BIOLOGICAL EVALUATION
FOR THE
CITY OF BONNERS FERRY LEVEE REPAIRS

Boundary County, Idaho

May 30, 2012

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ACRONYMS AND ABBREVIATIONS

BE	Biological Evaluation
BMP	Best Management Practices
City	City of Bonner's Ferry, Idaho
dBA	A-weighted sound level (airborne noise)
DPS	Distinct Population Segment
EFH	Essential Fish Habitat
ESA	Endangered Species Act
ESU	Evolutionarily Significant Unit
FEMA	Federal Emergency Management Agency
HUC	Hydrologic Unit Code
IDFG	Idaho Department of Fish and Game
kcfs	thousand cubic feet per second
KTOI	Kootenai Tribe of Idaho
LWD	large woody debris
LWM	large woody material
MSA	Magnuson-Stevens Act
msl	mean sea level
NMFS	National Marine Fisheries Service
PCE	Primary Constituent Elements
RM	River Mile
TSS	Total Suspended Solids
Corps	U.S. Army Corps of Engineers
USFWS	U.S. Fish and Wildlife Service
USGS	U.S. Geological Survey

EXECUTIVE SUMMARY

The City of Bonners Ferry, Idaho ("City") requested funding from the U.S. Army Corps of Engineers (Corps) to repair and stabilize the portions of the Kootenai River in and near to the city, during a flood event in May and June 2011. The high flows during this event caused some erosion of the levees, and caused some structures to be flooded. The Corps responded with an emergency flood-fight, adding rock to one site on the right bank, and two sites on the left bank, all downstream of the Highway 2 and 95 bridge. Upstream of the City, on the left bank, a meander channel was plugged to stem the flooding of structures at that location. It was found after the water subsided that the levee adjacent to the two flood-fight sites on the left bank in the city had eroded, and are in need of repair (see Appendix A for figures and plans). Thus, the Corps intends to repair the two left bank sites in the summer of 2012. The project goal is to protect the City's infrastructure and the Kootenai River by protecting the levee and reducing the potential for future erosion.

The purpose of this Biological Evaluation (BE) is to examine whether the Bonners Ferry Levee Repairs Project in Boundary County, Idaho will affect fish and wildlife species listed under the Endangered Species Act (ESA), and their designated critical habitat. This BE identifies the potential project impacts of both the flood-fight effort in 2011 as well as the repair work to be done in summer of 2012, including direct, indirect, interrelated, and interdependent effects and specifies conservation measures implemented to mitigate those impacts.

Initial consultation efforts with the U.S. Fish and Wildlife Service (USFWS) and National Marine Fisheries Service (NMFS) for a similar effort in 2007 culminated in a list of ESA species that occur in Boundary County (Appendix B, Species Lists). Review of the literature and the two agencies' websites determined that changes have been made to the list, including delisting of the bald eagle, and redesignation of critical habitat for both Kootenai River white sturgeon and bull trout. After determining the action area of the project, the county list was narrowed down to those species that are present in or may migrate through the action area (Table E-1). The action area is defined to include area that may be directly or indirectly affected by the federal action. ESA species that occur within Boundary County, but outside of the project action area include: woodland caribou, Canada lynx, grizzly bear, and slender moonwort. These species are not documented to occur in the action area. Therefore, they were eliminated from further consideration in this BE.

The ESA species that may be present within the action area are: Kootenai River white sturgeon and bull trout. Although bald eagle was delisted, it is still addressed as it continues to be protected under the Bald and Golden Eagle Protection Act (BAGEPA). Critical habitat for both white sturgeon and bull trout exist in the action area. This BE evaluates potential impacts to these species and habitats from project construction and operation based on existing information about the action area's existing habitat conditions and suitability for providing the life history requirements of these species. A summary of potential effects to those species and habitats is provided in Table ES-1. There is no Essential Fish Habitat (EFH) within the action area, therefore no further discussion on EFH will be provided. Furthermore, there are no species with NMFS jurisdiction within the action area.

Information for this BE was gathered from several sources including recent literature, the Idaho Department of Fish and Game (IDFG), local agencies, and the USFWS and NMFS species lists (Appendix B, Species Lists).

Table ES-1
ESA Effects Determination

Species	ESA Status	Jurisdiction	Effects – Construction	Effects – Long-term	Effects to Critical Habitat
Kootenai River white sturgeon	Endangered	USFWS	May affect, not likely to adversely affect	May affect, not likely to adversely affect	May affect, not likely to adversely affect
Bull trout	Threatened	USFWS	May affect, not likely to adversely affect	May affect, not likely to adversely affect	May affect, not likely to adversely affect
Bald eagle	Delisted	USFWS	No Effect	No Effect	NA

1.0 INTRODUCTION

Section 7(a) of the Endangered Species Act (ESA) of 1973, as amended, requires federal agencies to consult with the Secretary of the Interior (U.S. Fish and Wildlife Service [USFWS]) and the Secretary of Commerce (National Marine Fisheries Service [NMFS]) to insure that any action authorized, funded, or carried out by such agency is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species.

Section 7(c) of the ESA, as amended, requires federal agencies to prepare an assessment of potential biological and physical effects of the project on any threatened or endangered species which is likely to be found in the action area. An Essential Fish Habitat (EFH) Assessment is required for federal activities that may adversely affect EFH under the Magnuson Stevens Act.

The City of Bonners Ferry applied for funding assistance from the U.S. Army Corps of Engineers (Corps) and, therefore, the Corps is required to determine if the proposed action would affect listed (or proposed) species or designated (or proposed) critical habitats. There is no EFH within the action area, therefore no further discussion on EFH will be provided. Furthermore, there are no species with NMFS jurisdiction within the action area.

2.0 PROJECT LOCATION

The City of Bonners Ferry Levee Repairs Project is located along the Kootenai River in and near the City of Bonners Ferry in Boundary County, Idaho. Boundary County is the northernmost county in Idaho. The population of Bonners Ferry is approximately 2,700 people. The legal location is Township 62 North, Range 1 East, Section 28 at approximate latitude 48.41 and longitude 116.19 in HUC 17010104 (Lower Kootenai).

