

Kalispell-Kerr Transmission Line Rebuild Project

Draft Environmental Assessment

February 2015



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Chapter 1

Purpose of and Need for the Proposed Action

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 Northwest's high-voltage power from facilities that generate the power to users throughout the region.

BPA is proposing to rebuild one of those transmission lines, the Kalispell-Kerr transmission line that runs between Kalispell and Polson, Montana (Figure 1.1-1). The existing 41-mile-long 115-**kilovolt (kV)** transmission line is aging, and BPA proposes to replace its wood-pole **structures** and other line components and improve its road system that provides access to the line.

This chapter describes the need for the Kalispell-Kerr Transmission Line Rebuild Project (Proposed Action). This chapter also identifies the purposes that BPA is attempting to achieve while meeting the need and summarizes the public scoping process conducted for this Environmental Assessment (EA). This EA was prepared pursuant to regulations implementing the National Environmental Policy Act (NEPA), which requires federal agencies to assess the impacts their actions may have on the environment.

1.1 Need for Action

The Federal Columbia River Transmission System Act directs BPA to provide safe and reliable power and transmission service to its customers (16 United States Code [U.S.C.] § 838b(b-d)).

The Kalispell-Kerr transmission line was originally built in 1947. Wood poles for transmission lines are expected to have a service life of 55 to 60 years, at which point they are usually replaced due to age, rot, or other forms of deterioration. Most structures on the Kalispell-Kerr transmission line have reached the end of their service life, are physically worn, and in places are structurally unsound.

In addition, many of the poles are made of Douglas-fir in which the center of the pole was not treated with preservative to prevent rot and decay. Poles of this age and type are now experiencing a high frequency of decay at the ground, which makes them more prone to collapse. Collapse of any poles on the line could lead to failure of the line, which presents safety hazards to the public and BPA workers, as well as risk of **outages** to BPA's customers in northwest Montana.

The road system that BPA uses to access the transmission line is in poor condition with uneven and eroded travel surfaces, insufficient water controls (e.g., **water bars**, drain dips, and **culverts**), and overgrown vegetation, making scheduled maintenance and emergency repairs unsafe. BPA needs safe access to each transmission structure in order to rebuild the line, for ongoing maintenance, and for emergency repairs.

1.2 Purposes of Action

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

- Maintain or improve transmission **system reliability** to BPA and industry standards
- Continue to meet BPA's contractual and statutory obligations

- Minimize environmental impacts
- Demonstrate cost-effectiveness

1.3 Public Involvement and Issue Summary

To help determine issues to be addressed in the EA, BPA conducted public scoping outreach. BPA mailed letters on May 28, 2013, to potentially interested and affected persons, agencies, Tribes, and organizations. The public letter provided information about the Proposed Action and EA scoping period, requested comments on issues to be addressed in the EA, and described how to comment (mail, fax, telephone, the BPA website, and at scoping meetings). BPA also posted the public letter on a project website, which it established to provide information about the Proposed Action and the EA process:

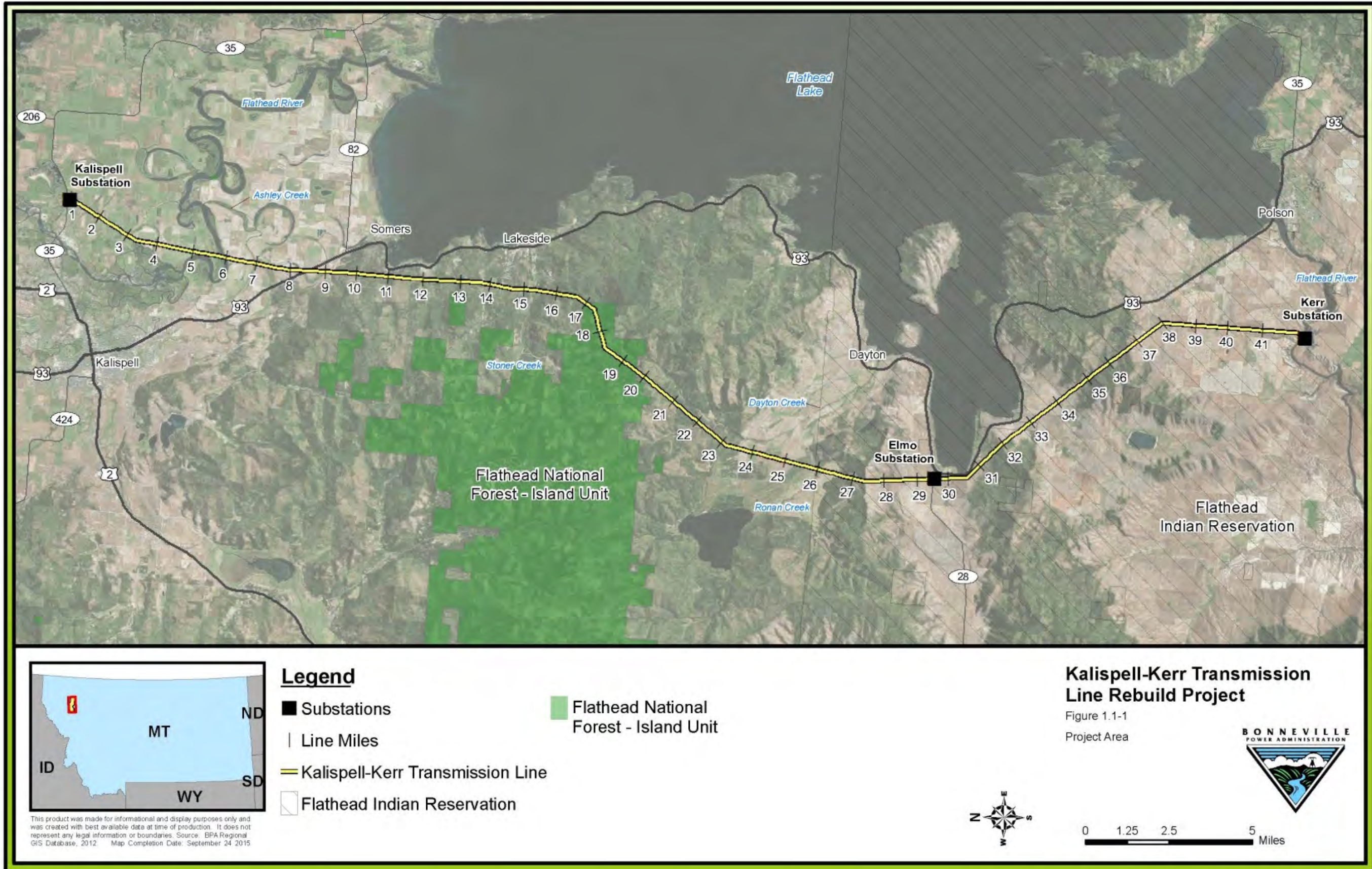
http://efw.bpa.gov/environmental_services/Document_Library/KALISPELL_KERR/

BPA determined that one Tribe has a potential interest in this project—the Confederated Salish and Kootenai Tribes. BPA requested comments on the Proposed Action from the Tribe, as well as on potential **cultural resources** to help shape the field investigation.

BPA held two public scoping meetings to describe the Proposed Action and to solicit comments. Public meetings were held on June 17, 2013, in Polson; and June 18, 2013, in Kalispell. The public comment period began on May 28, 2013, and BPA accepted comments on the project from the public until June 28, 2013. A combined total of 23 people attended the scoping meetings.

BPA considered comments it received during the scoping period in the development of the Draft EA. BPA received 27 comments during the scoping period. After the scoping period ended, BPA continued to receive comments; these comments continued to influence the environmental review. All comments submitted during the scoping period are located on the project website.

Figure 1.1-1. Project Area



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Comments were largely focused on requests that BPA continue, or initiate, coordination activities with landowners along the transmission line to minimize any possible impacts on crops, animals, existing habitat areas (e.g., streams, ponds), and the properties themselves. Questions and comments included the following:

- Questions about **access roads**—will there be new roads on private property, will road improvements increase the already prevalent unauthorized road use and trespass, will construction equipment degrade existing roads, and the need for landowners to be compensated for BPA use of existing roads. (Comments addressed in Chapter 2 [Section 2.2.4] and 3 [Sections 3.2.2, 3.2.3, and 3.10.2].)
- Reminders to obtain appropriate permits (e.g., Clean Water Act [CWA] Section 404 and Aquatic Lands Conservation permits) for construction in or near watercourses and **wetlands**, as well as for utility crossings of highways. (Comments addressed in Sections 3.6.3, and 4.3.)
- Requests regarding structure types and re-routing—some wanted the structures to retain existing wood-pole character, some wanted steel poles to be used to lessen maintenance needs, requests were made to move the structures or the line to improve views or land use. (Comments addressed in Sections 2.1, 2.2.1, 2.4, and 3.8.)
- Concerns about the spread of weeds within the **right-of-way** through ground disturbance and construction equipment and vehicles as potential seed carriers. (Comments addressed in Section 3.4.)
- Concerns about bird impacts—interactions with the line in high bird use areas (over water and wetlands) and nesting on structures. (Comments addressed in Sections 2.2.2 and 3.5.2)
- Reminder to consider the line as a **historic property** and to assess visual effects on historic properties. (Comment addressed in Section 3.11.)
- Request to underground the line and a recommendation to re-route the line around Elmo. (Comment addressed in Section 2.4.)
- Request to notify landowners before starting construction in agricultural fields. (Comment addressed in Section 3.2.3)
- Questions about potential thermal overloads of line—what is in place to monitor and control. (Comment addressed in Section 2.2.2.)
- Concerns about potential impacts where the line crosses a conservation easement that is in place to protect natural resources. (Comments addressed in Section 3.2.)
- Concerns about the devaluation of property values. (Comments addressed in Section 3.10.2)
- Information about history of line—originally built to provide power to build Hungry Horse Dam. (Comments addressed in Section 3.11.)
- Concerns about views, noise, and electric and magnetic field exposure from an existing local utility **substation**. (Comments addressed in Section 3.12.)

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Chapter 2

Proposed Action and Alternatives

This chapter describes the existing Kalispell-Kerr transmission line, 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 by the project purposes, and presents a summary of the potential environmental impacts of each of these two alternatives.

2.1 Existing Transmission Line

The existing 41-mile-long 115-kV Kalispell-Kerr transmission line runs between the BPA Kalispell **Substation** in Kalispell, Flathead County, and the Kerr Substation, in Polson, Lake County (Figure 1.1-1). The transmission line was constructed in 1947 and crosses private property, **unincorporated county land**, United States (U.S.) Forest Service land, Montana state land, and the Flathead Indian Reservation. (Representative photographs are presented in Section 3.5, *Wildlife* and Section 3.8, *Visual Quality*.)

Generally, BPA has easements or other authorizations with underlying landowners for the transmission line **right-of-way**. In most places, BPA's right-of-way is 200 feet wide. The Kalispell-Kerr transmission line occupies 100 feet of the right-of-way. The additional 100 feet of the right-of-way is in some places unoccupied; however, from line mile 9 to line mile 30, BPA's 230-kV Flathead-Hot Springs No. 1 transmission line occupies the additional 100 feet of right-of-way parallel to the Kalispell-Kerr transmission line.

The existing transmission line is made-up of 359 wood-pole structures, which are mostly two-pole wood-pole H-frame structures, with some three-pole structures and two-pole steel structures. Many of the wood-pole structures have **guy wires** to increase structural stability. The transmission line has three **conductors** (electrical wires) and stretches of overhead **ground wire** for the first 0.5 mile out each substation it passes through (Kalispell, Elmo, and Kerr substations) to protect substation equipment from lightning strikes. New design standards set forth in BPA's Transmission Services Standard require overhead groundwires for the entire length of all transmission lines east of the Cascades.

Roads used to access the transmission line are a combination of multi-use county or residential roads, roads that have been developed by landowners (e.g., driveways, farm roads, etc.), roads that BPA has developed, as well as routes-of-travel where BPA drives across unimproved surfaces to towers in farm fields or pastures. Many of the BPA **access roads** are within the transmission line right-of-way; however due to terrain, ownership, or other conditions, some access roads are outside of the transmission line right-of-way.

BPA has easements with underlying landowners for most of its access road system along the two lines; however, there are numerous locations where BPA does not have easement rights.

2.1.1 Ongoing Line Maintenance

BPA conducts routine periodic line inspections and maintenance along its entire 15,000-mile transmission system in the Pacific Northwest. BPA has operated and maintained the Kalispell-Kerr transmission line since the line was built in 1947. Typical maintenance on wood-pole transmission lines involves replacing individual deteriorating structures or broken **insulators** and fixing access roads as needed. Most maintenance activities are planned a year or so in advance, but occasionally emergency repairs are required due to weather events, fires, or vandalism.

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

2.1.2 Ongoing Vegetation Management

BPA also manages vegetation within its transmission line rights-of-way and access roads to keep vegetation a safe distance from the conductors, maintain access to structures, and control **invasive weeds**. When vegetation management is required for a BPA transmission line, BPA conducts environmental review for those site-specific maintenance activities as appropriate. Vegetation management is guided by BPA's *Transmission System Vegetation Management Program Final Environmental Impact Statement/Record of Decision* (BPA 2000). Depending on the vegetation type, environment, and landowner, a number of different vegetation management methods could be used: manual (e.g., hand-pulling, clippers, chainsaws), mechanical (e.g., roller-choppers, brush-hog), or chemical (e.g., herbicides).

Vegetation within the right-of-way is managed to keep trees, or other taller vegetation that could threaten the conductors, from growing. In some select situations, trees are allowed to grow within the right-of-way—such as where BPA has agreements with landowners to allow orchard trees or where the line spans high over the top of ravines and trees can grow beneath without nearing the conductors.

Along the Kalispell-Kerr transmission line, vegetation management is conducted every 3 to 5 years; it was most recently completed in spring 2013. Because the vegetation within the existing right-of-way has been managed to remove tall vegetation, the vegetation generally consists of low-growing shrubs, herbaceous vegetation, tree saplings, and agricultural field crops. However, the existing line is within a larger right-of-way easement, portions of which do not have an adjacent transmission line. This unoccupied portion of the right-of-way was never cleared of trees, but trees have been selectively removed when they have threatened to grow or fall into the line.

Vegetation outside of the right-of-way is also managed to remove select **danger trees** adjacent to the right-of-way that have the potential to grow or fall into the line. Identifying danger trees includes determining tree height and growth potential, the direction the tree leans, stability and health (e.g., root pathogen damage), and whether they are located in areas with severe storm damage potential. Although much of the transmission line crosses agricultural fields with no threats of danger trees, it also passes through areas of adjacent dense forest or over creeks where danger trees are often identified.

This ongoing vegetation management would continue whether or not the Proposed Action was implemented, but the rebuild would include tree removal as needed to keep the line safe, so the next vegetation management cycle would likely not occur for 3 to 5 years after the project was completed.

2.2 Proposed Action

The main components of the Proposed Action include the following:

- Removal and replacement of all wood-pole transmission line structures (including components such as **cross-arms, insulators, dampers, and guy wires**).
- Replacement of **conductors** (electric wires).
- Installation of a combination fiber optic cable-ground wire (optical ground wire) with **counterpoise for the entire length of the transmission line**.

- Improvements to the access road system, including improving or reconstructing existing roads, constructing new roads, installing temporary roads, obtaining access rights, and replacing or installing **culverts** and fords, and entrance gates.
- Installation of new, or replacement of existing, roadway culverts.
- Removal of trees and other vegetation within and along the right-of-way and along access roads.
- Establishment of temporary **staging areas**, material storage sites, and **tensioning sites** (for **pulling and tightening** conductors).
- Installation of temporary guard structures to protect roads, railroads, and other utilities during conductor stringing.
- Revegetation (primarily seeding) of areas disturbed by construction activities.
- Updating maintenance road access easements

Table 2.2-1 provides details of the Proposed Action elements. Each of these elements and activities is described in detail in the remaining portions of this chapter.

The rebuilt Kalispell-Kerr transmission line would be similar to the existing line in design and appearance, although most of the structures would be between 10 and 15 feet taller. No work is proposed on the Flathead-Hot Springs No. 1 transmission line that shares the transmission line corridor with the Kalispell-Kerr transmission line.

2.2.1 Transmission Line Structures

Removal of Existing Structures

BPA would remove and dispose of 354 of the 359 existing wood-pole structures. Transmission line structures are individually numbered by line mile and structure within the line mile. For example, Structure 1/1 is the first structure in the first mile of the Kalispell-Kerr transmission line just outside the Kalispell Substation. Throughout the EA, reference is made to the “line mile” as a point of reference instead of specific structure numbers when at all possible. Line mile 1 begins at the Kalispell Substation, line mile 2 is at the start of the second mile near the intersection of Kinshella Road and Fairmont Road, and so on until line mile 41 is reached just north of the Kerr Substation. In the process of rebuilding the transmission line, BPA would re-number the structures. For example, the existing second structure in line mile 3 is shown as 3/2; however, the new structure would be new structure 3/4 (the fourth structure in line mile 3). Therefore, within this EA when references to specific structures are made, both the existing and the new structure numbers are presented as 3/2|3/4 (existing|new). Structure 1/1|1/1 was replaced in 2013 and would not be removed/replaced as part of the Proposed Action. Structures within the **substation** fence-line would not be replaced.

Removing existing structures involves excavating around the structure base and using a boom crane to pull the structure out of the ground. Excavated poles would be hauled off site using a line truck and disposed of in accordance with federal, state, and local laws.

Table 2.2-1. Quantity of Required Elements for Proposed Action Activities

Description	Quantity ^a
Transmission Line Elements	
Corridor length	41 miles (no change)
Corridor right-of-way width	200 feet (no change)
Total number of structures (existing / replacement)	359/354 ^b
Number of structures outfitted with counterpoise (existing/replacement)	No Data/354
Number of structures outfitted with guy wires and anchors (existing/replacement)	23/45
Structure height range (existing / new)	40–80 feet/50–95 feet ^c
Operating voltage	115 kV (no change)
Number of conductors (existing/replacement)	3 (no change)
Conductor diameter (existing/replacement)	0.563–0.835 inch /0.835 inch
Optical Ground Wire	
Optical ground wire	2
In-ground vaults/junction boxes	4
Access Road Activities	
Total length of access road activities	61 miles ^e
<ul style="list-style-type: none"> • New construction 	4 miles ^e
<ul style="list-style-type: none"> • Reconstruction 	6 miles ^e
<ul style="list-style-type: none"> • Improvement 	25 miles ^e
<ul style="list-style-type: none"> • Direction of travel (no work needed) 	26 miles ^e
Gates (new/replaced)	77/28
Culverts (new/repair or replaced)	21/8
Fords (new/repair or replaced)	1/1
Access Rights and Easement Acquisition	
Acquire access roads/routes easements for roads	9 miles ^d
Vegetation Removal	
Removal or disturbance of low-growing vegetation ^f within the transmission line right-of-way (permanent/temporary)	3/37 acres ^f
Removal of trees inside transmission line right-of-way	Estimated up to 750
Removal of trees outside (adjacent) transmission line right-of-way	Estimated up to 200
Removal of trees along access roads	Estimated up to 1,300
Removal or disturbance of low-growing vegetation ^f along existing access roads (permanent/temporary)	43/92 acres ^f
Notes:	
^a Estimates are based on 90% design (August 2015).	
^b Five structures would not be replaced, including: the first structure outside the Kalispell Substation, the terminal structure within the Kalispell Substation, the terminal structure within the Kerr Substation, and two structures within the Elmo Substation.	
^c The structures at the Flathead River crossings in mile 5 would be 110 and 115 feet tall, which is 35 feet taller than existing structures.	
^d The sum of all segments where road design indicates that BPA has no rights and that an action of Acquire Permit, Acquire Route, or Acquire Standard is required.	
^e Quantity rounded up to the next whole number.	
^f Includes grassland, shrubland, and wetland and riparian vegetation types (See Section 3.4.2 and Table 3.4-4)	

Installation of New Structures

BPA would replace the existing structures and their components (such as cross-arms, insulators, and dampers) (Figure 2.2-1) with new ones. There are a total of 359 structures on the line, consisting of the following type and number of structures:

- 328 two-pole wood structures that would be replaced with two-pole wood structures.
- 2 two-pole steel structures that would be replaced with two-pole wood structures.
- 23 three-pole wood structures that would be replaced with three-pole wood structures.
- One three-pole wood structure (1/1|1/1) that would not be replaced.
- One two-pole wood structure (3/2|3/4) that would be replaced with a three-pole wood structure.
- Four structures within substation boundaries that would not be replaced (one structure at the Kalispell Substation, two at Elmo Substation, and one at Kerr Substation).

Two-pole wood structures are typically used to hold the conductors where the transmission line is straight within the right-of-way or where turning angles are less than 15 degrees. Three-pole structures are used in areas where additional strength is necessary to hold the weight and tension of the conductors, such as at longer spans between structures and angles greater than 15 degrees.

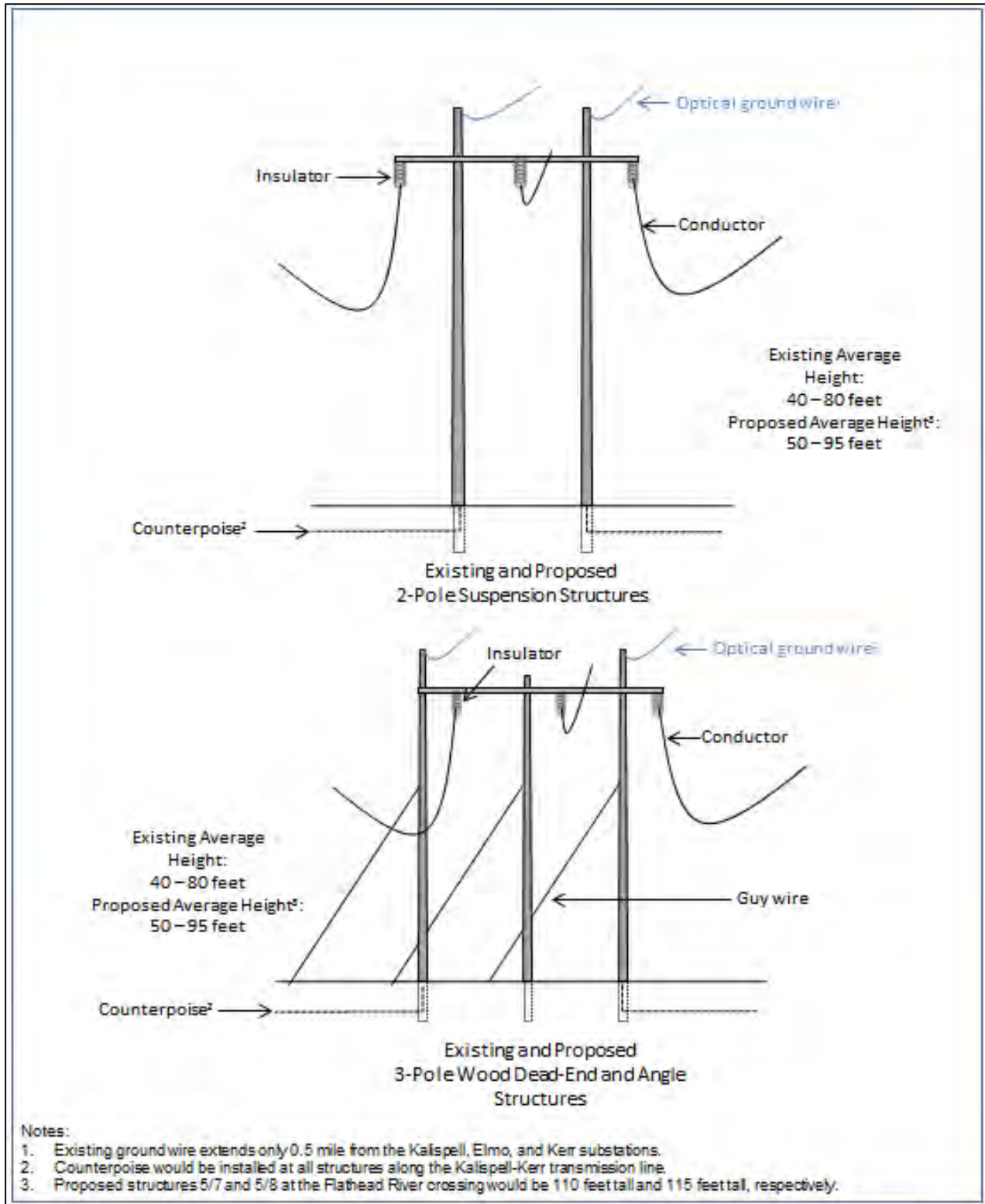
Replacement structures would be brought to the structure sites from the staging areas by flatbed truck and, in most cases, installed within 5 feet of the existing structure's location. However, 11 structures would be placed anywhere from 20 to 120 feet from their existing location and would still be located within the existing ROW. The reasons for relocating these structures further away from their current location include improving views for landowners, avoiding wetlands, and increasing ground to conductor clearance. The existing structure poles would be removed and the holes would be re-augered using a drill rig. Hole depth is typically 10 percent of the pole height plus 2 feet (about 7 to 11 feet), but this can vary depending on local conditions. The replacement structures would be lifted by crane or helicopter into position and placed into the holes. Holes would be backfilled with gravel and excavated soil. At most structure sites, any soil removed that is not used for backfill would be disposed of in accordance with federal, state, and local laws.

Spans between individual structures range from about 140 to more than 1,600 feet, with the longer spans over rivers and streams. Typically, between eight and ten structures are found within each line mile, although this number fluctuates depending on terrain and other factors. Current structure height ranges from about 40 feet to over 80 feet, and new structures are expected to be between about 50 and 95 feet, except at the two Flathead River crossings where structures are between 110 and 115 feet. The additional height is needed to increase ground to conductor clearance (Section 2.2.2).

At most two-pole and three-pole structure sites, structure replacement could temporarily disturb an area up to 50 feet by 100 feet per structure (about 0.1 acre) within the right-of-way. In or near specific sensitive habitats, work areas would be reduced to 50 feet by 50 feet or to the extent practicable to minimize disturbance. To protect sensitive habitats, staking, temporary fencing, or flagging would be installed in these areas to restrict vehicle and equipment access to designated routes and areas.

Guy wires and **guy wire anchors** to support new structures would be installed, as required. If guy wires need to be replaced at a structure site, 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. In most locations, new guy wires would be anchored with helical anchors that are screwed directly into the soil. This type of anchor minimizes the disturbance area and generates no spoils.

Figure 2.2-1. Existing and Proposed Wood-Pole Structures



In areas where helical anchors are not appropriate (e.g., very soft soils or bedrock), 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 compacted gravel or crushed rock. The remainder of the guy wire anchor hole would be backfilled with native material.

Equipment used for removing and installing wood structures 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 BPA's existing transmission line right-of-way and within access road easements and **travel routes** established for the Proposed Action.

2.2.2 Conductors, Optical Ground Wire, and Counterpoise

Conductors

Conductors are the wires on the structures that carry the electrical **current**. The transmission line carries three conductors. The new conductors would be installed with new hardware and insulators, which are strings of bell-shaped devices that prevent electricity from arcing from the conductors to the structures and traveling to the ground. The new conductors would be between ½ and 1 inch in diameter (Table 2.2-1). The new conductors would be installed after the new structures are erected.

The National Electrical Safety Code (NESC) and BPA require minimum conductor heights above the ground surface and other features (e.g., street lights, electrical distribution lines, etc.). The minimal height for a 115-kV line is 24 feet. Additional clearance would be provided over roadway and river crossings.

In addition, **dampers** would be added on the conductors along four spans in line miles 5 and 6 near the Flathead River crossing. Dampers consist of small weights or plastic coils attached to the conductors to suppress wind-induced vibrations. Dampers would be located within 15 feet of the insulators and would help protect the conductors from wear and premature fatigue failures.

The reconstructed transmission line would comply with the *Suggested Practices for Avian Protection on Power Lines* prepared by the Avian Power Line Interaction Committee (2006). **Bird flight diverters** are spiral-shaped devices that would be installed every 30 feet on the optical groundwire (described below) on spans where an increased risk of bird strikes exists (e.g., wetlands and rivers), and where technically feasible.

The existing conductors, as well as the overhead ground wire, would be removed by reeling the wires on to 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 and recycled.

Optical Ground Wire and Counterpoise

Optical ground wire is a dual-functioning cable designed to replace traditional ground wires on overhead transmission lines with the added benefit of containing optical fibers that can be used for telecommunications purposes. Fiber optics technology uses light pulses rather than radio or electrical signals to transmit information. This communication system can gather information about the transmission system (such as the line in service and the amount of power being carried, meter readings at interchange points, and status of equipment and alarms). Fiber optic cable also allows voice communications between power dispatchers and line maintenance crews and provides almost instantaneous transmission of commands that control power system operation.

Two optical ground wire cables, approximately 0.6 inch in diameter, would be strung along the entire length of the transmission line (Figure 2.2-1). The optical ground wire would be placed in the topmost position of the structures where it would shield the conductors from lightning while providing a communications link

for the transmission system. Each cable would contain 36 fiber optic strands; two strands would be reserved for the Confederated Salish and Kootenai Tribes per BPA's transmission line easement agreement with the Tribes. Reeling locations would be located approximately every 4 to 5 miles to string and then put tension on the optical ground wire cable.

New fiber optic vaults and/or splice boxes would be installed about every 4 to 5 miles at locations within the existing right-of-way. The vaults are 4 x 4 x 4-foot concrete enclosures that are typically placed on the ground or partially buried in the ground at the base of a transmission line structure, whereas the metal splice boxes are mounted directly on the transmission line structures. Vaults would be installed at the Kalispell, Elmo, and Kerr substations, and splice boxes would be located on structures as necessary between these locations.

To take the lightning charge from the optical ground wire and dissipate it into the earth, a series of wires, grounding rods, or both (called **counterpoise**) would be buried in the ground at the base of each structure and within the right-of-way. Counterpoise would be installed in trenches approximately 30 inches deep and 24 inches wide and vary in length from 15 to 100 feet (Figure 2.2-1). The disturbance area for installing counterpoise would be within the structure installation disturbance area.

2.2.3 Temporary Staging Areas, Tensioning Sites, and Guard Structures

Temporary staging areas would be used to store and stockpile materials, trucks, and other equipment during construction. Each staging area would occupy approximately 5 acres, based on the area needed to accommodate new and replaced structures. These staging areas would be within about 5 miles of the transmission line on existing paved or graveled lots, most likely in an industrial or commercial area. Staging areas would be identified by BPA or the construction contractor prior to construction. Once the locations are determined, BPA would obtain all necessary clearances and approvals to operate within those staging areas. For staging areas impacting previously undisturbed soils, BPA would complete a site-specific environmental review.

The conductor and optical ground wire would be installed by setting up tensioning sites at the beginning and end of each identified pulling section. Tensioning sites are used for pulling and tightening the conductor and optical ground wire cables to the correct tension once they are mounted on the transmission line structures. The sites would disturb an area approximately 100 feet by 300 feet (approximately 0.7 acre). Tensioning sites would be located within the right-of-way approximately every 2 to 4 miles depending on the length and angle of each span and terrain. At locations where the transmission line makes a sharp turn or angle, the tensioning sites may extend outside of the right-of-way. Temporary construction easements would be acquired and site-specific environmental reviews would be performed for those sites.

After the equipment (puller and tensioner) is set up, a **sock line** (usually a rope) would be temporarily strung through all structures on the section. The tensioner is a large piece of equipment with drums that the new conductor is fed through to set the proper tension. The sock line would be strung 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 the new conductor is pulled into place, it would be tensioned and sagged in place and secured to all of the structures.

Guard structures are temporary wood-pole structures with cross-arms placed on either side of a facility (distribution lines, roads, railroad crossings) to catch conductors or optical ground wire in the unlikely event that the conductors/wires fall while being removed or installed. Guard structures would be installed during construction and removed after the conductor is strung.

2.2.4 Access Roads

As part of the Proposed Action, BPA would improve and/or reconstruct many of the existing access roads, as well as build short sections of new access road.

Typical BPA access roads are built with a 14-foot wide road bed with 3-foot sides for slopes or drainage ditches. Some road and disturbance areas are wider to allow vehicles to negotiate curves in the road and to accommodate additional cut and fill on steep slopes and turns. For the purposes of the analysis in this EA, the total disturbance width for access roads is assumed to be 20 feet. Where practicable in specific sensitive areas such as wetlands, the access road widths may be reduced to minimize impacts.

The Proposed Action's access road work consists of four types of activities: new construction, reconstruction, improvements, and temporary roads.

- **New construction.** In total, approximately 4 miles of new road would be constructed on 69 individual new road segments. New construction involves vegetation clearing, grading and developing a road prism, and, applying gravel to the road surface. Drainage structures such as culverts, drain dips, and roadway ditches would be installed where necessary to manage water flow on and around the new road.
- **Reconstruction.** In total, approximately 6 miles of existing road would be reconstructed. Road reconstruction is needed where existing roads have deteriorated to the point where they are no longer safely usable by construction vehicles and equipment. Reconstruction can consist of the same activities as with new road construction, including vegetation clearing, grading and redeveloping the road prism, widening to pre-existing conditions, gravelling as necessary, and installation or repair of drainage structures and roadway ditches.
- **Improvements.** In total, approximately 25 miles of existing road would be improved. Improvements involve minor amounts of work such as clearing or cleaning the road, drainage improvements including culvert replacement, road widening, blading to reshape the existing road surface, and/or gravelling.
- **Temporary roads.** About 0.6 mile of temporary roads would be installed for construction then removed. Temporary roads would be installed using removable wetland mats or by laying geotextile fabric topped with gravel to access structures in agricultural fields, wetlands, or other sensitive areas.

In addition, BPA would use about 26 miles of access routes classified as direction of travel. Direction of travel routes would either follow existing roads or would involve vehicles and equipment traveling cross-country where there is no existing road, and would not require any road work. Although some direction of travel would occur on existing roads, there would be about 11 miles where crews would drive over unimproved field surfaces in the middle of farm fields and open grassland. Although there would be no developed access road, BPA has, or would obtain, easements to drive across the field to access the structure.

As a component of access road construction and improvements, 21 new culverts would be installed and 8 existing culverts repaired or replaced to manage **stormwater runoff** and, in one location, possibly provide fish passage. No bridges are proposed to be replaced as part of the Proposed Action. One new ford would be constructed and one existing ford repaired. A ford is a low-water stream crossing consisting of a roadbed reinforced with 3 to 12 inch diameter rock. Fords are a more cost effective means, compared to bridges or culverts, of crossing shallow, seasonal streams on infrequently used roads.

BPA places locked gates on access roads to maintain security and prevent unauthorized access to the transmission line right-of-way and private property. Unauthorized use of the access roads to enter private

land or obtain access to public lands has been an issue with the existing transmission line. Twenty-eight existing gates would be replaced as part of the Proposed Action, and 77 new gates would be installed. BPA would coordinate with landowners to ensure landowners have keys to the gates.

Access Road Easement Release and Acquisition

To ensure BPA has appropriate rights to use roads that are required to access the transmission line, an estimated 9 miles of new access road easements would be acquired from underlying landowners for new and some existing access roads. Generally, BPA obtains a 20-foot-wide easement for access road rights, although some easements may be wider depending upon the terrain and road alignment (e.g., larger cut and fill slopes are sometimes required on switchbacks). BPA would compensate landowners for any new easement rights acquired.

2.2.5 Vegetation Removal

Vegetation would be disturbed (e.g., mowed, crushed), and in some cases removed, to facilitate construction (equipment maneuvering), improve road clearance, construct new roads, and ensure no trees hinder safe operation of the line. Soil disturbance and removal would be minimized as much as possible during vegetation removal. An excavator would likely be used to grub out some of the smaller shrubs growing at the edge of the road surface. The use of an excavator is preferred to large mowers or brush cutters 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.

About 130 acres of low growing vegetation (grasses, low-shrubs, small saplings, and agricultural crops) would be disturbed or cleared for construction activities, and about 2,250 trees would be removed. Trees to be cut would include 750 **corridor trees**, 200 **danger trees**, and 1,300 trees for access road work (Table 2.2-2). About 2 percent of these trees are dead (snags). Danger trees are trees located outside of the transmission line right-of-way, while corridor trees are located inside the transmission line right-of-way; both trees that have the potential to fall, grow into, or grow too close to the conductor and cause line outages. As previously stated, the unoccupied portion of the right-of-way was never cleared of trees, as a result, there is a higher number of corridor trees identified for removal. Danger trees would be disposed of in accordance with landowner preference, whereas corridor trees are often cut and scattered onsite. The 1,300 trees that would be removed for the access road work would be for new road construction, existing road reconstruction or improvement, or to provide sufficient clearance for construction equipment. Trees along access roads were identified based on where they are in relation to a 14-foot wide travel surface with 3 feet of clearing on either side. The removal of these trees would allow for sufficient horizontal and vertical clearance for construction equipment so that long construction vehicles, such as trucks with trailers carrying the wood-pole structures, could navigate turns. These trees are dispersed over the access road system and are not located in one specific area (Table 2.2-2).

Table 2.2-2. Summary of Tree Removal

Proposed Activity	Estimated Quantity
Removal of trees outside of, or within the unoccupied portions of the transmission line right-of-way ^{a, b}	950
U.S. Forest Service Swan Lake Ranger District	10
Flathead Indian Reservation	550
Non-federal lands	440
Removal of other trees along access roads ^{a, c}	1,300
U.S. Forest Service Swan Lake Ranger District	550
Flathead Indian Reservation	220
Non-federal lands	530
^a Approximately 90% of all trees identified area 18-inch diameter at breast height (dbh) or smaller. ^b The trees to be removed along the transmission line right-of-way include 95% conifer and 5% deciduous. ^c The trees to be removed for access road construction include 98% conifer and 2.0% deciduous.	

After the transmission line is rebuilt, additional trees could be identified that require removal depending on whether the new conductor sagged such that a tree would potentially touch or grow too close to the wires.

All areas disturbed by construction activities, except permanent road surfaces, would be restored to pre-construction conditions as best as possible. In disturbed areas with native vegetation, restoration would include reseeding 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 practicable. Agricultural areas impacted from construction and use of temporary access roads would be restored to pre-construction conditions or conditions as agreed upon with the landowner.

During construction, a **mitigation** management plan would be implemented, including **best management practices (BMPs)**, to minimize construction-related impacts on the environment. These BMPs would include a variety of measures to reduce **erosion**, protect against the release of oil or chemicals, reduce the spread of **invasive weeds**, limit construction noise, seasonally limit construction in some areas, and other actions to protect the natural environment and reduce inconveniences and impacts on local communities.

2.2.6 Construction Sequencing and Scheduling

Construction of the Proposed Action is currently expected to begin in spring 2017, and the rebuilt line would be energized by fall 2018. Depending upon the site conditions and weather, construction crews can typically complete one line mile of construction (i.e., construct/improve access roads, remove trees, replace structures) every 6 to 8 days. The transmission line would be taken out of service (deenergized) while the line is being rebuilt. Construction typically consists of 50 to 80 personnel, including transmission line and road construction crew members, surveyors, inspectors, and other support staff. Two construction seasons are expected to be needed to finish the Proposed Action. While structures are being replaced, typically one bucket truck, one excavator, two cranes, and one dump truck would work at the site. While work is being done on access roads, any combination of dump trucks, rollers, graders, bulldozers, and excavators would be at the site.

2.3 No Action Alternative

Under the No Action Alternative, BPA would not rebuild the transmission line, add optical ground wire as presently required, upgrade access roads, and acquire necessary easements as a single coordinated project. BPA would continue to operate and maintain the existing transmission line in its current condition, replacing aged and rotting structures as they deteriorate and maintaining access roads. The overall scale and scope of the repairs done under the No Action Alternative would be smaller than what is described under the Proposed Action. However, improvements would be done on a piecemeal basis, as the need arises, rather than in a coordinated manner. This results in less cost efficiencies, and more service disruption. Additionally, BPA would be unable to address more comprehensive and beneficial improvements such as access road work to improve water runoff, decreasing unauthorized use of access roads through gate installation, and increasing fish passage through replacements to fish-friendly culverts.

2.4 Alternatives Considered but Eliminated from Detailed Study

Described below are alternatives BPA considered but determined infeasible and eliminated from detailed analysis.

