wetlands. These wetlands are classified as uncommon due to high functioning, rarity, or other features that make them irreplaceable.
- Category II wetlands also provide a relatively high level of function; and while it may be possible to replace them, it is considered difficult.

- Category III wetlands include those wetlands that have a moderate level of function and have usually been impacted in some way.
- Category IV wetlands have the lowest levels of functional value and are usually significantly impacted by humans.

Some wetlands have special characteristics that may make them exceptionally valuable; these characteristics include the provision of rare habitats, being hard to replace (e.g., mature forested wetlands or bogs), or containing rare plant species. Wetlands with these characteristics may automatically qualify as Category I or II wetlands, independent of the scores obtained for the three wetland functions (water quality, hydrology, and habitat) (Ecology 2004b). Additional information regarding wetland identification and classification is provided in Appendix D.

Wetlands in the Study Area

Wetlands in the study area were delineated and assessed during field surveys conducted in spring 2011, from May 16 to May 22, and from May 29 to June 1 (Tetra Tech 2011). Additional site visits were conducted in September 2011, from September 26 to September 28. A total of 66 wetlands were identified within or adjacent to the study area. Forty-eight of these wetlands were located within the ROW or off-ROW road/travel access easements and were delineated. There were 18 wetlands located outside of the study area that were not delineated; these wetlands were visually assessed and their locations were approximated based on observations from the study area (i.e., the adjacent ROW or access road/travel route). Wetland vegetation included a wide variety of shrub, emergent, and aquatic vegetation.

General Wetland Types in the Study Area

Many of the wetlands in the study area have been impacted by agricultural activities. Wetlands in dry land wheat fields were often identified based on hydrologic indicators because these areas have naturally low chroma soils, regular tilling, and often complete modification of the vegetation layer. Hydrologic indicators used for this type of identification included water marks, surface ponding, or water stressed vegetation. These wetlands were typically low value, Category IV wetlands located in topographical depressions and drainage ways.

Five of the identified wetlands were rated as Category I wetlands. Two of these wetlands (near structures 10/7-10/8 and 48/3) are large, structurally diverse wetlands located in landscape positions that result in high overall value for water quality improvement, hydrologic function, and provision of wildlife habitat. The remaining three Category I wetlands (near structures 5/1 and 7/8-8/2) were classified as such due to the presence of aspen, a special characteristic considered valuable for wildlife.

The study area contains many depressional “pothole” wetlands located in shrub steppe areas. These wetlands gradually fill with water throughout the winter and spring and many dry up completely as the summer progresses. Depressional wetlands are important for wildlife in an arid landscape, providing breeding habitat for amphibians and waterfowl, and an important water source for many terrestrial species. Sensitive plants are located within one of these wetlands (Wetland N).

Summary information is presented for the assessed wetlands in Table 3-6. This table identifies the wetland size, hydrologic isolation, pertinent scores and ratings, and required wetland buffer

Table 3-6. Summary of Wetlands in the Project Area

Wetland ID[1/]	Function[2/]			Total	Rating	Size (acres)	Buffer (feet)	Local Jurisdiction	Closest Structure
	Water Quality	Hydrologic	Habitat						
A	7	8	17	32	III	4.2	25	Lincoln County	1/8
B	7	8	19	34	III	2.0	25	Lincoln County	3/6
C[3/]	18	10	7	35	III	0.1	0	Lincoln County	27/7
D	6	8	16	30	III	1.8	25	Lincoln County	26/4
E	10	8	2	20	IV	1.2	25	Lincoln County	21/5
F	14	5	22	41	III	2.3	25	Lincoln County	18/9
G	10	8	14	32	III	1.9	25	Lincoln County	19/3
H	12	4	3	19	IV	3.0	25	Lincoln County	17/8
I	14	6	28	48	III	2.9	25	Lincoln County	3/8
J	6	14	25	45	III	0.7	25	Lincoln County	4/8
K	22	16	23	61	II	0.6	50	Lincoln County	5/1
L	8	14	20	42	III	0.9	25	Lincoln County	5/8
M[3/]	5	8	13	26	IV	0.0	0	Lincoln County	5/8
N[3/4/]	6	16	17	39	III	0.2	0	Lincoln County	5/9
O	9	16	30	55	II	0.8	50	Lincoln County	9/3
P	14	16	29	59	II	0.5	50	Lincoln County	9/4
Q	9	16	25	50	III	1.0	25	Lincoln County	10/6
R	14	32	35	81	I	10.0	100	Lincoln County	10/7-10/8
S	11	32	25	68	II	2.8	50	Lincoln County	11/2
T	11	28	25	64	II	4.8	50	Lincoln County	11/5
U	9	16	26	51	II	0.4	50	Lincoln County	11/6
V	13	16	31	60	II	0.6	50	Lincoln County	11/8
W	6	18	17	41	III	0.3	25	Lincoln County	13/2
X-A	12	6	14	32	III	2.0	25	Lincoln County	27/7
X-B	0	1	3	4	IV	1.2	25	Lincoln County	28/7
X-C	4	1	7	12	IV	1.5	25	Lincoln County	29/5
X-D	4	1	7	12	IV	1.3	25	Lincoln County	29/5
X-E	4	1	7	12	IV	1	25	Lincoln County	29/8
X-F	12	28	19	59	II	1.8	75	Spokane County	37/5
X-G	11	28	22	61	II	2.1	110	Spokane County	38/9
X-H	18	20	19	57	II	0.4	75	Spokane County	38/10
X-I1,I2	10	24	16	50	III	1.9	60	Spokane County	40/3
X-J	10	24	16	50	III	1.7	60	Spokane County	40/2
X-K	22	20	18	60	II	2.3	75	Spokane County	39/8
X-L1,L2	6	12	16	34	III	2.3	60	Spokane County	40/3

Table 3-6. Summary of Wetlands in the Project Area (continued)

Wetland ID[1/]	Function[2/]			Total	Rating	Size (acres)	Buffer (feet)	Local Jurisdiction	Closest Structure
	Water Quality	Hydrologic	Habitat						
X-M	8	16	26	50	III	0.3	110	Spokane County	42/3
X-N	22	28	17	67	II	1.5	75	Spokane County	42/4
X-O	4	12	21	37	III	0.6	110	Spokane County	51/8
X-P	12	16	19	47	III	1.4	60	Spokane County	51/9
X-Q	16	28	16	60	II	1	75	Lincoln County	31/9
X-X	32	24	25	81	I	8.0	110	Washington State	48/3
X-R	11	32	21	64	II	0.6	110	Spokane County	41/8
OFF-1	8	16	26	50	III	0.3	25	Lincoln County	3/6
OFF-2[5/]	18	6	18	42	I/III	1.2	100	Lincoln County	25/9
OFF-3[3/]	8	5	11	24	IV	0.1	0	Lincoln County	4/5
OFF-4[4/]	9	16	26	51	I/II	0.3	100	Lincoln County	5/1
OFF-5[3/]	9	12	15	36	III	0.2	0	Lincoln County	5/2
OFF-6[3/]	8	8	15	31	III	0.1	0	Lincoln County	6/2
OFF-7[3/]	6	16	22	44	III	0.2	0	Lincoln County	6/3
OFF-8	9	8	15	32	III	1.6	25	Lincoln County	6/4
OFF-9[3/]	11	12	15	38	III	0.2	0	Lincoln County	6/6
OFF-10[5/]	7	20	26	53	I/II	10.4	100	BLM	7/8-8/2
OFF-11	11	8	20	39	III	2.0	25	BLM	8/4
OFF-12	6	16	19	41	III	0.5	25	Lincoln County	8/9
OFF-13[3/]	6	16	20	42	III	0.2	0	Lincoln County	8/10
OFF-14	8	16	23	47	III	2.1	25	Lincoln County	9/2
OFF-15	11	16	28	55	II	0.3	50	Lincoln County	9/4
OFF-16	13	12	17	42	III	0.1	25	Lincoln County	10/7
OFF-17	9	16	25	50	III	0.5	25	Lincoln County	11/3
OFF-18	7	6	26	39	III	2.1	25	Lincoln County	12/9
OFF-20	13	16	22	51	II	1.8	50	Lincoln County	3/7
OFF-21[3/]	9	14	17	40	III	0.01	0	Lincoln County	10/1

Table 3-6. Summary of Wetlands in the Project Area (continued)

Wetland ID[1/]	Function[2/]			Total	Rating	Size (acres)	Buffer (feet)	Local Jurisdiction	Closest Structure
	Water Quality	Hydrologic	Habitat						
OFF-22	11	16	23	50	III	0.4	25	Lincoln County	10/8
OFF-24	11	14	23	48	III	0.4	25	Lincoln County	12/9
OFF-25[3/]	6	5	14	25	IV	0.7	0	Lincoln County	12/9
OFF-26	11	32	18	61	II	0.5	75	Spokane County	41/7

Notes:
1/ Wetland IDs were assigned during the wetland surveys, with two sets of alphabetical designations used for wetlands within the ROW. Wetlands located outside the ROW, but within the study area, were given numerical designations as well as an "off" label indicating they were off the ROW. Wetlands that were assessed, but not delineated are shaded in the above table.
2/ Functions are based on ratings using the Washington State Wetland Rating System for Eastern Washington (Ecology 2004b).
3/ Wetlands exempt under the Lincoln County Code due to small size and low category.
4/ May be classified as Category I wetlands following confirmation of rare plants.
5/ Classified as Category I wetlands due to the presence of mature aspen stands.
Source: Tetra Tech 2011

widths for the appropriate local jurisdiction. As noted above, wetlands were rated according to the Washington State Wetland Rating System for Eastern Washington (Ecology 2004b). Wetland size was approximated for wetlands that extended outside of the study area. Wetland sizes included in Table 3-6 represent the total wetland area, including approximated areas. Detailed information is presented for each wetland in Appendix B of the Wetland Delineation Report prepared for this project (Tetra Tech 2011).

3.7.2 Environmental Consequences—Proposed Action

The Proposed Action could result in direct and indirect impacts to wetlands as a result of project activities including structure replacement, road construction and reconstruction, and use of travel routes. Direct wetland impacts would include disturbances to soil and vegetation from project activities within wetland boundaries and from the installation of drainage features such as culverts for stream crossings. Indirect impacts could result from project activities occurring outside the wetland boundaries, but within the wetland buffer established for that area. Buffer areas used in the following evaluation are based on buffer width requirements established by the applicable local jurisdiction (Lincoln County or Spokane County). This width varies, depending on the functions of the wetlands and the intensity level of the proposed land use.

The Proposed Action has the potential to impact the three primary functions provided by wetlands: water quality improvement, hydrologic functions, such as flood control, and wildlife habitat. The following sections discuss potential impacts to wetland function by project component. Wetland impacts are summarized in Table 3-7.

Structure Removal and Replacement and Counterpoise

Structure removal and replacement is proposed in six wetlands: Wetlands A, B, D, O, T and X-X (Table 3-7). These wetlands are all lower value, Category III wetlands, with the exception of T and X-X which are Category II and I wetlands, respectively. BPA estimated that the average disturbance area resulting from structure replacement would be an area 50 feet by 100 feet in each case, which means these structures would disturb a combined total of 0.31 acre of wetland.

Existing Structure 1/8 is located in Wetland A, which is a lower value, Category III wetland. This two-pole structure would be replaced by the same type of structure using the existing holes. At most two-pole structure sites, structure replacement could disturb an area up to 50 feet by 100 feet (about 0.1 acre). This disturbance area is used to estimate the potential impacts to Wetland A shown in Table 3-7. However, as noted in Chapter 2, disturbance areas in or near sensitive habitats, like wetlands, would be reduced to 50 feet by 50 feet (approximately 0.06 acre) where possible. This would be the case with Structure 1/8 to the extent possible and, therefore, the impact shown in Table 3-7 may overestimate structure-related disturbance to this wetland.

Table 3-7. Estimate of Potential Impacts on Wetlands

Wetland ID	Wetland Category	Disturbance within Wetland (Acres)				Disturbance within Wetland Buffer (Acres)			
		Structure	Road Construction	Road Reconstruction	Travel Route	Structure	Road Construction	Road Reconstruction	Travel Route
A	III	0.11			0.16 t	0			0.30 t
B	III	0.03	0.03	0.02		0.07	0.06	0.21	
C	III								
D	III	0.01	0.06	0.01	0.04 t	0.04	0.01	0.01	0.03 t
E	IV				0.04 t				0.04 t
F	III		0.02				0.05		
G	III		0.06				0.30		
H	IV				0.03 t				0.05 t
I	III							0.01	0.05 p
J	III							0.08	
K	II							0.04	
L	III								
M	IV								
N	III								
O	II	0.01				0.07			
P	II								
Q	III					0.03	0.01		0.06 p
R	I					0.01			
S	II								
T	II	0.04				0.10			0.12 p
U	II								
V	II					0.02		0.03	0.03 p
W	III								
X-A	III								
X-B	IV								

Table 3-7. Estimate of Potential Impacts on Wetlands (continued)

Wetland ID	Wetland Category	Disturbance within Wetland (Acres)				Disturbance within Wetland Buffer (Acres)			
		Structure	Road Construction	Road Reconstruction	Travel Route	Structure	Road Construction	Road Reconstruction	Travel Route
X-C	IV				0.03 t				0.02 t
X-D	IV				0.03 t				0.02 t
X-E	IV				0.02 t				0.02 t
X-F	II							0.06	
X-G	II				0.02 p				0.08 p
X-H	II							0.02	
X-I1,I2	III						0.04	0.15	
X-J	III					0.04		0.06	
X-K	II					0.02	0.01	0.08	
X-L1,L2	III				0.01 p				0.04 p
X-M	III							0.03	
X-N	II					0.11			0.11 p
X-O	III						0.05		
X-P	III		0.02		0.01 p	0.01	0.05		0.04 p
X-Q	II								
X-X	I	0.11				0.11	0.02		
X-R	II								0.01 p
OFF-1	III								
OFF-2	I/III								
OFF-3	IV							0.03	
OFF-4	I/II								
OFF-5	III								
OFF-6	III								
OFF-7	III								
OFF-8	III								
OFF-9	III								
OFF-10	I/II								
OFF-11	III							0.04	
OFF-12	III								
OFF-13	III								

Table 3-7. Estimate of Potential Impacts on Wetlands (continued)

Wetland ID	Wetland Category	Disturbance within Wetland (Acres)				Disturbance within Wetland Buffer (Acres)			
		Structure	Road Construction	Road Reconstruction	Travel Route	Structure	Road Construction	Road Reconstruction	Travel Route
OFF-14	III								
OFF-15	II					0.01			
OFF-16	III								0.05 p
OFF-17	III								0.03 p
OFF-18	III							0.04	
OFF-20	II								
OFF-21	III								
OFF-22	III								
OFF-24	III		0.06				0.06		
OFF-25	IV						0.09		
OFF-26	II								
Total Disturbance		**0.31**	**0.25**	**0.03**	**0.39**	**0.64**	**0.74**	**0.89**	**1.10**

Note:
t = temporary travel route
p = permanent travel route
Source: Tetra Tech 2011

Existing Structures 3/6, 9/3, 11/5, and 26/4 are all located on the edge of wetlands, Wetlands B, O, T, and D, respectively. Wetlands B, and D are lower value, Category III wetlands. Wetlands O and T are higher value, Category II wetlands. These existing structures are all two-pole structures that would be replaced in the same locations, using the same holes. Structure-related disturbance estimates to these wetlands shown in Table 3-7 assume a disturbance area of 50 feet by 100 feet in each case, but this area would be reduced to 50 feet by 50 feet where possible. In the cases of Wetlands D and O, it is likely that structure-related disturbance could be avoided completely. Staking or flagging would be installed in these areas to restrict vehicle and equipment access to designated routes and areas to protect these sensitive habitats.

The existing wood pole structures 48/2 (two poles) and 48/3 (three poles) would be replaced by one steel lattice tower that would not be located at the same site as the existing structures. Existing Structure 48/3 is located in Wetland X-X, a category I wetland. The disturbance estimate presented in Table 3-7 assumes that removal of this structure would disturb a 50 feet by 100 feet area, but, as noted above, this area would be reduced to the extent possible. Potential disturbance to the wetland would be reduced by using the least damaging method possible to remove the existing structure. This would involve cutting the old poles below grade, rather than removing the entire base. Below grade cutting of poles results in the pole being cut off below the ground surface, leaving the base of the pole in the ground, but not visible at the ground surface. The new structure would be located outside the boundaries of Wetland X-X, but within the wetland buffer.

Structure removal and replacement is proposed in or near the buffers of 13 different wetlands, affecting an estimated total of 0.64 acre in these areas (Table 3-7). As noted above, under the Proposed Action a new steel lattice structure would be located outside Wetland X-X, but within the wetland buffer. This portion of the wetland buffer is located within an existing transmission line ROW where vegetation is currently maintained. Four of the other structures affecting wetland buffers are located within a wetland buffer; the other eight are located nearby and could disturb small areas along the edge of a wetland buffer. These buffer areas are all located within the existing maintained transmission line ROW in an area of existing disturbance.

Mitigation measures listed in Section 3.7.3, including marking of wetlands in the field, would minimize impacts to wetlands and buffers. With implementation of these mitigation measures, direct impacts would be limited to vegetation damage with the potential for indirect impacts to water quality from erosion and soil disturbance. Vegetation in these wetlands includes herbaceous plants and shrubs, which would likely regenerate quickly. These impacts would be temporary and are considered to be ***low***.

The removal of a structure in Wetland X-X and relocation to the wetland buffer may be considered beneficial in the long-term, as future wetland ground disturbance for structure maintenance would no longer be needed.

Buried counterpoise would be replaced as needed between the Creston Substation and Structure 1/6 and between Structure 54/7 and the Bell Substation. There are no wetlands located in these areas and there would, therefore, be ***no*** direct or indirect impacts to wetlands as a result of counterpoise replacement, if required.

Access Roads

Road Construction

Road construction is proposed in six wetlands: Wetlands B, D, F, G, X-P, and OFF-24 (Table 3-7). These wetlands are all lower value, Category III wetlands. BPA estimated that the average disturbance width for road construction would be 20 feet, which means these roads would disturb a combined total of approximately 0.25 acre of wetland.

Wetlands F and G (line miles 18 and 19, respectively) are linear wetlands that span the entire width of the extended transmission line corridor that includes the existing Creston-Bell transmission line and avoiding these wetlands would require lengthy detours off the existing corridor. Wetland D (line mile 26) also spans most of the transmission line corridor. The proposed road construction would cross the northern edge of this wetland and connect two parts of an existing road that would be reconstructed as part of the Proposed Action.

Wetland B (line mile 3) is a sinuous wetland located on both sides of an existing access road that would be reconstructed. A new spur road would be constructed that would extend from the existing road across the wetland to Structure 3/8. Impacts would be minimized by crossing Wetland B at the narrowest point.

The road that would be built through Wetland OFF-24 (line mile 12) follows the bed of a degraded road that previously existed in this location. Using this existing, disturbed road location would minimize wetland impacts.

The wetlands directly impacted by road construction are all lower value, Category III wetlands that have relatively low scores for both water quality and hydrologic function and moderate scores for wildlife value. The wetland acreage (0.25 acre) permanently affected by road construction would experience a decline in wetland functions. However, an overall decline in the hydrologic regime of the affected wetlands is not expected with implementation of the proposed mitigation measures identified in Section 3.7.3. To prevent adverse impacts to the hydrologic regime in the wetlands, roads would be constructed with sufficient cross culverts at proper elevations to ensure that the hydrologic regime of the wetland remains unaltered. Impacts from road construction would result in the loss of small areas of low quality wetland that could be mitigated. Compensatory mitigation could be required to mitigate the loss of wetland function from road fill. If this is required, the loss of function would be temporal. Compensatory mitigation, were it required, would likely result in additional acreage of wetland created. Direct impacts from road construction to wetlands are expected to be ***low*** to ***moderate*** depending on required mitigation measures for wetland fill.

Road construction would occur within the buffers of 12 wetlands. BPA estimated that the average disturbance width for road construction would be 20 feet, which means these roads would disturb a combined total of 0.7 acre of wetland buffer area (Table 3-7). Ten of the 12 wetlands are relatively low value Category III and IV wetlands and two are Category II wetlands. The buffer of the remaining one of these wetlands is associated with Wetland X-X, a Category I wetland. As noted above, under the Proposed Action, existing Structure 48/3, which is located in Wetland X-X, would be replaced by a new steel lattice tower that would be located outside the wetland, but in the wetland buffer. Road construction would occur near the outer edge of the buffer for this wetland. Indirect impacts to the wetland from road construction in wetland buffers would be ***low***, due to the existing disturbance in these areas and the low frequency of use.

Road Reconstruction

Road reconstruction would occur within two Category III wetlands, Wetlands B and D. BPA estimated that the average disturbance width for road reconstruction would be 20 feet, which means these roads would disturb a combined total of 0.03 acre of wetland (Table 3-7). Road reconstruction would also occur in the buffers for 15 wetlands, with the potential to disturb a combined total of 0.89 acre in these areas. The majority of these potentially affected buffers are associated with Category II and III wetlands.

While road reconstruction would occur within wetland and wetland buffer areas, this activity would occur on existing roads and would result in minimal new ground disturbance. Wetland functions potentially impacted could include water quality from erosion and ground disturbance, and temporary impacts to wildlife habitat as a result of human presence and noise associated with the road reconstruction. An overall decline in the hydrologic regime of the wetland is not expected with implementation of the mitigation measures identified in Section 3.7.3. Impacts are expected to be ***low***, due to the existing road bed and limited amount of new construction activities.

Travel Routes

Temporary travel routes would cross seven wetlands; five of these wetlands are Category IV wetlands and two are Category III wetlands (Table 3-7). These wetlands are located in agricultural areas and are disturbed, lower quality wetlands. BPA estimated that the average disturbance width for travel routes would be 20 feet; therefore, use of these temporary routes would disturb a combined total of 0.39 acre of wetland. Permanent travel routes would cross three wetlands (two Category III and one Category II) and could potentially disturb a combined total of 0.04 acre, based on the estimated disturbance width of 20 feet. Travel routes over existing non-public roads (permanent travel routes) may require surface improvements, such as blading, grading, and aggregate surfacing, and would have similar impacts to road reconstruction, described above. Impacts from travel routes to wetlands would be limited to water quality impacts associated with ground disturbance and would likely be ***low*** due to their brief period of use and minimal associated disturbance.

Temporary travel routes would also cross the buffers associated with seven wetlands (two Category III and five Category IV) (Table 3-7). Permanent travel routes would cross the buffers associated with 11 wetlands, including five Category II and six Category III wetlands (Table 3-7). Impacts from travel routes in wetland buffers would be ***low*** due to their brief period of use and minimal associated disturbance.

<u>Danger Tree Removal</u>

If required, danger tree removal within a wetland or wetland buffer could potentially disturb the structural diversity of that wetland and limit its value for wildlife habitat. The majority of wetlands in the study area do not have a forested vegetation layer. Therefore, the potential for this type of impact is limited and impacts to wetlands from danger tree removal are expected to be ***low***.

Staging Areas and Tensioning Sites

BPA would require the construction contractor to locate all staging areas at least 200 feet from wetlands in order to prevent water quality impacts from potential leaks and spills and disturbance to wildlife. Staging areas would not be located in or adjacent to wetlands and thus, would have ***no*** direct or indirect impacts to wetlands.

The use of tensioning sites would likely result in ***low*** indirect impacts to wetlands if they were located within 100 feet because there is a low potential for increased construction-related runoff and erosion. Tensioning sites would not be located in wetlands and thus, would have ***no*** direct impacts to wetlands.

Operation and Maintenance

Operation and maintenance activities with the potential to impact wetlands and buffers include occasional trimming or removal of tall vegetation from wetlands and adjacent uplands and road maintenance activities in or near wetlands. Vegetation trimming or removal would primarily affect wetlands with a forested vegetation layer. Most of the wetlands in the study area are scrub shrub or emergent wetlands, or farmed wetlands and would be unlikely to be affected by vegetation maintenance. Wetlands that naturally have a forested vegetation layer are limited and primarily located along the eastern portion of the study area. Water quality impacts, such as increased sedimentation, could occur as a result of road maintenance activities but these would occur infrequently. Operation and maintenance of the Proposed Action would likely have ***low*** impacts on wetlands and associated buffers due to the limited areas that would be affected by vegetation maintenance and the infrequent use of roads and travel routes.

3.7.3 Mitigation—Proposed Action

If the Proposed Action is implemented, the following mitigation activities would be used to reduce impacts on wetlands:

- Locate roads and structures to avoid wetlands, whenever possible.
- Design construction activities within wetlands to minimize unavoidable impacts, and coordinate with the Corps and Ecology for appropriate permits.
- Flag or stake wetland boundaries in the vicinity of construction areas and avoid these areas during construction.
- Place construction vehicles or equipment at least 50 feet from any wetland unless authorized by a permit or on an existing road.
- Locate tensioning sites outside of wetlands and buffers when possible.
- Limit disturbance to the minimum necessary when working in wetlands or their buffers.
- Place geotextile fabric around the work area when working on structures within 25 feet of wetlands to avoid depositing excavated material into the wetlands. Remove and stabilize material in an upland area.
- Store fuel and refuel machinery at least 200 feet from wetlands and waterways and inspect regularly for leaks.
- Require an environmental specialist to meet with contractors and inspectors in the field and visit wetlands near or within construction areas to go over mitigation measures and any permit requirements.

