BONNEVILLE POWER ADMINISTRATION

KOOTENAI RIVER HABITAT RESTORATION AT BONNERS FERRY PROJECT

Draft Environmental Assessment
February 2015

DOE/EA-1973

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Chapter 1 PURPOSE AND NEED FOR ACTION

Bonneville Power Administration (BPA) proposes to fund a project by the Kootenai Tribe of Idaho (Tribe) to restore Kootenai River white sturgeon (*Acipenser transmontanus*) habitat in Boundary County, Idaho (Figure 1-1). The Kootenai River Habitat Restoration at Bonners Ferry Project would improve habitat conditions at two locations in the Kootenai River to help adult sturgeon migrate upstream, improve spawning habitat, increase juvenile rearing habitat, and improve overall ecosystem function. The project would be located in Bonners Ferry, the largest city in Boundary County, Idaho (Figure 1-1).

The project would involve creating deeper pools in the river, installing structures to help direct water currents, developing and enhancing islands, grading banks, planting native vegetation, and enhancing areas of the river bottom with rock.

The project would improve habitat for Kootenai River white sturgeon, which are listed as threatened under the Endangered Species Act (16 USC 1531 *et seq*.) and other native fish. These efforts would complement other restoration activities already occurring on the Kootenai River, and would help mitigate for the construction and operation of Libby Dam located upstream in Montana.

BPA prepared this draft environmental assessment (EA) to comply with the National Environmental Policy Act (NEPA), which requires federal agencies to assess the effects their actions may have on the environment. Preparation of this EA helps BPA meet those requirements.

This chapter provides the following information:

- Why BPA needs to take action
- Background information on the Kootenai River restoration at Bonners Ferry
- Summary of the public engagement process and comments received
- Issues that are outside of the scope of this EA

1.1 Need for Action

BPA needs to respond to the Tribe's request to fund its proposal to restore and improve Kootenai River white sturgeon habitat in the Kootenai River near Bonners Ferry, Idaho. Currently, the project area lacks properly functioning riparian areas, hydrologic connection to floodplains, and deep pools for fish staging, holding, and migration. Shrubs and trees grow intermittently along a narrow band next to the banks, and there are two vegetated islands within the proposed project area. The existing shallow gravel bars do not support mature vegetation because water regularly submerges the area.

The proposed project would create three deep pools, establish two new islands, enhance adjacent bank margins, and place new rock on the riverbed to improve sturgeon spawning habitat.

1.2 Purposes

In meeting the need for action, BPA seeks to achieve the following purposes:

- Act consistently with all applicable laws, regulations, and policies that guide BPA
- Help mitigate for effects from the construction and operation of Libby Dam and the Federal Columbia River Power System (FCRPS) on fish and wildlife in the Kootenai River, pursuant to the Pacific Northwest Electric Power Planning and Conservation Act of 1980 (Northwest Power Act) (16 U.S.C. 839 *et seq.*)
- Seek to further address obligations under the 2006 Libby Dam Biological Opinion as clarified in 2008 that directs the BPA and US Army Corps of Engineers to "…support the Kootenai Tribe of Idaho's good-faith efforts to implement the Kootenai River Restoration Project Master Plan…." (USFWS 2006, 2008)

1.3 Background

1.3.1 *Ongoing Mitigation Efforts for Libby Dam*

Under the Northwest Power Act, 16 USC § 839b(h)(10)(A), BPA has an obligation to protect, mitigate, and enhance fish and wildlife, and their habitats, affected by the development and operation of the FCRPS. To help accomplish this, the Act requires BPA to fund fish and wildlife protection, mitigation, and enhancement actions consistent with the Northwest Power and Conservation Council's (Council) Fish and Wildlife Program, the purposes of the Act, and other environmental laws. Under this program, the Council reviews habitat improvement (or restoration) plans submitted by various entities, and makes recommendations to BPA about which fish and wildlife projects to fund.

The Tribe began data collection and analysis of Kootenai River habitat conditions under the Council's Program in 2006 and completed the Kootenai River Habitat Restoration Program Master Plan in 2009 (Kootenai, 2009) (described in Section 1.3.3). In 2011, the Tribe submitted a proposal to the Council to implement specific habitat restoration projects consistent with the framework presented in the Master Plan. In 2012, the Council's Independent Scientific Review Panel (ISRP) reviewed Kootenai River Habitat Restoration Program and the list of proposed projects, and recommended that BPA fund the proposal.

1.3.2 *Libby Dam Biological Opinion*

The Libby Dam is on the Kootenai River in Montana, approximately 220 miles from the confluence of the Columbia River. The US Army Corps of Engineers (USACE) operates Libby Dam for flood control, hydropower generation, navigation, recreation, fish, and wildlife. BPA markets the power generated from this dam, which is a major upriver storage dam for the region.

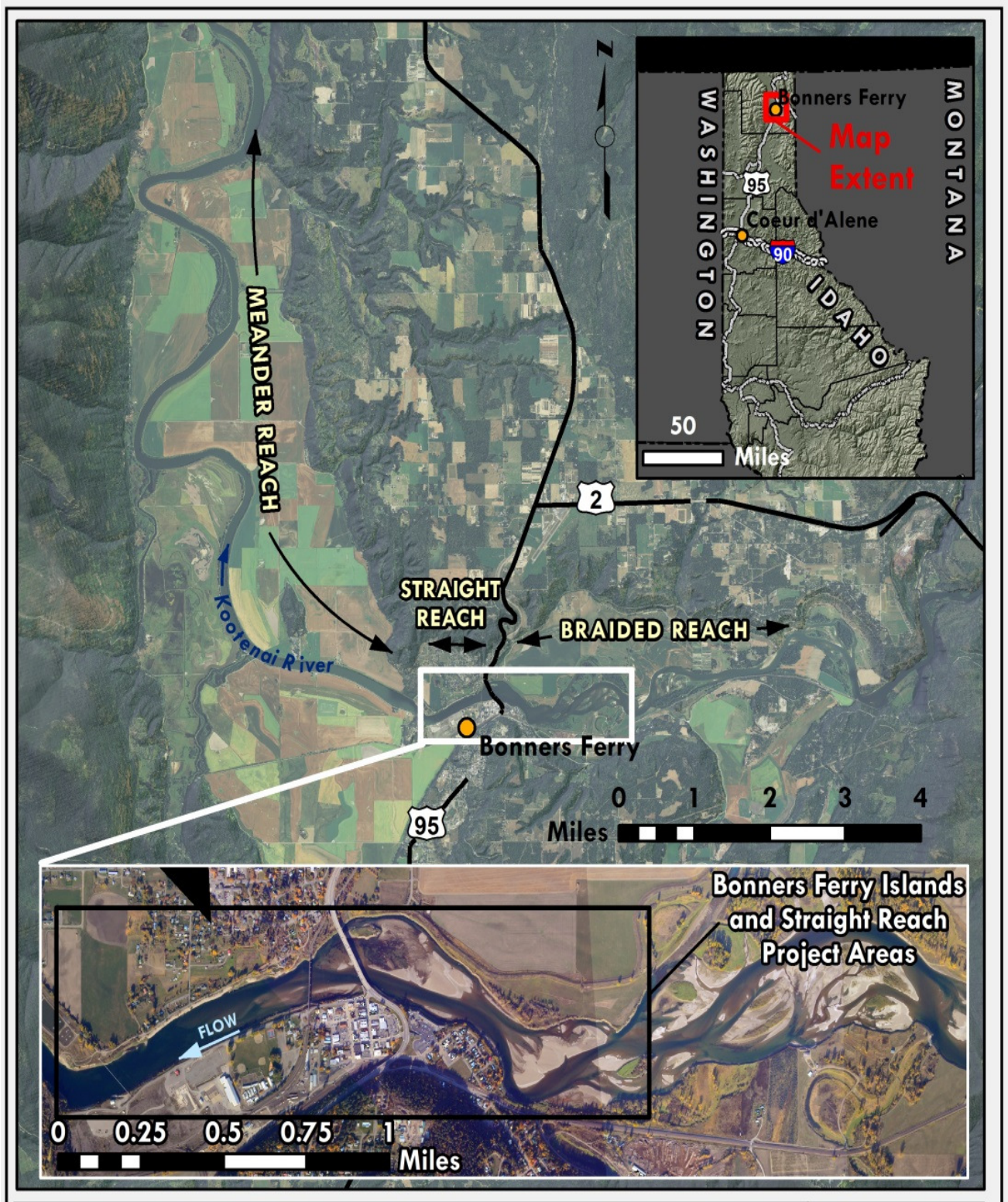

Figure 1-1. Kootenai River Restoration at Bonners Ferry Project Vicinity Map

08/2012, River Design Group, Inc.
Aerial Photography: Inset map: KTOI, Acquisition date 10/27/2011; Larger map: 2011 NAIP.

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The USACE, the Bureau of Reclamation, and BPA have consulted with the US Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) to address the effects of the operation of FCRPS projects, including Libby Dam, on fish listed as endangered or threatened under the Endangered Species Act and on their designated critical habitat. Dam operations have affected annual peak flows, temperature, and sediment transport in the Kootenai River. In 2003, the USACE began altering discharges at Libby Dam, on an interim basis, to more closely mimic the Kootenai River's historical flow patterns, while still providing flood control.

In February 2006, the USFWS issued a Biological Opinion on the Effects of Libby Dam Operation on the Kootenai River White Sturgeon, Bull Trout and Kootenai Sturgeon Critical Habitat (Libby Dam BiOp) (USFWS 2006, 2008). The Kootenai River white sturgeon is one of 18 land-locked populations of white sturgeon in western North America. The population of Kootenai River white sturgeon has declined due to the changes in river flows caused by Libby Dam and its operation, altered in-river habitat conditions, loss of floodplain habitat and connectivity, over-harvest (before listing under the Endangered Species Act), and land use changes such as agricultural development and urbanization (USFWS, 2013). Dam operations have reduced annual peak flows by approximately 50 percent and disrupted the historical rise and fall of water levels (Berenbrock 2005). Operation of Libby Dam has also created unnatural flow fluctuations and, in combination with diking, has largely eliminated the river's connection with its historical floodplain.

The Libby Dam BiOp identifies general categories of habitat improvement actions to enhance conditions where sturgeon currently spawn, to coax sturgeon to move upstream to spawn in areas where habitat is thought to be more suitable, and to improve river habitat conditions. The restoration actions that the Tribe would implement under the proposed project are actions identified in the Libby Dam BiOp and developed in more detail in the Tribe's Master Plan.

1.3.3 *Kootenai River Restoration Program Master Plan*

In 2006, BPA provided funding to the Tribe to begin the Kootenai River Habitat Restoration Program. This funding allowed the Tribe to collect information and identify specific habitat projects in the Kootenai River that would enhance habitat for Kootenai River white sturgeon as required by the Libby Dam BiOp.

In 2009, the Tribe completed a restoration Master Plan for a large-scale, ecosystem-based, river habitat restoration program. This plan incorporated a 55-mile segment of the Kootenai River, extending from the confluence of the Moyie and Kootenai rivers, downstream to the Canadian border.

The plan provides a summary of historical and existing conditions in the 55-mile program area, and identifies specific physical and biological characteristics in each of the river segments, in the program area. It also identifies factors that limit habitat (aka "limiting factors") for aquatic species including sturgeon, burbot, and native members of the salmon family, within the project area. Based on this information, the plan identifies restoration strategies and habitat enhancements to address the limiting factors in each river segment. The Master Plan defined limiting factors as the physical, biological, and ecological conditions within the project area that: 1) limit the ability of the ecosystem to sustain diverse native plant and animal populations, and to accommodate natural disturbances; 2) limit the quality or availability of habitat that supports all life stages of endangered Kootenai sturgeon and other focal species; and 3) limit the ability of the

ecosystem to sustain the local tribal culture, subsistence needs, and the economy. Examples of limiting factors are lack of surfaces that support riparian vegetation recruitment, insufficient depth for Kootenai sturgeon migration, and loss of channel and floodplain connection.

With funding primarily from BPA, the Tribe implemented habitat restoration projects from 2011 through 2014. All but one of these projects is upstream of Bonners Ferry, Idaho, in what is known as the Braided Reach. In 2014 the Tribe also implemented a project near Bonners Ferry in the Meander Reach (Figure 1-1).

The proposed Kootenai River Habitat Restoration at Bonners Ferry project addresses limiting factors and restoration strategies that were identified in the Master Plan.

1.4 Public Involvement and Issue Summary

BPA conducted public scoping outreach for the project at Bonners Ferry in February and March of 2014 to help determine what issues should be considered in the environmental analysis. On February 10, 2014, BPA sent a letter to people potentially interested in, or affected by, the proposed project, including nearby landowners, public interest groups, local governments, tribes, and state and federal agencies. The letter explained the proposal, the environmental process, and how to participate.

BPA identified five tribes that could have an interest in the proposed project, based on their historical or current use of the land in the project area: the Kalispel Tribe of Indians, the Coeur d'Alene Tribe, the Confederated Salish and Kootenai Tribes, Spokane Tribe of Indians, and the Kootenai Tribe of Idaho. BPA provided information to, and requested information from, these tribes. The exchange included information on potential cultural resources in the proposed project area. (Cultural resources is a broad term that encompasses physical remains and sites associated with past human activities – the collective evidence of past activities and accomplishments of people.)

BPA also held a public scoping meeting in Bonners Ferry, Idaho on February 26, 2014; notifying the public through a letter as well as through local newspapers. The scoping comment period for the proposed project began February 10, 2014, and closed March 10, 2014.

Twenty-seven people attended the public meeting. BPA received comments during the meeting and through written correspondence from 11 individuals and agencies. BPA considered these comments while preparing the environmental analysis in this EA.

Comments are posted in their entirety at the project website (http://efw.bpa.gov/environmental_services/Document_Library/BonnersFerry/). Themes and topics of the comments included the following:

- Questions about how the project would affect the river—would the project affect river levels and flooding; how would the project work with ongoing river fluctuations; would the project would change river currents;
- Questions about how the project would help sturgeon—is the location appropriate for restoration; is spawning habitat the right focus; and is bank armoring more important than the proposed restoration for protecting spawning.

- Suggestion to create community support through a public education element and to develop a public access footpath.
- Requests to consider potential impacts—to the Union Pacific railroad and railroad bridge, the City of Bonners Ferry water intake, nearby beavers and wetland areas, sediment deposits on existing sturgeon spawning areas.
- Concerns about potential impacts—county property tax base reductions if project includes tribal land acquisition; potential for creation of hazards to recreational boaters, tubers or swimmers due to whirlpools; visual impacts of protruding root wads from the Kootenai River Inn and US Highway 95/2 Bridge.
- Concerns about ongoing river issues—bank erosion from flooding, river fluctuations, and fast motor boat wakes; and USACE tree removal from levees and impacts to water temperature from the removal of tree shading.
- Opinions—support for the project; praise for the Tribe's restoration efforts elsewhere; and opposition to spending money on this type of endeavor.

1.5 Issues Outside the Scope of the this EA

Most issues raised during the scoping process are considered to be within the scope of the proposed action and are addressed in this EA. However, some issues are considered beyond the scope of this EA and thus not analyzed. The following describes these issues**.**

Pedestrian walkway access
One commenter asked for the proposed project to improve public access along the Kootenai River for walking. The project would not include funding for recreational access along the river, because BPA is proposing to provide funding for mitigation for effects to Kootenai River white sturgeon caused by the operation of Libby Dam. The proposed project is next to a Boundary County Park, so the Tribe is coordinating with the County to determine if the County could improve recreational facilities in the area to coincide with the proposed project. The potential environmental effects of any new or proposed public access in or near the proposed project are discussed and considered in the cumulative analysis in this EA (see Section 3.15 Cumulative Effects).

Land purchase for Tribes
One commenter requested that the project not include land acquisition for the Tribe because this would create a loss of property taxes paid to the county. Neither BPA nor the Tribe would purchase land as part of the proposed project.

Erosion due to ongoing river level fluctuations
A commenter asked about the erosion of private property along the river resulting from the fluctuations of the river. The effects to private property resulting from the change in river levels caused by operations at Libby Dam are outside the scope of this EA.

Tree removal from levees
One commenter asked about the removal of trees and other vegetation from levees. This project does not include actions designed specifically to remove trees from levees. The removal of trees and some other types of vegetation from levees is a USACE requirement and is not associated in any way with this project.

Chapter 2 PROPOSED ACTION AND ALTERNATIVES

This chapter describes the proposed action and the no action alternative. This chapter also compares the proposed action and the no-action alternative by the project purposes and the potential environmental effects.

2.1 Proposed Action

Under the proposed action, BPA would fund the Kootenai River Restoration Project at Bonners Ferry, which would enhance in-river, riparian and aquatic habitats to benefit juvenile and adult Kootenai River white sturgeon, listed as endangered under the Endangered Species Act, and other native fish and wildlife species found in and along the river. The Kootenai Tribe of Idaho would implement the proposed project in two areas in the Kootenai River at Bonners Ferry, Idaho. (Figure 2-1):

- The Bonners Ferry Islands location, upstream of the US Highway 95/2 Bridge
- The Straight Reach location, downstream from the Union Pacific Railroad Bridge

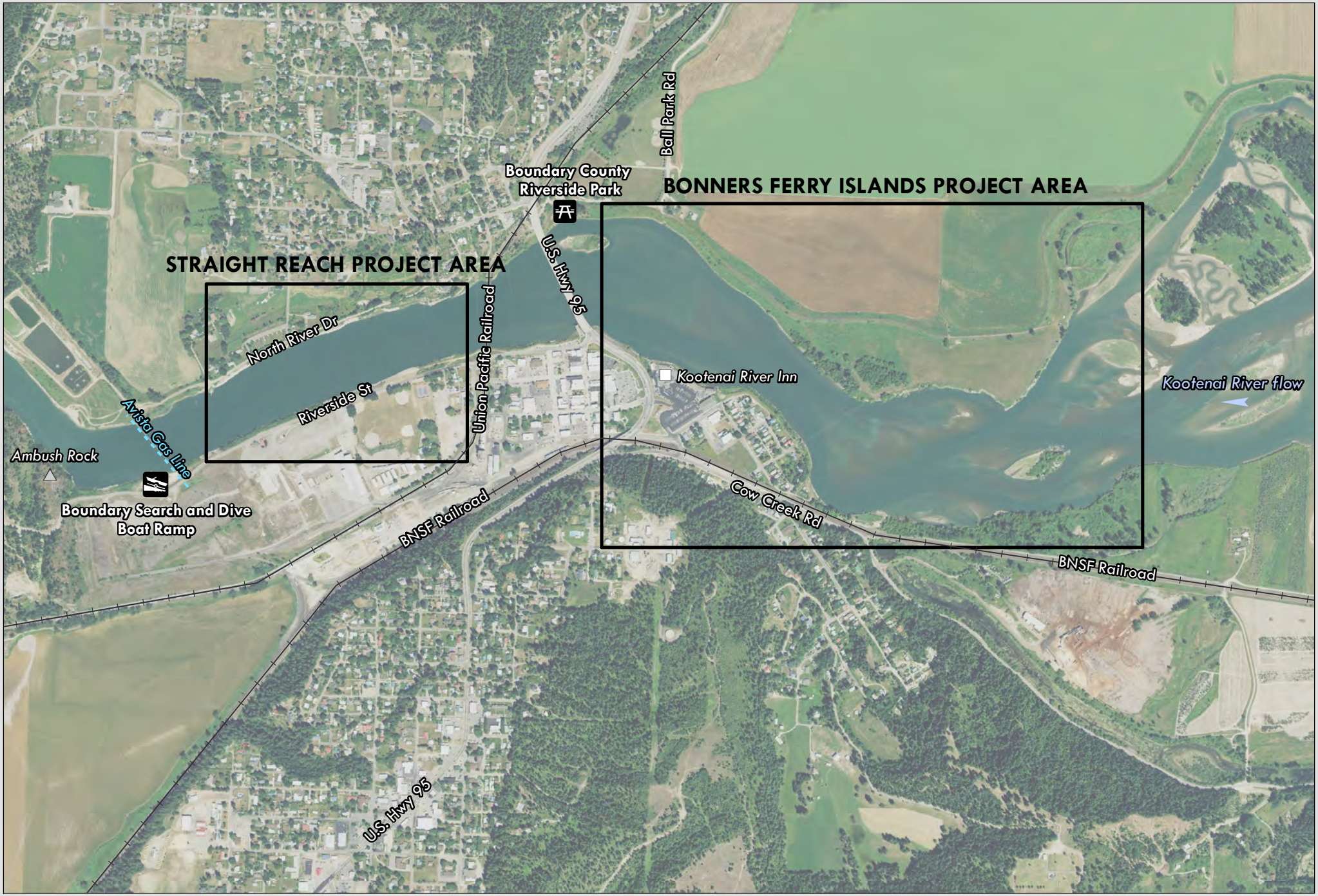

Figure 2-1. Kootenai River Habitat Restoration at Bonners Ferry Project Vicinity

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Imagery: USDA NAIP, August 2013

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2.1.1 *Bonners Ferry Island Area*

The Bonners Ferry Island project area is just upstream of the US Highway 95/2 Bridge (Figure 2-2). At this location, the proposed project calls for building two islands on existing mid-channel bars, excavating three deep pools in the riverbed, building two pool-forming structures, stabilizing banks, and establishing new areas of riparian habitat along the north and south shorelines of the river. These restoration actions would improve habitat conditions for adult and juvenile Kootenai River white sturgeon, bull trout, burbot, and other native fish.