Undergrounding. During public scoping, a commenter requested that the transmission line be put underground. In general, because of the costs of undergrounding high voltage transmission lines, BPA has only used underground cable in limited situations, such as for the long water crossings in the San Juan Islands of Washington where an overhead route is not possible. For the Kalispell-Kerr transmission line, placing the existing line underground would have substantially greater costs and environmental impacts than replacing the existing overhead structures. Some of the costs and impacts of undergrounding the transmission line would include the following (based on Xcel Energy 2011):

- Outages are more difficult to locate and repair when they occur.
- Additional equipment would be required on the underground system to compensate for voltage changes and forced cooling (higher voltages generate heat while transmitting electricity and if not removed, it could lead to failure).
- Construction impacts would be much greater to underground the line because the entire length of the right-of-way would be trenched—through agricultural fields, wetlands and waterways, and up and down steep terrain. (The existing overhead line spans many sensitive areas that can be left undisturbed.)
- Concrete vaults and manholes would be needed at regular intervals along the line for access.
- Transition stations would be required on either end of the line to terminate the underground cables and connect to the overhead transmission system. These stations would be in addition to the existing substations.
- Construction would take three to six times longer than overhead line construction.
- The life expectancy of the underground line would be about half of an overhead line because the insulation surrounding the conductor breaks down over time and must be replaced.
- Undergrounding the line would cost between four and 15 times more than keeping the line overhead.

Because of the higher construction and maintenance costs, environmental impacts, and shorter life expectancy, replacing the existing line with an underground cable was not considered a reasonable alternative for ensuring the integrity and reliability of the existing Kalispell-Kerr transmission line. For these reasons, this alternative was not carried forward for detailed analysis.

Use steel poles instead of wood. One of the scoping comments recommended that BPA use steel poles instead of wood because they would require less maintenance. BPA uses steel poles in certain situations, such as where there are right-of-way constraints, or when more support or longer spans are required. Steel-pole structures would cost about two to three times more than wood-pole structures due to both material and installation costs. Unlike wood poles, BPA does not carry an inventory of steel poles, but simply orders what is needed for specific projects, so it could be more difficult to replace structures in the case of emergency failures. In addition, steel-pole structures could change the visual character of the transmission line. Because there are no unique conditions warranting the use of steel poles for this project, and because use of steel poles would increase project costs by about two to three times, this alternative was not carried forward for detailed analysis.

Re-routing. Scoping comments requested that BPA consider re-routing the existing line around the town of Elmo, as well as moving some specific structure locations to improve views, minimize impacts on sensitive resources, or minimize agricultural use conflicts. BPA proposes to make some minor adjustments to the existing structure locations by moving some structures ahead or back on the line within the existing right-of-way where possible to address requests—but not all requests can be accommodated due to terrain or site-specific conditions.

In addition, BPA considered re-routing the line around Elmo. BPA understands that this reroute was requested to eliminate the visual and land use impacts to the Town of Elmo. Re-routing this section of line would likely increase the length by 0.5 mile and cost an additional \$200,000 to \$400,00 (depending on possible engineering constraints, cost to acquire new easements, etc.). Re-routing the line would also result in higher environmental impact due to clearing of new right-of-way and development of new roads and would require the purchase of new right-of-way easements. Because of costs and the introduction of new environmental impacts, this alternative was eliminated from detailed analysis.

2.5 Comparison of Alternatives

Table 2.5-1 summarizes the stated purposes of the Proposed Action (see Chapter 1, *Purpose of and Need for Action*) and compares the potential for the Proposed Action and No Action Alternative to meet those goals. A detailed comparison of the environmental impacts of the Proposed Action and No Action Alternative is presented in Table 2.5-2, based on the results of the analysis as presented in Chapter 3, *Affected Environment, Environmental Consequences, and Mitigation Measures*.

Table 2.5-1. Comparison of the Proposed Action and No Action Alternative by Purposes

Purpose	Proposed Action	No Action Alternative
Meet transmission system public safety and reliability standards set by NESC	The Proposed Action would result in a line rebuilt to current industry standards for operational reliability and safety. Replacing deteriorating structures and associated equipment would enhance transmission system reliability by reducing the risk of unplanned outages and the need for emergency repairs. Improved access roads would help ensure that emergency repairs could be made quickly.	Outdated and physically worn structures and associated equipment would pose a greater risk for unplanned outages and unreliable service. Emergency response times could increase due to access roads that are in poor condition.
Continue to meet BPA’s contractual and statutory obligations	The rebuilt transmission line would help ensure that BPA will continue to meet its obligations to maintain a safe and reliable system and to deliver power to its customers in Montana.	The existing line would continue to deteriorate and threaten system reliability and subsequent power delivery to customers in Montana.
Minimize environmental impacts	Environmental impacts from construction would occur (see Table 2.5-2 for a comparison of the environmental impacts of the alternatives). Construction-related impacts would be primarily short term, and would be mitigated through appropriate BMPs and mitigation measures described in Chapter 3.	While the No Action Alternative would not have the environmental effects of the Proposed Action, over time existing structures would fail at increasing rates as they aged. BPA would be forced to either replace them in smaller segments or on an emergency basis. Working under emergency conditions may reduce BPA’s ability to coordinate with landowners or avoid sensitive habitats like wetlands, times of year (bird nesting season), or saturated soil conditions.
Demonstrate cost-effectiveness	Total costs would be about \$24,000,000 to \$29,000,000 million.	The No Action Alternative would not require the expenditure of funds to rebuild the transmission line at this time. Repairs would require an ongoing outlay of funds to replace failed structures, rebuild roads, and replace and re-string failed conductors. The rate of maintenance spending would likely increase as aging structures fail at increasing rates. An as-needed approach would likely increase the cost associated with multiple mobilizations and would likely be less cost efficient, when compared to the Proposed Action.

Table 2.5-2. Comparison of the Environmental Impacts by Alternative

Alternative	Anticipated Level of Impact	Potential Impacts
Land Ownership, Use, Recreation, and Transportation		
Proposed Action	Low	<ul style="list-style-type: none"> • Transmission line would operate within its existing right-of-way. • 10 acres of new easement acquisition. • Potential temporary crop losses would be compensated by BPA. • Recreation use is low and dispersed and construction would be localized. • Potential temporary delays and traffic disruptions during construction; no permanent impacts on public transportation systems.
No Action Alternative	Low	<ul style="list-style-type: none"> • Similar to Proposed Action but spread out over time as emergency repairs are needed. • Continued trespass and unauthorized use of roads lacking gates.
Geology and Soils		
Proposed Action	Low to Moderate	<ul style="list-style-type: none"> • 60 acres of total permanent soil disturbance. • 35 acres of permanent disturbance in areas of severe erosion potential. • 2,250 trees removed. • Disturbance would be dispersed throughout right-of-way and would not occur in one area or all at one time. • Permanent and temporary erosion control measures would be implemented.
No Action Alternative	Low to Moderate	<ul style="list-style-type: none"> • Similar to Proposed Action but spread out over time as emergency repairs are needed. • Emergency repairs during wet seasons could increase risk of erosion and landslides.
Vegetation		
Proposed Action	Low	<ul style="list-style-type: none"> • 55 acres of permanent impacts on vegetation, 70% within grasslands. • 2,250 trees removed. • Vegetation removal and changes in plant cover. • Soil compaction and disturbance. • Increased potential for spread of invasive plants. • Low potential for special status plants to be impacted due to lack of suitable habitat.
No Action Alternative	Low	<ul style="list-style-type: none"> • Similar to Proposed Action but spread out over time as emergency repairs are needed.
Wildlife		
Proposed Action	Low	<ul style="list-style-type: none"> • Habitat loss, fragmentation, modification, degradation, and short-term disturbances. • Potential avian collisions with conductor. • Temporary noise and activity disturbances to wildlife. • Low level, temporary impacts on ESA-species (grizzly bear and Canada lynx)
No Action	Low	<ul style="list-style-type: none"> • Similar to Proposed Action but spread out over time as emergency

Alternative	Anticipated Level of Impact	Potential Impacts
Alternative		repairs are needed.
Wetlands and Floodplains		
Proposed Action	Low for wetlands Negligible to Low for floodplains	<ul style="list-style-type: none"> • Less than 1 acre of wetland and floodplain habitat filled for road construction • Disturbance of wetlands and temporary disruption of wetland functions. • Soil compaction and crushing of wetland vegetation. • Tree removal in floodplains. • Potential for accidental chemical spills and PCP leaching from wood poles.
No Action Alternative	Low for wetlands Low for floodplains	<ul style="list-style-type: none"> • Similar to Proposed Action but spread out over time as emergency repairs are needed.
Water Resources and Fish		
Proposed Action	Low for surface water and groundwater Low for fish	<ul style="list-style-type: none"> • Temporary erosion, runoff, sediment deposition, and turbidity during and immediately after construction. • Reduced infiltration rates from soil compaction and new road surfaces. • Potential spills of hazardous materials into or near streams during construction. • Improved channel conditions at culverts.
No Action Alternative	Moderate for surface water and groundwater Low to Moderate for fish	<ul style="list-style-type: none"> • Sedimentation and erosion during emergency repairs. • Continued passage obstructions for aquatic wildlife due to undersized and impassable culverts. • Fish mortality and habitat impacts during emergency repairs.
Visual Quality		
Proposed Action	Low	<ul style="list-style-type: none"> • Temporary changes in visual environment during construction (presence of workers, equipment, materials, signage; movement of vehicles and traffic congestion). • Increase in structure height of up to 15 feet. • Tree removal distributed throughout the project right-of-way. • New access roads. • Components of the Proposed Action would appear consistent within existing infrastructure.
No Action Alternative	Low	<ul style="list-style-type: none"> • Similar to Proposed Action but spread out over time as emergency repairs are needed.
Air Quality and Climate Change		
Proposed Action	Low	<ul style="list-style-type: none"> • Temporary increase in dust and vehicle emissions. • Minor increase in greenhouse gas concentrations from vehicle and equipment emissions and vegetation removal. • Loss of greenhouse gas sequestration potential from tree removal.
No Action Alternative	Low	<ul style="list-style-type: none"> • Similar to Proposed Action but spread out over time as emergency repairs are needed.

Alternative	Anticipated Level of Impact	Potential Impacts
Socioeconomics and Public Services		
Proposed Action	<p>Negligible to no for population</p> <p>Low to no for economic characteristics</p> <p>No impacts for environmental justice populations</p> <p>Low for public services</p>	<ul style="list-style-type: none"> • Temporary, small increase in population, stimulation of the economy, demand for lodging. • No environmental justice populations in project area. • BPA would compensate landowners for economic loss associated with agriculture and forestry. • No long-term changes to property values.
No Action Alternative	Low	<ul style="list-style-type: none"> • Reduced reliability of transmission line as a power supply.
Cultural Resources		
Proposed Action	Negligible to Low	<ul style="list-style-type: none"> • No adverse effect to the Kalispell-Kerr transmission line • No effect to the the Kalispell Substation, the Elmo Substation, or the Kerr Substation, Flathead Lake fish hatchery, or other identified cultural resources. • Potential disturbance of unidentified cultural resources.
No Action Alternative	Low	<ul style="list-style-type: none"> • Impacts could occur if emergency repairs were needed. • Section 106 compliance would be conducted for planned maintenance activities.
Noise, Public Health, and Safety		
Proposed Action	Low	<ul style="list-style-type: none"> • Construction noise from equipment and vehicles. • Potential disturbance of unidentified hazardous materials. • Measures would be implemented to prevent spills and leaks during construction. • Measures would be implemented to prevent PCP leaching for poles in wetlands, floodplains, and riparian areas.
No Action Alternative	<p>Low for Noise</p> <p>Low to Moderate for public safety</p>	<ul style="list-style-type: none"> • Power source for public safety agencies, health providers and businesses at risk. • Increased noise levels during emergency repairs. • Poles treated with PCP would remain in the ground longer before being replaced with new poles with measures to minimize leaching of PCP
PCP = pentachlorophenol.		

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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 affected environment for a specific resource, an analysis of the potential impacts on that resource, and the mitigation measures that would lessen or avoid impacts. *Cumulative impacts* are considered at the end of the chapter. The analysis in this chapter is based on 90 percent design data for the rebuilt transmission line and access roads.

3.2 Land Ownership, Use, Recreation, and Transportation

3.2.1 Affected Environment

Land Ownership

The transmission line and access roads traverse a mix of private, public, and Tribal land ownership, as summarized in Table 3.2-1 and shown in Figure 3.2-1. The majority of land crossed by the transmission line right-of-way and access roads is in private ownership. Major private land owners in the project area include Plum Creek Timber, which owns almost 850 acres of managed forest land between line miles 19 and 22.

The largest single public landowner is the U.S. Forest Service as the transmission line passes through the Flathead National Forest between line miles 16 and 19. The project also traverses land owned by the State of Montana. In several locations, the project passes through land owned by the Confederated Salish and Kootenai Tribes of the Flathead Indian Reservation, including north of the town of Elmo at line miles 26 and 27, south of the town of Big Arm at line miles 34 and 35, and at the Kerr Substation (line mile 41).

Although a much greater area is within the Flathead Indian Reservation, including much of the area south of Elmo along Flathead Lake, the majority of that land is non-Tribal owned, private fee land (Flathead County 2012; Lake County 2003). There are also a number of parcels owned by the Tribe or by individuals that are held in trust by the Bureau of Indian Affairs; in total, the Tribes control about 155 acres within the transmission line and access road rights-of-way.

Table 3.2-1. Land Ownership in the Transmission Line and Access Road Rights-of-Way

Ownership	Acres	Miles
Private	844.9	77.6
Public (State and Federal)	85.5	9.0
Tribal	154.6	14.2
Total	1,089.2^a	100.9

^a Includes 4.2 acres of open water; totals based on actual totals, not rounded table values.

Source: AECOM geographic information system (GIS) data.

Land Use

Land uses crossed by the transmission line and access road rights-of-way include agriculture, forestry, open space, residential, and limited areas of light industrial and commercial (Figure 3.2-2). The National Land Cover Database was used to quantify acres of different land uses crossed by the transmission line and access road rights-of-way. The translation from land cover (i.e., vegetation and other natural and constructed features that cover the land's surface) to land use (i.e., human activities on the land) is subject to interpretation and, consequently, imperfect, but it is generally adequate to obtain a big-picture view of land uses (Anderson et al. 1976). Land cover data were used in conjunction with aerial photography and review of County development plans and the *Flathead National Forest Land and Resource Management Plan, or Forest Plan* (Flathead National Forest 2001) to determine land uses. Land uses crossed by the transmission line and the access road rights-of-way are described below. Table 3.2-2 quantifies the amount (acreage and miles) of each of those land use types crossed by the project. Table 4.4-1 in Section 4.4 provides a summary of land use plans for agencies with land crossed by the transmission line or access road rights-of-way.

Table 3.2-2. Land Use in the Transmission Line and Access Road Rights-of-Way

Land Use	Acres	Miles
Agriculture	297.8	24.7
Forestry	239.7	26.5
Undeveloped Open Space	468.5	40.8
Residential Development	83.3	9.0
Total^a	1,089.2	100.9

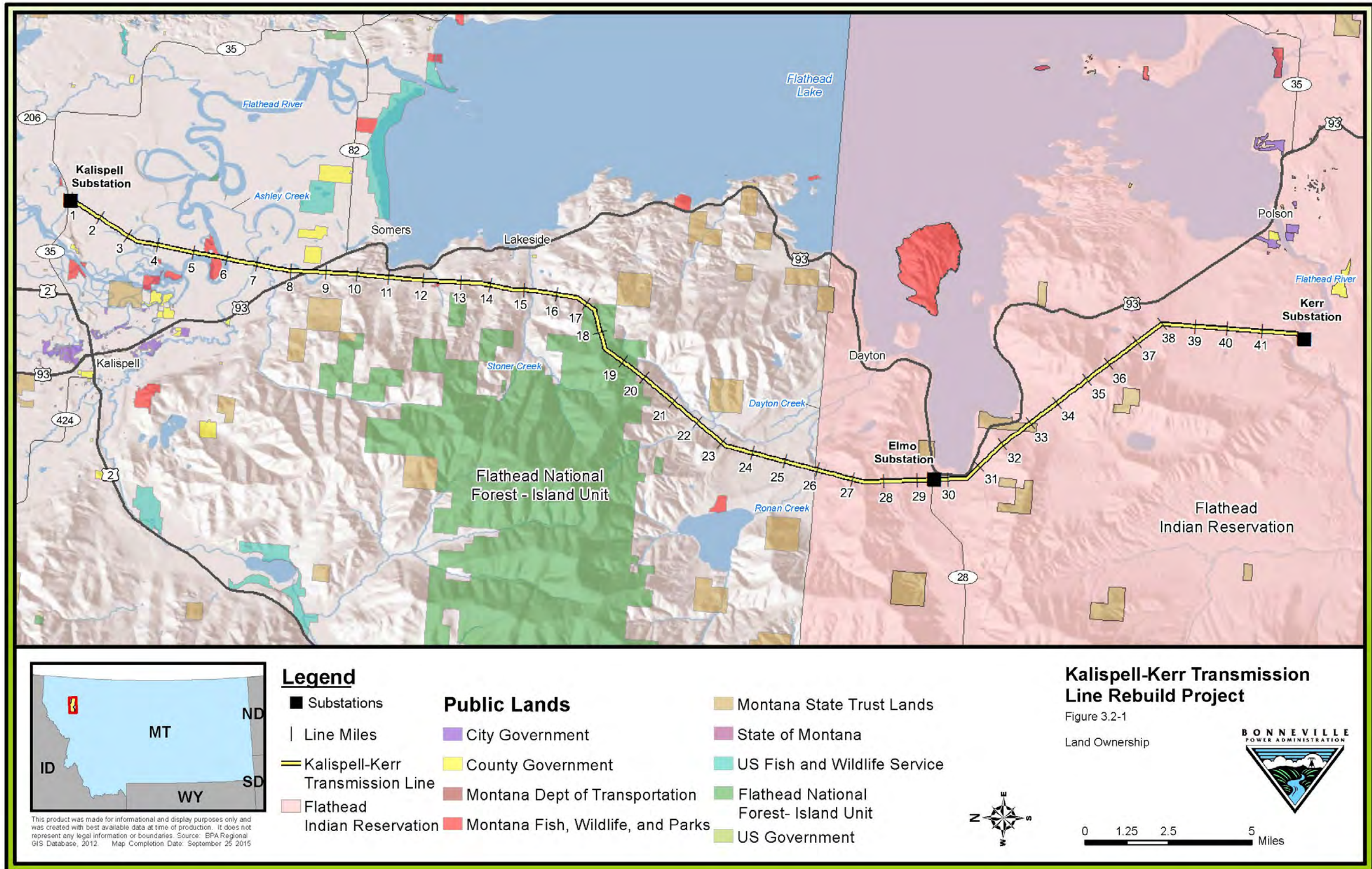
^a Total represents actual total, not the total from the rounded table values.
Source: AECOM GIS and National Land Cover Database (NLCD) data.

Agriculture

The transmission line and access road rights-of-way cross 297.8 acres of agricultural land. For purposes of this analysis, agricultural land is considered to include cultivated crops and hay/pasture land cover types. Cultivated crops include areas used for production of annual crops, where crop vegetation accounts for more than 20 percent of total vegetation and includes land that is actively tilled (NLCD 2006). Common annual crops grown in Flathead and Lake counties include grains, oilseeds, dry beans and peas, and sod (Flathead County 2012; Lake County 2003). Hay/pasture land cover includes areas of grasses, legumes, or grass-legume mixtures planted for livestock grazing or the production of seed or hay crops, typically on a **perennial** cycle where pasture/hay vegetation accounts for greater than 20 percent of total vegetation. Agricultural uses tend to consist of smaller farms, including some hobby farms that may not represent the primary source of income for landowners (Flathead County 2012). The largest concentration of agricultural land occurs south of the Kalispell Substation from line mile 1 to line mile 9.

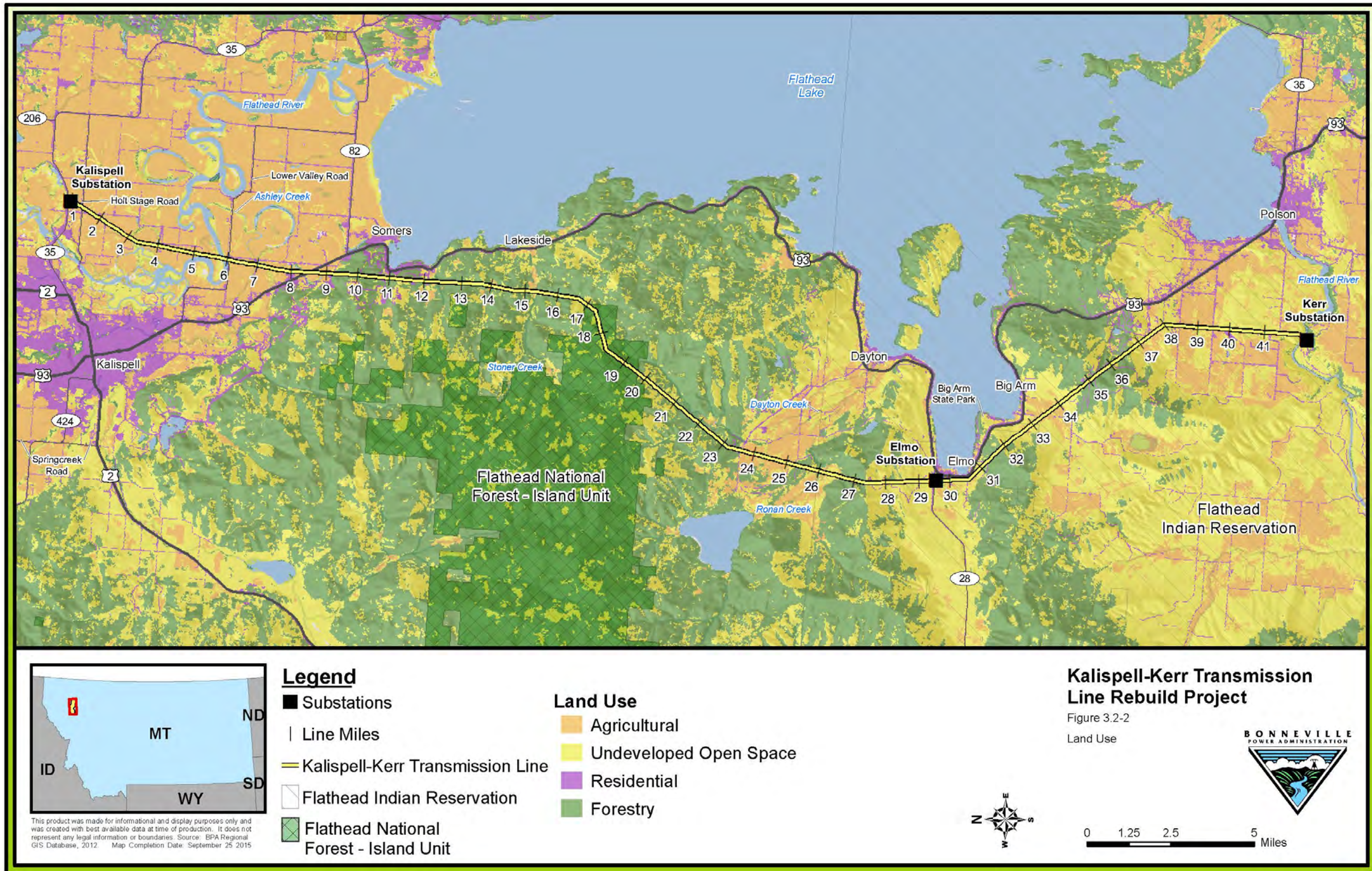
The Farmland Protection Policy Act requires federal agencies to minimize the extent to which their programs contribute to the unnecessary and irreversible conversion of Prime Farmland, Unique Farmland, and Farmland of Statewide or Local Importance to non-agricultural uses. The U.S. Department of Agriculture (USDA) defines Prime Farmland as land that has the best combination of physical and chemical characteristics for producing food, feed, forage, fiber, and oilseed crops and which is available for these uses. Unique Farmland is land that is used for the production of specific high-value food and fiber crops. Farmland of Statewide Importance is designated by the Montana Department of Agriculture (Natural Resources Conservation Service [NRCS] 2013). The transmission line and access road rights-of-way cross a total of 165.2 acres of farmland, of which 18.7 acres are Prime Farmland. Agricultural land is different than farmland, in that farmland (including Prime Farmland) is representative of actual land use and agricultural land is capable of being in agricultural production, but is not necessarily in production.

Figure 3.2-1. Land Ownership



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Figure 3.2-2. Land Cover



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The total acreage of farmland crossed by the transmission line and access road rights-of-way is less than a one-tenth percent of the total acreage of farmland found within all of Flathead and Lake counties.

Table 3.2-3 summarizes the total acreage and miles of farmland designations crossed by the transmission line and access road rights-of-way as well as the amount of farmland within Flathead and Lake counties as a whole.

Table 3.2-3. Farmland in the Transmission Line and Access Road Rights-of-Way

Farmland Type	Acres	Miles	Total Within Flathead and Lake Counties (acres)
Prime Farmland	20	1.5	36,290
Farmland of Statewide Importance	95	10	193,245
Unique Farmland	50	5	76,025
Total^a	165	16.5	305,560

^a Total represents actual total, not the total from the rounded table values.
Source: AECOM GIS and NLCD data.

Forestry

The transmission line and access road rights-of-way cross 240 acres of forestry land. Forest land includes lands owned and managed by the U.S. Forest Service within the Flathead National Forest and private timber land. For purposes of this analysis, forestry land is considered to equate to the evergreen forest land cover, which includes areas dominated by trees generally greater than 5 meters tall, and greater than 20 percent of total vegetation cover. More than 75 percent of the tree species within the evergreen forest land cover type maintain their leaves all year (NLCD 2006). Forestry land use primarily occurs from line miles 9 to 23, line mile 25, line miles 26 to 27, and line miles 34 to 36. These lands are primarily used for timber production and harvest, although some dispersed recreation activities also occur on lands within the Flathead National Forest.

Lands owned by the U.S. Forest Service are subject to the *Forest Plan* (Flathead National Forest 2001). The transmission line and access road rights-of-way cross through Management Area 15D as designated in the *Forest Plan*. Management Area 15D is primarily composed of timberlands where timber management with roads is economical and feasible, but also requires consideration of visual sensitivity (see Section 3.8 for discussion of visual sensitivity). Goals for Management Area 15D include the emphasis on cost-efficient timber production and protection of land and timber productivity. Utility corridors are allowed in Management Area 15D (Flathead National Forest 2001). BPA currently operates the Kalispell-Kerr transmission line under a Memorandum of Understanding with the U.S. Forest Service.

Undeveloped Open Space

The transmission line and access road rights-of-way cross 468.5 acres of undeveloped open space. For purposes of this analysis, undeveloped open space includes the following land cover types: deciduous forest, emergent herbaceous wetlands, grassland/herbaceous, open water, shrub/scrub, and woody wetland land cover types. In general, undeveloped open space includes lands that are in their natural state and have no specific use. Vegetation is primarily grassland and shrub-scrub, but does include small areas of mature, deciduous trees. Undeveloped open space provides aesthetic benefits to individuals living, recreating, and traveling through the area. Undeveloped open space includes five BPA conservation easements crossed by the transmission line: three near line mile 3, one at line mile 5 (the Foy's Bend property), and one near line mile 26. The easements preserve *riparian* habitat and restrict development

including new construction and the subdivision of land, while allowing for landowner repair and replacement of existing structures and maintenance and inspection of BPA's existing line(s).

Residential Development

The transmission line and access road rights-of-way cross about 85 acres of residential development. For purposes of this analysis, residential development includes high, medium, and low density developed land cover and developed open space. High, medium, and low density developed land cover types includes single-family housing units and farms with multiple out-buildings and equipment yards. Developed open space includes constructed buildings with impervious surfaces covering less than 20 percent of the total area (NLDC 2006). Developed areas include highway development near line mile 7 and the town of Elmo at line mile 29.

Recreation

No state or county parks or other formally-designated recreation sites are crossed by the transmission line or access road rights-of-way. The recreational opportunities near the transmission line and access road rights-of-way consist of informal opportunities within the Flathead National Forest including hunting, fishing, boating, hiking, snowmobiling, cross-country skiing, and berry picking. However, Flathead National Forest land within and adjacent to the transmission line and access road rights-of-way is primarily managed for timber not recreation, so recreation use is assumed to be light. Big Arm State Park is located approximately 0.3 mile east of line mile 32 and has trails and a small dock along the shore of Flathead Lake. A public vista point above the Kerr Dam is located approximately 0.3 mile southeast of the Kerr Substation.

Transportation

U.S. Highway 93 runs roughly north-south from Kalispell to Polson along Flathead Lake and the transmission line and access road rights-of-way cross U.S. Highway 93 at line mile 8. In other locations, access to the project area is provided by U.S. Highway 93 via county roads. The transmission line crosses State Route 28 at line mile 29 near the Elmo Substation. State Route 35 runs east to west near the Kalispell Substation, but the transmission line and access road rights-of-way do not cross the road. A number of designated bike routes cross the project area, including along U.S. Highway 93, along Holt Stage Road in the middle of line mile 1, along Lower Valley Road at the beginning of line mile 6, and along Spring Creek Road at line miles 11 and 12 (Flathead County 2012).

3.2.2 Environmental Consequences–Proposed Action

Land Ownership

Structure replacement would have no impacts on land ownership. All structure replacement activities would occur within the existing transmission line right-of-way and not require any land or easement acquisition that would affect land ownership.

BPA would acquire approximately 9 miles of new easements to construct new, or improve or reconstruct existing access roads. New easements would encumber lands underlying the parcels by granting certain property rights to BPA (i.e., ingress and egress for transmission line inspection and maintenance), resulting in a permanent impact on land ownership. BPA would not acquire exclusive use of any land crossed by the easements, and ownership of these areas would remain with the existing owner. BPA would negotiate the acquisition of such easements from willing landowners. Easement acquisitions would be required for new roads, for the use of private roads, and for traveling overland to the transmission line right-of-way. Because only 9 miles of new easements would be acquired, and they would be distributed throughout entire length of the right-of-way, the overall impact of the Proposed Action on land ownership would be **low**.

Land Use

Land use effects occur when a project converts one land use type to another. Since the Kalispell-Kerr transmission line corridor already exists, permanent impacts on land use would primarily occur as a result of the construction of new access roads. In addition, temporary impacts would occur with the temporary conversion of an existing land use type for construction activities including staging areas, tensioning sites, and temporary access roads. Impacts of the Proposed Action on land use are summarized in Table 3.2-4 and described in detail below.

Table 3.2-4. Structure Replacement and Access Road Impacts on Existing Land Use

Land Use Type	Permanent Impacts (acres)			Temporary Impacts (acres)		
	Transmission Structure Replacement	Access Road Construction ^a	Total ^b Permanent Impacts	Transmission Structure Replacement	Access Road Construction ^a	Total ^b Temporary Impacts
Agriculture	0.6	7.1	7.7	10.8	29.9	40.7
Forestry	0.6	17.8	18.4	9.3	36.6	45.9
Undeveloped Open Space	0.8	27.0	27.8	15.1	53.0	68.1
Residential Development	0.2	6.0	6.2	3.1	13.1	16.2
Total^b	2.2	57.8	60.0	38.4	132.5	170.9
^a Includes new construction, reconstruction, and improvements as described in Section 2.2.4. ^b Total represents actual total, not the total from the rounded table values. Source: NLCD 2006; AECOM GIS calculations.						

Agriculture

Permanent impacts on agricultural lands could result from construction of new permanent roads, and reconstruction and improvement of existing roads. The Proposed Action would result in a total of 7.1 acres of permanent road construction through agricultural lands, only 0.7 acre of which would be new construction. It should be noted that these impacts are based on land cover data, as discussed previously, and no new permanent roads are expected to be constructed through agricultural fields currently in production. While the new road easement may not exclude the area from agricultural use, it could disrupt agricultural operations periodically when BPA would need to use the road to access the transmission line for maintenance purposes. Impacts on agricultural land use would be **low**, since there would not be permanent conversion of productive agricultural fields to other uses.

The Proposed Action would permanently remove 0.9 acre of Prime Farmland, 4.6 acres of Farmland of Unique Importance, and 4.4 acres of Farmland of Statewide importance (Table 3.2-5). These impacts make up less than one-thousandth a percent of the total NRCS-designated farmland and Prime Farmland within Flathead and Lake counties. Long-term impacts on agricultural land use and farmland would be **low**, since permanent disturbance through productive agricultural lands is not expected, and the amount of farmland impacted would be less than 0.1 percent of the total acreage of farmland found within all of Flathead and Lake counties.

Construction activity associated with structure replacement and use of temporary access roads through agricultural land could result in soil compaction, disruption of farm activities, temporary crop losses from ground disturbance, and temporary use of agricultural land as a transportation corridor. Upon completion of structure replacement, temporary roads would be removed and returned to pre-construction conditions, resulting in no permanent conversion of agricultural lands. The Proposed Action would result in a total of

40.7 acres of temporary disturbance to agricultural land, which could result in soil compaction in those areas, which affects crop productivity and results in temporary crop losses within agricultural lands. Up to 29.9 acres of agricultural land would temporarily be used as a transportation corridor, resulting in temporary crop losses in those areas. Of this amount, BPA has 8.8 miles of direction of travel access rights impacting approximately 21.6 acres of agricultural fields to access structures within the right-of-way. Wherever possible, BPA would schedule construction to reduce potential effects on these fields, preferably after harvest. BPA would compensate land owners for damage to crops at an appropriate market value. Short-term disturbances from equipment moving and staging and construction activities could result in temporary crop losses, but would not permanently alter active agricultural fields because these areas are typically cultivated and replanted annually. Since BPA would compensate landowners for damage to crops and schedule construction after harvest when possible, impacts on agricultural lands from construction activities would be **low**.

Table 3.2-5. Structure Replacement and Access Road Impacts on Farmland

Farmland Designation	Permanent Impacts (acres)			Temporary Impacts (acres)		
	Transmission Structure Replacement	Access Road Construction ^a	Total ^b Permanent Impacts	Transmission Structure Replacement	Access Road Construction ^a	Total ^b Temporary Impacts
Prime Farmland	<0.1	0.9	0.9	0.5	1.6	2.1
Farmland of Statewide Importance	0.2	4.2	4.4	3.3	14.1	17.3
Unique Farmland	0.1	4.5	4.6	1.9	6.7	8.6
Total^b	0.3	9.6	9.9	5.7	22.3	28.0

^a Includes new construction, reconstruction, and improvements as described in Section 2.2.4.
^b Total represents actual total, not the total from the rounded table values.
Source: NLCD 2006; AECOM GIS calculations.

Forestry

Long-term impacts on forestry land could result from the construction of new permanent roads, and widening or reconfiguring of existing roads. Approximately 1,088 trees would be removed adjacent to the transmission line right-of-way (danger trees) and along access roads within forestry lands. As shown in Table 3.2-4, the Proposed Action including tree removal would impact 18.4 acres of forestry land. These impacts would be distributed throughout the nearly 240 acres of forestry land within the transmission line and access roads rights-of-way (7.6%) and not concentrated in one area. Therefore, they would have a negligible reduction in potential timber harvest, and would not preclude timber harvest in areas outside of the existing right-of-way. BPA may compensate individual land owners for trees removed on a case-by-case basis, depending on the terms of BPA's easements. Tree removal does not preclude future timber use in areas adjacent to the right-of-way and along access roads and would not affect future timber production in those areas. New transmission structures would replace existing structures in place within the existing right-of-way, and would not alter land use outside of the right-of-way. Trees removed within the existing BPA right-of-way would not affect forestry uses, because BPA has the authority to maintain vegetation within the right-of-way as part of standard operation and maintenance activities. The Proposed Action would be consistent with the *Forest Plan*, since it would continue to allow the surrounding area to be managed for cost-efficient timber production. Overall, permanent impacts on forestry land uses would be **low** since land owners may be compensated for trees that would be removed, and the majority of forest lands would remain usable for forestry uses in the future.

During construction, access could be limited to certain forested areas due to temporary closures. Due to the limited duration of construction activity in any one location, these access closures would be temporary, and effects to forestry land use in the area would be **low**.

Undeveloped Open Space

Construction of new permanent roads, reconstruction and improvement of existing roads, and tree removal would create permanent impacts on undeveloped open space. The Proposed Action would convert about 27 acres of undeveloped open space to a transportation corridor through construction of new and improvement of existing permanent access roads. While the access roads would not result in a continuous noticeable change in activity due to their low level of use, they could periodically disrupt the aesthetic benefits provided by undeveloped open space when BPA would need to use the right-of-way to access the transmission line for maintenance purposes. New roads would be gated to restrict public access. Approximately 240 trees would be removed as part of structure replacement and access road work in areas of open space. Tree removal and construction of new permanent roads would result in a low level of permanent visual change (see Section 3.8), which would affect the aesthetic benefits provided by undeveloped open space but would not preclude the area to be used as open space. BPA proposes a new access road within its existing transmission line right-of-way on the Montana Fish, Wildlife, & Parks (MTFWP) property at Foy's Bend (line mile 5). The lands adjacent to the right-of-way are currently managed as undeveloped open space pursuant to a conservation easement held by BPA. BPA is working with MTFWP to design a road that is consistent with the purpose and goals of the conversation easement. The road would be designed to maintain existing hydrology of the site and may include incorporation of culverts or dips in the road to allow water to move freely across the road. Overall, long-term impacts on undeveloped open space would be **low**, since the area would continue to be used as open space.

Construction activity associated with structure replacement and use of temporary access roads through undeveloped open space would cause temporary visual and noise impacts (see Sections 3.8 and 3.12). These impacts could temporarily disrupt the aesthetic benefits provided by undeveloped open space. Up to approximately 15 acres of undeveloped open space would temporarily be used as construction work areas for structure replacement, and 53 acres would temporarily be used as transportation corridors. Due to the limited duration of construction activity in any one location, effects on undeveloped open space from construction activity would be **low**.

Residential Development

Permanent impacts on residential land use could result from construction of new permanent roads, widening or reconfiguring of existing roads, and tree removal. The Proposed Action would convert about 6 acres of residential land to a transportation corridor through construction of new and reconfiguration of existing permanent access roads. The majority of these impacts would result from road widening, with only 0.4 acre of new road construction. While the new access roads would not result in a continuous noticeable change in activity, visual and sound impacts could periodically disrupt residents when BPA would need to use the roads to access the transmission line for maintenance purposes. However, these impacts would not result in a change to land use or preclude the adjacent area from future residential land use. Overall long-term impacts on residential land use would be **low**, since the area (with the exception of 0.4 acre from new roads) would continue to be used as residential.

Construction activity associated with structure replacement and use of temporary access roads through residential developed areas would cause temporary visual and noise impacts (see Sections 3.8 and 3.12), which could disrupt residents but would not result in an actual change to land use. Up to about 3 acres of residential land use would temporarily be used as construction work areas for structure replacement, and 13 acres would temporarily be used as transportation corridors. Due to the limited duration of construction activity in any one location, effects on residential land use from construction activity would be **low**.

Recreation

New construction and improvement of access roads could result in long-term impacts on recreation. These impacts would primarily be associated with changes to visual character from new road construction and tree removal. As described in Section 3.8, impacts on visual resources would be **low**. Additionally, since all new roads would have gated access, additional access for recreation is not expected as a result of the Proposed Action. Permanent impacts on recreation would be **low** since recreation use is assumed to be minimal given that there is no formal recreational use of the project area, in the form of parks or land use designations.

Temporary impacts on recreation from structure replacement and construction, reconfiguration, and use of access roads could result from noise, dust, and temporary access closures on existing roads, which could temporarily disrupt recreation activities such as hunting, camping, bicycling, off-roading, fishing, or other outdoor activities. However, given the lack of formal recreational use in the project area, the number of recreationists affected by construction activities would be limited. There would be no construction-related impacts on recreation use and experience in the Big Arm State Park, which is the only state park near the transmission line and access roads right-of-way, located near line mile 32. Since recreation activity is limited, but would not be precluded in the surrounding area due to construction activities associated with the Proposed Action, temporary impacts on recreation would be **low**.