- Install sediment barriers and other suitable erosion- and runoff-control devices, where needed, prior to ground-disturbing activities at construction sites to minimize offsite sediment movement near wetlands.
- Underlay temporary fill for temporary roads in wetlands with geotextile fabric and remove all fill in compliance with applicable permits.
- Remove trees cut in wetland areas.
- Vegetate disturbed wetland and buffer areas with appropriate native plant species and follow specific revegetation guidelines in permits.
- Monitor disturbed wetlands for weed invasion and control in accordance with BPA's *Transmission System Vegetation Management Program Final EIS* (BPA 2000).
- Construct permanent access roads with adequate cross culverts or other methods to maintain the existing hydrologic regime.

3.7.4 Unavoidable Impacts Remaining After Mitigation—Proposed Action

The Proposed Action would result in temporary wetland disturbance from structure removal and replacement (0.31 acre) and permanent impacts from road construction/reconstruction (0.28 acre). Areas of disturbed ground would require revegetation. Disturbances to emergent vegetation could likely recover within a year, while disturbances to the shrub layer could take several years to recover. Likewise, any wetlands created through compensatory mitigation would also require months or years to achieve the vegetation structure necessary to replace the areas disturbed.

Additional impacts could occur from road reconstruction, travel routes, and other project activities, although the area of impacts to wetlands is expected to be small and would likely not persist long after construction, with the exception of drainage structures such as culverts needed to facilitate future access. Operation and maintenance activities could affect wetlands in the future, resulting in additional soil disturbance and water quality impacts, as well as potential disturbance to wildlife that use these wetlands. The design of the Proposed Action and implementation of the mitigation measures described in Section 3.7.3 would minimize these potential impacts.

3.7.5 Cumulative Impacts—Proposed Action

Potential cumulative impacts to wetlands in the study area could result if other projects and actions were to affect wetland functions: water quality, hydrology, and wildlife habitat. Reasonably foreseeable future projects in the vicinity of the study area include the two BPA projects identified in Appendix B of this EA. These projects would take place within the existing extended ROW corridor that includes the Creston-Bell transmission line ROW. Implementation of the mitigation measures described in Section 3.7.3 would ensure that the incremental contribution of the Proposed Action to cumulative impacts on wetlands would be ***low***. In addition, wetlands are regulated by federal, state, and local agencies and impacts from other projects would likely require compensatory mitigation to ameliorate potential impacts to wetland functions.

3.7.6 Environmental Consequences—No Action Alternative

Under the No Action Alternative, the majority of wetland impacts associated with road construction and structure replacement would likely not occur. Continued operation and maintenance of the existing transmission line, including danger tree removal, would have ***low*** impacts on wetlands similar to those described for the Proposed Action. However, operation and maintenance activities would likely occur more frequently than under the Proposed Action because of the deteriorating condition of the existing transmission line. This increased frequency of activities could result in an increase in the magnitude of impact to wetlands, especially in areas that do not presently have permanent access roads.

3.8 FLOODPLAINS

3.8.1 Affected Environment

The study area for the floodplain analysis includes all areas within the transmission line ROW and access road and travel route system that lie within 200 feet of the mapped extent of a ***100-year floodplain***. The study area was defined to include areas within 200 feet of a floodplain to consider potential indirect impacts such as the inadvertent introduction of construction-related erosion into floodplains downstream of a work area. As defined by the Federal Emergency Management Agency (FEMA), 100-year floodplains include areas with a one percent chance of being flooded in a given year.

Within the study area, FEMA has designated floodplains associated with Hawk Creek, Coulee Creek, Deep Creek, the Spokane River, and an unnamed tributary to the Little Spokane River (Figure 3-3). Many other small creeks and intermittent or ephemeral drainage courses traverse the study area, but no other floodplains have been designated by FEMA within the study area. Mapped floodplains associated with the Columbia River, Dartford Creek, and other creeks and rivers lie beyond the floodplain study area (Figure 3-3).

Floodplains provide flood storage capacity and can reduce flood flows as they spread across the landscape. Floodplain vegetation provides water quality functions by slowing flood flows and allowing sediments and associated pollutants to settle out. Floodplains and their associated vegetation also provide fish habitat functions by providing shade to stream channels, off-channel refuge, and rearing and foraging habitat, and by contributing organic matter to the aquatic food chain. Similarly, floodplains provide food, water, and shelter to riparian-associated wildlife. Riparian corridors typical of floodplains also provide migration routes and refuge habitat for wildlife as they move across the landscape.

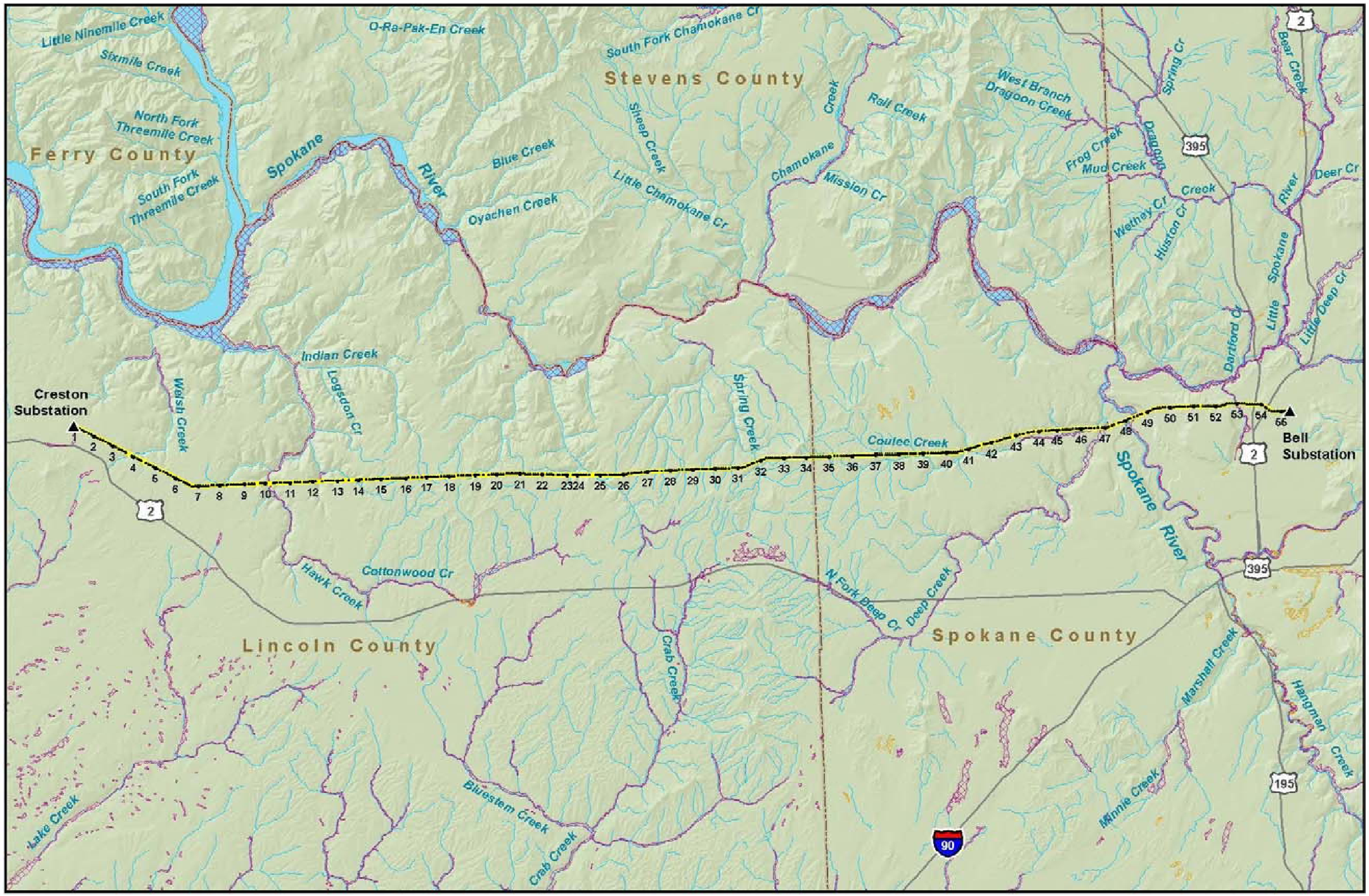

Figure 3-3. Floodplains and Waterways

BPA Creston-Bell Transmission Line Rebuild Project

- ▲ BPA Substation
- · Structure
- • First Structure of Each Mile
- BPA Transmission Line
- Rivers and Streams
- County Boundary

FEMA Flood Hazard Areas
- 100-year Flood Zone
- 500-year Flood Zone

N

0 2.5 5 Miles

Source: National Hydrography Dataset, FEMA Q3 Areas.

BONNEVILLE POWER ADMINISTRATION

Project Location
WASHINGTON

Z:\Gdrive\Projects_2011\BPA_Creston-Bell\maps\Figures\Figure3_8-1_Floodplains.mxd

3.8.2 Environmental Consequences—Proposed Action

Removal of Existing Structures and Installation of New Structures

The Proposed Action has the potential to directly affect floodplains and impair floodplain functions from construction disturbance associated with structure removal and installation. This could result in soil compaction that could interfere with the subsurface water flow in the floodplain. Removing existing structures and drilling holes for replacement structures could result in the deposition of some excavated soils on the soil surface within the floodplain.

One existing structure (48/3) is currently located in the 100-year floodplain for the Spokane River, on the west side of the river. This existing three wood-pole structure and existing Structure 48/2 (located further west and outside of the floodplain) would be removed and replaced by one steel lattice tower that would be located midway between the two existing structures and outside the 100-year floodplain. Removal of the existing structure (48/3) from the 100-year-floodplain would disturb an area approximately 50 feet by 50 feet (0.06 acre) in size.

In addition, one replacement structure (46/8) would be relocated in the floodplain of Deep Creek, on the east side of the creek. This structure would replace existing Structure 46/9, which is located outside the 100-year floodplain. Installation of this structure would disturb approximately 0.1 acre within the 100-year-floodplain (Table 3-8). The removal of structure 48/3 and the installation of structure 46/8 would have negligible effects on the flood storage capacity, direction of flood flows, and wildlife habitat value of the affected floodplains. These impacts would likely be ***low***.

Indirect impacts to floodplains could occur as a result of increased sedimentation. Ground disturbance associated with the replacement and installation of structures located within 200 feet of floodplains could cause erosion and the deposition of sediment in floodplains. In addition to the structures identified above, six existing structures (45/9, 46/6, 47/1, 47/2, 47/3, and 52/10) are located within 200 feet of mapped floodplains and would be replaced in-kind. Removal and replacement of these structures would disturb approximately 0.63 acre of land outside of the floodplains themselves, but within 200 feet of mapped floodplains (Table 3-8).

Table 3-8. Activities Proposed in or within 200 Feet of 100-Year Floodplains

Floodplain	New Structures Proposed[1/]				Access Roads Proposed for Construction/Reconstruction			
	Structure in Floodplain	Disturbance in Floodplain (square feet)	Structure within 200 Feet of Floodplain[2/]	Disturbance Area within 200 Feet of Floodplain (square feet)	Road in Floodplain	Disturbance Area in Floodplain (square feet)	Road within 200 Feet of Floodplain[2/]	Disturbance Area within 200 Feet of Floodplain (square feet)
Hawk Creek	—	—	—	—	Reconstruction of approx. 360 feet of road between structures 10/1 and 10/2	7,000	Reconstruction of approx. 500 feet of road between structures 10/1 and 10/2	10,000
Coulee Creek	—	—	45/9	3,200	—	—	Construction of approx. 150 feet of road to structure 46/6	3,200
	—	—	46/6	5,000	—	—	Reconstruction of approx. 25 feet of access road to structure 46/6	300
Deep Creek	46/8	4,400	47/1	5,000	Construction of approx. 10 feet of road to structure 46/8	400	Reconstruction of approx. 700 feet of access road between structures 46/8 and 47/1	13,600
	—	—	47/2	5,000	—	—	Construction of approx. 200 feet of road between structures 47/2 and 47/3	4,600
	—	—	47/3	2,200	—	—	—	—

Table 3-8. Activities Proposed in or within 200 Feet of 100-Year Floodplains (continued)

Floodplain	New Structures Proposed[1/]				Access Roads Proposed for Construction/Reconstruction			
	Structure in Floodplain	Disturbance in Floodplain (square feet)	Structure within 200 Feet of Floodplain[2/]	Disturbance Area within 200 Feet of Floodplain (square feet)	Road in Floodplain	Disturbance Area in Floodplain (square feet)	Road within 200 Feet of Floodplain[2/]	Disturbance Area within 200 Feet of Floodplain (square feet)
Spokane River	—	—	48/2	9,850	—	—	Reconstruction of approx. 400 feet of access road to structure 48/2	8,000
	—	—	—	—	—	—	Construction of approx. 50 feet of access road to structure 48/2	900
	—	—	48/3	10,000	—	—	Construction of approx. 100 feet of access road to structure 48/3	2,300
Unnamed drainage of Little Spokane River	—	—	52/10	5,000	—	—	Reconstruction of approx. 200 feet of access road to structure 52/10	4,000
	—	—			Reconstruction of approx. 50 feet of access road between structures 52/9 and 52/10	1,000	Reconstruction of approx. 400 feet of access road between structures 52/9 and 52/10	8,000
Total		**4,400 sq. ft. (0.10 acre)**		**45,250 sq. ft. (1.04 acres)**		**8,400 sq. ft. (0.19 acre)**		**54,900 sq. ft. (1.26 acres)**

Notes:

1/ Existing structure (48/3) would be relocated outside the 100-year floodplain for the Spokane River. Removal of existing Structure 48/3 would disturb an area approximately 0.06 acre in size within the floodplain.

2/ Within 200 feet in this context refers to the area outside, but within 200 feet of the mapped boundary of the 100-year floodplain.

Relocated structures (46/8, 46/9, and 48/4) would also involve disturbance within 200 feet of 100-year-floodplains in three other locations. Replacements for these structures would be installed outside the 200 feet buffer established for this analysis, but existing structure removal would disturb a combined total of approximately 0.30 acre of land within 200 feet of mapped floodplains.

Although this ground disturbance within 200 feet could indirectly affect floodplain function, these impacts are considered ***low*** because they would be temporary in nature, limited in scale, and would occur outside of the mapped floodplains. Also, the disturbed areas would likely revegetate in one growing season. These structures would have no impact on the flood storage capacity, direction of flood flows, or wildlife habitat value of any of the floodplains in the study area. Implementation of the mitigation measures described in Section 3.8.3 would further reduce potential indirect impacts associated with the removal and replacement of structures on floodplains in or near the study area.

Existing buried counterpoise would be replaced as needed where overhead ground wire is present (six structures in the first line mile and seven structures in the last line mile). There are no mapped floodplains in these areas and, therefore, counterpoise replacement, if required, would have ***no*** impact on floodplains.

Access Roads

Approximately 10 feet of access road would be constructed within the 100-year floodplain for Deep Creek to provide access to proposed Structure 46/8. BPA estimated a 20-foot disturbance width for road construction and reconstruction/improvement, which would disturb approximately 0.01 acre of land within the 100-year floodplain.

Reconstruction or improvement of existing, access roads would affect two floodplain areas along the Rebuild Project (Hawk Creek and an unnamed drainage of the Little Spokane River) (Table 3-8). Access roads would be reconstructed within 100-year floodplains allowing for access to Structures 10/1, 10/2, 52/9, and 52/10. These activities would result in about 0.19 acre of floodplain impact.

BPA would acquire the use of approximately 370 feet of existing non-public road (permanent travel route) located in the 100-year floodplain for the Spokane River. If required, improvements to this existing road could affect up to 0.18 acre in the 100-year floodplain.

Direct floodplain impacts from access road construction and reconstruction and improvements within floodplains would result from activities such as grading or rocking the road surfaces, replacing culverts, and removing vegetation. These activities could result in minor soil compaction and erosion. These impacts would not result in significant changes to floodplain capacity or substantial alteration to the course of flood waters. Therefore, direct impacts from access road work would be ***low*** (reconstruction) to ***moderate*** (construction). Implementation of the mitigation measures described in Section 3.8.3 would further reduce direct impacts on floodplains associated with access road construction and reconstruction in the study area.

Approximately 500 feet of access road would be constructed outside the physical boundary of the floodplains but within 200 feet of the mapped floodplains for Coulee Creek (150 feet), Deep Creek (200 feet), and the Spokane River (150 feet) (Table 3-8). Construction in these locations would disturb about 0.25 acre of land. In addition, ground disturbance during reconstruction of existing access roads would affect approximately 1.01 acre of land outside the physical boundary of the floodplains but within 200 feet of mapped floodplains. Road reconstruction would occur within 200 feet of the 100-year floodplains for Hawk Creek, Coulee Creek, Deep Creek, the Spokane River, and an unnamed tributary to the Little Spokane River (Table 3-8).

BPA would also acquire the use of approximately 3,560 feet of existing road (permanent travel route) located within 200 feet of the mapped floodplain for the Spokane River, but outside the physical boundary of the floodplain itself. Use of about 50 feet of existing non-public road would also be acquired within 200 feet of the mapped floodplain for Coulee Creek. If required, improvements to these existing roads could affect up to 1.65 acres of land outside the physical boundary, but within 200 feet of mapped floodplains.

Construction within 200 feet of a floodplain has the potential to indirectly affect floodplain function through erosion and deposition of soils in floodplains. Indirect impacts on these floodplains would be temporary in nature and limited in scale, because any disturbed areas would revegetate in one growing season. Construction and reconstruction of these access roads and permanent travel routes would have no impact on flood storage capacity, direction of flood flows, or wildlife habitat value. As a result, indirect impacts to floodplains would likely be ***low***. Implementation of the mitigation measures described in Section 3.8.3 would further ensure that any unanticipated indirect impacts on floodplains within 200 feet of the ROW would be minimized.

Danger Tree Removal

Danger tree and vegetation removal in floodplains has the potential to affect floodplain functions because vegetation removal can increase soil compaction and erosion, and reduce the capacity of the floodplain to dissipate flood energy and maintain water quality by filtering nutrients and contaminants. However, impacts on floodplains from tree and vegetation removal under the Proposed Action would be ***low*** because of the small area that would be affected relative to the overall size of each of the floodplains and the limited number of danger trees that would need to be removed in these areas. Implementation of the mitigation measures described in Section 3.8.3 would further reduce direct and indirect impacts from removal of danger trees and other vegetation during construction.

Staging Areas and Tensioning Sites

BPA would require the construction contractor to locate all staging areas at least 200 feet from FEMA-designated floodplains. As such, ***no*** direct or indirect impacts on floodplains would likely occur as a result of staging the Proposed Action.

Tensioning sites would also be restricted to areas outside floodplains, where possible. If tensioning sites were, however, placed within a 100-year floodplain, temporary disturbance could occur during construction. Implementation of the mitigation measures described in Section 3.8.3 would reduce impacts and, as a result, impacts to floodplains from tensioning sites, were they to occur, are expected to be ***low***.

Operation and Maintenance

Operation and maintenance activities in the study area, including grading or rocking road surfaces, replacing culverts, and vegetation removal, could result in minor soil compaction, erosion, and loss of vegetation within floodplains. These impacts are expected to be ***low*** because they would be infrequent, temporary, and limited in scope. Impacts on floodplain storage, water quality functions, and fish and wildlife habitat functions would be ***low*** for similar reasons.

3.8.3 Mitigation—Proposed Action

If the Proposed Action is implemented, the following mitigation measures would reduce impacts on floodplains.

- Minimize erosion, sedimentation, and soil compaction by conducting as much work as possible during the dry season when streamflow, rainfall, and runoff are low.
- Delineate construction limits as specified in the stormwater pollution prevention plan, using sediment fence or straw wattles or similar erosion and stormwater control BMPs to eliminate discharge into floodplains.
- Identify the locations of 100-year floodplains on project maps for contractors and restrict tensioning sites to areas outside floodplains, where possible.
- Locate all staging areas at least 200 feet from FEMA-designated floodplains.
- Inspect and maintain access roads, culverts, and other facilities after construction to ensure proper function and nominal erosion levels.

3.8.4 Unavoidable Impacts Remaining After Mitigation—Proposed Action

Implementation of the Proposed Action would generally result in low, temporary impacts on floodplains. Implementation of the mitigation measures described in Section 3.8.3 would further minimize these impacts.

3.8.5 Cumulative Impacts—Proposed Action

Potential cumulative impacts on floodplains in the study area could result from increased compaction, erosion, or temporary removal of vegetation. The Proposed Action would have ***low*** to ***moderate*** direct impacts on floodplains. Moderate impacts would be associated with the installation of Structure 46/8 and 10 feet of access road construction within the 100-year floodplain of Deep Creek. Reasonably foreseeable future projects in the vicinity of the Proposed Action include two BPA projects that would take place within the existing extended ROW corridor that includes the Creston-Bell transmission line ROW (see Appendix B). Each project is independent of the Rebuild Project and does not require that actions be taken previously or simultaneously for completion. These projects are expected to have similar impacts to floodplains as the Proposed Action. Implementation of the mitigation measures described in Section 3.8.3 would ensure that the Proposed Action would not contribute significantly to cumulative impacts to floodplains were other projects to occur. As such, the contribution of the Proposed Action to cumulative impacts is considered ***low*** to ***moderate***.

Viewed together with the two other reasonably foreseeable future BPA projects, the Proposed Action would disturb relatively small, localized areas within 100-year floodplains and would not alter flood storage capacity or have noticeable effects on fish and wildlife habitat related to floodplain areas. Similar mitigation measures to those proposed for the Proposed Action would be employed for the two reasonably foreseeable future projects, which would further reduce combined impacts.

3.8.6 Environmental Consequences—No Action Alternative

Under the No Action Alternative, the Proposed Action would not be constructed and there would be no construction-related impacts to floodplains. Continued operation and maintenance of the existing transmission line, including danger tree removal, would have impacts on floodplains similar to those described for the Proposed Action. These activities would, however, likely occur more frequently than under the Proposed Action because of the deteriorating condition of the existing transmission line. Although this impact would still be ***low***, the increased frequency of activities could result in a higher magnitude of impact.

3.9 VISUAL QUALITY

3.9.1 Affected Environment

The study area for visual resources includes the existing ROW, the access road and travel route system that extends off the ROW, and surrounding views to and from the transmission line. The study area for visual resources includes the surface water drainages, farmland, and buttes near the Spokane River and the outskirts of Spokane in eastern Washington State. Prominent visual resources within the study area include Riverside State Park and the Spokane River. The existing Creston-Bell transmission line shares an extended ROW corridor with other larger transmission lines for its entire length between the Creston and Bell substations. The other transmission lines in the corridor include one 500-kV line and two 230-kV lines, all of which are supported by lattice towers that are much larger than the wood-pole structures that comprise the existing Creston-Bell transmission line (see Figures 3-4 through 3-9). The existing Creston-Bell transmission line appears in these photographs as the smaller, wood-pole structures on the south side of the extended ROW corridor.

The western portion of the study area within Lincoln County is characterized by gently rolling hills, shallow valleys cultivated for agricultural production, and intermittent buttes. Land use is mostly agricultural, with few heavily forested areas, and the overall visual impression is one of openness. The portion of the study area within Spokane County is characterized by similar landscapes west of the Spokane River. Because of the low height of hills and lack of screening vegetation in this area, the existing transmission line corridor, primarily the large steel, lattice towers that support the single-circuit 230-kV (Grand Coulee-Bell No.5), the double-circuit 230-kV (Grand Coulee Bell No.3/Grand Coulee Westside No.1), and 500-kV (Grand Coulee Bell No.6) lines, are visible from many miles away. These lines are identified by name in Figure 2-1. Figures 3-4 through 3-6 illustrate the general visual character of the western portion of the study area.

Observed from hilltops and buttes, the rolling agricultural lands provide picturesque views enjoyed by outdoor recreational users, motorists, and residents. There are no State Scenic Highways in the vicinity of the study area (WSDOT 2011). U.S. Routes 2 and 395 and State Routes 25, 231, and 291 are the primary transportation roadways which have views of the transmission line.

Figure 3-4. Looking West from the Hawk Creek Area

Figure 3-5. Looking East from Zwainz Road

Figure 3-6. Looking East from West Seven Mile Road

Figure 3-7. Looking East from West Seven Mile Road at Riverside State Park

Figure 3-8. Looking Northeast from Nine Mile Road and North Jimmy

Figure 3-9. Looking West at the Whitworth University Sports Fields from North Whitworth Drive

The Spokane River flows through Spokane and north through the study area. The main resource for scenic and recreational resources along the river is provided by Riverside State Park. The existing transmission line corridor crosses the park north of Deep Creek. Figure 3-7 shows the view looking east from West Seven Mile Road in Riverside State Park. The existing Spokane River crossing is visible from Riverside Park Drive to the west and Nine Mile Road to the east, a distance of about 0.8 mile. The existing transmission line corridor also crosses the Spokane River Centennial Trail that generally follows the Spokane River, extending 37 miles from east of the city of Spokane to Nine Mile Falls, north of the study area.

East of the Spokane River, the study area passes through the Spokane urban area to the Bell Substation and residential neighborhoods and suburban development dominate the landscape, with more industrial land use in the vicinity of the Bell Substation. Due to the greater density of artificial structures in this part of the study area, the existing transmission line corridor is visible from much shorter distances than in the west portion of the study area.