Most of the valley bottom in and around Bonners Ferry has been converted from what were historically stands of cottonwoods and extensive seasonally flooded sedge meadows to crop production. The unfarmed floodplain areas in and around Bonners Ferry are characterized by ponderosa pine, Douglas-fir, black cottonwood, aspen, paper birch, willow, chokecherry, serviceberry, alder, dogwood, rose, and snowberry. In wetlands, willows, alder, aspen, dogwood, cattails, meadow grasses, and sedges dominate. Vegetation within developed areas of Bonners Ferry are primarily lawn with scattered planted trees, shrubs, or landscaping.

The Kootenai River watershed is the third largest in the Columbia River System (Knudson 1994) with a runoff volume that makes it the second largest Columbia River tributary (Kootenai River Network 2006). Approximately 73 percent of the Kootenai River watershed is located within the province of British Columbia (Kootenai River Network 2006); roughly 21 percent of the watershed lies within the state of Montana, and the remaining 6 percent falls within Idaho (Knudson 1994). See map in Section 6.1.

3.0 PROJECT AREA

The project area is the localized area where project activities will occur. The emergency flood-fight work included rock placement along 1134 feet of levee and riverbank. The project repairs in 2012 will affect about 350 lineal feet of the left bank levees in Bonners Ferry. The upstream boundary of the project area is approximately 150 feet upstream of each site location and the downstream boundary is approximately 150 feet downstream of each site location. The project area will extend approximately 25 feet laterally into the Kootenai River to account for the potential for turbidity that may have resulted from rock placement during the emergency repairs, as well as the potential for turbidity during the work planned for summer of 2012. The staging and construction equipment and vehicles will operate along the previously disturbed and mostly barren riverward side of the levees, though trucks carrying rock and other construction vehicles will drive along Riverside Street to access the construction sites. The project area also includes one site on the right bank as well as a site further upstream of Bonners Ferry on the left bank which received emergency work in 2011 (see description of work in Section 5).

4.0 ACTION AREA

The action includes “all areas to be directly or indirectly by the federal action and not merely the immediate area involved in the action” (USFWS and NMFS 1998).

The action area (Appendix A, Figures A1 and A2) includes:

- The project area from both the 2011 emergency actions and the proposed 2012 repairs, and

- The Kootenai River between the furthest upstream area of the project and the area extending 0.5-mile downstream from the furthest downstream site (the one closest to Ambush Rock).

5.0 PROJECT DESCRIPTION

5.1 Background Information / Project History

This non-federal urban levee was constructed to provide flood control protection from periodic recurring flooding from the Kootenai River at Bonners Ferry in Boundary County, Idaho. The levee system is approximately 8,000 linear feet (lf) RM 152.0 – 153.5) and extends 3,000 ft upstream of Hwy 2 and 95 and 5,000 ft downstream of Hwy 2 and 95. The levee is 6 to 8 feet high on the landward side; landward slopes vary between 2.0H:1V to 1.5H:1V. The levee along the damaged reach (downstream segment) also serves as a city road – Riverside Street with a top width of approximately 28 to 36 feet. The riverward slope is typically 1.5H:1V with a 6-10 foot bench mid slope along parts of the segment. The levee is predominantly composed of natural river bank with some overburden material. The levee does not have continuous armor erosion protection but does have periodic segments of slope protection placed during flood fights. There is no toe protection. The top of the left bank (LB) levee is approximately elevation 1784 foot (ft) at the damage location, which is between the 500 and 1000-yr flood event for Bonners Ferry. The immediate area behind the levee (at the local fairgrounds) is approximately elevation 1778 ft which is slightly more than the 500-yr flood event stage. Flood stage at Bonners Ferry is established at elevation 1764.0 ft. Due to the instability and over-steepness of the levee, the level of protection is reduced to approximately a 20 -year flood, even in its repaired state.

Rapidly accumulating above average snowpack in late winter 2010 and early spring 2011 led to concerns about the potential of flooding on the Kootenai River for the period May - June 2011. During this period, Libby Dam was operating for flood risk. Due to favorable runoff conditions, the actual runoff pattern did not result in the anticipated flood peaks as high as anticipated. However, the flood risk management operation and high spring snowmelt resulted in six weeks duration of high river stages. The river did not reach flood stage of 1764.0 but did reach 1763.35 for seven consecutive days. Flood risk and on-going damages during the high water resulted in the Corps conducting emergency flood-fight work at three locations in 2011. Following subsidence of the high flows, the City and Corps found that the levee suffered two (2) rotational failures due to this long duration of damaging elevated river flows. The local volume of inflow at Libby Dam over the April-August period has a return period of 18 years based on the historical inflow record (1928 – 2008). Under current conditions, the levee offers approximately a 2-year level of protection.

5.2 Emergency Levee Repairs

In May 2011 emergency actions were taken in four locations (see figure 1) as a result of an extended period of high water, all in the Bonners Ferry area. These actions were taken to stop ongoing erosion and scour of levees and overbank flooding. A total length of 1134 feet of flood fight work was done as generally described as following:

- 623 lf of scour protection was placed along the left bank levee downstream of the City. This is on the levee segment we are planning to rehabilitate. Approximately 9,840 tons of riprap was placed along this reach of the levee.

- 206 lf of scour protection was placed on the left bank near Ambush Rock. Approximately 3,250 tons of riprap was placed along this reach of the levee.

- 138 lf of scour protection was placed along the right bank at the upstream end of the City of Bonners Ferry right bank levee. Approximately 2,180 tons of riprap was placed along this reach of the levee.

- 167 lf of scour protection was placed on the cutoff levee upstream of town on the left bank, in the Fodge Mill area. Approximately 1,462 tons of embankment material and approximately 500 tons of riprap were placed at the cutoff levee.

5.3 Description of Proposed 2012 Repair

The repair will be accomplished in September, during a low-flow period of the Kootenai River. This will facilitate construction, as well as minimize in-water effects to water quality and fish and wildlife. September is the recommended work window of the U.S. Fish and Wildlife Service (USFWS) for the Kootenai River, as this period is a time when Kootenai River white sturgeon are at their least numerous in this reach of the river, and bull trout are unlikely to be present (Flory, USFWS, personal communication, 2012). This work window was also coordinated with the Idaho Department of Fish and Game (IDFG), which concurred that this time frame would be acceptable to help to reduce effects to native fish resources (Terra-Berns, IDFG, personal communication, 2012).