Transportation

Temporary impacts on transportation from the Proposed Action would include a short-term increase in traffic on local roads, as well as on U.S. Highway 93. The short duration of construction and the small amount of construction traffic generated relative to the typical amount of traffic carried by existing county roads and U.S. Highway 93 would result in a minimal effect on overall traffic. The transmission line directly crosses U.S. Highway 93 near the beginning of line mile 8, and State Route 28 in the middle of line mile 29 at the Elmo Substation. Temporary lane closures may be required when stringing the new conductors and optical ground wire across the roadways. Any such road or lane closures would be limited in duration and cause temporary delays. Temporary impacts on transportation associated with construction activities would be **low**.

The Proposed Action would not result in any long-term impacts on transportation. All new roads would be gated and not accessible to the public. Additionally, since the transmission line already exists, operation and maintenance of the line would not result in additional traffic to and from the right-of-way.

3.2.3 Mitigation Measures

BPA would implement the following mitigation measures to reduce impacts on land use, recreation, and transportation resources from the Proposed Action:

- **LAND-1:** Follow standard construction BMPs to limit noise, dust, and construction work hours when adjacent to residential land uses.
- **LAND-2:** Provide a construction schedule to all potentially affected landowners and post this schedule in affected recreational areas.
- **LAND-3:** Maintain existing access to residences and other areas during construction.
- **LAND-4:** Schedule construction during periods to minimize the potential for crop damage to the extent possible.
- **LAND-5:** Except for the new road construction and temporary access roads, limit construction activities to the existing right-of-way and easements to minimize impacts on crops.

- **LAND-6:** Coordinate with individual landowners to ensure that new or temporary access roads, gates, and construction and maintenance activities would minimize disruptions to agricultural and commercial operations.
- **LAND-7:** Notify landowners before starting construction in agricultural fields.
- Compensate landowners for the value of commercial crops or property damaged by construction activities as appropriate.
- **LAND-8:** Coordinate with local agencies to avoid construction activities that could conflict with their own construction activities.
- **LAND-9:** Restore compacted cropland soils as close as possible to pre-construction conditions. Break up compacted soils in non-cropland where necessary by ripping, tilling, or scarifying before seeding.

3.2.4 Environmental Consequences—No Action Alternative

The continued deterioration of existing structures would result in an increased need for maintenance and repair activities. Such activities would largely occur in response to emergencies as they occur. Emergency repairs would have short-term construction impacts similar to those described for the Proposed Action, except that impacts may require more disruptions to landowners and may not allow time for coordination with landowners for access or to minimize crop disruption. Overall, impacts on land use, recreation, and transportation from the No Action Alternative would be **low**. There would be no impacts on land ownership.

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3.3 Geology and Soils

3.3.1 Affected Environment

Geology

The Kalispell-Kerr transmission line is located in northwestern Montana in the Flathead River **Watershed** within the Northern Rocky Mountains physiographic province (U.S. Geological Survey 2013). The Flathead River Watershed is part of the Western Cordillera or North American Overthrust Belt composed of uplifted, folded, and faulted **sedimentary** and **metamorphic rocks**, with associated volcanoes and granitic intrusions, reshaped by massive glaciers associated with the Flathead Lobe of the Cordilleran Ice Sheet (Alt and Hyndman 1995; Blood 2013). The elevation profile ranges from 2,900 to 5,000 feet. The relatively flat segments of the project area are from line miles 1 to 9 and 36 to 41. Gentle to moderately sloped segments are from line miles 9 to 17 and 20 to 36. A segment from line miles 17 to 20 crosses some very steep areas.

Regional weather generally consists of hot and dry summers and cold winters. Annual snowfall varies from about 50 inches in the lower valleys to 300 inches or more in the highest mountain areas (Flathead County 2008). Most of the snow falls during the November–March period, but heavy snowstorms can occur as early as September or as late as May. Rapid warm-ups during the winter and early spring as well as rain-on-snow events can lead to significant snow melt that can result in flooding and increased landslide hazards.

Landslides are among the most common geologic hazards in Montana, causing damage in rural and urban areas of the state (Hofmann and Hendrix 2004). In landslide-prone areas, anything affecting slope condition, such as construction, seismic activity, or increased soil moisture, may cause movement or may reactivate old landslides. Recent landslide movements are often the reactivation of smaller sections of older, unstable landslide masses (Hofmann and Hendrix 2004).

Data from the U.S. Geological Survey indicate that there is generally a low landslide incidence and susceptibility along the transmission line (Godt 1997; Radbruch-Hall et al. 1982). However, several small (less than 50-acre) landslides have been mapped in the region (Flathead County 2008). These slides are predominantly in glacial and alluvial deposits and located above road cuts or riverbanks, which may have triggered movement. Although a segment of the transmission line from line miles 17 to 20 (21 structures) is located on steep slopes and may be susceptible to landslides as shown in the photograph in Figure 3.3-1, none have occurred to date.

Soils

The transmission line and access road rights-of-way cross eight major soil map unit associations (NRCS 2013). Within each soil map unit there are 104 soil types present within 100 feet of the transmission line and access road rights-of-way (NRCS 2013). In general, Swims silty clay loam and Kalispell loam soils are dominant in the northern portion of the transmission line and access road rights-of-way in the Upper Flathead Valley Area on terraces and farmlands (NRCS 2013). In the Salish Mountains, the central portion of the transmission line and access road rights-of-way, dominant soils are Kingspoint-Rock outcrop-Sharrott complex and Kingspoint gravelly silt loam (NRCS 2013). In Lake County, the southern portion of the transmission line and access road rights-of-way, Belton-Kerl silt loam soils are dominant on till plains and farmlands (NRCS 2013).

The NRCS considers slope and soil properties such as cohesion, drainage, and organic content in determining soil erosion hazard classes.



Figure 3.3-1. Looking North at Line Mile 20: Steep Slopes, Exposed Bare Ground, and Gravel Access Road Switchbacks Across the Transmission Line Right-of-Way

The susceptibility to erosion is generally a function of soil type, topography, occurrence of **groundwater** seepage or surface runoff, and the built environment. Erosion hazard potential is described in this analysis as not rated, slight, moderate, or severe, approximated using the NRCS Erosion Hazard (off-road/off-trail) rating. Soil with no erosion hazard data is classified as not rated. 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 roads or trails require frequent maintenance, and that erosion-control measures are needed for unsurfaced roads and trails.

Approximately 56 percent of soils crossed by the transmission line and access road rights-of-way are categorized as having a slight to moderate risk of erosion. Soils with a slight to moderate risk of erosion are generally located in relatively flat areas from line miles 1 to 9 and 36 to 41. Approximately 43 percent of soils have a severe erosion hazard rating. Soil erosion hazard is classified as severe throughout moderate to steep slopes from line miles 9 to 36. Most of the soils with a severe erosion hazard rating are located in the Salish Mountain area. Soils in one small segment of the transmission line on the north slope of the Flathead River near the end of line mile 41 are rated as severe.

A wildfire in the fall of 2013 occurred near the structures at line mile 41 and has likely compromised soil stability in the area. Soil can be damaged by fire through changes to soil structure, particularly through the loss of organic matter. The loss of soil structure increases the bulk density of the soil and reduces its porosity, thereby reducing soil productivity and making the soil more vulnerable to post-fire runoff and erosion (Neary et al. 2005).

3.3.2 Environmental Consequences–Proposed Action

Transmission line replacement and roadwork activities that have the potential to affect soils include vegetation removal, excavation, grading, construction equipment operations, pole installation and construction staging. These activities have the potential to impact soils through soil loss compaction, erosion, and contamination from preservatives, oils, or fuels.

The Proposed Action would result in permanently impacting 60 acres (Table 3.3-1). The majority of these impacts, 57.8 acres, are from construction or expansion of access roads. The remaining 2.2 acres is attributed to the installation of the support structures including guy anchors and counterpoise. Of the 60 acres impacted, approximately 33 acres occur in areas with severe soil erosion and stability concerns. Construction of new access roads in areas of severe erosion hazard would likely pose the greatest risk to erosion and landslides, since construction activities would create a contiguous area of exposed soils that were previously undisturbed. Tree removal required for the project would further exacerbate the erosion and soil instability of this area.

The potential for erosion is highest during periods of rapid warm-ups during winter and early spring and rain-on-snow events, particularly in areas where soil erosion hazard is rated as severe along the central portion of the transmission line right-of-way at line miles 9 through 36 and the recent burn area near mile 41. Should construction be necessary during times with a high chance of rain-on-snow or rainfall events, extra care would be taken to ensure that erosion control measures are properly placed and maintained.

A total of about 2,250 trees would be removed as part of transmission replacement and access road construction activities, which could affect soil stability and increase the potential for erosion and landslides.

Table 3.3-1. Structure Replacement and Access Road Impacts by Soil Erosion Hazard

Soil Erosion Hazard Rating	Permanent Impacts (acres)			Temporary Impacts (acres)		
	Transmission Structure Replacement	Access Road Construction ^a	Total ^b Permanent Impacts	Transmission Structure Replacement	Access Road Construction ^a	Total ^b Temporary Impacts
Not rated	<0.1	0.2	0.2	0.5	1.2	1.7
Slight	0.4	4.3	4.7	6.5	18.0	24.5
Moderate	0.9	21.3	22.1	14.9	48.7	63.6
Severe	0.9	32.1	33.0	16.5	64.7	81.1
Total^b	2.2	57.8	60.0	38.4	132.5	170.9

^a Includes new construction, reconstruction, and improvements as described in Section 2.2.4.
^b Total represents actual total, not the total from the rounded table values.
Source: NRCS 2013; AECOM GIS calculations.

To reduce the potential for erosion and landslides BPA would incorporate features such as water bars, ditch relief culverts, and drain dips into the road design.

In addition, trees would be removed in single locations or small patches, to avoid exposing large areas of soil. Also, stumps would be left in place, helping to minimize soil erosions and landslides over the short term as low-growing vegetation is reestablished. The combination of impacts and mitigation measures results in a **moderate** impact to soils.

The Proposed Action would temporarily impact a total of 170.9 acres of soils. The replacement of transmission structures and associated transmission line rebuild activities would temporarily disturb approximately 38.4 acres of soils through the vegetation removal, removal of existing structures, and construction laydown areas. This disturbance would likely result in erosion and soil compaction. Under the Proposed Action new and existing road construction activities would result in a temporary disturbance of 132.5 acres in addition to the permanent impacts previously discussed. Temporary disturbances to soil would occur through grading and vegetation removal, exposing the soil to weather, increasing erosion potential. Areas with steep slopes and severe erosion hazards would have a higher potential for erosion and risk of landslides before vegetation becomes re-established in exposed areas. A total of 81.1 acres of temporary impacts from transmission line and access road activities would be within areas with severe erosion hazards (Table 3.3-2), with 4.9 acres associated with new access road construction. Temporary erosion control measures would be implemented (see Section 3.3.3) to reduce the potential for erosion and sediment migration associated with the Proposed Action such that the Proposed Action would have a **low to moderate** temporary impact on soils, depending on work timing and weather conditions.

3.3.3 Mitigation Measures

The following mitigation measures would be implemented to reduce impacts on soils and impacts contributing to geological hazards from the Proposed Action:

- **GEO-1:** Avoid and minimize construction on steep or unstable slopes, if possible.
- **GEO-2:** Contact BPA geotechnical specialists if geotechnical issues, such as new landslides, arise during construction.
- **GEO-3:** Conduct construction activities during the dry season (between June 1 and November 1), as much as possible, to minimize erosion and soil compaction.
- **GEO-4:** Develop and implement a Stormwater Pollution Prevention Plan (SWPPP) to prevent stormwater contamination, control sedimentation and erosion, protect surface water and wetlands, and preserve the integrity of the roadway prism.
- **GEO-5:** Design temporary and permanent access roads to control runoff and prevent erosion by using drain dips, ditch relief culverts, water bars, etc., or a combination of these methods.
- **GEO-7:** Retain existing low-growing vegetation where possible, and minimize the use of clearing/grubbing to preserve the roots of these plants.
- **GEO-8:** Reseed disturbed areas with native grasses and *forbs*, using appropriate seed mixes, application rates, methods, and timing for the site conditions as soon as practicable following the completion of construction. Monitor revegetation and site restoration work for adequate growth; implement contingency measures as necessary.
- **GEO-9:** Leave erosion and sediment control devices in place until all disturbed sites are revegetated and erosion potential has returned to pre-construction conditions.

- **GEO-10:** Locate materials storage and temporary staging areas in flat, previously disturbed or graveled sites outside of sensitive areas to minimize soil and vegetation disturbance, where practicable.
- **GEO 11:** Use containment vessels, absorbent materials, or other removable impervious materials to contain leaching of preservatives and hazardous material leaks.

3.3.4 Environmental Consequences–No Action Alternative

As existing structures deteriorate and more structure repair and access road work would be needed, soils would be disturbed. Although road repairs would be done as needed to access structures, comprehensive road improvements to improve drainage and increase culvert size would not likely be made, increasing the risks for slumping and erosion. If emergency repairs were required during storm events (when structures are more likely to fail), saturated soil conditions and high levels of runoff would increase site-specific erosion risk and compaction. Overall, impact on soils from the No Action Alternative would be **low** for planned activities during the dry-season work; however, should work occur during the wet season under emergency conditions, impacts would be **moderate**.

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3.4 Vegetation

3.4.1 Affected Environment

General Vegetation

Information on plant communities along the line and access roads was obtained from field surveys conducted by BPA during September 2013 and June 2014. Plant communities within 200 feet of the transmission line and access road rights-of-way were mapped and described based on species composition and dominant life form. Additional information on wetland and riparian plant communities was obtained from the wetlands delineation report (RESPEC 2014).

The transmission line crosses four ecoregions: Flathead Valley, Salish Mountains, Flathead Hills and Mountains, and Camas Valley (Figure 3.4-1) (Woods et al. 2002). These ecoregions generally align with transitions in vegetation types. In the Flathead and Camas valleys, agricultural lands (crops and pasture lands) are predominant, with fragmented riparian areas associated with Ashley Creek and the Flathead River, and scattered tracts of rural residential lands near the town of Elmo. In the Salish Mountains and Flathead Hills and Mountains, the dominant plant vegetation type is coniferous forest.

Within the transmission line right-of-way, plant communities are managed to maintain low-lying vegetation compatible with the power lines, such as grass- and shrub-dominated communities (Table 3.4-1). The most prevalent vegetation type adjacent to the managed transmission line right-of-way is coniferous forest, which occurs for approximately 21 miles.

Table 3.4-1. Vegetation Types crossed by Transmission Line and Access Road Rights-of-Way

Vegetation Type ^a	Acres	Miles	Condition ^b
Coniferous Forest	93.3	14.3	Low – 48.2 acres Moderate – 45.1 acres
Grassland	839.3	70.8	Low – 808.9 acres Moderate – 30.3 acres
Shrubland (includes shrub-steppe)	79.8	7.4	Low – 51.7 acres Moderate – 28.1 acres
Wetland and Riparian	29.7	1.8	Low – 24.8 acres Moderate – 4.9 acres
Riparian Deciduous Forest	3.5	0.1	Low – 2.8 acres Moderate – 0.7 acre
Total	1,045.4	94.4	
Note: ^a This table does not include residential and other unvegetated areas, streams, and other open water. Total represents actual total, not the total from the rounded table values. ^b Condition refers to the overall quality of the vegetation community. Low quality habitats are generally not very diverse, support high levels of invasive plants, and are not structurally complex. Moderate quality communities support fewer invasive plants, higher diversity of native plants, and are more complex. For a detailed discussion specific to each type of habitat please refer to the text. Source: AECOM GIS data.			

Coniferous forests largely occur in the hills west of Flathead Lake. Coniferous forests are most prevalent adjacent to the transmission line and access road rights-of-way, with cleared forested areas (maintained as grasslands or shrublands) within the right-of-way. The majority of tree removal would occur between line miles 9 to 28, 31 to 33, and 35 to 37. On large spans or areas of steep slopes, coniferous forests are located

under the conductors where clearance is suitable. These forests correspond to the Rocky Mountain Dry-Mesic Montane Mixed Conifer Forest described in Vance and Luna (2010). While the species composition of **overstory trees** in these forests varies somewhat based on elevation and other site conditions, the dominant species is Douglas-fir (*Pseudotsuga menziesii*). Ponderosa pine (*Pinus ponderosa*) and western larch (*Larix occidentalis*) are also prevalent, with small numbers of Engelmann spruce (*Picea engelmannii*), grand fir (*Abies grandis*), and lodgepole pine (*Pinus contorta*) in unused portions of the transmission line right-of-way and adjacent to the transmission and access roads line rights-of-way. Ponderosa pine woodlands and savannas were also observed along portions of the transmission line right-of-way. These open stands are almost exclusively comprised of Ponderosa pine, with a grass-dominated understory, and typically grade into adjacent grassland habitats. Based on sample plots to characterize the forest vegetation adjacent to the transmission line and access road rights-of-way, trees are generally below 15 inches diameter at breast height (dbh) and under 60 feet tall. However, a few trees larger than 20 inches dbh were documented, with the largest sampled tree at 35 inches dbh. Forest vegetation within unused portions of the transmission line right-of-way are generally below 6 inches dbh and under 10 feet tall.

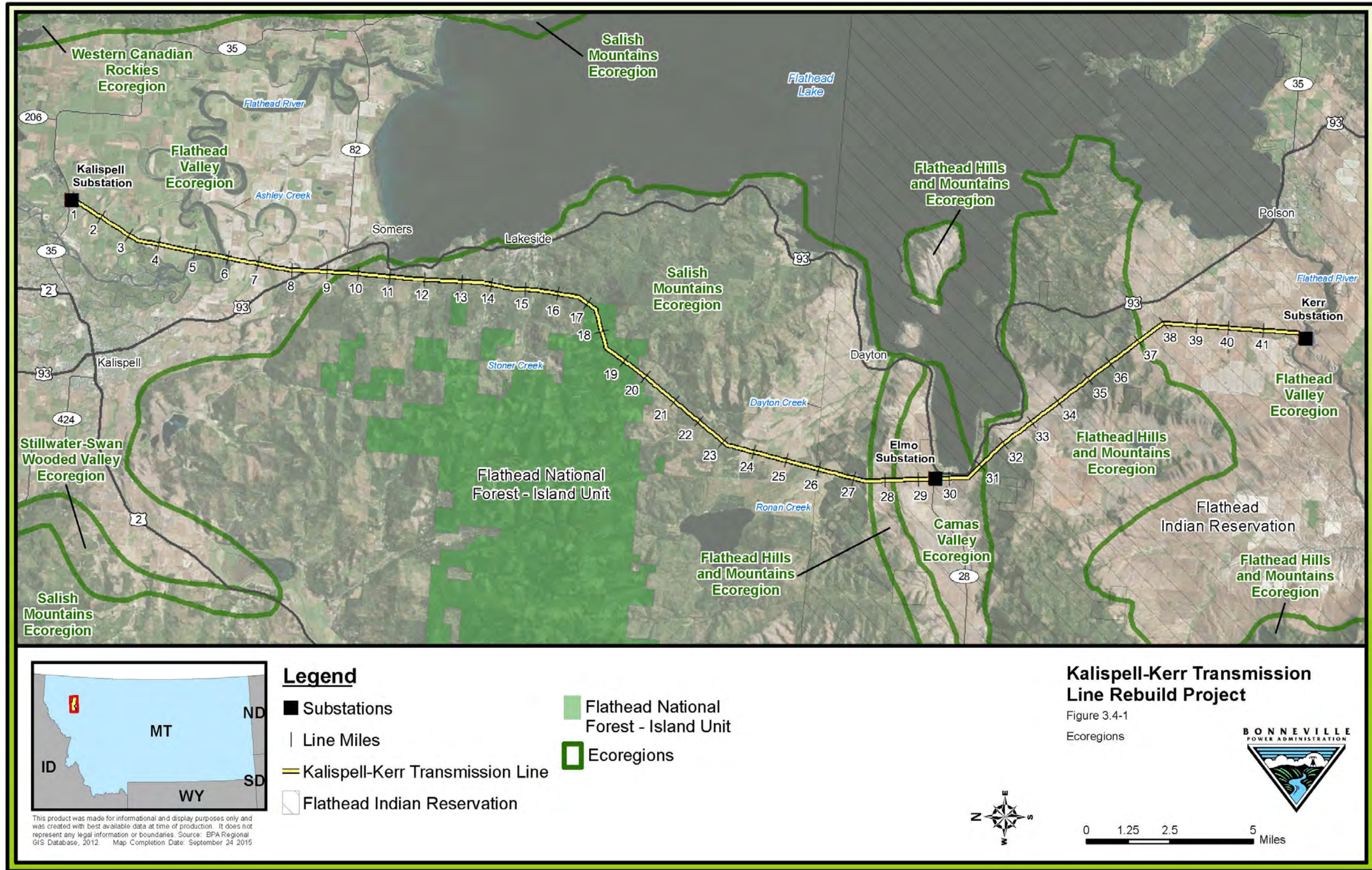
Coniferous forests were classified as being in low to moderate condition (Table 3.4-1). Forests in low condition have no shrub layer and typically show signs of disturbance from timber harvest, grazing, and/or residential development. Forests in moderate condition are generally missing a shrub layer and have predominantly young, small trees with no structural features such as snags and downed wood. Small forest stands with three distinct layers of vegetation, a larger component of large trees, and structural features were observed adjacent to the transmission line and access road rights-of-way. However, these areas are still considered to be in moderate condition because they are fragmented by roads, timber harvest, and other disturbances.

Grasslands crossed by the transmission line and access road rights-of-way have been altered through agricultural practices or for transmission line right-of-way management purposes. Agricultural grasslands consist of planted crops, hayed fields, and grazed pastures. At the time of the vegetation surveys, the most common hay species were wheat, barley, and timothy. The major cover crop was alfalfa. Pastures include a mix of native and non-native grasses with varying levels of grazing pressure. The condition of these areas is considered low because they have been converted to active agricultural uses.

The transmission line right-of-way is managed primarily as grassland, has been cleared of trees and shrubs, and is sometimes used for grazing and cropland. Aside from the areas managed for crops, the grasslands typically have a large component of invasive weeds—predominantly spotted knapweed (*Centaurea stoebe*) on the Montana list as a priority 2B species—and a mix of native and non-native grasses (see Noxious Weed discussion further down in this section). Scattered shrubs are present in small clumps within the grasslands, but generally do not exceed more than 10 percent cover. Grass-dominated rangelands also occur along portions of the transmission line right-of-way and adjacent areas. These areas have been disturbed by past land uses, but may retain a native grassland component. The condition of these areas is generally low because of grazing disturbance, the high cover of invasive weeds, and a lack of species diversity.

A large area of native grassland is located between line miles 27 and 28. Native bunchgrasses are present, as well as a diversity of native **forbs**, such as silvery lupine (*Lupinus argenteus*), mountain deathcamas (*Zigadenus elegans*), and arrowleaf balsamroot (*Balsamorhiza sagittata*). This area supports grazing but at much lower levels than areas converted to pasture. The condition of this area is moderate because, although there are native species present, they have been disturbed and a high number of invasive weeds are present.

Figure 3.4-1. Ecoregions



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Shrublands, Wetlands, Riparian, and Riparian Deciduous Forest – Other vegetation types combined make up approximately 10 percent of the area crossed by the transmission line and access road rights-of-way (Table 3.4-1). Shrub-dominated communities, with the exception of small areas of shrub-steppe, are typically located within the transmission line right-of-way. Riparian forests occur along water bodies and are generally dominated by black cottonwood (*Populus balsamifera* ssp. *trichocarpa*) and willows (*Salix* spp.). Wetlands generally support emergent vegetation, including broadleaf cattail (*Typha latifolia*), reed canarygrass (*Phalaris arundinacea*), and a variety of grass and sedge species. The riparian areas and wetlands are described in more detail in Section 3.6, *Wetlands and Floodplains*. Mixed deciduous-coniferous forests only occur along a **tributary** to Stoner Creek at about line mile 15.

Shrublands, Wetlands, Riparian, and Riparian Deciduous Forest were classified as being in low to moderate condition (Table 3.4-1). Generally, these vegetation communities with a low condition have limited species diversity and are highly disturbed. Disturbances include the existing transmission line right-of-way, roads, culverts, stream modifications (e.g., ditching), agriculture, livestock grazing, and equestrian use. These vegetation communities with a moderate condition generally have higher species diversity, but are still moderately or highly disturbed. More information on wetland condition is provided in Section 3.6.1.

Special-Status Plant Species

Information on special-status plant species potentially occurring within the transmission line and access road rights-of-way was obtained from county lists maintained by the U.S. Fish and Wildlife Service (USFWS) and the Montana Natural Heritage Program (MTNHP). Special status species are plant species identified for protection or management under federal or state law. Documented occurrences of special-status plant species within 5 miles of the transmission line and access road rights-of-way were obtained from the MTNHP. While vegetation surveys were conducted along the entire transmission line and access road rights-of-way biologists took note of any special-status plant species observed. The *Kalispell-Kerr Transmission Line Rebuild Project, Draft Final Wetlands Delineation Report* (RESPEC 2014) provides a comprehensive list of special-status plant species that were encountered in wetland habitats.

Three plant species federally listed under the Endangered Species Act (ESA), or candidates for listing, are found in Flathead and Lake counties (USFWS 2013a):

- Spalding’s campion (*Silene spaldingii*) – Federally listed as **Threatened**; Flathead and Lake counties.
- Water howellia (*Howellia aquatilis*) – Federally listed as Threatened; Lake County.
- Whitebark pine (*Pinus albicaulis*) – Candidate for federal listing; Flathead and Lake counties.

There are no past documented occurrences of these plant species within the transmission line right-of-way (MTNHP 2013c), although Spalding’s campion has been documented approximately 2.5 miles west of the transmission line right-of-way. Water howellia and whitebark pine were not encountered during vegetation and wetland surveys in 2013 and 2014, nor was suitable habitat for these species observed during surveys. However, a native campion was observed within the transmission line right-of-way in line mile 27. Although the native campion was not flowering and could not be identified to the species level, it was found in grassland habitat suitable for Spalding’s campion.

In addition, 81 Montana State Species of Concern—plants that are rare, threatened, and/or have declining populations—have been documented in Flathead and Lake counties. Nine species of concern have documented occurrences within 5 miles of the transmission line and access road rights-of-way, and only one species—wedge-leaf saltbush (*Atriplex truncata*)—has been mapped as potentially occurring within the transmission line and access road rights-of-way (Table 3.4-2). The mapped location is adjacent to Flathead Lake, at Big Arm. However, the species has not been observed in this area in more than 20 years (MTNHP 2014) and was not found in any of the surveyed wetlands (RESPEC 2014). Three U.S. Forest Service sensitive

plant species have documented occurrences within 5 miles of the transmission line right-of-way (Table 3.4-2). All three are wetland species and are addressed below.

Most of the plant species of concern, including the U.S. Forest Service species, occur in wetland, riparian, or aquatic habitats (Table 3.4-2). During the wetland delineations, biologists observed that, with the exception of wedge-leaf saltbush, none of the delineated wetlands provided the necessary habitat component for any particular species of concern (pers. comm., Pipp 2014). Additionally, most of the wetland areas surveyed were degraded in some way, as is most of the project area in general. Therefore, based on available information, there is a low probability of species of concern in the transmission line and access road rights-of-way.

Table 3.4-2. Special Status Plant Species Within 5 Miles of the Transmission Line and Access Road Rights-of-Way

Common Name	Scientific Name	Federal Status	State Status	U.S. Forest Service Status	Habitat
Beaked Spikerush	<i>Eleocharis rostellata</i>	--	SOC (S3)	Sensitive	Alkaline wetlands
Columbia Locoweed	<i>Oxytropis campestris</i> var. <i>columbiana</i>	--	SOC (S1)	--	Wetland/riparian (gravelly shorelines)
Columbia Water-meal	<i>Wolffia columbiana</i>	--	SOC (S2S3)	--	Aquatic
Greenleaf Manzanita	<i>Arctostaphylos patula</i>	--	SOC (S1)	--	Forest (montane)
Pygmy Water-lily	<i>Nymphaea leibergii</i>	--	SOC (S1)	--	Aquatic
Spalding's Campion	<i>Silene spaldingii</i>	T	SOC (S2)	--	Grasslands (intermountain)
Water Bulrush	<i>Schoenoplectus subterminalis</i>	--	SOC (S3)	Sensitive	Wetland/riparian
Water Star-grass	<i>Heteranthera dubia</i>	--	SOC (S1S2)	Sensitive	Wetland/riparian
Wedge-leaf Saltbush	<i>Atriplex truncata</i>	--	SOC (S3)	--	Wetland/riparian

T = Threatened; SOC = Species of Concern; S1 = at very high risk for extinction or extirpation; S2 = at high risk for extinction or extirpation; and S3 = at risk for extinction or extirpation; two numbers (e.g., S1S2) represent conservation status in different parts of the state.
Sources: MTNHP 2013c.

Noxious Weeds

As defined in the Montana County Weed Act (Montana Code Annotated 7-22-2101(8)(a)), **noxious weeds** are exotic plants "...that may render land unfit for agriculture, forestry, livestock, wildlife, or other beneficial uses, or that may harm native plant communities...". Under the provisions of the Weed Control Act, the Montana Department of Agriculture (MTDA) maintains and updates a statewide list of noxious weeds, with county governments responsible for the implementation and enforcement of weed management. Noxious weeds that require eradication or containment are categorized by priority for control, based on how widespread and abundant they are throughout the state (MTDA 2010):

- **Priority 1A** – These weeds are not present in Montana. Management criteria will require eradication if detected, along with education and prevention.
- **Priority 1B** – These weeds have limited presence in Montana. Management criteria will require eradication or containment and education.

- **Priority 2A** – These weeds are common in isolated areas of Montana. Management criteria will require eradication or containment where less abundant. Management shall be prioritized by local weed districts.
- **Priority 2B** – These weeds are abundant in Montana and widespread in many counties. Management criteria will require eradication or containment where less abundant. Management shall be prioritized by local weed districts.
- **Priority 3 weeds**, although regulated, are not considered noxious weeds and their control is not mandated. The state noxious weed lists includes 32 species in the Priority 1A/B and 2A/B categories.

Based on the most recent state noxious weed report (MTDA 2014), an estimated 22,267 acres (16 percent) of lands in Flathead County, and 19,791 acres (29 percent) of lands in Lake County are infested by noxious weeds. In addition to the species on the state list, Lake County has listed ten local invasive species of concern (Lake County 2012), and Flathead County has listed four additional “County Declared” noxious weeds.

Noxious weed surveys of the transmission line and access road rights-of-way were completed in September 2013 and June 2014. Out of the 43 noxious weed species documented in the two counties crossed, 20 species of noxious weeds were encountered and identified during these surveys, including two priority 1B weeds, five Priority 2A weeds, and 13 Priority 2B weeds (Table 3.4-3). Surveys indicated that noxious weeds were distributed throughout the transmission line and access road rights-of-way. The most commonly occurring species are spotted knapweed, Canada thistle (*Cirsium arvense*), tumble mustard (*Sisymbrium altissimum*), sulfur cinquefoil (*Potentilla recta*), and oxeye daisy (*Leucanthemum vulgare*). Spotted knapweed was the dominant weed species along the transmission line and access road rights-of-way from the beginning of line mile 9 to the end of line mile 25, and again from the start of line mile 31 to the Kerr Substation. In total, over 510 acres of spotted knapweed were mapped during field surveys. The next most abundant weed species was oxeye daisy, which occupies about 100 acres within the right-of-way.

Table 3.4-3. Noxious Weed Species within the Transmission Line and Access Road Rights-of-Way

Common Name	Scientific Name	Priority	List
Canada thistle	<i>Cirsium arvense</i>	2B	State
Common tansy	<i>Tanacetum vulgare</i>	2B	State
Dalmation toadflax	<i>Linaria dalmatica</i>	2B	State
Eurasian watermilfoil	<i>Myriophyllum spicatum</i>	1B	State
Field bindweed	<i>Convolvulus arvensis</i>	2B	State
Houndstongue	<i>Cynoglossum officinale</i>	2B	State
Leafy spurge	<i>Euphorbia esula</i>	2B	State
Meadow hawkweed complex	<i>Hieracium</i> spp.	2A	State
Orange hawkweed	<i>Hieracium auranticum</i>	2A	State
Oxeye daisy	<i>Chrysanthemum leucanthemum</i> or <i>Leucanthemum vulgare</i>	2B	State
Rush skeletonweed	<i>Chondrilla juncea</i>	1B	State
Russian knapweed	<i>Centaurea repens</i>	2B	State
Russian thistle	<i>Salsola tragus</i>	2A	Flathead County
Spotted knapweed	<i>Centaurea stoebe</i> or <i>maculosa</i>	2B	State
St. Johnswort	<i>Hypericum perforatum</i>	2B	State
Sulfur cinquefoil	<i>Potentilla recta</i>	2B	State
Tumble mustard	<i>Sisymbrium altissimum</i>	2A	Flathead County
White campion	<i>Silene latifolia</i>	2A	Flathead County

Common Name	Scientific Name	Priority	List
Whitetop	<i>Cardaria draba</i>	2B	State
Yellow toadflax	<i>Linaria vulgaris</i>	2B	State

Sources: MTDA 2010; Lake County 2012; Flathead County 2013a.

3.4.2 Environmental Consequences–Proposed Action

General Vegetation

Construction activities associated with the Proposed Action would directly affect vegetation through vegetation removal (including trees), establishment of temporary staging areas, improvement of the access road system, operation of ground equipment and machinery, and backfill of structure replacement sites with spoils and gravel. Permanent impacts on vegetation would occur where the site would be modified so that it no longer supported vegetation, or where native plant communities would be permanently altered as a result of activities associated with the Proposed Action. Construction of the Proposed Action would result in 54.6 acres of permanent impacts associated with the loss of vegetation (Table 3.4-4). The majority of impacts would be in grassland vegetation and associated with access roads improvements.

Table 3.4-4. Structure Replacement and Access Road Impacts on Vegetation

Vegetation Type	Permanent Impacts (acres)			Temporary Impacts (acres)		
	Transmission Structure Replacement	Access Road Construction	Total ^a Permanent Impacts	Transmission Structure Replacement	Access Road Construction	Total ^b Temporary Impacts
Coniferous Forest	<0.1	9.9	9.9	0.5	31.1	31.5
Grassland	1.9	37.5	39.4	32.2	82.4	114.6
Shrubland (Includes shrub-steppe)	0.2	4.6	4.8	3.5	7.7	11.1
Wetland and Riparian	0.1	0.3	0.3	1.1	1.2	2.2
Riparian Deciduous Forest	0.0	0.1	0.1	0.1	0.1	0.1
Total^c	2.1	52.3	54.5	37.2	122.4	159.5

^a Includes impacts associated with new access road construction. Minimal additional impacts associated with access road improvement and reconstruction would also occur.

^b Includes temporary impacts from all road types.

^c Total represents actual total, not the total from the rounded table values.

Most of the acreage that would be permanently impacted is low quality grassland/agricultural vegetation (Table 3.4-4). Permanent loss of high-quality vegetation would be negligible, with the exception of native grassland vegetation located near line miles 27 and 28. Construction activities at this location have the potential to alter plant species composition by introducing noxious weeds. The spread of noxious weeds would be minimized by reseeding temporary impact areas and other measures listed below.

The removal of an estimated 2,250 trees would affect the plant communities in which they are located by increasing light within the understory, possibly resulting in small, localized changes in species composition, depending on what shrubs or seeds are present in the affected area. Nearly half (54 percent) of the total number of trees that would be removed are 6 to 12 inches dbh. In conifer forests, trees of this size are typically 16 to 30 years old. Mature trees, which are typically between 31 and 80 years old with 13 to 18 inch dbh, account for 31 percent of the total number of trees that would be removed. In some cases, removal of trees could increase the risk of noxious weed invasion. Because tree removal would occur along the edge between forested areas and the existing cleared transmission line right-of-way, and would be spread over about 23 miles of the line, removal would not be expected to substantially alter the native forest communities found in the transmission line and access road rights-of-way.

The Proposed Action would result in about 159.5 acres of temporary impacts to vegetation (Table 3.4-4) from access roads improvements and construction, and pulling and tensioning sites. The majority of temporary impacts would be in grassland vegetation and previously disturbed habitats and managed rights-of way. In addition to a temporary loss of vegetation, there could be a long-term alteration of plant species composition, depending on the seed mix applied after construction. Other temporary impacts on vegetation would be associated with the use of heavy equipment at construction sites, staging areas, on temporary access routes, and in work areas along roads. Vegetation in these areas could be crushed or uprooted, and localized areas of soil compaction could affect plant communities by reducing infiltration, altering soil characteristics, and favoring species adapted to compacted conditions. However, most affected areas have already been degraded by past disturbances. In line mile 26 where there is a large seasonally flooded wetland, BPA would use low ground pressure equipment (e.g., tracked vehicles) or temporary wood mats to allow access to structure locations. Use of these measures would harm vegetation through crushing, compaction, and temporarily preventing photosynthesis and growth. However, vegetation would be expected to recover following the removal of these materials.

Overall, because the types of vegetation that would be impacted are prevalent in the area, most of the affected areas have already been degraded, and permanent impacts would be limited, impacts on vegetation would be **low**.

Special-Status Plant Species

Four of the 9 special-status plant species with the potential to occur within the transmission line and access road rights-of-way grow in wetland and riparian vegetation communities. The Proposed Action would temporarily disturb 2.2 acres and permanently remove 0.3 acre of wetland and riparian vegetation. Most of the temporary disturbance would be associated with temporary access road work in a large wetland near line mile 26. To replace structures in these locations, wood mats or other measures (e.g., low ground pressure equipment) would be utilized; these measures would crush vegetation but not result in a permanent change to the habitat. Although wetland and riparian habitat would be disturbed, it is unlikely that special-status plant species would be affected by the Proposed Action because none were observed during the wetland delineation or invasive weed field surveys. Additionally the one documented occurrence of wedge-leaf saltbush near Big Arm has not been observed in more than 20 years (MTNHP 2014) and is unlikely to be affected by the Proposed Action. The native campion species that was found during the June 2014 surveys is outside of all work areas and would be avoided. Therefore, impacts on special-status plant species would be **low**.

Noxious Weeds

Construction activities could contribute to the establishment and spread of noxious weeds within the transmission line and access road rights-of-way through vegetation removal and soil disturbance, creating site conditions favorable to establishment of noxious weeds. In areas where noxious weeds are already present, project-related disturbance could result in an expansion of existing weed populations, possibly at the expense of native vegetation. Construction vehicles and equipment could transport weed seeds and

propagules along roads and other travel routes, potentially leading to the establishment of new populations of these species. Potential impacts would be greatest at line miles 27 and 28 where native vegetation is found and noxious weed populations are low. Implementation of measures to minimize seed transport would reduce this risk. Overall, because noxious weeds are widespread in the transmission line and access road rights-of-way, the level of impact on native vegetation from new invasions of noxious weeds in the Proposed Action is **low**.

3.4.3 Mitigation Measures

In addition to the following mitigation measures to reduce impacts on vegetation resources in the project area, BPA would implement measures GEO-8 (Revegetation) and GEO-10 (Staging Areas) would also reduce vegetation impacts:

- **VEG-1:** Use stakes, flagging, fencing, or signs to identify sensitive areas (e.g., wetlands or riparian areas, native vegetation areas between mile 27 and 28) prior to construction so that construction crews can avoid unintentional impacts on vegetation.
- **VEG-2:** Clearly mark trees identified for removal and tree removal disturbance limits, and identify staging areas.
- **VEG-3:** Use existing road systems, where practicable, to access structure locations.
- **VEG-4:** Minimize the construction area to the extent practicable within native plant communities and sensitive habitats to prevent the expansion of invasive weed species.
- **VEG-5:** Avoid locating temporary access roads and overland travel routes in high-quality areas within wetlands, native plant communities, and riparian areas.
- **VEG-6:** Locate staging areas in disturbed or common habitat types (e.g., pasture land, unused industrial areas, or timber harvest sites).
- **VEG-7:** Clearly mark the location of the unknown champion species on maps and in the field, and avoid any construction work in this area.
- **VEG-8:** Return temporarily disturbed areas to the original (pre-construction) contours and conduct site restoration as soon as practicable following construction.
- **VEG-9:** Inspect seeded sites to verify adequate growth and implement contingency measures as needed.
- **VEG-10:** Implement measures to minimize the spread of noxious weeds in agricultural lands and areas of intact native vegetation (e.g., line miles 27 and 28), including cleaning of vehicles before entering construction areas and installation and use of weed wash/blow stations at selected locations within the project area.
- **VEG-11:** Identify noxious weed infestations with fencing, flagging, or stakes at construction sites in agricultural lands and native vegetation, and avoid these areas as much as practicable during construction.
- **VEG-12:** Use weed-free straw, hydromulch, or similar ground cover for erosion control during construction and restoration activities in areas that cannot be immediately revegetated.