The majority of the area east of the Spokane River is hilly and tree-covered, with housing developments next to the corridor or within view of it. As described in Section 3.2, Land Use and Recreation, rural residences are scattered throughout the study area west of the Spokane River. East of the Spokane River, medium and high intensity developed areas are located either side of the existing transmission line corridor. Within this area, the largest concentrations of private residences and businesses near the transmission line are located in the following areas:

- From North Nine Mile Road to North Indian Trail Road (Structures 48/6-49/6)
- From North Arrowhead Road to North Fleetwood Court (Structures 49/9-50/2)
- From U.S. Route 2 to East Hawthorne Road (Structures 54/2-54/9)

Lattice-steel towers and wood poles are visible from homes located near or within view of the corridor. Figure 3-8 shows the existing corridor viewed from a residential development in Spokane just east of Nine Mile Road.

Whitworth University is located directly south of the existing transmission line corridor between North Waikiki Road and North Whitworth Drive in Spokane. The corridor is not visible from the northern boundary of the campus due to grade changes and screening by trees, but as noted in Section 3.2, Land Use and Recreation, the university maintains trails that intersect with the corridor and university sports fields are located beneath the existing transmission lines. Figure 3-9 shows the view looking west at the existing corridor across the sports fields from North Whitworth Drive.

3.9.2 Environmental Consequences—Proposed Action

Operation, maintenance, and construction activities have the potential to affect visual resources in the study area. Operation and maintenance activities would be similar to those already implemented along the transmission line and would not result in any new or different impacts on visual resources. Construction activities would, however, represent new temporary activity that could affect visual resources. Replacing structures, clearing vegetation, working on access roads, and using and storing construction equipment would temporarily affect visual resources and viewers sensitive to visual changes caused by the project in the study area. Sensitive viewers may include motorists on nearby roads, local residents, and recreational users in areas close to the ROW.

As most of the project involves replacing existing wood pole structures with new, but similar wood pole structures in essentially the same locations, the long-term impacts on visual resources would be from the addition of two new lattice-steel structures (one on either side of the Spokane River) and the construction of new access roads and reconstruction/improvement of existing access roads.

Impacts to specific types of viewers are discussed in the following sections.

Motorists

The existing transmission line corridor is visible from U.S. Routes 2 and 395 and State Routes 25, 231, and 291. The majority of these roads cross the corridor at an approximate right angle, so the existing transmission lines are visible to approaching motorists for a moderate distance to the north and south of the intersection for a limited duration. The exception to this occurs where the transmission line corridor runs generally parallel to U.S. Route 2 for approximately 5.7 miles extending east from the Creston Substation. In this area, the existing corridor is at least 1 mile from U.S. Route 2.

Construction activities, such as structure replacement and vegetation removal, could detract from views in the study area, but these impacts would be localized and short in duration. The transmission line is an existing visual element of the landscape and replacement with similar structures, many in the same locations, would not substantially alter the visual landscape. Impacts would be further reduced because of the limited time motorists have to view transmission infrastructure while traveling on these roadways. Further, the rebuilt Creston-Bell transmission line and access road system would remain visually subordinate to the larger lattice-steel towers that dominate the visual landscape in the study area. Visual impacts to motorists are, therefore, expected to be ***low***.

Residents

Residential viewers are highly sensitive to changes in their visual environment. However, as described above, the existing transmission line corridor is already a prominent element in the visual landscape for nearby residential viewers and for most residences the existing Creston-Bell line is visually subordinate to the larger lattice-steel towers that dominate the visual landscape in the study area (Figure 3-8). This would remain the case once the existing line is rebuilt. Replacement of the existing line with similar structures, many in the same locations, would not substantially alter the visual landscape, and most residential viewers would be unlikely to be able to distinguish the difference between the existing and rebuilt version of the Creston-Bell transmission line. Long-term visual impacts to residential viewers in the western and eastern part of the study area are, therefore, expected to be ***low***.

Construction activities would, however, temporarily modify the visual landscape for residential viewers through the presence of construction equipment and the removal of vegetation, including danger trees, along the ROW. Relatively few residences are located in the portion of the study area west of the Spokane River. Although the generally open landscape and lack of screening vegetation in the west portion of the study area would allow construction activities to be visible from greater distances, construction impacts to residential viewers would be temporary and localized. Construction impacts to residential viewers in the more densely populated east portion of the study area would also be temporary and localized and impacts to residential viewers are, therefore, expected to be ***low***. Potential construction-related impacts to visual resources would be further reduced through the implementation of the mitigation measures identified in Section 3.9.3.

Construction of 10.1 miles of roads under the Proposed Action would represent a permanent change to the visual landscape that could be visible to some residential viewers. However, as noted above, the majority of the new proposed road segments would extend existing roads to the structure locations, with much of this construction occurring within the extended ROW corridor. Implementation of the mitigation measures described in Section 3.9.3 would result in only minor scarring and erosion from new or improved access roads and, therefore, access road–related impacts to residential viewers would likely be ***low***. In addition, these roads would be consistent with visual conditions in the existing transmission line corridor and would not represent a new introduction to previously undisturbed areas.

Recreation

The existing transmission line corridor crosses Riverside State Park. The part of the existing line that crosses the park is generally only visible from the immediate vicinity, when next to or under the line. Short-term visual impacts to recreational viewers in Riverside State Park, including non-motorized trail users on the Spokane River Centennial Trail, would mainly consist of the temporary exposure to construction activities. These impacts would be short in duration and are expected to be ***low***.

Permanent changes to the visual landscape in Riverside State Park would occur from the removal of two existing wood pole structures on the east side of the Spokane River (Structures 48/2 and 48/3) and their subsequent replacement by a single, lattice-steel tower that would likely be visible from the park on the west side of the river. Existing Structure 48/2 consists of two wood poles, 70 feet in height. Existing Structure 48/3, which is located closest to the river and within the 100-year floodplain, consists of three poles, 90 feet in height, with guy wires. The replacement lattice-steel structure would be 70 feet tall and located outside the 100-year floodplain between the locations of existing Structures 48/2 and 48/3. The replacement lattice-steel structure would be consistent with three other existing lattice-steel transmission lines in the corridor (see Figure 3-7). The lattice-steel structure would be treated to dull the shininess of the steel and reduce reflectivity. However, park visitors normally have a high awareness of their surroundings and, therefore, permanent visual impacts from structure replacement in this location are considered ***moderate***.

Road construction in Riverside State Park would occur within the existing extended ROW corridor and primarily involve the addition of short spurs to existing roads. Road reconstruction/improvement would mainly occur within the corridor, but would also include an existing access road that extends off the ROW. Implementation of the mitigation measures described in Section 3.9.3 would result in only minor scarring and erosion from new or improved access roads and, therefore, access road–related impacts would be ***low***. In addition, these roads would be consistent with visual conditions in the existing transmission line corridor and would not represent a new introduction to previously undisturbed areas.

The existing structures in the Meadowglen conservation land area and adjacent to Whitworth University would be replaced with similar structures in the same locations. Some existing roads would be improved/reconstructed in both areas, and some short lengths of new spur road would be constructed in the corridor near Whitworth University. Visual impacts in these areas would mainly consist of the temporary exposure to construction activities. This would also be the case for local residents in the Spokane area who use the existing corridor for informal recreation activities. These impacts would be short in duration and are expected to be ***low***.

Informal recreation use also occurs in the more rural part of the study area, west of the Spokane River. In addition to limited outdoor recreation, such as hunting and fishing, networks of four-wheel-drive trails and county and existing access roads provide access to Hawk Creek and other streams for dispersed recreation. Visual impacts in these areas would primarily result from construction activities. These impacts would be temporary and short in duration. While the quality of public views is an integral part of recreational activity, the existing transmission line corridor is already a prominent element of the recreational landscape in the western part of the study area. Visual impacts on recreationists in the west part of the study area would likely be ***low***.

3.9.3 Mitigation—Proposed Action

If the Proposed Action is implemented, the following mitigation measures would reduce the visual prominence of the transmission line and reduce temporary visual impacts during project construction.

- Schedule all construction work during daylight hours to avoid noise and the use of nighttime illumination of work areas.
- Use non-reflective conductors and insulators on all replacement structures. Treat tower steel on the two new lattice towers to reduce reflectivity.
- Avoid storing construction equipment and supplies on residential streets or access roads directly adjacent to residential property, to the greatest extent possible.
- Incorporate BMPs for the control of erosion and dust associated with construction of access roads to minimize permanent visual impacts on nearby residential viewers.
- Reseed disturbed, non-farmed areas once construction is complete using a predominantly native seed mix or a seed mix agreed upon with landowners. Periodically inspect reseeded sites to verify adequate growth. If necessary, implement contingency measures to ensure adequate growth and vegetation cover.
- Locate construction staging areas away from sensitive viewers as much as possible.
- Require contractors to maintain clean construction sites.

3.9.4 Unavoidable Impacts Remaining After Mitigation—Proposed Action

If the Proposed Action is implemented, motorists, residents, and recreational users would be exposed to the sight of construction activities, as well as new permanent elements (two new lattice-steel structures and some new and improved/reconstructed access roads) in the visual landscape. These changes would, however, remain visually subordinate to the large, lattice-steel towers that dominate the visual landscape of the study area and with the implementation of the mitigation measures in Section 3.9.3, these unavoidable impacts are expected to be ***low***.

3.9.5 Cumulative Impacts—Proposed Action

There are two reasonably foreseeable future BPA projects in the vicinity that are independent of the Rebuild Project and do not require that actions be taken previously or simultaneously for completion. The Proposed Action would have low to moderate impacts to visual resources and while the reasonably foreseeable future BPA projects within the corridor would create short-term construction impacts, they would not alter the existing lattice-steel transmission line structures and would be subject to similar mitigation measures to those identified above in Section 3.9.3. Therefore, the overall cumulative impacts to visual resources are expected to be ***low*** to ***moderate*.**

3.9.6 Environmental Consequences—No Action Alternative

Under the No Action Alternative, no construction-related impacts on visual resources would occur. Continued operation and maintenance of the existing transmission line would result in visual impacts on motorists, residents, and recreational users similar to existing conditions. Although the maintenance activities are expected to be more frequent as the line deteriorates, overall visual impacts are expected to be ***low***.

3.10 AIR QUALITY

3.10.1 Affected Environment

The study area for air quality includes the airsheds of Spokane and Lincoln counties. The agencies with primary air quality jurisdiction in Spokane and Lincoln counties are the EPA and Ecology. Under the Clean Air Act (42 U.S.C. 7401 *et seq*.), the EPA has established national ambient air quality standards (NAAQS) for six criteria air pollutants: carbon monoxide (CO), ozone, particulate matter, lead, sulfur dioxide, and nitrogen dioxide. Ecology has adopted the standards set by EPA. For each of the six criteria pollutants, the NAAQS represent a maximum concentration above which adverse effects on human health may occur. When an area's air quality exceeds these standards, it is designated a ***nonattainment area***.

Given the rural to low-density urban setting of the project area, the three criteria pollutants of potential interest are CO, ozone, and particulate matter. The remaining three criteria pollutants (lead, sulfur dioxide, and nitrogen dioxide) are not discussed further in this section. No part of the study area is within a designated nonattainment area for monitored pollutants (Ecology 2011b).

CO is generally associated with transportation sources (e.g., roads and traffic). The highest ambient CO concentrations often occur near congested roadways and intersections during periods of low temperatures, light winds, and stable atmospheric conditions. The NAAQS standards for CO levels are as follows: 8-hour standard of 9 parts per million and 1-hour standard of 35 parts per million. Vehicles traveling along U.S. Routes 2 and 395 are the primary sources of CO in the study area. Ecology monitors CO levels for much of Spokane County. Ecology's monitoring data has not detected an exceedance of the NAAQS standards for CO levels in the portion of the study area located in east Spokane County.

Traffic volumes along the portions of U.S. Routes 2 and 395 that are located in the study area, but outside EPA's monitoring area (i.e., western Spokane County and all of Lincoln County) are low and congestion is rare; therefore, it is unlikely that CO levels exceed the NAAQS 8-hour or 1 hour standards for CO levels in this portion of the study area.

Ozone is primarily a product of more concentrated motor vehicle traffic on a regional scale. It is created during warm sunny weather by photochemical reactions involving volatile organic compounds (VOCs) and nitrogen oxides (NO_X). Small amounts of ozone may be produced by the existing transmission line as a result of the ***corona*** effect (i.e., the breakdown of air at the surface of conductors). Ecology does not monitor ozone in Spokane or Lincoln counties; ozone concentrations in the study area are, however, anticipated to be below the NAAQS 8-hour average standard of 0.075 parts per million because much of the area is sparsely developed and traffic levels are relatively low.

Particulate matter is generated by industrial emissions, residential wood combustion, motor vehicle tailpipes, and fugitive dust from roadways and unpaved surfaces. The highest ambient concentrations generally occur near emissions sources. Two forms of particulate matter are regulated by EPA: particulate matter less than 10 micrometers in size (PM10) and particulate matter less than 2.5 micrometers in size (PM2.5). PM2.5 has a more severe effect on health than PM10, and can impact locations farther from the emitting source because it remains suspended in the atmosphere longer and travels a greater distance.

Ecology monitors PM 2.5 levels in part of the study area located in Spokane County. Ecology's monitoring data have not detected an exceedance of the PM 2.5 24-hour standard of 35 micrograms per cubic meter ($\mu g/m^3$) in this portion of the study area. Ecology does not monitor particulate matter levels in the western portion of Spokane County or in Lincoln County; however, particulate matter levels in this portion of the study area are anticipated to be less than the NAAQS 24-hour standard of 150 $\mu g/m^3$ for PM10, or 35 $\mu g/m^3$ for PM2.5 because the area is sparsely developed and traffic levels are relatively low. Industrial emissions, residential wood combustion, and fugitive dust from roadways and unpaved surfaces are, therefore, also expected to be relatively low.

Air quality can have an effect on visibility. Section 106 of the Clean Air Act and its amendments require that air quality be preserved, protected and enhanced in specific areas of national or regional natural, recreational, scenic or historic value. These areas are designated as Class 1 areas, and there are eight mandatory Class 1 areas in Washington State where the protection of visibility is required (Ecology 2011c). In these areas, there are restrictions on the use of the land and resources in order to avoid damaging visibility, plants, and other resources. There are no Class 1 areas in the general vicinity of the project area.

3.10.2 Environmental Consequences—Proposed Action

Air quality would be primarily affected during construction, if the Proposed Action were implemented. Construction would take about 7 months (May through November 2012). Construction activities have the potential to temporarily increase particulate matter, CO, NO_X, and VOC levels on a temporary basis within a localized area.

Particulate matter would be the pollutant of most concern generated by construction activities. Fugitive dust could be created during site preparation, including access road work, onsite travel on unpaved surfaces, and soil-disrupting operations. However, construction activities would only increase dust and particulate levels on a temporary basis in a localized area. Implementation of the mitigation measures described in Section 3.10.3 would minimize these impacts.

In addition to increased particulates, the operation of heavy equipment and vehicles during construction of the Proposed Action could result in increases in CO, NO_X, and VOC levels. However, these emissions would also be short-term and localized. In addition, vehicle and equipment emissions would be relatively small, and comparable to current conditions found in agricultural and urban areas.

Air quality could also be slightly affected as a result of the operation and maintenance of facilities associated with the Proposed Action. During operation, the transmission line emits limited amounts of ozone and NO_X as a result of the corona effect. However, these substances would be released in small quantities. In addition, although there would be occasional vehicle emissions during maintenance activities, the number of vehicles trips is anticipated to be low and would also be similar to existing conditions.

For these reasons, impacts on air quality from construction, operation, and maintenance activities would likely be ***low***.

3.10.3 Mitigation—Proposed Action

If the Proposed Action is implemented, the following mitigation measures would be used to minimize potential construction-related impacts on air quality:

- Use water trucks or other dust control measures to control dust during construction.
- Keep construction vehicles at low speeds (15 miles per hour) on unpaved access roads to minimize dust.
- Keep all vehicle engines in good operating condition to minimize exhaust emissions.
- Implement vehicle idling and equipment emissions measures.

3.10.4 Unavoidable Impacts Remaining After Mitigation—Proposed Action

As noted above, short-term increases in some criteria pollutants would occur during construction of the Proposed Action, and levels of ozone and NO_X similar to existing levels would result from the corona effect throughout operation. Although these impacts are unavoidable, they would not violate air quality standards and impacts would, therefore, be considered ***low***.

3.10.5 Cumulative Impacts—Proposed Action

Vehicular traffic, agricultural activities, residential wood burning, and other commercial and industrial facilities in the study area have all contributed to ambient air pollutant emissions. These sources of pollutants will continue to occur. In addition, BPA plans to implement two other reasonably foreseeable future projects in the extended ROW corridor (Appendix B). These reasonably foreseeable future projects would also contribute to air pollutants through emission from construction equipment. Ongoing and reasonably foreseeable future activities in the study area are not, however, expected to violate NAAQS. While the Proposed Action would contribute a small amount to pollutant levels, it is unlikely that cumulative concentrations would violate the NAAQS; therefore, cumulative impacts would be ***low***.

3.10.6 Environmental Consequences—No Action Alternative

Under the No Action Alternative, there would be no impacts on air quality from construction activities. ***Low*** impacts on air quality would continue from the corona effect during operation of the existing line. There is also a possibility that the aging transmission line would require increased maintenance over time, resulting in additional emissions of criteria pollutants from increased vehicle use compared with existing conditions.

3.11 SOCIOECONOMICS AND PUBLIC SERVICES

3.11.1 Affected Environment

The study area for socioeconomics and public services consists of Lincoln and Spokane counties, the counties in which the Proposed Action would occur.

Population

The populations of Lincoln and Spokane counties in 2010 were 10,570 and 471,221, respectively. Lincoln County is sparsely populated with a population density of just 4.6 persons per square mile compared to a state average of 101.1 persons per square mile (U.S. Census Bureau 2011a). Based on total population, Lincoln County ranked 35 out of the 39 counties in Washington in 2010 (Washington Office of Financial Management [OFM] 2011a). Population remained relatively constant in Lincoln County between 2000 and 2010, increasing by just 386 people (3.8 percent).

Spokane County, with a population density of 267.2 persons per square mile, more than twice the state average of 101.1 persons per square mile, is the fourth most populous county in Washington (U.S. Census Bureau 2011a; Washington OFM 2011a). From 2000 to 2010, the total population in Spokane County increased by 12.7 percent. The city of Spokane accounted for approximately 44 percent of total county population in 2010, down from 47 percent in 2000.

Economic Characteristics

Agriculture accounted for 16 percent of total employment in Lincoln County in 2009 compared to just 2 percent statewide and 1 percent in Spokane County. Employment was also concentrated in the government sector, which comprised 28 percent of total employment versus 16 percent statewide. Employment in Spokane County in 2009 more closely resembled the statewide average. Leading employment sectors were retail trade (12 percent of total employment), health care and social assistance (14 percent), and government (15 percent) (U.S. Bureau of Economic Analysis 2011a). Lincoln and Spokane counties had seasonally unadjusted unemployment rates in August 2011 of 7.9 percent and 9.2 percent, respectively, compared to a statewide rate of 8.9 percent (Washington Employment Security Department 2011).

Approximately 74 percent of the land area in Lincoln County was in farms in 2007, compared to 35 percent statewide and 55 percent in Spokane County (U.S. Census Bureau 2011a; USDA 2009). A total of 798 farms in Lincoln County with an average size of 1,366 acres generated approximately $126 million in agricultural sales in 2007, with crops accounting for 93 percent of sales by value. In Spokane County, 2,502 farms with an average size of 250 acres generated $117 million in sales, with crops accounting for 88 percent of that total.

Per capita income in Lincoln County in 2009 was $31,364, which was equivalent to 73 percent of per capita income for the state as a whole. In Spokane County, per capita income in 2009 was $34,599, approximately 81 percent of the statewide figure (U.S. Bureau of Economic Analysis 2011b). Median household income was approximately $45,000 in both Lincoln and Spokane counties in 2009, approximately 79 percent of the statewide median (U.S. Census Bureau 2010). The share of the population below the poverty level was higher than the state average in both Lincoln and Spokane counties in 2009, 14.2 percent and 14.8 percent, respectively, versus 12.3 percent statewide (U.S. Census Bureau 2010).

Property

As described in Section 3.2, Land Use and Recreation, development west of the Spokane River is primarily in the form of rural residences scattered throughout the study area. The area east of the Spokane River is more densely developed. Given the age of the existing transmission line, which was built in 1942, much of the residential development in the area east of the Spokane River is likely to have occurred after its construction.

Public Services

The primary providers of electricity and gas service in the study area are Avista Utilities, IPL, and Ferrellgas. Public water in the study area is provided by municipal systems and water divisions.

The Spokane Regional Solid Waste System is responsible for providing solid waste disposal in Spokane County. There are three disposal facilities located in Spokane County under the jurisdiction of the Spokane Regional Solid Waste System: the Waste to Energy Plant, the North County Transfer Station, and the Valley Transfer Station. There are no operational landfills in Lincoln County. The county does, however, own and operate a transfer station, located in Lincoln County about 3.5 miles west of Davenport.

Fire protection in the study area is provided by either the City of Spokane’s Fire Department (for the portion of the study area located within city boundaries) or the respective county fire districts (for the remaining parts of the Project). Emergency response services are also provided by these fire departments and districts. Police protection in the study area is provided by the City of Spokane’s Police Department, the Spokane County Sheriff’s Department, the Lincoln County Sheriff’s Department, and the Washington State Patrol.

Spokane County is served by 14 school districts and Lincoln County is served by eight school districts, all providing kindergarten through twelfth grade education. Students are transported to schools by an extensive system of school-bus routes that traverse most county roads. There are five colleges located in Spokane County, including Eastern Washington University, Gonzaga University, Spokane Community College, Spokane Falls Community College, and Whitworth University. There are no colleges located in Lincoln County.

Environmental Justice Populations

All projects involving a federal action (funding, permit, or land) must comply with Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, signed by President Clinton on February 11, 1994. This Executive Order directs federal agencies to take the appropriate and necessary steps to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of federal programs, policies, and activities on the health or environment of ***minority populations*** and ***low-income populations*** (collectively, the ***environmental justice populations***) to the greatest extent practicable and permitted by law.

Guidelines provided by the CEQ (1997) and EPA (1998) indicate that a minority community may be defined where either 1) the ***minority population*** comprises more than 50 percent of the total population, or 2) the minority population of the affected area is meaningfully greater than the minority population in the general population of an appropriate benchmark region used for comparison. The population in the study area counties and the communities located in relatively close proximity to the Proposed Action primarily identified as White in the 2010. This was also the case with the Census Block Groups crossed by the transmission line ROW and associated road system (U.S. Census Bureau 2011b).

Low income may be defined based on the U.S. Department of Health and Human Services poverty guidelines; for 2009, this was $22,050 for a family of four (U.S. Department of Health and Human Services 2010). Median household incomes in Lincoln and Spokane counties substantially exceeded this level in 2009; however, 14.2 percent and 14.8 percent of the populations of Lincoln and Spokane counties, respectively, had incomes below the poverty level, compared to 12.3 percent statewide (U.S. Census Bureau 2010). The most recent year that income and poverty data are available at the census block group level is 1999. Median household income in the affected Census Block Groups ranged from 69 percent to 116 percent of the state median; the share of the population below the poverty level ranged from 2.3 percent to 18.9 percent compared to 10.6 statewide and 12.6 percent and 12.3 percent in Lincoln and Spokane counties, respectively (U.S. Census Bureau 2000).

3.11.2 Environmental Consequences—Proposed Action

Employment and Income

The Proposed Action would have a small, positive impact on the regional economy during construction through the local procurement of materials and equipment and spending by construction workers. These direct expenditures generate economic activity in other parts of the economy through what is known as the multiplier effect, with direct spending generating indirect and induced economic impacts. Indirect impacts consist of spending on goods and services by industries that produce the items purchased as part of the project. Induced impacts include expenditures made by the households of workers involved either directly or indirectly in the construction process.

The construction cost is expected to be approximately $10.6 million. Local purchases would likely include fuel for vehicles and equipment, some equipment rentals, staging area rental, and other incidental materials and supplies. Local purchases, employment of local residents, and the temporary relocation of construction workers to the project area would have small, but positive impacts on local businesses.

The rebuild would require up to 30 construction workers each working an average of 60 hours per week for approximately 6 to 7 months. The total labor construction payroll, including per diem payments and other allowances, is expected to be approximately $4.0 million over the life of the project. There were approximately 273,733 full- and part-time jobs in Lincoln and

Spokane counties in 2009, including about 16,796 construction jobs (U.S. Bureau of Economic Analysis 2011a). Unemployment rates in Lincoln and Spokane counties in August 2011 were 7.9 percent and 9.2 percent, respectively (Washington Employment Security Department 2011).

As the preceding discussion indicates, estimated local project-related expenditures, employment, and construction-related earnings are small relative to the total amount of economic activity, employment, and income in the two study area counties, and are short-term in nature. As a result, the overall impact of construction-related activities on the local and regional economies, while positive, is expected to be ***temporary and low***.

Operation of the Project would have limited direct impacts in the local area. Existing BPA staff would be responsible for operation and maintenance of the new transmission line and associated facilities. No existing employees would be required to relocate to the two potentially affected counties. Local expenditures on project-related goods and services would be ***none*** to ***low***.

Property Value

Some short-term impacts on property value and salability could occur on an individual basis during construction; however, the Proposed Action involves replacing an existing transmission line with similar structures in many of the same locations and would have no appreciable impacts on property values over the long term. Therefore, property value impacts would likely be ***none*** to ***low***.

Property Taxes

The Proposed Action would not affect the amount of property taxes collected by the counties crossed by the transmission line. The underlying land ownership would not change nor would the assessed land value. Property owners would continue to pay property taxes in accordance with existing valuations and no property devaluations would be likely. Therefore, there would be ***no*** property tax impacts.