Site 1 is a 300 LF repair of an upper slope rotational failure. The riprap placed to help stabilize the slope will tie into a stable portion of slope with a riverward vegetated bench upstream and an existing armored slope downstream. The location of the damage is depicted in Figures 2 and A1.

Site 2 is a 50 LF repair of a full slope failure. A vegetated riverward bench exists upstream and downstream of the damage. The repair will tie in to these hard points. The location of the damage is depicted in Figures 2 and A1.

The recommended alternative will seek to stabilize and armor the riverward slope and restore the levee to the pre-flood level of protection. The total repair length is approximately 350 LF of slope repair with two sites (50 ft and 300ft). Dump trucks would deliver materials and an excavator or similar equipment, would move the material into final place and compact the material. The riverward slope would include the installation of filter material below the armor rock that would create the riverward face. Material would be placed until the pre-flood protection and geometries are matched, though it should be noted that these two sections of levee were not previously riprapped. Even though there is no toe, riprap will extend horizontally into the river approximately 8 to 9 feet to provide a stable base for the riprap on the levee (but during the September work time-frame, the water would be about 6” to 12” in depth at the work locations). Work will generally consist of re-grading the riverward slope and placing 48 inches of Class II riprap on the lower slope (extending about 2/3 up the slope). A 2-foot thick quarry spalls blanket will be placed between the in-situ soil and the overlying riprap blanket. The voids in the riprap would be filled with 2-inch to 4-inch quarry spall filter cap approximately 1 foot in

depth, and capped with a 1 foot layer of top soil over the quarry spalls. The combination of quarry spalls and top soil will cover the rock and fill all voids. All disturbed surfaces will be hydroseeded with native grasses, and willows will be planted at the top of the riprap (elevation 1770') at both sites. The City of Bonners Ferry has agreed to water the willows during their first year of growth.

Site 1 would require riprap armoring up to the elevation 1770, slightly above the 100-year-event water surface elevation. The upper 1/3 of the levee will be re-sloped to 2H:1V, but the lower portion will retain the existing 1.5H:1V slope (see Figure A2 in Appendix A).

Site 2 would require riprap up to 2 feet below the natural bench at approximately elevation 1770'. The proposed plan would re-construct the existing bench, and reslope the upper 1/3 of the levee to a 1.75H:1V slope, but retain the existing 1.5H:1V slope on the lower portion, with a 6'-8' wide level bench between the two gradients. The horizontal top of the riprap just below the bench will be covered with a one-foot layer of quarry spalls, and a one-foot layer of topsoil over the spalls, effectively extending the bench another 3-4 feet (see Figure A3 in Appendix A).

A major component of the design is to reduce the overburden on the top of the slope that would otherwise drive a slope stability failure. The re-work of the approximately 600 LF flood fight repair from 2011 will allow some of the excess material deposited there to be used on the other sites. This material is larger (Class IV) and would be used to create a stable toe on which to build the remaining slope. The upper slope of Site 1 will be re-graded to achieve a minimum 2H:1V slope. Site 2 has a naturally shallower 1.75H:1V minimum slope. The presence of a natural bench terrace breaks up the slip plane sufficiently. Adding a high strength rock buttress to the bottom of the slope is expected to bolster the stability significantly at both sites.

Volumetric quantities were calculated based on approximate representative damage cross sections. The tonnage expected for each soil unit was calculated from the volumetric quantity by assuming typical material unit weights and adjusting for expected void ratio. A conversion factor between 1.5 and 1.75 tons/yd^3 was used for the material. The total weight of materials needed to complete each site is tabulated below.

Site	Length (ft)	Topsoil (tons)	2" – 4" Spalls (tons)	Riprap (tons)
Site 1	300	350	1440*	3040
Site 2	100	100	610	350
Total	**350**	**450**	**2050**	**2710****

*Quarry Spall fill for Site 1 void is only needed for 50 LF of slough.

**Salvaged riprap from the flood fight repair will reduce the net total tons required by approximately 20 percent.

A 4" gas pipeline runs parallel along Riverside Street. The pipeline is assumed to be 3 feet riverward of the road and a depth of approximately 3 feet below the ground surface. Extreme

care and a utility locate would be implemented when re-grading the upper slope to achieve a 2H:1V minimum slope.

5.4 Source of Materials

Armor material will be brought in from an approved and permitted quarry. Specific existing conditions for the location(s) where the fill material will be purchased are unknown as the materials will be purchased from local, privately owned companies. The site(s) will be chosen through a contract bidding process prior to construction. However any borrow site, quarry, or gravel mine would be fully permitted by the state.

5.5 Staging and Stockpiling

All work would be performed from the west bound lane of Riverside Street. This is a trafficked street and will necessitate flaggers throughout the duration of construction. Storage and staging would occur at the project location and consist of temporary stockpiling of excess rock and equipment and vehicles. Excavated material would be staged for later use or moved off site for disposal.

5.6 Construction Schedule

The in-water work window for this reach of the Kootenai River is August 1 through August 31 (Terra-Berns, IDFG, pers. comm. 2012). However, due to the nature of the work and species involved (primarily bull trout and Kootenai River white sturgeon), Mary Terra-Berns indicated that an earlier start date of July 15 would be preferable. On the other hand, lower flows occur in September (9 kcfs) and October (6 kcfs), vs. 12 kcfs or higher in July and August. The Corps requested an exemption to work during this lower flow period in September. The river may have even lower flows in September 2012 due to a request by the Kootenai Tribe of Idaho for low flows to better facilitate habitat restoration work that they will be undertaking this summer. Coordination with USFWS (Flory, 2012) disclosed that early September is the preferred time frame for work in the Kootenai River, as sturgeon are scarce, and bull trout are not yet migrating through the river. And, especially because this is a low-flow period, both species are likely to be away from the banks seeking deeper water. In a subsequent conversation with Terra-Burns, she confirmed that USFWS has ultimate authority for Federal agency work and affirmed that early September is an acceptable time frame for doing the work.