3.4.4 Environmental Consequences—No Action Alternative

Emergency repair activities would impact vegetation in localized areas along the route, in much the same way that construction activities under the Proposed Action would impact vegetation. Most loss of vegetation would be temporary, although localized changes in plant species composition could be long term.

Populations of weeds within the right-of-way would continue to spread and increase in size. New populations would establish as a result of natural processes of seed dispersal, as well as through the transport of seeds and propagules on maintenance equipment, as well as construction equipment needed for emergency or other spot repairs. Overall, this alternative would have a **low** level of impact on vegetation resources.

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3.5 Wildlife

3.5.1 Affected Environment

Common Wildlife

The project area crosses four ecoregions: the Flathead Valley, which includes the Kalispell area and Big Arm/Draw area (line miles 1 to 9, 36 to 41); Salish Mountains (line miles 9 to 27); Camas Valley (line miles 28 to 30); and the Flathead Hills and Mountains (line miles 27 to 28, 30 to 36) (Woods et al. 2002; Omernik 1987) (Figure 3.4-1). These ecoregions identify areas with similar geology, physiography, geomorphology, climate, plant communities, and wildlife habitat, and provide a contextual framework for wildlife resources in the affected environment.

The project area provides wildlife habitat for 374 terrestrial wildlife species, which includes 11 amphibians, 11 reptiles, 281 birds, and 71 mammals (Confederated Salish and Kootenai Tribes and MTFWP 2004). Common wildlife species observed in project area are shown in Figure 3.5-1. Common amphibians and reptiles potentially occurring in the project area include long-toed salamander (*Ambystoma macrodactylum*), western toad (*Bufo boreas*), Pacific tree frog (*Hyla regilla*), painted turtle (*Chrysemys picta*), common garter snake (*Thamnophis sirtalis*), and western terrestrial garter snake (*Thamnophis elegans*). Small mammals potentially occurring in the project area include muskrat (*Ondatra zibethicus*), raccoon (*Procyon lotor*), Columbian ground squirrel (*Urocitellus columbianus*), red squirrel (*Tamiasciurus hudsonicus*), northern flying squirrel (*Glaucomys sabrinus*), and voles (*Microtus* spp.). Large mammals include white-tailed deer (*Odocoileus virginianus*), mule deer (*O. hemionus*), elk (*Cervus canadensis*), and black bear (*Ursus americanus*). Common birds observed in the project area include savannah sparrow (*Passerculus sandwichensis*), western meadowlark (*Sturnella neglecta*), western bluebird, (*Sialia mexicana*), yellow-breasted chat (*Icteria virens*), and downy woodpecker (*Picoides pubescens*). **Upland** gamebird species observed in the project area include dusky grouse (*Dendragapus obscurus*) and ruffed grouse (*Bonasa umbellus*). Common raptors observed in the project area include American kestrel (*Falco sparverius*), northern harrier (*Circus cyaneus*), and red-tailed hawk (*Buteo jamaicensis*). Waterfowl such as American wigeon (*Anas americana*), canvasback (*Aythya valisineria*), mallard (*Anas platyrhynchos*), and pintail (*Anas acuta*) were observed in wetlands and the Flathead River.

There is a nesting platform on a transmission structure in line mile 5. The origin of the nesting platform is unknown, but BPA maintenance crew report seeing Canada geese and osprey using it.

Flathead Valley Ecoregion

The Flathead Valley is primarily lowlands where wetland and riparian vegetation associated with the Flathead River **floodplains** have been converted to agricultural land; these areas are also called farmed wetlands. These areas attract both resident and migratory birds that fly into the areas to rest and feed. Bird numbers tend to be highest in spring and fall when fog collects on and near the Flathead River, limiting visibility.

Salish Mountains Ecoregion

The Salish Mountains is primarily mid-elevation mixed conifer forest habitats over rugged terrain on private timberlands, and the Island Unit of the Flathead National Forest. In the Salish Mountains, the transmission line right-of-way is surrounded by mixed conifer forest, providing habitat for a variety of wildlife. Snags and dead trees are scattered within the transmission line right-of-way and in the adjacent forest. On the Flathead National Forest, at least 42 species of birds and 10 species of mammals are dependent on dead trees for nesting, feeding, or shelter (U.S. Forest Service 2012a).

Camas Valley Ecoregion

The Camas Valley is a small, 2-mile segment of primarily low-elevation agricultural lands used for pasture. Wildlife habitat is somewhat similar to the Flathead Valley except it is more remote with fewer disturbances associated with human activity. The Camas Valley also includes small patches of forested riparian areas and wetlands and is a flyway for waterfowl moving between Flathead Lake and Lake Mary Ronan.

Flathead Hills and Mountains Ecoregion

The Flathead Hills and Mountains, located within the Flathead Indian Reservation, changes from agricultural pasture lands to rolling forested hills. White-tailed deer, mule deer, and elk are common in the area (pers. comm., Barce 2013). Wildlife habitat is somewhat similar to the Salish Mountains but is lower in elevation with a more open forest canopy.

The Proposed Action traverses several different habitat types, including grassland, mixed conifer forest, wetland and riparian, shrubland, and riparian deciduous forest. However, vegetation within the transmission line right-of-way is actively managed as low-growing vegetation communities for safety and operational standards. The line fragments habitat for wildlife species dependent on intact mature forest areas; however, transmission line corridors provide early successional habitat in forested landscapes and thus play an important role in biodiversity (Komonen et al. 2013). Outside of the transmission line right-of-way, wildlife-habitats include mixed conifer forest, agriculture, developed and altered areas, and riparian and wetland communities (Table 3.5-1). Plant species composition for these wildlife habitats is described in Section 3.4, *Vegetation*.

Table 3.5-1. Wildlife Habitats within the Transmission Line and Access Road Rights-of-Way

Wildlife Habitat	Acres	Miles
Grassland	839.3	70.8
Mixed Conifer Forest	93.3	14.3
Wetland and Riparian	29.7	1.8
Shrubland	79.8	7.4
Riparian Deciduous Forest	3.5	0.1
Total^a	1,045.4	94.4
^a Total represents actual total, not the total from the rounded table values. Source: AECOM 2014.		

Montana Wildlife Species of Concern

Montana species of concern are native species that are at risk because of declining populations, threats to their habitats, restricted distribution, and/or other factors. The Montana Natural Heritage Program (MTNHP) database collects information on Montana wildlife species of concern. The database was searched for wildlife species of concern documented within 5 miles of the transmission line and access road rights-of-way (MTNHP 2013a). Based on this search, Montana wildlife species of concern that have a moderate potential to occur in the transmission line and access road rights-of-way include the following: the western toad (*Anaxyrus boreas*), bald eagle (*Haliaeetus leucocephalus*), Clark's nutcracker (*Nucifraga columbiana*), great blue heron (*Ardea herodias*), long-billed curlew (*Numenius americanus*), and veery (*Catharus fuscescens*; a bird in the thrush family). Table 3.5-2 provides more information on habitat and potential for occurrence in the project area for Montana Wildlife Species of Concern.

U.S. Forest Service Sensitive Wildlife

The U.S. Forest Service sensitive wildlife species list (U.S. Forest Service 2012a, 2012b) was reviewed for occurrences specific to the transmission line and access road rights-of-way that cross the Flathead National Forest Island Unit (Island Unit). The only U.S. Forest Service sensitive wildlife species with a potential to occur on U.S. Forest Service-managed lands are the bald eagle and gray wolf (*Canis lupus*) (Table 3.5-2).

Table 3.5-2. Wildlife Species of Concern Documented Within 5 Miles of the Project Area and Potential Occurrence in the Project Area

Common Name Scientific Name	USFWS Status	U.S. Forest Service Status	Montana Status^a	Habitat Association	Potential for Occurrence in the Project Area^b
Amphibians					
Western Toad <i>Anaxyrus boreas</i>		Sensitive	G4/S2	Low elevation beaver ponds, reservoirs, streams, marshes, lake shores, potholes, wet meadows, and marshes, to high elevation ponds, fens, and tarns at or near treeline.	Moderate. Wetlands and floodplain pools are present in the project area that provide suitable habitat. Known occurrences near the project area are limited to open ponds.
Birds					
Bald Eagle <i>Haliaeetus leucocephalus</i>		Sensitive	G5/S4	Forages primarily along rivers and lakes; also consumes carrion on roadways. Nests are typically in large trees within about 0.5 mile from water (Johnsgard 1990).	Present. Likely forages along the Flathead River and Flathead Lake. No documented nests within transmission line and access road rights-of-way. Documented nests near line miles 1, 3, 5, 13, and 41 are greater than 0.25 mile from transmission line.
Black-backed Woodpecker <i>Picoides arcticus</i>		Sensitive		Conifer forest, recently burnt landscapes, areas of large-scale forest disturbance.	Low. No habitat within the transmission line and access road rights-of-way. No documented occurrence in the Island Unit. May use the Island Unit as corridor for movement between recently burned areas.
Clark's Nutcracker <i>Nucifraga columbiana</i>			G5/S3	Conifer forests dominated by whitebark pine at higher elevations, ponderosa pine/Douglas-fir at lower elevations.	Moderate. Marginal habitat present in the foothills of the Salish Mountains. Single individual observed near the end of line mile 27.
Common Loon <i>Gavia immer</i>		Sensitive	G5/S3B	Mountain lakes with emergent vegetation.	Low. No suitable habitat within the transmission line and access road rights-of-way. Closest occurrence is at Lake Mary Ronan, 2 miles east of line mile 23.

Table 3.5-2. Wildlife Species of Concern Documented Within 5 Miles of the Project Area and Potential Occurrence in the Project Area

Common Name Scientific Name	USFWS Status	U.S. Forest Service Status	Montana Status ^a	Habitat Association	Potential for Occurrence in the Project Area ^b
Common Tern <i>Sterna hirundo</i>			G5/S3B	Large rivers and lakes. Vegetated islands in large bodies of water.	Low. Foraging habitat present in the Flathead River at two locations near line mile 5 and line mile 41.
Flammulated Owl <i>Otus flammeolus</i>		Sensitive		Open dry conifer forest with some large old trees, mid to upper slopes of ridges, scattered thickets of saplings, shrubs, or clearings.	Low. No nests documented in the Island Unit. Closest occurrence is 15 miles from the Island Unit.
Great Blue Heron <i>Ardea herodias</i>			G5/S3	Riparian woodlands. Wetlands and riparian habitats along major rivers and lakes.	High. Habitat present within the transmission line and access road rights-of-way. Multiple occurrences documented in the Flathead Valley.
Great Gray Owl <i>Strix nebulosa</i>			G5/S3	Conifer forest. Dense forests in mountainous areas. Known to occur in lodgepole pine and Douglas-fir stands in Montana.	Low. No habitat within the transmission line and access road rights-of-way. Conifer forest is present in the project area. One occurrence documented 2 miles east of the project area.
Long-billed Curlew <i>Numenius americanus</i>			G5/S3B	Grasslands. Short-grass or mixed prairie habitat with flat to rolling topography; may use agricultural fields for foraging.	High. Documented occurrence within the transmission line and access road rights-of-way from line mile 38 to 41.
Northern Goshawk <i>Accipter gentilis</i>			G5/S3	Prefers conifer forests where it uses a wide variety of forest types; most have tall trees with medium amount of canopy closure and small open areas for foraging (Johnsgard 1990).	Low. Conifer forest is present in the project area, but there are no documented records within 5 miles of the transmission line and access road rights-of-way.
Peregrine Falcon <i>Falco peregrinus</i>		Sensitive		Cliffs for nesting, near open landscapes for foraging.	Low. No suitable nesting habitat in the project area. No documented occurrences within 5 miles of the transmission line and access road rights-of-way.
Veery <i>Catharus fuscescens</i>			G5/S3B	Riparian forest and shrublands. Cottonwood forest and willow thickets along streams and lakes in valleys.	Moderate. A single documented occurrence 1 mile west of line mile 3. Suitable habitat present within the transmission line and access road rights-of-way.

Table 3.5-2. Wildlife Species of Concern Documented Within 5 Miles of the Project Area and Potential Occurrence in the Project Area

Common Name Scientific Name	USFWS Status	U.S. Forest Service Status	Montana Status ^a	Habitat Association	Potential for Occurrence in the Project Area ^b
Mammals					
Canada Lynx <i>Lynx canadensis</i>	Threatened Critical Habitat			Western Montana alpine and sub-alpine montane spruce/fir forests with high snow accumulation. Within these habitats they are most often found in areas of recent disturbance (e.g., fire) that support relatively higher densities of snowshoe hare, the preferred prey.	Low. Marginal habitat is present in foothills of the Salish Mountain portion of the project area. The project area is fragmented and lacks preferred contiguous habitat, and lynx have not been trapped in the Island Unit.
Hoary Bat <i>Lasiurus cinereus</i>			G5/S3	Summer resident of forested habitats. Typically forages over water near forested areas; habitats used range from coniferous forests to riparian habitats.	Low. Most forests crossed by the line are not in close association with water. Marginal amount of fragmented riparian habitat is present along the Flathead River, Ashley Creek, and West Fork Dayton Creek.
Gray Wolf <i>Canis lupus</i>		Sensitive		No particular habitat preference except for the presence of native ungulates on a year-round basis. Wolves usually occur in areas with few roads and little human disturbance.	Moderate. Recent observation of a wolf pack in the Island Unit.
Grizzly Bear <i>Ursus arctos horribilis</i>	Threatened			Alpine/subalpine coniferous forest.	Moderate. No documented occurrence in the project area. Documented occurrences within 2 miles of the transmission line and access road rights-of-way. Marginal habitat is present in foothills of the Salish Mountain portion of the project area.
Wolverine <i>Gulo gulo</i>			G4/S3	Conifer forest. Alpine tundra, boreal conifer forest, isolated wilderness.	Low. No suitable habitat within the transmission line and access road rights-of-way. Marginal habitat in foothills of Salish Mountains.
Invertebrates					
Caenis Mayfly <i>Caenis youngi</i>			G4/S2	Sloughs/backwaters.	Low. May occur along Flathead River and Ashley Creek.

Table 3.5-2. Wildlife Species of Concern Documented Within 5 Miles of the Project Area and Potential Occurrence in the Project Area

Common Name Scientific Name	USFWS Status	U.S. Forest Service Status	Montana Status ^a	Habitat Association	Potential for Occurrence in the Project Area ^b
Lophomus Millipede <i>Lophomus laxus</i>			G1G3/S1S3	Mixed conifer forest. No description of ecology available.	Low. No habitat within the transmission line and access road rights-of-way. May occur in forested areas in the foothills of the Salish and Flathead mountains.
<p>Notes:</p> <p>^a G =Global Status; multiple global ranks for a given species (e.g., G1G3) indicate uncertainty about the actual rank, which is considered likely to be between the two ranks shown.</p> <p>S = State Status; multiple state ranks (e.g., S2S3) indicate that populations in different geographic portions of the species range in Montana have different ranks.</p> <p>Species are assigned numeric ranks ranging from 1 (highest risk, greatest concern) to 5 (demonstrably secure), reflecting the relative degree of risk to the species' viability, based on available information. The "B" qualifier for birds indicates that the listing applies to those members of this species that breed in the state.</p> <p>^b Potential for Occurrence: Low = Suitable habitat but no documented occurrence; Moderate = Suitable habitat present and documented occurrence within 1 mile of the project area; High = Suitable habitat and documented occurrence in the project area or observed during project-related surveys.</p> <p>Sources: MTNHP 2013a, 2013b; U.S. Forest Service 2012a, 2012b; USFWS 2013b; and pers. comm., Ruby 2013b, Bodurtha 2013.</p>					

ESA-listed Wildlife Species

The USFWS lists of endangered, threatened, proposed, and candidate species for Montana counties were reviewed. BPA discussed preliminary information on the Proposed Action and potential effects on ESA-listed species with the USFWS on July 31, 2013 (pers. comm., Bodurtha 2013). ESA-listed wildlife species that have potential to occur within transmission line and access road rights-of-way include grizzly bear (*Ursus arctos horribilis*) and Canada lynx (*Lynx canadensis*). In addition, the meltwater lednian stonefly (*Lednia tumana*) is a candidate for listing under the ESA.

Grizzly Bear

The grizzly bear was listed as threatened by the USFWS on July 28, 1975 (40 Federal Register [FR] 31734). In a 5-year review completed on September 6, 2011, the USFWS confirmed that the grizzly bear should retain its threatened status. Within the lower 48 states, grizzly bear populations are designated by recovery zone ecosystems. The Grizzly Bear Recovery Plan (USFWS 1993) identified areas for recovery where grizzly bears were known or thought to have been present in 1975; the zones include the Northern Continental Divide Ecosystem within the Flathead National Forest. The transmission line and access road rights-of-way do not cross designated recovery zones for grizzly bears. However, current information suggests that the grizzly bear population on the Flathead National Forest and the Northern Continental Divide Ecosystem is expanding its range outside of the recovery zone and has a population that exceeds recovery plan levels (Kendall et al. 2009; U.S. Forest Service 2002). In 2010, a young female grizzly bear was trapped for management reasons south of the Island Unit outside of the town of Lakeside. Because it had naturally migrated west of U.S. Highway 93, this female was radio-collared and released on Wild Bill Mountain (U.S. Forest Service 2012b; pers. comm., Ruby 2013a, 2013b). The female remained in the Island Unit (near line miles 17-20) until September of 2010 when it traveled across Flathead Lake and denned in the northern

Mission Mountains. In 2010, a female and cub were observed during an MTFWP monitoring flight on the southern slopes of Blacktail Mountain, 4 miles west of the project area. Also, during the summer of 2010, a U.S. Forest Service employee observed a subadult grizzly bear in Cramer Creek, 2 miles west of the project area. In 2011, a grizzly bear was documented north of the Island Unit across U.S. Highway 2 on the western edge of Kalispell approximately 10 miles from the Island Unit.

Canada Lynx

The Canada lynx was listed as threatened on March 24, 2000 (65 FR 16053), and **critical habitat** was designated on February 25, 2009 (74 FR 8616). Because suitable habitat for Canada lynx in the western mountain states is fragmented and peninsular, conservation of the species is a great concern (U.S. Forest Service 2012b). The species occurs throughout the U.S. Forest Service's Northern Region and is present within the Flathead National Forest. Designated critical habitat for Canada lynx does not occur in the project area. Based on trapping records, there were no reported lynx within the Island Unit from 1980–2005 (U.S. Forest Service 2012b). Because the project area is fragmented, lacks preferred contiguous habitat, and lynx have not been trapped in the Island Unit, the potential presence of the Canada lynx in the project area is low.

Meltwater Lednian Stonefly

The meltwater lednian stonefly is a candidate for listing under the ESA. The meltwater lednian stonefly is a small, dark-colored species found in extremely cold glacier-fed streams at high elevations in Glacier National Park, which is located approximately 30 miles northeast of the Kalispell-Kerr transmission line's northern terminus. Adults typically hatch and mate by mid-summer (July–August). There is no suitable habitat for the meltwater lednian stonefly within transmission line and access road rights-of-way and therefore it is not discussed further.

The Final EA will include results from informal consultation under Section 7 of the ESA with the USFWS on grizzly bear and Canada lynx.

3.5.2 Environmental Consequences–Proposed Action

Common Wildlife

The Proposed Action has the potential to permanently impact wildlife through incidental mortality from vegetation clearing, earth-moving, and avian collision, loss of breeding, rearing, and foraging habitat, and habitat degradation through the spread of noxious weeds and further fragmentation.

During construction, there is potential for incidental mortality of some wildlife with limited mobility, such as amphibians and small mammals, which could be crushed by vehicles or caught in collapsed burrows during clearing and grading activities (Trombulak and Frissell 2000). Vegetation removal could also result in active nest destruction. Most birds in the project area are relatively common, and loss of individual nests would not affect the regional population. Furthermore, the habitat to be affected by tree removal is generally considered to be of low quality, being adjacent to areas previously disturbed by the transmission right of way and existing access roads. Nonetheless, to minimize impacts to nesting birds, BPA would either conduct preconstruction nesting bird surveys and avoid removing vegetation in areas where nesting birds are found until after the young have fledged, or BPA would perform vegetation removal outside of the nesting season.

The nesting platform at transmission line mile 5 would be removed as part of the construction associated with the Proposed Action. BPA would work with MTFWP to determine appropriate timing for removing the platform and finding a suitable location for its replacement.

Birds can collide with conductors or ground wires, especially where lines cross known flyways, during periods of low visibility (e.g., nighttime, fog, snow). The largest known flyway crossed by the Kalispell-Kerr transmission line is in the Flathead River valley. Although no specific bird collision data are associated with the Kalispell-Kerr transmission line (pers. comm., Bissell 2013), BPA proposes to install bird flight diverters at specific locations to minimize bird collisions (Table 3.5-3). These locations were selected because they are either known migratory pathways (e.g., the Flathead River and associated oxbows and wetlands) or wetland complexes that provide foraging and resting opportunities. The installation of flight diverters would reduce the risk of bird collisions with the transmission line.

Avian electrocution occurs when a bird's wingspan completes a circuit between energized and/or grounded structures, conductors, hardware, or equipment (Avian Power Line Interaction Committee 2006) and is typically a problem with lower voltage distribution lines where the typical distance between conductors is 2 to 6 feet. Avian electrocution is not an issue with high-voltage transmission lines, such as the Kalispell-Kerr transmission line, because the typical distance between conductors is about 12 feet. Even the largest local birds (i.e., eagles and herons) do not have a sufficient wing span to touch two conductors simultaneously and be electrocuted.

Vegetation removal from the edges of existing roads and transmission line right-of-way would permanently remove foraging, breeding, and rearing habitat. However, as noted above, this habitat is considered to be of low quality as it is adjacent to areas already disturbed by existing roads and transmission right of way. Also, given that vegetation removal would occur in small areas scattered along the entire right-of-way, BPA does not anticipate the proposed action would alter local movement foraging, or long-range migration.

The spread of noxious and invasive plant species could have a long-term effect on wildlife habitat quality through degradation (Westbrooks 1998). To reduce these effects, BPA would implement best management practices to minimize the spread and introduction of weeds (see Section 3.4, *Vegetation*).

Roads and vegetation removal can fragment wildlife habitat by discouraging various species from moving across the landscape to forage, breed, and rear young (Beier and Loe 1992; Trombulak and Frissel 2000). In addition, despite repairing and installing gates to restrict unauthorized access, new and improved access roads could facilitate the increased use of new areas by humans, resulting in certain species avoiding these areas.

Construction of the proposed project is expected to temporarily impact wildlife in the project area through noise and increased human activity. The majority of construction activities would take place during daylight hours when species such as deer, bear, and elk are less active. Nonetheless, wildlife movement and foraging would likely be disrupted with mobile wildlife temporarily relocating to nearby areas away from construction activity. Because similar habitat is prevalent nearby, BPA anticipates this temporary relocation to have minimal impact to wildlife species.

Overall, impacts on common wildlife species would be **low** because most of the species are highly mobile and would avoid temporary construction disturbance, incidental mortality would not affect regional populations, habitat changes would be minimal when compared to the habitat adjacent to the transmission right-of-way and access roads, the spread of noxious weeds would be minimized through mitigation measures, and flight diverters would reduce the risk of collision with conductors.

Table 3.5-3. Proposed Bird Flight Diverter Locations

Line Mile	Number of Spans	Total Span Length (ft.)	Crossing
1	2	820	Historic oxbow of Flathead River
2-3	4	2,485	Wetland complex, tributary to Flathead River
3	1	625	Historic oxbow of Flathead River
5	1	625	Tributary to Flathead River
5	1	1,195	Flathead River
6-7	5	2,775	Ashley Creek, Patrick Creek, adjacent wetlands
8	1	1,000	Wetland complex
15	2	1,000	Stoner Creek, tributary and wetlands
22	2	955	West Fork Dayton Creek
26	4	2,625	Ronan Creek and adjacent marsh
41	1	1,130	Flathead River

Montana Wildlife Species of Concern

Impacts on the Montana wildlife species of concern with potential to occur in the transmission line and access road rights-of-way would be similar to the permanent and temporary impacts described for common wildlife. Only species-specific potential impacts are described below.

Long-billed Curlew

Long-billed curlew are ground-nesters in grasslands, and most nests are well camouflaged or almost undetectable. Construction activities have the potential to result in incidental mortality with the destruction of active nests, eggs, or nestlings from vegetation clearing, grubbing, or other site preparation and construction activities. To minimize the potential impacts to active nests, BPA would either conduct pre-construction nest surveys or perform vegetation clearing outside of the nesting period (March 15-August 31) in potential habitat.

The Proposed Action would permanently affect almost 40 acres of grassland habitat (Table 3.4.4). Given the prevalence of grassland habitat in the project area (almost 840 acres) and adjacent to the transmission line, BPA anticipates this loss of habitat to have minimal impact on the curlew.

Clark's Nutcracker

Clark's Nutcrackers tend to nest on the edges of open coniferous forests and are almost entirely dependent on seeds from coniferous trees. The Proposed Action has the potential to result in incidental mortality with the removal of vegetation, most of which occurs at the edge of the existing forests. Incidental mortality can be minimized by performing tree clearing activities outside of the nesting season which typically occurs in the early to late spring.

The Proposed Action would also permanently convert about 10 acres of coniferous forests to either roads or shrub/grassland ecosystems from about line mile 9 to line mile 30 through the Salish Mountains, thereby reducing nesting and foraging habitat for the species. Because coniferous forest is the most prevalent vegetation type adjacent to the transmission line (for about 21 miles), BPA believes the Clark's nutcracker would have ample alternative locations for foraging and nesting.

Clark's Nutcrackers are typically accustomed to human activity and, consequently, are not likely to be affected by construction activities.

Western Toad

Distribution of the western toad is limited to riparian forest and wetland habitats. Having limited mobility, there may be incidental mortality associated with the operation of heavy equipment. Given the small amount of wetland and riparian area to be affected by the Proposed Action, 2.7 acres according to Table 3.4.4, BPA anticipates impacts to the toad would not affect the regional population.

Great Blue Heron

Great blue herons rely on fish for their primary food source and, consequently, live near water and wetland habitat. Great blue herons nest in colonies called "heronries" and usually build nests of large sticks high above the ground in trees, though they can also nest on the ground. Tree removal and earth-moving activities have the potential to result in incidental mortality through nest destruction. Incidentally mortality can be minimized either through pre-construction surveys or limiting tree removal to outside the nesting season, typically from early spring to late summer.

Approximately 0.2 acre of forested wetland/riparian area and 2.5 acres of open wetland/riparian area would be impacted by the project (Table 3.4.4). Given the relatively small amount of habitat to be affected and the large amount of similar habitat adjacent to the project area, BPA anticipates impacts to the species through the loss of this habitat to be minimal.

Veery

Veery typically nest in wet forested riparian areas with thick understories, on or near the ground, frequently at the base of a bush or small tree. Earth-moving activities associated with the Proposed Action have the potential to destroy active nests, eggs, or nestlings which could result in incidental mortality. Pre-construction nest surveys and vegetation clearing outside of the nesting period in potential veery habitat would be implemented as part of the Proposed Action, minimizing the potential for incidental mortality.

The Proposed Action is anticipated to impact no more than 0.2 acres of forested wetland (Table. 3.4.4). Consequently, BPA anticipates impacts to the species through the loss of this habitat to be minimal.

Bald Eagle

Although bald eagles do not nest in the right-of-way, bald eagle nests are nearby, and BPA would comply with the Bald and Golden Eagle Protection Act by implementing mitigation measures, such as avoiding construction activities within 660 feet of active bald eagle nests during the breeding season (January 1 to August 31) and avoiding snag and large tree removal to the extent possible (see Section 4.2.4).

Overall, impacts on Montana wildlife species of concern would be **low** because

- Incidental mortality would be minimized through the implementation of mitigation measures described in Section 3.5.3
- High quality habitat does not generally occur within the rights-of-way
- The species are highly mobile and there are large amounts of similar habitats adjacent to the project area that can be used by the species

U.S. Forest Service Sensitive Wildlife

The evaluation of impacts on U.S. Forest Service sensitive wildlife species is limited to the transmission line and access roads that cross the Island Unit of the Flathead National Forest. New access road construction, reconstruction, and improvement would temporarily affect 12.1 acres of vegetation (8.3 acres of coniferous forest, 1.5 acres of grassland, and 2.3 acres of shrubland) and permanently affect 1.7 acres of coniferous forest within the Flathead National Forest. Habitat loss would occur primarily within the transmission line right-of-way, which provides low quality habitat, and species use of this area is generally limited to movement between more suitable habitats and localized foraging opportunities.

Bald Eagle

Effects on bald eagles from the Proposed Action are described above in *Montana Wildlife Species of Concern*. While nesting is known to occur beyond 0.25 mile from the transmission line near line miles 1, 3, 5, 13, and 41, no breeding locations are documented in the portion of the transmission line right-of-way or access roads on U.S. Forest Service land. Impacts on bald eagles would be **low** because suitable foraging habitat does not occur within most of the right-of-way, active nests are located greater than 0.25 mile from the proposed action, and bald eagles are highly mobile and would avoid temporary construction disturbance.

Gray Wolf

Transient gray wolves have been documented near the portion of the project area in the Island Unit of the Flathead National Forest (pers. comm., Ruby, 2013b), however, there is currently no evidence of a resident pack in the area (U.S. Forest Service 2012a). Impacts to gray wolves include an increase in noise associated with construction of structures and access roads, and minor conversion of existing vegetation communities. Impacts from noise and human disturbance during construction would be temporary. Permanent and temporary removal of vegetation would be a small percentage of the average territory size of the gray wolf, which is 185 square miles (118,400 acres) (MTFWP 2015). In addition, hunting opportunities are abundant given the relatively large home range and deer habitat that extends far beyond the project area. Impacts on the gray wolf would be **low** because transient gray wolves are present in extremely low densities, would be able to avoid the construction areas, and the project would have a limited effect on hunting opportunities.

ESA-listed Wildlife

Grizzly Bear

Grizzly bears have been documented in the central portion of the transmission line right-of-way, from line miles 17 to 21, but occurrence is uncommon and infrequent (USFWS 2012). There are documented grizzly bear travel routes in the Island Unit. Critical habitat has not been designated for grizzly bear, and the Proposed Action is outside of identified recovery zones. The Island Unit consists primarily of dry site habitat and lacks avalanche chutes that are preferred habitats in all seasons (Mace and Waller 1997 in U.S. Forest Service 2012b). The project area provides low habitat quality for grizzly bears because it is mostly low to mid-elevation forest, existing road densities are high, and there is extensive disturbance from current and historic timber management and hikers, hunters, motorized recreation, firewood collection, and other forms of recreation (USFWS 2012).

Removal and replacement of structures, and construction of access roads would result in temporary increases in noise and human activity, which could disrupt grizzly bears traveling through the project area. Given the low quality habitat and low densities of grizzly bears, project-related effects would be temporary, the impact of the Proposed Action on this species is **low**.

Canada Lynx

Proposed Action elements having the greatest potential of impacting the lynx include tree clearing and road construction. Approximately 2,250 trees would be removed from the edges of the existing right-of-way, which is devoid of the dense, multi-layered coniferous forest habitat that Canada lynx prefer. Once roads

are in place, they would continue to fragment wildlife habitat and provide new or improved levels of access for human use into the project area. The road network could disrupt movement and foraging options for wildlife.

Construction activities would result in temporary increases in sound and human activity and could disrupt movement of Canada lynx if they were traveling through the project area.

Overall, because no Canada lynx have been documented in the project area, the lack of critical habitat, the low quality of the habitat that is present the impact of the Proposed Action on this species is **low**. BPA would implement any measures to minimize harm identified during the ESA consultation process with USFWS. .

3.5.3 Mitigation Measures

In addition to the following mitigation measures proposed to reduce impacts on wildlife resources in the project area, BPA would implement measures GEO-4 (SWPPP), GEO-5 (Erosion and Runoff Control BMPs), GEO-7 (Vegetation Retention), GEO-8 (Revegetation), VEG 1 (Work Area Staking), VEG-4 (Minimize Construction Footprint), VEG-7 (Recontouring), VEG-8 (Inspection), VEG-9 (Control Weed Introductions), VEG-10 (Identify Weed Infestations), and VEG-11 (Weed Free Materials):

- **WILD-1:** Prepare and implement Spill Prevention and Response Procedures (SPRP). In the event of a spill, immediately contain the spill, eliminate the source, and deploy appropriate measures to clean and dispose of spilled materials in accordance with the SPRP and federal, state, and local regulations.
- **WILD-2:** Implement any potential additional avoidance or minimization measures for protection of ESA-listed species identified through consultation with the USFWS.
- **WILD-3:** Avoid disruptive construction activities within 660 feet (USFWS 2007) of active bald eagle nests during the nesting period (January 1 to August 31).
- **WILD-4:** For all species other than bald eagles, if tree removal occurs during the nesting season (March 15-August 31), conduct nesting bird pre-construction surveys prior to tree removal and avoid removal of trees with active nests until fledging has been completed.
- **WILD-5:** Avoid snag and large tree removal to the extent possible.
- **WILD-6:** If acceptable to the landowner, not a fire risk, and otherwise appropriate, leave small portions of cut and felled trees in **upland** as additional habitat/structure for wildlife.
- **WILD-7:** Where not a hazard to other resources (recreational users, roads, structures, etc.) and the trees will not re-sprout, top, trim, or girdle danger trees to create snags where practicable.
- **WILD-8:** Ensure that all equipment has standard sound-control devices and spark arrestors.
- **WILD-9:** Store food items and garbage in vehicles or bear-proof containers and remove from the work areas daily.
- **WILD-10:** Conduct noise-generating construction activities only during normal daytime hours (i.e., between 7:00 a.m. and 7:00 p.m.) to the extent possible.
- **WILD-11:** Work with MTFWP to replace the nesting platform within line mile 5 at a suitable location outside of the right-of-way.

3.5.4 Environmental Consequences–No Action Alternative

Impacts on wildlife resulting from the No Action Alternative would include disturbance from activities associated with the increasing need for transmission line and road repairs. Emergency repairs could occur in areas or during times of year where impacts on nesting bird species could occur. It is reasonable to expect that isolated structures would fail as they continue to deteriorate. This would necessitate emergency repairs without the ability to schedule work for periods less impactful on wildlife. The isolated nature of failures would likely result in overall low levels of impacts on wildlife when the project area is considered as a whole; however, individual repairs may require work in seasons or at times of day when wildlife are more active or sensitive to disturbance, or when weather conditions prevent minimization of access road footprints. Since emergency incidents would likely occur only periodically over several years, impacts on specific species would likely be **low**.

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3.6 Wetlands and Floodplains

3.6.1 Affected Environment

Wetlands

Wetlands are areas that are inundated or saturated by surface or groundwater at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions (33 Code of Federal Regulations [CFR] 328.3, 40 CFR 230.3) (Environmental Laboratory 1987). To be considered a wetland, certain hydrologic, vegetative, and soil conditions must be met.

A wetland investigation was conducted between September 2013 and August 2014 to determine the presence of wetlands within the transmission line right-of-way and within 20 feet of the **centerline** of access roads (RESPEC 2014). The transmission line and access road rights-of-way cross 30 wetlands. All of the delineated wetlands are palustrine— freshwater wetlands dominated by trees, shrubs, emergent (herbaceous), or emergent mosses or lichens (Cowardin et al. 1979; RESPEC 2014). Most of the palustrine wetlands are emergent; others are a combination of emergent and other vegetation classes (forested, scrub-shrub, aquatic bed). The wetland delineation report (see Table 3-4 in RESPEC 2014) lists the hydrology source, location in the landscape, and vegetative characteristics of each wetland in the transmission line and access road rights-of-way, in addition to other details used for permitting.

Of the wetlands found within the transmission line and access road rights-of-way, two are ranked as Category I wetlands (highest functioning), four are ranked as Category II wetlands, 21 are ranked as Category III wetlands, and three are ranked as Category IV (lowest functioning) wetlands using the Montana Wetland Assessment Method (RESPEC 2014). The Category I wetlands have a low amount of existing disturbance; however, all other wetlands are moderately or highly disturbed. Disturbances within wetlands include the existing transmission line right-of-way, roads, culverts, stream modifications (e.g., ditching), agriculture, livestock grazing, and equestrian use. Wetlands along the Flathead River scored high (Category I) for supporting threatened and **endangered species** habitat because bull trout (*Salvelinus confluentus*) occur in the river, and their designated critical habitat includes areas adjacent to the river. All other wetlands scored low for this function (RESPEC 2014). The wetland delineation report (see Table 3-3 in RESPEC 2014) provides the individual scores for each of the 12 functions and values assessed and the overall Montana Wetland Assessment Method rankings for all of the wetlands in the transmission line and access road rights-of-way.

Floodplains

The Federal Emergency Management Agency (FEMA) identifies areas with a one percent chance of being flooded in a given year as **100-year floodplains**. Vegetation in floodplains is essential to their proper function, as it provides structural integrity to the floodplain and roughness, which dissipates flood energy and slows flows allowing for storage of water and sediment during flood events. Encroachment on floodplains, such as structures and fill, reduces flood-carrying capacity, increases flood heights and velocities, and increases flood hazards in areas beyond the encroachment itself. The floodway is defined as the channel of a stream, plus any adjacent floodplain areas, that must be kept free of encroachment so that the one percent chance flood can be carried without substantial increases in flood heights. The transmission line right-of-way crosses the 100-year floodplain of the Flathead River between line miles 3 and 4 at Foy's Bend, line miles 5 to 7, and smaller channels through the end of line mile 8 (Figure 3.6-1). Eighteen of the 359 existing transmission line structures are located within the Flathead River 100-year floodplain, which encompasses several **tributaries**, including Ashley Creek.

On the north side of Foy's Bend, the transmission line crosses the Flathead River channel migration zone and a high hazard **avulsion** hazard zone within the 100-year floodplain approximately between structures 5/3|5/4 and 5/7|5/8 (Figure 3.6-1). On the south side of Foy's Bend, the transmission line crosses a moderate hazard avulsion hazard zone within the 500-year floodplain approximately between structures 5/8|6/1 and 6/5|6/6; FEMA identifies 500-year floodplains as areas with a 0.2 percent chance of being flooded in a given year.

Low flows in the Flathead River Basin occur naturally during the winter, and flooding normally occurs in the spring during periods of rapid snowmelt (FEMA 2013a). Rain may also be an important factor during these flood periods. The most severe flooding in Flathead and Lake counties occurs in the spring and early summer months as a result of snowmelt and/or rainfall runoff (FEMA 2013a, 2013b). Occasionally, a long, sustained rainfall will cause localized flooding, and on rare occasions, ice jams and log jams may cause some overbank flooding (FEMA 2013a, 2013b). In addition to flooding along streams, shallow flooding periodically occurs in other isolated areas of Flathead County, caused by the relatively high groundwater table, which limits percolation (described in detail in Section 3.7, *Water Resources and Fish*), rapid snowmelt, heavy sustained rainfalls, and other factors. Areas in Flathead County where this type of flooding occurs are generally on the down side of sloping topography or in low-lying areas of the Flathead River valley with minimal topographic relief. Historically, seven severe flood events have occurred along the Flathead River in 1894, 1928, 1933, 1948, 1964, 1975, and 1997; the 1964 event was the most severe. The reach of the Upper Flathead River between Kalispell and Flathead Lake has been subject to high flood-crest elevations in all of the seven years listed. During the 1964 flood event, there was extreme flooding along the mainstem Flathead River upstream from Flathead Lake, even with flows of South Fork Flathead River regulated by the Hungry Horse Dam. In 1997, snowmelt flooding caused numerous road closures and road washouts throughout the region and flooded at least 50 homes, including homes along Ashley Creek (FEMA 2013a).