Sales Taxes

States cannot tax direct purchases by the federal government; however, Washington State would tax local purchases by government contractors building the line (Excise Tax Bulletin 316.08.193 and WAC 458-20-17001). The Proposed Action would result in an estimated $3.2 million in purchases of construction materials for use in Washington, with nearly all purchases originating out-of-state. State sales and use tax in Washington is 6.5 percent. Unincorporated Lincoln and Spokane counties had respective local sales and use tax rates in 2011 of 1.2 percent and 1.6 percent, resulting in combined sales and use tax rates of 7.7 percent and 8.1 percent. The City of Spokane had a local sales tax rate of 2.2 percent and a combined sales and use tax rate of 8.7 percent (Washington Department of Revenue 2011). Assuming total construction material purchases of $3.2 million, sales and use tax revenues of approximately $207,000 and $53,000 would accrue to Washington and the local jurisdictions, respectively.[10]

Workers would also be taxed on all local purchases of goods in the state, except for purchases of tangible personal property for use outside Washington by workers whose permanent residences

[10] Revenues for local jurisdictions were estimated using a rate of 1.7 percent, the average of the local sales and use tax rates for the three jurisdictions crossed.

are within states or other jurisdictions that are exempt from paying a local sales or "use tax" within the state (RCW 82.08.0273). These revenues are not estimated, but are expected to be positive and relatively low.

Overall impacts to sales tax revenues would be ***low***.

Environmental Justice Populations

As described above, the Proposed Action would have a small but positive impact on local economic conditions in Lincoln and Spokane counties. Construction of the Proposed Action is not expected to have high and adverse human-health or environmental effects on nearby communities. Further, no minority or low income communities were identified in the vicinity of the project. As a result, the Proposed Action would result in ***no*** adverse or disproportionate impact on minority populations or low-income populations.

Public Services

The Proposed Action would result in ***low*** or ***no*** impacts on public services. During construction, guard structures would be placed over local utility lines and roadways to ensure continued service and safe passage in the event that the conductor line or other materials were dropped during construction. Dust suppression and truck washing for weed management would require the use of washing stations and water trucks; however, it is anticipated that a sufficient water supply would be provided by the local water providers with negligible impact on the local water supply. Construction waste would be recycled or taken to local landfills/transfer stations, with no anticipated impact to the operation of these waste facilities.

Increased truck traffic associated with the project would result in minimal localized delays. These delays would not disrupt the ability of emergency service personnel to respond to emergencies. Construction plans would incorporate fire prevention measures to limit the potential effects of the project on fire departments/districts. Medical facilities are located within the study area, and would likely be able to treat any injuries that would occur during construction, without interfering with their ability to serve the larger community. Project construction would take place from May through November, and no impacts on schools or school transportation services would be expected.

As the preceding discussion indicates, the Proposed Action is expected to have ***low*** or ***no*** impact on the provision of public services in the study area.

3.11.3 Mitigation—Proposed Action

If the Proposed Action is implemented, the following mitigation measures would be employed to minimize impacts on socioeconomic resources and public services:

- Distribute a schedule of construction activities to all potentially affected landowners.
- Coordinate with local farmers and landowners to minimize potential construction-related disruptions.
- Compensate landowners for the value of commercial crops damaged or destroyed by construction activities.
- Coordinate the routing and scheduling of construction traffic with WSDOT and county road staff.

Measures identified elsewhere in this EA, including Section 3.2, Land Use and Recreation, Section 3.12, Cultural Resources, and Section 3.13, Noise, Public Health, and Safety would also have the effect of mitigating potential impacts on socioeconomic resources and public services.

3.11.4 Unavoidable Impacts Remaining After Mitigation—Proposed Action

There would be ***no*** unavoidable impacts on the socioeconomic environment, public services, or environmental justice populations under the Proposed Action.

3.11.5 Cumulative Impacts—Proposed Action

The Proposed Action would have a small but positive impact on the regional economy during construction through the local procurement of materials and equipment and spending by construction workers. These impacts would be ***temporary*** and ***low*** and not expected to noticeably contribute to cumulative impacts in the study area. The two other reasonably foreseeable future BPA projects proposed for the extended ROW corridor would have similar impacts to the Proposed Action (Appendix B). These independent projects would occur within the same general timeframe as the Proposed Action, with one project expected to employ 20 workers and the other expected to employ 12 workers. These workers would be distributed along the extended ROW corridor with the workforce employed as part of the Proposed Action, which is expected to consist of up to 30 workers. The combined impacts of these projects on the regional economy would be similar to those under the Proposed Action, small but positive.

The Proposed Action is not expected to affect the provision of public services or disproportionately affect environmental justice populations, and, therefore, cumulative impacts would be ***low***.

3.11.6 Environmental Consequences—No Action Alternative

Under the No Action Alternative, the beneficial socioeconomic impacts of construction activities would not occur and there would be ***no*** associated impact. In addition, there would be the potential for greater cost of electrical service and more frequent disruption of service, because the existing transmission line would likely require more frequent maintenance and upkeep.

3.12 CULTURAL RESOURCES

3.12.1 Affected Environment

Cultural resources include things and places that demonstrate evidence of human occupation or activity related to history, architecture, archaeology, engineering, and culture. Historic properties, as defined by 36 CFR 800 the implementing regulation of the National Historic Preservation Act (NHPA) (16 USC 470 *et seq.*), are a subset of cultural resources that consists of any district, site, building, structure, artifact, ruin, object, work of art, or natural feature important in human history that meets defined eligibility criteria for the National Register of Historic Places (NRHP).

The NHPA requires that cultural resources be inventoried and evaluated for eligibility for listing in the NRHP and that federal agencies evaluate and consider the effects of their actions on these resources. Cultural resources are evaluated for eligibility for the NRHP using four criteria commonly known as Criterion A, B, C, or 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 in the NRHP.

Historic properties include prehistoric resources that predate European contact and settlement. Traditional Cultural Properties (TCPs) are properties that are eligible for inclusion in the NRHP because of their association with the cultural practices or beliefs of a living community that are rooted in that community's history and are important in maintaining the continuing cultural identity of the community (Parker and King 1998). The study area, or area of potential effects, for cultural resources includes the existing ROW and the proposed access road and travel route system that extends off the ROW.

The earliest evidence of human occupation in southeastern Washington dates to 6,400 to 11,000 years ago (Ames et al. 1998). Populations were mainly hunter gatherers exploiting a large range of resources. As time passed, people became more dependent on fewer resources on a seasonal basis, spending more time in fewer locations. There is evidence for increased subsistence on anadromous fish, especially salmon, and root crops. Within the last four thousand years, the archaeological record shows an increasing social complexity with larger trade routes evidenced by the presence of materials not found within the occupation range of certain groups.

The region was historically inhabited by the Interior Salish people, a classification based on shared language (Ross 1998). This includes groups today known as the Spokane, Colville, Methow, Southern Okanogan, Nespelem, Sanpoil, and Nez Perce. The greatest change to traditional lifeways came with the introduction of the horse in the eighteenth century. This allowed people a greater range of travel as well as more contact with neighboring groups.

The nineteenth century brought changes to the region as fur trappers, traders, and eventually settlers entered the area following the Lewis and Clark expeditions. Congress created the Washington Territory in 1853. Conflict between Native American groups and settlers continued into the twentieth century as Native Americans were pushed onto reservations to make room for settlers expanding into the Pacific Northwest.

In compliance with the NHPA, BPA identified and documented cultural resources in the study area and evaluated them for eligibility for listing in the NRHP. In the first step of identification, BPA conducted a literature review to identify previously recorded cultural sites (Roulette et al. 2011). As required by the NHPA, BPA subsequently consulted with the Washington State Historic Preservation Officer (SHPO), Spokane Tribe of Indians, and the Confederated Tribes of the Colville Indian Reservation, requesting additional information on cultural resources within the study area.

Because the Creston-Bell transmission line shares an extended ROW corridor with three other transmission lines, different sections of the ROW have been surveyed multiple times in the past under Section 106 of the NHPA (Gough 1994; Morgan et al. 2004; Sharley and Komen 2008). Applied Archaeological Research conducted an additional cultural resource survey of the remaining unsurveyed portion of the ROW in early 2011 (Roulette et al. 2011) and the off-ROW access roads, which had not been previously surveyed, were surveyed in fall 2011 by

Archaeological and Historical Services of Eastern Washington University (Ives and Gough 2011).

Archaeological Resources

BPA's initial literature review identified eight previously recorded sites within the study area and the ROW survey identified two new sites. BPA revisited three of these sites (45SP315, 45SP366, and 45SP367) to further evaluate their location within the ROW (Oliver and Cannell 2011). Site 45SP315 was found to be located north of the study area; the other two sites (45SP366 and 45SP367) were determined to be a single site and are addressed as one site below. No cultural resources were identified in the access road survey.

Built Resources

BPA also evaluated built resources for inclusion in the NRHP. Currently BPA is in the process of compiling a Multiple Property Submission to the NRHP for its Transmission Network. The period of significance is defined as from 1937 to 1974. As part of the Transmission Network, the existing Creston-Bell transmission line is a potential cultural resource. Portions of the Creston-Bell No. 1 transmission line remain in its original ROW and the line continues to serve its original purpose, but other portions of the line have been moved and most of the line does not retain its original equipment. The relocation of portions of the line, coupled with the lack of original equipment has damaged the line's integrity. As a result, the Creston-Bell No. 1 transmission line is not considered eligible for the NRHP.

3.12.2 Environmental Consequences—Proposed Action

BPA is required under the NHPA to consider the effects of the Proposed Action to sites eligible for listing in the NRHP. Cultural resource surveys for this and other projects identified eleven cultural resource sites in the vicinity of the study area (Table 3-9). BPA determined that three of the identified sites are ineligible for listing in the NRHP: the Creston-Bell line itself (as noted above), and sites 45LI605 and 45SP696, which do not meet any of the criteria for NRHP eligibility. Because the Proposed Action would have no effect on the other eight sites due to a strategy of avoidance and monitoring, BPA has not made a formal determination of their eligibility for listing in the NRHP.

Site 45SP315, is located some distance north of the study area and would not be directly or indirectly impacted. Potential impacts to the remaining seven sites where no determination has been made would be mitigated through avoidance and monitoring. Sites 45SP303, 45SP321 and 45SP540 are far enough from work areas that they can be avoided by marking the surrounding area as "avoidance areas." No equipment may be placed or work conducted within the boundaries of an avoidance area. Sites closer to work areas (45SP366/45SP367, 45SP368, 45LI215 and 45LI216) would be protected by avoidance areas and an archaeological monitor would also be present. Based on the identified avoidance and monitoring strategies, BPA made a finding of no adverse effect to historic properties and the Washington SHPO concurred in February 2012.

Table 3-9. Cultural Resources within the Study Area

Site Number	Site Type	Avoidance Measure and Reasoning
45SP303	10 talus pits	Avoidance area with no monitor. This site is down slope of the project area. Silt fencing would be used to prevent access to the site.
45SP315	Rock feature	None. This site is located outside the project area.
45SP321	1-4 cairns	Avoidance area with no monitor. The closest project activities would involve pole replacement 100 meters away; no access road work would occur near this site.
45SP366 / 45SP367	Historic scatter	*Monitor*. Scheduled access road work would come within a few meters of the site.
45SP368	Historic debris	*Monitor*. Scheduled access road work comes within a few meters of the site.
45SP540	Talus pits and historic scatter	Avoidance area with no monitor. Site is outside the ROW. No access road construction or improvements are planned near this site.
45SP696	Historic scatter	Not eligible for listing on the NRHP.
45LI215	2 cairns	*Monitor*. Scheduled access road work comes within a few meters of the site.
45LI216	Prehistoric debitage and tool scatter.	*Monitor*. Scheduled access road work comes within a few meters of the site.
45LI605	Historic isolate (agricultural equipment – “Tillavator”)	Not eligible for listing on the NRHP.
Creston-Bell No. 1 Transmission Line	Historic transmission system	Not eligible for listing on the NRHP.

Construction activities, including removal of existing and installation of new structures and construction, improvement or reconstruction of access roads/travel routes, have the potential to affect cultural resources, including human remains, not currently known to exist in the study area. Implementation of the mitigation measures described in Section 3.12.3 would ensure that previously undiscovered historic properties were managed properly, and as required by the NHPA and would minimize both direct and indirect impacts from the Proposed Action. In the event that previously undiscovered historic properties are encountered, potential impacts would be ***low*** to ***moderate***, depending on the level and amount of disturbance and the eligibility of the resource for listing under the NHPA.

Some impacts on cultural resources could occur during the continuing operation and maintenance of the proposed transmission line. Impacts would likely be ***low*** to ***moderate***, depending on the level and amount of disturbance and the eligibility of the resource.

3.12.3 Mitigation—Proposed Action

If the Proposed Action is implemented, the following mitigation measures would be implemented to avoid and minimize impacts on cultural resources.

- Restrict work areas to avoid disturbance to seven cultural resource sites. Employ an archaeological monitor at four of the sites to further ensure impacts are avoided.
- Stop all activities in the vicinity of the find if ground-disturbing activities reveal any cultural materials (e.g., structural remains, Euroamerican artifacts, or Native American artifacts) per BPA's Inadvertent Discovery Procedure for projects. Notify the BPA archaeologist, the Washington Department of Archaeology and Historic Preservation (DAHP), and affected tribes immediately.
- Stop operations immediately within 200 feet of the find if human remains, suspected human remains, or any items suspected to be related to a human burial (i.e., funerary items, sacred objects, or objects of cultural patrimony) are encountered during project construction. Secure the area around the discovery and immediately contact the Lincoln or Spokane County Sheriff, the BPA archaeologist, the SHPO, and the affected tribes.

3.12.4 Unavoidable Impacts Remaining After Mitigation—Proposed Action

The potential impacts described in Section 3.12.2 are unavoidable because they are associated with impacts on cultural resources that are currently not known to exist, but may be discovered during construction of the Proposed Action. Implementation of the mitigation measures described in Section 3.12.3 would minimize those construction-related impacts.

3.12.5 Cumulative Impacts—Proposed Action

Cultural resources in the project vicinity have likely been cumulatively affected by past, present, and current development activities. Most impacts have likely occurred as a result of inadvertent disturbance or destruction from ground-disturbing activities such as road work, farming, site development, and forestry operations. Like the Proposed Action, other reasonably foreseeable future projects in the vicinity of the study area have the potential to disturb previously undiscovered cultural resources. Reasonably foreseeable future projects in the vicinity of the study area include two independent BPA projects identified in Appendix B of this EA. These projects would take place within the existing extended ROW corridor that includes the Creston-Bell transmission line ROW. Implementation of the mitigation measures described in Section 3.12.3 would minimize potential impacts associated with the Proposed Action and reduce the potential for construction activities to contribute incrementally to the adverse cumulative impact to cultural resources in the area. Similar mitigation measures would be employed for the two reasonably foreseeable future BPA projects, which would further reduce total impacts. In the event that previously undiscovered historic properties were encountered, potential impacts would be ***low*** to ***moderate***, depending on the level and amount of disturbance and the eligibility of the resource.

3.12.6 Environmental Consequences—No Action Alternative

Under the No Action Alternative, the existing transmission line would not be rebuilt and impacts related to the construction of the Proposed Action would not occur. Operation and maintenance activities would continue and would be similar to existing conditions. Maintenance activities would, however, likely increase as existing structures deteriorate, and more structure repair and replacement could be required. This could in turn result in potential ground disturbance that would have the potential to affect cultural resources. Impacts would be ***low*** to ***moderate***, depending on the level and amount of disturbance and the eligibility of the resource for listing under the NHPA.

3.13 NOISE, PUBLIC HEALTH, AND SAFETY

3.13.1 Affected Environment

Noise

Noise is commonly defined as loud, unwanted, or unexpected sound that disrupts normal human activities or diminishes the quality of the human environment. Audible noise is measured in ***decibels*** on the A-weighted scale. The ***A-weighted decibel*** scale (dBA) describes sound that corresponds to human perception. Table 3-10 contains examples of common activities and the associated noise level in dBA.

Table 3-10. Common Activities and Associated Noise Levels

Noise Source	Noise Level (dBA)
Loud live band music	110
Truck 50 feet away	80
Gas lawnmower 100 feet away	70
Normal conversation indoors	60
Moderate rainfall on vegetation	50
Refrigerator	40
Bedroom at night	25

Ambient Noise Environment

The study area for the noise analysis includes the noise-sensitive land uses within 1,000 feet of the transmission line corridor or within 500 feet of access roadways (i.e., any road that could be subject to increases in traffic volume from construction vehicles and worker trips). Noise-sensitive land uses within the study area include residences, recreation areas, and other areas where noise can affect how outdoor areas are used or enjoyed.

Within the study area, ***ambient noise*** levels vary with the proximity of the transmission line corridor to highways and other noise-generating activities. Most of the transmission line corridor is located in rural, undeveloped areas where noise levels are generally very low. In these areas, the predominant sources of noise are agricultural equipment operation and some vehicular traffic. Other sources of noise include maintenance activities along the transmission line corridor. In the more developed areas, particularly in the area east of the Spokane River, traffic and noise associated with human activity are major contributors to background noise. Noise from the existing transmission lines contributes to the noise setting, but is overshadowed by other noise sources in existing developed areas. Sources of audible noise associated with electrical transmission systems include construction and maintenance equipment, transmission line corona (see below), and the hum of electrical transformers.

Audible noise from high-voltage transmission lines (generally 345-kV and above) occurs as a result of conductor corona activity (i.e., the electrical breakdown of air molecules in the vicinity of high-voltage conductors). This corona activity produces a hissing, crackling, popping sound, particularly during wet conditions such as rain or fog. Generally, audible noise from 115-kV lines is so low as to be not noticeable (due to the low amount of corona activity generated at this voltage level) and is usually well below other ambient noise levels in the area. BPA designed this 115-kV transmission line to meet applicable state and federal noise regulations. Historically, public complaints/inquiries related to transmission line audible noise at this voltage level are extremely rare.

Public Health and Safety

All electrical wires, from household wiring to transmission lines, produce EMF. The primary parameters that impact the EMF levels produced by a power line are line voltage, current loading, line configuration, and line routing. Exposure to EMF depends on the design of the line and proximity to the line. The State of Washington has no regulations regarding transmission line electric or magnetic fields, and no nationally recognized regulatory standards/limits exist for electric fields from transmission lines. The NESC does specify a maximum 5-milliampere criterion for maximum permissible induced shock current from large vehicles under transmission lines with voltages 230 kV or greater. BPA designs transmission line projects to meet the NESC exposure criteria within and outside the transmission corridor ROW.

Radio and television interference from high-voltage power lines can be produced from two general sources: conductor corona activity (see Audible Noise section) and spark-discharge activity on connecting hardware. Interference from these sources is known as ***electromagnetic interference*** (EMI). In certain circumstances, EMI can affect other types of communication systems and sensitive receivers. 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). As with corona audible noise, corona EMI is generally associated with lines operating at voltages of 345 kV or higher. Historically, public complaints of radio and television interference from BPA transmission lines operating at 115-kV are rare.

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

Magnetic fields are measured in units of gauss (G) or milligauss (mG). Average magnetic field strength in most homes (away from electrical appliances and home wiring) is typically less than 2 mG. Very close to appliances carrying high current, fields of tens or hundreds of mG are present. Unlike electric fields, magnetic fields from outside power lines are not reduced in strength by trees and building material. So, 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 in the United States, and Washington does not have a limit for magnetic fields from transmission lines.

3.13.2 *Environmental Consequences—Proposed Action*

Construction Noise

Construction activities would result in short-term and intermittent noise impacts as construction progresses along the transmission line corridor. Noise would result from construction equipment and vehicles used for road work and structure removal and replacement. Noise from truck traffic and increased worker trips would temporarily contribute to existing traffic noise on local roads and highways, but is not expected to result in a substantial increase in average traffic noise levels. Noise impacts from construction traffic along local roads are expected to be ***low***.

Noise within the study is regulated by local jurisdictions (Spokane and Lincoln counties) for compliance with WAC 173-60. These regulations specify noise limits according to the type of property where the noise would be heard (the receiving property) as well as land use designation for the area where the noise would be generated (the noise source). Transmission lines are classified as industrial sources for purposes of establishing allowable noise levels at receiving properties. Nighttime noise limits are 50 dBA in residential neighborhoods, 55 dBA in commercial areas, and 60 dBA in industrial areas. The daytime noise threshold for residences is 60 dBA. Construction noise would be limited to daylight hours (7:00 a.m. to 5:00 p.m.).

Helicopters would be used to install conductors at structures. Noise associated with helicopter use would be temporary and intermittent. It would generally take less than 10 minutes to string the conductor at each structure and it is estimated that helicopters would not be in any given line mile for more than 3 hours. Although helicopter noise would likely exceed noise thresholds for some noise-sensitive receptors, the impact would be considered ***moderate*** because of the short duration of the disturbance.

Table 3-11 summarizes noise levels generated by typical equipment that would likely be used to construct the Proposed Action. Noise levels at 50 feet from a construction site would range from 80 to 89 dBA (with higher temporary-intermittent levels associated with the helicopters used to install conductors). Noise produced by construction equipment would decrease with distance at a rate of about 6 dBA per doubling of distance from the site. Based on that assumed attenuation rate, noise-sensitive properties within 800 feet of construction sites could be exposed to daytime noise levels higher than the applicable noise threshold level for residences (i.e., 60 dBA).

Table 3-11. Typical Construction Noise Levels

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

Source: Federal Transit Administration 2006

West of the Spokane River, the transmission line corridor is located far from population centers and borders mostly undeveloped land. The area east of the Spokane River is more densely developed with residences located either side of the extended transmission line ROW that includes the existing Creston-Bell transmission line. Although construction activities could exceed applicable noise thresholds for some residences, the impact would be considered ***moderate*** because construction activities at any given location are expected to be relatively short in duration (approximately 1 to 2 days) and limited to daylight hours (7:00 a.m. to 5:00 p.m.). In addition, implementation of the mitigation measures described in Section 3.13.3 would reduce noise impacts.

Noise from construction vehicles and increased work trips would temporarily contribute to existing traffic noise on local roads, but is not expected to result in a substantial increase in average traffic noise levels. Noise impacts from construction vehicles on local roadways would be ***low***.

Maintenance and Operational Noise

Periodic noise impacts would occur during maintenance activities and would typically be associated with equipment used to maintain or repair infrastructure (e.g., wood-pole structures, access roads) associated with the Proposed Action. In addition, during periodic vegetation maintenance activities, noise could be generated by various cutting devices, such as chainsaws, used to remove vegetation from the transmission line corridor. Given the short-term nature of this noise, this impact would be considered ***low***.

Although not part of the Proposed Action, BPA also conducts routine helicopter inspection patrols of the federal transmission system in the Pacific Northwest, including the transmission lines in the study area. As part of these routine patrols, BPA would continue to use helicopters to fly the line to look for any problems or repair needs. These patrols typically occur two or three times a year, generally in March, July, and/or October. Any noise experienced by receptors on the ground during these flyovers would be extremely infrequent and limited in duration (i.e., only for the few seconds it would take for the helicopter to pass over the receptor).

During stormy or very humid weather, corona noise from a transmission line operating at 230 kV or greater can contribute substantially to ambient noise. BPA design criteria ensure a maximum level of 50 dBA for corona-generated audible noise from transmission lines at the edge of the ROW. Under the Proposed Action, no changes to the operating line voltage of the Creston-Bell 115-kV transmission line are expected. Thus, the audible noise environment along the impacted line sections is not expected to substantially change as a result of the Proposed Action.

BPA has calculated audible noise levels (under wet conditions) for the Proposed Action (Table 3-12). These data are for all the lines that share the extended ROW corridor with the Creston-Bell 115-kV transmission line and include three existing 230-kV lines (one single-circuit and one double-circuit) and one 500-kV line, as well as the Creston-Bell line (see Figure 2-1). The data illustrate that there would be no substantial changes to the audible environment near the existing ROW. The impacted lines will remain compliant with applicable State of Washington noise regulations. As a result, potential impacts associated with audible noise from the corona effect would be ***low***.

Table 3-12. Existing Right-of-Way Audible Noise (dBA, wet conditions)

ROW Section Description		Northern ROW Edge	Maximum on ROW	Southern ROW Edge
Creston-Bell 115-kV and 4 adjacent lines[1/]	Before Action	44.6	52.7	46.3
	After Action	44.6	52.7	46.3

ROW = right-of-way

1/ Audible noise calculations are for the existing 400-foot-wide ROW and the following lines: Grand Coulee – Bell No. 5 230-kV; Grand Coulee – Bell No. 3 230-kV/Grand Coulee – Westside No. 1 230-kV (double-circuit); Grand Coulee – Bell No. 6 500-kV; and Creston – Bell No.1 115-kV.

Public Health and Safety during Construction

Potential public health and safety impacts would be associated with the use of construction and heavy equipment; potential exposure to hazardous materials, such as fuels and lubricants during construction; construction traffic entering and traveling across the transmission line corridor; potential aircraft hazards; and worker proximity to high-voltage power lines. Standard construction safety procedures would be employed. Implementation of the mitigation measures described in Section 3.13.3 would reduce these potential impacts, which are, therefore, expected to be ***low***.

The presence of a transmission line could also pose a hazard to any low-flying aircraft. However, given the relatively low height of the proposed structures, the risk associated with this potential hazard would be considered ***low***. Furthermore, the proposed structures would replace similar existing structures; therefore, risks to low-flying aircraft would not change from current conditions.