The Tribe would implement the following items:

Pool-Forming Structures and Pool Creation
Pool-forming structures are wood and rock structures that would be built into the riverbank and extend into the river. Two pool-forming structures would be installed in the Bonners Ferry Islands project area on the south bank of the river. These would help redirect water flow to allow scouring of the river bottom to form deeper pools for sturgeon and burbot holding habitat. These structures would redirect flow away from the riverbank to help protect the bank from erosion and establish recirculation eddies that would provide refuge and feeding areas for Kootenai River white sturgeon and other native fish.

The proposed structure locations were selected because they would be in areas accessible by land-based excavation equipment. The river is already deepest in these locations, and has appropriate flow and channeling (aka “hydraulics”) to successfully maintain pools.

To create the pool-forming structures, a number of wood piles would be driven into the riverbed; rocks would be placed around the outside of the pilings; and additional logs would be bolted to the pile structure to provide structural stability. Each structure would be approximately 300 feet long, protrude 200 feet into the channel, and contain approximately 180 wood pole pilings.

The piles would be between 25 to 45 feet long and 16 to 18 inches in diameter. They would be driven into the ground with an air-driven impact pile-driving hammer. Driving each pile into the ground would require about 380 impact hammer strikes. Approximately 8 to 10 piles would be installed per day, over a three to four week period.

The structures would create resting areas for adult Kootenai River white sturgeon as they move upstream to spawn. The creation of new pools in an area where pool habitat is currently limited may encourage sturgeon to migrate upstream to locations thought to be higher quality spawning habitat. The addition of large pools in the Bonners Ferry Islands project area would also enhance refuge and feeding habitat for other native fish species.

Figure 2-2. Bonners Ferry Island Area and Restoration Actions

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Imagery: Low flow aerial photos, October 2011

RESTORATION TREATMENTS

- Bank stabilization and riparian habitat creation
- Pool forming structure
- Island construction
- Pool creation
- Large wood bank structure

Figure 2-3 shows an example of pool-forming structures at previously implemented habitat restoration projects in the Kootenai River.

Figure 2-3. Examples of Pool-forming Structures

Three pools would be created by digging out river-bottom material with a long-arm excavator. Each pool would be approximately two acres (150 feet by 550), and would be excavated to a depth of 20 to 30 feet, depending on flows and the river elevation. The excavated material would be placed on existing mid-channel gravel bars to build and raise the elevation of the two islands. For the combined three pool locations, approximately 300,000 cubic yards of material would be excavated. The excavated materials would be moved with off-road dump trucks to the designated island fill areas.

Figure 2-4 shows examples from previous habitat restoration projects of pool excavation work on the Kootenai River.

Figure 2-4. Examples of Pool Excavation

Island Creation and Enhancement

In the Bonners Ferry Island project area, two in-river islands, located upstream of the US Highway 95/2 Bridge, would be built on existing gravel bars. The gravel bar elevations would be raised to an elevation that would support perennial native vegetation such as willows. The two islands, once completed, would total 18 acres at average annual high flow levels. The islands would be built using the material from the excavated pools and would require approximately 175,000 cubic yards of material. Additional woody material, such as small trees and branches, would be embedded into the island edges and surface to slow water flow, provide habitat for

juvenile fish, and provide sheltered areas for young plants. Native vegetation would be planted on the islands after construction.

Figure 2-5 shows an example of earth moving and excavation work at previously implemented habitat restoration projects in the Kootenai River. These activities are similar to activities that would occur for creation of the islands

Figure 2-5. Examples of Island Creation

Bank Stabilization and Riparian Habitat Creation

In the Bonners Ferry Islands project area, both the north and south banks of the Kootenai River would be graded to create a gradual slope, stabilized with soil lifts (described below) and wood, and re-vegetated to enhance riparian habitat and reduce erosion. Approximately 2,250 linear feet of the north bank would be graded and 3,450 linear feet for the south bank (primarily between the two pool forming structures).

Soil lifts (described in the next paragraph) and wood structures would be installed to help stabilize the banks while newly planted native vegetation has a chance to establish. The wood structures would also provide cover and habitat for aquatic insects, as well as a place for native fish species to hide from predators.

The vegetated soil lifts would consist of three tiers of soil wrapped in coir (coconut fiber) fabrics placed on top of a rock foundation on the newly re-graded bank (Figure 2-6). Vegetation

cuttings would be placed between each of the tiers to facilitate rapid development of bank vegetation.

Figure 2-6. Examples of Vegetated Soil Lifts

Recently completed soil lifts

With established vegetation

Over a period of five to seven years, the biodegradable fabric would decompose and be replaced by woody vegetation that would stabilize the banks.

The wood structures would be built using materials ranging from large trees with root wads to small brush. Two types of wood structures would be installed in the Bonners Ferry Islands project area:

Type 1 Wood Structure

Type 1 wood structures are large engineered structures that would be installed at two locations on the north bank of the Kootenai River (Figure 2-7). These structures would provide smaller-scale pool habitat, hydraulic complexity and diversity, and cover for small fish to hide from predators. Each structure would be approximately 50 feet long and would extend above and below the water surface with an upper elevation that is within three feet of the top of the bank. The structure would extend approximately 20 feet into the river.

Figure 2-7. Type 1 wood structure immediately after construction.

The type 1 structures would be installed by excavating a foundation and placing successive decks of logs and brush to create a structure that would accumulate naturally occurring woody debris. Each structure would be made of 30 pieces of brush and 60 logs varying in length from 12 to 30 feet and from 3 to 24 inches in diameter. Some of the larger diameter pieces would have root wads attached. The structures would be backfilled with soil and small riprap (i.e., rock or other material used to protect shorelines or streambeds against erosion) that is 12-inches or smaller to provide stability and to counteract buoyancy. The longevity of the structure is about 20 years, by which time naturally deposited woody debris and sediment should be able to replace the function provided by the structure.

Type 2 Wood Structure

Type 2 wood structures are smaller than the Type 1 structures, and are generally logs with root wads lining the shoreline to provide bank protection and habitat complexity. Type 2 structures would be installed on both the north and south banks of the river (180 linear feet on the north and 180 linear feet on the south banks).

Figure 2-8. Examples of Type 2 Wood Bank Structures Immediately After Construction

Type 2 wood structures would be built in 30-foot-long segments separated by 30- to 50-foot gaps of gently sloping riverbank between structures. The structures would extend above and below the water surface, with an upper elevation that is within three feet of the top of the riverbank. The structures would extend approximately 15 feet into the river.

Type 2 wood structures would be built by excavating a foundation and placing successive decks of logs and brush. Over time, these structures would accumulate naturally occurring woody debris. Each structure would be made of 20 logs and 12 pieces of brush. Logs would vary in length from 12 to 24 feet, and range in diameter from 3 to 18 inches, some with attached root wads. Some log pieces would be secured using 0.5-inch rebar, or by weaving smaller logs and brush into the log pieces. Each structure would be backfilled with soil and small rock riprap (12-inches or smaller) to provide stability and to counteract buoyancy. The longevity of the structure is about 20 years, by which time naturally deposited woody debris and sediment should replace the function provided by the structure.

Figure 2-8 shows examples of wood bank structures constructed as part of previous habitat restoration projects on the Kootenai River.

2.1.2 *Straight Reach Area*

The Straight Reach Project Area is located downstream of the Union Pacific Railroad Bridge (Figure 2-9). Restoration activities here would include creating two pool-forming structures and placement of rock substrate clusters on the river bottom. The pool-forming structures would provide areas for Kootenai River white sturgeon and other native fish where they can rest during their migration through this reach. The rock clusters on the river bottom would provide suitable areas for Kootenai River white sturgeon to attach eggs, and provide places for very young sturgeon to hide.

Pool-forming Structures

Pool-forming structures in the Straight Reach would be rock structures that would be built into the riverbank and extend into the river. These structures differ from the pool-forming structures that would be installed in the Bonners Ferry Islands reach, which would be constructed of wood and backfilled with wood. The rock structures in the Straight Reach would create hydraulic complexity and provide more diverse habitat conditions in this otherwise uniform segment of river. As with the pool-forming structures in the Bonners Ferry Island Reach, the structures in the Straight Reach would help redirect water flow to allow scouring of the river bottom to form deeper pools for sturgeon and burbot holding habitat. These structures would redirect flow away from the riverbank to reduce erosion and establish recirculation eddies that would provide refuge and feeding areas for Kootenai River white sturgeon and other native fish.

Pool-forming structures would be built from a mixture of large and small rock (riprap). The structures would form “spurs” into the river that would extend outward from the existing levees, and angle upward from the riverbed to a level approximately 13 feet above the water surface at flows of 10,000 cubic feet per second (cfs; a standard river flow measurement). About 7,000 cubic yards of rock would be used to create the structure on the south bank and 8,000 cubic yards of rock for the north bank structure. The sizes of rock used to construct these structures would range from 1 to 48 inches.

Figure 2-9. Straight Reach Area and Proposed Restoration Actions

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0 250 500 Feet

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Imagery: Low flow aerial photos, October 2011

RESTORATION TREATMENTS

Pool forming structure

Substrate cluster

A temporary ramp-type access road would be built from the top of the levee for vehicles and equipment. Rock would be placed into the river at precise locations using a survey-grade global positioning system. Fill material would be placed on the levees to form an access ramp to the river (the levees would not be excavated). These ramps would be removed after construction and the surface of the levees restored to pre-project conditions.

Substrate Enhancement Clusters
Substrate clusters would be piles of rocks placed on the river bottom to enhance habitat for sturgeon spawning and provide small spaces between the rocks where small sturgeon can hide once they hatch. Twenty substrate clusters of approximately 2,500 square feet (50-feet by 50-feet) each and 5 feet thick would be placed on the river bottom in this reach. The clusters would be installed downstream of the pool-forming structures and would be made of rocks 12 inches in diameter or less. A barge would transport the rock from the onshore staging area to the location of each cluster. A long-reach excavator would place the rock by lowering the excavator boom over the edge of a barge, or by lowering the boom through an internal opening in the barge. The boom would extend as close to the bottom as possible to ensure strategic placement.

2.1.3 *Construction Access and Staging Areas*

Bonners Ferry Islands - North Bank Access
To get equipment and workers to the north bank of the river, construction traffic would exit US Highway 95/2, turn east on County Road 60 (District 2 road), cross the Union Pacific railroad tracks, turn south on Ball Park Road, and travel to the end of the District 2 levee. A temporary haul road would be built from the end of Ball Park Road along the right bank. Access to the river would be via ramps over the levee at four locations. Temporary haul roads would extend from the existing bank to the mid-channel bars.

Bonners Ferry Islands - South Bank Access
To access work areas along the south bank, construction traffic would come from US Highway 95/2, head east on Cow Creek Road and turn left on Riverhouse Lane, crossing the Burlington Northern-Santa Fe railroad tracks. A temporary haul road would be built from the railroad crossing to the river, and then crossing an existing pasture. Another temporary haul road would be built from the existing bank line to the in-river gravel bars.

Straight Reach - North Bank Access
To access work areas along the north bank of the Straight Reach project area, construction traffic would come from US Highway 95/2 and head west on Chinook Street, west on Comanche Street, and south on Birch Street to North River Drive. Temporary construction access to the river would allow trucks to access the river and place rocks for the single pool-forming structure along the north bank of the river.

Straight Reach - South Bank Access
To access work areas along the south side of the Straight Reach project area, construction traffic would come off US Highway 95/2 and head east on Riverside Street. Temporary construction access to the river would allow trucks to access to the river and place rocks for the single pool-forming structure along the south bank of the river.

Staging Areas
Temporary staging areas would be developed for construction materials storage, an office and equipment trailer(s), contractor parking, portable toilets, refuse and recycling, and equipment

fueling and maintenance. Stored materials might include erosion and sediment control materials, pipe, piles, rock, root wads, logs, live cuttings, and plant stock. Fueling and hazardous materials storage would occur within areas with spill containment measures in place. A stabilized construction entrance and fencing would secure all staging areas.

Table 2-1: Bonners Ferry Islands and Straight Reach Staging Areas and Temporary Haul Roads

Location	Staging Areas (acres)	Land Description	Temporary Haul Roads (linear feet)	Land Description
Bonners Ferry Islands (**north** bank)	2.1	• Private ownership • Inactive pasture	6,300	• Private ownership • City levees • Overhead power lines
Bonners Ferry Islands (**south** bank)	1.9	• Private ownership • Partially forested	2,940	• Private ownership • Inactive pasture (east) • Partially forested (west)
Straight Reach (**north** bank)	1.6	• Private land (north) • Inactive industrial site (south)	240	• Private land • City levees • Disturbed
Straight Reach (**south** bank)	1	• Boundary Search & Rescue boat ramp	100	• City levees • Disturbed

2.1.4 *Proposed Construction Sequencing*

Construction is currently planned to occur in two phases: 2015 and 2016.

2015 Construction

In 2015, Bonners Ferry Islands project construction would occur on the north bank and on existing mid-channel gravel bars (Figure 2-10). Work would include building the pools and islands, grading the bank, installing wood structures, and revegetation. To ensure river flows are low enough to allow for the work, the Tribe would submit a system operations request to the USACE in early 2015 to temporarily limit flows at Bonners Ferry to between 4,000 and 6,000 cubic feet per second (cfs.) Normal operations during September and October would likely be around these same levels, but the systems operations request would cap flow releases at 6,000 cfs during that time to ensure construction can be safe and efficient.

2016 Construction

In 2016, construction would occur in the Straight Reach area and the south side of the Bonners Ferry Island area (Figure 2-10). In the Bonners Ferry Island project area, the same type of construction that occurred on the north bank and gravel bars in 2015 would be implemented on about 3,400 feet of the south bank, and on the mid-channel gravel bars closest to the south banks. In the Straight Reach project area, the pool forming structures would be installed on both south and north banks, and the substrate enhancement rock clusters would be placed on the riverbed.

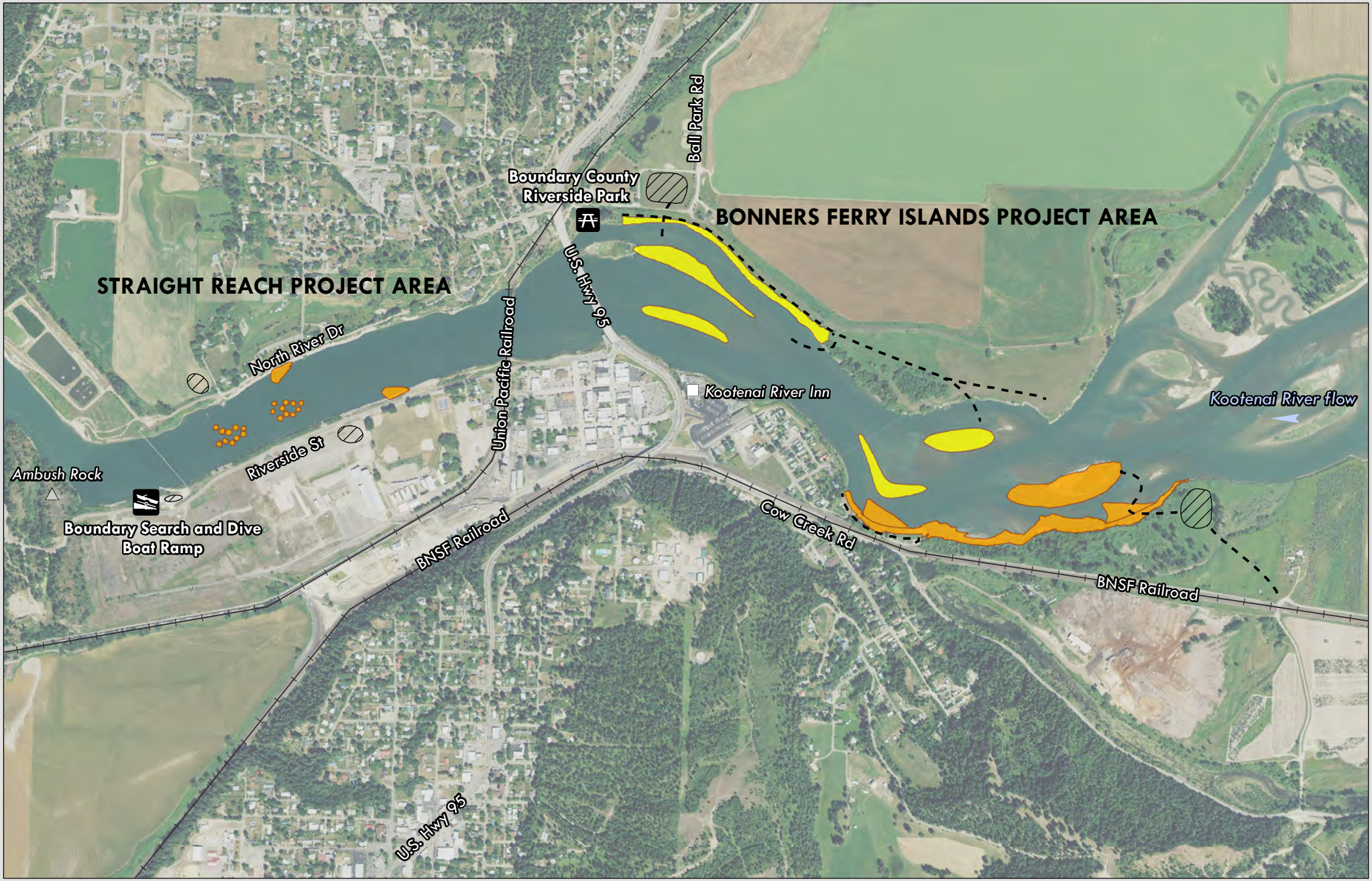

Figure 2-10. Proposed Construction Sequencing for Bonners Ferry Islands and Straight Reach Projects

BONNEVILLE POWER ADMINISTRATION

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Imagery: USDA NAIP, August 2013

PROJECT IMPLEMENTATION

- 2015 implementation
- 2016 implementation
- Project implementation staging area
- Project implementation access route

2.2 No Action Alternative

Under the no action alternative, BPA would not fund the Kootenai River Habitat Restoration at Bonners Ferry and the Tribe would not build the proposed action as described. In addition, BPA would not use the project to help satisfy its fish and wildlife mitigation obligations under the Northwest Power Act, or further support habitat improvement efforts identified in the Libby Dam Biological Opinion.