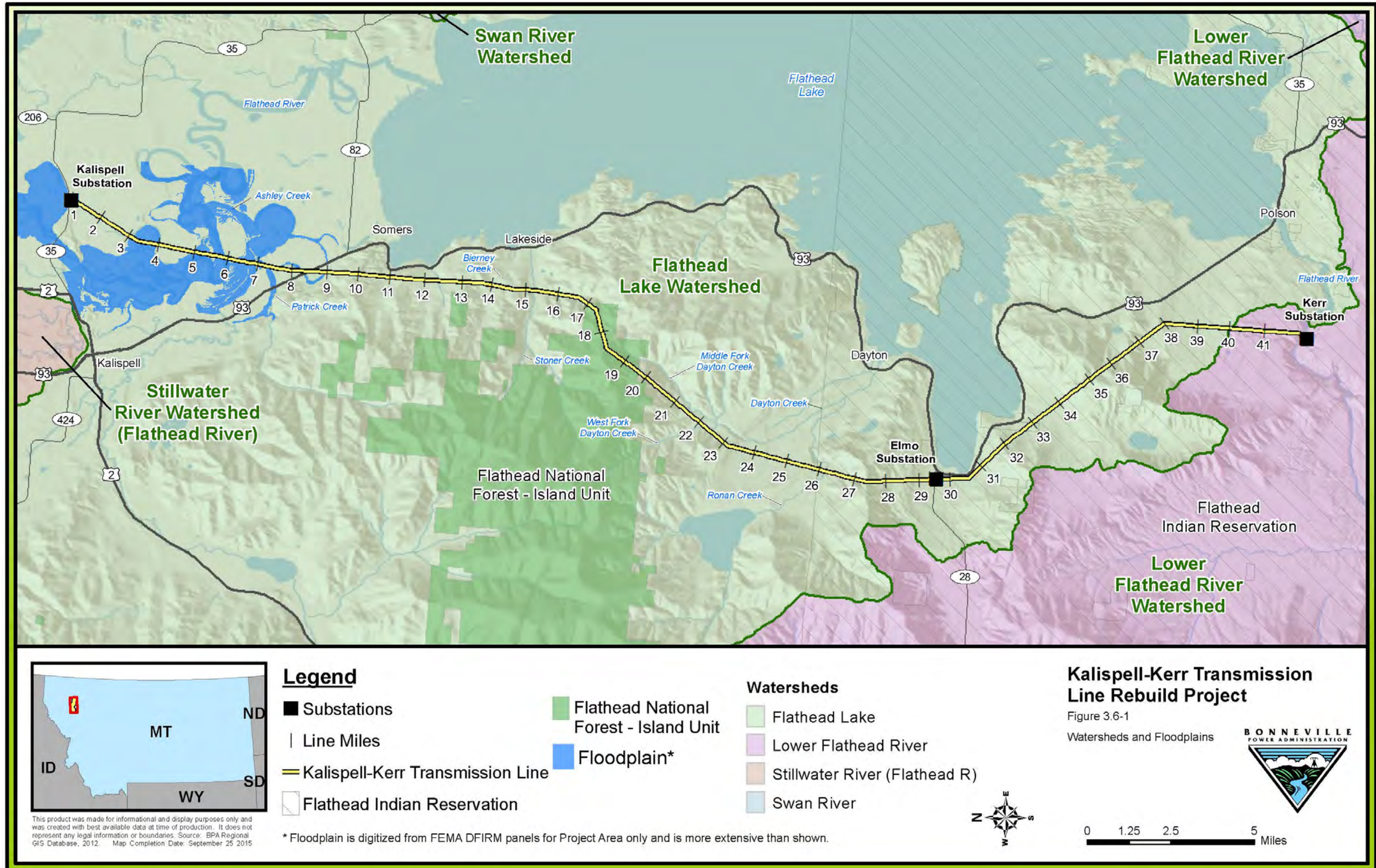
Surface landforms and underground **aquifers** (described in detail in Section 3.7, *Water Resources and Fish*) occasionally have an effect on flooding in the Flathead River valley. High water levels of the Flathead River during regional flood events affect the free-flowing characteristics of tributary streams, including Ashley Creek, causing backwater effects along the surface channels and raising the groundwater tables in the valley, a combination of factors that cause valley flooding (FEMA 2013a). Because Flathead Lake and the Lower Flathead River are controlled by dams, flooding in the Lake County portion of the project area has historically been limited to minor seasonal flooding of some tributaries (Lake County 2003).

3.6.2 Environmental Consequences—Proposed Action

Wetlands

Structure replacement and access road work would result in 0.4 acre of permanent impacts on wetlands. Ten structures would be replaced within wetlands, and 16 structures would be replaced within 100 feet of wetlands. In most cases, structures would be placed within 5 feet from their original location. The 10 structures in wetlands would be placed in 4-foot diameter vertical corrugated metal pipe backfilled with crushed rock, resulting in approximately 12.5 square feet of permanent impacts per pole (or 25 square feet per structure) for a total of less than 0.1 acre of impacts distributed across seven wetlands. The corrugated metal pipe backfilled with crushed rock would improve pole stability in soft wetland soils and would also increase the life of the structure. Most of the wetland vegetation disturbed during structure replacement is in the Flathead River valley in the northern portion of the project area and consists of native and **nonnative** emergent and aquatic vegetation (common cattail, rushes, sedges, aquatic plants, and reed canarygrass) located along tributary streams, oxbows, and old river channels of the Flathead River within its 100-year floodplain. Where the transmission line runs through forested lands to the south, wetland vegetation disturbed during structure replacement consists primarily of riparian trees and shrubs (e.g., alder [*Alnus* spp.], willow [*Salix* spp.], red-osier dogwood [*Cornus stolonifera*]) and forbs within and along stream channels in the maintained transmission line right-of-way.

Figure 3.6-1. Watersheds and Floodplains



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New construction, reconstruction, and improvement of access roads in wetlands would result in a permanent loss of wetland habitat and function within the road prism from the removal of vegetation, grading, placement of new road fill, and installation of culverts. Permanent impacts on wetlands from access roads would total 0.3 acre distributed across four wetlands (Table 3.6-1). To reduce permanent wetland impacts, the width of new access roads in wetlands would be limited to a 16-foot footprint (travel surface, drainage ditches, and shoulder) where possible, compared with the standard 20-foot access road footprint.

New road fill and drainage features would permanently alter wetland hydrology, but culverts and other drainage features would be designed to preserve overall wetland drainage patterns and hydrologic function. No new culverts would be placed in wetlands. Overall, there would be 0.4 acre of permanent disturbance distributed throughout 10 wetlands.

As shown in Table 3.6-1, one Category I wetland (0.2 acre), three Category II wetlands (<0.1 acre), and six Category III wetlands (0.1 acre) would be permanently impacted. No Category IV wetlands would be permanently impacted by the Proposed Action.

Table 3.6-1. Wetland and Floodplain Impacts in the Transmission Line and Access Road Rights-Of-Way

Resource Impacted	Permanent Impacts ^a			Temporary Impacts ^a		
	Structure Replacement	Access Road Work	Total Permanent Impacts	Structure Replacement	Access Road Work	Total Temporary Impacts
Wetlands disturbance (acres / number of wetlands)	0.1 / 7	0.3 / 4	0.4 / 10 ^b	0.5 / 9	1.0 / 17	1.5 / 20 ^b
Category I Wetlands (acres/number)	<0.1 / 1	0.2 / 1	0.2 / 1 ^b	0.1 / 1	0.3 / 1	0.3 / 1 ^b
Category II Wetlands (acres/number)	<0.1 / 3	0.0 / 0	<0.1 / 3 ^b	0.1 / 3	0.2 / 2	0.3 / 3 ^b
Category III Wetlands (acres/number)	<0.1 / 3	0.1 / 3	0.1 / 6 ^b	0.3 / 5	0.5 / 13	0.8 / 15 ^b
Category IV Wetlands (acres/number)	0.0 / 0	0.0 / 0	0.0 / 0 ^b	0.0 / 0	<0.1 / 1	<0.1 / 1 ^b
New disturbance area in floodplains (acres)	0.0	0.5	0.5	1	4.5	5.5
Net Fill in floodplains (cubic yards) ^c	0	520	520	0.0	620	620
Notes:						
^a Acreages are displayed rounded to one decimal place. The total is calculated based on the original (not rounded) acreages.						
^b The same wetland could be impacted by structure replacement and road work, and therefore, not equal the addition of the two.						
^c Fill in floodplains from access roads was calculated assuming a new 3-inch layer of rock for roads that would be improved or reconstructed and 12 inches of new rock for new road construction.						
Sources: RESPEC 2014; AECOM GIS calculations.						

As shown in Table 3.6-1, one Category I wetlands (0.3 acre), three Category II wetlands (0.3 acre), 15 Category III wetlands (0.8 acre), and one Category IV wetland (<0.1 acre) would be temporarily impacted. Temporary impacts in wetlands would occur from structure replacement, access road construction, and construction equipment traveling through wetlands on temporary access routes. Disturbance areas for structure replacement in wetlands would be limited to 50 feet by 50 feet per structure to the extent possible, resulting in approximately 0.5 acre of temporary impacts in wetlands from structure replacement

across nine wetlands. Work areas would be marked in the field to restrict vehicles and equipment access to designated routes and areas to minimize impacts on wetlands. Structures located within wetlands would be accessed using temporary access routes where placement of a permanent road is not feasible. In wetlands that are only seasonally wet, construction equipment may be able to access structure locations by driving over wetlands in the dry season. This would minimize impacts but would still result in some temporary disturbance to wetland vegetation and soils (e.g., crushing of vegetation, soil compaction from heavy construction equipment). In wetlands that remain wet during the construction season, temporary roads would be constructed using wooden mats or geotextile fabric and rock or wood chips to minimize impacts on wetland vegetation and soils. Temporary roads would be removed after construction, but temporary impacts on the wetland would occur from crushing vegetation and soil compaction. Temporary impacts on wetlands from access roads would total approximately 1 acre distributed across 17 wetlands. In some areas, minor grading and re-contouring could be necessary to re-establish pre-construction contours after construction is complete. Overall the Proposed Action would temporarily disturb a total of 1.4 acres distributed across 20 wetlands.

All temporary disturbance areas in wetlands would be reseeded with an appropriate native seed mix and BPA would monitor these areas for adequate growth and implement contingency measures as necessary. BPA would monitor until uniform perennial vegetation provides 70 percent or more of the density of coverage that was provided prior to earth-disturbing activities. Wetland functions are expected to return to pre-construction conditions after construction and restoration.

Although there would be some permanent and temporary impacts to high and moderate quality wetlands, overall the amount of disturbance would be small. Additionally, the measures that BPA would implement to preserve drainage patterns and restore temporary disturbance areas to pre-construction conditions, permanent and temporary impacts on wetlands from structure replacement and access road work would be **low**.

Floodplains

The Proposed Action would result in permanent impacts on floodplains through vegetation removal, road fill, and structure replacement. The Proposed Action would result in 0.5 acre of new permanent disturbance from access road construction, reconstruction, and improvement in the Flathead River 100-year floodplain (Table 3.6-1). Vegetation removal, including the removal of approximately 20 trees, grading, and the placement of fill materials would permanently alter the floodplain. Road construction would result in approximately 520 cubic yards of fill within the floodplain. Eighteen structures that are within the Flathead River 100-year floodplain would be replaced. Structure 3/9|3/7 would be removed from the floodplain and no additional structures would be placed in the floodplain, so there would be a net reduction of one structure within the floodplain. Considering the size of the floodplain, the amount of net new fill in floodplains required for access road construction and reconstruction in combination with the removal of one transmission structure would be small, and would not alter flood flows or result in a negligible decrease in flood storage capacity. Vegetation removal in floodplains could affect floodplain function by altering the roughness of the floodplain, reducing its ability to dissipate water energy and slow flows during flood events. However, since a small number of trees would be removed, and since tree removal would not occur in one isolated area, the effect on floodplain function would be **low**.

Disturbance areas for structure replacement in floodplains would be limited to 50 feet by 50 feet per structure to the extent possible, resulting in just under 1 acre of vegetation and soils disturbance in the floodplain during construction. Temporary access roads would be necessary within the Flathead River 100-year floodplain in some areas, resulting in approximately 4.5 acres of temporary disturbance and about 620 cubic yards of temporary fill (Table 3.6-1). However, there would be no net fill associated with temporary roads, so there would be no temporary change to flood capacity. Construction work areas and temporary

access roads could result in some vegetation disturbance; however, the effect on vegetation and its role in floodplain function would be **negligible**.

3.6.3 Mitigation Measures

In addition to the following mitigation measures proposed to reduce impacts on wetland and floodplain resources in the project area, BPA would implement measures GEO-3 (Construction Timing), GEO-5 (Erosion and Runoff Control BMPs), GEO-8 (Revegetation), VEG-1 (Work Area Staking), VEG-3 (Use Existing Roads), and VEG-7 (Recontouring):

- **WET-1:** Avoid construction within wetlands where possible. Avoid using wetlands for construction staging, equipment or materials storage, or fueling of vehicles.
- **WET-2:** Avoid and minimize wetland impacts where possible by re-routing access roads, decreasing road width, or only crossing wetlands during the dry season.
- **WET-3:** Obtain and comply with applicable federal, state, and tribal permits for all work in wetlands and streams.
- **WET-4:** Deposit and stabilize excess soil in upland areas outside of wetlands, floodplains, or other sensitive habitats.
- **WET-5:** Remove temporary road materials (mats, fill, geotextile fabric) and revegetate temporary road areas.
- **WET-6:** Revegetate all temporary disturbance areas within wetlands with native seed mix. Monitor revegetation and site restoration work for adequate growth; implement contingency measures as necessary.
- **WET-7:** If necessary for weed control near wetlands, use herbicides in accordance with BPA's *Transmission System Vegetation Management Program Final Environmental Impact Statement/Record of Decision* (BPA 2000) to limit impacts on water quality.
- **WET-8:** Avoid construction within floodplains where possible.

3.6.4 Environmental Consequences—No Action Alternative

Given the deteriorating condition of the existing structures and some access roads, it is expected that poles would be replaced and access road reconstruction and improvement would occur as needed, and would have impacts similar to the Proposed Action over the long term and would be **low**.

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3.7 Water Resources and Fish

3.7.1 Affected Environment

Surface Water and Water Quality

The Kalispell-Kerr transmission line is located within the Flathead Watershed, which includes all the land that drains into the Flathead River and Flathead Lake and beyond the lake to the confluence of the Flathead and Clark Fork rivers. This analysis considers all streams that are within 100 feet of the transmission line and access road rights-of-way, which includes several unnamed tributaries, intermittent streams, and seven perennial watercourses: Flathead River, Ashley Creek, Patrick Creek, Stoner Creek, an unnamed tributary to Middle Fork Dayton Creek, West Fork Dayton Creek, and Ronan Creek (Figure 3.6-1). Streams were identified using the National Hydrography Dataset from the U.S. Geological Survey (U.S. Geological Survey 2013). The transmission line and access road rights-of-way also cross through numerous swales and ditches that convey water during and after runoff events.

Every two years, the Montana Department of Environmental Quality (MTDEQ) is required to assess water quality and report to the U.S. Environmental Protection Agency (EPA) on the condition of Montana's waters. Montana prepares an integrated report that meets the requirements of Sections 305(b) and 303(d) of the federal CWA. Section 305(b) requires a report on the overall condition of Montana's waters. Section 303(d) requires states to develop lists of impaired waters, which are waters that are too polluted or otherwise degraded to meet water quality standards set by the state. Section 303(d) requires states to establish priority rankings for impaired waters and develop **Total Maximum Daily Loads (TMDLs)**; a TMDL is a calculation of the maximum amount of a pollutant that a water body can receive and still safely meet water quality standards. Streams that are impaired and require a TMDL or other water quality improvement project that are 303(d)-listed are also known as Category 5 streams. There is one Category 5 stream within 100 feet of the transmission line and access road rights-of-way: Ashley Creek.

Flathead River

The Flathead River is the major watercourse through Flathead County and is an upper tributary to the Columbia River. Its headwaters are in the mountainous areas in western Montana on the western side of the Continental Divide and north of the international boundary. The three major tributaries to the Flathead River (the North, Middle, and South forks of the Flathead River) join near the city of Hungry Horse to form the mainstem of the Flathead River. The Flathead River flows south for approximately 95 miles from Columbia Falls, Montana to Dixon, Montana. The middle one-third of the river is occupied by Flathead Lake. The Flathead River upstream of Flathead Lake is referred to as the Upper Flathead River, and the Flathead River downstream of Flathead Lake is referred to as the Lower Flathead River.

The Kalispell-Kerr transmission line crosses the Flathead River in two locations, once at the end of line mile 5 and again in line mile 41, near Kerr Substation. At the end of line mile 5, the transmission line crosses an approximately 930-foot wide segment of the Upper Flathead River just east of a sharp meander in the river channel, referred to as Foy's Bend (Applied Geomorphology and DTM Consulting 2010). Both the north and south shorelines of the Flathead River in this crossing location are prone to erosion over the next 100 years (Applied Geomorphology and DTM Consulting 2010). At the Foy's Bend river crossing, the north bank of the Flathead River is stable (with no signs of erosion) and densely vegetated with wetland vegetation (RESPEC 2014). The steep, 10- to 15-foot high south bank shows signs of slumping and appears unstable (RESPEC 2014).

The transmission line crosses an approximately 345-foot wide segment of the Lower Flathead River between structures 41/10|42/1 and 41/11|42/2, near the Kerr Substation. The north bank of the Flathead River in this location is a steep mountain slope that is stable and consists primarily of bedrock interspersed with

pockets of coniferous riparian vegetation (RESPEC 2014). The south bank is moderately sloped and densely vegetated with riparian forest (RESPEC 2014).

Ashley Creek

The transmission line crosses Ashley Creek, a perennial tributary to the Upper Flathead River, within line mile 6. Within the transmission line right-of-way, Ashley Creek is an approximately 70-foot wide, low-gradient stream with no pool or *riffle* habitat. During the September 2013 field work (RESPEC 2014), the stream contained almost stagnant water with an abundance of algae.

The segment of Ashley Creek that is crossed by the transmission line is an impaired water body under the CWA and has a Category 5 stream rating by MTDEQ. Ashley Creek is listed as impaired for its ability to support primary contact recreation and aquatic life. Alterations in stream-side vegetation cover and pollutants (chlorophyll-a, nitrate/nitrite, nitrogen, and phosphorous) from irrigated crop production, municipal point sources, and municipal separate storm sewer systems are the probable causes and sources of impairment in this segment of Ashley Creek (MTDEQ 2013).

Patrick Creek

The transmission line crosses Patrick Creek, a perennial tributary to Ashley Creek, within line mile 7. In this area, agricultural land surrounds the creek. The creek channel itself is not discernable due to a wetland that occupies the wide floodplain on either side of the creek, encroaching on the creek channel (RESPEC 2014). The stream banks are densely vegetated by balsam poplar (*Populus trichocarpa*), Bebb willow (*Salix bebbiana*), squashberry (*Viburnum edule*), reed canarygrass, creeping meadow-foxtail (*Alopecurus arundinaceus*), common cattail, hardstem club-rush (*Schoenoplectus acutus*), and water smartweed (*Polygonum amphibium*) (RESPEC 2014).

Stoner Creek

The transmission line crosses Stoner Creek, a tributary to Flathead Lake, at the start of line mile 15. Within the transmission line right-of-way, Stoner Creek is an approximately 8-foot wide, sinuous perennial stream that is bordered on both sides by wetland (RESPEC 2014). The stream banks are completely vegetated with forbs, grasses, emergent wetland vegetation, and some shrubs. The stream banks are moderately grazed by horses but appear to be stable. Outside of the transmission line right-of-way, Stoner Creek is shaded by tall shrubs and trees (RESPEC 2014). The stream appears to have a surface connection with the adjacent wetland at higher streamflows.

Unnamed Tributary Stream to Middle Fork Dayton Creek

The transmission line crosses an unnamed tributary of the Middle Fork Dayton Creek in the middle of line mile 19. Within the transmission line right-of-way, this stream is a shallow, sinuous intermittent stream that averages 2 feet in width. Upstream of the right-of-way, it is crossed by an access road that would be improved. At this crossing, the stream is perennial and flows through a wetland on either side of the road (RESPEC 2014). During the September 2013 field work, flow in this stream went underground downstream of the access road.

West Fork Dayton Creek

West Fork Dayton Creek is a perennial tributary to Dayton Creek. Near the beginning of line mile 22, the stream is an incised 2-foot wide channel. The stream catchment is primarily composed of areas previously harvested for timber. Vegetation surrounding the stream channel is primarily limited to low-growing grasses and shrubs, as the right-of-way is cleared of mature trees as part of ongoing operation and maintenance activities.

Ronan Creek

Ronan Creek is a perennial tributary to Flathead Lake. The transmission line crosses the creek near the beginning of line mile 26; nearby, a proposed access road also crosses Ronan Creek (RESPEC 2014). This stream is well defined with established vegetation and apparently stable bed and banks. At the transmission line crossing, the creek is about 25 feet wide, while at the road crossing it is about 10 feet wide (RESPEC 2014). Ronan Creek forms the northern border of a large swampy area that is the largest single wetland in the project area.

Unnamed Tributaries

There are several intermittent streams and unnamed tributaries within 100 feet of the transmission line and access road rights-of-way. These include Bierney Creek, which is an intermittent stream, near line mile 14 and several tributaries, including tributaries to Ashley Creek within line mile 6, Bierney Creek within line mile 14, Stoner Creek within line miles 15 and 16, Middle Fork Dayton Creek within line mile 21, West Fork Dayton Creek within line mile 22, an unnamed drainage flowing to a depression within line mile 27, tributaries to Jette Lake within line mile 26, and numerous tributaries to Flathead Lake within line miles 29, 30, 32, 33, 35, 37, and 39.

Groundwater

Groundwater is an important resource in the Flathead Basin. In Flathead County, both public and private water supplies commonly depend on wells that utilize a variety of natural aquifers (Flathead County 2012). Most residential and agricultural development relies on groundwater wells. A large intermediate and deep aquifer exists below the Flathead Valley. This large aquifer is confined by bedrock to the north, west, and east, and by Flathead Lake to the south. Water at depths of 100–200 feet below the surface are from the intermediate aquifer, while wells drilled to over 200 feet below the surface are from the deep aquifer. Well logs show that most residents living at the outer perimeter of the Flathead Valley derive water from the intermediate and deep aquifer. Well-defined shallow aquifers are found in the Delta region, between the north shore of Flathead Lake and the Flathead River; the Evergreen aquifer, located between the Flathead and Whitefish rivers, is the most developed shallow aquifer. Residents living closer to the center of the Flathead Valley commonly access these shallow alluvial aquifers. The depth to groundwater along the segment of transmission line through the Kalispell Valley in Flathead County (from approximately the Kalispell Substation to line mile 9) is generally less than 50 feet, and for much of the area less than 5 feet (Flathead County 2012). Private wells are present in the vicinity of the project area in these shallow groundwater areas (Flathead County 2012). The depth to groundwater along the western perimeter of Flathead Lake is generally greater than 100 feet (Flathead County 2012). Groundwater in the Lake County portion of the project area is primarily from fractured bedrock, with most wells over 255 feet deep (MTBMG 2004).

Fish

Common Fish

Major fish-bearing waters in the project area include the following: Flathead River (line miles 5 and 41), Ashley Creek (line mile 6), Patrick Creek (line mile 7), Stoner Creek (line mile 15), Middle Fork Dayton Creek tributaries (line mile 19), West Fork Dayton Creek (line mile 22), and Ronan Creek (line mile 26) (Figure 3.6-1). Common fish that use streams in the project area include brook trout (*Salvelinus fontinalis*), brown trout (*Salmo trutta*), rainbow trout (*Oncorhynchus mykiss*), mountain whitefish (*Prosopium williamsoni*), largemouth bass (*Micropterus salmoides*), peamouth (*Mylocheilus caurinus*), large-scale sucker (*Catostomus macrocheilus*), longnose sucker (*Catostomus catostomus*), northern pike (*Esox lucius*), slimy sculpin (*Cottus cognatus*), and yellow perch (*Perca flavescens*) (MTFWP 2013; U.S. Forest Service 2012a).

Montana Fish Species of Concern and U.S. Forest Service Sensitive Fish

Montana fish species of concern that are potentially present in the project area include: westslope cutthroat trout (*Oncorhynchus clarki lewisi*), lake trout (*Salvelinus namaycush*), and pygmy whitefish (*Prosopium coulteri*) (MTFWP 2013; U.S. Forest Service 2012a). Westslope cutthroat trout are also a U.S. Forest Service sensitive species/management indicator species (U.S. Forest Service 2012a) and could potentially occur in the unnamed tributary to the Middle Fork Dayton Creek on U.S. Forest Service land in the middle of line mile 19. Outside of Forest Service lands, westslope cutthroat trout are also documented in the West Fork Dayton Creek near the beginning of line mile 22 and in the Flathead River near the end of line mile 5. Lake trout and pygmy whitefish are documented in the Flathead River.

ESA-listed Fish

The bull trout is the only fish species listed under the ESA that occurs in the project area; bull trout are located in the Flathead River crossed by the transmission line at line miles 5 and 41. Bull trout typically spawn from August to November during periods of decreasing water temperatures (Swanberg 1997). Their preferred spawning habitat is low-gradient stream reaches with loose, clean gravel (Fraleigh and Shepard 1989). The existing transmission line spans bull trout critical habitat in the Flathead River in line mile 5 within the Flathead River-Lake Blaine subwatershed and is located in the Clark Fork River Basin critical habitat unit.

3.7.2 Environmental Consequences—Proposed Action

Streams and Water Quality

The Proposed Action would result in permanent impacts on streams through the construction of roads, and new and replacement culverts and fords. For this analysis, construction of permanent roads within 100 feet of streams was considered to have impacts on streams. All structures that would be replaced within 100 feet of streams would either be at or within 5 feet of their existing location in already disturbed areas. Therefore, structure replacement would not result in new permanent impacts on streams.

Reconstruction and improvement of existing access roads and construction of new access roads would result in 2.5 acres of new gravel access road surface within 100 feet of streams (Table 3.7-1). Compacted gravel roads reduce the rate of infiltration, increase runoff to receiving streams and adjacent areas, and could increase the amount of sediment discharged to receiving streams through overland runoff. New gravel roads constructed for the project would be dispersed throughout the project area, and therefore vegetation clearing and ground compaction would not be concentrated around any one water body.

Table 3.7-1. Permanent and Temporary Impacts within 100 feet of Streams

Stream	Fish Presence	Permanent Disturbance (acres)^a	Temporary Disturbance (acres)^a	Number of New or Repaired/Replaced Stream Crossings^b
Flathead River	Westslope cutthroat trout ^c , pygmy whitefish ^c , lake trout ^c , bull trout ^d	0.0	0.1	0
Tributaries to Flathead River	No Data ^e	0.0	0.4	0
Ashley Creek	Rainbow trout, northern pike minnow, largescale sucker, peamouth, redbreast shiner	0.0	0.0	0
Patrick Creek	Brook trout	0.2	0.3	0
Unnamed Tributary to Stoner Creek	Slimy sculpin	0.1	0.6	1 replacement culvert
West Fork Dayton Creek	Brook trout, westslope cutthroat trout ^c	0.0	0.5	0
Tributaries to West Fork Dayton Creek	No Data	0.0	0.2	0
Tributaries to Flathead Lake	No Data	1.9	3.6	1 new culvert 1 new ford
Tributaries to Middle Fork Dayton Creek	No Data	0.1	1.2	2 replacement culverts 1 repaired ford
Bierney Creek	No Data	0.0	0.3	0
Ronan Creek	Bull trout ^d , Brook trout	0.0	0.6	0
Tributaries to Jette Lake	No Data	0.2	0.2	0
Unnamed Drainages	No Data	0.3	0.7	0
Total		2.8	8.7	Culverts: 1 new, 3 replaced Fords: 1 new, 1 repaired
Notes:				
^a Acreages are displayed rounded to one decimal place. The total is calculated based on the original (not rounded) acreages.				
^b This column identifies stream crossings on access roads that are being improved or reconstructed for the purpose of identifying the need for stream protection BMPs during construction. It does not represent proposed in-water work.				
^c Montana species of concern.				
^d ESA-listed species.				
^e No data were found regarding fish presence; however, it is possible that common fish could occur.				
Source: Developed by AECOM 2014.				

The Proposed Action includes the installation of 21 new culverts, repair of one culvert, and replacement of 7 culverts. One new culvert would be installed in a tributary to Flathead Lake, one culvert would be replaced in a tributary to Stoner Creek, and two culverts would be replaced in tributaries to Middle Fork Dayton Creek. The remaining culverts would be installed, repaired, or replaced in swales and ditches. New culverts include outfall protection that does not currently exist. Outfall protection (rip-rap) at each culvert would alter approximately 20 square feet of streambed and bank. However, replacement of existing culverts currently located within streams would improve stream conditions, since replacement culverts would be

embedded in the stream channel and sized at least 1.5 times the active channel width (e.g., a 3-foot wide stream channel would receive a 4.5-foot diameter culvert). Additionally, inlet and outlet protection would prevent scour associated with water entering and exiting the culvert. New culverts could have a long-term impact by altering flows and channel characteristics (e.g., channel width/depth, streambed substrate, etc.) in the immediate vicinity of the culvert. However, BPA requires new and replacement culverts to be at least 1.5 times the active channel width to accommodate high flows and passage of debris and sediments. Therefore, impacts would dissipate quickly within distance from the culvert and would not have noticeable effects on the stream as a whole.

One new ford would be constructed across a tributary to Flathead Lake in line mile 32, and an existing ford across a tributary to Middle Fork Dayton Creek in line mile 19 would be repaired. The new ford would be a low-water stream crossing consisting of a roadbed reinforced with 3- to 12-inch diameter rock and would be approximately 20 feet wide and 30 feet long. The ford would result in the disturbance of approximately 600 square feet of streambed and bank and adjacent vegetation composed of short grasses and shrubs. Replacement of the existing ford would occur within the existing road prism and would not require the removal of riparian or streamside vegetation.

The Proposed Action would result in temporary impacts on streams from vegetation clearing and crushing, and soil compaction. A total of 11.5 acres would be disturbed: 2.8 acres permanent disturbance and 8.7 acres temporary disturbance (Table 3.7-1). Clearing and crushing of streambank vegetation increases soil exposure and soil compaction results in reduced infiltration. When exposed and compacted soils are subject to runoff (rain, snowmelt, etc.), erosion occurs, which increases *turbidity*, temporarily degrading water quality, and depositing sediments into the channels. Most construction work would be performed during the dry season, which would reduce the potential for soil compaction, erosion, and runoff. Soil excavated from structure holes that is not used to backfill the hole would be disposed of in upland areas away from water bodies. All temporary disturbance areas would be restored to pre-construction conditions to the extent possible, which would include reseeding with an appropriate native upland or wetland seed mix, or other seed mix agreed to by the landowner.

Temporary impacts would also result from the construction and replacement of culverts and fords. Temporary impacts would include incidental vegetation removal, which could result in erosion of soils that could temporarily increase turbidity and result in some sediment deposition in streams. Erosion and sediment control measures would be implemented during construction to prevent adverse impacts on water quality in streams. All culvert work in streams would likely occur during the dry season (June-September) when there is little to no flow to avoid or minimize impacts on stream function and water quality during construction. Culvert work in perennial streams would likely require that flows be diverted around the work area.

The implementation of mitigation measures would minimize temporary and permanent impacts on streams and water quality from the structure, access road, and culvert work described above. The majority of the impacts on streams and water quality from these activities would be localized and temporary, and are not expected to affect stream hydraulic and hydrologic functions, or result in water quality parameters being exceeded. Additionally, all temporary disturbance areas from structure, access road, and culvert work would be restored to pre-construction conditions to the extent possible, which would include reseeding with an appropriate native upland, riparian, or wetland seed mix or other seed mix agreed to by the landowner.

Since new road work would be distributed throughout the project area and not be concentrated near any one stream, and mitigation measures would be implemented, impacts on streams and water quality would be **low**.

Groundwater

Groundwater supplies water bodies (rivers, streams, lakes, ponds) and wetlands during periods of low precipitation and low flow. New, improved, and reconstructed access roads would result in approximately 58 acres of new gravel compacted surface, which could reduce surface to groundwater infiltration rates in localized areas, but not to a degree that would affect groundwater recharge. Soil compaction during structure and access road work would temporarily impact groundwater flows by reducing infiltration capacity and increasing surface runoff to streams. However, these impacts are expected to be temporary and spread out over a wide area, and therefore would not affect groundwater recharge.

Potential impacts on groundwater quality from the accidental release of hazardous materials used during construction (e.g., fuels, lubricants, solvents, etc.), the removal of existing creosote-treated wood poles and creosote-contaminated soil excavated from existing structure holes, and leaching of PCP from new PCP-treated wood poles into water resources during construction and over the long term are described in detail in Section 3.12, *Noise, Public Health, and Safety*. Mitigation measures would be implemented regarding the handling and disposal of creosote-treated wood poles and creosote-contaminated soils; spill prevention, containment, and cleanup; and wood-pole storage methods to minimize the risk to groundwater from the accidental release of hazardous materials. Hazardous materials used during construction (e.g., fuels, lubricants, solvents) could be released into the environment where they could leach into groundwater. However, any such spills would likely be small and localized. BPA would immediately contain and clean up spills and dispose of regulated materials in accordance with federal and state laws.

Since groundwater recharge would not be affected and mitigation measures would be implemented to minimize the risk to groundwater quality from the accidental release of hazardous materials, the impacts on groundwater would be **low**.

Fish

Common Fish

Permanent impacts on streams resulting from new road surface and culvert and ford construction and replacement, as described above, would be minimal and in some cases beneficial. The diameter of new and replacement culverts would be at least 1.5 times the active channel width which would maintain or improve fish passage and fish access to upstream aquatic habitats. The larger replacement culverts would also improve channel condition by maintaining more natural hydraulic conditions at stream-road crossings. The improved access road conditions and drainage features would facilitate more natural infiltration and sediment trapping functions, providing associated temperature and water quality benefits to fish by reducing direct runoff from access roads into streams. Increases in stream water temperatures could result from vegetation removal, which could reduce habitat quality (causing fish to leave the habitat) and alter food availability; however, only about 3 acres of riparian habitat distributed across 13 streams would be permanently disturbed. This small disturbance, when combined with the limited hydraulic residence time within the transmission line right-of-way, is unlikely to increase stream water temperatures. During construction, vegetation removal would be limited to the project footprint, and riparian areas would be restored and revegetated with native plants. Plant roots would be left in place to maintain soil stability and allow for re-sprouting, and any felled trees would be left within the riparian area to provide habitat.

Temporary impacts on fish could occur through construction-related erosion and the potential release of sediment to fish-bearing streams, construction noise and activity, by stress from in-water work site isolation and fish handling, and accidental oil or fuel spills into streams from construction equipment used adjacent to streams. There would be about 0.1 acre of temporary disturbance within 100 feet of the Flathead River, which supports common fish as well, as Montana Fish Species of Concern, and ESA-listed fish (discussed below). There would be 0.3 acre and 0.6 acre of temporary disturbance from structure replacement and road work within 100 feet of Patrick Creek and a tributary to Stoner Creek, respectively, which both support

common fish species. Additionally, there would be 7.2 acres of temporary disturbance within 100 feet of several streams where fish presence is unknown, but for the sake of this analysis they are assumed present (Table 3.7-1). Fish in those streams could experience impacts similar to those described above.

New culvert and ford installation, replacement, and repair conducted when there is water in the stream would cause a temporary increase in turbidity and sedimentation for a short distance downstream. One culvert would be replaced in an unnamed tributary to Stone Creek which is a fish-bearing stream but does not support any fish that are a Species of Concern or ESA-listed. In-water work, associated with culvert and ford installation, could also occur within tributaries to Flathead Lake and Middle Fork Dayton Creek. It is unknown whether these creeks support fish; however, it is possible that common fish species are present. Site isolation to minimize the downstream transport of turbid water would be required if there is flowing water present at the time of construction. Work site isolation would require the placement of sand bag barriers, silt curtains, or other barriers to fish movement; installation of a temporary pipe to convey water through or around the work area; and fish salvage. Implementation of these measures along with the standard erosion control methods described previously would minimize adverse effects on fish.

Standard erosion control measures at these work areas would contain overland flow and typically prevent sediment from entering fish habitat, minimizing temporary impacts from construction activities. If sediment does reach fish habitat, sediment inputs are expected to be a small pulse and temporary in duration. The aquatic noise and vibration disturbance generated by the removal and replacement of structures within 100 feet of fish-bearing streams would not exceed background ambient underwater noise levels. Mitigation measures described in Section 3.7.3 would be implemented, including setback distances for fueling and staging areas from water bodies to minimize spills.

Overall, because one culvert replacement would occur within known fish-bearing streams, work would be distributed throughout the project area and not be concentrated near any one stream, culverts would be designed to maintain current stream hydraulic characteristics and mitigation measures would be implemented, impacts on common fish species would be **low**, and primarily a result of the possible temporary minor input of sediment to streams from adjacent upland construction.

Montana Fish Species of Concern and U.S. Forest Service Sensitive Fish

Under the Proposed Action, there would be no permanent impacts and 0.1 and 0.5 acre of temporary disturbance within 100 feet of the Flathead River and West Fork Dayton Creek, respectively, which both support westslope cutthroat trout, pygmy whitefish, and lake trout. There would be no in-water work conducted in streams that support Montana Fish Species of Concern or U.S Forest Service Sensitive fish. Because erosion and sediment controls and setback distances from water bodies for fueling and staging areas would be implemented, the potential temporary impacts on westslope cutthroat trout are expected to be **low**.

ESA-listed Fish

One structure in mile 5 would be replaced within 30 feet of the Upper Flathead River, which is bull trout critical habitat. Standard erosion control measures at this site would minimize or prevent sediment from entering fish habitat. If sediment does reach the river, sediment inputs are expected to be a small pulse and temporary in duration. Access road construction, structure replacement, and new culverts associated with the Proposed Action would not occur in any areas occupied by bull trout or within designated critical habitat. There would be 0.6 acre of temporary disturbance associated with direction of travel routes within 100 feet of Ronan Creek, which also supports bull trout. Incidental vegetation disturbance and soil exposure could occur on direction of travel access routes from large equipment traveling overland. Since no actual road work would be conducted, erosion and sediment transport would be limited, and any sediment reaching the creek is expected to occur in small pulses and be temporary in duration. BPA would implement any measures to minimize harm identified during the ESA consultation process with USFWS. Therefore, the

Proposed Action would have a **low** impact on federally listed bull trout. Table 3.7-1 summarizes the potential impacts on streams and fish from the Proposed Action.

3.7.3 Mitigation Measures

In addition to the following mitigation measures proposed to reduce impacts on water resources and fish in the project area, BPA would implement measures GEO-3 (Construction Timing), GEO-4 (SWPPP), GEO-5 (Erosion and Runoff Control BMPs), GEO-8 (Revegetation), GEO-10 (Staging Areas), WILD-1 (Spill Prevention), WILD-4 (ESA consultation)WET-4 (Spoils Deposit/Stabilize Locations), and WET-7 (Herbicides Near Wetlands):

- **WAT-1:** Inspect and maintain tanks containing oil, fuel, or chemicals for drips or leaks to prevent spills onto the ground or into water bodies.
- **WAT-2:** Store, refuel, maintain, and repair equipment on impervious surfaces away from all natural or manmade drainages and water bodies including streams, wetlands, ditches, catch basins, ponds, and culverts.
- **FISH-1:** Design and construct access road culverts at a minimum of 1.5 times the active channel width.
- **FISH-2:** Conduct all construction activities in fish-bearing streams during the low-flow season (late summer through winter) or when intermittent streams are dry.
- **FISH-3:** For areas where in-water work is necessary, isolate work areas and use turbidity curtains, sandbag barriers, or other measures to prevent sediment-laden water from exiting the work area.
- **FISH-4:** Reduce erosion at non-culverted stream crossings by installing drive-through fords and rolling dips.
- **FISH-5:** Implement any potential additional avoidance or minimization measures for the protection of ESA-listed species identified through informal consultation with the USFWS.
- **FISH-6:** Convey streamflow around isolated work areas to maintain a downstream water supply and ensure that downstream water quality remains the same as locations upstream of the work area.
- **FISH-7:** Conduct fish salvage activities to remove fish from isolated in-water work areas. All work would be done by qualified biologists in coordination with state and federal resource management agencies.