Public Health and Safety during Operation

The primary parameters that affect EMF levels produced by a power line are line voltage, current loading, line configuration, and line routing. The Proposed Action would not appreciably change any of these parameters and, therefore, generally speaking, ***no*** substantial changes to the EMF environment in the vicinity of the line are expected. In a few isolated cases, pole heights will need to be increased slightly to raise the conductor-to-ground clearances. In these areas, ground-level EMF would decrease slightly within the existing ROW. No changes are expected beyond the existing ROW.

BPA has calculated electric and magnetic field levels for the Proposed Action (Tables 3-13 and 3-14). These data are for all the lines that share the extended ROW corridor with the Creston-Bell 115-kV transmission line and include three existing 230-kV line and one 500-kV line, as well as the Creston-Bell line. The data illustrate that the Proposed Action would not substantially change either the electric or magnetic field environment on the existing ROW[11].

[11] Calculation of annual average and annual peak magnetic field levels reported in Table 3.14 were based on historical 2006-2011 annual line loading statistical data obtained from BPA's Supervisory Control of Data Acquisition system.

Table 3-13. Existing Right-of-Way Electric Field (kV/m)

ROW Section Description		Northern ROW Edge	Maximum on ROW	Southern ROW Edge
Creston-Bell 115-kV and 4 adjacent lines[1/]	Before Action	1.4	9.3	0.2
	After Action	1.4	9.4	0.2

ROW = right-of-way

1/ Electric field calculations are for the existing 400-foot-wide ROW and the following lines: Grand Coulee – Bell No. 5 230-kV; Grand Coulee – Bell No. 3 230-kV/Grand Coulee – Westside No. 1 230-kV (double-circuit); Grand Coulee – Bell No. 6 500-kV; and Creston – Bell No.1 115-kV.

Table 3-14. Existing Right-of-Way Magnetic Field (milligauss, based on annual 2006-2011 line load statistics)

ROW Section Description		Northern ROW Edge		Maximum on ROW		Southern ROW Edge	
		Annual Average	Annual Peak	Annual Average	Annual Peak	Annual Average	Annual Peak
Creston-Bell 115-kV and 4 adjacent lines[1/]	Before Action	8.6	18.4	114.2	185.0	7.9	11.7
	After Action	8.6	18.4	114.2	185.0	7.9	11.7

ROW = right-of-way

1/ Magnetic field calculations are for the existing 400-foot-wide ROW and the following lines: Grand Coulee – Bell No. 5 230-kV; Grand Coulee – Bell No. 3 230-kV; Grand Coulee – Westside No. 1 230-kV; Grand Coulee – Bell No. 6 500-kV; and Creston – Bell No.1 115-kV.

Under the Proposed Action, no changes to the operating line voltage of the Creston Bell 115-kV transmission line are expected. Additionally, the Proposed Action would result in new, properly installed connecting hardware that would reduce any risk associated with aging hardware that may cause electromagnetic interference with radio or television performance. 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. Radio or television interference complaints 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—Proposed Action

To reduce the potential for temporary, adverse noise impacts during construction, the following mitigation measures would be incorporated into contract specifications:

- Locate equipment as far away as is practical from noise-sensitive uses.
- Require all construction equipment powered by gasoline or diesel engines to have sound-control devices that are at least as effective as those originally provided by the manufacturer.
- Require all equipment to be operated and maintained to minimize noise generation.
- Prohibit gasoline or diesel engines from having unmuffled exhaust.

The following mitigation measures would minimize potential public health and safety risks if the Proposed Action is implemented.

- Prepare and maintain a safety plan that would detail how to manage hazardous materials such as fuel, and how to respond to emergency situations. This plan, prepared prior to the start of construction, would be kept on site at all times.
- Hold crew safety meetings at the start of each workday to review potential safety issues and concerns.
- Secure the site at the end of each workday, as much as possible, to protect equipment and the general public.
- Comply with all fire safety laws, rules, and regulations of the State of Washington and prepare a fire prevention and suppression plan to meet BPA, local authority, and land manager requirements.
- Construct and operate the new transmission line to comply with the NESC.
- 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 the site is properly cleaned up.
- Ground fences and other metal structures on and near the transmission line corridor during construction to limit the potential for shocks.

3.13.4 Unavoidable Impacts Remaining After Mitigation—Proposed Action

Unavoidable noise impacts would include noise that would be experienced by noise-sensitive receptors (i.e., residences, recreational users) during construction activities. With implementation of mitigation measures, construction noise impacts would be ***low*** to ***moderate*** and would cease upon the completion of construction activities.

Potential unavoidable public health and safety risks include increased risk of electrical shocks, accidental release of fuels or oils, accidental injury to construction workers, and possible collisions between construction vehicles and vehicles driven by the public while construction is ongoing. Implementation of the mitigation measures listed in Section 3.13.3 would reduce potential impacts to a ***low*** level.

3.13.5 Cumulative Impacts—Proposed Action

Construction noise from the Proposed Action would temporarily contribute to existing noise levels in the area. Noise levels would return to current levels following construction. Cumulative noise impacts typically occur when noise receptors are exposed to more than one noise source at approximately the same time, such as cumulative noise from construction traffic and activities, agricultural activities, and residential uses.

Other reasonably foreseeable future projects in the vicinity include two independent BPA projects that would take place within the extended ROW corridor that includes the Creston-Bell transmission line ROW. While these projects and the Proposed Action would occur within the same general timeframe, they would proceed at different speeds, and, as a result, short-term impacts in specific locations would likely occur at different times. Therefore, the potential for the Proposed Action to contribute to construction noise-related cumulative impacts is expected to be ***low***.

The Proposed Action would not increase the overall level of EMF exposure along the corridor. The transmission lines with new wood-pole structures would have similar EMF levels to those of the existing lines, and, therefore, the Proposed Action is not expected to contribute to increased EMF exposure. This would also be the case with the other reasonably foreseeable future BPA projects proposed for the extended ROW corridor.

3.13.6 Environmental Consequences—No Action Alternative

Under the No Action Alternative, noise associated with construction activities would not occur. Noise associated with maintenance would continue as in the past, and could occur more often than under the Proposed Action because of the deteriorated condition of the existing lines and the likely need for more frequent maintenance activities. Potential construction-related public health and safety risks would also not occur under the No Action Alternative. EMF exposure would remain similar to current conditions. Continued operation and maintenance of the existing transmission line would have ***low*** impacts on Noise, Public Health, and Safety.

3.14 CLIMATE CHANGE

3.14.1 Affected Environment

Greenhouse gases (GHG) are chemical compounds found in the Earth's atmosphere that absorb and trap infrared radiation as heat. Global atmospheric GHG concentrations are a product of continuous emission (release) and removal (storage) of GHGs over time. In the natural environment, this release and storage is largely cyclical. For instance, through the process of photosynthesis, plants capture atmospheric carbon as they grow and store it in the form of sugars. When plants decay or are burned, the stored carbon is released back into the atmosphere, available to be taken up again by new plants (Ecological Society of America 2008). In forests, the carbon can be stored for long periods of time, and because they are so productive and long-lived, forests have an important role in carbon capture and storage and can be thought of as temporary carbon reservoirs. There is also a large amount of GHGs stored deep underground in the form of fossil fuels, and soils store carbon in the form of decomposing plant material and serve as the largest carbon reservoir on land.

Human activities such as deforestation, soil disturbance, and burning of fossil fuels disrupt the natural cycle by increasing the GHG emission rate over the storage rate, which results in a net increase of GHGs in the atmosphere. When forests are permanently converted to cropland, for instance, or when new buildings or roads displace vegetation, the GHG storage capacity of the disturbed area is diminished. Carbon dioxide (CO_2), nitrous oxide (N_2O), and methane (CH_4) emissions increase when soils are disturbed (Kessavalou et al. 1998), and burning fossil fuels releases GHGs that have been stored underground for thousands of years and cannot be readily replaced. The resulting build up of heat in the atmosphere due to increased GHG levels increases temperatures, which causes warming of the planet through a greenhouse-like effect (U.S. Energy Information Administration 2009a). Increasing levels of GHGs could increase the Earth's temperature by up to 7.2 degrees Fahrenheit by the end of the twenty-first century (U.S. Environmental Protection Agency 2010a).

The principal GHGs emitted into the atmosphere through human activities are CO_2, CH_4, N_2O, and fluorinated gases, such as hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6) (U.S. Environmental Protection Agency 2010a). CO_2 is the major GHG emitted, and the burning of fossil fuels accounts for 81 percent of all U.S. GHG emissions (U.S.

Environmental Protection Agency 2010a; Houghton 2010; U.S. Energy Information Administration 2009b). CO_2 enters the atmosphere as a result of such activities as land use changes; burning of fossil fuels including coal, natural gas, oil, and wood products; and from the manufacturing of cement. CO_2 levels have increased to 379 parts per million within the last century, a 36 percent increase, as a result of human activities (Intergovernmental Panel on Climate Change 2007). A report discussing these specific GHGs in more detail is in Appendix E.

3.14.2 Environmental Consequences—Proposed Action

GHG emissions resulting from the Proposed Action were calculated using the methodology described in the GHG technical report (see Appendix E). Calculations were done for three types of activities that produce GHG emissions: 1) rebuilding the transmission line, 2) ongoing annual operations and maintenance for the estimated 50-year operational life of the transmission line, and 3) permanently removing vegetation for construction of roads and danger tree removal. GHG emissions associated with construction activities would occur over a period of approximately 7 months.

The Proposed Action would result in an estimated total of 8,909 metric tons of ***carbon dioxide equivalent*** (CO_2e)[12] emissions during the first year of implementation (when project construction activities would occur), and a total of an estimated 10,741 metric tons of CO_2e emissions for ongoing operations and maintenance activities over the 50-year lifespan of the line (Table 3-15). Tree removal for road construction/reconstruction and danger tree removal would constitute a reduction in the GHG storage capacity of the area. BPA assumed for the purposes of analysis that each affected acre contained the maximum level of carbon storage, which resulted in an estimated net carbon footprint associated with the removal of trees of 12,020 metric tons of CO_2e. (Detailed information related to calculations is presented in Appendix E).

Table 3-15. Net Carbon Footprint over the 50-Year Life of the Rebuild Project

Type of Activity	Total CO_2e Emissions in Metric Tons
Construction	8,909
Operation and maintenance (total)	10,741
Permanent vegetation removal	12,020

To provide context for this level of emissions, the EPA mandatory reporting threshold for large sources of GHGs is 25,000 metric tons of CO_2e emitted annually (EPA 2010b). This threshold is approximately the amount of CO_2e generated by 4,400 passenger vehicles per year. Comparatively, the emissions during project construction would be equivalent to the emissions generated by about 1,568 passenger vehicles. Operation and maintenance activities would translate into CO_2 emissions about equal to that of about 1,891 passenger vehicles over a 50-year period, or about 39 passenger vehicles per year. Because these activities would be similar to existing conditions, project GHG emissions from the Proposed Action would not represent a substantial change. Therefore, given these low contributions, the impacts of construction, operations and maintenance, and vegetation removal on GHG concentrations would be ***low***.

[12] CO_2e is a unit of measure used by the Intergovernmental Panel on Climate Change that takes into account the global warming potential of each of the emitted GHGs using global warming potential factors.

3.14.3 Mitigation

If the Proposed Action is implemented, BPA would implement the following mitigation measures to avoid or minimize impacts on GHG emissions. See Section 3.10, Air Quality, for additional mitigation measures that would minimize GHG emissions.

- Implement vehicle idling and equipment emissions measures.
- Encourage carpooling and the use of shuttle 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.
- Encourage the use of the proper size of 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 turning off computers and other electronic equipment every night.
- Recycle or salvage non-hazardous construction and demolition debris where practicable.
- Use local rock sources for road construction.

3.14.4 Unavoidable Impacts Remaining After Mitigation

Implementation of mitigation measures identified in Sections 3.10.3 and 3.14.3 would help to reduce GHG emissions. However, unavoidable impacts would include slight increases in GHG releases and decreases in GHG storage capacity. These impacts are considered to be ***low*** for the reasons discussed in Section 3.14.2.

3.14.5 Cumulative Impacts

As described above in Section 3.14.2, the impacts of the Proposed Action on GHG concentrations would be ***low***. Impacts would be further reduced through implementation of the mitigation measures identified in Section 3.14.3. All levels of GHG emissions are significant in that they contribute to global GHG concentrations and climate change. However, given the low amount of contribution, the Proposed Action's incremental impact on GHG concentrations would be ***low***. This would also be the case when combined with the other two independent reasonably foreseeable future BPA projects proposed for the extended ROW corridor (Appendix B). These projects would have similar overall impacts to the Proposed Action and employ similar mitigation measures, further reducing their potential impact.

3.14.6 Environmental Consequences—No Action Alternative

Under the No Action Alternative, the existing transmission line would not be rebuilt, so the impacts related to the construction of the Proposed Action would not occur. Operation and maintenance activities would continue similar to existing conditions, as described in Section 2.1.7. Operation and maintenance activities would include danger tree removal, which like the Proposed Action would result in an estimated net carbon footprint of 6,678 metric tons of CO_2e (see Appendix E, Table E-2). Other operation and maintenance activities would result in similar levels of CO_2e emissions to the Proposed Action (Appendix E, Table E-3). However, the frequency of maintenance activities would likely increase as existing structures deteriorate, and more structure repair and replacement could be required resulting in increased GHG emissions. Maintenance of access roads would be needed and road work would likely need to take place as an operations and maintenance activity. The maintenance activities would result in very minor increases in GHG emissions. Because the increase would be small, the impacts on Climate Change and GHG emissions are expected to be ***low***.

Chapter 4
Environmental Consultation, Review, and Permit Requirements

This chapter addresses federal statutes, implementing regulations, and executive orders applicable to the Proposed Action. This EA is being sent to tribes, federal agencies, and state and local governments as part of the consultation process for the Proposed Action. Persons consulted are listed in Chapter 5, Persons, Tribes, and Agencies Consulted.

4.1 NATIONAL ENVIRONMENTAL POLICY ACT

BPA prepared this EA pursuant to regulations implementing NEPA (42 U.S.C. 4321 *et seq.),* which require federal agencies to assess the impacts that their actions may have on the environment. NEPA requires preparation of an EIS for major federal actions significantly affecting the quality of the human environment. BPA prepared this EA to determine if the Proposed Action would cause any significant environmental impacts that would warrant preparation of an EIS or whether it is appropriate to prepare a Finding of No Significant Impact.

4.2 STATE, AREAWIDE, AND LOCAL PLAN AND PROGRAM CONSISTENCY

BPA, as a federal agency, is not required to comply with the requirements associated with obtaining state and local land use approvals or permits because Congress has not waived sovereign immunity in these areas. As a federal agency, BPA only obtains those state and local permits for which Congress has clearly and unambiguously waived sovereign immunity. However, BPA will, to the maximum extent practical, strive to meet or exceed the substantive standards and policies of the state and local environmental regulations described below.

4.2.1 Farmland Protection Policy Act

The Farmland Protection Policy Act (FPPA) (7 U.S.C. 4201 *et seq.*) requires that federal agencies avoid the unnecessary and irreversible conversion (directly or indirectly) of farmland to nonagricultural uses by ensuring that their proposed actions are consistent with federal, state, and local programs and policies designed to protect farmland. The act's purpose is to minimize the number of federal programs that contribute to the unnecessary and irreversible conversion of agricultural land to nonagricultural uses. As discussed in Section 3.2, Land Use and Recreation, of this EA, the Proposed Action would convert a small area (3 acres) of agricultural land to access roads. Other potential impacts on agricultural lands are also discussed in Section 3.2, Land Use and Recreation.

4.2.2 Washington State Growth Management Act

The Washington State Growth Management Act of 1990 (GMA), which was enacted as chapter 36.70a of the Revised Code of Washington, requires that most counties and cities in Washington adopt comprehensive plans, including "a utilities element consisting of the general location, proposed location, and capacity of all existing and proposed utilities, including, but not limited to, electrical lines, telecommunication lines, and natural gas lines." The 1991 and subsequent amendments to the GMA added more planning requirements. All of the jurisdictions crossed by the Creston-Bell transmission line rebuild project have adopted comprehensive plans under GMA. These plans are discussed below in Sections 4.2.5 through 4.2.7.

4.2.3 Washington State Shoreline Management Act

The state's Shoreline Management Act (Revised Code of Washington [RCW] Chapter 90.58) identifies "shorelines of the state" and "shorelines of statewide significance" that would be spanned by the Proposed Action. The ROW crosses the Spokane River, which is a designated shoreline of the state (WAC 173-18-040).

BPA would take the following measures, where practicable, to assure consistency with applicable Shoreline Master Plans:

- Structures near shorelines of the state would be placed in an existing corridor.
- Structures would not be placed in water bodies.
- In shoreline areas, disturbed land would be restored as closely as possible to pre-project forms and reseeded with native species.
- Erosion control measures would be implemented to protect the 200-foot shoreline area.

Other mitigation measures that would protect shorelines are listed in Section 3.5.3, Water Resources and Water Quality, and Section 3.6.3, Fish and Wildlife.

4.2.4 Critical Areas Ordinances

GMA requires that all local jurisdictions designate and protect critical areas, which are defined as wetlands, critical aquifer recharge areas, frequently flooded areas, geologically hazardous areas, and fish and wildlife habitat conservation areas. The City of Spokane and Spokane County have adopted ordinances and plans protecting critical areas. In most cases, the Proposed Action would attempt to be consistent with the provisions of these ordinances and plans because BPA would avoid critical areas and critical area buffers to the maximum extent possible. This Preliminary EA will be sent to these jurisdictions for comment.

4.2.5 Lincoln County Comprehensive Plan

The Lincoln County Comprehensive Plan (Lincoln County 1983) designates the areas crossed by the existing transmission line as an Agricultural zone. This zoning designation is intended to protect the agricultural base of Lincoln County, and to maintain agriculture's important position in the county. Non-agricultural developments are only allowed if they are compatible with the current agricultural practices in these areas. The Proposed Action would use the existing transmission line corridor and would be consistent with the Lincoln County Comprehensive Plan to the extent practicable.

4.2.6 Spokane County Comprehensive Plan

The Spokane County Comprehensive Plan (Spokane County 2011) designates the areas crossed by the existing transmission line as one of the following zoning designations:

- **Rural Conservation.** This designation applies to environmentally sensitive areas, including critical areas and wildlife corridors; it occurs in the study area around streams crossed by the Proposed Action.
- **Large Tract Agricultural zones.** This designation establishes large tract agricultural areas devoted primarily to commercial crop production. Non-resource related uses, other than rural residences, are discouraged and residential densities are typically one unit per 40 acres; the remaining portion of the Proposed Action crosses within this zone.

The Proposed Action would use the existing transmission line corridor and would be consistent with the Spokane County Comprehensive Plan to the extent practicable.

4.2.7 City of Spokane Comprehensive Plan

Under the City of Spokane's Comprehensive Plan (City of Spokane 2009), the areas crossed by the existing transmission line are assigned to one of the following zoning designations (heading from west to east along the line):

- **Conservation Open Space.** This designation includes areas that are publicly owned, not developed, and designated to remain in a natural state.
- **Residential 4-10.**This designation allows single-family residences and attached (zero-lot line) single-family residences, at a minimum of 4 and maximum of 10 units per acre.
- **General Commercial.** This designation includes a wide range of commercial uses.
- **Light Industrial.** This designation is intended for lighter industrial uses, which produce little noise, odor or smoke.
- **Heavy Industrial.** This designation is intended to accommodate heavier industrial uses at locations with no interaction with residential uses.
- **Institutional.** This designation includes uses such as middle and high schools, colleges, universities, and large governmental facilities; the Proposed Action crosses directly north of, but not through, this zone between Highway 395 and North Waikiki-North Mill Road.

The Proposed Action would use the existing transmission line corridor and would be consistent with the City of Spokane's Comprehensive Plan to the extent practicable.

4.3 VEGETATION

4.3.1 Washington Forest Practices Act

The Washington Forest Practices Act (FPA), which was enacted as Chapter 76.09 of the Revised Code of Washington, and Forest Practices Rules and Regulations, which was adopted under Title 222 of the WAC, are the state's principal means of regulating activities on nonfederal forestlands. The FPA rules and regulations are administered by WDNR. The FPA does not apply to federal agencies on nonfederal land; therefore, BPA would not obtain a FPA permit from the state. BPA will attempt to comply with the FPA where possible, and will incorporate many of the BMPs described in the FPA into the Proposed Action. In addition, as required under the FPA, BPA will consult with WDFW to protect critical habitats including riparian areas, wetlands, and habitat for bull trout.

4.3.2 Endangered Species Act

The Endangered Species Act (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 U.S. Fish and Wildlife Service (USFWS) for wildlife and freshwater species, and by NOAA Fisheries Service (NOAA Fisheries) 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 endangered or threatened species or their critical habitats. Section 7(c) 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 proposed endangered species and critical habitats.

The study area is within the potential habitat range of three federally listed plant species: water howellia (*Howellia aquatilis*), Spalding’s catchfly (*Silene spaldingii*), and Ute ladies’-tresses (*Spiranthes diluvialis*) (USFWS 2011a, 2011b). All three of these species are listed as threatened under the ESA. Potential impacts to these species are discussed in Section 3.4, Vegetation. No populations of federally listed plants were found during plant surveys of the study area in 2011. These surveys included the entire length of the existing Creston-Bell ROW, and off-ROW access roads and travel routes between the Creston Substation and line mile 17. They did not include off-ROW access roads and travel routes between line mile 17 and the Bell Substation (see Section 3.4, Vegetation). These areas will be surveyed during spring and summer of 2012, prior to construction. If present, impacts to populations of special status plant species would be reduced by implementation of the mitigation measures identified in Section 3.4.3.

4.4 WATER RESOURCES AND WATER QUALITY

4.4.1 Clean Water Act

The Clean Water Act regulates discharges into waters of the United States. The various sections applicable to the Proposed Action are discussed below.

- **Section 401.** A federal permit to conduct an activity that causes discharges into navigable waters is issued only after the affected state certifies that existing water quality standards would not be violated if the permit were issued. Applicants receiving a Section 404 permit from the Corps are required to obtain a Section 401 water quality certification from Ecology. BPA will consult with Ecology and the Corps to determine the need for permitting.
- **Section 402.** This section authorizes stormwater discharges under the National Pollutant Discharge Elimination System. EPA Region 10 has a general permit for federal facilities for discharges from construction activities. BPA would determine the need to issue a notice of intent to obtain coverage under the EPA general permit and is preparing a stormwater pollution prevention plan to address stabilization practices, structural practices, stormwater management, and other controls (see Section 3.5, Water Resources and Water Quality).
- **Section 404.** Authorization from the Corps is required in accordance with the provisions of Section 404 when dredged or fill material is discharged into waters of the United States,

including wetlands. Impacts on wetlands are described in Section 3.7, Wetlands and other regulations pertinent to wetlands and floodplains are described in Section 4.7 below. Wetlands along the ROW and new and reconstructed roads and travel routes were delineated in summer and fall 2011. BPA will coordinate with the Corps to determine the need for permitting. If the project activities are covered under an existing Nationwide Permit (33 Code of Federal Regulations [CFR] 330.1), all conditions of the permit would be followed.

4.5 FISH AND WILDLIFE

4.5.1 Endangered Species Act

The ESA is summarized above in Section 4.3.2. Lists prepared for Lincoln and Spokane counties by the USFWS indicate that pygmy rabbit (*Brachylagus idahoensis*) – Columbia Basin DPS, listed as endangered, may be present in Lincoln County. Habitat features that would support these species are currently rare or absent, and few historical occurrences of these species in the study area have been documented, thus, this species is highly unlikely to occur in the study area. The USFWS also identified four candidate species—the greater sage grouse (*Centrocercus urophasianus*) – Columbia Basin DPS, North American wolverine (*Gulo gulo luteus*) – contiguous U.S. DPS, Washington ground squirrel (*Spermophilus washingtoni*), and yellow-billed cuckoo (*Coccyzus americanus*)—that may be present in Lincoln and Spokane counties (USFWS 2010a, 2011c). The greater sage grouse has limited potential to occur in the general vicinity of the study area, but very little or no suitable habitat is present for this species in the study area; the other three identified candidate species are considered very unlikely to occur. Potential impacts are discussed in Section 3.6, Fish and Wildlife.

In addition, the USFWS lists indicate that one fish species, bull trout (*Salvelinus confluentus*) – Columbia River DPS, listed as threatened, may be present in Lincoln and Spokane counties. However, as discussed in Section 3.6, Fish and Wildlife, this species is highly unlikely to be present in streams that cross the study area.

NOAA Fisheries indicated that there are no salmon or steelhead populations in the vicinity of the Proposed Action and consultation would not be required for this project (Bambrick pers. comm.).

4.5.2 Fish and Wildlife Conservation Act and Fish and Wildlife Coordination Act

The Fish and Wildlife Conservation Act of 1980 (16 U.S.C. 2901 *et seq*.) encourages federal agencies to conserve and promote conservation of non-game fish and wildlife and their habitats. In addition, the Fish and Wildlife Coordination Act (16 U.S.C 661 *et seq*.) requires federal agencies with projects affecting water resources to consult with USFWS and the state agency responsible for fish and wildlife resources. The analysis in Section 3.6, Fish and Wildlife, indicates that the Proposed Action would result in a level of impact ranging from no impact to low impact on fish and wildlife resources. The USFWS and WDFW will be sent copies of this Preliminary EA and mitigation measures designed to avoid and minimize impacts to fish and wildlife and their habitat is identified in Section 3.5, Water Resources and Water Quality, and Section 3.6, Fish and Wildlife of this EA.