All proposed construction activities for 2012, including staging, would occur during a 1-week period in late August early September. The expected construction sequence would be: (1) regrade the bank, (2) install riprap on the lower portion of the riverward slope down to the mean high water line, and (3) sow grass seed mixture.

5.7 Construction Methods

Construction will occur using the following equipment: two dump trucks and one or two excavators. The excavator will be used to first reslope the bank and then to install class II riprap

by placing individual rock on the slope. Above the water line, a layer of spalls will be placed and then covered with more class II riprap.

5.8 Conservation Measures / Best Management Practices

The following conservation measures have been incorporated into the project to protect and minimize the impact to ESA-listed species and their habitat. These conservation measures were determined to be the minimum necessary to support the Effects Determinations:

In-water Work Timing -For the protection of Kootenai River white sturgeon and bull trout, in-water work will occur during daylight hours only (no dusk to dawn work) and during the lowest flows of the year (September). The work will take about one week. Although the work will occur outside of the in-water work window, USFWS concurs that this is allowable based on the project description.

Obtain Local Permits: The Corps will obtain and comply with the terms and conditions of applicable federal permits. The Walla Walla District has already issued a permit to the City of Bonners Ferry for the emergency work that was completed in the summer of 2011, and work planned for 2012 meets the conditions for, and is therefore covered by analogy to Nationwide Permit 13 (bank stabilization).

Best Management Practices: The following steps would be taken as best management practices and offsetting measures to reduce and/or mitigate (minimize) the above adverse affects:

1) General

a. Equipment that will be used near the water will be cleaned prior to construction.
b. Refueling will occur a minimum of 100 ft. away from the riverbank.
c. Construction equipment will be regularly checked for drips or leaks.
d. At least one fuel spill kit with absorbent pads will be onsite at all times.
e. After construction is complete, the repaired levee back slopes would be reseeded using a native grassland seed mix.
f. Willows will be planted at about elevation 1770' to replace lost riparian vegetation.

2) **Sediment Control.**

a. Visual inspections will be made by the Construction Lead to ensure compliance.
b. Turbidity would be visually monitored throughout construction of the project.
c. Minimal in-water work is planned and turbidity is expected to be minor. In the event that significant sediment enters the river, work will be halted until the situation can be assessed and corrected.
d. BMPs for erosion control for the contingency of not having the hydroseed installed by 15 October include:

1. Install straw over dirt surfaces as necessary
2. Additional measures such as coir logs and plastic sheeting that could also be utilized as determined by field conditions.

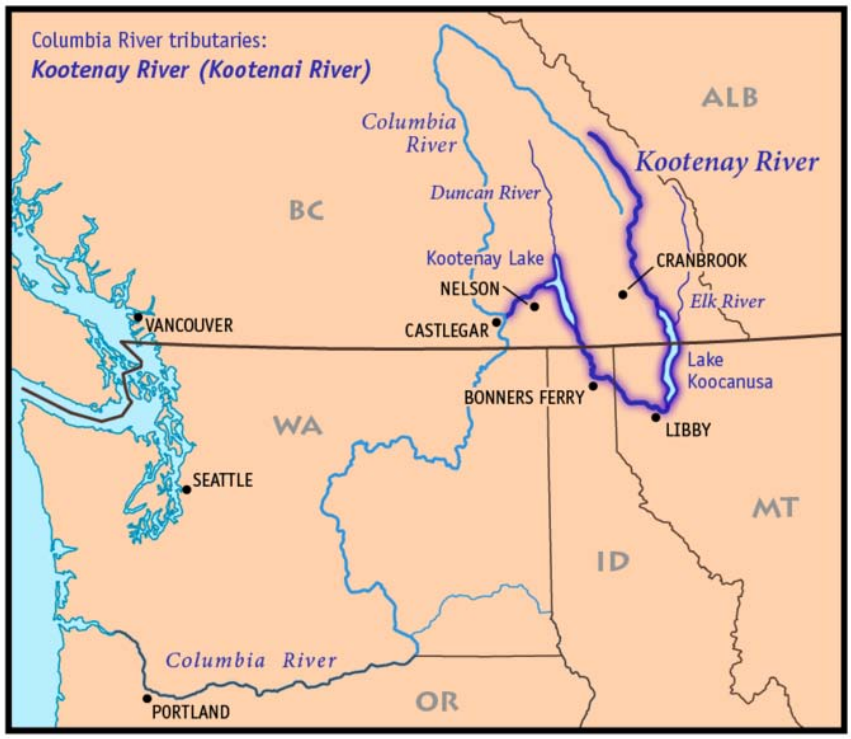
3) **Biological Monitoring**

a. District Environmental and Cultural Resources Branch personnel will make regular visits to the site to assure that BMPs and other activities comply with environmental laws and regulations.

6.0 EXISTING ENVIRONMENTAL CONDITIONS

6.1 Kootenai River

The Kootenai River (spelled Kootenay in Canada) has its origins in British Columbia's Kootenay National Park in Canada. From there it flows 485 miles into northwest Montana and through the towns of Libby and Troy. Sixteen miles north (and upstream) of Libby, the river is impounded by Libby Dam, creating a 90-mile long reservoir called Lake Koocanusa which reaches back into Canada. Downstream from Libby, but upstream of (before) Troy, the Kootenai River enters a canyon and flows over Kootenai Falls, one of the largest free-flowing waterfalls in the northwest. From there the river flows into northern Idaho (through Bonner's Ferry), then turns north back into Canada and flows into the south end of Kootenay Lake. The river then flows west out of the lake and eventually flows into the Columbia River near Castlegar.