2.3 Comparison of Alternatives

Table 2-1 compares how well the alternatives meet the project purposes. Table 2-2 summarizes and compares the potential environmental consequences of the alternatives. See Chapter 3 for a full discussion of environmental consequences.

Table 2-2 Comparison of the Proposed Action and No Action Alternative by project purposes

Purpose	Proposed Action	No Action Alternative
Act consistently with all applicable laws, regulations, and policies that guide the agency including the federal trust responsibility as embraced by BPA in its Tribal Policy	Would be consistent with applicable laws, regulations, and policies.	Would be consistent with applicable laws, regulations, and policies.
Support efforts to mitigate for effects from the construction and operation of Libby Dam and the FCRPS on fish and wildlife in the main stem Columbia River and its tributaries, pursuant to the Pacific Northwest Electric Power Planning and Conservation Act of 1980	Would help support the mitigation efforts called for in the Northwest Power Act by enhancing fish and wildlife habitat in the Kootenai River at Bonners Ferry.	Would not support BPA's efforts to enhance fish and wildlife habitat in the Kootenai River at Bonners Ferry.
Seek to further address obligations under the 2006 Libby Dam Biological Opinion as clarified in 2008, which directs the BPA and USACE to "…support the Kootenai Tribe of Idaho's good-faith efforts to implement the Kootenai River Restoration Project Master Plan…."	Would further address BPA's obligations under the 2006 Libby Dam Biological Opinion.	Would not contribute to BPA's efforts to meet obligations specified under the 2006 Libby Dam Biological Opinion.

Table 2-3. Summary and Comparison of the Potential Environmental Consequences of the Alternatives.

Resource	Proposed Action	No Action Alternative
Soils and Geology	**Low.** Construction would have short -term increases turbidity and soil erosion. Bank stabilization and plantings would have a long term beneficial effect on soil resources by reducing shoreline and stream bank erosion.	**Low**. There would be no short-term construction impacts (e.g., ground disturbance) from the proposed project, but stream bank erosion forces would not be reduced and sediment deposition would not occur.
Wetlands	**Low.** 3.7 acres of low-functioning wetlands would be affected but 10.7 acres of restored wetlands would be created, so long term effects would be beneficial.	**Low.** There would be no decrease in wetlands from construction, but low functioning wetlands would continue to exist in the project area. Wetlands on existing islands would continue to erode and could eventually disappear.
Water Resources	**Low.** The proposed project would create localized changes to hydraulics that would help create and maintain deeper pools. Temporary increases in turbidity would result from construction, but long-term decreases would result from the project's bank grading and grading in high erosion areas. The project would cause a 0.15 foot increase in base flood elevations but would not cause a change in operations at Libby Dam to prevent flooding.	**Low.** There would be no short-term water quality impacts (e.g., turbidity) from the proposed project, but turbidity from stream bank erosion would continue within the project area.
Fish and Fish Habitat	**Low.** Construction would cause a small amount of turbidity, but effects would be temporary and low. Pile driving would create underwater noise, which could alter the behavior of fish, but few fish are expected to be in the area during construction so effects would be low. Long term, habitat restoration would improve habitat conditions for fish.	**Low.** There would be no short-term construction impacts on fish and fish habitat (e.g, turbidity, noise), but low functioning habitat conditions would continue.
Recreation	**Low.** Following construction, structures would extend out into the river where recreational boaters would need to avoid them. The structures would be visible as boaters and tubers approached from upstream and allow enough time for boaters and tubers to avoid them.	**None.** There would be no construction within the project area so there would be no impacts to recreationalists and recreational resources.

Cultural Resources	**Low.** Previously recorded sites would not be affected by the project. If unanticipated sites were discovered during construction, sites could be affected; however, stop work, notification, and mitigation requirements would lessen potential impacts.	**None.** No new ground disturbance would occur in the project area so there would be no potential impacts to cultural resources,
Visual Resources	**Low.** Temporary construction activities would be visible by the public from various locations in Bonners Ferry. Over time project elements would resemble natural features that occur along large rivers, and would be consistent with the existing landscape and effects would be low	**None.** There would be no construction within the project area so there would be no impacts to visual resources.
Noise	**Low-to-Moderate.** Noise impacts would be temporary and moderate for the noise receptors within 2,000 feet of construction, and low for noise receptors farther than 2,000 feet from activities.	**None.** There would be no construction within the project area so temporary construction noise would not occur.
Air Quality and Climate Change	**Low.** During construction, equipment would temporarily emit pollutants and dust emissions may increase from disturbed ground and traffic on paved and unpaved roads. Greenhouse gas emissions from construction vehicles would occur during construction but would be lower than the EPA's reporting threshold	**None.** There would be no construction within the project area so temporary construction emissions would not occur.
Public Health and Safety	**Low.** Boundary Search and Rescue boat ramp would be used for construction staging but would not affect emergency operations if they were needed. The potential for injuries associated with hazardous construction activities would temporarily increase. The potential for motor vehicle accidents could temporarily increase due to construction traffic.	**None.** There would be no construction within the project area so potential delays at the boat ramp and on Bonners Ferry streets as well as construction-related injuries would not occur.
Transportation	**Low.** Construction activities would temporarily increase vehicular traffic on some local roads.	**None.** There would be no construction within the project area so there would be no construction-related increases in traffic or traffic delays.
Socioeconomics, Public Services and Environmental Justice	**No-to-Low.** There would be no impact to environmental justice populations. The project would generate a temporary, local increase in economic activity through construction spending. Potential temporary disturbances to public services from increased traffic could occur.	**None.** Impacts to environmental justice populations would be the same as the proposed action. There would be no construction within the project area so there would be no short term increase in construction spending or potential delays related to construction traffic.

Chapter 3 AFFECTED ENVIRONMENT AND ENVIRONMENTAL CONSEQUENCES

3.1 Introduction

This chapter evaluates the potential effects of the proposed project, as well as the no action alternative, on human and natural resources, to determine whether either have the potential to cause significant environmental effects. For each resource, the existing environment that could be affected by the alternatives, and the potential environmental consequences of the alternatives are described. Discussion of the cumulative effects (incremental effects of the action when added to other past, present, and reasonably foreseeable future actions) is at the end of this chapter.

3.2 Soils and Geology

3.2.1 *Affected Environment*

Regional Geology

The proposed project area is on the Boundary County soil survey, which is within the Northern Rocky Mountains geographic province. Between 100,000 and 11,000 years ago, the Cordilleran ice sheet (a large mass of ice, also known as a continental glacier) covered most of the valley areas in the region, leaving only the higher mountain peaks exposed. These glacial episodes created much of the surface materials and topography that exists today. Alpine glaciers eroded the craggy, jagged peaks and filled in mountain valleys with moraine (soil and rock deposited by glaciers) and outwash (sand and gravel left by melting water) deposits. The ice sheet extended as far south as Coeur d'Alene Lake, 75 miles to the south. The glaciers left thick deposits of glacial till (unsorted glacial sediment) and silt, transported large boulders to the area, and scoured some areas, leaving bedrock exposed at the surface (USDA NRCS, 2013).

Seismic Faults

No known seismic faults exist in Boundary County. The Boundary County Comprehensive Plan states that the county is in Seismic Zone 2, as delineated in the Uniform Building Code. Seismic Zone 2 indicates that a moderate damage risk could be experienced in this area should an earthquake occur (Boundary County, 2008).

Local Surface Soils

Soils in the Kootenai River floodplain are comprised of silty, alluvial (material deposited by flowing water) deposits left behind from floodwaters that spread over the floodplain and deposited silt, clay, and very fine sands (USDA NRCS, 2013). More ashy, silty loam soils occur on the gently sloping areas bordering the shoreline and floodplain and the steep escarpments. (Toxicity sampling of river sediments is discussed in Section 3.3 Water Quality.)

3.2.2 *Environmental Consequences – Proposed Action*

Within the Bonners Ferry Islands project area, large amounts of soil would be moved and topography would be changed (lowering pool elevations in the riverbed and raising island elevations). The work would cause sedimentation and erosion in the short-term during construction, but the bank grading and bank stabilization structures and planting of native vegetation would help stabilize soil movement in the long-term.

Of the three pools that would be excavated in the river, two would be excavated from a gravel bar along the north shore, and would require removal of 80,000 and 100,000 cubic yards of material. The third pool would be excavated from the south shore, and would involve removal of approximately 115,000 cubic yards of material.

Excavated material from the two north bank pools would be deposited on existing gravel bars to create new in-river islands by raising the elevation of the gravel bars approximately 5 to 8 feet. The newly created island surfaces would be stabilized with grading and large wood. River bottom material excavated from the third pool along the south bank would be placed along 3,450 feet of riverbank to stabilize the bank and create a sloped riparian area.

Restoration and enhancement of the north and south shore banks in the Bonners Ferry Islands project area would result in some temporary erosion and soil loss. In the short term, erosion and sediment control measures would be used during construction to control and manage temporary soil loss, reduce sediment delivery to the river, and minimize turbidity. Over the long term, the proposed project would have beneficial effects on soils, as bank stabilization, pool-forming structures, and more robust riparian areas would reduce the amount of soils exposed to river currents.

Very little ground disturbance would occur in the Straight Reach project area. Temporary access roads, about 100 feet long would be built to allow trucks to approach the river and dump rock. These temporary roads would be removed and the land restored following construction.

Construction could result in erosion caused by stormwater runoff or windblown dust during dry conditions. These effects would be minimized by implementing best management practices (see Section 3.2.3.). Thus, the effects to soils and geology would be low.

3.2.3 *Mitigation - Proposed Action*

If the proposed action were implemented, the Tribe would use the following mitigation measures to avoid or minimize effects on geology and soils:

- Prepare and implement an erosion and sedimentation control and a stormwater pollution prevention plan for construction activities to minimize erosion and soil loss (e.g., use silt fences, straw bales, interceptor trenches or other perimeter sediment management devices; maintain as necessary throughout construction).
- Locate staging areas in previously disturbed or graveled areas to minimize soil and vegetation disturbance, where practicable.
- Design and build access roads to minimize drainage from the road surface directly into surface waters, and direct sediment-laden waters into vegetated areas.
- Inspect and maintain access roads and other facilities during construction to ensure proper function and nominal erosion levels.

- Reseed disturbed areas, monitor seed germination, and implement contingency measures as necessary until areas disturbed from construction activity are stabilized.

3.2.4 *Unavoidable Effects Remaining After Mitigation - Proposed Action*

Although implementation of construction best management practices and mitigation would reduce the potential for increased erosion, some increased levels of temporary erosion and soil loss would be expected during and immediately after construction.

3.2.5 *Environmental Consequences – No Action*

Under the no action alternative, there would be no short-term soil losses or topography changes because construction activities would not occur. The ongoing erosional processes occurring in the river would continue.

3.3 Wetlands

3.3.1 *Affected Environment*

In general, wetland functions are separated into three primary categories; water quality, hydrology, and habitat (Novitzki et al. 1996). Palustrine wetlands next to river systems have the potential to improve water quality by filtering and storing sediments, processing pollutants, and storing and cycling nutrients. Hydrologic functions often include groundwater recharge, flood moderation and floodwater storage. Wetlands can support high levels of primary productivity and provide unique habitat for fish and wildlife (Hruby 2004). Their ability and opportunity to perform any of these functions depends largely on their position in the landscape, size and complexity, adjacent land use, and level of disturbance.

Within the Bonners Ferry Islands project area, 1.37 acres of palustrine scrub shrub wetlands and 2.8 acres of palustrine emergent wetlands exist (Figure 3-1). Palustrine emergent wetlands are characterized by erect, rooted, and non-woody vegetation. (Geum, 2014) The vegetation found in the emergent wetland in the project area is dominated by either water knotweed (*Polygonum amphibium*) or sedges (*Carex spp.*). The vegetation found within the palustrine scrub shrub wetlands included sandbar willow (*Salix exigua),* yellow willow (*S. lutea*), and red-osier dogwood (*Cornus stolonifera*).

Because of the high rates of erosion in the areas where these wetlands exist, and the presence of non-native plants, these areas are considered low functioning because of their limited ability to provide the functions of healthy wetland systems, such as water quality and habitat.

Within the Straight Reach, 0.39 acre of palustrine and emergent wetlands exist within the project area (Figure 3-2). These areas are on low bench features above the ordinary high water mark (OHWM). In general terms, the OHWM is marked by the line of perennial vegetation above the unvegetated portion of the river's bed and banks; however, specific definitions of the OHWM vary depending on the purpose of the definition.

These wetlands are dominated by reed canarygrass (*Phalaris arundinacea*) and few other vegetation species are present. Adjacent uplands include unvegetated riprap surfaces and a mix of herbaceous and shrub vegetation communities on the slopes. Because of their location between the riprapped levy and the river, and the presence of non-native species, these wetlands areas are considered low functioning because of their limited ability to provide the functions of healthy wetland systems.

3.3.2 *Environmental Consequences – Action Alternative*

In the Bonners Ferry Islands project area, pool excavation would remove a total of about 1 acre of low-quality palustrine scrub shrub and 2.7 acres of low-quality palustrine emergent wetlands spread over the mid-channel islands and along the south bank of the river (Geum Environmental Consulting, Inc., 2014). The focus of the proposed project is river restoration, which would result in 0.5 acre of new palustrine emergent wetlands created and 10.2 acres of palustrine scrub shrub created; these restoration actions would result in a net loss in palustrine emergent wetlands of 2.3 acres, and a net gain in palustrine scrub shrub wetlands of 8.8 acres. Because the existing wetlands within the Bonners Ferry Islands project area are not currently functioning , and because of the increased amount of palustrine scrub shrub wetlands that would be created, the net effect on wetlands would be beneficial.

The wetlands found within the Straight Reach project area are located in areas that would not be affected during construction (Figure 3-2). Thus, there would be low impacts on wetlands as a result of the project.

Figure 3-1. Existing Wetlands in the Bonners Ferry Islands Project Area

BONNEVILLE POWER ADMINISTRATION

0 500 1,000 Feet

N

Imagery: Low flow aerial photos, October 2011

MAPPED WETLAND AREAS

- Palustrine emergent wetland
- Palustrine scrub-shrub wetland
- Area of potential effect
- Ordinary high water mark

Figure 3-2. Existing Wetlands in the Straight Reach Project Area

BONNEVILLE POWER ADMINISTRATION

0 250 500 Feet

N

Imagery: Low flow aerial photos, October 2011

MAPPED WETLAND AREAS

Palustrine emergent wetland

Area of potential effect

Ordinary high water mark

3.3.3 *Mitigation - Proposed Action*

If the action were implemented, the Tribe would use the following mitigation measures to avoid or minimize effects on wetlands.

- Identify clearing limits on all construction drawings and flag as no-work areas in field before construction.
- Revegetate temporarily disturbed areas (including wetlands) with appropriate native species using seed mixes that meet the requirements of federal, state, and county noxious weed control regulations and guidelines.
- Take actions to control potential noxious weed infestations (treat known infestations before ground disturbance, ensure construction equipment is free of weeds and weed seeds, clean equipment and vehicles after working in infested areas, maintain weed-free staging areas, implement post-construction noxious weed control as-needed).
- Implement best management practices during construction to minimize adverse effects on wetlands (e.g., limit wetland disturbance areas; flag or stake wetland boundaries; refuel machinery and store fuels away from wetlands; develop and implement erosion and sedimentation control plan).

3.3.4 *Unavoidable Effects Remaining After Mitigation— Proposed Action*

After mitigation measures have been implemented, 2.26 acres of palustrine emergent wetland would be filled and 8.8 acres of palustrine scrub shrub wetlands would be created

3.3.5 *Environmental Consequences – No Action*

Under the no action alternative, the existing wetlands would remain and there would be no wetland fill or creation. Existing mid-channel islands would continue to erode and the effect to thee palustrine scrub wetlands over time.