4.5.3 Magnuson-Stevens Fishery Conservation and Management Act

Public Law 104–297, the Sustainable Fisheries Act of 1996, amended the Magnuson-Stevens Fishery Conservation and Management Act (16 USC 1801 *et seq.*). Under Section 305(b)(4) of the Act, BPA is required to consult with NOAA Fisheries for actions that adversely affect essential fish habitat (EFH). EFH can include all streams, lakes, ponds, wetlands, and other viable water bodies, and most of the habitat historically accessible to salmon necessary to fish for spawning, breeding, feeding or growth to maturity. NOAA Fisheries is required to provide EFH conservation and enhancement recommendations. There is no EFH for any Pacific salmon species in or near the study area because all the streams in the area are well upstream of anadromous fish accessible areas.

4.5.4 Migratory Bird Treaty Act and Federal Memorandum of Understanding

The Migratory Bird Treaty Act implements various treaties and conventions between the United States and other countries, including Canada, Japan, Mexico, and the former Soviet Union, for the protection of migratory birds (16 U.S.C. 703–712). Under the Act, taking, killing, or possessing migratory birds, or their eggs or nests, is unlawful. The Act classifies most species of birds as migratory, except for upland and nonnative birds such as pheasant, chukar, gray partridge, house sparrow, European starling, and rock dove.

BPA, through the U.S. Department of Energy, and USFWS have a memorandum of understanding (MOU) to address migratory bird conservation in accordance with Executive Order 13186, which directs each federal agency that is taking actions possibly negatively affecting migratory bird populations to work with the USFWS to develop an agreement to conserve those birds (U.S. Department of Energy and U.S. Fish and Wildlife Service 2006). The MOU addresses how both agencies can work cooperatively to address migratory bird conservation and includes specific measures to consider implementing during project planning and implementation.

The Proposed Action may affect migratory birds through loss of habitat and potential for collisions with the transmission line. BPA would implement feasible measures, including the design of transmission lines to minimize bird collisions and electrocutions. The larger conductor that would be used could make it more visible to birds, decreasing the potential for collisions. The transmission line would continue to operate at 115 kV. This transmission line is designed with conductors spaced far enough apart to prevent electrocution of raptors. BPA would mark the rebuilt transmission line with bird flight diverters over any major water body that may be a potential flyway for migratory bird species (water fowl) where appropriate. Potential impacts and mitigation measures are discussed in Section 3.6, Fish and Wildlife.

Construction, operation, and maintenance of the Proposed Action would result in a similar level of impact on migratory birds as it would on other birds and wildlife described in Section 3.6.2. Construction, operation, and maintenance of the Proposed Action would result in low impacts on migratory birds, as a result of loss of habitat or direct mortality.

4.5.5 Bald Eagle and Golden Eagle Protection Act

The Bald Eagle and Golden Eagle Protection Act prohibits the taking or possessing of and commerce in bald and golden eagles, with limited exceptions (16 U.S.C. 668–668d). Because the

Act covers only intentional acts, or acts in "wanton disregard" of the safety of bald or golden eagles, the Proposed Action is not considered to be subject to its compliance because any impacts would not be intentional or result from disregard. Danger trees along and adjacent to the existing ROW would be inspected for the presence of nesting avian species prior to removal. Large stick nests (raptors) would be documented to species to determine whether they can be removed. No trees containing large stick nests would be removed during the nesting season (see Section 3.6.3).

4.6 WETLANDS AND FLOODPLAIN PROTECTION

The U.S. Department of Energy mandates that impacts on 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 Executive Orders 11988 and 11990. Potential impacts on floodplains and wetlands from the Rebuild Project are discussed in detail in Sections 3.7, Wetlands, and 3.8, Floodplains.

Wetland management, regulation, and protection are addressed in several sections of the Clean Water Act, including Sections 401, 402, and 404 (see Section 4.6 above). Wetlands are also addressed in a combination of other state and federal laws, including the Coastal Zone Management Act, ESA, National Historic Preservation Act (NHPA), Rivers and Harbors Act, and Wild and Scenic Rivers Act.

4.7 AIR QUALITY

4.7.1 Clean Air Act

The federal Clean Air Act, as revised in 1990 (42 U.S.C. 7401 *et seq.*), requires EPA and individual states to carry out a wide range of regulatory programs intended to assure attainment of the national ambient air quality standards. In the state of Washington, EPA has delegated authority to Ecology, which has regulations requiring all industrial activities (including construction projects) to minimize windblown fugitive dust.

There would be no burning of cleared material, due to the small amount of land where tree removal would take place. Vehicles used during construction of the Proposed Action would be maintained so as to minimize emissions. Water trucks would be used to minimize fugitive dust during project construction. Potential impacts from the Rebuild Project on air quality are discussed in detail in Section 3.10, Air Quality.

4.8 SOCIOECONOMICS AND PUBLIC SERVICES

4.8.1 Federal Communications Commission

Federal Communications Commission regulations require that transmission lines be operated so that radio and television reception would not be seriously degraded or repeatedly interrupted. While the Proposed Action is not expected to increase EMI above existing levels, any complaints about EMI would be investigated.

4.8.2 Executive Order on Environmental Justice

In February 1994, Executive Order 12898, Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations, was released to federal agencies. This order states that federal agencies must 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 Proposed Action would not cause disproportionately high and adverse impacts on minority and low-income populations (see Section 3.11, Socioeconomics and Public Services).

4.8.3 Overhead Power and Communication Lines

WAC 468-34-280 recommends that longitudinal installations of power lines (on public ROWs) be of single-pole construction, and that joint-use single-pole construction is generally desirable and should be used whenever feasible. The Proposed Action design calls for the rebuilt line to be supported by structures composed of two or three wood poles and essentially replace the existing structures in-kind. It is not feasible to construct the Proposed Action with single-pole structures. Single poles would result in twice as much disturbance and be more costly because more poles would be required for the line.

4.8.4 Vertical Clearance and Location

WAC 468-34-290 and 468-34-300 require that vertical clearances for overhead power lines conform to the National Electric Safety Code and/or the clearances identified in the WAC, whichever are greater. The minimum clearance specified for 115 kV transmission lines is 32 feet above the groundline, including roadways. The code also specifies that utility lines be located as near as practicable to the edge of the ROW while still maintaining a reasonably uniform alignment. The Proposed Action would conform to the minimum clearances, as required by the NESC, and would be located as close to the ROW edge as practicable.

4.9 CULTURAL RESOURCES

Several regulations are in place to govern management of cultural resources. 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, such as national landmarks, archeological sites, and properties listed (or eligible for listing) on the NRHP. Established regulations include:

- Antiquities Act of 1906 (16 U.S.C. 431–433)
- Historic Sites Act of 1935 (16 U.S.C. 461–467)
- Section 106 of the NHPA of 1966 (16 U.S.C. 470 *et seq*.), as amended
- Archaeological Data Preservation Act of 1974 (16 U.S.C. 469 a–c)
- Archaeological Resources Protection Act of 1979 (16 U.S.C. 470aa-mm), as amended
- Native American Graves Protection and Repatriation Act (25 U.S.C. 3001 *et seq*.)
- Executive Order 13007 Indian Sacred Sites
- American Indian Religious Freedom Act of 1978 (42 U.S.C. 1996, 1996a)

Section 106 of the NHPA requires federal agencies to consider the effects of their actions on historic properties. The NHPA provides a process, known as the Section 106 process that enables agencies to assess impacts on historic properties along with participation from interested and affected parties such as tribes, and then avoid, minimize, or mitigate for these impacts. Historic properties may be prehistoric or historic sites, including objects and structures that are included in or eligible for inclusion in the NRHP. Historic properties also include artifacts or remains within historic sites and properties of traditional and cultural importance to tribes.

To this end, BPA has provided information about the Proposed Action and requested input on the level and type of proposed identification and evaluation efforts of the prehistoric resources from the following tribes: the Spokane Tribe of Indians and the Confederated Tribes of the Colville Indian Reservation. Consultation with these tribal organizations was initiated on February 7, 2011. BPA also initiated consultation with the Washington DAHP on February 7, 2011. Consultation was initiated with WDNR, BLM, and Washington State Parks on February 15, 2011.

The extended ROW that includes the existing Creston-Bell transmission line has been surveyed multiple times in the past as a result of BPA's work under Section 106 of the NHPA, which requires documentation of historic properties (Gough 1994; Morgan et al. 2004; Sharley and Komen 2008). An additional cultural resource survey of the ROW was conducted in early 2011 and a survey of off ROW access roads was conducted in fall 2011 (Roulette et al. 2011; Ives and Gough 2011). The results of these surveys are summarized in Section 3.12, Cultural Resources. Based on the avoidance and monitoring strategies identified in Section 3.12, Cultural Resources, BPA made a finding of no adverse effect to historic properties and the Washington SHPO concurred in February 2012.

4.10 NOISE, PUBLIC HEALTH, AND SAFETY

4.10.1 Toxic Substances Control Act

The Toxic Substances Control Act (15 U.S.C. 2601 *et seq.*) is intended to protect human health and the environment from toxic chemicals. Section 6 of the act regulates the use, storage, and disposal of PCBs. BPA adopted guidelines to ensure that PCBs are not introduced into the environment. Equipment used for the Proposed Action would not contain PCBs. Any equipment removed that may have PCBs would be handled according to the disposal provisions of this Act.

4.10.2 Federal Insecticide, Fungicide, and Rodenticide Act

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 in accordance with BPA's *Transmission System Vegetation Management Program Final Environmental Impact Statement*. Herbicides are used on transmission line ROWs and in substation yards 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 Resource Conservation and Recovery Act (RCRA) standards discussed below.

4.10.3 Resource Conservation and Recovery Act

RCRA (42 U.S.C. 6901 *et seq.*), as amended, is designed to provide a program for managing and controlling hazardous waste by imposing requirements on generators and transporters of this waste, and on owners and operators of treatment, storage, and disposal facilities. Each facility owner or operator is required to have a permit issued by EPA or the state. Typical construction and maintenance activities have generated small amounts of the following hazardous wastes: solvents, pesticides, paint products, motor and lubricating oils, and cleaners. Small amounts of hazardous wastes may be generated under the Proposed Action. These materials would be disposed of according to state law and RCRA.

If a hazardous material, toxic substance, or petroleum product is discovered, and may pose an immediate threat to human health or the environment, BPA requires that the contractor notify the Contracting Officer's Technical Representative immediately. Other conditions such as large dump sites, drums of unknown substances, suspicious odors, and stained soil must also be reported immediately. The technical representative will coordinate with the appropriate BPA personnel. In addition, the contractor will not be allowed to disturb such conditions until the technical representative has given the notice to proceed.

The construction contractor and transmission line facilities manufacturers will consult with the WSDOT and with city and county public works departments to secure necessary permits for the transportation of large loads on the roadways.

4.10.4 Maximum Environmental Noise Levels

The federal Noise Control Act of 1972 (42 U.S.C. 4901 *et seq.*) requires that federal entities, such as BPA, comply with state and local noise requirements. Environmental noise limits relevant to the Proposed Action are regulated by Ecology Maximum Environmental Noise Levels (WAC 173-60), which establish limits on levels and duration of noise. Allowable maximum sound levels depend on the land use of the noise source and receiving property. In addition, BPA has established a 50 dBA design criterion for corona-generated audible noise from transmission lines at the edge of the ROWs. Ecology has interpreted this criterion to meet its noise regulations. As described in Section 3.13, Noise, Public Health, and Safety, the Proposed Action would have temporary low to moderate noise impacts, and mitigation measures identified in Section 3.13.3 would further reduce these impacts.

4.10.5 Transportation Permits

According to RCW 46.44, oversized or overweight vehicles need transportation permits to travel on highways and local public roads in the state. The construction contractors will consult with WSDOT and the Lincoln County and Spokane County Public Works Departments to comply with state and local requirements. Necessary transportation permits for oversized or overweight vehicles used for project construction and maintenance would be secured as required.

4.10.6 Uniform Fire Code

The development of a hazardous materials management plan may be required by local fire districts in accordance with the Uniform Fire Code. BPA will develop and implement such a plan, if required.

4.11 CLIMATE CHANGE

Various federal and state mandates address the need to reduce GHG emissions, including the following.

- The Clean Air Act is a federal law that establishes regulations to control emissions from large generation sources such as power plants; limited regulation of GHG emissions occurs through New Source Review permitting program.
- EPA has issued the *Final Mandatory Reporting of Greenhouse Gases Rule* (40 CFR 98) that requires reporting of GHG emissions from large sources. Under the rule, suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHGs are required to submit annual reports to EPA (EPA 2010).
- Executive Orders 13423 and 13514 require federal agencies to measure, manage, and reduce GHG emissions by agency-defined target amounts and dates.
- In Washington State, Executive Orders 07-02 and 09-05 direct state agencies to work with western states and Canadian provinces to develop a regional emissions reduction program designed to reduce GHG emissions to 1990 levels by 2020 (Ecology 2010).

GHG emissions were calculated for the Proposed Action activities that would produce GHG emissions: construction of the transmission line, permanent vegetation removal for roads, and ongoing annual operations and maintenance for the estimated 50-year operational life of the transmission line. GHG emissions would be below EPA's mandatory reporting threshold. The impact of the Proposed Action on GHG concentrations would be low, as discussed in Section 3.14, Climate Change.

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Chapter 5
Agencies, Organizations, and Persons Receiving Notice of the Availability of this EA

The project mailing list includes tribes; local, state, and federal agencies; utilities; public officials; and potentially interested or affected landowners. These agencies, organizations, and people will have an opportunity to review and comment on the EA. Specific entities (other than private persons) receiving this EA are listed below by category.

5.1 FEDERAL AGENCIES

National Oceanic and Atmospheric Administration, National Marine Fisheries Service
U.S. Army Corps of Engineers
U.S. Department of the Interior, Bureau of Land Management
U.S. Department of the Interior, Fish and Wildlife Service
U.S. Environmental Protection Agency

5.2 STATE AGENCIES

Washington State Department of Archaeology and Historic Preservation
Washington Department of Fish and Wildlife
Washington State Department of Natural Resources, State Lands Archaeology
Washington State Department of Natural Resources, Washington Natural Heritage Program
Washington State Department of Transportation
Washington State Parks and Recreation Commission

5.3 TRIBES

The Confederated Tribes of the Colville Indian Reservation
The Spokane Tribe of Indians

5.4 LOCAL GOVERNMENTS AND UTILITIES

5.4.1 County

Lincoln County

Commissioner Rob Coffman
Commissioner Dennis Bly
Jim Degraffenreid, Land Services Director
Director Rick Becker, Department of Public Works
Lincoln County Emergency Services, Sheriff’s Office
Kevin Hupp, Coordinator Noxious Weed Control Board
Chairman Scott Hutsell, District 2

Spokane County

Planning Director John Pederson
Commissioner Todd Mielke
Commissioner Mark Richard
Chairman Al French, District 3
Spokane County Emergency Management

5.4.2 City

Mayor Blake Angstrom, City of Creston
Jo Anne Wright, Department of Planning, City of Spokane

5.4.3 Utilities

Inland Power & Light, Rick Campos

Chapter 6
Glossary and Acronyms

6.1 GLOSSARY

Access road – roads and spurs that provide access to the transmission line corridor and structure sites during construction and operation and maintenance.

Ambient noise – background noise generated by existing noise sources in the surrounding area.

Angle structures – structures that support the transmission line at points where it changes direction at an angle of 15 degrees or more.

Aquifer – underground bed or layer of permeable rock, sediment, or soil that contains groundwater.

Average daily traffic – the average number of vehicles that pass a specific point going both directions over a 24-hour period.

A-weighted decibels – logarithmic measurement of sound based on the decibel but weighted to approximate the human perception of sound. Commonly used for measuring environmental and industrial noise levels.

Best management practices – the practices determined by the discipline to be the most effective at achieving a specific goal.

Capacity – the ability to store an electrical charge.

Carbon dioxide equivalent – a measurement used to compare the global warming potential of a typical greenhouse gas, based on concentrations of carbon dioxide.

Centerline – the center line of the transmission corridor, which divides the corridor into halves of equal width.

Circuit – the pathway for an electrical current.

Compaction – the compression of soils by heavy equipment, which degrades soil structure and increases the risk of sheet erosion.

Conductor – the wire cable strung along a transmission line through which electricity flows.

Counterpoise – a weight that counterbalances the weight of the transmission lines, typically underground wires that extend horizontally from each structure and that connect with ground wire to provide lightning protection.

Corona – an electrical field around the surface of a conductor, insulator, or hardware caused by ionization of the surrounding air.

Cultural resources – historic, archaeological, or paleontological resources that are protected under federal statutes, regulations, and executive orders.

Culvert – a device used to carry or divert water from a drainage area in order to prevent erosion.

Cumulative impacts – 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.

Current – the flow of an electrical charge through the transmission line conductor.

Dampers – devices attached to insulators in order to minimize vibration of the conductors in windy conditions.

Danger trees –trees located off the transmission line corridor that are a current or future hazard to the transmission line.

Dead-end structure – a structure that can independently carry the weight and tension of conductors and is typically used on a straight alignment, at angles greater than 15 degrees, or over river crossings.

Debitage – all waste material produced during lithic reduction and the production of chipped stone tools.

Decibel – a logarithmic ratio of sound relative to a reference level.

Distinct Population Segment –a vertebrate population or group of populations that is discrete from other populations of the species and significant in relation to the entire species. The federal Endangered Species Act provides for listing species, subspecies, or distinct population segments of vertebrate species.

Dryland – land that receives little precipitation; used in reference to agricultural production without irrigation.

Electromagnetic field – the physical field around the electric wire or conductor that is produced when electric transmission is occurring.

Electromagnetic interference – interference of an electrical device caused by the presence of an electromagnetic field.

Endangered Species - a plant or animal species in danger of extinction within the foreseeable future throughout all or a significant portion of its range.

Environmental justice populations – low-income and minority populations protected under Executive Order 12898 from disproportionate adverse effects of federal projects.

Erosion – the movement of soil and surface sediments caused by wind and water.

Essential fish habitat – the environmental conditions that are necessary for the spawning, breeding, growth, and nurture of specific fish species.

Flash flood – a rapid flood of a low-lying area such as a steep wash or canyon that results from intense rainfall

Floodplain – the flat land that is adjacent to a surface water that is periodically flooded.

Fossil fuels – fuels derived from hydrocarbon deposits in the Earth's crust; typically combusted for energy (e.g., natural gas, oil, and coal).

Global warming potential - a relative measure of how much heat a greenhouse gas traps in the atmosphere that compares the amount of heat trapped by a certain mass of the gas in question to the amount of heat trapped by a similar mass of carbon dioxide.

Graminoids – herbaceous plants with narrow leaves growing from the base, including grasses (cereals, bamboo, and grassland), sedges, and rushes.

Greenhouse gas – chemical compounds that absorb and trap infrared radiation as heat (e.g., carbon dioxide, nitrous oxide, methane, and fluorinated gases).

Ground wire – wires placed above the conductors to route lightning-strike electricity to the ground.

Groundwater – water that is stored beneath the Earth's surface in soil pores or rock formations.

Guy wire – a tensioned cable that anchors a structure to the ground to provide extra stability.

Historic isolate – an archaeological site with less than 9 artifacts.

Insulator – a component made of non-conductive materials that connects the conductor to the suspension structure and prevents the transmission of electrical current from the conductor to the ground.

Intermittent stream – a stream or waterway that only flows for part of the year.

Kilovolt– one thousand volts of electrical power.

Landslide – the movement of surface soil and other matter down a steep slope.

Large woody debris – large woody matter that falls into surface waters and provides channel stability and habitat complexity for aquatic species.

Lattice-steel structure – a square or triangular transmission tower constructed steel poles.

Lek - traditional breeding area for sage and sharp-tailed grouse where male grouse assemble to establish dominance and display to attract females during the breeding season (also referred to as strutting-ground).

Liquefaction – a process whereby waterlogged soil becomes soft and liquid as a result of ground shaking.

Low-income population – a group of low-income residents who live in geographic proximity that could be disproportionately affected by a federal action.

Minority population – a group of minority persons who live in geographic proximity that could be disproportionately affected by a federal action.

Mitigation –measures that would reduce the impacts of the Proposed Action on a resource by reducing the impact, avoiding it completely, or compensating for the impact.

Nonattainment area – an air basin that is not in compliance with applicable air quality standards for a specific pollutant.

Nonnative – a species that has been introduced and has acclimated to an area outside of its normal distribution range.

Noxious weeds – nonnative plants that have been identified by state law as damaging to natural or human resources.

100-year floodplain – areas that have a 1% chance of being flooded in a given year, as designated by the Federal Emergency Management Agency.

Outage – the loss of electric power to an area caused by a natural or human disturbance to the electrical system.

Perennial – refers to streams or waterways with continuous, year-round water flow.

Pliocene - an epoch of the Tertiary period occurring between about 5 and 2 million years ago.

Priority habitats – a habitat designated for protection because of its rarity or functional significance.

Pulling and tensioning – the process of installing and tightening new conductors.

Reconductor – to replace the cable or wire on a transmission line.

Redox concentrations - zones of apparent accumulation of iron and manganese oxides in soils.

Right-of-way – the corridor of land in which transmission structures and conductors are established, operated, and maintained.

Riparian – refers to vegetation or habitat situated on the banks of rivers and streams.

Salmonid – member of the family of soft-finned fish that includes salmon and trout. Most are anadromous: they spawn in fresh water, but spend their life in the marine environment.

Sheet erosion – the removal of a uniform, thin layer of soil by raindrops or water runoff on bare soil.

Sock line – the line or rope connected to a steel wire that is used to pull the conductors through the structures during installation.

Sole Source Aquifer – defined by the EPA as an underground water source that supplies at least 50 percent of the drinking water consumed in the area overlying the aquifer.

Special-status species – plant or wildlife species that have been identified for protection and/or management under federal or state law.

Spur road – a short length of new road extending an existing road network.

Staging area – the area cleared and used to store and assemble materials and equipment.

Stormwater runoff – precipitation water that runs off non-permeable surfaces into a drainage, sewer, or stormwater system.

Structure – a type of support used to hold up transmission or substation equipment.

Substation – the fenced site that contains the terminal switching and transformation equipment that transforms voltage.

Surface water – open water bodies such as rivers, lakes, and streams.

Tap Line – a line that connects to an existing transmission or distribution line without breakers at the tap point, resulting in an additional terminal on the existing line.

Threatened species – a plant or animal species that is likely to become endangered within the foreseeable future throughout all or a significant portion of its range.

Total Maximum Daily Load – the maximum amount of a pollutant that can be introduced to a water body while still being compliant with water quality standards.

Travel route – either a route through farm fields (temporary travel route) or existing non-public roads in good condition that may require improvement for use (permanent travel route).

Turbidity –the amount of particulate matter, such as suspended sediment, per unit volume of water.

Unconsolidated sediments – sediments such as soil, sand, or organic matter that are not bound together and are susceptible to wind and water erosion.

Unincorporated land – land that is not part of or governed by a municipality.

Upland – land above the floodplain that supports precipitation-dependent vegetation.

Watershed – a geographic area that is drained by a river and its tributaries. Separated from other watersheds by an elevated boundary such as a mountain.

Wetland – land that is permanently or periodically saturated with water. May be connected to a surface water or groundwater source. Indicators of wetlands include plant species adapted to such conditions, characteristic soil colors and chemical properties, and physical evidence of flooding or waterlogged soils.

6.2 ACRONYMS AND ABBREVIATIONS

ADT	average daily traffic
AOL	Ahead-On-Line
BLM	Bureau of Land Management
BMP	best management practice
BOL	Back-On-Line
BPA	Bonneville Power Administration
CFR	Code of Federal Regulations
CH_4	methane
CO	carbon monoxide
CO_2	carbon dioxide
CO_2e	carbon dioxide equivalent
Corps	U.S. Army Corps of Engineers
DAHP	Washington Department of Archaeology and Historic Preservation
dBA	A-weighted decibel
dbh	diameter at breast height
DPS	distinct population segment
EA	Environmental Assessment
Ecology	Washington State Department of Ecology
EFH	essential fish habitat
EIS	environmental impact statement
EMF	electromagnetic fields
EMI	electromagnetic interference
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act of 1973
FAA	Federal Aviation Administration
FEMA	Federal Emergency Management Agency
FPA	Forest Practices Act
FPPA	Farmland Protection Policy Act
G	gauss
GHG	greenhouse gas
GMA	Washington State Growth Management Act of 1990
IPL	Inland Power & Light
kV	kilovolt
$\mu g/m^3$	micrograms per cubic meter

mG	milligauss
MOU	memorandum of understanding
N_2O	nitrous oxide
NAAQS	national ambient air quality standards
NEPA	National Environmental Policy Act
NESC	National Electric Safety Code
NHPA	National Historic Preservation Act
NLCD	National Land Cover Database
NOAA Fisheries	National Oceanic and Atmospheric Administration Fisheries Service
NO_X	nitrogen oxides
NPCC	Northwest Power and Conservation Council
NRCS	Natural Resources Conservation Service
NRHP	National Register of Historic Places
OFM	Washington Office of Financial Management
PCBs	polychlorinated biphenyls
PCC	Palouse River and Coulee City
PHS	Priority Habitats and Species
PM10	particulate matter less than 10 micrometers in size
PM2.5	particulate matter less than 2.5 micrometers in size
RCRA	Resource Conservation and Recovery Act
RCW	Revised Code of Washington
Rebuild Project	Creston-Bell Transmission Line Rebuild Project
ROW	right-of-way
SVRPA	Spokane Valley-Rathdrum Prairie Aquifer
Type F	fish-bearing waters
Type N	non-fish-bearing waters
Type Np	perennial, non-fish-bearing waters
Type Ns	seasonal, non-fish-bearing waters
Type S	shorelines of the state
Type U	unidentified waters
U.S.C.	United States Code
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey
VOCs	volatile organic compounds

WAC	Washington Administrative Code
WDFW	Washington Department of Fish and Wildlife
WDNR	Washington State Department of Natural Resources
WSDOT	Washington State Department of Transportation

Chapter 7
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7.2 PERSONAL COMMUNICATIONS

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Burnett, Linda. Public Affairs Office for Washington State Parks and Recreation Commission. September 21, 2011—Personal Communication with Derek Holmgren, Tetra Tech, regarding visitation to Riverside State Park.