Source: http://en.wikipedia.org/wiki/Image:Kootenay_River_Map.png

The Kootenai River is the second largest tributary to the Columbia River in terms of runoff volume, third in terms of drainage area. The major tributaries of the Kootenai River are the St. Mary, Bull Elk, Fisher, Yaak, Moyie, and Slocan Rivers. The Kootenai Basin is largely mountainous and dominated by three major ranges. The Rocky Mountain Range and its offshoot, the Flathead Range, constitute the eastern boundary; the Purcell Range roughly bisects it from north to south. The Selkirk and Cabinet ranges mark the western boundary. Elevations reach a maximum of about 12,000 feet with most summit elevations between 6,000 and 7,500 feet. Except for a few areas, the entire watershed is heavily forested.

6.1.1 Riparian Vegetation

Mature riparian vegetation is limited within the project area, though on both banks of the river immediately upstream and downstream of the project area shrubs and small trees, along with herbaceous plants and grasses, have become established over the years. See Appendix C, Site Photographs. Further upstream, beyond the levee system, the river is a natural channel still retaining mature riparian forests on both sides of the river. The locations at which emergency work was performed in 2011 were hydroseeded with a grass and herb mixture following construction. The paucity of mature riparian vegetation in Bonners Ferry area may contribute to the increased temperatures of the river in this region; however, higher temperatures may also be due in part to the fact that this reach is in the lowest-elevation forested subbasin in the state (IDEQ 2006) (see next section).

6.1.2 Limiting Factors and Matrix Indicators

Water Quality

The Federal Clean Water Act (CWA) requires that states and tribes restore and maintain the chemical, physical, and biological integrity of the nation's waters. States and tribes, pursuant to Section 303 of the CWA, are to adopt water quality standards necessary to protect fish, shellfish, and wildlife, while providing for recreation in and on the nation's waters whenever possible. Subsection 303(d) of the CWA establishes requirements for states and tribes to identify and prioritize water bodies that are water quality limited (i.e., water bodies that do not meet water quality standards). States and tribes must periodically publish a priority list (a "§303(d) list") of impaired waters. For waters identified on this list, states and tribes must develop a total maximum daily load (TMDL) for the pollutants, set at a level to achieve water quality standards.

The Idaho Department of Environmental Quality under Section 303 (d) of the CWA lists the Kootenai River and tributaries as impaired for temperature between the Moyie River and the Idaho/Canada border (IDEQ 2008). The Kootenai River supports cold water aquatic life habitat, sturgeon spawning, salmonid spawning, primary contact recreation, and drinking water supply. Temperature is an issue in the Kootenai River between the project site and upstream to the confluence of the Moyie River, a tributary located approximately 8 miles upstream of the project site (Streamnet 2007). A 2006 IDEQ report explains:

> "An assessment of temperature data in 2002 indicates that all monitored streams in the Lower Kootenai and Moyie Subbasins exceed Idaho temperature criteria. In a situation where all streams, including un-disrupted streams, have numeric criteria exceedances, a special look at natural conditions must be taken into account. The Lower Kootenai and Moyie watersheds are located in the northern-most portion of Idaho at relatively low elevations. Throughout the state it has been demonstrated that water temperatures are most strongly affected by air temperatures, which directly relate to elevation."

Another reason why stream temperatures may rise is through the modification/removal of shading vegetation by forestry and agricultural practices (IDEQ 2006). Human-caused sediment delivery resulting in wider/shallower channels can also contribute to increased stream

temperatures (IDEQ 2006). These are relevant factors in the Bonners Ferry area, though the low elevation is probably the primary reason for higher stream temperatures.

Habitat Access

The primary limitations to habitat access are due to a series of small dams on Kootenai River tributaries between the project site and Libby Dam including the Moyie River, Lake Creek, Flower Creek, Libby Creek, and Rainy Creek. The closest of these small dams is located approximately 9.5 miles from the project site on the Moyie River. Libby Dam is located approximately 70 miles upstream of the project site. However, spawning, rearing and migrating habitat is available throughout the action area for both white sturgeon and bull trout. It should be noted that spawning habitat for sturgeon from the highway bridge downstream to and including Shorty's Island is considered to be relatively poor due to the lack of proper substrate. And bull trout do not spawn in the river, but rather in tributaries, thus work would not affect bull trout spawning habitat.

Habitat Elements (substrate, large woody debris (material), pools, and off-channel habitat)

Aquatic habitat in the project area is fairly homogenous, with little or no large woody material, no defined pools and little off-channel habitat. The substrate of the Kootenai River varies from gravel to sand depending on the reach. The project area is comprised of two reaches: the braided reach and the meander reach (Kootenai River Network 2006) (though some classify the reach between the highway and Ambush Rock as the "straight reach"). The substrate within the braided reach, which extends approximately from the Moyie River downstream to the town of Bonners Ferry, is comprised of gravel and cobbles (Barton et al. 2004). The meander reach, which extends downstream from Bonners Ferry to Kootenay Lake (Kootenai River Network 2006), is comprised principally of sand, though there are places where native bedrock forms the bed of the channel (Barton 2004).

Channel Conditions

The channel conditions at the project reach remain relatively unchanged. High flows move rocks and sand, but the levees confine the flow below the highway bridge, and the levees tend to take the brunt of the force of these high flows, occasionally causing damage, as was the case in 2011. In addition, backwater from Kootenay Lake, combined with discharges from Libby Dam and tributaries downstream of it, influence river velocities in the meander reach, which are in a dynamic equilibrium that has helped maintain its sinuous nature.

Flow/Hydrology

Snyder and Minshall (1996) identified three different geomorphic reaches of the Kootenai River between Libby Dam and Kootenay Lake: the canyon, braided, and meander reaches. The project area occurs at the junction of the braided and meander reaches. The canyon reach extends approximately 57 miles from Libby Dam downstream to the Moyie River. This reach has a limited flood plain due to the close proximity of the mountains (Kootenai River Network 2006). The substrate in this reach is comprised of large cobble and gravel (Kootenai River Network 2006). The channel width in this reach ranges from 400 to 500 feet and depths are typically less than 20 feet (Berenbrock 2005).

The braided reach extends from the Moyie River downstream approximately 4.5 miles to the town of Bonners Ferry. This reach is extensively braided with depths that are typically less than 26 feet, and substrates that consist mostly of gravels (Kootenai River Network 2006, IDEQ 2006). This reach consists of several small islands and exposed gravel bars at low flows (IDEQ 2006). The river at this reach has an average gradient of 0.32 feet per mile, and velocities higher than 2.6 feet per second (Kootenai River Network 2006). The width of the braided reach is approximately twice the size of the canyon reach, with shallower depths averaging 7 feet (Berenbrock 2005).