3.7.4 Environmental Consequences—No Action Alternative

Given the deteriorating condition of the existing structures and some access roads, it is expected that poles would be replaced and access road reconstruction and improvements would occur as needed. Emergency repairs to roads and structures could occur when soils are saturated and erosion and runoff risks are high; however, appropriate erosion control measures and BMPs would be implemented and are expected to prove effective at controlling erosion. Under the No Action Alternative, access roads would be improved on an as-needed basis, but would occur less frequently than under the Proposed Action. Water and sediment would continue to runoff the deteriorating access road surfaces, contributing to increased flows, erosion, and sediment deposition in streams. Overall, impacts on streams, water quality, and groundwater resources, including runoff, erosion, and sedimentation in streams, would be **moderate**.

Under the No Action Alternative, the transmission line would likely require more maintenance work overtime as the aging structures and roads fail at increasing rates. Emergency repairs near fish-bearing streams would likely be more frequent when compared with the Proposed Action and could occur outside appropriate in-water work windows. BPA would work with the USFWS to evaluate the urgency of the

repairs, such as immediate threat to public health and safety, in determining the appropriate BMPs on a case-by-case basis. Given the relatively low density of fish-bearing streams and few sensitive species present, the overall impact on fish from the No Action Alternative is **low**; however, should work be required in a fish-bearing stream under emergency conditions, site-specific impacts could be **moderate** depending on the work required (e.g., culvert replacement during high-water conditions) and associated fish exclusion or handling requirements.

3.8 Visual Quality

3.8.1 Affected Environment

Landscape Setting

The Proposed Action is generally located within the eastern foothills of the Salish Mountains, west of Flathead Lake. Flathead Lake, Flathead National Forest, and the Salish Mountains are scenic resources located in the vicinity of the project area and within the project *viewshed*. The built environment in the project area consists primarily of rural residences, and pasture land abounds within the valleys. Higher density development is present within the towns along Flathead Lake. U.S. Highway 93 is the primary travel corridor through the region. This highway runs east of the transmission line for most of its length, except in the area north of Somers, where the transmission line crosses over the highway. Local roads and streets, many of which are unpaved, provide access for residents and recreationists throughout the project area.

The northern portion of the transmission line, from line mile 1 at the Kalispell Substation to approximately line mile 8, passes through the Flathead Valley characterized by flat, green agricultural fields and the wide, meandering, low gradient channel of the Flathead River. Vegetation is primarily low-growing with some taller deciduous trees grouped around rural residences and in riparian areas. Colors include a mosaic of greens and browns. The Swan Range to the northeast, and to a lesser degree the Salish Mountains to the southwest, add height and topographic variety in the background and appear as mounded and peaked forms with undulating lines. Human development includes scattered rural residences, farm buildings, and roads. State Route 35 runs east-west just north of the Kalispell Substation and U.S. Highway 93 crosses the line between line miles 8 and 9. The transmission line crosses over the Flathead River near line mile 5. Due to flat topography and low-growing vegetation, the transmission line and structures are visible from locations along State Route 35, U.S. Highway 93, the Flathead River, and from nearby residences. Viewers include recreationists on the Flathead River, roadway travelers, and residents. Figure 3.8-1 shows the view of the Kalispell-Kerr transmission line as viewed to the north from U.S. Highway 93.

The central portion of the transmission line, from approximately line mile 8 to line mile 27, traverses the Salish Mountains, where the landscape is primarily mixed conifer forest and hilly to mountainous terrain. Manmade development is limited in this area, and includes scattered residences, dirt roads, and existing transmission lines. The existing transmission line rights-of-way appear as bold, wide, light colored lines cutting through the darker coniferous forest. Timber production is prevalent in this area, so tree age and coverage vary throughout the forest as a result of past timber harvests. Flathead Lake sits to the east and is a major recreational attraction in the area. For the majority of its length, the Kalispell-Kerr transmission line is several miles (3 to 5) from Flathead Lake; however, near line miles 11 and 30, the line is within $\frac{1}{4}$ of Flathead Lake. The transmission line crosses through the Flathead National Forest and an area of land administered by the Confederated Salish and Kootenai Tribes, which includes Chief Cliff, a 150-foot cliff and a sacred monument to the Kootenai people. Although the Flathead National Forest is managed for timber production, special consideration is given to visual management in this area (Flathead National Forest 2001). Figure 3.8-2 shows the Kalispell-Kerr transmission line right-of-way in the distance along the back side of Chief Cliff.

The landscape surrounding the southern portion of the transmission line from approximately line mile 27 to the southern terminus at the Kerr Substation includes the Flathead Hills and Mountains and surrounding flat agricultural areas. Human development includes dispersed rural residences, farms, local roads, and transmission lines. Between line miles 29 and 30, the transmission line crosses Highway 28 and runs adjacent to U.S. Highway 93. Vegetation includes mixed conifer forest interspersed with the low-lying vegetation of agricultural lands.



Figure 3.8-1. U.S. Highway 93 North of Somers

View of the existing Kalispell-Kerr transmission line to the north from U.S. Highway 93 (line mile 8, 2 miles northwest of Somers). Residential development is visible in the foreground, lower mountains of the Swan Range are visible in the middleground, and snow-covered peaks of the Flathead Range are visible in the background.



Figure 3.8-2. Dayton Creek Road

Composite view of the right-of-way looking west from Dayton Creek Road (line mile 23), showing the right-of-way (center of photo in the background) along the back side of Chief Cliff (from left to right in the background). The right-of-way crosses the valley in a north-to-south direction. The valley is generally flat and consists of pasture land with scattered rural residences in the foreground and middleground.

From about line mile 36 to the Kerr Substation, the surrounding terrain turns to broad, flat, valleys where agricultural land predominates in the foreground and middleground views, with ridges of the Salish Mountains visible to the north and the Flathead National Forest visible to the east in the background (Figure 3.8-3). In the vicinity of the Kerr Substation, the transmission line crosses over the Flathead River and the deep gorge cut by the river into the surrounding (Figure 3.8-4). The viewshed in this area consists of the river and scattered trees on both sides of the river in the foreground, the substation and associated vegetation on a small plateau to the southwest, and the steep rocky sides of the river canyon.

Viewer Sensitivity

Visual sensitivity, a measure of the public concern for scenic quality of an area and the perceived visual changes to that scenic quality, is generally considered high along the transmission line. Visual sensitivity can vary based on the type of viewer. Primary viewers of the project include roadway travelers, Tribes, and residents, all of whom are considered to have a high level of sensitivity to visual change as described below. The west side of Flathead Lake, where the transmission line and access road rights-of-way are located, contains thousands of rural residences, many of which have been purposefully built in their existing locations so that residents can enjoy the scenic views. Outdoor recreationists that could have views of the transmission line and access road rights-of-way would primarily be recreating on Flathead River or Flathead Lake, with some dispersed recreation occurring in the Flathead National Forest. Outdoor recreationists are assumed to generally have a heightened awareness of their surroundings and are seeking an experience in a natural setting. U.S. Highway 93 is a designated scenic corridor in Flathead County and provides scenic views of the surrounding mountains, valleys, forest, and Flathead Lake. U.S. Highway 93 is the primary travel corridor for visitors traveling to and from Glacier National Park. Motorists traveling along this scenic roadway are assumed to have a high sensitivity to visual change, due to the abundant scenic views provided along the drive. The transmission line and access road rights-of-way cross several segments of Tribally controlled lands that have a specific cultural significance (see Section 3.11, *Cultural Resources*, for additional details, particularly as related to Chief Cliff). Due to these areas of cultural significance, the members of the Confederated Salish and Kootenai Tribes are also considered to have a high sensitivity to visual change in the landscape.



Figure 3.8-3. Walking Horse Lane

View from Walking Horse Lane (south of Big Arm, line mile 33) looking east showing right-of-way going southeast into mountain lands to the right, with Flathead Lake and Flathead National Forest in the background to the left.



Figure 3.8-4. Kerr Dam Loop Road Viewpoint

Photo looking west, down on the Kerr Substation (line mile 41) with transmission line crossing the Flathead River. Kerr Substation appears as a grey, irregular polygon surrounded by trees on the left side of the photograph.

3.8.2 Environmental Consequences–Proposed Action

The Proposed Action would introduce slight changes to the visual character surrounding the transmission line. Aspects of the Proposed Action that could introduce noticeable visual change to the landscape include a new optical ground wire, increased pole height by approximately 10 to 15 feet, tree removal, and new access roads. The new optic ground wire would introduce additional horizontal lines; however, they would be consistent in terms of line, color, and texture with the conductor, would introduce a weak level of contrast with the surroundings, and would only be noticeable at short distances. Increased pole height from an average structure height of 40 to 80 feet to the proposed height of 50 to 95 feet could increase the visibility of the structures. The top of some structures currently screened by trees could be visible with the proposed taller height, and the extent the structures are visible could extend farther. However, this is not expected to result in a high level of visual change since the cleared right-of-way is the most visible aspect of the transmission system and is typically visible at greater distances than the transmission structures themselves.

Tree removal would introduce a low level of visual change, since tree removal would be dispersed throughout the entire right-of-way in and adjacent to areas already cleared of vegetation, and would not remove large contiguous areas of trees. New access roads would introduce the most visual change in forested areas and appear as light-colored linear features surrounded by dark green vegetation. Due to the short length (generally ranging from 200–800 feet) and narrow width of the access roads, and the existing network of forest roads in the area, new access roads would introduce weak contrast and a low level of visual change to the landscape. The conductors and transmission structures do not contain any elements that would result in daytime or nighttime glare effects. No new structures are proposed for construction within the existing substations, and there would be no changes to the existing nighttime security lighting at the substations. Therefore, the Proposed Action would not introduce new sources of light and glare.

Although there are numerous sensitive viewers in the area, as described in Section 3.8.2, permanent impacts from the Proposed Action would be **low** due to the weak contrast and low level of visual change that would result.

Workers and equipment (e.g., boom cranes, backhoes, augers, and bucket trucks), material stockpiles, debris, signage, staging areas, clearing and grading, and the removal and installation of poles would occur at various locations along the transmission line and access road rights-of-way for short periods of time. The smooth, solid forms and mosaic of color associated with equipment and stockpiles would represent a temporary change from the existing visual environment. The movement of large construction vehicles at each work site along the right-of-way could add visually distracting elements to the landscape. Dust disturbed during construction could also temporarily encroach upon views. Existing access roads would be resurfaced with new gravel and may appear brighter and more apparent in the short term. Work platforms and machines would add linear and geometric shapes that would generally not be consistent with the existing viewshed. Although these effects on visual quality would be adverse, they would be of temporary duration at each location as work progresses in a linear fashion along the transmission line right-of-way. Each work area would be small, and therefore only a low number of viewers would be affected at each work site. As work is completed at each site, the site would be returned to its existing visual character, and the temporary presence of workers and equipment would be removed. The temporary effects on the visual character and scenic vistas within the project area would be **low**.

3.8.3 Mitigation Measures

BPA would implement the following measure to reduce impacts on visual resources from the Proposed Action:

- **VIS-1:** Maintain clean construction sites and regularly remove debris.

3.8.4 Environmental Consequences—No Action Alternative

Under the No Action Alternative, there would be no changes to visual resources in the project area associated with the rebuild of the transmission line. While there would be no temporary construction effects, more frequent emergency repairs would have similar impacts as the Proposed Action and would be **low**.

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3.9 Air Quality and Climate Change

3.9.1 Affected Environment

Air Quality

The analysis area for air quality is defined as the air basin that includes Flathead and Lake counties, Montana. The MTDEQ and EPA regulate air quality in Montana. Under the Clean Air Act (42 U.S.C. 7401 *et seq.*), EPA has established the National Ambient Air Quality Standards (NAAQS) for six criteria air pollutants: carbon monoxide, ozone, particulate matter, lead, sulfur dioxide, and nitrogen dioxide (Appendix A). The MTDEQ has adopted the standards set by EPA. For each of the six criteria pollutants, NAAQS are defined as a maximum concentration above which adverse effects on human health may occur. An area that fails to meet the standards established by EPA for any criteria pollutant is designated a **nonattainment area**. If a nonattainment area meets the EPA-promulgated standards for the criteria pollutant in question, then the area is designated a “maintenance area” after a maintenance plan has been established to keep the area within the standards approved by EPA. This analysis focuses on carbon monoxide and particulate matter because these emissions are most closely linked to vehicle emissions and dust from construction activities, and the project area is near areas of concern for carbon monoxide and nonattainment areas for particulate matter. The other pollutants are not described because their primary generation pathways are not part of the Proposed Action (e.g., sulfur dioxide from power plants), and there are no nonattainment areas near the Proposed Action.

Carbon Monoxide

Carbon monoxide is an air pollutant generally associated with transportation sources, but also comes from wood-burning activities. The highest ambient carbon monoxide concentrations often occur near congested roadways and intersections during periods of low temperatures, light winds, and stable atmospheric conditions. Primary sources of carbon monoxide from vehicle emissions are from traffic on highways and other local roads. Kalispell is listed as an area of concern for carbon monoxide, but is not legally designated as a nonattainment area (MTDEQ 2014c).

Particulate Matter

Particulate matter is generated by industrial emissions, residential wood combustion, motor vehicle use, and dust from roadways and unpaved surfaces. Two forms of particulate matter are regulated by EPA: particulate matter less than 10 microns in size (PM₁₀), and particulate matter less than 2.5 microns in size (PM_{2.5}). PM_{2.5} has a greater health effect than PM₁₀ at locations far from the emitting source, because it remains suspended in the atmosphere longer and travels farther. Air quality, especially particulate matter, can have an effect on visibility and regional haze. Section 160 of the Clean Air Act (42 U.S.C. 7470(2) *et seq.*), requires 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 where only a small amount of air quality degradation is allowed. The Flathead Indian Reservation is a Class 1 area crossed by the transmission line (MTDEQ 2014d).

Columbia Falls (approximately 11 miles north of the line), Kalispell (approximately 3.5 miles west of the line), and Whitefish (approximately 14 miles northwest of the line) are designated by the state as nonattainment areas for PM₁₀. Polson, located just under 4 miles east of the line, is a federally designated nonattainment area for PM₁₀ (MTDEQ 2014c).

Climate Change

Greenhouse gases are chemical compounds found in the Earth’s atmosphere that absorb and trap infrared radiation as heat. Global atmospheric greenhouse gas concentrations are a product of continuous emission

(release) and removal (storage) of greenhouse gases 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). Productive and long-lived forests play an important role in carbon capture and storage and act as temporary carbon reservoirs by storing carbon for extended periods of time. A large amount of greenhouse gas is also stored deep underground in the form of **fossil fuels**. 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 release and storage cycle by increasing the greenhouse gas emission rate over the storage rate, which results in a net increase of greenhouse gases in the atmosphere. When forests are permanently converted to cropland, for instance, or when new buildings or roads displace vegetation, the greenhouse gas storage capacity of the disturbed area is diminished. Carbon dioxide, nitrous oxide, and methane emissions increase when soils are disturbed (Kessavalou et al. 1998), and burning fossil fuels releases greenhouse gases 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 greenhouse gas levels increases temperatures, which causes warming of the planet through a greenhouse-like effect (U.S. Energy Information Administration 2009).

The principal greenhouse gases emitted into the atmosphere through human activities are carbon dioxide, nitrous oxide, methane, and fluorinated gases, such as hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride (EPA 2013a).

- Carbon dioxide is the major greenhouse gas emitted through human activities (EPA 2013c). Carbon dioxide enters the atmosphere as a result of such actions as land use changes, the burning of fossil fuels (e.g., coal, natural gas, oil, and wood products), and the manufacturing of cement. Carbon dioxide emissions resulting from the combustion of coal, oil, and gas constitute 84 percent of all U.S. greenhouse gas emissions (EPA 2013c). Before the industrial revolution, carbon dioxide concentrations in the atmosphere were roughly stable at 280 parts per million. By 2010, carbon dioxide levels had increased to 390 parts per million, a 40 percent increase, as a result of human activities (EPA 2013b).
- Methane is emitted during the processing and transport of fossil fuels, through intensive animal farming, and by the degradation of organic waste. Concentrations of methane in the atmosphere have increased more than 2.5 times those of preindustrial levels (EPA 2013b).
- Nitrous oxide is emitted during agricultural and industrial activities and during the combustion of fossil fuels and solid waste. Atmospheric levels of nitrous oxide have increased 18 percent since the beginning of industrial activities (EPA 2013b).
- Fluorinated gases, including hydrofluorocarbons, perfluorocarbons, and sulfur hexafluoride, are synthetic compounds emitted through industrial processes. They sometimes replace ozone-depleting compounds such as chlorofluorocarbons in insulating foams, refrigeration, and air conditioning. Fluorinated gases, particularly sulfur hexafluoride, are often used in substation equipment. Sulfur hexafluoride is used as an electrical insulator in high-voltage substation equipment such as circuit breakers, transformers, and ground switches. Although fluorinated gases are emitted in small quantities, fluorinated gases have the ability to trap more heat than carbon dioxide and are gases with a high global warming potential (EPA 2013a).

Total human-caused greenhouse gas emissions were the highest in human history from 2000 to 2010 and reached 49 gigatons of **carbon dioxide equivalent** per year in 2010 (Intergovernmental Panel on Climate Change 2014). Annual greenhouse gas emissions grew on average by 1.0 gigaton of carbon dioxide equivalent (2.2 percent) per year from 2000 to 2010 compared to the 0.4 gigaton (1.3 percent) increase per year from 1970 to 2000. Increasing levels of these greenhouse gases could increase the Earth's temperature

by between 2.0 and 11.5 degrees Fahrenheit by 2100 (EPA 2013a). In the Pacific Northwest region, an increase in annual temperature between 3.3 and 9.7 degrees Fahrenheit may be realized between 2070 and 2099, depending on future total global emissions of greenhouse gases (Mote et al. 2014).

Increases in the Earth's temperature may result in accelerated melting of arctic sea ice and glaciers, decreased periods of ice cover on lakes and rivers, changes in hydrology associated with early melting and decreased snow packs, changes in growing seasons and plant hardiness zones, changes in surface water characteristics, and increased extreme weather (Melillo et al. 2014). All of these changes could have a ripple effect on agricultural production, human health, public infrastructure, water supplies, hydropower generation, and terrestrial, aquatic, and marine ecosystems. While models predict that atmospheric concentrations of all greenhouse gases and temperatures will increase over the next century due to human activity, the extent and rate of change resulting from an individual project or action are difficult to predict, especially on a global scale.

To lessen the contribution of BPA system's to greenhouse gas emissions, BPA developed a climate change roadmap (BPA 2008), which included the adoption of a new Strategic Business Objective and a Key Agency Target related to climate change. The climate change roadmap identified measuring BPA's overall greenhouse gas emissions as a key starting point for BPA to manage its greenhouse gas footprint. As a result, BPA started collecting greenhouse gas data in 2009 to complete an inventory of existing greenhouse gas emissions. This inventory serves as a benchmark for quantifying reductions in greenhouse gas emissions from various activities and functions and helps BPA in quantifying the value of potential remedies for reducing emissions, estimating the costs of changing current practices, and prioritizing future greenhouse gas emission reduction actions. In 2009, BPA became a founder and member of The Climate Registry, a nonprofit collaboration that sets standards to calculate, verify, and report greenhouse gas emissions. BPA has completed and published a greenhouse gas inventory for the years of 2009, 2010, 2011, and 2012 (The Climate Registry 2013). The Climate Registry has been third-party verified and is publically available.

In 2012, BPA's system-wide direct emissions from stationary and mobile combustion and ***fugitive sources of emissions*** totaled 88,524 metric tons of carbon dioxide equivalent (The Climate Registry 2013). These direct emissions were calculated from the use of vehicles, air transportation, building operation, and transmission line operation. The greenhouse gas emissions reported to The Climate Registry also include a quantification of the sulfur hexafluoride emissions from BPA facilities. In addition to reporting sulfur hexafluoride emissions associated with total greenhouse gas emissions to The Climate Registry, BPA joined the EPA's sulfur hexafluoride Emission Reduction Partnership in 1999, which includes voluntarily reporting of sulfur hexafluoride emissions.

3.9.2 Environmental Consequences—Proposed Action

Air Quality

Air quality impacts of the Proposed Action would be limited to temporary construction impacts. Impacts would be localized and occur for short durations associated with specific construction sites and periods. Ground-disturbing activities, including structure replacement and counterpoise installation, would create dust. Ground-disturbing activities may result in the removal of vegetation, exposing soil to erosion and result in dust formation. Construction BMPs to control dust would minimize temporary impacts, and BMPs requiring revegetation of exposed soils upon completion of construction would prevent long-term air impacts associated with dust. Construction equipment and other vehicles would emit pollutants, including particulate matter and carbon monoxide, resulting in localized, temporary impacts on local air quality and visibility during periods of construction activity. Overall, the limited extent and duration of construction activity would result in a **low** impact on air quality and would not violate air quality standards.

Greenhouse Gases

Greenhouse gas emissions, primarily in the form of carbon dioxide, nitrous oxide, and methane, would be generated under the Proposed Action through the use of vehicles, heavy equipment, and helicopters during project construction.

Non-tree vegetation and soil disturbance could also result in an increase in greenhouse gas concentrations. Emissions as a result of soil disturbance are short lived and return to background levels within several hours (Kessavalou et al. 1998; Intergovernmental Panel on Climate Change 2006). Carbon that would be stored in removed vegetation would be offset in time by the growth and accumulation of carbon in soils and new vegetation. For these reasons, the temporary increase in greenhouse gas concentrations as a result of temporary soil and non-tree vegetation disturbance are not quantified below.

Tree removal does not immediately emit greenhouse gas and is not considered a direct emission, although tree removal could result in a permanent loss of a carbon storage reservoir. The below subsections estimate the project's direct emissions and loss of carbon storage from tree removal. Detailed assumptions used to derive these estimates are provided in Appendix A.

Direct Emissions

Direct greenhouse gas emissions resulting from the Proposed Action were calculated using the assumptions described in Appendix A. The Proposed Action could result in an estimated total of 4,900 metric tons of carbon dioxide equivalent emissions through the use of vehicles, equipment, and helicopters during construction activities. As described further in Appendix A, greenhouse gas emissions associated with equipment operation and vehicle use were overestimated to account for all potential construction activities and associated material deliveries to and from the construction site.

To provide context for these levels of emissions, the EPA mandatory reporting threshold for large emission sources of greenhouse gas is 25,000 metric tons of carbon dioxide equivalent emitted annually (74 FR 56260). This threshold is approximately the amount of carbon dioxide equivalent generated by 5,263 passenger vehicles per year. Comparatively, the emissions during project construction would be equivalent to the emissions generated by about 1,032 passenger vehicles per year (Appendix A). Given the low level of emission contributions, the impacts of the Proposed Action on carbon dioxide equivalent concentrations would be **low**.

Tree Sequestration Reduction

Based on the carbon cycle, trees act as temporary carbon reservoirs. Peak solid carbon storage occurs when a tree is fully mature. Alternatively, minimum solid carbon storage may occur when a forested area is permanently converted to a non-forested area, such as grasslands.

Rebuilding the transmission line could require the removal of an estimated 18 acres of trees for new structures, access road work, and danger tree removal (Refer to Table 3.2-4). The nature of tree removal is to permanently convert land within the clearing area to a non-forested land use. Therefore, this action can be characterized as permanently maintaining the clearing area at the minimum level of carbon storage.

The estimated 18 acres of trees, if not removed, would have sequestered approximately 5,000 metric tons of carbon dioxide equivalent at full maturity. This quantity would have sequestered the quantity of carbon dioxide equivalent generated by 1,053 passenger vehicles in 1 year (Appendix A). As described further in Appendix A, this estimate assumes that the removed trees are at full maturity and would remain in that state to provide full sequestration potential. This estimate is conservative as most of the removed trees are not at full maturity (i.e., at full sequestration potential) and many trees would not have reached maximum maturity through natural attrition or other human-related disturbances. Due to the small loss of

greenhouse gas sequestration potential, tree removal for the Proposed Action would result in a **low** effect on greenhouse gas concentrations.

3.9.3 Mitigation Measures

BPA would implement the following measures to reduce impacts on air quality and climate change in the project area:

- **AIR-1:** Use water trucks to control dust during construction.
- **AIR-2:** Keep all vehicles in good operating condition to minimize exhaust emissions.
- **AIR-3:** Turn off construction equipment during prolonged periods of non-use.
- **AIR-4:** Drive vehicles at low speeds (less than 5 miles per hour) on access roads and within the BPA right-of-way to minimize dust during high dust conditions.
- **AIR-5:** Locate staging areas as close to construction sites as practicable to minimize driving distances between staging areas and construction sites.
- **AIR-6:** Locate staging areas in previously disturbed or graveled areas to minimize soil and vegetation disturbance where practicable.
- **AIR-7:** Encourage the use of the proper size of equipment for the job to maximize energy efficiency.
- **AIR-8:** Recycle or salvage non-hazardous construction and demolition debris where practicable.
- **AIR-9:** Dispose of wood poles in the local area where practicable.
- **AIR-10:** Use local rock sources for road construction where practicable.

3.9.4 Environmental Consequences—No Action Alternative

Under the No Action Alternative, there would be no impacts on air quality or climate change in the project area associated with the rebuild of the transmission line. Ongoing routine maintenance and repair of the existing transmission line would result in similar temporary, localized air quality impacts. Such maintenance activities would be spread over time, likely as emergency repair operations throughout the life of the transmission line, and would be limited in extent to specific repair operations. The air quality impacts associated with these activities would be **low** and would not violate air quality standards. Maintenance activities on structures and roads would also result in very minor increased greenhouse gas emissions. Because the increase in greenhouse gases emissions would be very small, the impacts on climate change and greenhouse gas emissions would be **low**.

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3.10 Socioeconomics and Public Services

3.10.1 Affected Environment

This section addresses socioeconomic conditions, including population, economic characteristics, income and revenues, and **environmental justice populations**, and describes public services, including electrical and natural gas services, solid waste disposal facilities, fire protection and emergency services, police protection services, and public schools.

The Kalispell-Kerr transmission line runs through **unincorporated** portions of Flathead and Lake counties. The area is mostly rural, and includes large tracts of farm and forest land with scattered rural residences (as described in more detail in Section 3.2, *Land Use, Recreation, and Transportation*). The region of influence considered for socioeconomics, environmental justice populations, and public services is Flathead and Lake counties.

Population and Community Character

Flathead County encompasses 5,098 square miles in northwest Montana. British Columbia forms its northern boundary, Lake County shares its southern border, Pondera and Teton counties constitute its eastern boundary, and Lincoln County lies to the west. Flathead County includes 3 incorporated cities and 10 unincorporated communities. The county population increased from 74,471 in 2000 to 90,928 in 2010, or a 22.1 percent increase over the 10-year period (U.S. Census Bureau 2010).

Lake County encompasses 1,645 square miles and is bound by Flathead County on the north, Missoula County on the south, Flathead and Missoula counties on the east, and Sanders County on the west. Lake County includes 2 incorporated cities and 18 unincorporated communities, and over two-thirds of the county lies within the Flathead Indian Reservation. The county population increased from 26,507 in 2000 to 28,746 in 2010, or an 8.4 percent increase over the 10-year period (U.S. Census Bureau 2010).

The transmission line and access road rights-of-way crosses a portion of the Flathead Indian Reservation in Lake County. The Flathead Indian Reservation encompasses approximately 1,938 square miles in Flathead, Lake, Missoula, and Sanders counties and is home to the Confederated Salish and Kootenai Tribes. The Confederated Salish and Kootenai Tribes of the Flathead Nation is a federally recognized American Indian Tribe and Sovereign Nation. Approximately 28,359 people reside on reservation lands within these four counties (U.S. Census Bureau 2010).

Economic Characteristics

Flathead County's 2012 civilian work force consisted of 43,840 people. Of these, 39,909 were employed and 3,931 were unemployed, an unemployment rate of 9.0 percent (Montana Department of Labor and Industry 2014). In 2012, the civilian labor force in Lake County included 11,300 people. Of these, 10,293 were employed and 1,007 were unemployed, an unemployment rate of 8.9 percent (Montana Department of Labor and Industry 2014).

The principal sources of income in the area are derived from agriculture (grains, oilseeds, dry beans and peas, nursery, greenhouse, floriculture, and sod), cattle ranching, and timber. There are approximately 251,597 and 637,306 acres of agricultural land within Flathead and Lake counties, respectively, most of which is used as pastureland (USDA 2007a, 2007b). Coniferous forest, owned and managed by the U.S. Forest Service and private entities, is adjacent to the transmission line right-of-way for approximately 21 miles. Approximately 60.3 million and 18.4 million board feet of timber were harvested in Flathead County and Lake County in 2011, respectively (Bureau of Business and Economic Research 2012a, 2012b). Since

original construction of the transmission line, timber production has not been allowed within the transmission line right-of-way.

The principal income of the Confederated Salish and Kootenai Tribes is derived from its timber industry sales and from revenues paid to the Tribes through the co-license for the Kerr Dam facility with PPL Montana (a subsidiary of Pennsylvania Power & Light Co.). The Confederated Salish and Kootenai Tribes purchased the dam in September 2015 for \$18.2 million (Energy Keepers 2015). The Tribes also operate six Tribally owned corporations: Eagle Bank, Energy Keepers, S&K Gaming, S&K Electronics, S&K Technologies, and S&K Holdings (Confederated Salish and Kootenai Tribes 2013). Together, these corporations provided more than 500 permanent and 68 seasonal jobs in 2012 (Confederated Salish and Kootenai Tribes 2013).

Property Taxes and Values

All federal, state, and local government real property is exempt from paying property taxes. When BPA acquires an easement across private property, the landowner continues to pay property taxes (which could be at a lesser value if there is a limitation of use created by the easement encumbrance).

If BPA acquires new easements (for roads or new transmission line right-of-way) on private land, landowners are offered fair market value for the land as established through the appraisal process. The appraisal accounts for all factors affecting property value, including the impact of the easement on the remaining portion of the property. Each property is appraised individually using neighborhood-specific data to determine fair market value.

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.

Census tract data were used for the environmental justice analysis. The transmission line right-of-way crosses three census tracts (tracts 12, a small portion of 13.02, and 14) in Flathead County, and two tracts (tracts 9403.03 and 2) in Lake County (Figure 3.10-1). Census tract 9403.03 includes the majority of the Flathead Indian Reservation. To provide a basis for comparison of the localized project area, environmental justice demographic data are also provided for Flathead and Lake counties and the State of Montana.

Minority Populations

Guidelines provided by the Council on Environmental Quality (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.

For this analysis, minority individuals include the following U.S. Census categories for race: Black/African American, Asian, Native Hawaiian or Other Pacific Islander, American Indian or Alaska Native, some other race, and two or more races. Per CEQ mandate, persons identified through the U.S. Census as ethnically Hispanic, regardless of race, were also included in minority counts (CEQ 1997).

Minority populations are present in the project area. The project crosses through the Flathead Indian Reservation, which is considered a minority population as it is home to the Confederated Salish and Kootenai Tribes. Within the census tract that overlaps with part of the Flathead Indian Reservation (tract 9403.03), 76.5 percent of individuals identify as white, which is lower than the State of Montana average of 89.1 percent. Sixteen percent of the total population within the census tract identified as being American Indian, representing the largest non-white group within the project area. This percentage is close to three times greater than the state population identified as American Indian (6.3 percent) (U.S. Census Bureau 2010). The four other census tracts crossed by the transmission line and access road rights-of-way have individuals identified as white higher than the state of Montana average. Therefore the portion of the project that crosses through the Flathead Indian Reservation could affect minority populations, since this area has a meaningfully (nearly three times) greater minority population than the State of Montana.

Low-Income Populations

Guidelines provided by the CEQ (1997) and EPA (1998) indicate that a low-income community may be defined where either: (1) the low-income population comprises more than 50 percent of the population below the poverty level in the affected area, or (2) the low-income population of the affected area is meaningfully greater than the low-income population in the general population of an appropriate benchmark region used for comparison.

Low-income populations are present in the project area. The census tract that includes part of the Flathead Indian Reservation (tract 9403.03) has a median income of \$41,733, which is below the state of Montana median income of \$45,456. The census tract also has a larger proportion of families and individuals below the poverty level (15.4 percent and 24.0 percent, respectively) than the state average (9.8 percent and 14.8 percent, respectively). Consequently, in this census tract families and individuals living below the poverty line are 64 percent and 61 percent greater, respectively, than the state average. The four other census tracts crossed by the transmission line and access road rights-of-way have mean household incomes above the state median and have less families and individuals living beneath the poverty level than the state average (U.S. Census Bureau 2012).

Public Services

The following discussion identifies public services that could be utilized or affected by the Proposed Action, including electrical and natural gas services, fire protection and emergency services, police protection services, and public schools.

The primary electrical service providers in Flathead County (in the vicinity of the transmission line) are Flathead Electric Cooperative and Mission Valley Power, both customers of BPA.

Fire protection and emergency services in Flathead County in the vicinity of the project area are provided by the Somers-Lakeside Volunteer Fire Department and the South Kalispell Volunteer Fire Department. The Polson Rural Fire District and Rollins Volunteer Fire Department provide fire protection and emergency services within unincorporated areas of Lake County. The Montana Department of Natural Resources and Conservation Forestry Division protects private, public, Tribal, state, and federal forestland from fire, including wildland-urban interface areas (i.e., forest lands with residences and other structures within the reach of wildfires), through a coordinated system of fire prevention, suppression, and fuels management. The Flathead Tribal Division of Fire also provides fire protection for Tribal lands only.

Police protection in the vicinity of the project area is provided by the Flathead County Sheriff's Office, the Lake County Sheriff's Office, and the Flathead Tribal Police Department, which provides law enforcement services to the Flathead Indian Reservation. The Montana Highway Patrol provides patrol services to rural areas throughout the state and assists local city police and sheriff's departments.

Elementary and middle school students (grades K–8) within Flathead County in the vicinity of the project area are located within the Fair-Mont-Egan School District and the Somers Lakeside School District boundaries, and high school students (grades 9–12) are located within the Kalispell School District and Columbia Falls School District boundaries. Portions of the project area within Lake County are located within the Polson School District boundaries.

3.10.2 Environmental Consequences–Proposed Action

Population and Community Character

The Proposed Action would not cause any permanent changes to population in Flathead and Lake counties. The work force may include both local and non-local workers. There is sufficient housing capacity (e.g., rental housing and apartment vacancies) as well as hotels and recreation vehicle parks/campgrounds in Flathead and Lake counties to accommodate non-local workers during construction. The short-term nature of the construction work suggests that these workers would not typically change residences. Given that the Proposed Action is not expected to cause any permanent changes in population, it would have **negligible to no** impacts on population in the project area.

Economic Characteristics

The Proposed Action would have a small, beneficial impact on the regional economy during construction. Local purchases would likely include fuel for vehicles and equipment, staging area rental, and other incidental materials and supplies. The temporary construction workforce would include 50 to 80 personnel and would bring new income to the region as construction workers spend money in the local area, resulting in revenue for some local businesses, such as hotels, restaurants, gas stations, and grocery stores. Local expenditures would support jobs and incomes for these businesses and their employees, who would in turn spend their money in the local economy, creating a multiplier effect. Overall spending from the construction of the Proposed Action would be temporary (14-month construction period) and is likely to have **low** socioeconomic impacts on employment and income in the project area. No adverse impacts are expected. The overall impact of construction-related activities on the local and regional economies, while positive, is expected to be **low**. No new employment would be anticipated for the operation of the transmission line; therefore, there would be **no** permanent impacts on the regional economy in Flathead and Lake counties.

Part of the Proposed Action is located within existing agricultural fields (see Section 3.2, *Land Use, Recreation, and Transportation* for a detailed discussion). In these areas, the structures would be replaced in effectively the same locations and overland direction of travel roads would be used to access the transmission line right-of-way during construction. These activities would result in approximately 41.3 acres of temporary construction-related impacts on agricultural lands including vegetation removal and crushing and compaction. There would be no net permanent loss of agricultural lands associated with the Proposed Action. BPA would coordinate with the local farmers and landowners to minimize potential construction-related disruptions. BPA has committed to compensating landowners for all revenue losses they would incur as a result of the Proposed Action. Such compensation would reduce both the local and region-wide impacts of displaced crop production. Because the disruptions would be temporary and landowners would be compensated for lost revenue, the economic impact associated with the loss of agricultural production would be **low**.

There is no timber production within the transmission line right-of-way, and therefore trees removed within the right-of-way would not affect timber production. Removal of up to 1,088 trees outside of the right-of-way on forestry land would potentially impact timber resources through a loss of supply. BPA may compensate individual land owners for trees removed on a case-by-case basis, depending on the terms of BPA's easements. Landowners typically retain ownership of the cut trees, thereby reducing the economic impact of tree removal. Removal of trees outside the right-of-way does not preclude future timber use in

areas adjacent to the right-of-way and would not affect future timber production in those areas. Overall impacts on forest lands and timber resources are expected to be **low**.

Property Taxes and Values

During construction, the area adjacent to the transmission line and access roads would experience temporary disturbances, including noise and exhaust from construction equipment and activities, changes in travel routes resulting from lane closures, and potential roadside parking hazards from construction vehicles and work areas. As a result of these disturbances, some temporary impacts on property value and salability could occur for individual properties during construction; however, replacing an existing transmission line with similar structures in essentially the same locations would have no change to property values over the long term. BPA would obtain new easements for approximately 9 miles of access roads to operate and maintain the transmission line (see Section 2.1, *Proposed Action*). BPA would pay the landowners for new easements, and the underlying land ownership would not change. Property owners would continue to pay property taxes in accordance with existing valuations. Although BPA's acquisition of access road easements would reduce some property taxes on a site-specific basis, given the scale of these acquisitions compared to that of the counties' total tax base, it would not result in a measureable reduction for either Flathead or Lake County. Therefore, the Proposed Action would not affect the amount of taxes collected by the counties crossed by the transmission line, and there would be **low** temporary and **no** permanent tax impacts.

Environmental Justice Populations

As discussed above, the project area contains minority and low-income populations within the census tract that overlaps part of the Flathead Indian Reservation (tract 9403.03). However, the majority of project activity would occur outside of that census tract and the nature of impacts would be the same across the project area, such that all persons, regardless of race or income, would experience the same low levels of impacts associated with construction within the transmission line right-of-way. Construction impacts resulting from the disturbances described above are expected to be temporary in duration. Therefore, there would be **no** long-term disproportionately adverse effects on minority and low-income populations.

The EPA's environmental justice guidance states that "impacts that may affect a cultural, historical, or protected resource of value to an Indian Tribe or a minority population, even when the population is not concentrated in the vicinity" should be considered in an environmental justice analysis. The transmission line passes through an area of land administered by the Confederated Salish and Kootenai Tribes of the Flathead Nation, which includes Chief Cliff. Chief Cliff represents a sacred monument to the Confederated Salish and Kootenai Tribes and is associated with their creation stories. BPA has initiated Section 106 consultation with the Confederated Salish and Kootenai Tribes. Construction activities that impact sites considered sacred by local Native American communities would require mitigation as stated in Section 3.11, *Cultural Resources*. With the implementation of the appropriate mitigation measures, there would be **no disproportionately adverse impacts** on Native American populations from the Proposed Action.

Public Services

There would be no permanent increase in the local populations that would subsequently increase the demand for local public facilities and services (i.e., law enforcement, fire protection, medical services, schools, and utilities).

During construction, public services such as police, fire, and medical facilities would be needed only in cases of emergency (e.g., construction accidents). Standard safety procedures would be followed at all times during construction, and the potential for accidents is low. The Proposed Action would be constructed during the dry months of the year, and as such, there could be a higher risk for fire. This would create the potential for increased fire protection services while construction is ongoing during the drier months. BPA's

construction crews and contractors would coordinate with the local departments and implement all fire protection measures identified to ensure adequate protection during construction. Therefore, the Proposed Action is expected to have **low** impacts on fire protection services.

During construction, local communities could experience short-term impacts from increased construction traffic, lane closures, and/or traffic delays. Access to all properties, including public facilities, schools, and social service agencies, would be maintained during construction, and local agencies and residents would be notified of upcoming construction activities and potential disruptions to transportation facilities. The Proposed Action would not displace or otherwise hinder the ability of any agency or organization to provide public services to communities near the project area. Additionally, the Proposed Action would maintain or improve transmission system reliability to those served by the line. Overall, the Proposed Action is expected to have **low or no** temporary or permanent impacts on the provision of public services in the project area.