3.4 Water Resources

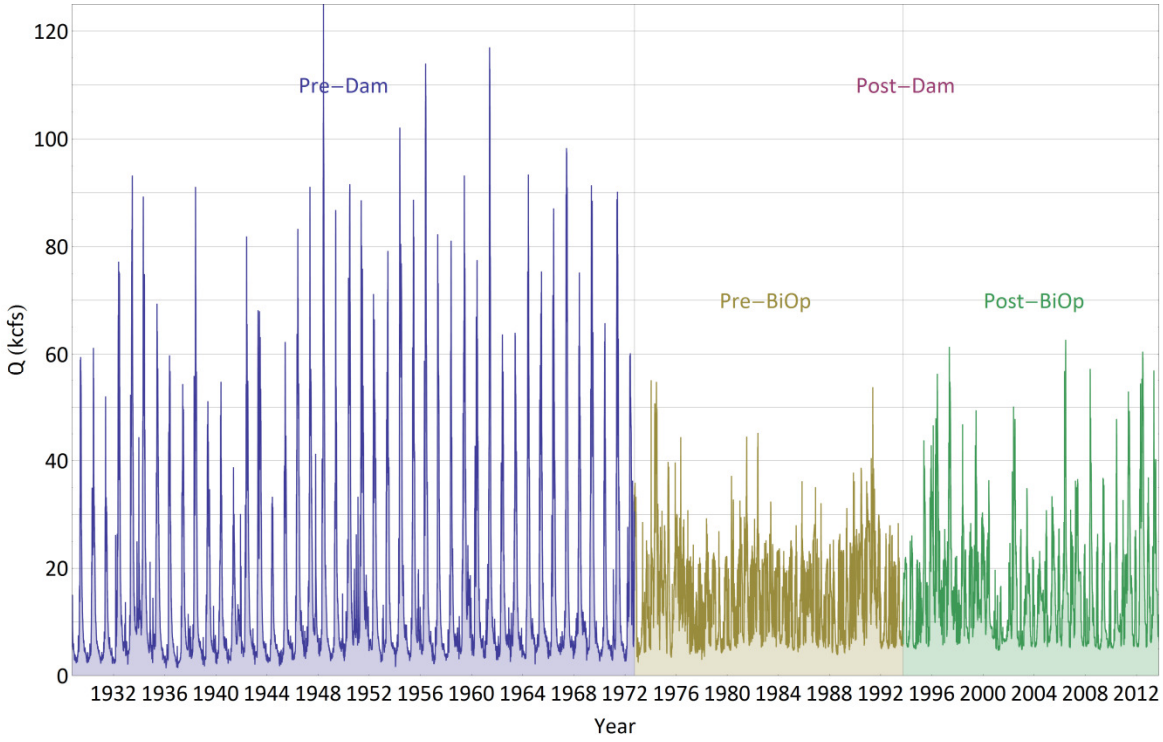
3.4.1 *Affected Environment*

Hydrologic Characteristics

The Kootenai River (spelled “Kootenay” in Canada) originates in southeastern British Columbia (BC). From the headwaters, it flows south into Lake Koocanusa, which straddles the border between British Columbia and Montana. (Lake Koocanusa is a melding of the words Kootenai, Canada, and the USA.) Libby Dam, operated by the US Army Corps of Engineers (USACE), holds the river back to form the Lake Koocanusa Reservoir. Downstream of the dam, near Libby, Montana, the river turns and flows westward toward Idaho. Near Bonners Ferry, Idaho, the river turns north, and flows again into BC where it enters Kootenay Lake. From the outlet on the west arm of the lake near Nelson, BC, the river flows westward, through several hydropower facilities, to its confluence with the upper Columbia River near Castlegar, BC.

The Kootenai River is the third largest sub-basin by area, and the second largest by volume of water in the Columbia River basin (KTOI 2009). It encompasses approximately 18,000 square miles.

Figure 3-3; Peak Flows in the Kootenai River, 1932-2012



Historically, the amount of water in the Kootenai River has varied greatly through the year. As with many rivers in the Columbia River basin, the Kootenai is fed by melting snow, and the annual peak flows occurred in the spring. Once the snow had melted at higher elevations, hot dry summers would result in dramatic decreases in flows through late summer into the fall, when winter rains would resume. Following the construction of Libby Dam in 1972, peak springtime flows have been reduced by 50 percent, and winter flows have increased by 300 percent (USFWS 2006, 2008) (Figure 3-3).

Flows in the Kootenai River through Bonners Ferry are also affected by a backwater effect (reduced water surface slope which causes little or no current in the river) caused by Kootenay Lake. Kootenay Lake is 70 miles downstream of Bonners Ferry and is regulated by Corra Linn Dam. When high flows raise the level of Kootenay Lake during the spring runoff, a backwater effect occurs in the portion of the Kootenai River between Kootenay Lake and Bonners Ferry. In most years, the upstream extent of the backwater reaches into the proposed Bonners Ferry Islands project area (river mile 153). This backwater effect changes the slope of the water surface, and consequently, the flow rate of the water passing through the proposed project area. When the amount of water in the river is greatest, the velocity of the water slows through the proposed project area and the water surface elevation increases. When the flows are lower, and the lake level drops, the velocity of the water through the proposed project area increases, and water surface elevation decreases.

Water Quality

The Idaho Department of Environmental Quality lists the Kootenai River and tributaries as "impaired for temperature" (not suitable) between the Moyie River and the Idaho/Canada border (IDEQ 2008). The construction of Libby Dam has altered the historic temperature regime of the river making it too warm or too cold depending on the time of the year and if the water is drawn from the top or bottom of the reservoir., To help mitigate for the effects on temperature caused by Libby Dam operations, the USACE built a selective withdrawal system in 1977, and upgraded it in 2010. The selective withdrawal system allows the USACE to release water from the reservoir behind the dam at varying depths in an attempt to mimic temperature conditions in the river that more closely matched the natural, pre-Libby Dam state.

Agriculture, mining, logging, sawmill operations, and other development brought on by settlers contributed sediment and pollutants to the Kootenai River system. Although not all potential for contamination has been eliminated, pollution prevention and control technologies have reduced contaminants from past activities within the last 30 years. However, agricultural runoff, permitted discharges, and legacy mining discharges still have the potential to contaminate the Kootenai River.

The Tribe assessed river sediments in the proposed project area to determine if the toxics from past land uses still exist. The assessment was based on the Northwest Regional Sediment Evaluation Framework, which established consistent regulatory controls and public accountability for assessment, characterization, and management of sediments (USACE et al. 2009).

For this assessment, the Tribe reviewed regulatory databases and previous reports, and conducted sediment core samples at the proposed project site to determine the presence and concentration of contaminants in the river sediments in the Bonners Ferry project area. Sediments in the Straight Reach were not evaluated because the proposed project does not include the excavation of material in that project area. The sediment evaluation determined that metals and organochlorine compounds were present. Organochlorine compounds (often used in pesticides) contain carbon, chorine and hydrogen, and do not break down easily. They are insoluble in water, and are attracted to fats. These compounds can accumulate in fish, and if the fish is eaten, the toxic compounds can accumulate in wildlife or people up the food chain. The evaluation showed that Polychlorinated Biphenyls, a toxic compound more commonly known as PCBs, (used in the manufacture of electrical transformers, capacitors, oil and other industrial products) were present in the project area. However, the concentration of these toxics is below levels considered harmful to Kootenai River white sturgeon and other fish species (USACE et al. 2009).

The evaluation indicated that these contaminants have the potential to stress sturgeon reproduction and affect embryo survival, especially when considering the potentially cumulative effects of multiple contaminants.

Sediment samples collected in 2007 near the area of the proposed Bonners Ferry Islands project (Barton et al. 2012) did not exceed the contaminant thresholds, and one sample slightly exceeded the threshold for total organic compounds. Concentrations of polynucleararomatic hydrocarbons (byproducts of petroleum processing or combustion) and total PCBs, in the sediment sampled in all cores, were less than the sediment quality guidelines for river sediment dredging.

Floodplains

A floodplain is an area near a river or a stream that floods when the water level reaches flood stage. Federal Emergency Management Agency (FEMA) defines the 100-year floodplain as any area that has a 1 percent chance of flooding during a given year.

FEMA uses flood insurance rate maps (FIRM) to identify the areas with the potential to flood. For the proposed project, two FIRM maps depict the flood risk; one shows the risk outside of the Bonners Ferry where no levees exist, and the others shows the area inside the city where levees protect it from flooding. In areas protected by levees, a base flood elevation, rather than a floodplain area, is used to determine flood risk. Like the 100-year floodplain, the base flood elevation is the height that has a one percent chance or greater of flooding in a given year. The base flood elevation for the portion of the project within the City of Bonners Ferry is 1,768 feet at the downstream end, and 1,769 feet at the upstream end (Figure 3-4). Because Libby Dam primarily regulates flows in the Kootenai River, USACE ensures that flows do not exceed the base flood elevation. For the areas outside Bonners Ferry (Figure 3-5), project activities would occur within the river channel, and consequently, within the 100-year floodplain.

3.4.2 *Environmental Consequences – Proposed Action*

Hydrology

Proposed work in the river would create localized changes in river flows to help create or maintain deeper pools.

The installation of the two pool-forming structures would provide erosion protection by deflecting river flow currently eroding the south bank. The large wood structures and pool-forming structures would create and enhance pools, provide areas with slower flows and recirculation eddies, and provide places for juvenile fish to rest and hide from predators. The use of river bottom material to create two new islands in the Bonners Ferry Islands project area would create new areas of shallow water habitat where water velocity would slow down and provide additional places for juvenile fish to rest and hide from predators.

In the Straight Reach project area, the substrate clusters placed along the river bottom would create areas of hydraulic complexity and near bottom habitat diversity where it currently is lacking. The clusters would be small enough that there would be no effect on the surface regardless of water flow.

Water Quality

Construction activities such as channel excavation and bank grading would generate temporary and localized increased turbidity in the Kootenai River. However, Core samples taken in the Bonners Ferry Islands project area show that the river bottom material is comprised predominantly of gravel and sand (95-97%) with very little silt or fine material (3%-5%) (River Design Group, 2012) Because of the small amount of fine material in the sediment that would remain suspended in the water column, turbidity in the river during construction would dissipate quickly. During the construction of a large pool for a similar restoration project just upstream of the Bonners Ferry Islands project area, aerial photographs showed the sediment plume stayed in a narrow band along one side of the river and dissipated within 0.6 miles downstream of the source of the sediment (USFWS, .

Stormwater runoff from temporarily disturbed construction and staging areas could also contribute sediment laden water to the river and increase turbidity. During all construction activities erosion and sediment control measures would be used to prevent discharges from the site to the river to the maximum extent practicable.

The use of hazardous materials or substances during construction of the project has the potential to result in the contamination surface water or groundwater. Construction equipment contains petroleum products, such as gasoline, diesel fuel, motor oil, and hydraulic fluid, and other hazardous fluids, such as anti-freeze. Equipment leakage may lead to the release of small quantities of these substances into the environment. The implementation of a spill prevention, control and countermeasure plan and BMPs will reduce the potential for leaks or spills of hazardous materials from equipment during construction. Releases of hazardous substances to the environment may also occur if existing sites of contamination are encountered during construction. As described above, the sediment analysis conducted in the project area showed low levels of contaminants but they were within allowable levels (Barton et al. 2012).

Some sedimentation and erosion of the two new islands would likely occur since rivers are dynamic, and features such as pools, bank lines and islands, are expected to change slowly over time. Because of the added roughness and native vegetation planting in the proposed project, the amount of erosion around the newly created islands would likely be less than the amount of erosion currently along the riverbanks in the Bonners Ferry Islands project area, so the project would have an overall positive effect on turbidity.

In the Bonners Ferry Islands project area, the newly created riparian areas and the two new mid-channel islands would be planted with native vegetation that, when mature, would provide a beneficial effect on water temperature by creating additional shade along the river. Thus, the short-term impacts from construction would be low.

Floodplains

As shown in Figure 3-5, in Bonners Ferry the 100-year floodplain is contained within flood control levees. The proposed project is located within this area so the floodplain analysis was used to determine if the project and changes in river topography (excavation of river bottom material to create pools and establish islands) would alter the base flood elevation though Bonners Ferry to the extent that a change in the operations at Libby Dam to maintain existing flood protection would be necessary. The USACE's hydrologic model (HEC-RAS, Version 4.2.0) was used to evaluate the potential change in base flood elevations in Bonners Ferry if the proposed project was implemented. The modeling results showed that implementation of the proposed project could result in up to 0.15 foot of rise in base flood elevation within the project area (River Design Group, Draft-2014). The USACE determine that a rise of 0.15 feet in base flood elevation would cause an operation change of approximately 300 to 500 cfs at Libby Dam to ensure river levels remained below the top of the levees. Based on this analysis, the USACE determined that this change would not impact the USACE operation of Libby Dam or its ability to meet flood risk management obligations (Personal Communication, Amy Reese, USACE, September 2014). Therefore, the floodplain effects resulting from the proposed project would be low.

3.4.3 *Mitigation - Proposed Action*

If the proposed action were implemented, the Tribe would use the following mitigation measures to avoid or minimize potential effects to water resources:

- Deposit and stabilize all excavated material not re-used in an upland area outside of floodplains.
- Follow the Idaho Department of Environmental Quality's Catalog of Stormwater Best Management Practices for Idaho Cities and Counties (IDEQ, 2005) to create a stormwater pollution prevention plan for construction activities. Use and maintain this plan throughout construction to minimize erosion and soil loss (e.g., use silt fences, straw bales, interceptor trenches or other perimeter sediment management devices).
- Implement measures to prevent stockpile erosion during rain events (e.g., surround piles with compost berms, cover piles with impervious materials, or use other equally effective methods).
- Minimize staging areas to the size necessary to conduct the work, and locate the staging areas in previously disturbed areas at least 150 feet from the river or wetlands.
- Create and use a spill prevention, control and countermeasure plan to minimize the potential for spills of hazardous material, which includes provisions for storage of hazardous materials, and refueling of construction equipment outside of riparian zones, a spill containment and recovery plan, and notification and activation protocols.
- Store spill containment kits at each work site, and train the construction crews in proper use.
- Wash all equipment before moving it to the project site, to minimize the introduction of foreign materials and fluids to the project site.
- Retrofit hydraulically operated equipment that may work below the OHWM with vegetable-based fluid in the hydraulic system.
- Inspect all equipment to ensure it is free of oil, hydraulic fluid, and diesel fuel leaks. Repair detected leaks in the vehicle staging area before the vehicle resumes operation. Document inspections in a record that is available for review on request.
- Locate vehicle staging, cleaning, maintenance, refueling, fuel storage areas, and sanitary facilities, such as chemical toilets, at least 150 feet the river or wetlands.
- Clean all equipment operated in stream before beginning operations below the bankfull elevation to remove all external oil, grease and dirt. Every day, inspect all power equipment within 150 feet of the water for fluid leaks.
- Diaper any stationary power equipment (e.g., generators) operated within 150 feet of any stream, water body or wetland to prevent leaks.

3.4.4 *Unavoidable Effects Remaining After Mitigation - Proposed Action*

River hydraulics would be changed in localized areas in the project area and construction activities would result in temporary and localized effects on surface water quality. Over the long term, reduced turbidity would occur in the river from the creation of new riparian habitat areas along both banks of the river in the Bonners Ferry Islands project area by reducing streambank erosion.

3.4.5 *Environmental Consequences – No Action Alternative*

Under the no action alternative, there would be no changes in river hydrology, no construction related turbidity, and no change in base flood elevations in Bonners Ferry, or changes in the operations at Libby Dam to maintain existing flood protection would be necessary. Ongoing shoreline erosion would continue to contribute to some sedimentation in the river.

3.5 Fish and Fish Habitat

3.5.1 *Affected Environment*

Numerous native fish species including, bull trout, westslope cutthroat trout, Columbia River redband trout, kokanee, burbot, and Kootenai River white sturgeon exist in the Kootenai River, in or near the proposed project area. No anadromous (fish that live part of their life in the ocean, then return to the river to spawn) fish populations occupy the Kootenai River. Table 3-1 shows a list of fish species in the Kootenai River.

Two fish species on the Endangered Species Act (ESA) list may exist in the Bonners Ferry Islands and Straight Reach project areas; the Kootenai River white sturgeon, which is endangered, and the Columbia River bull trout, which is threatened (USFWS, 2013).

Juvenile and adult Kootenai River white sturgeon live year-round in the Kootenai River downstream of Bonners Ferry (USFWS, 2006, 2008). Juvenile sturgeon can be found all year long upstream of Bonners Ferry, but adult sturgeon infrequently exist past Bonners Ferry – about a third of Kootenai River white sturgeon in spawning condition migrate upstream to the Bonners Ferry area annually (May through July), but few remain there to spawn (USFWS, 2013).

The Kootenai River is one of 22 designated bull trout recovery units in the Columbia River Basin, and has been designated as critical habitat for bull trout. Field studies show that adult bull trout exist in the Idaho portion of the main stem Kootenai River in very low densities. Bull trout have two life history strategies: migratory or resident. Migratory forms move between lakes or main stem rivers to small tributaries to spawn. Resident forms remain in the small tributaries all year long. Migratory forms of bull trout in the Kootenai River use the main stem Kootenai River as a migratory corridor to access the small tributaries, located upstream in Montana, in June and July. After spawning, they move into deep pools downstream of those tributaries starting in late October and November.

Table 3-1. Fish species in the Kootenai River and Potentially in the Project Area River (Both Native and Non-Native)

White sturgeon	*Acipenser transmontanus*	**Longnose sucker**	*Catostomus catostomus*
Bull trout	*Salvelinus confluentus*	**Torrent sculpin**	*Cottus rhotheus*
Westslope cutthroat trout	*Oncorhynchus clarki lewisi*	**Rainbow trout**	*Oncorhynchus mykiss*
Redband Rainbow trout	*Oncorhynchus mykiss subspecies*	**Brown Trout**	*Salmo trutta*
Kokanee salmon	*Oncorhynchus nerka*	**Brook trout**	*Salvelinus fontinalis*
Mountain whitefish	*Prosopium williamsoni*	**Bluegill**	*Lepomis macrochirus*
Burbot	*Lota lota*	**Pumpkinseed**	*Lepomis gibbosus*
Redside shiner	*Richardsonius balteatus*	**Smallmouth Bass**	*Micropterus dolomieu*
Peamouth chub	*Mylocheilus caurinus*	**Largemouth Bass**	*Micropterus salmonides*
Northern pikeminnow	*Ptychocheilus oregonensis*	**Northern Pike**	*Esox lucius*
Largescale sucker	*Catostomus macrocheilus*	**Yellow perch**	*Perca flavescens*
Slimy sculpin	*Cottus cognatus*	**Black bullhead**	*Amerius melas*

Human activity since the early 1900s has caused significant losses in riparian and wetland areas along the lower Kootenai River, negatively affecting fish habitat in the Kootenai River (US EPA, 2004). Some of the most serious effects to fish habitat have come from the following activities:

- Water impoundment and diversion
- River diking
- Flood control and channelization
- Dam construction and operation
- Wetland draining and associated reduction of native species dependent on wetlands (including beavers)
- Livestock grazing
- Urban and suburban development
- Land clearing for agriculture
- Road building
- Recreation

These activities caused degradation that impaired key ecological functions, including sediment filtering, stream bank building, water storage, aquifer recharge, dissipation of stream energy, primary productivity, and nutrient retention. The degradation of these key ecological functions has caused the loss of aquatic habitats that are important for the survival of the native fish found in the Kootenai River habitat (US EPA, 2004).

3.5.2 *Environmental Consequences – Proposed Action*

Although the proposed project activities would improve fish habitat conditions over the long term, short-term adverse effects to fish and fish habitat may occur because of construction activities. The proposed action could affect fish by increasing turbidity during construction, noise from pile driving, general construction noise, and disturbance and injury from rock placement.

In-water work would occur between late August and early November, per the work window identified by IDFG and USFWS, and the period of lowest seasonal flows in the Kootenai River. The work window for the project was established so that construction would occur well after the spawning period for Kootenai River white sturgeon, and to ensure that adult Kootenai River white sturgeon would not be in the area during project implementation. Even at such low flows, because of the size of the work area and the depth and velocity of the water, site isolation and dewatering would not be practical. Consequently, dewatering is not proposed, and pool excavation and bank structure installation would occur in wet conditions. In addition, because of the water depth and velocity, silt curtains are not feasible – any material used to capture or slow water sufficiently to allow turbidity to settle out would be quickly over-topped. However, because the river bottom material is predominantly gravel and sand with very little silt or fine material that remain suspended in the water column; turbidity in the river during construction would dissipate quickly.

Because of the amount of in-water work necessary to implement the proposed project, other effects to water quality could occur, such as accidental hazardous material spills or fluid leaks from construction equipment. The use of best management practices during implementation would cause effects to fish to be low (see Section 3.5.3 and 3.43.).