Guidotti, Chris. Washington State Parks and Recreation Commission. Riverside State Park Manager. February 16, 2012—Email communication with Katy Beck, Beck Botanical Services, regarding rare plant surveys in Riverside State Park.

Appendix A
Potential Danger Trees

Total # of Trees:	274	Creston-Bell No.1 Rebuild Project Danger Tree Cutting List						
Distance from Structure +/- FT	**Structure #**	**Distance to Tower +/- FT**	**Structure #**	**Right or Left of Center Line**	**Distance from Center Line**	**Species**	**Quantity**	**DBH**
-55	4/3	+10	4/3	Right	50-60'	Ponderosa	1	-8"
"	"	"	"	"	"	"	2	8"
"	"	"	"	"	"	"	1	10"
"	"	"	"	"	"	"	2	11"
"	"	"	"	"	"	"	1	12"
"	"	"	"	"	"	"	1	14"
"	"	"	"	"	"	"	1	16"
-80	4/7	+100	4/7	"	"	"	1	14"
"	"	"	"	"	"	"	1	20"
"	"	"	"	"	"	"	1	24"
+160'	4/8	+185'	4/8	"	50-60'	"	1	14"
"	"	"	"	"	"	"	1	18"
+250'	5/3	-245	5/4	"	50-55'	"	2	8"
"	"	"	"	"	"	"	2	9"
"	"	"	"	"	"	"	1	10"
"	"	"	"	"	"	"	4	11"
"	"	"	"	"	"	"	4	12"
"	"	"	"	"	"	"	1	13"
"	"	"	"	"	"	"	2	15"
"	"	"	"	"	"	"	1	16"
+180'	5/4	+280'	5/4	"	50-60'	"	1	16"
"	"	"	"	"	"	"	1	21"
+200'	5/6	+215	5/6	"	"	"	1	13"
"	"	"	"	"	"	"	3	16"
-10'	5/7			"	"	"	1	-8"

Total # of Trees:	274	Creston-Bell No.1 Rebuild Project Danger Tree Cutting List						
Distance from Structure +/- FT	**Structure #**	**Distance to Tower +/- FT**	**Structure #**	**Right or Left of Center Line**	**Distance from Center Line**	**Species**	**Quantity**	**DBH**
"	"			"	"	"	2	9"
-20'	6/1			"	50-70'	"	1	28"
+270'	7/4	-100'	7/5	"	50-60'	"	1	8"
"	"	"	"	"	"	"	1	13"
"	"	"	"	"	"	"	2	15"
"	"	"	"	"	"	"	1	16"
"	"	"	"	"	"	"	1	19"
"	"	"	"	"	"	"	1	23"
-120'	7/7			"	"	"	1	26"
+85'	7/7	+160'	7/7	"	"	"	1	13"
"	"	"	"	"	"	"	1	14"
"	"	"	"	"	"	"	2	18"
-320'	7/8			"	50-70'	"	1	16"
+120'	8/1			"	"	"	1	16"
"	"			"	"	"	1	18"
+50'	8/2			"	50-60'	"	1	17"
-90'	8/3	-60'	8/4	"	"	"	2	14"
"	"	"	"	"	"	"	1	17"
"	"	"	"	"	"	"	2	18"
"	"	"	"	"	"	"	1	19"
-170'	8/5			"	"	"	1	20"
+150'	8/6			"	"	"	1	28"
"	"			"	"	"	1	30"
+0'	10/1	+80'	10/1	"	50-70'	"	4	14"
"	"	"	"	"	"	"	1	15"

Total # of Trees:	274	Creston-Bell No.1 Rebuild Project Danger Tree Cutting List						
Distance from Structure +/- FT	**Structure #**	**Distance to Tower +/- FT**	**Structure #**	**Right or Left of Center Line**	**Distance from Center Line**	**Species**	**Quantity**	**DBH**
"	"	"	"	"	"	"	2	17"
+150'	10/2			"	"	"	1	22"
"	"			"	"	Douglas Fir	1	21"
-75'	10/3	-200'	10/4	"	50-75'	Ponderosa	1	-8"
"	"	"	"	"	"	"	2	10"
"	"	"	"	"	"	"	1	12"
"	"	"	"	"	"	"	1	19"
"	"	"	"	"	"	Douglas Fir	4	-8"
"	"	"	"	"	"	"	12	8"
"	"	"	"	"	"	"	1	9"
"	"	"	"	"	"	"	4	10"
"	"	"	"	"	"	"	3	12"
"	"	"	"	"	"	"	2	13"
"	"	"	"	"	"	"	1	14"
"	"	"	"	"	"	"	2	15"
"	"	"	"	"	"	"	2	16"
"	"	"	"	"	"	"	2	17"
-25'	10/4	+230'	10/4	"	"	"	1	8"
"	"	"	"	"	"	"	1	13"
"	"	"	"	"	"	"	1	14"
"	"	"	"	"	"	"	2	15"
"	"	"	"	"	"	"	2	19"
"	"	"	"	"	"	"	1	20"
"	"	"	"	"	"	"	1	22"
"	"	"	"	"	"	Ponderosa	1	-8"

Total # of Trees:	274	Creston-Bell No.1 Rebuild Project Danger Tree Cutting List						
Distance from Structure +/- FT	**Structure #**	**Distance to Tower +/- FT**	**Structure #**	**Right or Left of Center Line**	**Distance from Center Line**	**Species**	**Quantity**	**DBH**
"	"	"	"	"	"	"	1	18"
+245'	10/4	-215'	10/5	"	"	"	1	9"
"	"	"	"	"	"	"	1	10"
"	"	"	"	"	"	"	1	12"
"	"	"	"	"	"	"	1	13"
"	"	"	"	"	"	"	1	14"
"	"	"	"	"	"	"	2	18"
"	"	"	"	"	"	Douglas Fir	1	11"
"	"	"	"	"	"	"	1	13"
"	"	"	"	"	"	"	1	14"
"	"	"	"	"	"	"	2	16"
"	"	"	"	"	"	"	1	17"
"	"	"	"	"	"	"	1	20"
"	"	"	"	"	"	"	1	21"
-265'	10/8	-215'	10/8	"	50-75'	Ponderosa	5	-8"
"	"	"	"	"	"	"	1	8"
"	"	"	"	"	"	"	1	9"
"	"	"	"	"	"	"	1	10"
"	"	"	"	"	"	"	1	12"
"	"	"	"	"	"	"	1	14"
"	"	"	"	"	"	"	5	16"
"	"	"	"	"	"	"	2	17"
"	"	"	"	"	"	"	2	18"
"	"	"	"	"	"	"	1	19"
"	"	"	"	"	"	"	1	20"

Total # of Trees:	274	Creston-Bell No.1 Rebuild Project Danger Tree Cutting List						
Distance from Structure +/- FT	**Structure #**	**Distance to Tower +/- FT**	**Structure #**	**Right or Left of Center Line**	**Distance from Center Line**	**Species**	**Quantity**	**DBH**
"	"	"	"	"	"	"	1	21"
"	"	"	"	"	"	"	1	23"
+160'	10/8			"	50-80'	"	1	22"
+200'	11/2			"	"	"	1	13"
"	"			"	"	"	1	14"
"	"			"	"	"	1	16"
"	"			"	"	"	2	18"
"	"			"	"	"	2	20"
"	"			"	"	"	1	22"
"	"			"	"	"	2	26"
-400'	11/3			"	50-65'	Ponderosa	1	18"
-140'	11/7			"	"	"	1	17"
"	"			"	"	"	1	18"
"	"			"	"	"	1	20"
"	"			"	"	"	1	24"
+15'	11/8	+100'	11/8	"	"	"	1	10"
"	"	"	"	"	"	"	1	14"
"	"	"	"	"	"	"	1	16"
"	"	"	"	"	"	"	1	18"
+125'	18/9			"	50-70'	"	1	15"
-200'	19/1	-100'	19/1	"	50-70'	"	1	8"
"	"	"	"	"	"	"	1	10"
"	"	"	"	"	"	"	1	15"
"	"	"	"	"	"	"	1	18"
"	"	"	"	"	"	"	1	21"

Total # of Trees:	274	Creston-Bell No.1 Rebuild Project Danger Tree Cutting List						
Distance from Structure +/- FT	**Structure #**	**Distance to Tower +/- FT**	**Structure #**	**Right or Left of Center Line**	**Distance from Center Line**	**Species**	**Quantity**	**DBH**
"	"	"	"	"	"	"	1	23"
+60'	19/1			"	"	"	2	-8"
"	"			"	"	"	1	14"
"	"			"	"	"	1	24"
-280'	19/5			"	50-55'	"	11	-8"
-40	24/1			"	50-60'	Douglas Fir	1	11"
+145'	24/1	+175	24/1	"	"	"	1	-8"
"	"	"	"	"	"	"	1	11"
"	"	"	"	"	"	"	1	12"
-150'	24/2	-10'	24/2	"	"	"	1	20"
"	"	"	"	"	"	Ponderosa	1	14"
"	"	"	"	"	"	"	1	18"
"	"	"	"	"	"	"	1	19"
+175	24/4			"	50-65'	Douglas Fir	1	20"
-110'	38/9	-100'	38/9	"	50-60'	Ponderosa	1	12"
"	"	"	"	"	"	"	1	20"
+400'	39/2	+460'	39/2	"	50-60'	Ponderosa	1	12"
"	"	"	"	"	"	"	1	14"
"	"	"	"	"	"	"	1	16"
"	"	"	"	"	"	"	1	18"
"	"	"	"	"	"	"	1	22"
+00'	39/3	+260'	39/3	"	50-60'	Ponderosa	1	16"
"	"	"	"	"	"	"	1	18"
-75'	40/2			"	50-70'	Ponderosa	1	18"
+55'	40/5			"	50-60'	Ponderosa	1	14"

Total # of Trees:	274	Creston-Bell No.1 Rebuild Project Danger Tree Cutting List						
Distance from Structure +/- FT	**Structure #**	**Distance to Tower +/- FT**	**Structure #**	**Right or Left of Center Line**	**Distance from Center Line**	**Species**	**Quantity**	**DBH**
"	"			"	"	"	1	20"
-300'	40/6			"	50-70'	Ponderosa	1	20"
-160'	40/7			"	50-55'	Ponderosa	1	16"
+65'	40/7			"	50-55'	Douglas Fir	1	18"
-95"	41/2			"	50-60'	Ponderosa	1	21"
+215'	41/2			"	50-70'	Ponderosa	1	17"
+365'	41/2			"	50-60'	Ponderosa	1	16"
-225'	42/1			"	50-65'	Ponderosa	1	17"
-90'	42/1			"	50-60	Ponderosa	1	15"
+15'	42/2	+130'	42/2	"	50-65'	Ponderosa	1	17"
"	"	"	"	"	"	"	1	20"
"	"	"	"	"	"	"	1	22"
-250'	42/4			"	50-60'	Ponderosa	1	20"
+85'	42/6			"	50-55'	Ponderosa	1	14"
"	"			"	"	"	1	16"
-415'	45/9			"	50-60'	Ponderosa	2	16"
+55'	46/3			"	50-75'	Ponderosa	1	16"
+90'	46/3			"	50-75'	Ponderosa	1	16"
-80'	46/4			"	50-55'	Ponderosa	1	24"
-275'	46/6	-255'	46/6	"	50-60'	Ponderosa	2	22"
-80'	46/6			"	50-55'	Ponderosa	1	26"
+200'	47/7			"	50-75'	Ponderosa	1	20"
+65'	48/1			"	50-75'	Ponderosa	1	20"
-135'	48/2			"	50-70'	Ponderosa	1	20"
+125'	48/5			"	50-60'	Ponderosa	1	20"

Total # of Trees:	274	Creston-Bell No.1 Rebuild Project Danger Tree Cutting List						
Distance from Structure +/- FT	**Structure #**	**Distance to Tower +/- FT**	**Structure #**	**Right or Left of Center Line**	**Distance from Center Line**	**Species**	**Quantity**	**DBH**
+230'	48/5			"	50-60'	Ponderosa	1	24"
+155'	48/6			"	50-60'	Ponderosa	1	20"
+400'	51/4	+530'	51/4	"	50-60'	Douglas Fir	1	-8"
"	"	"	"	"	"	"	3	12"
"	"	"	"	"	"	"	2	14"
"	"	"	"	"	"	"	2	16"
+150'	51/6			"	50-65'	Douglas Fir	1	16"
+85'	51/8	+110'	51/8	"	50-55'	Douglas Fir	1	12"
"	"	"	"	"	"	"	1	20"
+45'	52/2			"	50-65'	Douglas Fir	1	22"
+215'	52/2	-10'	52/3	"	50-60'	Douglas Fir	1	15"
"	"	"	"	"	"	"	1	16"
"	"	"	"	"	"	"	1	24"
"	"	"	"	"	"	Ponderosa	1	8"
+50'	52/3	-125'	52/4	"	50-60'	Ponderosa	1	17"
"	"	"	"	"	"	"	1	20"
"	"	"	"	"	"	"	1	23"
+00'	52/4			"	50-60'	Ponderosa	1	12"
+85'	52/5			"	50-55'	Ponderosa	1	20"

Appendix B
Other Projects in the Rebuild Project Vicinity

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OTHER PROJECTS IN THE REBUILD PROJECT VICINITY

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 would result in ***low*** to ***moderate*** cumulative impacts to all assessed resources (see Sections 3.2 through 3.14 of the EA for discussion).

The following list of projects in the Rebuild project vicinity is used in the cumulative effects assessments presented in the EA. This list is based on review of the following sources:

- Washington State Department of Transportation (WSDOT) project website (WSDOT 2011)
- BPA list of current and proposed transmission line projects (BPA 2011a)
- Lincoln County Public Works Department website (Lincoln County 2011)
- Phone conversations with planners at the City of Spokane, Spokane County, and Lincoln County (Reeves pers. comm., Thompson pers. comm., Weinand pers. comm.)

OTHER BPA PROJECTS IN THE PROJECT AREA

There are two other BPA projects currently proposed in the extended ROW corridor that the Creston-Bell transmission line shares with three other larger transmission lines. These projects, as proposed, would occur adjacent to the Proposed Action and over the same general timeframe. However, each project will proceed independently of the others and does not require that actions associated with the other two BPA projects be taken previously or simultaneously. Thus, these projects are not "connected actions" under NEPA and can be evaluated under separate environmental reviews.[13]

GRAND COULEE-BELL NO. 3 230 KV DOUBLE CIRCUIT RECONDUCTOR PROJECT

BPA proposes to reconductor 81.7 miles of the existing double-circuit Grand Coulee-Bell No. 3 and No. 4 230-kV transmission line. The project involves removing the existing conductor for both circuits and replacing it with an upgraded conductor. Much of the construction for this project would occur within the existing ROW and involve existing access roads. Approximately 16.5 miles of access road would require improvement to allow equipment access. The majority of these improvements would be located along the first 19 miles of the Grand Coulee-Bell ROW, between the Grand Coulee and Creston substations. Environmental review for this project is currently in progress and BPA anticipates that it will issue a Categorical Exclusion under NEPA

13 Under NEPA, actions are connected if they: (i) Automatically trigger other actions which may require environmental impact statements. (ii) Cannot or will not proceed unless other actions are taken previously or simultaneously. (iii) Are interdependent parts of a larger action and depend on the larger action for their justification. *See* 40 C.F.R. § 1508.25(a)(1).

that addresses this project in spring 2012, prior to project initiation. This project is scheduled to take place from May through October 2012.

GRAND COULEE-BELL NO. 6 500KV SPACER REPLACEMENT PROJECT

BPA is proposing to replace worn spacers along the 83-mile-long Grand Coulee-Bell No. 6 500-kV transmission line. Work would be conducted on energized lines using live-line and bare-hand techniques as well as standard techniques requiring an outage. Spacers, which are located at various points along the conductor between transmission line towers, would be accessed using a specialized heavily insulated line truck or a standard line truck. For the specialized truck to access towers, a small number of existing access roads within the ROW may need to be improved by clearing, grading, widening, or rocking. Areas approximately 500 square feet or less around the towers (landings) may also need minimal grading and rocking to allow for safe positioning of both specialized and standard line trucks. Heavy equipment used on the proposed project may include, but is not limited to, a mower, grader, roller, and dump truck. BPA released a Categorical Exclusion under NEPA that addressed this project on November 3, 2011 (BPA 2011b). This project is scheduled to take place from March through October 2012.

OTHER PROJECTS IN THE PROJECT VICINITY

Review of the resources identified above did not identify any other reasonably foreseeable future projects that would coincide in time or space with the Proposed Action.

REFERENCES

Bonneville Power Administration (BPA). 2011a. BPA Transmission Services Projects. Available online at: http://www.transmission.bpa.gov/planproj/

———. 2011b. Environmental Clearance Memorandum. Replace Spacers on the Grand Coulee-Bell No. 6 500-kV Transmission Line. http://efw.bpa.gov/environmental_services/categoricalexclusions.aspx

Reeves, Matt. GIS Technician. Spokane County. June 20, 2011—Phone conversation with John Crookston, Tetra Tech, regarding ongoing and future projects in Spokane County.

Thompson, Courtney. Senior Planner. Lincoln County. June 7, 2011—Phone conversation with John Crookston, Tetra Tech, regarding ongoing and future projects in Lincoln County.

WSDOT (Washington State Department of Transportation). 2011. Project Index [Internet]. Available online at: http://www.wsdot.wa.gov/projects/index.htm

Weinand, Kathleen. City Planner. City of Spokane. May 31, 2011—Phone conversation with John Crookston, Tetra Tech, regarding ongoing and future projects in the city of Spokane.

Appendix C
Surface Waters in the Study Area

Table C-1. Surface Waters in the Study Area

Number[1/]	Water body Name	Next Named Downstream Water body	WDNR Water Type[2/]	Flow Type NHD	Nearest Structure - West	Nearest Structure - East	Existing Structures within 300 feet	Proposed Structures/Road Work within 300 feet
1	Unnamed	Welsh Creek	N	Inter	2/8	3/1	2/8	2/8, reconstruct road
2	Unnamed	Welsh Creek	N	Inter	3/2	3/3	3/2, 3/3	3/2, 3/3, reconstruct road, access road
3	Welsh Creek	Lake Roosevelt	F	Peren	3/8	3/9	none	reconstruct road, travel route
4	Unnamed	Welsh Creek	N	Inter	4/5	4/6	none	reconstruct road
5	Unnamed	Hawk Creek	N	Inter	9/6	9/7	none	reconstruct road, travel route
6	Hawk Creek	Lake Roosevelt	F	Peren	10/1	10/2	none	travel route
7	Unnamed	Stock Creek	N	Inter	12/3	12/4	none	none
8	Unnamed	Stock Creek	N	Inter	12/9	13/1	none	access road
9	Unnamed	Stock Creek	F	Inter	12/9	13/1	none	access road
10	Stock Creek	Hawk Creek	F	Inter	13/4	13/5	none	none
11	Unnamed	Stock Creek	N	Inter	14/3	14/4	14/4	14/4, reconstruct road, travel route
12	Unnamed	Stock Creek	N	Inter	14/4	14/5	14/4, 14/5	14/4, 14/5, reconstruct road, access road, travel route
13	Unnamed	Stock Creek	N	Inter	14/5	14/6	14/5, 14/6, 14/7	14/5, 14/6, 14/7, reconstruct road, access road, travel route
14	Unnamed	Stock Creek	N	Inter	15/4	15/5	15/4	15/11, travel route
15	Unnamed	Indian Creek	N	Inter	15/11	16/1	15/11	15/4, travel route
16	Indian Creek	Hawk Creek	N	Inter	16/5	16/6	none	travel route
17	Unnamed	Indian Creek	N	Inter	17/2	17/3	17/2, 17/3	17/2, 17/3, travel route
18	Unnamed	Spokane River	N	Inter	17/7	17/8	17/8	17/8, reconstruct road, travel route
19	Unnamed	Spokane River	N	Inter	18/5	18/6	18/5	18/5, access road, travel route
20	Unnamed	Spokane River	N	Peren	18/9	19/1	none	reconstruct road, access road, acquire access road
21	Unnamed	Spokane River	N	Inter	19/4	19/5	none	reconstruct road, acquire access road
22	Unnamed	Spokane River	N	Inter	20/5	20/6	20/6	20/6, travel route
23	Unnamed	Spokane River	N	Inter	21/1	21/2	none	travel route
24	Unnamed	Spokane River	N	Inter	21/3	21/4	21/3	21/3, 21/4, travel route
25	Unnamed	Spokane River	N	Inter	22/2	22/3	none	travel route
26	Unnamed	Spokane River	F	Inter	23/1	23/2	none	reconstruct road
27	Unnamed	Spokane River	N	Inter	24/1	24/2	none	reconstruct road, access road

Table C-1. Surface Waters in the Study Area (continued)

Number[1/]	Water body Name	Next Named Downstream Water body	WDNR Water Type[2/]	Flow Type NHD	Nearest Structure - West	Nearest Structure - East	Existing Structures within 300 feet	Proposed Structures/Road Work within 300 feet
28	Unnamed	Spokane River	F	Peren	24/5	24/6	none	reconstruct road, access road, acquire AR, travel route
29	Unnamed	Spokane River	F	Peren	24/5	24/6	none	reconstruct road
30	Unnamed	Spokane River	N	Peren	25/5	25/6	25/5	25/5, reconstruct road, access road acquire access road
31	Unnamed	Spokane River	NA[3/]	Inter	26/3	26/4	26/4	26/4
32	Unnamed	Spring Creek	F	Peren	27/6	27/7	27/6	27/6, travel route
33	Unnamed	Spring Creek	F	Peren	27/7	27/8	27/7	27/7, travel route
34	Unnamed	Spring Creek	N	Peren	28/5	28/6	28/5	28/5
35	Unnamed	Spring Creek	F	Peren	28/6	28/7	28/7	28/7, access road
36	Unnamed	Spring Creek	N	Peren	29/4	29/5	none	travel route
37	Unnamed	Spring Creek	N	Peren	29/5	29/6	29/5	29/5, travel route
38	Unnamed	Spring Creek	N	Peren	29/7	29/8	29/8	29/8, travel route
39	Unnamed	Spring Creek	N	Inter	30/2	30/3	30/3	30/3, travel route
40	Unnamed	Spring Creek	N	Peren	30/6	30/7	30/6	30/6, travel route
41	Unnamed	Spring Creek	N	Peren	30/7	30/8	none	travel route
42	Unnamed	Spring Creek	N	Inter	30/9	31/1	31/1, 31/2, 31/3	31/1, 31/2, 31/3, access road, travel route
43	Unnamed	Spring Creek	N	Inter	31/4	31/5	31/5	31/5, travel route
44	Spring Creek	Spokane River	F	Peren	31/8	31/9	31/9	31/9, access road
45	Unnamed	Spring Creek	N	Inter	32/4	32/5	32/4	32/4, acquire AR Route, travel route
46	Unnamed	Spring Creek	N	Inter	33/4	33/5	33/5	33/5, travel route
47	Unnamed	Spring Creek	N	Peren	33/9	33/10	33/9	33/9, travel route
48	Unnamed	Coulee Creek	N	Peren	34/2	34/3	34/3	34/10, 35/1, travel route
49	Unnamed	Coulee Creek	N	Peren	34/10	35/1	34/10, 35/1	34/3, travel route
50	Unnamed	Coulee Creek	F	Peren	35/2	35/3	35/2	35/2, travel route
51	Unnamed	Coulee Creek	N	Inter	35/9	36/1	36/1	36/1, travel route
52	Unnamed	Coulee Creek	F	Inter	37/4	37/5	37/5	37/5, reconstruct road, access road
53	Unnamed	Coulee Creek	N	Inter	38/2	38/3	38/2	38/2, reconstruct road, access road
54	Unnamed	Coulee Creek	F	Inter	38/9	38/10	38/9	38/9, reconstruct road, access road

Table C-1. Surface Waters in the Study Area (continued)

Number[1/]	Water body Name	Next Named Downstream Water body	WDNR Water Type[2/]	Flow Type NHD	Nearest Structure - West	Nearest Structure - East	Existing Structures within 300 feet	Proposed Structures/Road Work within 300 feet
55	Unnamed	Coulee Creek	N	Inter	39/2	39/3	none	reconstruct road, access road
56	Unnamed	Coulee Creek	F	Inter	40/10	41/1	40/10	40/10, reconstruct road, travel route
57	Unnamed	Coulee Creek	F	Inter	40/10	41/1	41/1	41/1,reconstruct road, travel route
58	Unnamed	Coulee Creek	N	Inter	41/6	41/7	none	41/7, reconstruct road
59	Unnamed	Coulee Creek	U	Inter	41/9	42/1	none	reconstruct road
60	Unnamed	Coulee Creek	N	Inter	42/2	42/3	none	reconstruct road
61	Unnamed	Coulee Creek	N	Inter	42/9	43/1	none	reconstruct road
62	Unnamed	Coulee Creek	N	Inter	43/1	43/2	none	reconstruct road
63	Unnamed	Coulee Creek	N	Inter	43/2	43/3	none	reconstruct road
64	Unnamed	Coulee Creek	N	Inter	43/3	43/4	none	reconstruct road, access road, acquire access road
65	Unnamed	Coulee Creek	F	Inter	43/7	44/1	none	reconstruct road
66	Unnamed	Coulee Creek	N	Inter	43/7	44/1	none	reconstruct road
67	Unnamed	Coulee Creek	N	Inter	45/8	45/9	none	reconstruct road, access road
68	Unnamed	Coulee Creek	F	Peren	45/8	45/9	45/7, 45/8	45/7, 45/8, reconstruct road, access road, travel route
69	Unnamed	Coulee Creek	N	Inter	45/9	45/10	45/9	45/9, reconstruct road, access road
70	Unnamed	Coulee Creek	N	Inter	46/1	46/2	none	reconstruct road, access road
71	Unnamed	Coulee Creek	N	Inter	46/3	46/4	46/4	46/4, access road
72	Unnamed	Coulee Creek	N	Inter	46/5	46/6	46/5	46/5, reconstruct road, access road
73	Coulee Creek	Deep Creek	F	Peren	46/6	46/7	46/6	46/6, access road
74	Deep Creek	Spokane River	F	Peren	46/8	46/9	46/9	46/9, reconstruct road, access road
75	Unnamed	Deep Creek	F	Peren	46/9	47/1	47/1	47/1, reconstruct road, access road
76	Deep Creek	Spokane River	F	Peren	47/1	47/2	47/1, 47/2	47/1, 47/2, reconstruct road, travel route
77	Unnamed	Spokane River	N	Inter	47/5	47/6	none	reconstruct road, travel route
78	Spokane River	Columbia River	S	Peren	48/3	48/4	none	none
79	Unnamed	Spokane River	F	Inter	48/6	48/7	48/4, 48/5, 4/6, 48/7	48/4, 48/5, 4/6, 48/7, reconstruct road, access road

Table C-1. Surface Waters in the Study Area (continued)

Number[1/]	Water body Name	Next Named Downstream Water body	WDNR Water Type[2/]	Flow Type NHD	Nearest Structure - West	Nearest Structure - East	Existing Structures within 300 ft.	Proposed Structures/Road Work within 300 ft.
80	Unnamed	Spokane River	U	Inter	48/7	49/1	none	none
81	Unnamed	Spokane River	U	Inter	48/7	49/1	none	none
82	Unnamed	Spokane River	U	Inter	48/7	49/1	none	none
83	Unnamed	Spokane River	U	Inter	48/7	49/1	none	reconstruct road
84	Unnamed	Spokane River	U	Inter	48/7	49/1	49/1	49/1,reconstruct road
85	Unnamed	Little Spokane River	N	Inter	50/7	50/8	none	reconstruct road
86	Unnamed	Little Spokane River	N	Inter	51/8	51/9	51/8, 51/9	51/8, 51/9,reconstruct road, access road
87	Unnamed	Little Spokane River	N	Inter	51/9	51/10	51/9, 51/10	51/9, 51/10,reconstruct road, access road
88	Unnamed	Little Spokane River	N	Inter	52/1	52/2	52/1	52/1, reconstruct road, access road, acquire access road
89	Unnamed	Little Spokane River	N	Inter	52/9	52/10	52/10	52/10, reconstruct road

1/ Streams were identified in the field as part of the wetlands surveys conducted for this project. A total of 45 streams with a defined channel and flow, most likely for greater than 3 months of the year, were observed in the study area. The shaded rows in the above table identify these streams. As this lower number suggests, many of the streams identified in the WDNR map layer were not present. This was particularly common in wheat fields (Tetra Tech 2011).