The meander reach begins just below the town of Bonners Ferry and extends downstream approximately 51 miles to Kootenay Lake in British Columbia. Here, the river slows to an average gradient of 0.11 feet per mile, deepens, and meanders through the Kootenai Valley back into British Columbia and into the southern arm of Kootenay Lake (Kootenai River Network 2006). Throughout the Kootenai Valley, the meander reach is characterized by water depths of 40 to 100 feet (Snyder and Minshall 1996). The meander reach has been extensively modified by a series of dikes and channelization. Depths in the meander reach range from 25 to 50 feet and the width is typically about 600 feet (Berenbrock 2005).

Watershed Conditions

The Lower Kootenai watershed remained in a relatively natural condition until the early twentieth century when miners, loggers, and ranchers began to settle in the area. In recent years, timber harvest and grazing have been restricted to the floodplain of the lower portion of the Kootenai River.

Water temperature is discussed above under water quality.

Six of seven monitored tributary streams were listed for sediment, two for temperature, and one for metals and pH (IDEQ 2006). The sediment in the subbasin is primarily from road crossings and encroachment. Temperature is most affected by stream shading. Metals and pH exceedances stem from historic mining activity in the northern reaches of the watershed (IDEQ 2006).

7.0 ESA SPECIES AND CRITICAL HABITAT INFORMATION

7.1 Species and Habitat Present

As part of agency consultation, USFWS was contacted to obtain information about special status species in the action area. The provided information was used to develop the list of endangered, threatened, proposed and candidate species with the potential to occur in the vicinity of the project. Of the ESA species that occur within Boundary County, only those that may occur within the action area are considered further in this BE. The complete list of ESA species provided from the USFWS that occur within Boundary County is provided in Table 7-1, as well as the species known or likely presence in the action area. Table 7-2 provides a summary of critical habitat in the action area.

Table 7-1
ESA Species and Potential for Presence in the Action Area

Species in Boundary County	Federal Status	Presence in the Action Area
Kootenai River white sturgeon *(Acipenser transmontanus)*	Endangered	Documented in the Kootenai River
Bull trout *(Salvelinus confluentus)*	Threatened	Documented in the Kootenai River
Woodland caribou *(Rangifer tarandus caribou)*	Endangered	Absent from the action area. Occur at elevations above 4,000 feet. No suitable habitat. Nearest presence is more than 5 miles outside of the action area.
Canada lynx *(Lynx canadensis)*	Threatened	Absent from the action area. Occurs at elevations above 4,000 feet in forested habitats. No suitable habitat. Nearest presence is more than 5 miles outside of the action area.
Grizzly bear *(Ursus arctos horribilis*)	Threatened	Absent from the action area. No suitable habitat. Nearest presence is more than 5 miles outside of the action area.
Bald eagle *(Haliaeetus leucocephalus)*	Delisted	Present in the action area. Active nest located approximately 1000 feet from the project area.
Slender moonwort *(Botrychium lineare)*	Candidate	Absent from the action area. No suitable habitat in the action area and Idaho population believed to be extirpated. No suitable habitat. Nearest presence is more than 5 miles outside of the action area.

Table 7-2
Critical Habitat in the Action Area

Species	Federal Status	Critical Habitat in the Action Area
Kootenai River white sturgeon *(Acipenser transmontanus)*	Designated	Yes
Bull trout *(Salvelinus confluentus)*	Designated	Yes
Woodland caribou	Proposed	Yes
Canada lynx	Designated	No

7.1.1 White sturgeon, Kootenai River population *(Acipenser transmontanus)*

Status

The Kootenai River population of white sturgeon was federally listed as endangered under the ESA in September 1994 (59 FR 45989-46002, September 6, 1994). In 1999, the USFWS and the Kootenai River White Sturgeon Recovery Team released the final recovery plan for the Kootenai River white sturgeon (USFWS 1999a). Kootenai River white sturgeon occur in the river downstream from Kootenai Falls, Montana and in Kootenay Lake. No white sturgeon are known to occur upstream from the falls. In 2001, the Kootenai River from RM 141.4 (just downstream from Shorty's Island) to RM 152.6 (just upstream from the Highway 95 bridge) was designated as critical habitat for Kootenai River white sturgeon (66 FR 46548, September 6, 2001). On February 8, 2006, the USFWS published an interim rule for re-designated critical habitat for sturgeon in response to a District Court ruling, which extended the existing critical habitat 6.9 miles from the highway bridge upstream into the braided reach (71 FR 6383-6396, February 8, 2006). On July 9, 2008, the USFWS published a final rule designating critical habitat for Kootenai River white sturgeon (73 FR 39505-39523). The revised critical habitat is on the Kootenai River from river mile (RM) 141.4 (river kilometer (RKM) 228) to RM 159.7 (RKM 257), a distance of 18.3 miles. This coincides with Shorty's Island (141.4) on the downstream end, to the mouth of the Moyie River (159.7) on the upstream end.

Background Information

The Kootenai River population of white sturgeon inhabits and migrates freely in the Kootenai River from Kootenai Falls in Montana downstream into Kootenay Lake, British Columbia (B.C.), Canada (USFWS 2000). The Kootenai River population of white sturgeon is one of 18 land-locked populations of white sturgeon found in the Pacific Northwest. It is restricted to approximately 168 miles (270 kilometers) of the Kootenai River in Idaho and Montana and Kootenay Lake in British Columbia, Canada (including the Duncan River), primarily upstream from Cora Linn Dam at the outflow from Kootenay Lake (USFWS 2000). The Kootenai River population has been declining since the mid-1960. By 1997 the population was estimated to be approximately 1,468 wild fish with few individuals less than 25 years of age (USFWS 2000). The most recent estimate put the adult population somewhere near 1,000 fish (Flory, USFWS, 2011). The wild population has been augmented with the release of nearly 200,000 hatchery-reared juvenile white sturgeon from the Kootenai Tribal Hatchery in Bonners Ferry, Idaho, over the past 20 years, with approximately 20,000 surviving at present (USFWS 2000; Ireland, KTOI, 2012).