3.10.3 Mitigation Measures

In addition to the following mitigation measure proposed to reduce or eliminate impacts on socioeconomic and public service resources from the Proposed Action, BPA would implement measures LAND-4 (Schedule Construction), LAND-5 (Limit Construction), LAND-6 (Coordinate with Landowners), and LAND-7 (Compensate Landowners).

- **SOC-1:** Follow fire safety procedures (e.g., properly functioning spark arrestors, carry hand tools and extinguishers, emergency response plans, etc.) and coordinate with local fire departments to minimize wildfire risk.

3.10.4 Environmental Consequences—No Action Alternative

Under the No Action Alternative, there would be no impacts on socioeconomics associated with the rebuild of the transmission line. The temporary beneficial effects related to employment and income benefits of construction activities would not occur. If the transmission line's reliability is reduced there could be adverse impacts on the social and economic vitality of communities that rely on power supplied by the transmission line. Power outages, if they occur, could temporarily disrupt the operation of public facilities, community services, and businesses. In addition, there would be the potential for more frequent disruption of service, because the existing transmission line would likely require more frequent maintenance and upkeep. Although the risk of these disruptions would be higher with the No Action Alternative than the Proposed Action, associated impacts would be temporary and infrequent, so the impacts on public services would be **low**. Other socioeconomic impacts associated with the No Action Alternative are expected to be similar to the Proposed Action.

3.11 Cultural Resources

3.11.1 Affected Environment

Cultural resources are those physical remains, objects, places, historic records, and traditional cultural practices or beliefs that connect people to their past. The National Historic Preservation Act (NHPA; 54 U.S.C. 306108) affords protection for a subset of cultural resources known as **Historic properties**. As defined by the NHPA implementing regulations, 36 CFR Part 800, historic properties include any prehistoric or historic district, site building, structure, or object that meets defined eligibility criteria for the National Register of Historic Places (National Register). Historic properties can include artifacts, records, and remains that are related to and located within sites and properties of religious and cultural significance to an Indian Tribe organization (also often described as **Traditional Cultural Properties**).

The NHPA requires federal agencies to evaluate and consider impacts its proposed actions may have on cultural resources eligible for listing on the National Register. To do so, federal agencies must inventory cultural resources within the area of potential effect (APE). For this analysis, the APE includes the transmission line and access road rights-of-way where all construction activities are anticipated to occur. Cultural resources identified within the APE are then evaluated for eligibility for listing on the National Register using criteria including the cultural resource's age, integrity (of location, design, setting, materials, workmanship, feeling, and association), and significance in American culture, among other things. Cultural resources meeting at least one criterion, are considered eligible for listing on the National Register. Unevaluated sites are considered eligible until an eligibility recommendation has been determined. If cultural resources within the APE are determined eligible for listing on the National Register, the federal agency proposing the action must consider whether the project adversely affects the resource and, if so, means to avoid, minimize, or mitigate those impacts.

Cultural Overview

The project area falls within the Plateau cultural area, a region drained by the Columbia and Fraser rivers and inhabited by the Interior Salish peoples, the Sahaptian peoples, Athapaskan outliers, as well as the Kootenai and Cayuse peoples (Chatters and Pokotylo 1998; Walker 1998). The cultural patterns of the Plateau are characterized by several distinguishing features including:

- Riverine settlement patterns in an inland maritime environment
- A diverse subsistence base including anadromous fish (usually salmonids), large ungulates, and root resources
- Extension of kinship ties through inter-marriage throughout the region
- Limited political integration, primarily at the village and band levels, until introduction of the horse.
- Relatively uniform mythology, art styles, and religious beliefs and practices focused on the vision quest, shamanism, life-cycle observances, and seasonal celebrations of the annual subsistence

The Flathead Valley was at the intersection of three cultural groups: the Flathead-Pend d'Oreille, the Kootenai, and the Kalispell (Brunton 1998; Malouf 1956; Lahren 1998). The range and territories of all three groups changed with the arrival of the horse in the mid-18th century. Prior to the introduction of the horse, subsistence practices focused on fish and the collection of important plants such as camas, bitterroot, and berries. Bison became an important additional food source with arrival of the horse.

The Euro-American history of the region began in earnest with the fur trade, with tenures in the area by Hudson's Bay Company, Northwest Fur Company, and the Pacific Fur Company (Gray 1990). The first historic mention of the Flathead Lake area was in a letter written by Peter Fidler of the Hudson's Bay

Company in 1802, 3 years before the Lewis and Clark expedition. The Jesuits were the second Euro-American group to influence the area. Father DeSmet arrived in the Flathead Lake area in 1842 to begin working with the Flathead and Nez Perce (Roeder 1981; Toole 1959). Euro-American populations in the Flathead Valley increased after the Northern Pacific Railroad reached Missoula in 1883; however, more locally important was the arrival of the Great Northern Railroad in Kalispell in 1891 (Gray 1990).

The BPA transmission network has had a significant role in the history and development of the Pacific Northwest (Kramer 2010, 2012). BPA was created in 1937 as part of President Roosevelt's New Deal in order to market electricity generated at Bonneville and Grand Coulee dams along the Columbia River. At present, BPA operates over 15,000 circuit miles of transmission line spreading over all or portions of eight states and provides over 50 percent of the electrical energy consumed within its service region (Kramer 2010, 2012).

Extension of the BPA network into western Montana began with the approval in 1944 of the Hungry Horse Dam on the South Fork of the Flathead River upstream of Columbia Falls, which would become the first post-World War II federal hydropower generation facility in the Northwest (Kramer 2012). The dam began to generate power in October of 1952, with the stipulation that two-thirds of dam's power output was for use within Montana.

Cultural Resource Investigation

A cultural resources inventory, consisting of background research and field surveys, was conducted within the APE. Based on the results of the background research, one previously recorded archaeological site and two historic era resources were reported within the APE. The field survey conducted within the APE resulted in the identification of 17 cultural resources. These included ten newly recorded historic-period archaeological resources (five linear rock wall features, four small scatters of historic debris/trash dating as far back as the 1800s, and springboard-notched cut tree stumps); three newly recorded built environment resources (Kalispell-Kerr transmission line, Elmo Substation, and Kerr Substation); two previously recorded built environment resources (Kalispell Substation and Flathead Lake Fish Hatchery); one newly recorded prehistoric isolate (stone tool), and one previously recorded archaeological resource (rock cairn).

The rock wall features appear to be the result of past field clearing. The walls are constructed from local basalt boulders and cobbles stacked two to four courses high. Several portions of the walls have collapsed and are no longer intact. The walls do not appear to be related to significant past persons or associated with significant events in the history of the region. Additionally, they lack the ability to yield information important in history. Therefore, these features do not appear to meet the registration requirements for listing in the National Register.

The historic debris scatters appear to be the result of multiple episodes of dumping domestic and agricultural refuse (e.g., abandoned vehicles, crushed cans, glass and ceramic fragments, milled lumber). The sites do not appear to be related to significant past persons or associated with significant events in the history of the region. Additionally, they lack the ability to yield information important in history. Therefore, these features do not appear to meet the registration requirements for listing in the National Register.

The springboard-notched stumps are likely associated with logging activities prior to the construction of the transmission line in 1947. One of the trees was cut to approximately 8 feet in height and is 1.5 feet in diameter. The second tree was cut to 10 feet in height and is also 1.5 feet in diameter. Neither of these stumps appear to be related to significant past persons or associated with significant events in the history of the region. Additionally, they lack the ability to yield information important in history. Therefore, these features do not appear to meet the registration requirements for listing in the National Register.

The prehistoric isolate is a single ground stone artifact, no other diagnostic artifacts or features were identified near it. The isolated artifact does not possess the qualities required for listing in the National Register and is recommended as ineligible for listing in the National Register.

The archaeological resource (rock cairn) consists of basalt boulders and cobbles stacked two courses high. No diagnostic artifacts or features are present. Although rock cairns can be associated with past events or persons if importance to Native American tribes, little is known about function of this rock feature. Due to this uncertainty, the site is considered eligible for listing in the National Register for its potential to yield specific data and information important in history. It may also be eligible because of its potential significance to the CSKT.

Historic resources evaluation also included assessing the National Register-eligibility of the Kalispell-Kerr transmission line, Elmo and Kerr substations, and a re-assessment of the National Register-eligibility of the Kalispell Substation and Flathead Lake Fish Hatchery. The Kalispell-Kerr transmission line, and the Kalispell, Elmo and Kerr substations are considered important for their association with the development, design, and construction of the technologically advanced BPA Transmission Network. The substations and the transmission line appear to meet the registration requirements for listing in the National Register as significant elements of the BPA Transmission Network. Similarly the Flathead Lake Fish Hatchery, which has been in continual use since 1912, retains important historical connections to Montana's public hatchery system. Thus the hatchery meets the registration requirements for listing in the National Register.

3.11.2 Environmental Consequences—Proposed Action

Because the Proposed Action would not modify the Kalispell, Elmo, or Kerr substations, it would not adversely affect them. Rebuilding the Kalispell-Kerr transmission line would not adversely affect the characteristics that make the transmission line eligible for listing in the National Register. The replacement structures would be the same as the existing structures and the transmission line would retain its current alignment. The main difference between the existing and proposed transmission line is that some of the tower heights would increase and some structures would be moved slightly within the ROW to improve views for landowners, avoid wetlands, and increase ground to conductor clearance. Because the material type and pole design of the support structures would remain largely the same and because the alignment and function would be unchanged, the transmission line's visual uniformity would remain and the integrity of the transmission line would remain intact. BPA has submitted a determination of no adverse effect to the Montana SHPO for concurrence (see Section 4.6).

The Flathead Lake Fish Hatchery includes several buildings and outbuildings associated with operations; however, only an underground wood pipeline is located within the project area. The wood pipeline transports water from a spring west of the transmission line to the hatchery east of the transmission line in line mile 12. The only work proposed in this area are improvements to an existing access road within the right-of-way. Standard pre-construction utility location and avoidance measures would be used avoid disturbance of the pipeline. Therefore implementation of the proposed action would result in no effect on the pipeline or the Hatchery.

The five linear rock wall features, four historic debris/trash scatters springboard-notched cut tree stumps, prehistoric isolate (stone tool), and rock cairn identified during the surveys are located in areas that would not be affected by construction activities. Therefore, there would be no effect to these resources. Unknown cultural resources could be disturbed through accidental discovery. The Proposed Action could result in adverse impacts on these resources, depending on the extent of the resource sites and their proximity to structure sites and access roads. The structures and access roads have been sited to avoid areas that are likely to contain cultural and historic resources, so maintenance of the structures or access roads should not affect known resources. This combined with the inadvertent discovery requirements

implemented during construction would result in negligible to low impacts to cultural resources. Therefore, impacts to cultural resources would be expected to be **negligible to low**.

3.11.3 Mitigation Measures

The following mitigation measures would be implemented to reduce impacts on cultural resources in the project area:

- **CULT-1:** If ground-disturbing activities cause an inadvertent discovery, all activities near the find would be stopped per BPA's Inadvertent Discovery Procedure. Inadvertent discoveries can include human remains, structural remains, Native American artifacts, or Euroamerican artifacts that were previously unknown. The BPA archaeologist, Montana State historic Preservation Office (SHPO), and affected Tribes would be notified immediately.
- **CULT-2:** Operations would stop immediately within 200 feet of the inadvertent discovery of 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. The area would be secured around the discovery and local law enforcement, the BPA archaeologist, the Montana SHPO, and affected Tribes would be contacted immediately.
- **CULT-3:** Explain cultural resource-related mitigation measures to construction contractors and inspectors, including field marking for avoidance, during preconstruction meetings. Depict cultural sites as sensitive areas to avoid in construction documents, on construction maps, and in the field.

3.11.4 Environmental Consequences—No Action Alternative

Under the No Action Alternative, emergency repairs would be performed as needed and could impact cultural resources. Impacts on cultural resources from the No Action Alternative would be **low** for planned activities because BPA would conduct appropriate Section 106 compliance. Impact levels could be higher should work be required under emergency conditions and could result in impacts to previously unidentified cultural resources.

3.12 Noise, Public Health, and Safety

3.12.1 Affected Environment

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

Noise

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

Existing noise levels in the transmission line right-of-way are characteristic of rural lands with limited areas influenced by urban activities, as well as in localized areas where U.S. Highway 93, State Route 28, and local streets cross the transmission line. Noise-sensitive receptors in the vicinity of the transmission line primarily include residences. The majority of the transmission line right-of-way is located in rural and/or undeveloped areas characterized by low noise levels.

Hazardous Materials

In general, hazardous materials are media containing organic or inorganic constituents considered toxic to humans or the environment. Wood poles treated with chemical preservatives (e.g., PCP) are used throughout the transmission line right-of-way. Government environmental databases that record the handling, storage, and release of hazardous materials to the environment were reviewed to document existing conditions in the transmission line right-of-way (MTDEQ 2014a). No documented areas of hazardous material contamination within the transmission line right-of-way were identified during the database review. No areas of obvious hazardous material contamination were observed during site visits in September 2013 and June 2014, or through a review of recent, high resolution aerial imagery of the transmission line right-of-way. The transmission line and access road rights-of-way travel through farmland. Farms are a potential source of unknown contamination as they commonly have old or inactive underground storage tanks. Additionally, ongoing agricultural activities in the area may involve the use of pesticides or herbicides that could pose a health and safety risk to construction workers.

Electric and Magnetic Fields

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

EMFs are found around any electrical wiring, including household wiring and electrical appliances and equipment. Electric fields are measured in units of volts per meter or thousands of volts per meter (kV/m). Magnetic fields are measured in units of gauss or milligauss (mG), which are thousandths of a gauss. Throughout a home, the electric field strength from wiring and appliances is usually less than 0.01 kV/m. However, fields of 0.1 kV/m and higher can be found very close to electrical appliances. There are no national guidelines or standards for electric fields from transmission lines. For siting transmission lines

under its jurisdiction, the State of Montana, through the Major Facility Siting Program, requires that a proposed transmission line be designed and operated so that its electric fields at the edge of the right-of-way do not exceed 1 kV/m measured roughly 3 feet above ground surface in residential or subdivided areas, and that electric fields do not exceed 7 kV/m at road crossings measured roughly 3 feet above ground surface (Administrative Rule of Montana 17.20.1607).

Average magnetic field strength in most homes (away from electrical appliances and home wiring, etc.) is typically less than 2 mG. Fields of tens or hundreds of mG are present very close to appliances carrying high current. Unlike electric fields, magnetic fields from outside power lines are not reduced in strength by trees and building material. Transmission lines and distribution lines (the lines feeding a neighborhood or home) can be a major source of magnetic field exposure throughout a home located close to the line. There are no national standards for magnetic fields, and Montana and BPA do not have magnetic field limits for transmission lines. Guidelines created by national and international organizations range from 833 to 9,040 mG for public magnetic field exposure, and from 4,200 to 27,100 mG for occupational magnetic field exposure. The existing transmission line operates well below these standards.

Decades of scientific studies are inconclusive as to whether magnetic fields can potentially cause health effects. Scientific studies and reviews of research on the potential health effects of power line EMFs have found there is insufficient evidence to conclude that exposure to either field leads to long-term health effects, such as adult cancer, neurodegenerative diseases (such as Alzheimer’s or Lou Gehrig’s disease), or adverse effects on reproduction, pregnancy, or growth and development of an embryo. Uncertainties do remain about possible links between childhood leukemia and childhood magnetic field exposures at levels greater than 3-4 mG. There are also suggestions that short-term exposures to magnetic fields greater than 16 mG may be related to an increased risk of miscarriage. However, animal and cellular studies provide limited support for a causal relationship between magnetic field exposure and an increased risk of childhood cancer or miscarriage.

Radio and Television Interference

Radio and television interference from high voltage power lines can be produced from two general sources: conductor corona activity (see *Noise* section, above) and **spark-discharge activity** on connecting hardware. Conductor corona activity is primarily a function of the operating line voltage, while spark-discharge activity on connecting hardware is usually associated with the aging condition of hardware (e.g., over time, hardware connections can become loose and corroded causing small spark-gaps). Historically, public complaints of radio and television interference from BPA transmission lines operating at 115 kV, such as the Kalispell-Kerr transmission line, are rare.

3.12.2 Environmental Consequences–Proposed Action

Noise

The Proposed Action would not result in any permanent impacts from noise. Construction would temporarily result in higher noise levels during structure replacement, access road reconstruction, and tree removal. Typical construction equipment used for the Proposed Action would generate noise levels peaking just over 90 dBA (Table 3.12-1).

Table 3.12-1. Typical Construction Noise Levels

Type of Equipment	Maximum Noise Level (dBA) at 50 feet
Road grader	80–92
Bulldozer	80–92

Heavy truck	78–90
Backhoe	72–92
Pneumatic tools	82–87
Concrete pump	81–83
Crane	85–88
Source: EPA 1971.	

Construction activity noise levels would range from 70 to 95 dBA and may be bothersome to those in the immediate vicinity of the Proposed Action. Construction would be limited to daytime hours and at any one location would be temporary, lasting only a matter of days. Construction activity within the transmission line and access road rights-of-way would produce temporary noise levels similar to noise from machinery used for agricultural purposes. Nearby residents regularly experience machinery noises from agricultural activities, therefore additional construction noise, while noticeable, would not result in a substantial change to the existing soundscape. As a result, noise impacts due to construction would be **low**. There would be no introduction of corona noise because the transmission line would remain at 115 kV.

Hazardous Materials

The Proposed Action has the potential to release hazardous materials into the environment through PCP from creosote-treated poles leaching into surrounding soils and groundwater, and spills or leaks from hazardous materials used during construction of the transmission line and access roads (e.g., solvents, pesticides, paint products, motor and lubricating oils, and cleaners).

New wood poles and cross-arms are treated with the wood preservative PCP, which contains toxic compounds (micro-contaminants) that can leach into soil or water (EPA 2008). PCP can move through and leach from the bottom of the pole, contaminating surrounding soils (EPA 2008). PCP in oil is rapidly transported from the upper portion of the pole to the underground for the first few years of use, and becomes relatively constant over time (EPA 2008). PCP has a tendency to degrade rapidly in the environment, and concentrations decrease rapidly with distance from wood utility poles (EPA 2008; EPRI 1995). A study conducted on the fate of PCP and creosote in soils adjacent to in-service utility poles showed that, in general, the highest PCP concentrations remain close to the pole and at the surface (EPRI 1995). The EPRI (1995) study indicated that PCP concentrations decrease by as much as two orders of magnitude between 3 and 8 inches from the pole, but the rate of migration depends on local factors such as soil type, soil chemistry, local weather and topography, initial level of pole treatment, and age of the pole. The EPRI (1995) study also indicated that PCP might move greater distances and depths at sites where the wood pole intersects the water table. The EPA estimates that environmental concentrations of PCP in surface waters from PCP-treated wood poles are less than one part per billion (ppb), well below EPA's level of concern (10,465 ppb for adults and 2,990 ppb for children) (EPA 2008). Environmental concentrations of PCP in groundwater were not available to compare with the EPA levels of concern for PCP. However, EPA concluded that because PCP adsorbs to soils and degrades relatively rapidly in the environment, PCP usage on utility poles is not likely to contaminate groundwater, except in situations where the bottom of the pole is directly in contact with the water table (or with a fluctuating water table), or where leaching occurs from multiple poles in a wood storage area (EPA 2008).

All of the new structures installed as part of the Proposed Action would meet BPA's current standards and specifications for wood poles. BPA's specification for wood poles exceeds the Western Wood Preservers Institute (WWPI) BMPs for the use of PCP-treated wood in aquatic environments (WWPI 2012). To minimize the amount of residual treating solution that may occur on the treated wood surface, the WWPI BMPs require incorporating one of the following procedures into the treating process: steaming, expansion bath, or extended vacuum cycle time. The BPA specification requires all three of these steps to comply with the American Wood Protection Association U1, *Commodity Specification* (American Wood Protection

Association 2013). Toward the end of the treatment process, the poles go through an expansion bath, which involves heating the treating oil to make it expand in the wood cells and facilitate the evacuation of the oil from the poles. After pump-out and pre-final vacuum, the poles are post-steamed, to clean off the surface, and then undergo a final vacuum. All of BPA's wood poles are treated and provided by McFarland-Cascade, a WWPI-certified supplier of BMP-conforming wood. As described in the Chapter 2, *Proposed Action and Alternatives*, materials storage sites and temporary staging areas would generally be located on existing flat, paved, or gravel lots in commercial or industrial areas. Sorbent materials or other impervious materials would be placed underneath wood poles to prevent leaching of PCP. Additionally, BPA would install barrier wraps on structures within 50 feet of streams and wetlands and within floodplains to prevent wood preservatives from contacting soil, surface water, and ground water. These barrier wraps are impermeable membranes that are placed over the butt end of wood poles just prior to installation in the ground.

Preservative treated wood poles removed as part of the Proposed Action would be hauled off site and disposed of in accordance with federal and state laws. Unknown hazardous materials could potentially be disturbed during construction of the Proposed Action, resulting in an unexpected release to the environment potentially impacting the public health and safety of nearby residents. Construction activities associated with the Proposed Action, including construction of access roads, could involve the use of small amounts of solvents, pesticides, paint products, motor and lubricating oils, and cleaners, which could be released into the environment. If any of these materials were spilled, BPA would immediately contain and clean up the spill and dispose of all regulated materials in accordance with federal and state laws. Impacts resulting from a hazardous materials release to soil or groundwater during construction would likely be low because of the implementation of mitigation measures described below. The mitigation measures would reduce the risk of hazardous material releases to the environment and exposure of workers or nearby residents.

As described in Section 3.12.1, no obvious areas of hazardous materials contamination were observed in the area crossed by the transmission line and access road rights-of-way. However, hazardous material sites, such as leaking underground storage tanks or contaminated soils, could be present within the rights-of-way as a result of past or ongoing land use activities and could be encountered during construction of the Proposed Action, especially in areas where ground disturbance would occur. If such areas are encountered, they would be reported to the MTDEQ and would be handled in accordance with federal and state regulations.

Overall, with the implementation of the measures described here regarding the handling and disposal of creosote-treated wood poles; spill prevention, containment, and cleanup; wood pole storage methods; and construction methods for installing PCP-treated wood poles in environmentally sensitive areas, the risk to public health and safety from hazardous materials would be **low**.

Electric and Magnetic Fields

The primary parameters that affect the EMF levels produced by a power line are line voltage, current loading, line configuration, and line routing. The Proposed Action would not appreciably change any of these parameters. Therefore, no changes in the EMF levels in the vicinity of the transmission line would occur, except in a few isolated cases where structure heights would be raised slightly to increase the conductor-to-ground clearances. In these areas, ground-level EMF would decrease slightly within the transmission line right-of-way. No changes would occur beyond the transmission line right-of-way. BPA would continue to meet the State of Montana's electric field regulations for transmission lines. The data illustrate that the Proposed Action would not change either the electric or magnetic field environment on the right-of-way (Tables 3.12-3 and 3.12-4). Since there would only be isolated cases where the EMF could change and BPA would continue to meet the State of Montana's electric field regulations for transmission lines, impacts would be **low**.

Radio and Television Interference

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

Table 3.12-2. Transmission Line Right-of-Way Electric Field Values (kV/m)^a

	Eastern Right-of-Way Edge	Maximum on Right-of-Way	Western Right-of-Way Edge
Right-of-Way Section A: 1 Line^b			
Existing Conditions	0.4	1.4	0.02
Proposed Action	0.4	1.4	0.02
Right-of-Way Section B: 2 Lines^c			
Existing Conditions	0.3	4.2	0.4
Proposed Action	0.4	3.1	0.4
Notes:			
^a Values developed from BPA modeling programs. These are based upon a 200-foot right-of-way with 115-kV line(s).			
^b Section A represents the 20-mile section of right-of-way (200 feet wide) with only the single Kalispell-Kerr transmission line from the Kalispell Substation to Forest Hill Road in line mile 9, and from 1 mile south of the Elmo Substation to the Kerr Substation.			
^c Section B represents the 21-mile section of right-of-way (200 feet wide) that parallels the Flathead-Hot Springs 230-kV line from Forest Hill Road in line mile 9 to 1 mile south of the Elmo Substation.			

Table 3.12-3. Transmission Line Right-of-Way Magnetic Field Values^{a,b}

	Eastern Right-of-Way Edge		Maximum on Right-of-Way		Western Right-of-Way Edge	
	Annual Average (mG)	Annual Peak (mG)	Annual Average (mG)	Annual Peak (mG)	Annual Average (mG)	Annual Peak (mG)
Right-of-Way Section A: 1 Line^c						
Existing Conditions	3.3	7.1	10.3	34.6	0.5	0.9
Proposed Action	3.3	7.1	11.2	34.6	0.5	0.9
Right-of-Way Section B: 2 Lines^d						
Existing Conditions	3.1	12.6	28.9	165.7	5.6	17.9
Proposed Action	3.0	12.6	29.2	165.7	5.6	17.9
Notes:						
^a mG based on 2011–2012 line load statistics.						
^b Values developed from BPA modeling programs. Based on a 200-foot right-of-way with 115-kV line(s).						
^c Section A represents the 20-mile section of right-of-way (200 feet wide) with only the single Kalispell-Kerr transmission line from the Kalispell Substation to Forest Hill Road in line mile 9, and from 1 mile south of the Elmo Substation to the Kerr Substation.						
^d Section B represents the 21 mile section of right-of-way (200 feet wide) that parallels the Flathead-Hot Springs 230-kV line from Forest Hill Road in line mile 9 to 1 mile south of the Elmo Substation.						

3.12.3 Mitigation Measures

In addition to the following mitigation measures to be implemented to reduce impacts on noise, public health, and safety in the project area, BPA would implement measures GEO-3 (Construction Timing), GEO-4 (SWPPP), GEO-10 (Staging Areas), WILD-1 (Spill Prevention), WAT-1 (Tank Inspection), and WAT-2 (Equipment Service Locations):

- **NPHS-1:** Dispose of creosote-treated wood (poles, cross-arms, etc.) in accordance with federal and state laws.
- **NPHS-2:** Do not use contaminated soil as backfill or spread around new structures in wetlands, floodplains, or shallow groundwater areas.
- **NPHS-3:** Maintain appropriate spill containment and cleanup materials in construction equipment, in staging areas, and at work sites.
- **NPHS-4:** Use pumps, funnels, and absorbent pads for all equipment fueling operations.
- **NPHS-5:** Ensure that specification for wood poles exceeds the WWPI BMPs for the use of PCP-treated wood in aquatic environments.
- **NPHS-6:** Install barrier wraps on structures within 50 feet of wetlands and streams and within floodplains.

3.12.4 Environmental Consequences—No Action Alternative

If structures failed, downed lines have the potential to cause a fire in the vicinity or create an electrocution risk as a result of accidental or inadvertent contact with an energized, downed line. Although contingencies are in place to back-up power when failures occur and for lines to be turned off when structures go down, impacts on public health and safety could be **moderate** if failures created loss of power, fire, or electrocution.

Under the No Action Alternative, the existing structures would continue to deteriorate and require repair or replacement as needed. Poles treated with PCP would remain in the ground longer. However, when poles are replaced as needed they would include the same measures to prevent PCP leaching as described in the Proposed Action. Nearby noise-sensitive receptors would be impacted by increased repair activity, but work in any one location would be temporary and impacts would be **low**. More frequent emergency repairs would have similar impacts on noise as the Proposed Action and would be **low**.

3.13 Cumulative Impact Analysis

Cumulative impacts are the effect on the environment that results from the incremental impact of an action when added to other past, present, and reasonably foreseeable future actions, regardless of which agency (federal or non-federal), organization, or person undertakes such other actions (40 CFR 1508.7). Cumulative impacts can result from individually minor, but collectively significant actions taking place over a period of time. The effects of past actions in the vicinity of the Proposed Action are considered to form a part of the affected environment baseline for each resource. Past actions that have adversely affected natural and human resources in the project area include, construction and maintenance of the original transmission system, logging activities, highway construction, farming and ranching, and commercial and residential development.

3.13.1 Reasonably Foreseeable Projects

This list of reasonably foreseeable projects is based on a review of planned work by BPA, the U.S. Forest Service, and the Montana Department of Transportation (MTDOT). A review of county planning documents and other publically available planning information sources was also conducted, but generally turned up little in the way of specific projects that could be considered reasonably foreseeable. Reasonably foreseeable future actions considered in the cumulative effects analysis include the following:

- BPA is considering work on three transmission line segments in the vicinity of the Proposed Action. These possible projects are:
- Taft-Hot Springs 500 kV transmission line reconductoring project.
- Columbia Falls-Trego 115-kV transmission line rebuild project.
- Hot Springs-Rattlesnake 230-kV transmission line rebuild project.
- Elmo to Hot Springs fiber optic cable installation.

The scope of work for the Columbia Falls-Trego and Hot Springs-Rattlesnake projects would likely be similar to the Proposed Action in terms of replacement of structures and access road work. The Taft-Hot Springs reconductoring project would likely not involve the replacement of structures, only conductor and hardware; some access road improvements might be required for this project (pers. comm., Moffett 2014). The Elmo to Hot Springs fiber optic cable installation project would include the installation of a new fiber optic cable on an existing lattice steel transmission line between the Elmo and Hot Springs substations. The project would also include some road improvements to facilitate construction vehicle access to individual transmission towers, and the installation of fiber optic vaults, fiber optic wood poles, guy wires, and anchors to provide intermediate support between towers.

- BPA would continue to operate and maintain other transmission lines in and near the Kalispell-Kerr transmission line right-of-way. Routine work may include hardware replacement, vegetation management, danger tree removal, and minor access road work.
- The Flathead National Forest is planning to implement the Wild Cramer Forest Health and Fuels Reduction Project (U.S. Forest Service 2013). The project would be located in the Island Unit of the Flathead National Forest. The Kalispell-Kerr transmission line crosses through the Island Unit from about line miles 17 through 19. As currently proposed, the main Wild Cramer project activities would include:
 - Harvest trees on approximately 2,750 acres.
 - Thin saplings on approximately 3,846 acres.

- Conduct prescribed burns on 201 acres.
- Construct approximately 7 miles of permanent roads and 8.2 miles of temporary roads.
- MTDOT is constructing a U.S. Highway 93 alternative bypass route to the west of Kalispell. The section of the bypass route between U.S. Highway 93 and U.S. Highway 2 nearest to the Proposed Action has already been constructed. Shorter segments of the bypass route on the west side of Kalispell are expected to be under construction concurrently with the Proposed Action (MTDOT 2014).
- New recreational trails are being planned by Lake and Flathead counties. The Lake County trail connection would extend from Lake Mary Ronan to Dayton along Dayton Creek Road at line mile 23 (Lake County 2013). A planned recreational trail to Flathead Lake would intersect the right-of-way at line miles 11 and 12 (Flathead County 2012).
- General and routine road and bridge maintenance activities would continue. These include maintenance on both paved and unpaved roads in the vicinity of the Proposed Action. Types of actions would include filling potholes, cleaning culverts and ditches, road resurfacing, upgrades to guard rails, restriping, maintaining non-paved roads, and other types of general road maintenance by MTDOT and the counties.
- Farming, ranching, and forest management activities would continue into the foreseeable future adjacent to and in the immediate vicinity of the Proposed Action.
- Residential and commercial development would continue in the vicinity of the project area.

3.13.2 Cumulative Impacts

The Proposed Action, in combination with past, present, and reasonably foreseeable future actions, could potentially result in cumulative impacts on the natural, physical, and socioeconomic resources described in Sections 3.2 through 3.12 of this EA. The effects remaining after avoidance and minimization measures are the effects that could contribute to cumulative impacts. The following analysis describes these potential cumulative impacts from the remaining effects of the Proposed Action. Topics are generally presented in the order that they were previously presented in this chapter.

Land Use, Recreation, and Transportation

Planned trails may cross the Kalispell-Kerr transmission line, including a Lake County trail connection from Lake Mary Ronan to Dayton along Dayton Creek Road at line mile 23 (Lake County 2013). Flathead County has a planned recreational trail to Flathead Lake that would intersect the transmission line right-of-way at line miles 11 and 12 (Flathead County 2012). Even with these planned trails considered in the analysis, the cumulative impacts on land use and recreation from other similar transmission line rebuild projects in the project area would be similar to those described for the Proposed Action. These would largely be limited to temporary, localized construction impacts associated with structure replacement and access road construction and improvement. The limited extent and duration of such activities would result in **low** cumulative impacts on land use and recreation.

Geology and Soils

The principal ongoing and future activities that can be reasonably assumed to cumulatively affect soils are agricultural practices, including farming and grazing activities, and timber harvest. Agricultural activities continually disturb soils during the planting and harvest cycle. Timber harvest is planned in the U.S. Forest Service-managed lands. While forest management plans limit annual timber harvest levels, soil disturbance would occur during timber harvest as a result of haul road and landing construction, along with timber skidding.

The Proposed Action would contribute to cumulative effects on soils, particularly through increased erosion potential associated with ground disturbance and tree removal. These effects would decrease when the disturbed areas return to existing conditions as vegetation matures and soils stabilize. The Wild Cramer Forest Health and Fuels Reduction Project would be implemented on lands crossed by line mile 17 through 19 of the transmission line, where the erosion hazards are high. The Proposed Action would remove approximately 2,250 trees, the majority of which would be associated with access road construction, within this stretch the transmission line. The Proposed Action in combination with tree removal associated with the Wild Cramer Forest Health and Fuels Reduction Project and timber harvest within the Flathead National Forest would cumulatively result in a higher risk of erosion than any of the projects would have individually. However, since tree removal would be dispersed along access roads and transmission line right-of-way and would not occur in concentrated areas, and erosion control measures would be implemented to reduce the risk for erosion (Section 3.3.3), the Proposed Action would have a **low** cumulative impact on soils.

Vegetation

Vegetation communities in the project area have been impacted by past development projects in the region, and the conversion of native habitats to agriculture. These activities have resulted in the permanent loss and modification of native vegetation. Past clearing of vegetation and the removal of trees by BPA to build the Kalispell-Kerr transmission line and associated access roads have altered current plant communities in the project area, including the conversion of forested land to grassland. Past disturbances along the right-of-way have contributed to the spread of invasive weeds, which are prevalent throughout the project area. Ongoing maintenance and vegetation management in relation to the line, including removal of danger trees, is expected to maintain disturbed grassland habitats within the project area for the foreseeable future. Populations of invasive weeds within the project area are expected to continue to spread and increase in abundance, although ongoing efforts to control invasive weeds by BPA will help control the rate of spread.

Impacts on vegetation under the Proposed Action include the permanent loss of vegetation and a minor alteration in plant communities through project-related disturbances that permanently change vegetation communities (i.e., new road construction). The possible future rebuilds of other BPA transmission lines and installation of fiber optic cable in the vicinity would have similar impacts as the Proposed Action.

Other actions near the Proposed Action, including road construction and maintenance, and fuels reduction associated with the Wild Cramer Forest Health and Fuels Reduction Project, would impact vegetation as well. The fuels reduction project would entail the removal of trees and other vegetation through mechanical methods and application of prescribed fire in forested areas. The Wild Cramer Forest Health and Fuels Reduction Project consists of a total of 30,727 acres within the Island Unit of the Flathead National Forest located approximately 10 miles south of Kalispell and 2 miles west of Flathead Lake. Overall, the Proposed Action's cumulative impacts on vegetation is **low** because the acreage permanently altered by the Proposed Action is very small, especially in comparison to other timber harvest and fuels reduction projects in the area.

Wildlife

Past and ongoing agricultural activities (grazing, crop production, timber harvest), human-caused wildfire, urbanization, weed control and recreation have affected wildlife habitat in the vicinity of the project area through the direct loss and fragmentation of habitats. Wildlife habitat is directly associated with vegetation. Reasonably foreseeable projects that would substantially alter vegetation communities, and therefore wildlife habitat, include the Wild Cramer Forest Health and Fuels Reduction Project. The Proposed Action would cumulatively impact wildlife and their habitats through temporary disturbance during construction and permanent removal of small areas of wildlife habitat. The incremental contribution of the Proposed Action to cumulative impacts associated with past, present, and reasonably foreseeable future actions on wildlife and their habitat is **low**.

Wetlands and Floodplains

Wetlands

Incremental losses and degradation of wetlands have occurred over time in Montana and throughout the U.S. Montana has lost approximately one-third of its naturally occurring wetlands since settlement (MTDEQ 2014b). Within the transmission line right-of-way, construction of the existing transmission line likely contributed to the loss of wetlands and a reduction in wetland function from the placement of structures, construction of access roads in wetlands, and right-of-way clearing. Agricultural activities (e.g., livestock grazing, crop production, and timber harvest) and development have also likely contributed to the loss of wetlands and wetland function in the vicinity of the project area, and will likely have some ongoing impacts. Future projects (e.g., development, timber harvest) in the transmission line vicinity would be required to avoid, minimize, and compensate for any potential impacts on wetlands under federal and state laws, but could still contribute to a cumulative loss of wetland function at the local level. The Proposed Action would result in some temporary disturbance to wetlands (approximately 3.0 acres). However, temporary impacts would be mitigated as described in Section 3.6.3. The Proposed Action would result in about 0.1 acre of permanent wetland impacts and would therefore represent a small cumulative loss of wetlands. The cumulative impact of the Proposed Action in addition to other past, present, and future development in wetlands would be **low**.

Floodplains

Past and ongoing residential and commercial development and land use practices (including agriculture and timber harvest) in Flathead County that add fill in the floodplain and disturb vegetation and soils have increased floodplain levels and increased stormwater runoff contributing to the frequency and intensity of flooding in the Upper Flathead River valley. Flathead County has more than doubled in population since 1970 and is expected to continue growing. The City of Kalispell is currently growing and expected to continue this trend. Approximately one-half of the City of Kalispell planning area is composed of slopes in excess of 20 percent, floodplains, and soils, all of which pose severe limitations for development. Under these conditions, the pressure to develop in valley land, some of which lies within floodplains, is expected in the future (FEMA 2011). While Flathead County regulates development within floodplains (Flathead County 2013b), low to moderate impacts on floodplains are expected to continue as a result of ongoing and future development.

The replacement of wood poles would not alter floodplain function because the existing structures would be replaced by new structures in approximately the same locations. The construction of new access roads and reconstruction of some existing access roads would permanently disturb about 0.3 acre of floodplain habitat and result in a small amount of net fill within floodplains. The cumulative impact of the Proposed Action in addition to other past, present, and reasonably foreseeable future actions on floodplains would be **low**.

Water Resources and Fish

Incremental impacts on streams and water quality have occurred over time in Montana, including the project area within Flathead and Lake counties. Construction of the existing transmission line likely contributed to some impacts on streams, water quality, and fish habitat from structure installation, road construction and ongoing maintenance, culvert installation, and vegetation management (including danger, corridor, and access road tree removal). Many streams and riparian areas in the vicinity of the transmission line have been altered as a result of past commercial and residential development, road construction, and agricultural activities, including timber harvest, crop production, and livestock grazing. Streams have been realigned, straightened, and channelized, and culverts have been installed at road crossings. Riparian vegetation has been converted to impervious surfaces or crops, degraded from livestock grazing, or altered as a result of forestry practices. Municipal point sources, municipal stormwater sewer systems, and irrigated crop production have contributed pollutants to streams, reducing water quality. These activities have all contributed to a reduction in overall stream function, water quality, and high quality fish habitat in

the project area. Past and ongoing development, road construction and maintenance, and agricultural activities will all likely have some ongoing impacts on streams and water quality.

Future projects, including BPA reconductoring, rebuild, and fiber optic cable installation projects, the Wild Cramer Forest Health and Fuels Reduction Project, and MDOT operation and maintenance activities, would be required to comply with federal, state, and local regulations for the protection of streams and riparian buffers, and would be required to meet water quality criteria, but these projects could contribute to a cumulative impact on streams and water quality at the local level.

Ground-disturbing activities and culvert installation associated with the Proposed Action would result in some temporary disturbance in and within 100 feet of streams. Temporary impacts would be avoided and/or minimized through the implementation of BMPs. The Proposed Action would result in less than 0.1 acre of permanent stream impacts from new outfall protection where existing culverts would be replaced with new, larger diameter culverts. When considered in relation to other past, ongoing, and future projects, the Proposed Action's contribution to water quality degradation is not considerable and would therefore result in a **low** cumulative impact on water quality. The Proposed Action would have no cumulative impact on groundwater recharge within the transmission line right-of-way.