Implementation of the proposed project in the Bonners Ferry Islands project area would require driving timber piles into the riverbed to create two pool-forming structures on the south bank of the river. The larger structure would be approximately 300 feet long, protrude 200 feet into the channel, and contain approximately 250 piles, 30 to 50 feet long, and 12 to 18 inches in diameter. The smaller structure would be approximately 50 feet long, protrude into the channel 35 feet, and contain approximately 50 piles with the same dimensions as the largest structures. Driving each pile into the ground would require about 380 impact hammer strikes. Workers would install eight to 10 piles per day (see Section 2.1.1).

The level of effect to fish is based on the sound exposure level, which is determined by the loudness and duration of the noise, and the distance fish would be from the noise. Fish are also affected by the accumulated sound exposure level. The accumulated sound exposure level that a fish would experience is calculated by using the number of hammer strikes during a one-day work period (assuming there will be a break of at least 12 hours between work periods) minus the amount of sound energy absorbed by the water. The accumulated sound exposure level, per work period/day, determines the level of effect to fish from the exposure to prolonged noise.

During installation of the pool-forming structures, the sound pressure levels would likely exceed the physical injury threshold for bull trout and Kootenai River white sturgeon. Accumulated sound exposure levels would also reach the threshold for adverse physical effects to both bull trout and Kootenai River white sturgeon, extending 128 meters from the pile being driven. Bull trout and Kootenai River white sturgeon up to 215 meters away from pile driving activities would likely be behaviorally affected (move away from the noise) by noise generated by driving piles (USFWS, 2013).

Although it is possible that bull trout would be in the project area during construction, they are in low abundance, and the habitat area available in the lower Kootenai is quite large compared to the area that would be temporarily affected by elevated noise levels during construction. Additionally, the project area is currently characterized by degraded habitat, which makes it unlikely that bull trout would be present. In addition, because bull trout typically migrate at night (Howell and Buchannan, 1992), it is unlikely that they would be passing through the project areas when pile driving is occurring. Therefore, the effects on bull trout from noise generated by pile driving would be low.

Downstream of the Straight Reach project area is Ambush Rock; a known area for sub-adult and juvenile Kootenai River white sturgeon foraging (USFWS, 2006, 2008). The closest pool-forming structure to Ambush Rock would be approximately 720 feet upstream. Although some juvenile, or sub-adult Kootenai River white sturgeon, may venture outside the area near Ambush Rock, because of the poor quality of habitat in the Straight Reach and Bonners Ferry Islands project areas, they would be expected to only remain for brief periods of time, and not long enough for the accumulated sound exposure levels to cause harm. Therefore, the effects on Kootenai River white sturgeon from noise generated by pile driving would be low.

In the Straight Reach project area, rock would be placed onto the Kootenai River bed using a long-reach excavator secured to a floating barge. The excavator would reach into the water and place the rock directly onto the riverbed. There is a potential that, as the rock is placed, some Kootenai River sturgeon in the area could be disturbed, injured, or killed (e.g. crushed). Because the closest placement of substrate clusters in the Straight Reach would be approximately 530 feet away from Ambush Rock, the effects to Kootenai River white sturgeon from substrate placement during implementation of the Straight Reach project area would likely be low-to-moderate.

Fish leaving because of construction noise would be leaving poor-quality habitats, and would have ample nearby areas to inhabit. For these reasons, potential disturbance or injury effects to bull trout and other fish from implementation of the Straight Reach substrate clusters would be low.

Other fish species that may be present in the project area during construction (Table 3-1) would also benefit from the habitat improvements implemented by the proposed project because the project would create habitats that once occurred naturally in the Kootenai River system but have been lost due human-caused changes to the basin. These fish would also be affected by construction activities, but those effects would be temporary, and they would likely occupy other nearby habitats during that time.

The construction of the proposed project would result in low to moderate short-term effects to fish in the project area; however, after construction, fish species that use this portion of the

Kootenai River would find improved habitat conditions for all life stages, and the long-term outcomes would be beneficial.

3.5.3 *Mitigation - Proposed Action*

If the proposed action were implemented, the Tribe would use the following mitigation measures to avoid or minimize effects on fish and fish habitat. Additional measures are discussed in Sections 3.3, Wetlands, 3.4, Water Resources; and 3.11, Noise.

- Conduct work below the OHWM from August through November in 2015 and 2016.
- Operate machinery for below-OHWM construction from the top of the stream bank along adjacent upland areas, to the extent possible.
- Protect existing riparian and wetland vegetation, to the extent possible.

3.5.4 *Unavoidable Effects Remaining after Mitigation - Proposed Action*

Fish would be temporarily disturbed or would leave the area during construction due to turbidity and noise.

3.5.5 *Environmental Consequences – No Action*

Under the no action alternative, there would not be disturbance to fish due to construction activities and poor habitat conditions for Kootenai River white sturgeon, bull trout, and other native fish species would remain and possibly worsen.

3.6 Recreation

3.6.1 *Affected Environment*

Within the Bonners Ferry Islands project area, Boundary County Parks and Recreation maintains Riverside Park just upstream of the US Highway 95/2 Bridge. This park includes picnic sites and two ball fields. Within the Straight Reach project area, the Boundary Search and Rescue boat ramp is on the south bank of the Kootenai River, off Riverside Drive. This boat ramp is available for use by the public as well as for launching Boundary County's water rescue efforts.

Motorized and non-motorized boating occurs year-round on the Kootenai River through Bonners Ferry Islands and upstream and downstream. Anglers, swimmers, and picnickers use a beach on the north bank of the river, at the south end of the Straight Reach project area but there are no locations within either the Bonners Ferry Islands or Straight Reach project areas where swimming occurs. The next public recreation access point is five miles upstream of the Bonners Ferry Islands project area at the Kootenai Tribe's Twin Rivers Canyon Resort.

3.6.2 *Environmental Consequences – Proposed Action*

Because the Kootenai River is regularly used for recreational boating, the implementation of the proposed project has the potential to affect recreation. During the public scoping period, BPA received a comment that expressed concern regarding the installation of large wood structures along the banks because of the danger these structures posed to boaters, kayakers and tubers. The concerns raised were that the log structures protruded out into the current of the river and that boats were in danger of being caught up on or damaged by the logs and tubers being injured or entrained by the swirling currents created by the structures.

Construction of pool-forming and large wood structures in the Bonners Ferry Islands project. would occur between late August and early November of 2015 and 2016. During construction, some construction equipment would be in or near the river but the river channel would not be blocked. There is less recreational boating during this time due to cooler air temperatures and low river flows. Additionally, the Tribe's previous habitat improvement projects, installed in 2011, 2012, and 2013, conflicts with recreational boaters were not reported(Ireland, personal communication, October 2014.

Following construction, all of these structures would extend out into the river where recreational boaters would need to avoid them. The structures would mimic natural habitat conditions that would occur along a major waterway, like the Kootenai River, and would deflect flow away from the structures and toward the unobstructed parts of the river. The proposed structures would not split the flow, nor would they span the entire width of the channel. Once completed, the recreation effects would be low because the structures would be visible as boaters and tubers approached from upstream and allow enough time for boaters and tubers to move away from the structures as they would from other obstacles encountered on the river.

The Boundary Search and Rescue boat ramp would serve as a staging area in 2016 for construction activities in the Straight Reach project area and, would also be used to load a barge with rocks to build the substrate clusters. This use of the boat ramp would be shared with the public and emergency service activities. Barge use would occupy the ramp for 10 minutes at a time while the barge was loaded, (with 90 minutes in between each trip) allowing sufficient access by other users during the 6 week construction period. Construction materials would be stored in a portion of the boat ramp parking lot that would not impede use of the ramp by recreational users. The Tribe met with the Boundary County Waterways Committee on July 30, 2014 to discuss their proposal to use the Search and Rescue boat ramp. The Waterways Committee confirmed their agreement with the Tribe's approach and use of the ramp (Ireland, personal communication, October 2014).

Construction staging and access for the Bonners Ferry Islands project area along the north bank of the river would utilize land adjacent to Boundary County's Riverside Park. The staging area and movement of construction vehicles in and out of the area would produce dust and noise that would temporarily affect recreational users of the park, particularly those using the baseball fields. Because construction would last for up to two months, these effects would be temporary and the impacts on recreation would be low. Once construction was completed, the areas used for staging and access would be restored to their previous condition.

3.6.3 *Mitigation - Proposed Action*

If the proposed action were implemented, the Tribe would use the following mitigation measures to avoid or minimize effects to recreation.

- Install temporary signage upstream at the Tribally-owned Twin Rivers Canyon Resort boat launch, which is located on part of the Kootenai Indian Reservation, to inform boaters of construction activities occurring downstream in the Bonners Ferry area.
- Install permanent signs upstream at the Twin Rivers boat ramp requesting that boaters and tubers stay clear of the restoration area in order to protect the restoration work. Signs

would also contain an educational element to describe the different project locations, the types of structures, and the benefits they provide for fish.

3.6.4 *Unavoidable Effects Remaining after Mitigation - Proposed Action*

During the proposed 2016 construction, recreational boaters using the boat ramp could experience short delays of about 10 minutes in the Straight Reach project area. Recreational boaters and tubers through this area currently navigate around shallows and bars, once the restoration is complete, they would also need to navigate around four pool-forming structures and two large wood structures in the Bonners Ferry Islands and Straight Reach project areas. .

3.6.5 *Environmental Consequences – No Action*

Under the no action alternative, no restoration actions would be implemented in the Bonners Ferry Islands and Straight Reach project areas and there would be no effect on recreation activities on the Kootenai River.

3.7 Cultural Resources

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

The NHPA requires that federal agencies inventory and evaluate cultural resources for eligibility for listing in the NRHP, and evaluate and consider effects of their actions on these resources. Federal agencies evaluate cultural resources for eligibility in the NRHP using specific criteria, including an examination of the cultural resource's age, integrity (of location, design, setting, materials, workmanship, feeling and association), and significance in American culture, among other things. A cultural resource must meet at least one criterion to be eligible for listing in the NRHP. Historic properties include prehistoric resources that predate European contact and settlement.

3.7.1 *Affected Environment*

Ethnographic Overview

Both of the proposed project areas are within the traditional territory of the Ktunaxa (Kootenai) Nation, and specifically, the Lower Kootenai people. The Kootenai Tribe of Idaho is part of the Ktunaxa Nation. The Lower Kootenai people traditionally occupied the Kootenai River, nearby valleys, and the surrounding areas, from what are now Libby and Jennings, Montana, to Kootenay Lake in British Columbia.

A few Lower Kootenai would accompany the Upper Kootenai on snowshoes (before they had horses), to areas east of the Rocky Mountains, on their yearly bison-hunting expeditions (Brunton, 1998). One of the stops along the river where groups would find resources was at the mouth of the Moyie River, now the site of the Kootenai Tribe's Twin Rivers Canyon Resort and Twin Rivers Sturgeon and Burbot Hatchery (on a portion of the Kootenai Tribe Reservation). Some of the Kootenai, especially the Lower Kootenai, would join large tribal gatherings at Kettle

Falls, for the July and August runs of Chinook, coho, and sockeye salmon (Kennedy and Bouchard, 1998). In the summer and fall, they collected berries, fall roots, seeds, and various plants, and hunted for deer, elk, caribou, and moose. They also hunted or trapped beaver, muskrat, mountain goats, bear, lynx, wolf, and other animals for their hides and, occasionally, for food. Bird hunting was essential to the Lower Kootenai, and sought-after species included cranes, ducks, sea gulls, fool hens, and geese. In the fall, Kootenai people would prepare the village for winter.

Historical Overview

David Thompson, a British-Canadian surveyor and fur trader, was the first non-Indian to explore the area. In 1807, Thompson travelled up the Kootenai River from Kootenay Lake in southeastern British Columbia. He stored canoes near Bonners Ferry and traveled on horseback up the Moyie River valley, to the area that is now Cranbrook and Ft. Steele, B.C. (Tyrell J. B., 1916).

Following the early exploration of the region by fur traders, the discovery of gold caused the first sustained rush of Euro-American settlers to northern Idaho. This inspired the construction of a transportation system sufficient to carry people and goods. After the initial rush of prospectors brought development of more stable communities, interest turned to rock mines. This, in turn, required a regional transportation system to bring the massive equipment that the mills and smelters required (Ostrogorsky et al, 1991).

In 1882, workers completed the transcontinental Northern Pacific Railroad. It spanned northern Idaho, north of the Clark Fork River, around the north side of Lake Pend Oreille, along the north side of the Pend Oreille River. There, it crossed just above Albeni Falls, and then went southwest from Newport to Spokane, Washington.

In 1893, James J. Hill completed his Great Northern Railroad, which ran from Duluth, Minnesota, to Seattle, Washington, by way of the Kootenai River and Bonners Ferry. The railway route in north Idaho crossed the Kootenai River at Bonners Ferry, ran south to cross Lake Pend Oreille at Sandpoint, and continued across the Rathdrum Prairie to Spokane. The Spokane International line followed in 1905, crossing the Kootenai River at Bonners Ferry, and connecting Spokane with the Canadian Pacific Railway (Bonner County History Book Committee, 1991).

Railroads opened the area to large-scale logging, mining, and agricultural development. This gave rise to small communities and lumber mills along their routes. Small towns including Addie, Meadow Creek, Snyder, and Moyie Springs in Idaho, depended on the railroad for supplies and communication.

3.7.2 *Environmental Consequences – Proposed Action*

Based on the review of archaeological site records and cultural resource survey reports on file at the Idaho State Historic Preservation Office and nineteenth-century maps created by the General Land Office three previously recorded archaeological sites or historic structures within the Bonners Ferry Islands and Straight Reach project areas were identified. One, the South Side Pump House (10BY475), is within the affected area and was found to be in fair to good condition. Because of the structure's distance from the proposed construction activities BPA determined that it would not be affected. A second site was a cluster of structures associated with

the Bonners Ferry Lumber Company located on the south bank of the Kootenai River. While the Bonners Ferry Islands project area includes part of the old Bonners Ferry Lumber Company site, the previously documented structures are south of the area that would be impacted by the proposed project. The third site was also a structure associated with the Bonners Ferry Lumber Company. No structures or evidence of a structure were found at the recorded location.

A pedestrian and subsurface survey was conducted on September 15 through 19, 2014 and finished October 3, 2014. Ron Abraham, Kootenai Tribe of Idaho Tribal Councilman, observed the fieldwork. During the pedestrian survey two new archaeological sites were identified: a historic artifact scatter (2286-HS-01), and a historic dump of abandoned vehicles (2286-HS-02). Because of the poor physical condition of both site, BPA has determined that they are not eligible for listing in the NRHP. In a letter dated December 4, 2014 the Idaho State Historic Preservation Officer concurred with this determination. No additional cultural resources were identified in the affected area, and so BPA determined no addition cultural resource survey work was necessary. Thus, the potential for the proposed action to effect cultural resources is low.

3.7.3 *Mitigation - Proposed Action*

If the proposed action were implemented, the Tribe would use the following mitigation measures to avoid or minimize effects on cultural resources.

- Protect any unanticipated cultural resources discovered during construction as follows:
  - Stop all work; cover and protect find in place
  - Notify Kootenai Tribe's project manager who will notify the BPA cultural resources specialist and the Kootenai Tribe of Idaho Cultural Resource Program
  - Implement mitigation or other measures as instructed by BPA

3.7.4 *Unavoidable Effects Remaining after Mitigation - Proposed Action*

There is the low potential to uncover or affect cultural resource during construction of the Proposed Action due to results of cultural resources surveys so unavoidable effects to cultural resources would not be expected.

3.7.5 *Environmental Consequences – No Action*

Under the no action alternative, because no restoration actions would be implemented there would be no potential for effects on cultural resources.

3.8 Visual Resources

3.8.1 *Affected Environment*

The Kootenai River forms the boundary between downtown Bonners Ferry to the south, and the agricultural and low-density residential areas to the north. The developed downtown area is west of US Highway 95/2, which crosses the Kootenai River and bisects the proposed project area. The Union Pacific railroad line passes through Bonners Ferry and crosses the Kootenai River just upstream of the proposed Straight Reach project area. The Burlington Northern-Santa Fe railroad passes through Bonners Ferry and follows the south bank of the Kootenai River. A series of levees protects Bonners Ferry from flooding, and these levees block direct views of the river from the main business district. South of the main business district, the town is on a hill with views to the west and north, including both the Straight Reach and Bonners Ferry Island project

areas. The Kootenai River Inn is just east of US Highway 95/2 and is above the levees. The main restaurant and majority of the rooms at the Kootenai River Inn have views of the Kootenai River and the Bonners Ferry Islands project area.

Riverside Park and one private residence are on the northern bank of the river upstream of the US Highway 95/2 Bridge, but this area is comprised primarily of agricultural land. Low-density residential housing is downstream of the bridge, on the north riverbank.

Recreational boaters view the Bonners Ferry Islands and Straight Reach project areas from the water. Upstream of the proposed project area, the river is bordered mostly by agricultural land, forested areas, and a few private residences. Boaters can also pass by several other restoration projects implemented by the Tribe in 2011, 2012 and 2013 extending from upstream of Bonners Ferry project area, almost to the confluence with the Moyie River. Within the Bonners Ferry Islands and Straight Reach project areas, boaters pass through Bonners Ferry, and the view is mostly of structures, infrastructure, and the levees that protect the town from flooding.

3.8.2 *Environmental Consequences – Action Alternative*

Building the proposed project would cause several changes to the visual landscape. The two new islands, bank grading and stabilization, and large wood structures on the north bank of the Bonners Ferry Islands project area, would be visible from the Kootenai River Inn, from the bluff south of the main downtown area, and by recreational boaters. Because of their location upstream of Bonners Ferry, the two pool-forming structures in the Bonners Ferry Islands project area would only be visible to recreational boaters and several residences next to the river. In the Straight Reach project area, two pool-forming structures and the placement of rock to create the substrate clusters would be visible from the levees through town, from residences on the north bank of the Straight Reach with views of the river, and by recreational boaters.

Construction activities would be visible from August to November in 2015 and 2016. Within the Bonners Ferry Islands and Straight Reach project areas the view would include construction vehicles, construction materials, and disturbed areas where project elements are being installed. Because of the brief amount of time that construction would occur in both 2015 and 2016, the effects on visual resources during construction would be temporary and low.

Once construction is completed, the habitat structures and islands in the Bonners Ferry Islands project area would be visible in and near the river. Over time, as new vegetation establishes and matures, the changes would resemble natural features that occur along large rivers, and would be consistent with the existing landscape. Consequently, the effects on visual resources would be low.

Once construction is completed, the two pool-forming structures in the Straight Reach project area would be visible from the levees through town, residences on the north bank of the Straight Reach with views of the river, and by recreational boaters. The two pool-forming structures in the Straight Reach project area would be built of rock and would look very similar to the riprap along the levees, and so the visual effects would be low.

3.8.3 *Mitigation - Proposed Action*

If the proposed action were implemented, the Tribe would use the following mitigation measures to minimize effects on visual resources:

- Retain existing vegetation, when possible, to visually screen new disturbances, during construction.
- Reseed and plant disturbed areas with appropriate native species, and control weeds, following construction.