In the spring, white sturgeon migrate upstream from Kootenay Lake (in British Columbia) to the spawning reach located between Bonners Ferry and Shorty's Island (USFWS 2006). Once there, spawning white sturgeon release eggs which sink and adhere to bottom substrates (clean gravel or cobble with interstices appears to be the ideal substrate) where they remain until hatching (USFWS 2006). The sac fry depend on gravel substrates for cover until the yolk sac is absorbed, at which time they enter the water column in search of food.

Throughout their range, white sturgeon do not create redds, but rather broadcast their eggs over clean cobble at depths greater than 20 feet at column velocities less than 0.77 feet per second (USFWS 2006). Favorable water temperatures for white sturgeon spawning typically ranged from 57 to 68 degrees Fahrenheit (USFWS 2006). Spawning has occurred at relatively low discharges (13 to 20 kcfs [thousand cubic feet per second]) and over finer substrate than is considered optimal for egg to fry survival. It remains uncertain whether any juveniles survive when eggs are dispersed over fine substrates (USFWS 2006).

Male and female white sturgeon become reproductively active at approximately 28 to 30 year, respectively (Paragamian et al. 2005). Only a portion of the population spawns each year. Spawning occurs when peak conditions occur including high flows and water velocities (USFWS 2006).

Once the eggs are fertilized, they adhere to the rocky riverbed and hatch in 8 to 15 days (Brannon et al. 1985). Recently hatched larvae drift or swim with the current, eventually settling into interstitial spaces in the substrate. After 20 to 30 days, they emerge as juveniles and disperse into the water column (58 FR 36379-36387, July 7, 1993).

The lack of recruitment of young fish to the adult population is a primary reason for the protection of white sturgeon in the Kootenai River. Since Libby Dam was finished in 1973, sturgeon have produced substantial numbers of offspring only once-in 1974. In a 2006 Biological Opinion for operation of Libby Dam (USFWS 2006), the USFWS described habitat attributes that are based on the best available scientific information regarding what is necessary to adequately provide for successful Kootenai sturgeon spawning, and natural in-river reproduction. Habitat attributes that are believed to be related to white sturgeon recruitment and could be affected by Libby Dam operations include flow timing and duration, velocity, temperature fluctuation, depth at spawning sites, substrate, and minimum frequency of occurrence.

Populations in the Action Area

White sturgeon utilize the Kootenai River in vicinity of Bonners Ferry for spawning and rearing. In 2000, the Idaho Department of Fish and Game (IDFG) estimated that that there were about 1000 adult sturgeon remaining in the Kootenai River population (Flory, 2011). This is down from an estimated 5,000 to 6,000 adults in the early 1980s. The most recent status review also reported that the rate of decline was reevaluated and scientists now believe that adults are being lost to natural causes at the rate of 4 percent per year (Flory, 2011). Based on recently revised aging information, females are not expected to reach sexual maturity until 16 to 35 years of age (Devore et al. 1995). Thus, there is increasing urgency in restoring the spawning and incubation

habitat to again allow the sturgeon to recruit naturally and to begin rebuilding a healthy population structure.

Critical Habitat in the Action Area

Critical habitat for the Kootenai River population of white sturgeon occurs in the action area (See critical habitat map provided in Appendix B). The project area includes the reaches of the Kootenai River that are designated critical habitat for this population (Units 1 and 2).

7.1.2 Bull trout (*Salvelinus confluentus*)

Status

The U.S. Fish and Wildlife Service issued a final rule listing the Columbia River population of bull trout as a threatened species on June 10, 1998 (63 FR 31647, June 10, 1998). A recovery plan for the species, including the Kootenai River population, was released in 2002 (USFWS 2002). Critical habitat was established for bull trout in 2005 (70 FR 56211-56311, September 26, 2005), and revised in 2010 (75 FR 63898-64070, October 18, 2010). The revised critical habitat includes all of the Kootenai River in Idaho.

Background Information

Bull trout have stringent requirements for cold water and clean gravel to rear and reproduce, and spawning usually occurs in mountain streams fed by snow-melt or springs fed by snow fields (USFWS 2004a, 2004b; Goetz et al. 2004). Juvenile bull trout feed on aquatic insects and crustaceans, while adult bull trout feed almost entirely on fish. Bull trout have been recorded to make movements of over 100 miles during foraging or spawning migrations (Goetz et al. 2004).

Bull trout have been documented to exhibit four life-history forms in the northwest. Resident bull trout reproduce in small streams, where they remain for their entire life-cycle. Fluvial bull trout reproduce in small streams, but as 1- to 2-year-old juveniles, migrate into mainstem rivers to rear and mature. Fluvial-lacustrine populations reproduce in streams but soon migrate into large lakes to rear and mature (WDFW, 2004a). All three of these life history types have been documented to occur in the Columbia River basin (WDFW 2004). The fourth life history form is called anadromous, but this life history form does not occur in the Kootenai River; only the resident, fluvial, and fluvial-lacustrine forms are present in the Kootenai River.

Populations in the Action Area

Within the Kootenai River Recovery Unit, the historic distribution of bull trout is relatively intact. But abundance of bull trout in portions of the watershed has been reduced, and remaining populations are fragmented (USFWS 2002). Available data indicate that numbers of adult bull trout in this core area may have expanded during the late 1990's, with total redd counts approaching 250, indicating an adult population possibly exceeding 1,000 individuals by 1999 (USFWS 2006). However, redd counts in 2002/2004 indicate numbers may have decreased and may currently be lower than 1,000 fish (MFWP 2004). The Idaho Department of Fish and Game is currently conducting research on bull trout distribution and movements. Typically, sightings of bull trout in Idaho waters have been limited to individual fish. Adult bull trout appear to be

well distributed throughout the Kootenai River in Idaho, but at very low densities, based on electrofishing data. Radio telemetry data indicates that some of those fish overwinter in the deep holes of the lower river (Walters 2002).