Visual Quality

Past and current projects, including the existing Kalispell-Kerr transmission line, urban development, roads, large farming operations, timber harvest, and other transmission lines and electrical infrastructure, contribute to the existing visual character and modification of the visual landscape in and around the transmission line and access road rights-of-way. Future projects may have construction schedules that overlap with the Proposed Action, and temporary construction activities during this period would result in visual effects. However, considering construction of the Proposed Action is temporary in duration, and would only occur in any one place for a few days at a time, the cumulative impacts on visual resources during construction are **low**.

The Proposed Action would have slightly taller structures, on average, than the existing structures. The maximum height of the structures would be 15 feet taller than the maximum height of the existing structures (95 feet compared to 80 feet). Once constructed, the rebuilt transmission line would look similar in character to the existing transmission line. When compared with the other past, present, and reasonably foreseeable projects and activities, the Proposed Action is expected to have a **low** cumulative impact on visual resources.

Air Quality

The Proposed Action would not have any permanent impacts on air quality, and therefore would not contribute to permanent cumulative effects on air quality. The Proposed Action would result in temporary impacts on air quality, such as temporary increases in particulate matter, dust, and vehicle emissions. These impacts would be localized; however, if project construction were to occur concurrently with schedules of other future projects nearby, all projects could cumulatively create a temporary impact on air quality that would be greater than if each project were constructed at separate times. The Proposed Action could occur within close enough proximity to the Wild Cramer Forest Health and Fuels Reduction Project and routine road and bridge maintenance activities that, if constructed concurrently, the projects could cumulatively result in a larger temporary impact on air quality than if constructed at different schedules. Since construction of the Proposed Action would not be concentrated in any one location, but spread out over 41 miles, its contribution to cumulative effects would be **low**.

In terms of cumulative impacts on the atmospheric levels of greenhouse gases, any addition, when considered globally, could contribute to long-term effects in terms of climate change. However, as described previously (Section 3.9, *Air Quality and Climate Change*), the concentrations estimated for the

Proposed Action (approximately 2,500 metric tons of carbon dioxide equivalent), when compared to the regional, national, and global rates, are low. In addition, the potential of the Proposed Action to assist in the transmission and distribution of renewable (non-fossil fuel burning) energy, such as wind power, would help offset the Proposed Action's contribution to cumulative greenhouse gas impacts. As of October 2013, wind, solar, and hydropower accounted for 53 percent of the generation capacity transmitted by BPA (BPA 2010). Overall, given the Proposed Action's small amount of contribution to greenhouse gases, the cumulative impact of the Proposed Action on greenhouse gas concentrations would be **low**.

Socioeconomics and Public Services

The region of influence considered for cumulative impacts on socioeconomics, environmental justice populations, and public services is Flathead and Lake counties. Other reasonably foreseeable future projects in the vicinity of the Proposed Action could affect these same resources. While many of these projects would bring temporary workers to the area, they would be constructed at various times, thereby reducing the potential overlap of project construction with construction of the Proposed Action. When considered collectively with other projects in the vicinity, the Proposed Action would not result in a large increase in the number of workers or spending related to work in Flathead and Lake counties. The small influx of revenue associated with the Proposed Action and other projects occurring at the same time would result in **low** but positive cumulative impacts on the economy in Flathead and Lake counties.

The project area contains minority and low-income populations within the census tract that overlaps part of the Flathead Indian Reservation (tract 9403.03). However, as mentioned in Section 3.10.2, the majority of the project footprint is located outside of that census tract and the type and intensity of impacts would be the same throughout the area affected by project. Therefore, during original construction of the transmission line, as well as during the rebuild activities analyzed in this EA, all persons, regardless of race or income, would experience the same low levels of effects. As a result, the contribution to cumulative impacts on environmental justice populations would be **low**.

The Proposed Action would have **low** temporary effects on fire protection services during construction. The Proposed Action would have no permanent increase in the local population that would subsequently increase the demand for public facilities and services (i.e., law enforcement, fire protection, medical services, schools, and utilities). Therefore, the contribution to cumulative impacts on public services would be **low**.

Cultural Resources

Past and present actions that likely impacted cultural resources are ground-disturbing activities associated with road and facility (including the transmission line) construction, residential development and agricultural practices. Reasonably foreseeable future projects in the vicinity of the APE that have the potential to disturb previously undiscovered cultural resources include, primarily, continued commercial and residential development. Publicly funded development projects are anticipated to have minimal cumulative effects due to the need to comply with state and federal laws regulating impacts to cultural resources. Because the Proposed Action occurs primarily within previously disturbed ROW of the existing transmission line, and BPA's commitment to implement mitigation measures described in Section 3.11, *Cultural Resources*, incremental impacts to cultural resources are anticipated to be low.

Noise, Public Health, and Safety

Past and ongoing activities within and near the transmission line and access road rights-of-way that have contributed to noise and public health and safety issues include timber harvest, agriculture, road construction and maintenance, transmission line maintenance, and some residential and commercial development. Planned future activities include transmission line rebuilds similar to the Proposed Action, transmission line maintenance, general road and bridge maintenance, and ongoing timber harvest and

agricultural activities. Noise, public health, and safety impacts associated with these types of activities are similar to those for the Proposed Action, and include temporary, periodic, or intermittent increases in noise levels, particularly during construction, the potential release of small amounts of hazardous materials (e.g., fuels, lubricants, and solvents) to the environment, and exposure of workers and nearby residents to public health and safety risks. The impacts of the Proposed Action in combination with ongoing and reasonably foreseeable future actions would have a **low** cumulative impact on noise because impacts would be temporary and localized, would not affect a large number of sensitive receptors, and corona noise would not change from existing conditions. The cumulative impacts on public health and safety from the release of hazardous materials would also be **low** because the Proposed Action includes mitigation measures to reduce the risk of accidental spills and exposure of workers and nearby residents to hazardous materials.

3.14 Intentional Destructive Acts

In its December 1, 2006 memorandum, the Department of Energy (DOE) issued interim guidance titled “Need to Consider Intentional Destructive Acts in NEPA Documents” (DOE 2006). This interim guidance was developed by the Office of NEPA Policy and Compliance and requires that all environmental impact statements and EAs prepared for proposed DOE actions address the potential environmental consequences of intentional destructive acts such as sabotage, terrorism, vandalism, and theft. Where applicable, partial guidance is also offered in “Recommendations for Analyzing Accidents under NEPA,” that was also prepared by the Office of NEPA Policy and Compliance in July 2002 (DOE 2002).

Intentional destructive acts, such as sabotage, terrorism, vandalism, and theft, sometimes occur at power utility facilities. Vandalism and theft are most common, and recent increases in the prices of metal and other materials have accelerated theft and destruction of federal, state, and local utility property. The impacts from vandalism and theft, although expensive, do not generally cause a disruption of service to the area.

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

Acts of sabotage or terrorism on electrical facilities in the Pacific Northwest are rare, although some have occurred. These acts generally focused on attempts to destroy large transmission line ***lattice-steel structures***. Depending on the size and voltage of the line, destroying towers or other equipment could cause electrical service to be disrupted to utility customers and end users. The effects of these acts would be as varied as those from the occasional sudden storm, accident, or blackout (disconnection of the source of electricity from all electrical loads in a geographic area) and would depend on the particular configuration of the transmission system in the area. While in some situations these acts would have no noticeable effect on electrical service, in other situations, service could be disrupted in the local area, or if the damaged equipment was part of the main transmission system, a much larger area could be left without power.

When a loss of electricity occurs, all services provided by electrical energy cease. Illumination is lost. Lighting used by residential, commercial, industrial, and municipal customers for safe movement and security is affected. Residential consumers lose heat. Electricity for cooking and refrigeration is also lost, so residential, commercial, and industrial customers cannot prepare or preserve food and perishables. Residential, commercial, and industrial customers experience comfort/safety and temperature impacts, increases in smoke and pollen, and changes in humidity due to loss of ventilation. Mechanical drives stop,

causing impacts as elevators, food preparation machines, and appliances for cleaning, hygiene, and grooming are unavailable to residential customers. Commercial and industrial customers also lose service for elevators, food preparation, cleaning, office equipment, heavy equipment, and fuel pumps.

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

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

While the likelihood for sabotage or terrorist acts on the Proposed Action is difficult to predict, it is unlikely that such acts would occur. If such an act did occur, it could impact the transmission system or electrical service to the local area. However, any impacts from sabotage or terrorist acts likely could be quickly isolated. The DOE, public and private utilities, and energy resource developers include the security measures described above, as well as other measures, to help prevent such acts and to respond quickly if human-caused damage occurs.

Chapter 4

Consultation, Review, and Permit Requirements

4.1 National Environmental Policy Act

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

4.2 Vegetation, Fish, and Wildlife

4.2.1 Endangered Species Act

The ESA of 1973 (16 U.S.C. § 1531 *et seq.*) established a national program for the conservation of threatened and endangered species of fish, wildlife, and plants, and the preservation of the ecosystems on which they depend. The ESA is administered by the USFWS for plants, wildlife, and freshwater species. The ESA defines procedures for listing species, designating critical habitat for listed species, and preparing recovery plans. It also specifies prohibited actions and exceptions.

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

BPA is preparing a biological assessment to address potential impacts on listed fish, wildlife, and plant species. The species addressed include Canada lynx, grizzly bear, bull trout, Spalding's campion, and water howellia. Proposed and candidate species (meltwater lednian stonefly and whitebark pine) will also be addressed in the biological assessment. As a result of the consultation process, the USFWS will likely prepare a Biological Opinion.

4.2.2 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 species and their habitats. In addition, the Fish and Wildlife Coordination Act (16 U.S.C. § 661 *et seq.*) requires federal agencies undertaking projects affecting water resources to consult with the USFWS and the state agency responsible for fish and wildlife resources.

BPA has consulted with the USFWS and has worked with the MTFWP and incorporated recommendations to avoid and minimize potential impacts on fish and wildlife resources. The Proposed Action would have low-to-moderate impacts on fish and wildlife, as described in Sections 3.5, *Wildlife* and 3.7, *Water Resources and*

Fish. Mitigation designed to avoid and minimize impacts on fish and wildlife and their habitat is identified in Sections 3.5.3 and 3.7.3 of this EA.

4.2.3 Migratory Bird Treaty Act and Federal Memorandum of Understanding

The Migratory Bird Treaty Act (MBTA) implements various treaties and conventions between the U.S. and other countries, including Canada, Japan, Mexico, and the former Soviet Union, for the protection of migratory birds (16 U.S.C. § 703-712). Under the MBTA, taking, killing, or possessing migratory birds or their eggs or nests is unlawful. Most species of birds are classified as migratory under the MBTA, except for certain nonnative species birds (e.g., European starlings [*Sturnus vulgaris*]).

BPA (through the DOE) and the USFWS have a Memorandum of Understanding to address migratory bird conservation in accordance with Executive Order 13186 (*Responsibilities to Federal Agencies to Protect Migratory Birds*), which directs each federal agency that is taking actions possibly negatively affecting migratory bird populations to work with the USFWS to develop an agreement to conserve those birds (DOE and USFWS 2013). The memorandum of understanding addresses how both agencies can work cooperatively to address migratory bird conservation and includes specific measures to consider implementing during project planning and implementation.

Dozens of species of birds protected under the MBTA are found within the transmission line right-of-way. The Flathead Audubon Society reports almost 200 breeding species from the Flathead Basin and surrounding areas (Flathead Audubon 2008). BPA would mitigate impacts on migratory birds through the use of timing restrictions during nesting seasons and installing bird strike diverters on conductor spans where a high risk of bird strikes might exist (e.g., river or wetland crossings) and where technically feasible (see Section 3.5, *Wildlife*).

4.2.4 Bald and Golden Eagle Protection Act

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

Bald and golden eagles occur within the vicinity of the project, but there are no documented bald or golden eagle nests within the transmission line and access road rights-of-way. If nests are discovered prior to construction and occupied at time of construction, timing restrictions would be implemented to avoid disturbance to nesting eagles.

4.3 Water Quality, Wetlands, and Floodplains Protection

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

Section 402 of the CWA authorizes discharges of pollutants, such as stormwater from point sources, into waters of the U.S. through the National Pollutant Discharge Elimination System (NPDES) permitting program. The EPA and delegated states administer the NPDES permitting program. As part of this program, general NPDES permits are issued to regulate stormwater discharges associated with construction activities. Under

the Stormwater Phase II Final Rule, all construction activities that disturb 1 or more acres of land are regulated. "Disturbance" refers to exposed soil resulting from activities such as clearing, grading, and excavating. Construction activities can include road building and demolition.

For federal facilities in Montana, EPA has delegated enforcement and permitting authority to the MTDEQ. MTDEQ regulates stormwater runoff from construction sites through a series of general and individual permits. BPA does not have a general permit that would cover the Proposed Action and therefore would have to obtain an individual permit from MTDEQ before construction begins. The individual permit conditions would be specific to the Proposed Action but would likely require BPA to notify the issuing agency of proposed construction activities, prepare and implement stormwater pollution prevention plans to control stormwater pollution associated with construction activities, and to notify the issuing agency once construction ceases and the site has been stabilized.

BPA would prepare a SWPPP to meet the requirements of the EPA Construction General Permit (February 16, 2012; EPA 2012) at the direction of MTDEQ. The EPA Construction General Permit also requires that BPA construction projects comply with water quality standards set by the state in Montana Code Annotated 75-5. The purpose of a SWPPP is to ensure that non-point source pollution does not contaminate waters of the U.S., either during or after construction.

Section 404 of the CWA established a program to regulate the discharge of dredged or fill material into waters of the U.S., including wetlands. This includes excavation activities that result in the discharge of dredged material that could destroy or degrade waters of the U.S. Dredge and fill activities are controlled by a Section 404 permit process that is administered by the Corps in Montana. BPA would obtain the required permits for this Proposed Action. The application would be reviewed by the Corps, MTDEQ, and Montana Department of Natural Resources and Conservation for work in streams, as appropriate. BPA would not begin construction until after the appropriate permits have been obtained.

The DOE mandates that impacts on floodplains and wetlands be assessed and alternatives for the protection of these resources be evaluated in accordance with *Compliance with Floodplain/Wetlands Environmental Review Requirements* (10 CFR 1022.12) and Federal Executive Orders 11988 (*Floodplain Management*) and 11990 (*Protection of Wetlands*). The Proposed Action crosses a mapped 100-year floodplain in the Kalispell Valley between line miles 3 and 8. An evaluation of project impacts on floodplains and wetlands is included in Section 3.6, *Wetlands and Floodplains*, of this EA. This EA serves as the notice of floodplain and wetlands actions, as required under 10 CFR 1022.12(b).

4.4 Land Use Plan and Program Consistency

As a federal agency, BPA is not required to comply with state and local land use approvals or permits; however, BPA strives to meet or exceed these substantive standards and policies to the maximum extent practical. Several state and local land use plans guide development in and along the transmission line right-of-way (Table 4.4-1). BPA would coordinate with state and local agencies to obtain the necessary access and alert them of potential impacts from the Proposed Action, such as on utilities or floodplains. BPA would also coordinate with MTDOT for modification to or any new access roads requiring access off an MTDOT-managed state roadway.

Table 4.4-1. Land Use Plans in the Transmission Line Right-of-Way

Federal		
Flathead National Forest	Flathead National Forest Land & Resource Management Plan	The Forest Plan provides guidance for management activities, establishes management standards for land within the Flathead National Forest, and provides long-term direction for management of those lands. Lands crossed by the Proposed Action are used primarily for economical timber management, but the plan also considers visual sensitivity with a “modification” Visual Quality Objective.
State		
State of Montana	Montana Code Annotated, Title 76 – Land Resource and Use, Chapter 2 – Planning and Zoning	Authorizes counties to exercise zoning authority, establish zoning authority and development regulations, and require permits.
Tribal		
Confederated Salish and Kootenai Tribes	Comprehensive Resources Plan	This plan establishes goals, policies, and objectives for management of natural, cultural, and other land resources on the Flathead Indian Reservation. The Tribes coordinate with the county and other governments to ensure that land use policies enforced by those entities are consistent with Tribal goals. The Tribes issue permits and leases for certain types of development on Tribal land (Confederated Salish and Kootenai Tribes 1995).
County		
Flathead County	Growth Policy	Sets goals and policies for land use, transportation, parks and recreation, and other factors affecting growth and development within the county.
	Zoning Regulations	Regulates land uses within unincorporated county lands. Zoning designations in the project area include several agricultural zones (AG-80, AG-20, and SAG-10) and two residential zones (R-1 and R-2). Near line mile 6, the land is zoned for agriculture, and areas around U.S. Highway 93 and State Route 35 are designated scenic corridors. Other portions of the right-of-way within Flathead County are unzoned. The zoning regulations establish allowable uses, permitting requirements, dimensional standards, and other development standards.
Lake County	Growth Policy	Sets goals and objectives to guide land use in unincorporated areas of the county and non-Tribal fee lands within the Flathead Indian Reservation.
	Density Map and Regulations	Regulates land uses within unincorporated county lands. The Density Map establishes maximum development density within portions of the county that are outside of certain designated zoning districts. The Proposed Action is not within any specifically zoned land use areas in Lake County. The Density Regulations set minimal development requirements, such as subdivision requirements or sanitary sewer standards, but do not prescribe allowable land uses.

4.5 Air Quality and Greenhouse Gases

4.5.1 Air Quality

The Clean Air Act, as revised in 1990 (42 U.S.C. § 4701), requires the EPA and delegated states to carry out a range of regulatory programs intended to ensure attainment of the NAAQS. Air quality impacts of the Proposed Action would be low, localized, and temporary, as described in Section 3.9, *Air Quality and Climate Change*.

4.5.2 Greenhouse Gases

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

- The Clean Air Act (as described in Section 3.9, *Air Quality and Climate Change*) is a federal law that establishes regulations to control emissions from large generation sources such as power plants; limited regulation of greenhouse gas emissions occurs through the New Source Review permitting program.
- EPA has issued the *Final Mandatory Reporting of Greenhouse Gases Rule* (40 CFR 98) that requires reporting of greenhouse gas emissions from large sources. Under the rule, suppliers of **fossil fuels** or industrial greenhouse gases, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of greenhouse gases are required to submit annual reports to EPA (EPA 2010).
- Executive Orders 13423 and 13514 require federal agencies to measure, manage, and reduce greenhouse gas emissions by agency-defined target amounts and dates.

Greenhouse gas emissions were calculated for activities that would produce greenhouse gas emissions as part of the Proposed Action, focused on the construction activities associated with the transmission line rebuild. The Proposed Action's greenhouse gas emissions would be below EPA's mandatory reporting threshold. The impact of the Proposed Action on greenhouse gas emissions is described in Section 3.9, *Air Quality and Climate Change*.

4.6 Cultural and Historic Resources

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

- Antiquities Act of 1906 (16 U.S.C. § 431-433).
- Historic Sites Act of 1935 (16 U.S.C. § 461-467).
- NHPA (16 U.S.C. § 470 *et seq.*), as amended, inclusive of Section 106.
- Archaeological Data Preservation Act of 1974 (16 U.S.C. § 469 a-c).

- Archaeological Resources Protection Act of 1979 (16 U.S.C. § 470 aa-mm), as amended.
- Native American Graves Protection and Repatriation Act (NAGPRA) (25 U.S.C. § 3001 *et seq.*).
- Executive Order 13007, *Indian Sacred Sites*.
- American Indian Religious Freedom Act of 1978 (42 U.S.C. § 1996, 1996a).

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

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

To this end, BPA provided information about the Proposed Action and requested input on cultural resources from the Confederated Salish and Kootenai Tribes. BPA also conducted a records search of the APE to identify potential impacts on cultural resources from the Proposed Action (see Section 3.11, *Cultural Resources*). The records search indicated that there were few documented resources in the APE and none that would be adversely affected after application of appropriate mitigation measures. Field surveys of the entire APE planned for the summer of 2015 would verify the records search and identify undocumented resources. BPA would work with the SHPO to determine the appropriate mitigation measures at any sites that could be affected by the Proposed Action. Mitigation measures would likely include additional site characterization before construction, and on-site monitoring during construction.

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

4.7 Noise, Public Health, and Safety

4.7.1 Noise

The Noise Control Act of 1972 (42 U.S.C. § 4901 *et seq.*), as amended, sets forth a broad goal of protecting all people from noises that jeopardize their health or welfare. The Noise Control Act further states that federal agencies are authorized and directed, to the fullest extent consistent with their authority under federal laws administered by them, to carry out the programs within their control in such a manner as to further this policy. As described in Section 3.12, *Noise, Public Health, and Safety*, the Proposed Action would

have temporary and low noise impacts. Standard mitigation measures are identified to further reduce noise impacts and ensure compliance with the Noise Control Act.

4.7.2 Public Health and Safety

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

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

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

The Safe Drinking Water Act (41 U.S.C. § 300f *et seq.*) is designed to protect the quality of public drinking water and its sources. BPA would comply with state and local public drinking water regulations. All wood poles to be used would be treated with preservatives in a manner that exceeds the WWPI standards (see Section 3.12, *Noise, Public Health, and Safety* for details). The Proposed Action would not affect any **sole source aquifers** or other critical aquifers, or adversely affect any surface water supplies.

4.8 Environmental Justice

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

The Proposed Action has been evaluated for potential disproportionately high environmental effects on minority and low-income populations, and none were identified, as described in Section 3.10, *Socioeconomics and Public Services*.

4.9 Federal Communications Commission

Federal Communications Commission (FCC) regulations require that transmission lines be operated so that radio and television reception is not seriously degraded or repeatedly interrupted. Furthermore, FCC regulations require that the operators of these devices mitigate such interference. There would likely be no interference with radio, television, or other reception as a result of the Proposed Action (see Section 3.12, *Noise, Public Health, and Safety*). BPA would comply with FCC requirements relating to radio and television interference from the Proposed Action if any such interference occurs.

4.10 Farmland Protection Policy Act

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

A large portion of the transmission line is located in or adjacent to agricultural land. The Proposed Action would occur almost entirely along the existing transmission line right-of-way and within existing access road rights-of-way (the only exception being a few new access roads). Evaluation of the Proposed Action according to the criteria set forth in the Farmland Protection Policy Act indicates that the Proposed Action would comply with the act and would have little long-term impact on area farmlands. Impacts on farmland are described in Section 3.2, *Land Use, Recreation, and Transportation*.

4.11 Permits for Right-of-Way on Public Lands

Building a transmission line across federally owned lands requires the approval of the land management agency. The U.S. Forest Service has been included in the scoping and public review noticing of this EA. While not a cooperating agency as defined in the implementing NEPA regulations, the U.S. Forest Service must decide whether or not to grant BPA a permit for additional access roads on the Island Unit of the Flathead National Forest beyond what has been granted under the Special Use Permit for the existing transmission line.

4.12 Federal Aviation Administration

As part of transmission line design, BPA seeks to comply with Federal Aviation Administration (FAA) procedures. The FAA requires BPA to submit its designs for approval if a proposed structure is taller than 200 feet from the ground, if a conductor is 200 feet above the ground, or if any part of the proposed transmission line or its structure is within the approach path of an airport. While the Proposed Action does not appear to be within any of the distances specified, final locations of structures, structure heights, and conductor heights would be submitted to the FAA for approval.

4.13 Recreation Resources

BPA used the Wild and Scenic River inventory of listed and proposed rivers (16 U.S.C. Sec. 1273 (b)) qualifying for Wild, Scenic, or Recreation River to evaluate recreational resources and impacts. The North and Middle forks of the Flathead River are designated Wild and Scenic, as is the South Fork Flathead River upstream of Hungry Horse Reservoir. All of these river segments are outside the areas affected by the Proposed Action. Therefore, the Proposed Action would not cross any segments listed as Wild and Scenic. Impacts on the visual quality in the vicinity of the river are described in Section 3.8, *Visual Quality*.

The Northwest Power and Conservation Council's Protected Area Amendments to the Pacific Northwest Electric Power Planning Council Designation Act of 1980 are not applicable to the project.

No National Recreation or National Scenic Trails identified in the National Trail System (16 U.S.C. Sec. 1242-1245) either cross or are in the vicinity of the right-of-way. No other areas of national environmental concern are found on or near the right-of-way.

Executive Order 12962 mandates disclosure of effects to recreational fishing. The Proposed Action would not be expected to affect recreational fishing species or opportunities in the vicinity of the project area. For more information, see Section 3.2, *Land Use, Recreation, and Transportation*, and Section 3.7, *Water Resources and Fish*.

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Chapter 5

Persons, Tribes, and Agencies Receiving Notice of Availability of the EA

The project mailing list contains hundreds of stakeholders, including potentially interested or affected landowners; Tribes; local, state, and federal agencies; public officials; non-governmental organizations; businesses; and libraries. They have directly received or have been given instructions on how to receive all project information made available to date. Information distributed to these stakeholders includes scoping notifications, comment submission forms and website addresses, and review opportunities for the Draft EA. Specific entities (other than private persons) receiving or consulted during the preparation of this EA are listed below by category.

5.1 Federal Agencies and Officials

U.S. Forest Service	U.S. Environmental Protection Agency
U.S. Fish and Wildlife Service	U.S. Senator Jon Tester
U.S. Army Corps of Engineers	U.S. Senator Max Baucus
U.S. Bureau of Reclamation	U.S. Representative Steve Daines

5.2 Tribes

Confederated Salish and Kootenai Tribes

5.3 State Agencies and Officials

Montana Fish, Wildlife, and Parks	Montana State Legislator, Dee Brown, Senator
Montana Department of Environmental Quality	Montana State Legislator, Verdell Jackson, Senator
Montana Bureau of Mines and Geology	Montana State Legislator, Jon Sonju, Senator
Montana State Historic Preservation Office	Montana State Legislator, Janna Taylor, Senator
Montana Department of Transportation	Montana State Legislator, Bruce Tutvedt, Senator
Montana Department of Natural Resources and Conservation	Montana State Legislator, Mark Blasdel, Representative
Montana Department of Commerce	Montana State Legislative Environmental Policy Office
Montana Governor's Office	

Montana State Legislator, Randy Brodehl,
Representative

Montana State Legislator, Jerry O'Neil,
Representative

Montana State Legislator, Carl Glimm,
Representative

Montana State Legislator, Keith Regier,
Representative

Montana State Legislator, Greg Hertz,
Representative

Montana State Legislator, Scott Reichner,
Representative

Montana State Legislator, Steve Lavin,
Representative

Montana State Legislator, Daniel Salomon,
Representative

Montana State Legislator, Ed Lieser,
Representative

5.4 Local Governments and Utilities

Goode/Mission Valley Power

Flathead County Commissioner, Pamela Homquist

NorthWest Energy

Flathead County Commissioner, Gary Krueger

Flathead Electric Cooperative

Flathead County River Commission

Grant Public Utilities District

Flathead County Weeds Department

PPL Montana

Lake County Commissioner, Ann Brower

Western Montana Generating & Transmission
Cooperative, Inc.

Lake County Commissioner, Gale Decker

City of Kalispell

Lake County Commissioner, Bill Barron

Flathead County Commissioner, Cal Scott

Lake County Planning Department

5.5 Non-governmental Organizations

Northwest Power and Conservation Council

Clark Fork Coalition

Clearwater Resources Council

Flathead Basin Commission

Headwaters Montana

Flathead Land Trust

Flathead Chapter, National Audubon Society

Flathead Lakers

Montana Chapter, National Audubon Society

Kootenai River Network

Flathead Conservation District

Montana Environmental Information Center

Citizens for a Better Flathead

Montana Land Reliance

Montana Trout Unlimited

Swan View Coalition

Montana Wilderness Association

Trout Unlimited

Montana Wildlife Federation

Swan Ecosystem Center

Swan Lakers

Whitefish Lake Institute

5.6 Libraries

Flathead County Library, Main Library, Kalispell, Montana (MT)

St. Ignatius School-Community Library, St. Ignatius, MT

Flathead County Library, Bigfork Branch, Bigfork, MT

Ronan City Library, Ronan, MT

Polson City Library, Polson, MT

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Chapter 6

Glossary and Acronyms

6.1 Glossary

100-year floodplain – areas that have a 1 percent chance of being flooded in a given year, as designated by FEMA.

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

Anchor – an object secured in the ground, typically a helical object, used to secure guy wires into the ground.

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

Area of Potential Effects (APE) – the geographic area or areas within which an undertaking may directly or indirectly cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effects is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.

Avulsion – the geomorphic process of channel movement across a floodplain whereby a stream leaves one channel and enters another, most typically during flood or extremely high flow events.

A-weighted decibel scale – the scale used to measure and describe volume that corresponds to human perception.

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

Bird flight diverter – small object attached to the conductor to increase the visibility of overhead wires to birds to deter birds and reduce the risk of collision with the line.

Blading – mechanical alteration of the ground surface to achieve a level surface. Typically used for access road improvements and accomplished with bulldozers or road graders.

Built environment resources – a feature constructed by humans.

Carbon dioxide equivalent (CO₂e) – a measurement used to compare the global warming potential of a typical greenhouse gas, based on concentrations of carbon dioxide. This unit of measure is used by the Intergovernmental Panel on Climate Change and takes into account the global warming potential of each of the emitted greenhouse gases using global warming potential factors.

Centerline – the center line of the right-of-way, which divides it into halves of equal width.

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.

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

Corridor tree – trees within BPA’s legally defined right-of-way but that are not considered part of a low-growing plant community.

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.

Critical habitat – as defined by the ESA, a specific geographic area(s) that is essential for the conservation of a threatened or endangered species and that may require special management and protection. Critical habitat may include an area that is not currently occupied by the species but that will be needed for its recovery.

Cross-arms – horizontal arms near the top of the transmission structure that support the insulators and conductors.

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 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 to minimize vibration of the conductors in windy conditions.

Danger trees – trees located outside the transmission line right-of-way that are a current or future hazard to the transmission line.

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

Electric and magnetic field (EMF) – the physical field around the electric wire or conductor that is produced when electric transmission is occurring.

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 or water.

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

Forb – a broadleaf non-woody plant that is not a grass, sedge, or rush.

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

Fugitive sources of emissions –those emissions that could not reasonably pass through a stack, chimney, vent, or other functionally equivalent opening (Administrative Rules of Montana 17.8.1201.19). For example, dust from dirt roads is a fugitive emission.

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 property – any prehistoric or historic district, site, building, structure, or object included in, or eligible for inclusion in the National Register (16 U.S.C. Section 470(w)(5)).

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.

Invasive weeds – includes noxious weeds and other plant species that are not native to the area where they are found.

Isolate – an archaeological site with less than nine artifacts.

Kilovolt (kV) – one thousand volts of electrical power.

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

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

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

Metamorphic rock – rock that was once one form of rock but has changed to another under the influence of heat, pressure, or some other agent without passing through a liquid phase. Examples are marble (which can be formed from limestone) and slate (which is formed from shale).

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.

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

Overstory tree – a tall, generally mature tree that creates a forest canopy over lower growing vegetation closer to the ground (the understory).

Perennial – refers to 1) streams or waterways with continuous, year-round water flow, or 2) a plant that lives more than 2 years.

Period of significance – that time period in which the property established its historical associations with events or persons, or when the property achieved its defining physical characteristics. The period of significance may span several years or may be only a single year.

Propagule(s) – refers to a plant part that can break off the parent plant and grow into an entirely new plant.

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

Riffles – fast, turbulent, shallow flow over submerged or partially submerged gravel and cobble substrates. Low gradient; usually 0.5–2 percent slope, rarely up to 6 percent.

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

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

Sedimentary rock – rock that has formed through the deposition and solidification of sediment, especially sediment transported by water, ice, and wind. Sedimentary rocks are often deposited in layers and frequently contain fossils.

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.

Spark-discharge activity – electric sparks between electrical separations (gaps) in the metal parts of a transmission line. Spark discharges can create noise and possible electromagnetic interference. Spark-discharge activity with transmission lines is often associated with aging connecting hardware.

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.

System reliability – the amount of certainty that a transmission system will consistently operate and provide power to its operating standard without interruption.

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 (TMDL) – the maximum amount of a pollutant that can be introduced to a water body while still being compliant with water quality standards.

Traditional cultural property – one that is eligible for inclusion in the National Register because of its association with 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).

Travel route – any of several different types of roads that are used to move construction or maintenance equipment and supplies to and from the work areas.

Tributary – a stream or river that flows into a main stem (or parent) river or a lake. A tributary does not flow directly into a sea or ocean.

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

Unincorporated land – land that is not part of or governed by a municipality, usually used when referring to lands not within a city.

Upland – land above a wetland that supports precipitation-dependent vegetation.

Viewshed – an area visible from a defined location.

Voltage – the flow of electrical current through the conductor.

Water bar – a channel across the road surface that diverts surface water that would otherwise flow down the whole length of the road, used to prevent erosion on sloping roads, cleared paths through woodland, or other access ways by reducing flow length.

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

APE	area of potential effects
BMP	best management practice
BPA	Bonneville Power Administration
CEQ	Council on Environmental Quality
CFR	Code of Federal Regulations
Corps	U.S. Army Corps of Engineers
COTR	Contracting Officer's Technical Representative
CWA	Clean Water Act
dBA	A-weighted decibel
dbh	diameter at breast height
DOE	Department of Energy
EA	Environmental Assessment
EMF	electric and magnetic field
EPA	U.S. Environmental Protection Agency
ESA	Endangered Species Act
FAA	Federal Aviation Administration
FCC	Federal Communications Commission
FEMA	Federal Emergency Management Agency
FR	Federal Register
GIS	geographic information system
kV	kilovolt
kV/m	kilovolts per meter
MBTA	Migratory Bird Treaty Act
mG	milligauss
MOU	Memorandum of Understanding
MPD	Multiple Property Documentation
MT	Montana
MTDA	Montana Department of Agriculture
MTDEQ	Montana Department of Environmental Quality
MTDOT	Montana Department of Transportation
MTFWP	Montana Fish, Wildlife, & Parks
MTNHP	Montana Natural Heritage Program
NAAQS	National Ambient Air Quality Standards

NAGPRA	Native American Graves Protection and Repatriation Act
NEPA	National Environmental Policy Act
NESC	National Electrical Safety Code
NHPA	National Historic Preservation Act
NLCD	National Land Cover Database
NPDES	National Pollutant Discharge Elimination System
NRCS	Natural Resources Conservation Service
PM ₁₀	particulate matter less than 10 microns in diameter
PM _{2.5}	particulate matter less than 2.5 microns in diameter
ppb	parts per billion
PPL	Pennsylvania Power and Light
RCRA	Resource Conservation and Recovery Act
SHPO	State Historic Preservation Office/Officer
SOC	Species of Concern
SPRP	Spill Prevention and Response Procedures
SWPPP	Stormwater Pollution Prevention Plan
TMDL	Total Maximum Daily Load
U.S.	United States
U.S.C.	United States Code
USDA	U.S. Department of Agriculture
USFWS	U.S. Fish and Wildlife Service
WWPI	Western Wood Preservers Institute

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Chapter 7

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Appendix A

Greenhouse Gas Supplemental Information

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APPENDIX A ASSUMPTIONS USED TO CALCULATE GREENHOUSE GAS EMISSIONS AND DETAILED RESULTS

Implementation of the Proposed Action could contribute to an increase in greenhouse gas (GHG) concentrations through the below-listed activities. The assumptions and methods used to determine the project's contribution to GHG levels are described below.

ASSUMPTIONS

Construction

Project construction would take about 15 months during two construction seasons, with peak construction activity, including road and structure installation, occurring during most of this period. Non-peak construction activities would include installing and removing best management practices (BMPs), establishing staging areas, moving equipment and material into and out of the project area, and site preparation and restoration work.

The transportation components of GHG emissions were estimated based on the approximate number of vehicles that would be used during project construction and the approximate distance those vehicles would travel. GHG emissions were calculated for both the 10-month-long peak construction period and the 5-month-long 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 Kalispell, Montana to the Hills Creek Substation and back (about 100 miles round trip)¹.
- 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 17 miles per gallon (EPA 2013). 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 80 construction workers could be at work on the transmission line during the peak construction period (10 months), and an estimated 20 workers could be present during the non-peak construction period (5 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 1 round trip every week from the Kalispell District Headquarters during the 15-month-long construction period at an estimated 100 miles per trip.

¹ This distance was chosen as part of developing a conservative estimate. Workers would likely travel fewer miles to reach most project work areas.

Helicopters may be used to replace the conductor. It was assumed that the helicopter would be used for approximately 4 hours a day for 3 months (26 work days) to conduct this work. An estimated 2 round trips from the Kalispell Airport each day would result in a total of an estimated 150 miles per day.

Fuel consumption and GHG emissions would also result from operation of on-site heavy construction equipment. Heavy construction equipment may include augers, bulldozers, excavators, graders, heavy-duty trucks, and front-end-loaders. Similar to the transportation activities identified above, the increased use of heavy construction equipment would occur during peak construction.

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. Although it is difficult to develop an accurate estimate of total fuel consumption associated with heavy construction equipment operation, the following assumptions were used:

- A maximum of 20 pieces of equipment would be in operation during peak construction, and 5 pieces of equipment 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 overestimate because equipment commonly operates in idle or at reduced power.
- Equipment would operate at approximately 35 percent efficiency, representing the percentage of productive energy extracted from the diesel fuel relative to the maximum potential energy within the fuel (i.e., 128,450 British thermal units per gallon of diesel) (AFDC 2013).

Tree Sequestration Reduction

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 Rocky Mountain North, a report published by the U.S. Forest Service in 2006 estimates that the maximum carbon density associated with a fully mature forest ranges from 41 to 233 metric tons of carbon per acre (Smith et al. 2006). Although tree removal does not immediately emit any GHG, this analysis is intended to account for the permanent loss of a carbon storage reservoir resulting from land use changes.

The analysis assumes that approximately 18 acres of land would be permanently cleared of trees and converted to an area where trees would not be allowed to regrow. This is an overestimation because some of these areas currently lack mature trees and trees would be allowed to regrow in areas outside the right-of-way. Further, trees in some of these areas would never reach full maturity due to natural attrition or other human-related disturbances. Because a majority of the tree clearing would occur in either a Douglas fir or Ponderosa pine forest type, a carbon storage estimate of 60 metric tons of carbon per acre was used (Smith et al. 2006). It is assumed that 100 percent of the stored carbon would be converted to CO₂ upon conversion. The use of tree removal equipment to clear access road areas and the right-of-way was included within the construction section analysis, described above.

DETAILED RESULTS

The GHG emissions or storage loss are quantified below for each type of activity described above.

Construction Emissions

Table A-1 displays the results of calculations for the construction activities that would contribute to GHG emissions. Construction of the Proposed Action would result in an estimated 8,841.6 metric tons of CO₂e² emissions.

Table A-1. Estimated Greenhouse Gas Emissions from Project Construction

Estimated GHG Emissions of Construction Activities	CO ₂ (metric tons) ¹	CH ₄ (CO ₂ e) (metric tons) ²	N ₂ O (CO ₂ e) (metric tons) ²	Total CO ₂ e (metric tons) ³
Peak construction transportation	452.8	296.7	1,773.2	2,522.7
Off-peak construction transportation	56.6	37.1	221.7	315.3
BPA employee transportation	1.1	0.7	4.4	6.3
Helicopter operation	105.6	1.9	0.4	107.9
Peak construction: equipment operation	1,252.3	1.3	8.4	1,262.0
Off-peak construction: equipment operation	626.1	0.7	4.2	631.0
TOTAL³	2,494.6	338.3	2,012.3	4,845.2

¹ CO₂ emission factors calculated from The Climate Registry (2014).
² CH₄ and N₂O emissions have been converted into units of equivalent carbon dioxide (CO₂e) using the IPCC global warming potential (GWP) factors of 25 GWP for CH₄ and 298 GWP for N₂O (The Climate Registry 2014).
³ The sum of the individual entries may not sum to the total depicted due to rounding.
⁴ This value was rounded to 4,900 metric tons in Chapter 3 of the environmental assessment.

Tree Sequestration Reduction

BPA estimates that approximately 18 acres of trees need to be removed for the Proposed Action. If those trees were to be allowed to reach full maturity, the area would provide approximately 1,080 metric tons of CO₂e³.

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² CO₂e 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 D-1.

³ Based on a maximum carbon storage rate of 160 tons of carbon per acre. Assumes that 100 percent of the carbon stored would be converted to CO₂.

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