3.8.4 *Unavoidable Effects Remaining after Mitigation - Proposed Action*

Construction activities would be visible from several locations in town as well as to recreationalists. Once completed, the four pool-forming structures and several large wood structures in the Bonners Ferry Islands and Straight Reach project areas would be visible from multiple locations.

3.8.5 *Environmental Consequences – No Action*

Under the no action alternative, no restoration actions would occur in the Bonners Ferry Islands and Straight Reach project areas. The views of the Kootenai River in Bonners Ferry, both from land and water, would still change overtime as the shoreline and existing mid-channel islands would continue to erode, cut banks shift, and as the river channel redeposits materials.

3.9 Noise

3.9.1 *Affected Environment*

Noise is any sound that is loud, disruptive, unexpected, or otherwise undesirable. Environmental noise is commonly quantified in terms of A-weighted decibels (dBA); an overall frequency-weighted sound level that approximates the frequency response of the human ear. Table 3-8 contains examples of common activities and their associated noise levels in dBA.

Table 3-8: Common Activities and Associated Noise Levels

Source/Location	Sound Level
Threshold of Hearing	0 dBA
Library	35 dBA
Chicago Suburbs – nighttime	minimum 40 dBA
Small Town/Quiet Suburb	47-53 dBA
Private Business Office	50 dBA
Light Traffic at 100 ft. Away	50 dBA
Average Residence	50 dBA
Large Retail Store	60 dBA
Accounting Office	60 dBA
Boston - Inside House on Major Avenue	68 dBA
Average Traffic on Street Corner	75 dBA
Inside Sports Car (50 mph)	80 dBA
Los Angeles - ¾ mile from Jet Landing	86 dBA
Inside New York Subway Train	95 dBA
Loud Automobile Horn (at 1 m)	115 dBA

Source: EPA 1971

The ability to perceive a new noise source intruding into background conditions depends on the nature of the intruding sound, and the background sound. For situations where the nature of the new sound is similar to the background sound (e.g., new traffic noise added to background traffic noise), a noise of 3 dBA is just noticeable, a change of 5 dBA is clearly noticeable, and a change of 10 dBA is perceived as doubling (or halving, if the sound is reduced) the sound level. For situations where the nature of the new intruding sound is different from background sound (e.g., construction noise in an otherwise quiet setting), the new sound (including sporadic "clanks" from construction equipment) can be easily perceived, even if it only raises the overall noise level by less than 1 dBA.

People in nearby residences, businesses, and those in the area for recreation, would all be "sensitive noise receptors". Existing noise sources include traffic along US Highway 95/2, and train traffic on both of the nearby railway lines. Background noise levels in small towns such as Bonners Ferry are typically around 45 dBA during the day and 35 dBA at night (EPA, 1971). The Burlington-Northern Santa Fe train line is next to the south bank of the Bonners Ferry Islands project area, which creates intermittent, loud sounds when trains pass by. Noise from an individual train depends on the train type, length, speed, and whether the train uses its warning whistle. Trains sound their warning whistle at the "at-grade" vehicle crossings, like the one on Oak Street, to warn motorists of the on-coming train. At a distance of 100 feet, a train-warning whistle can generate maximum noise levels of about 100 to 105 dBA. Train engines typically make maximum noise levels of approximately 80 to 85 dBA, while train cars create noise levels of about 70 to 75 dBA.

3.9.2 *Environmental Consequences – Action Alternative*

An impact pile-driving hammer is a large piston-like device that is usually attached to a crane. Most impact pile driver hammers have a vertical support that holds the pile in place, and a heavy weight, or ram, moves up and down, striking an anvil that transmits the blow of the ram to the pile. The noise from an impact pile-driving hammer comes from the impact of the tool against material. These levels can vary depending on the type and condition of the material. Noise levels at 50 feet from impact pile-driving hammer can range from 80 to 110 dBA.

Implementation of the pool-forming structures in the Bonners Ferry Islands project area would require the use of an impact pile-driving hammer to install the two pool-forming structures along the south bank of the Bonners Ferry Islands project area. Approximately 380 impact hammer strikes would be required to drive each pile, with 8-10 piles being installed per day. Installation of the two pool-forming structures would last for approximately three to four weeks with work occurring Monday through Saturday, 7:30 am to 6 pm.

Assuming maximum construction-generated noise level of 110 dBA at 50 feet, and an average exterior or interior structural attenuation of 15 dBA, inhabitants of residences within approximately 2,000 feet of the construction areas and material yards could experience increases in ambient noise levels of greater than 10 dBA. There are approximately 100 residences in the neighborhoods along the south side of the Kootenai River within 2,000 feet of the proposed construction area. If construction activities were to occur during the more noise-sensitive periods of the day (i.e., evening and nighttime hours), resultant increases in ambient noise levels could result in sleep disruption to occupants of these residential dwellings. Because the project would restrict construction to daytime hours, over a three to four week period, effects from construction-generated noise would be moderate but short term for nearby residences.

For all other general construction activities in the Bonners Ferry Islands and Straight Reach project areas noise generated during construction would likely be only slightly higher than existing background levels. Because of the low noise levels and the short duration of the construction period, noise impacts during construction would be low.

3.9.3 *Mitigation - Proposed Action*

If the proposed action were implemented, the Tribe would use the following mitigation measures to minimize noise effects.

- Limit construction noise to normal daytime working hours.

3.9.4 *Unavoidable Effects Remaining after Mitigation—Proposed Action*

Residences along the south bank of the Kootenai River in the Bonners Ferry Islands project area would experience elevated noise levels during pile driving activities. Pile driving is expected to last for three to four weeks so these effects would be temporary.

3.9.5 *Environmental Consequences – No Action*

Under the no action alternative, no restoration actions would be implemented in the Bonners Ferry Islands and Straight Reach project areas and there would be no effect on noise.

3.10 Air Quality and Greenhouse Gases

3.10.1 *Affected Environment*

Existing, localized sources of air pollutants in the study area include vehicles on state and local highways, diesel train locomotives, agricultural activities, and industrial land uses, such as timber mills. Boundary County is "in attainment" with the National Ambient Air Quality Standards. These standards contain criteria that the Environmental Protection Agency (EPA) uses to determine air quality based on what kind of contaminants, and how much of them, are in an air sample for a given time period (IDEQ, 2014). Being "in attainment" means that the concentrations of air pollutants in the area are historically below the limits described in the National Ambient Air Quality Standards.

3.10.2 *Environmental Consequences – Action Alternative*

Air pollutant emissions would be generated during the construction of the proposed action. If the pollutants occur in significant amounts, they could cause a public health hazard, especially for people with respiratory ailments. The emissions could reduce visibility on roads, highways, and in scenic areas, to the detriment of public safety or enjoyment. In addition, vehicle emissions and combustion of fossil fuels during project operations, as well as during construction, could emit greenhouse gases.

The pollutants that could increase because of project construction are carbon monoxide, ozone, and particulate matter (dust). Dust could be created during construction by vehicles travelling on unpaved surfaces and from ground-disturbing activities. The one house on the north bank, next to the Bonners Ferry Islands project area, and the residential neighborhood on the south bank within 1,000 feet of the project area, would likely experience an increase in dust and particulate matter during construction. However, dust effects would be low because they would only occur during construction (August through November of 2015 and 2016) and so would be temporary,

and would occur in localized areas. In the Straight Reach, there would be very little ground disturbance, so the small amounts of dust generated during the construction would disperse. Consequently, air quality effects during construction would be low.

Emissions from construction vehicles would contribute greenhouse gases to the atmosphere through gasoline and diesel combustion motors.

Greenhouse gas (GHG) emissions were estimated based on the approximate number of vehicles to be used during project construction, and the approximate distance those vehicles would travel during the construction period. For the proposed project, workers would have an estimated 30 vehicle round trips per day at the site during two two-month construction periods (2015 and 2016). The estimated greenhouse gas emissions for the two two-month construction periods would be 383 metric tons of CO2. While all emissions of greenhouse gases are significant, in that they contribute to global greenhouse gas concentrations and climate change, the total CO2 emissions from the proposed project would be low compared to emissions from other contributors. The emissions would also be lower than the EPA's mandatory reporting threshold for annual CO2 emissions, which is 25,000 metric tons of C02 equivalents (CEQ, 2010).

3.10.3 *Mitigation - Proposed Action*

If the proposed action were implemented, the Tribe would use the following mitigation measures to avoid or minimize effects on air quality and GHG emissions:

- Use water trucks to control dust during construction, as needed.
- Ensure that all vehicle engines are maintained in good operating condition to minimize exhaust emissions.
- Implement vehicle idling restrictions.
- Encourage the use of the proper size of equipment for each job.
- Use alternative fuels for stationary equipment at the construction sites, such as propane, or use electrical power, where practicable.
- Reduce electricity use in the construction office by using compact fluorescent bulbs and turning off computers and other electronic equipment every night.
- Recycle or salvage nonhazardous construction and demolition debris, where practicable.

3.10.4 *Unavoidable Effects Remaining after Mitigation - Proposed Action*

There would be temporary localized increases in air pollutants (dust, vehicle emissions) during construction activities.

3.10.5 *Environmental Consequences – No Action*

Under the no action alternative, no restoration actions would be implemented in the Bonners Ferry Islands and Straight Reach project areas and there would be no effect on air quality and no emissions of GHGs.

3.11 Public Health and Safety

3.11.1 *Affected Environment*

Within the Bonners Ferry Islands and Straight Reach proposed project areas, emergency response vehicles use the surface streets and US Highway 95/2. Recreational boaters pass

through the proposed project area and use the Boundary Search and Rescue boat ramp within the Straight Reach project area and the Deep Creek boat ramp, which is just downstream of the Straight Reach project area. Boundary Search and Dive Rescue is a group of volunteers that operates under the direction of the Boundary County Sheriff's Office. The group helps with searches for lost hunters or hikers, and with water rescues and recoveries. They use the ramp to launch their boats in the event of a water emergency on the Kootenai River.

3.11.2 *Environmental Consequences – Proposed Action*

The proposed project would use the Boundary Search and Rescue boat ramp in the Straight Reach project area for three weeks during the installation of the substrate clusters. This boat ramp would be used for loading a barge that would carry rock to be placed for the substrate clusters. During construction, the barge would occupy the boat ramp for approximately 10 minutes as rock is loaded. The barge would then depart from the dock for 90 minutes to place the rock on the river bottom before returning to the dock to reload.

In the event of a water emergency, the barge would vacate the boat ramp to allow Boundary Search and Dive Rescue to launch their boats. The Boundary County Waterways Committee approved the proposed use of the dock during construction (Ireland, Personal Communication, October 2014).

Potential impacts to boaters are discussed in Recreation, Section 3.6.

Risk of injury to workers comes from the use of heavy equipment, working near high-voltage lines, working in water, and being exposed to hazardous materials such as fuels during temporary road construction and earthwork, and placement of structures. Work around water is inherently dangerous, and risk of drowning would increase because worker mobility would be restricted while equipment is moving. Thus, the impact to public health and safety would be low.

3.11.3 *Mitigation - Proposed Action*

If the proposed action were implemented, the Tribe would use the following mitigation measures to avoid or minimize effects on Public Health and Safety:

- Follow agreed to protocols for using the Boundary Search and Rescue boat ramp
- Confine vehicle fueling and maintenance to approved locations.

3.11.4 *Unavoidable Effects Remaining after Mitigation - Proposed Action*

The risk of injury to construction workers would exist because of the dangers inherent in such work, especially near water.

3.11.5 *Environmental Consequences – No Action*

Under the no action alternative, no restoration actions would be implemented in the Bonners Ferry Islands and Straight Reach project areas, and there would be no effect on public health and safety.

3.12 Transportation and Utilities

3.12.1 *Affected Environment*

Transportation

US Highway 95/2 is the primary north/south traffic route through the Idaho panhandle. It crosses the Kootenai River between the Bonners Ferry and Straight Reach proposed project areas. The US Highway 95/2 Bridge was built in 1984, replacing the steel truss bridge that stood there since 1933. The bridge is 1,370 feet long and has nine concrete piers. Average daily traffic volumes on this bridge between 1990 and 2011 were 7,991 vehicles for September, 7,325 vehicles for October, and 6,590 vehicles for November (IDT, 2014). The location of the primary roads within the project area is shown on Figure 3-6.

Construction vehicles for proposed project would access the area as follows:

- Construction access to the north side of the Bonners Ferry proposed project area would come off of US Highway 95, turn east on County Road 60, cross the Union Pacific railroad tracks, and turn south on Ball Park Road (county road) to the proposed project staging area. Users of these roads are residents who live to the west along County Road 60, visitors to Riverside Park, or farm traffic accessing nearby fields.
- Construction access to the south side of the Bonners Ferry proposed project area would come off of US Highway 95, head east on Cow Creek Road, turn left on Riverhouse Lane, cross the Burlington Northern-Santa Fe railroad tracks, and then turn left onto a temporary haul road to cross an existing pasture. Users of these roads are residents who live to the west along Cow Creek Road, workers at the Fodge Pulp Mill, or farm traffic travelling to nearby fields.
- Construction access to the north side of the Straight Reach proposed project area would come off US Highway 95/2 and head west on Chinook Street, west on Comanche Street, south on Birch Street and then North on River Drive. Construction traffic would exit the site by following North River Drive east back to Chinook Street, essentially forming a one-way loop that minimizes truck traffic in residential areas. Users of these roads are residents who live in the neighborhoods along Chinook, Comanche, and Birch streets; traffic to and from the Bonners Ferry Community Hospital; and Kootenai Tribal members headed to the tribal reservation.
- Construction access to the south side of the Straight Reach proposed project area would come off US Highway 95/2 and head east on Riverside Street. Users of these roads are headed towards stores in Bonners Ferry, Riverside Park, the Boundary Search and Rescue boat ramp, or several farms north of town along the river.

The Union Pacific railroad bridge spans the river immediately downstream of the Highway 95/2Bridge. An average of eight trains per day use the bridge. The Burlington Northern-Santa Fe rail line parallels the Kootenai River along its southern bank, and approximately 42 trains use this rail line per day.

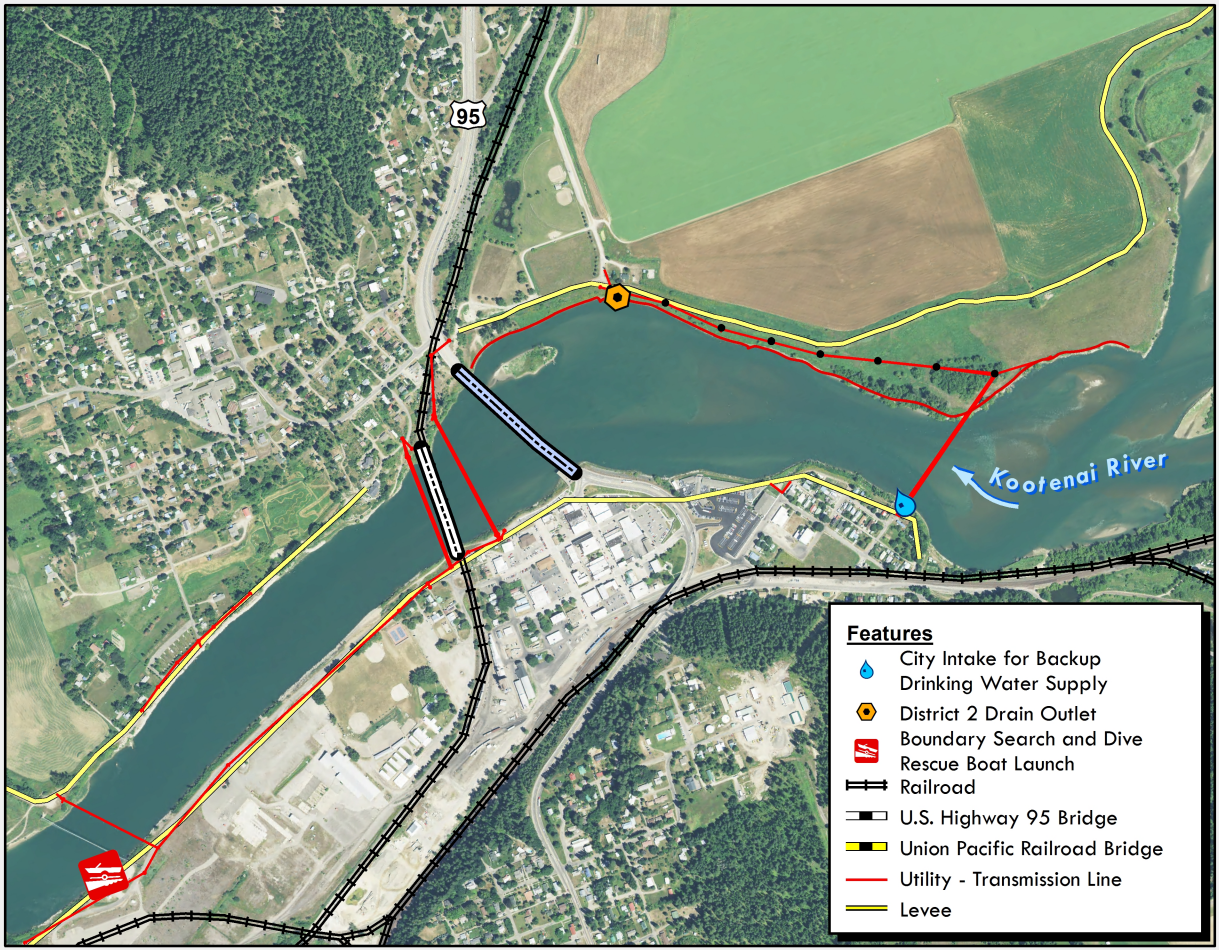


Figure 3-6. Utilities and Transportation Infrastructure

10/2014, River Design Group, Inc.
Aerial Photography: 2013 NAIP.

0 950 1,900 Feet

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BONNEVILLE POWER ADMINISTRATION

Utilities
The City of Bonners Ferry's back-up water intake for drinking water is within the Bonners Ferry Islands proposed project area, on the south bank of the Kootenai River. Several power transmission lines owned by Eugene Water and Electric Board (EWEB) cross the Kootenai River within the Bonners Ferry Island and Straight Reach proposed project areas. All transmission lines crossing the river are between, or downstream of, proposed construction areas, except the transmission line at the east end of the proposed project area.

The Pacific Gas Transmission Company natural gas pipeline spans the Kootenai River at the downstream end of the Straight Reach proposed project area.

3.12.2 *Environmental Consequences – Proposed Action*

The proposed action would temporarily increase traffic from vehicles carrying construction materials to and from the Bonners Ferry Islands and Straight Reach project areas. Large construction equipment traveling to the project areas may also periodically block traffic, causing short-term delays for other vehicles.

Along the south bank of the Kootenai River in the Bonners Ferry Islands project area most of the truck traffic would access the staging and construction areas via Riverhouse Lane. Some construction vehicles would need to access the downstream pool-forming structure through the residential area on Arizona Street and Oak Street. There would be approximately five to seven log or dump trucks per day, Monday through Saturday, for 2 to 3 weeks.