2/ Washington State Department of Natural Resources (WDNR) water types (WAC 222-16-030): S = shoreline of the state; F fish-bearing water; N = non-fish-bearing water; Np = perennial, non-fish-bearing water; Ns = seasonal, non-fish-bearing water; U = unidentified type

3/ Not in WDNR database.

Peren = Perennial, Inter = Intermittent

Appendix D
Wetlands Identification and Classification

WETLANDS IDENTIFICATION AND CLASSIFICATION

METHODOLOGY

Wetlands in the study area were identified based on the methodology and guidelines in the U.S. Army Corps of Engineers (Corps) Wetland Delineation Manual (Environmental Laboratory 1987) and the Regional Supplement to the Corps' Wetland Delineation Manual: Arid West (Environmental Laboratory 2008). These guidelines were used to identify the presence of wetlands. A positive determination of wetland presence was made if the indicators for wetland vegetation, soil, and hydrology were met, as summarized below. Wetlands in areas that have been disturbed, including agricultural areas farmed for wheat, were delineated utilizing the guidance in the Regional Supplement. In these cases, the wetland boundary was determined based on the best professional judgment of the delineator and the presence of the other wetland indicators. For sites with extensive alteration to the vegetation layer, the hydric soil and hydrology indicators were relied on to determine the wetland boundary. Wetland boundary location and sample plot locations were marked in the field and mapped with a Trimble GeoXT handheld Global Positioning System unit and post-processed to submeter accuracy.

Wetlands were rated according to the Washington State Wetland Rating System for Eastern Washington (Ecology 2004). This rating system was created to categorize wetlands while considering factors such as rarity, vulnerability to modification, and functions provided by wetlands. Three broad categories of commonly recognized wetland functions—water quality improvement, hydrologic function, and wildlife habitat—are assessed by this rating system. Wetlands are assigned point values based on their ability to perform each of these functions; the total score from all three categories is then used to classify the wetlands as Category I, II, III, or IV. These categories are defined as follows:

- Category I wetlands are the most uncommon wetlands. These wetlands are classified as uncommon due to high functioning, rarity, or other features that make them irreplaceable.
- Category II wetlands also provide a relatively high level of function; and while it may be possible to replace them, it is considered difficult.
- Category III wetlands include those wetlands that have a moderate level of function and have usually been impacted in some way.
- Category IV wetlands have the lowest levels of functional value and are usually significantly impacted by humans.

Some wetlands have special characteristics that may make them exceptionally valuable; these characteristics include the provision of rare habitats, being hard to replace (e.g., mature forested wetlands or bogs), or containing rare plant species. Wetlands with these characteristics may automatically qualify as Category I or II wetlands, independent of the scores obtained for the three wetland functions (water quality, hydrology, and habitat) (Ecology 2004).

The study area is located within two local jurisdictions, each of which has specific wetland regulations that determine width of protective buffers around wetlands. Buffer widths for wetlands identified in the study area were assigned according to the local wetland regulations for Lincoln County and Spokane County (Tetra Tech 2011). These widths vary, depending on the function of the wetlands and the intensity of the proposed land use.

Wetland impacts were calculated through GIS by overlaying the project structures, roads, and travel routes on the wetland boundary and buffer locations. Detailed maps of delineated wetlands and project features are included in the Wetland Delineation Report prepared for this project (Tetra Tech 2011).

WETLANDS IN THE STUDY AREA

Wetlands in the study area were delineated and assessed during field surveys conducted in spring 2011, from May 16 to May 22, and from May 29 to June 1. Additional site visits were conducted in September 2011, from September 26 to September 28 (Tetra Tech 2011). A total of 66 wetlands were identified within or adjacent to the study area. Forty-eight of these wetlands were located within the ROW or off-ROW road/travel access easements and were delineated. There were 18 wetlands located outside of the study area that were not delineated; these wetlands were visually assessed and their locations were approximated based on observations from the study area (i.e., the adjacent ROW or access road/travel route).

VEGETATION

The study area has several distinct types of vegetation. The western 15 miles of the study area is predominantly shrub steppe and relatively undisturbed, dominated by sagebrush (*Artimesia tridentata*) and bunchgrasses. Wetland vegetation included a wide variety of shrub, emergent, and aquatic vegetation. Common wetlands plants included red-osier dogwood (*Cornus sericea*), and species of willow (*Salix* spp.), camas (*Cammasia quamash*), cattail (*Typha latifolia*), bull rush (*Scirpus acutus*), baltic rush (*Juncus balticus*), and yellow pond lily (*Nuphar polysepalum*). Forested areas are more common in the eastern part of the study area; they are also present but less frequent towards the western end of the study area. Dominant trees in these areas were Douglas-fir (*Pseudotsuga menziesii*) and ponderosa pine (*Pinus ponderosa*). Much of the middle part of the study area is agricultural land used for dry land wheat cultivation.

SOILS

Soils in the study area generally resembled the soil types mapped for this area by the NRCS (NCRS 2011). Wetland soils were typically a black (10YR 2/1) silt loam or a very dark brown (10YR 2/2) silt loam with ***redox concentrations***. There were some areas that contained “problem soils,” that is, soils that were in areas with clear indicators of wetland hydrology, but lacked indicators themselves. These were black silt loam soils, most often located in farmed wheat fields. The lack of indicators in these areas was generally assumed to be due to tilling of the soil or the masking of redox features by organic material.

HYDROLOGY

As noted above, the majority of wetland delineations occurred in the spring. While the overall rainfall for the water year was within the normal range, much of that rainfall occurred in late winter and early spring. As a result, the area was wet during the spring visits and indications of wetland hydrology (soil saturation, high water table, or surface water) were present. During the fall visits, evidence of ponding earlier in the year was typically obvious. Indicators included water marks and water-stained leaves.

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Appendix E
Greenhouse Gases

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INTRODUCTION

Greenhouse gases (GHG) are chemical compounds found in the Earth's atmosphere that absorb and trap infrared radiation as heat. They are released both naturally and through human activities such as deforestation, soil disturbance, and burning of fossil fuels. These activities disrupt the natural cycle by increasing the GHG emission rate over the storage rate, which results in a net increase of GHGs in the atmosphere. The resulting build up of heat in the atmosphere due to increased GHG levels causes warming of the planet through a greenhouse-like effect (EIA 2009a). Increasing levels of GHGs could increase the Earth's temperature by up to 7.2 degrees Fahrenheit by the end of the twenty-first century (EPA 2010a).

The principal GHGs emitted into the atmosphere through human activities are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), and fluorinated gases (EPA 2010a).

- **Carbon dioxide** is the major GHG emitted (EPA 2010a; Houghton 2010). CO_2 enters the atmosphere as a result of such activities as land use changes, the burning of fossil fuels (e.g., coal, natural gas, oil, and wood products), and the manufacturing of cement. CO_2 emissions resulting from the combustion of coal, oil, and gas constitute 81% of all U.S. GHG emissions (EIA 2009b). Before the industrial revolution, CO_2 concentrations in the atmosphere were roughly stable at 280 parts per million. By 2005, CO_2 levels had increased to 379 parts per million, a 36% increase, as a result of human activities (IPCC 2007).
- **Methane** is emitted during the processing and transport of fossil fuels, through intensive animal farming, and by the degradation of organic waste. Concentrations of CH_4 in the atmosphere have increased 148% above preindustrial levels (EPA 2010a).
- **Nitrous oxide** is emitted during agricultural and industrial activities and during the combustion of fossil fuels and solid waste. Atmospheric levels of N_2O have increased 18% since the beginning of industrial activities (EPA 2010a, 2010b).
- **Fluorinated gases**, including hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), and sulfur hexafluoride (SF_6), are synthetic compounds emitted through industrial processes. They are replacing ozone-depleting compounds such as chlorofluorocarbons (CFCs) in insulating foams, refrigeration, and air conditioning. Although they are emitted in small quantities, fluorinated gases have the ability to trap more heat than CO_2 and are considered gases with a high global warming potential. Atmospheric concentrations of fluorinated gases have been increasing over the last 20 years and this trend is expected to continue (EPA 2010a).

While models predict that atmospheric concentrations of all GHGs will increase over the next century due to human activity, the extent and rate of change is difficult to predict, especially on a global scale. As a response to concerns over the predicted increase of global GHG levels, various federal and state mandates address the need to reduce GHG emissions, including those described below.

- The federal **Clean Air Act** establishes regulations to control emissions from large generation sources such as power plants: limited regulation of GHG emissions occurs through a review of new sources.
- The U.S. Environmental Protection Agency (EPA) has issued the *Final Mandatory Reporting of Greenhouse Gases Rule* (40 CFR 98) that requires reporting of GHG emissions from large sources. Under the rule, suppliers of fossil fuels or industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHGs are required to submit annual reports to EPA (EPA 2010b), although no other action is required (40 CFR Parts 98).
- **Executive Orders 13423 and 13514** require federal agencies to measure, manage, and reduce GHG emissions by agency-defined target amounts and dates.
- In **Washington State, Executive Orders 07-02 and 09-05** direct state agencies to work with western states and Canadian provinces to develop a regional emissions reduction program designed to reduce GHG emissions to 1990 levels by 2020 (Ecology 2010).

ACTIVITIES THAT WOULD CONTRIBUTE TO GREENHOUSE GAS EMISSIONS

The Creston–Bell Transmission Line Rebuild Project (Rebuild Project or Proposed Action) would involve rebuilding the existing transmission line. Under the No Action Alternative, the transmission line would not be rebuilt and ongoing operation and maintenance activities would continue; however, maintenance activities would likely increase as the line deteriorates. Implementation of the Proposed Action would contribute to an increase in GHG concentrations through the following activities, each discussed in more detail below:

- **construction:** use of gasoline and diesel-powered vehicles, including cars, trucks, construction equipment, and helicopters;
- **construction:** temporary removal and/or disturbance of vegetation and soils;
- **construction:** permanent removal of vegetation, including trees, for the construction of roads;
- **ongoing operation and maintenance:** use of gasoline and diesel-powered vehicles for routine patrols, maintenance project work (vegetation management and site-specific repairs of roads and transmission line structures and associated hardware), emergency maintenance, and resource review; and
- **ongoing operation and maintenance:** use of helicopters for aerial inspections of the transmission line corridor.

METHODS USED TO CALCULATE GREENHOUSE GAS EMISSIONS

CONSTRUCTION

Construction for the Rebuild Project would take about 7 months (May through November 2012), with peak construction activity occurring during a 6-month period (June through November 2012). Road and structure-related construction would take place during the 5-month peak construction period. Non-peak construction activities would include installing and removing best management practice measures such as silt fencing, establishing staging areas and moving equipment and materials into and out of the project area, conducting site preparation and site restoration work along roadways and at structure sites, monitoring culvert function, and other similar activities.

The transportation components of GHG emissions were estimated for the Proposed Action based on the approximate number of vehicles that would be used during project construction and the approximate distance those vehicles would travel during the construction period. GHG emissions were calculated for both the 5-month peak construction period and the 2-month non-peak period based on estimates of vehicle round trips per day.

Overestimating the number of round trips ensures that GHG emission estimates are conservatively high. The number of round trips was deliberately overestimated using the following assumptions.

- All workers would travel in separate vehicles to and within the project area each day.
- A maximum number of workers would be required to construct the project.
- The round-trip distance to the project area is the distance from Spokane, Washington, to the Creston Substation and back (about 100 miles round trip).
- All workers would travel the full length of the project area each day. Although this is true for some workers such as inspectors, other workers could be localized.
- Fuel consumption is based on the average fuel economy for standard pickup trucks of 18 miles per gallon. Again, this is likely an overestimation as more efficient vehicles may be occasionally used.
- Average helicopter fuel consumption is estimated by BPA pilots at 1 mile per gallon.

Up to 30 construction workers would be at work on the transmission line during the peak construction period (6 months) and an estimated 20 workers could be present during the non-peak construction period (2 months).

BPA staff would travel to the transmission line for various purposes, such as road inspection, work inspection, staff meetings, environmental compliance monitoring, and meetings with landowners. An estimated two round trips per week from the Mead, Washington, BPA offices during the 7-month construction period would result in a total of 56 round trips at an estimated 135 miles per trip.

Helicopters may be used to replace the conductor. After the equipment (puller and tensioner) is set up, a sock line (usually a rope) is strung through all of the structures using a helicopter. It was assumed that the helicopter would be used for approximately 1.5 months (30 work days) to conduct this work. An estimated two round trips from the Spokane Airport each day would result in a total of 60 round trips at an estimated 100 miles per trip.

Fuel consumption and GHG emissions would also result from operation of on-site heavy construction equipment. Heavy construction equipment may include augers, dozers, excavators, graders, heavy-duty trucks, and front-end-loaders. Similar to the transportation activities listed above, increased use of heavy construction equipment would occur during peak construction.

Although it is difficult to develop an accurate estimation of total fuel consumption associated with heavy construction equipment operation, the following assumptions were used.

- A maximum of 40 equipment machines would be in operation during peak construction and 20 equipment machines would be in operation during off-peak construction.
- The average size of the equipment would not exceed 250 horsepower. All equipment would operate at maximum power for 8 hours per day and 5 days per week throughout the construction phase. This is a significant overestimation because equipment commonly operates in idle or at reduced power.
- Equipment would operate at approximately 35% efficiency, representing the percentage of productive energy extracted from the diesel fuel relative to the maximum potential energy within the fuel (i.e., 138,000 British thermal units per gallon of diesel) (DOE and EPA 2011).

GHG emissions associated with equipment operation were overestimated to account for all potential construction activities and associated material deliveries to and from the construction site. They are also expected to account for the low levels of GHG emissions related to temporary soil disruption and damaged vegetation from construction activities, which were not estimated separately in this analysis. GHG emissions that result from soil disturbance are short-lived and return to background levels within several hours (Kessavalou et al. 1998). Emissions from decomposing vegetation would also be relatively short-lived where vegetation would be allowed to reestablish following construction.

PERMANENT VEGETATION REMOVAL

The permanent removal of trees and other vegetation would occur as a result of the construction of roads and ROW clearing. Although permanent tree removal would not immediately emit any GHGs, it would reduce the level of solid carbon storage in the area. Tree growth and future carbon sequestration rates are highly variable and depend on several factors, including the species of tree, age of tree, climate, forest density, and soil conditions. In the Pacific Northwest, the U.S. Forest Service estimates the maximum carbon density associated with a fully mature forest ranges from 60 to 364 metric tons of carbon per acre (Birdsey et al. 2006).

Approximately 10.1 miles of access roads within a 50-foot easement would be constructed. Because BPA access road standards only require a minimum 14-foot-wide travel surface with a 20-foot-wide travel corridor, a portion of the 50-foot-wide road easements would remain undisturbed. In total, up to 25 acres of land would be cleared vegetation for access road construction, with an estimated 4 acres of trees, a mix of Douglas-fir and Ponderosa pine, permanently removed. The remaining 21 acres impacted by road construction would consist of agricultural crops, shrubs, grasses and forbs, which have smaller carbon storage capacities.

Additionally, BPA estimates that approximately 274 danger trees, located 50 to 80 feet from the centerline, would also need to be removed. Danger tree species include Douglas-fir and Ponderosa pine, and vary in size from 8 inches to 30 inches dbh. These trees combined are assumed for the purposes of analysis to be equivalent to approximately 5 acres of mature forest (Meyer 1961).

The operation of tree removal equipment to clear new road areas of trees was included within the construction section analysis described above.

OPERATIONS AND MAINTENANCE

During operation and maintenance of the transmission line, the following annual activities would result in GHG emissions:

- routine patrols (access road, structure, and vegetation inspections): 60 round trips per year, from the BPA Mead office, 135 miles round trip;
- maintenance of roads and structures and associated hardware: 160 round trips per year, from the BPA Mead office, 135 miles;
- emergency maintenance to address line outages, landslides, and other unpredicted events: 40 round trips per year, from BPA Mead office, 135 miles round trip;
- natural resource review: 8 round trips per year, from the BPA Portland office, 700 miles round trip; and
- aerial inspections by helicopter: routine visits twice per year and up to twice per year for specific maintenance needs such as facility winter readiness checks: four round trips from Spokane Airport to Creston Substation, 100 miles round trip.

Vegetation management activities, including danger tree removal, mowing along roadsides, and weed control, would be conducted during most years. Because vegetation management does not include permanent vegetation removal other than trees, this activity was not included in GHG calculations.

Calculations of GHG emissions include operations and maintenance work for the estimated 50-year life span of the rebuilt transmission line.

RESULTS

GHG emissions were calculated using the estimated values described above for three types of activities: construction of the Rebuild Project, permanent vegetation removal, and ongoing annual operations and maintenance for the estimated 50-year life span of the transmission line. Each type of activity is discussed separately below.

CONSTRUCTION EMISSIONS

Table E-1 displays the results of calculations for the construction activities that would contribute to GHG emissions. Construction of the Rebuild Project would result in an estimated 8,909 metric tons of CO_2e[14] (equivalent carbon dioxide) emissions. All GHG emissions associated with construction activities would occur in the first year. The Proposed Action's contribution to GHG emissions during construction would be considered ***low*** (see Section 3.14).

[14] CO_2e is a unit of measure used by the IPCC that takes into account the global warming potential of each of the emitted GHGs using global warming potential factors. See Table 1.

Table E-1. Estimated Greenhouse Gas Emissions from Project Construction

Estimated GHG Emissions of Construction Activities	CO_2 (metric tons)	CH_4 (CO_2e)[1] (metric tons)	N_2O (CO_2e)[1] (metric tons)	Total CO_2e (metric tons)
Peak construction transportation	192	133	798	1123
Off-peak construction transportation	43	30	177	250
BPA employee transportation	8	6	34	48
Helicopter operation	14	0.24	0.06	14
Peak construction: equipment operation	6,489	7	44	6,540
Off-peak construction: equipment operation	927	1	6	934
TOTAL	**7,673**	**177**	**1059**	**8,909**

[1] CO_2 emission factors calculated from DOE and EIA 2005. CH_4 and N_2O emission factors from EPA 2007.
[2] CH_4 and N_2O emissions have been converted into units of equivalent carbon dioxide (CO_2e) using the IPCC global warming potential (GWP) factors of 21 GWP for CH_4 and 310 GWP for N_2O (ICBE 2000).

PERMANENT VEGETATION REMOVAL EMISSIONS

Table E-2 displays the contribution to atmospheric GHG levels that would result from tree removal for new road construction and danger tree maintenance for the transmission line. Assuming each affected acre contains the maximum level of carbon storage within the proposed carbon density range above, the net carbon footprint associated with the removal of trees under the Proposed Action would be an estimated 12,020 metric tons of CO2e. Given this estimate, the impact of vegetation removal on GHG emissions would be considered low.

Table E-2. Net Carbon Footprint Associated with Removal of Maximum Number of Trees

Type of Activity	Maximum Loss of Carbon Storage (metric tons)	Total CO_2e[1] (metric tons)
New road construction	1,457	5,342
Danger tree removal	1,821	6,678
TOTAL	**3,278**	**12,020**

[1] Carbon was converted to units of CO_2e using a conversion factor of 3.67.

OPERATIONS AND MAINTENANCE EMISSIONS

Table E-3 displays the contribution to GHG emissions that would result from operations and maintenance activities. Under the Proposed Action, these activities would result in an estimated

10,071 metric tons of CO_2e emissions over the 50-year life of the project. Given this estimate, the impact of operations and maintenance activities on GHG emissions would be considered ***low***.

Table E-3. Estimated Greenhouse Gas Emissions from Operations and Maintenance over the 50-Year Life of the Rebuild Project

Type of Operation and Maintenance Activity	CO_2 (metric tons)	CH_4 (CO_2e)1 (metric tons)	N_2O (CO_2e)[1] (metric tons)	Total CO_2e (metric tons)
Routine patrols	200	56	828	1,085
Maintenance work	533	150	2,210	2,892
Emergency maintenance	133	37	552	723
Natural resource review	1,105	-310	4,583	5,998
Helicopter surveys	42	0.7	0.2	43
TOTAL	**2,013**	**554**	**8,173**	**10,741**

1 CO_2 emission factors calculated from DOE and EIA 2005. CH_4 and N_2O emission factors from EPA 2007.
2 CH_4 and N_2O emissions have been converted into units of equivalent carbon dioxide (CO_2e) using the IPCC global warming potential (GWP) factors of 21 GWP for CH_4 and 310 GWP for N_2O (ICBE 2000).

SUMMARY OF RESULTS

To summarize, the Proposed Action would result in an estimated total of 8,909 metric tons of CO_2e emissions during the initial project year, and an estimated 10,741 metric tons of CO_2e emissions from ongoing operation and maintenance activities over the estimated 50-year lifespan of the line. The lost carbon storage capacity of the trees equals an estimated net loss of 12,020 metric tons of CO_2e (emissions resulting from biomass combustion or land use changes such as deforestation are considered optional for reporting and, if reported, should not be added to direct or indirect emission calculations [The Climate Registry 2008]).

To provide context for this level of emissions, EPA's mandatory reporting threshold for annual CO_2 emissions is 25,000 metric tons of CO_2e, roughly the amount of CO_2 generated by 4,400 passenger vehicles per year (EPA 2010b). The construction emissions associated with the Proposed Action would be roughly equivalent to 1,568 passenger vehicles for the initial year of construction. Operation and maintenance activities would translate into CO_2 emissions about equal to that of about 1,891 passenger vehicles over a 50-year period, or about 39 passenger vehicles per year. All levels of GHG emissions are significant in that they contribute to global GHG concentrations and climate change. Given this low amount of contribution, however, the Proposed Action's impact on GHG concentrations would be considered ***low***.

RECOMMENDED MITIGATION MEASURES

The following mitigation measures have been identified to reduce or eliminate GHG emissions:

- Implement vehicle idling and equipment emissions measures.

- Encourage carpooling and the use of shuttle 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.
- Encourage the use of the proper size of 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 turning off computers and other electronic equipment every night.
- Recycle or salvage nonhazardous construction and demolition debris, where practicable.
- Use local sources for rock for road construction where practicable.

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