While construction would temporarily increase traffic, the effect would be minor compared with existing roadway use, and is not expected to substantially alter traffic operations on the local roads.

Although large construction vehicles, or trucks, containing materials could cause traffic delays, potential delays would be brief and infrequent. Therefore, transportation effects during construction at both locations would be low to moderate.

Construction vehicles would be required to cross the unmarked level crossing of the Burlington Northern Santa Fe rail line on Riverhouse Lane. Because this crossing is unmarked, a Burlington Northern Santa Fe flagger would be present during all construction times to avoid train conflicts or delays.

The Tribe conducted a hydraulic analysis to determine if there would be any potential long-term water currents or erosion impacts on the Union Pacific Bridge or the U.S. 95/2 Highway Bridge. The analysis showed that the Bonners Ferry Islands and Straight projects would not have an effect on river conditions near the bridges and would not pose a risk to either bridge. The Tribe sent a memo summarizing the analysis of potential effects to the Union Pacific Bridge to the Union Pacific on May 23, 2014. Union Pacific responded via email on July 16, 2014 and concurred that the project would not pose a risk to the Union Pacific Bridge.

The Tribe analyzed potential effects of the proposed project to the U.S. 95/2 Highway Bridge, and sent a memo summarizing that analysis to the Idaho Department of Transportation on May 15, 2014. The Idaho Department of Transportation responded via email on October 27, 2014 and concurred that the project would not pose a risk to the U.S 95/2 Highway Bridge.

Additionally, the Tribe analyzed potential effects to E WEB power poles and requested grading setback criteria from power poles, and sent a memo summarizing that analysis to EWEB. . EWEB responded via email on October 16, 2014 and provided grading clearance requirements for EWEB power poles.

An analysis of potential effects on the City of Bonners Ferry's backup drinking water intake structure indicates that the proposed projects would produce localized changes in Kootenai River velocity near the backup water intake structure. This could produce minor changes in the amount of water passing over the intake structure; however, the depth of flow passing over the intake structure would not change effect the City's ability to draw water using the pump.

Turbidity generated during construction would not affect the City's back up intake because levels generated by construction would not exceed turbidity levels that normally occur in the river at other times of the year. Therefore, the effects on the backup intake would be low (River Design Group, 2014).

3.12.3 *Mitigation - Proposed Action*

The Tribe would use the following mitigation measures to avoid or minimize transportation effects:

- Keep construction activities and equipment clear of residential driveways, to the greatest extent possible.
- Employ traffic control flaggers and post signs along roads warning of construction activity and merging traffic for temporary interruptions of traffic, where needed.
- Ensure a Burlington Northern Santa Fe flagger is present during all construction times to avoid train conflicts or delays at the unmarked crossing of the Burlington Northern Santa Fe rail line.

3.12.4 *Unavoidable Effects Remaining after Mitigation - Proposed Action*

Arizona Street and Oak Street would experience increased amounts of truck traffic during installation of the downstream pool-forming structure. Construction traffic would be present in this area for up to three weeks so the effects would be temporary.

3.12.5 *Environmental Consequences – No Action*

Under the no action alternative, restoration activities in the Bonners Ferry Islands and Straight Reach project areas would not occur; therefore, there would be no effect on transportation.

3.13 Socioeconomics

3.13.1 *Affected Environment*

Boundary County, Idaho, is the study area for socioeconomics. Data for the analysis came from the Bureau of Economic Analysis, which organizes data according to markets for labor, products, and other economic information.

Population and Housing

In 2013, Boundary County, Idaho had an estimated population of 10,972 (US Census, 2014). The largest city in the county is Bonners Ferry, with an estimated population of 2,543 in 2013 (US Census, 2014).

Employment and Income
About 4,288 people age 16 and over had jobs in some capacity in Boundary County in 2012 (US Census, 2012). The unemployment rate in the study area in 2012 was 5.6%. In 2012, per-capita personal income in the study area was $18,298 (US Census, 2012).

Table 3-9: Demographic Characteristics

	Bonners Ferry	Boundary County	State of Idaho
Total Population	2,543	10,972	1,567,582
Minority population	146 (5.7%)	574 (5.2%)	171,095 (10.9%)
Low-income population	23.9 (+/- 7.9)	16.1 (+/- 3.8)	15.0% (+/- 0.3)

Environmental Justice
When a federal agency proposes an action, such as this project, it must identify and address "disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority populations and low-income populations" (collectively, environmental justice populations) (59 Federal Register 7629 [February 11, 1994]). This executive order directs agencies to analyze the effects of potential actions on minority and low-income communities through the National Environmental Policy Act review process (Council on Environmental Quality, 1997).

To determine potential impacts, federal agencies identify geographic areas where ethnic and racial minorities exceed 50 percent of the population, in addition to geographic areas where the percentage of the ethnic and racial minority population is "meaningfully greater" than the percentage in the surrounding area. Low-income populations are populations that are at or below the poverty line, as established by the U.S. Department of Health and Human Services.

Analysis showed that minority populations of Latino and Hispanic origin, American Indian, and two or more races live in the environmental justice study area. In Bonners Ferry, Idaho, 4.7 percent of the population is considered a minority population. In Boundary County, Idaho 3.6 percent of the population is considered a minority population. In the state of Idaho, 5.4 percent of the population is considered a minority population (US Census, 2012).

The US Census Bureau uses a set of dollar value thresholds that vary by family size and composition to determine the poverty level. Between 2008 and 2012 in Bonners Ferry, Idaho 23.9 percent of people had incomes below the poverty level Boundary County, Idaho, 16.1 percent of people had income below the poverty level, as compared to 16.1 percent of the population of Boundary County and 13.6 percent of the statewide population (US Census, 2014).

3.13.2 *Environmental Consequences – Proposed Action*

Population and Housing
Because staging and construction for the proposed action would occur between July and November in 2015 and 2016, the duration of work would likely not be long enough to induce any permanent changes to population in the study area. Construction would require approximately 20

workers, with the workforce coming from both inside and outside Boundary County. Workers from outside Boundary County would likely reside temporarily within the project vicinity and have an indiscernible effect on the overall population of the study area. The workers from out of the area would require temporary lodging in the local area. Construction workers would likely occupy recreational vehicle parks and hotels or motels. There is expected to be sufficient temporary lodging to accommodate this small increase in demand over the construction period. Therefore, the potential for effects on population and housing from construction would be low.

Employment and Income

As discussed above, the temporary increase in jobs during construction would represent a very small proportion of the current workforce in the study area. Therefore, the temporary effect on the labor market in the study area would be low. For those people who get construction jobs, especially if they are currently unemployed, the individual effect would be positive.

Construction of the proposed action is expected to cost approximately $8-10 million. This cost would include expenditures on materials and equipment, and expenditures on labor – some of which would be spent locally in the study area. These local expenditures would have ripple effects on the economy, as workers and businesses receiving income would respend some of the money locally, the workers and businesses that receive that money would respend some locally, and so on. These direct and indirect expenditures would represent a small proportion of the total annual income in the study area, so the effect would be temporary and low.

Environmental Justice

During construction, the area next to the Bonners Ferry Islands and Straight Reach project areas would experience short-term disturbances, including noise and dust from construction equipment and activities, and traffic delays from construction traffic. These effects would be greatest for the neighborhoods located within 1,000 feet of the Bonners Ferry Islands south bank construction area, and the neighborhood on the north bank of the Straight Reach project area. Because of the low population densities in the panhandle of Idaho, census tracks are large, and do not provide sufficient detail on the race or income level of this neighborhood. As described above, construction of the proposed action would have a low but positive temporary impact on the economy in the affected area. Additionally, all persons, regardless of race or income, would experience the same low impacts associated with construction. Thus, construction of the proposed action would likely have no adverse or disproportionate impacts on minority or low-income populations.

3.13.3 *Mitigation - Proposed Action*

If the proposed action were implemented, the Tribe would use the following mitigation measures to minimize socioeconomic effects.

- Limit construction noise to daytime working hours (see Noise, Section 3.9.3)
- Use water trucks to control dust during construction , as needed (see Air Quality, Section 3.10.3)
- Keep construction activities and equipment clear of residential driveways to the greatest extent possible (see Transportation, Section 3.12.3)

3.13.4 *Unavoidable Effects Remaining after Mitigation - Proposed Action*

There could be a temporary increase in employment, spending, and the demand for short-term housing in the project area during the proposed construction seasons.

3.13.5 *Environmental Consequences – No Action*

Under the no action alternative, restoration actions in the Bonners Ferry Islands and Straight Reach project areas would not occur; therefore, the effects related to construction would not happen, and there would be no effect on socioeconomics or environmental justice populations.

3.14 Other Environmental Elements

3.14.1 *Wildlife*

Adverse effects on wildlife would be low. Tree and vegetation removal along the south bank of the Kootenai River in the Bonners Ferry proposed project area would cause the loss of some habitat, but much of this vegetation is non-native and does not provide much habitat value. As a part of the proposed project approximately 10 acres of native vegetation would be planted, which would increase the amount of functional wildlife habitat in the project area once the planting is mature. The proposed restoration of in-river and riparian habitats along the Kootenai River would likely benefit native wildlife species such as beaver, muskrat, otter and mink. The project would have no effect on ESA-listed wildlife species because the project area is outside management areas or designated critical habitat for three ESA-listed wildlife species known to occur in Boundary County, grizzly bear, woodland caribou, and Canada lynx. . In addition, staging and construction would occur between July and November, which is outside the nesting period for migratory birds.

BPA received a comment during scoping regarding the presence of beaver near the baseball fields at Riverside Park. The baseball fields and wetland areas adjacent to the fields are outside the project area and would not be disturbed by construction.

3.14.2 *Vegetation*

Effects on upland vegetation would be low. Removal of several trees and shrubs along the south bank of the Kootenai River in the Bonners Ferry proposed project area would consist mostly of non-native vegetation such as reed canary grass and box elder. Planting native vegetation over 10 acres throughout the project area would mitigate for the removal of this vegetation.

3.14.3 *Land Use*

Effects on land use would be low. The construction would occur in the main channel of the Kootenai River and cause no changes to land use. Some land currently used for agriculture and pasture would be used for temporary access and staging areas but those land uses would continue during construction..

3.15 Cumulative Effects Analysis

3.15.1 *Introduction*

Cumulative effects are effects that could occur when considered in addition to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-

federal) or person undertakes such other actions. Current actions are those projects, developments, and other actions that are currently underway because they are either under construction or occurring on an ongoing basis. Reasonably foreseeable future actions generally include those actions formally proposed or in the planning stages. Cumulative effects can result from individually minor but collectively significant actions taking place over a period.

Past actions that have affected natural and human resources along the Kootenai River in Idaho include the construction of Libby Dam, timber harvest, diking, agriculture, road development, commercial and residential development, and mining. Since 2011, the Tribe has implemented aquatic and riparian habitat restoration projects along the Kootenai River intended to benefit native fish and wildlife species, but focused on the recovery of Kootenai white sturgeon. The Tribe has also implemented upland restoration actions along the Kootenai River historic floodplain and its tributaries.

In determining the present and reasonably foreseeable actions with the potential, when combined with the effects of the alternatives, to result in cumulative effects, BPA considered other planning efforts, large-scale projects, or restoration actions along the Kootenai River below Libby Dam that would be likely to result in effects that could interact cumulatively with those from the proposed project.

1. Timber harvesting activities contribute sediment to the rivers and streams that flow into the Kootenai River. The Kootenai River below Libby Dam flows through the Three Rivers Ranger District of the Kootenai National Forest in Montana and the Bonners Ferry Ranger District of the Idaho Panhandle National Forest in Idaho. There are no timber sales being considered in either of these ranger districts that would result in impacts to the Kootenai River. (USFS, 2014a, 2014b) Private timber sales could occur that could result in impacts to wetlands, vegetation, and water quality.
2. The USFS's Collaborative Forest Landscape Restoration Program (CFLRP) provides funding for collaborative, science-based ecosystem restoration of priority forest landscapes. Past practices have degraded forest health and increased fire risk. The Kootenai Valley Restoration Initiative has received CFLRP funding to implement restoration actions on USFS lands that focus on:
    - Reforestation:
    - Pre-commercial Thinning
    - Prescribed Burn:
    - Invasive Plant Management:
    - Culvert Upgrades:
    - Fish Passage Culvert Replacement:
    - Road Decommission:
    - Road Maintenance

3.15.2 *Soils and Geology*

The past, present, and reasonably foreseeable future actions that could cumulatively affect soils and geology are habitat restoration actions and continued hydroelectric dam operations as well as land-disturbing operations such as road construction, agriculture, commercial and residential development, and mining.

The project may cumulatively affect vegetation and wetlands during construction because there would be other actions impacting vegetation and wetlands during the same general timeframe as project construction. The project, when considered with past, present, and future habitat restoration projects in the Kootenai Basin below Libby Dam would contribute to preventiung soil loss over time by the reestablishment of healthy native vegetation along the river and in the uplands. Environmental design features/mitigation measures described in Table 2-2 would ensure that cumulative impacts from the project on vegetation and wetlands would be low.

3.15.3 *Wetlands*

Because the proposed project would result in an overall increase in wetland area and improved wetland functions the proposed action would not contribute to the cumulative effects of the loss of wetlands along the Kootenai River that have occurred over time. Implementation of the mitigation measures described in Section 3.3.3would ensure the cumulative effects on wetlands would be low.

The past, present, and reasonably foreseeable future actions that could cumulatively affect wetlands are habitat restoration actions and continued hydroelectric dam operations as well as land-disturbing operations such as road construction, agriculture, commercial and residential development, and mining. The Proposed Action would decrease low quality (e.g., dominated by non native place species) palustrine emergent wetlands in the project area by 2.3 acres while increasing palustrine scrub shrub wetlands by 8.8 acres. These impacts, when combined with the impacts of the projects in the analysis area would result in low cumulative impacts on wetlands.

3.15.4 *Water Resources*

The past, present, and reasonably foreseeable future actions that could cumulatively affect water resources are habitat restoration actions and continued hydroelectric dam operations as well as land-disturbing operations such as road construction, agriculture, commercial and residential development, and mining.

As discussed in Section 3.4.2, water quality effects from the proposed action would be low during construction, and would likely improve water quality from the bank stabilization and erosion control elements of the project. Thus, the cumulative impacts on water resources would be low.

3.15.5 *Fish and Fish Habitat*

The past, present, and reasonably foreseeable future actions that could cumulatively affect fish and fish habitat are habitat restoration actions and continued hydroelectric dam operations as well as land-disturbing operations such as road construction, agriculture, commercial and residential development, and mining.

The short term effects of the proposed action on fish and fish habitat would be low (e.g., fish avoidance) while the long term benefits would include increased habitat quantity, diversity, and complexity. Thus, the cumulative effect on fish and fish habitat would be low.

3.15.6 *Recreation*

There are no major construction projects or other development projects planned in the project vicinity that would have potential effects to recreational activities. Therefore, the effects on

recreation activities from the proposed action combined with the impacts of other past projects would have a low cumulative impact on recreational resources.

3.15.7 *Cultural Resources*

Cultural resources in the project area have likely been cumulatively affected by past, present, and current development activities. Most impacts have likely occurred as a result of inadvertent disturbance or destruction from ground-disturbing activities such as land-disturbing operations such as road construction, agriculture, commercial and residential development, and mining.. Implementation of the mitigation measures described in Section 3.7.3 would reduce the potential for construction activities to contribute incrementally to the cumulative impacts on unknown cultural resources. In the event that previously undiscovered cultural resources are encountered, potential impacts would depend on the level and amount of disturbance, and the eligibility of the resource for listing in the NRHP.

3.15.8 *Visual Resources*

There are no major construction projects or other development planned in the immediate vicinity of the project area that would be visible to the same sensitive viewer groups (see Section 3.8, Visual Resources). Therefore, the contribution of the proposed action to cumulative visual resource effects would be low.

3.15.9 *Noise*

While the proposed action would cause a temporary increase in noise levels for nearby residents, businesses and recreationalists during construction, there are no other projects planned in immediate vicinity during this time. "The existing noise sources (trains and train horns) described in Section 3.9 combined with the Proposed Action would have a moderate cumulative impact on noise.

3.15.10 *Air Quality*

Ongoing vehicular use, agricultural activities, and commercial and residential facilities in the cumulative effects analysis area all contribute to ambient air pollutant emissions. These sources of pollutants would continue to occur. While the Proposed Action would contribute a small amount to pollutant levels, when combined with present and reasonably foreseeable future actions in the affected area, these actions are not expected to violate NAAQS and, therefore, cumulative impacts on air quality would be low. All levels of greenhouse gas emissions play a role in contributing cumulatively to global GHG concentrations and climate change. However, given the low emissions caused by the construction of the proposed action (383 metric tons of CO2 for the two two-month construction periods), its cumulative contribution to global greenhouse gas concentrations is considered low.

3.15.11 *Public Health and Safety*

There are no major construction projects or other development planned in the immediate vicinity of the project area that would affect the Boundary Search and Rescue boat ramp. Additionally, the mitigation measures described in Section 3.11.3 would reduce the impacts of the proposed action on public health and safety. Therefore, the contribution of the proposed action to cumulative public health and safety effects would be low.

3.15.12 *Transportation and Utilities*

The proposed action would cause minimal increases in traffic during construction of the proposed action. No known development or additional construction projects are planned that would increase traffic delays. Additionally, a flagger would be used to avoid train conflicts or delays on the Burlington Northern Santa Fe line. Therefore, the proposed action would have low cumulative effects on transportation. There are no major construction projects or other development planned in the immediate vicinity of the project area that would affect the City's back up water intake, the EWEB power line, or the Union P rail line. Therefore, the contribution of the proposed action to cumulative effects on utilities would be low.

3.15.13 *Socioeconomics*

Other construction projects in the study area have contributed to the local economy, as well as temporarily affecting population and housing, employment and income. Because the effects of the proposed action would largely be temporary and low, it would have a low cumulative effect on population and housing, employment and income, and no effect on environmental justice populations.

Chapter 4 ENVIRONMENTAL 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 the effects their actions may have on the environment. NEPA requires preparation of an EIS for major federal actions significantly affecting the quality of the human environment. BPA prepared this draft EA to determine if the Proposed Action would create significant environmental effects that would warrant preparing an Environmental Impact Statement, or if a Finding of No Significant Impact is justified.

4.2 Wetlands, Floodplains, and Water Resources

As part of the NEPA review, U.S. Department of Energy NEPA regulations require the assessment of effects on floodplains and wetlands, and the evaluation of alternatives for protection of these resources in accordance with Compliance with Floodplain/Wetlands Environmental Review Requirements (10 CFR 1022.12) and Executive Orders 11988 (Floodplain Management) and 11990 (Protection of Wetlands). An evaluation of impacts of the project on floodplains and wetlands is discussed briefly below and in more detail in Section 3.3, Wetlands and Section 3.4, Water Resources, of this EA.

Several sections of the Clean Water Act (33 USC 1251 et seq.) and the Idaho Stream Channel Protection Act (Title 42, Chapter 38, Idaho Code) address wetland and waterway management, regulation, and protection. The Tribe will submit a Joint Permit Application to the USACE and Idaho Department of Water Resources before construction. The applicable regulations to the project are discussed below.

4.2.1 *Clean Water Act Section 401*

A federal permit to conduct an activity that causes discharges into navigable waters is issued only after the State of Idaho certifies that existing water quality standards would not be violated if the permit were issued. DEQ will review the project's Section 402 and Section 404 permit applications for compliance with Idaho water quality standards and grant certification if the permits comply with these standards.

4.2.2 *Clean Water Act Section 402*

This section authorizes National Pollutant Discharge Elimination System permits for the discharge of pollutants, such as stormwater. The EPA, Region 10, has a general permit for discharges from construction activities. The Tribe would issue a Notice of Intent to get coverage under this general permit, and would prepare a stormwater pollution prevention plan to address stabilization practices, structural practices, stormwater management, and other controls.

4.2.3 *Clean Water Act Section 404*

When dredged or fill material discharges into waters of the United States, including wetlands, it requires authorization from the USACE in accordance with the provisions of Section 404 of the Clean Water Act. The Tribe will work with the USACE to get a Section 404 permit for fill

placed in wetlands or other waters, and work with DEQ to get Section 401 water quality certification (see Section 4.2.1). Sections 3.3, Wetlands, and 3.4, Water Resources, of this EA describe potential effects on wetlands and other waters.

4.2.4 *Idaho Stream Channel Protection Act*

The Idaho Stream Channel Protection Act requires protection of stream channels of the state and their environment against alteration to protect fish and wildlife habitat, aquatic life, recreation, aesthetic beauty and water quality. Idaho Department of Water Resources issues a Stream Channel Alteration permit before any work is done within the beds and banks of a continuously flowing stream. The Tribe will submit a Joint Permit application to the USACE and Idaho Department of Water Resources before construction.

4.3 Fish and Wildlife

4.3.1 *Endangered Species Act*

The ESA (16 USC 1531 et seq.) establishes a national program for the conservation of threatened and endangered species of fish, wildlife, and plants, and the preservation of the ecosystems on which they depend. The USFWS administers the ESA for terrestrial species and some freshwater fish species, while NMFS has jurisdiction over anadromous fish and marine species. Section 7(a) of the ESA requires federal agencies to ensure that the actions they authorize, fund, and carry out do not jeopardize the continued existence of any endangered or threatened species or result in the destruction or adverse modification of critical habitat. Section 7(c) of the ESA and other federal regulations require that federal agencies prepare a biological assessment addressing the potential effects of their actions on listed or proposed endangered species and critical habitats.

In 2013, BPA prepared a programmatic biological assessment and submitted it to USFWS (Meridian Environmental, Inc., 2013). The 2013 - 2015 Restoration Program Programmatic Biological Assessment evaluated the effects to Kootenai River white sturgeon (endangered) and Columbia River bull trout (threatened), and their designated critical habitat associated with the Tribe's proposal to implement their 2013-2015 Restoration Program. The 2013-2015 Restoration Program includes projects identified in the Kootenai Tribe's Kootenai River Habitat Restoration Program, which identified specific habitat projects in the Kootenai River that would enhance habitat for Kootenai River white sturgeon as required by the Libby Dam BiOp The restoration actions described in this EA were part of the consultation with USFWS for the larger restoration program.

The USFWS issued a biological opinion on July 30, 2013 with the determination that implementing the Kootenai River Habitat Restoration Program is not likely to jeopardize the continued existence of the Kootenai River white sturgeon, or its critical habitat. The biological opinion provided an incidental take statement to exempt the potential incidental take of Kootenai River white sturgeon that may occur during construction activities, and stated that no reasonable and prudent measures nor terms and conditions were necessary, in addition to those measures incorporated into the program's description, to further minimize such incidental take of Kootenai sturgeon. The biological opinion also concurred with BPA's determination of "may affect, not likely to adversely affect" bull trout and bull trout critical habitat.

In addition to Kootenai River white sturgeon and bull trout, BPA determined that three terrestrial species are listed as threatened or endangered under the federal ESA in Boundary County, Idaho.

Based on the scope, timing, and location of the proposed projects in the Kootenai River, BPA has determined that the proposed action would have no effect on woodland caribou (endangered), grizzly bear (threatened), or Canada lynx (threatened).

Because the Kootenai River Habitat Restoration Program was expected to be implemented over several years with a time line that was subject to change, the USFWS treated the ESA consultation in a semi-programmatic way. This means that the USFWS determination is based on an agreement that BPA will informally consult with the USFWS before the implementation of each phase of restoration. As a result, BPA is reviewing the proposal for the Kootenai River Habitat Restoration at Bonners Ferry Project in relation to the information presented in the original biological assessment, considering any new information available, and making a determination of whether the effects upon ESA-listed species and critical habitat are within the type and scope of effects addressed within this opinion. BPA will then request confirmation from the USFWS that the project's effects on bull trout and its designated critical habitat, and Kootenai River white sturgeon and its designated critical habitat are identical to the type and scope of effects addressed in the original biological assessment and opinion. Within 30 calendar days of such a request from BPA, the USFWS will either confirm or deny that the specific project's effects are consistent with the biological assessment and opinion. However, if the type or scope of effects, or effect determination is different than addressed in the biological assessment, BPA will prepare a biological assessment amendment and submit it to USFWS for review. Upon receipt of an amendment, and consultation request from BPA, the USFWS will review such a request and issue concurrence amendments or biological opinion amendments as appropriate.

4.3.2 *Fish and Wildlife Conservation Act and Fish and Wildlife Coordination Act*

The Fish and Wildlife Conservation Act of 1980 (16 USC 2901 et seq.) encourages federal agencies to conserve and promote conservation of non-game fish and wildlife and their habitats. The Fish and Wildlife Coordination Act (16 USC 661 et seq.) requires federal agencies with projects affecting water resources to consult with USFWS and the state agency responsible for fish and wildlife resources. The analysis in Section 3.5, Fish and Fish Habitat, of this environmental assessment indicates that the project would have low to moderate short-term effects on fish and fish habitat, with implementation of appropriate mitigation. BPA and the Tribe are consulting with USFWS regarding potential effects of the project on ESA-listed fish and wildlife species and will implement the mitigation measures included in the biological assessment and any other measures that USFWS requires. The USFWS and IDFG have been notified of the project and will be sent copies of the Draft and Final EA.

4.3.3 *Migratory Bird Treaty Act and Federal Memorandum of Understanding*

The Migratory Bird Treaty Act of 1918, as amended, implements various treaties and conventions between the United States and other countries, including Canada, Japan, Mexico, and Russia, for the protection of migratory birds (16 USC 703–712). Under the act, taking, killing, or possessing migratory birds, or their eggs or nests, is unlawful. The act classifies most species of birds as migratory, except for upland and nonnative birds such as pheasant, chukar, gray partridge, house sparrow, European starling, and rock dove.

BPA (through the U.S. Department of Energy) and USFWS have a memorandum of understanding to address migratory bird conservation in accordance with Executive Order 13186 (Responsibilities to Federal Agencies to Protect Migratory Birds). This order directs each federal agency taking actions that could negatively affect migratory birds 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.

The analysis in Section 3.14.1 Wildlife, of this environmental assessment indicates that the project would have low effects on birds, including migratory birds. The project would avoid potential effects on nesting birds because no trees would be removed and staging and construction activities would be conducted between July and November, which is outside the nesting period for migratory birds.

4.3.4 *Bald Eagle and Golden Eagle Protection Act*

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

Bald and golden eagles may exist at the proposed project site. Because the project would not involve knowing take or other acts in wanton disregard of bald or golden eagles, its implementation would not violate the provisions of the Bald Eagle and Golden Eagle Protection Act.

4.4 Land Use Plan Consistency

As indicated in Section 3.14.3, construction activities would occur in the main channel of the Kootenai River and result in no changes to land use. Also, there would be no change in land use from temporary access road construction and staging of materials.

4.4.1 *Farmland Protection Policy Act*

The Farmland Protection Policy Act (7 USC 4201 et seq.) directs federal agencies to identify and quantify adverse effects of federal programs on farmlands. This act minimizes the number of federal programs that contribute to the unnecessary and irreversible conversion of agricultural land to non-agricultural uses. The proposed action would not permanently convert any area of agricultural land to non-agricultural uses.

4.5 Cultural and Historic Resources

Laws and regulations govern the management of cultural resources. A cultural resource is an object, structure, building, site, or district that provides irreplaceable evidence of natural or human history of national, state, or local significance, such as National Landmarks, archaeological sites, and properties listed (or eligible for listing) in the NRHP. Cultural resource-related laws and regulations include:

- Antiquities Act of 1906 (16 U.S.C. 431–433),
- Historic Sites Act of 1935 (16 U.S.C. 461–467),

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

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

To this end, BPA has provided information about the proposed action to, and requested information from numerous agencies, on the level and type of proposed identification and evaluation efforts of the prehistoric resources. Agencies consulted include the Idaho State Historic Preservation Office, the Confederated Salish and Kootenai Tribes, Coeur d'Alene Tribe of Idaho, Kalispel Tribe of Indians, and the Spokane Tribe of Indians, ad the Kootenai Tribe of Idaho.

4.6 Air Quality

The Clean Air Act, as amended (42 U.S.C. 7401 et seq.), requires the EPA and states to carry out a wide range of regulatory programs intended to comply with the National Ambient Air Quality Standards. In Idaho, both the EPA and Idaho Department of Environmental Quality are responsible for air quality. Because the proposed action would occur in an area that is in attainment with the air quality standards, and because no stationary sources of air emissions would occur, construction associated with the proposed action are exempted from state regulation. Air quality effects from construction would be low. Section 3.10.3, Air Quality, discusses mitigation measures.

4.7 Climate Change

Gases that absorb infrared radiation and prevent heat loss to space are called greenhouse gases (GHGs). Models predict that atmospheric concentrations of all GHGs will increase over the next century, but the extent and rate of change is difficult to predict, especially on a global scale. As a response to concerns over the predicted increase of global GHG levels, various federal and state mandates address the need to reduce GHG emissions, including the following.

- The Clean Air Act is a federal law with regulations to control emissions from large generation sources such as power plants; limited regulation of GHG emissions occurs through the New Source Review permitting program.
- The EPA's *Final Mandatory Reporting of Greenhouse Gases Rule* (40 C.F.R. 98) requires reporting of GHG emissions from large sources. Under the rule, suppliers of

fossil fuels or industrial GHGs, manufacturers of vehicles and engines, and facilities that emit 25,000 metric tons or more per year of GHGs must submit annual reports to the EPA (CEQ, 2010).

- Executive Orders 13423 (Strengthening Federal Environmental, Energy, and Transportation Management) and 13514 (Federal Leadership in Environmental, Energy and Economic Performance) require federal agencies to measure, manage, and reduce GHG emissions by agency-defined target amounts and dates.

GHG emissions would be below EPA's mandatory reporting threshold of 25,000 metric tons or more per year for the proposed project (383 metric tons of CO2 equivalent for the two two-month construction periods). The effect of the proposed action on GHG concentrations would be low, as discussed in Section 3.10, Air Quality, of this EA.

4.8 Noise

The Noise Control Act of 1972 (42 USC 4901 et seq.) sets forth a broad goal of protecting all people from noise that jeopardizes their health or welfare. The Act further authorizes federal agencies to carry out the programs within their control to further this policy. Idaho does not have statewide regulations limiting noise emissions from commercial facilities. Similarly, neither Boundary County nor the City of Bonners Ferry has a noise control ordinance that limits noise emissions. The noise effects from the project would be temporary and moderate for people within 2,000 feet of construction, and low to none for those farther than 2,000 feet from project actions. As described in Section 3.9, Noise, of this EA, the project would have temporary low to moderate noise effects, and mitigation would further reduce noise effects (see Section 3.9.3).

4.9 Hazardous Materials

Several federal laws related to hazardous materials and toxic substances potentially apply to the project, depending upon the quantities and types of hazardous materials being used.

4.9.1 *The Spill Prevention, Control, and Countermeasures Rule*

The Spill Prevention Control and Countermeasures Rule (40 CFR Part 112) includes requirements to prevent discharges of oil and oil-related materials from reaching navigable waters and adjoining shorelines. It applies to facilities with total aboveground oil storage capacity (not actual gallons onsite) of greater than 1,320 gallons, and facilities with belowground storage capacity of 42,000 gallons. This project does not propose onsite storage of oil or oil-related materials.

4.9.2 *Comprehensive Environmental Response, Compensation, and Liability Act*

The Comprehensive Environmental Response, Compensation, and Liability Act (42 USC 9601 et seq.) funds hazardous materials training, emergency planning, preparedness, mitigation implementation, response, and recovery. Eligible individuals include public officials, emergency service responders, medical personnel, and other tribal response and planning personnel. No hazardous materials sites are located within the project.

4.10 Executive Order on Environmental Justice

In February 1994, the President released Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority and Low-Income Populations*. This order requires federal agencies to identify and address, as appropriate, disproportionately high and adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations. The proposed project would not cause disproportionately high and adverse effects on minority and low-income populations. (see Section 3.13, Socioeconomics),

Chapter 5 TRIBES, AGENCIES, AND PERSONS RECEIVING THE EA

Those consulted or receiving notice of document availability include local, state, and federal agencies, public officials, and tribes in the project vicinity. Specific individuals were contacted to gather information and data about the project area and applicable requirements, as part of consultation, or for permit applications.

5.1 Federal Agencies

U.S. Environmental Protection Agency

U.S. Army Corps of Engineers

U.S. Fish and Wildlife Service, Spokane Office

5.2 State Agencies

Idaho Department of Environmental Quality

Idaho Department of Fish and Game

State of Idaho House and Senate members for Districts encompassing the project area

Idaho State Historic Preservation Office

5.3 Tribes

Kootenai Tribe of Idaho

Confederated Salish and Kootenai Tribes

Kalispel Tribe of Indians

Coeur d' Alene Tribe of Idaho

Spokane Tribe of Indians

5.4 Local Governments

Boundary County
Bonners Ferry, Idaho

5.5 Other

Union Pacific Railroad

Burlington Northern – Santa Fe Railroad

Eugene Water and Electric Board

Chapter 6 GLOSSARY AND ACRONYMS

6.1 Glossary

A-weighted sound pressure level (dBA)	A logarithmic measurement of sound based on the decibel but weighted to approximate the human perception of sound. Commonly used for measuring environmental and industrial noise levels.
Ambient noise	The composite of noise from all sources near and far. The normal or existing level of environmental noise at a given location.
Area of potential effect	The geographic area within which a proposed action may directly, or indirectly, cause alterations in the character or use of historic properties, if any such properties exist. The area of potential effect is influenced by the scale and nature of an undertaking and may be different for different kinds of effects caused by the undertaking.
Carbon dioxide equivalent (CO_{2e})	Measure for comparing the global warming potential of a given type and amount of greenhouse based on concentrations of carbon dioxide (CO_2). Global warming potential compares the amount of heat trapped by a certain mass of the gas in question to the amount of heat trapped by a similar mass of carbon dioxide.
Critical habitat	Habitat essential to the conservation of an endangered or threatened species listed under the ESA as designated by the USFWS or the National Marine Fisheries Service.
Cubic feet per second (cfs)	The acronym "cfs" represents a standard measurement used to determine the flow of a river. A cubic foot per second is equal to the discharge through a rectangular cross-section one foot wide and one foot high, flowing at an average velocity of one foot per second. One cubic foot per second equals 448.8 gallons per minute.
Cultural resource	Cultural resources is a broad term that encompasses physical remains and sites associated with past human activities. They are the collective evidence of past activities and accomplishments of people. They include things and places that demonstrate evidence of human occupation or activity related to history, architecture, archaeology, engineering and culture.
Cumulative effect	The effect on the environment that results from the incremental effect of the action when added to other past, present, and reasonably foreseeable future actions regardless of what agency (federal or non-federal) or person undertakes such other actions. Cumulative effects can result from individually minor but collectively significant actions taking place over a period.

Decibel (dB)	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the measured pressure to the reference pressure, which is 20 micropascals.
Endangered species	Plants or animals that are in danger of extinction through all or a significant portion of their ranges and that have been listed as endangered by the USFWS or NOAA.
Environmental Justice Populations	Low-income and minority populations protected under Executive Order 12898 from disproportionate adverse effects of federal projects.
Fill material	Materials that may include combinations of soil, rock, or wood that is placed at a specified location to bring the ground surface up to a desired elevation.
Floodplain	The area of land next to a stream or river that stretches from the banks of its channel to the base of the enclosing valley walls and experiences flooding when the river has high flow
Greenhouse gas (GHG)	Gases that absorb infrared radiation and prevent heat loss to space. The primary greenhouse gases in the Earth's atmosphere are water vapor, carbon dioxide, methane, nitrous oxide, and ozone.
Low-income population	Defined as persons residing in households with an income between the federal poverty guidelines and an amount two times greater than those guidelines.
Minority population	Defined as people with the following origins: Black (or African-American, having origins in any of the black racial groups of Africa); Hispanic (of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race); Asian-American (having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands); or American Indian and Alaskan Native.
Mitigation	Mitigation is a mechanism to avoid, minimize, rectify, or reduce the adverse environmental effects associated with agency actions. Federal agencies typically rely upon mitigation to reduce environmental effects through modification of proposed actions and consideration and development of mitigation alternatives during the NEPA process. Planned mitigation at times can serve to reduce the projected effects of agency actions to below a threshold of significance, or to otherwise minimize, the effects of agency action.
Reach	A selected portion of a channel's length between any defined limits.
Riparian	Pertaining to anything connected with, next to, or influenced by a stream, river, lake, reservoir, or other water body.

Riprap	Rock or other material used to enhance shorelines or streambeds against erosion.
Substrate	Material that exists in the bottom of the river, like dirt, rocks, sand, or gravel
Threatened species	Any plants or animals that are likely to become endangered within the foreseeable future throughout all or a significant portion of their ranges and which have been listed as threatened by the USFWS or NOAA.
Turbidity	The measure of relative clarity of a liquid.
Wetland	Wetlands, for the purposes of the Clean Water Act, must meet a three-parameter approach that includes the presence of hydrophytic (water-loving) vegetation, wetland hydrology, and hydric soils (soils subject to saturation/inundation). All three parameters must be present, under normal circumstances, and the wetland must be connected to or have a significant nexus with "waters of the U.S." for an area to be designated as a jurisdictional wetland under the Clean Water Act.

6.2 Acronyms

dBA	A-weighted decibels
BiOp	Biological Opinion
CFR	Code of Federal Regulations
cfs	cubic feet per second
EA	environmental assessment
EPA	Environmental Protection Agency
ESA	Endangered Species Act
EWEB	Eugene Water and Electric Board
FCRPS	Federal Columbia River Power System
FEMA	Federal Emergency Management Agency
FIRM	flood insurance rate maps
ISRP	independent scientific review
NEPA	National Environmental Policy Act
NHPA	National Historic Preservation Act
NMFS	National Marine Fisheries Service
NRHP	National Register of Historic Places
OWHM	ordinary high water mark
USACE	US Army Corps of Engineers
USC	U.S. Code
USFWS	US Fish and Wildlife Service

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