Critical Habitat in the Action Area

Critical habitat for bull trout includes the action area (See critical habitat map provided in Appendix B).

7.1.3 Bald eagle (*Haliaeetus leucocephalus*)

Status

In 1967, bald eagles south of the 40th parallel (between Red Bluff and Chico, California) were listed as endangered (41 FR 28525-28527, July 12, 1967). Later, in 1978, all bald eagles in the 48 conterminous states were listed as endangered, with the exception of those in Washington, Oregon, Minnesota, and Michigan, which were listed as threatened (43 FR 6230-6233, February 14,1978). In 1995, the status was changed to threatened throughout the 48 conterminous states (60 FR 35999-36010, July 12, 1995). On July 9, 2007, the eagle was declared recovered and notice was given that it would be officially delisted throughout its range effective August 8, 2007 (72 FR 37345-37327, July 9, 2007). The bald eagle continues to be protected under the Bald and Golden Eagle Protection Act (16 U.S.C. 668a-d, 1978, as amended) and the Migratory Bird Treaty Act (16 U.S.C. §§ 703-712, 1989, as amended).

Background Information

Bald eagles are large birds of prey that nest and forage along fish-bearing waters. The primary prey items for bald eagles include fish, waterfowl, small mammals, and carrion. Bald eagles build large stick nests in coniferous or deciduous trees, or occasionally on cliffs. Eagles watch for their prey from a high perch and feed mainly by diving for fish at or near the surface. Feeding territories are very large, up to 16 square miles.

Most bald eagles are capable of breeding at 4 or 5 years of age (USFWS 2007). In the West, breeding and nesting activities occur between January 1 and August 15. Nests are most common near marine shorelines, but also occur on rivers and lakes. The nest is a massive structure (up to 5 feet wide and 3 feet deep) of sizable sticks lines with leaves and grass. The nest is often located near the top of the largest tree and offers an unobstructed view. The nest is usually built within easy flight distance of an ocean, lake, pond, or stream. Eagles may use the same nest for many years, adding to it each season. It is not unusual for a nesting pair to create one or more alternate nests (USFWS 2007). Nesting activity usually occurs in January and February and culminates with laying of one to three eggs. Eggs generally hatch in April and May. Fledglings will typically leave the nest in mid-July, but often remain at or near the nest until mid-August (USFWS 2007).

In winter, bald eagles congregate at specific wintering (non-nesting) sites that are generally close to open water and offer an abundant and readily available food supply with good perch trees and suitable night roosts (USFWS 1999b). When foraging, bald eagles select dominant trees with branches large enough to support their weight as perches to view foraging areas. Night roosts

typically offer isolation and thermal protection. Eagles roost in stands of timber adjacent to or relatively near foraging areas (Stinson et al. 2001). Communal roost sites are an important component of wintering habitat (Stinson et al. 2001).

Habitat loss continues to the be the most important long-term threat to the bald eagle. Disturbance of nesting areas is another concern. Eagles may abandon a nest due to loud inconsistent noise, such as the type produced by construction activities. Under the ESA, nests or roosts within 0.5-mile of a project site are managed for disturbance through timing restrictions on construction projects (USFWS 1986). However, recent management guidelines, issued by the USFWS to maintain protection after delisting, recommend a buffer of 660 feet from an active nest during the nest season, if the nest site is visible from the project area (USFWS 2007). Outside of the nesting season, activity may be carried out adjacent to a nest; however, communal roost sites should be protected by limiting disturbance (USFWS 2007). In general, bald eagles can become highly habituated to human noise and disturbance and even with a certain percent of nest failure each year, the eagles typically return and nest successfully the following year (WDFW, Stoefel pers. comm. 2005).

Populations in the Action Area

Bald eagles are both yearlong residents and winter visitors in northern Idaho. In 2006, there were 49 active nest territories in the northern Idaho/eastern Washington region (IDFG 2006). Thirty-two, or 65 percent, of the active nests successfully fledged one or more eaglets compared to a statewide average of 55 percent success (IDFG 2006).

An active bald eagle nest is located 1000 feet east from the project area and within the action area. This nest was active between 2002 and 2006 (IDFG 2006), and again in 2010 (Robinson, retired, IDFG, personal communication, 2012); its current status is unknown. Other active bald eagle nests are located 2.7 miles, 3.0 miles, and 3.8 miles from the project area and outside of the action area.

Critical Habitat in the Action Area

There is no designated critical habitat for the bald eagle as the bald eagle is no longer listed under ESA.

8.0 ESA EFFECTS ANALYSIS

8.1 Effects On USFWS Matrix Indicators

The USFWS checklist for documenting the effects of the proposed project on bull trout habitat indicated that the project would maintain all habitat indicators for bull trout. In addition, this BE also looked at effects to primary constituent elements (PCEs) of critical habitat for both bull trout and Kootenai River white sturgeon. The most obvious effect would be a short-term increase in turbidity downstream of the project during and after construction.

8.2 Effects to Listed Species

The following sections address the direct effects of the project on listed species including the interdependent actions, interrelated actions, and indirect effects of the project.

- Direct effects are defined as the direct or immediate effects of the project on the species or its habitat. Direct effects include those resulting from interdependent or interrelated actions (NOAA Fisheries 2004).

- Interdependent actions are those that have no independent utility apart from the action under consideration (50 CFR 402.02). Interdependent actions are typically “because of” the proposed action.

- Interrelated actions are those that are part of a larger action and depend on the larger action for their justification (50 CFR 402.02). Interrelated actions are typically “associated with” the proposed action.

- Indirect effects are those that are caused by or will result from the proposed action and are later in time, but still reasonably certain to occur (50 CFR 402.02).

- Cumulative effects include the effects of future state, tribal, local, or private actions that are reasonably certain to occur in the action area considered in this BE. Future federal actions that are unrelated to the proposed action are not considered in this section because they require separate consultation pursuant to Section 7 of the Act. Cumulative effects that reduce the ability of a listed species to meet its biological requirements may increase the likelihood that the proposed action will result in jeopardy to that listed species or in destruction or adverse modification of a designated critical habitat.

8.2.1 Kootenai River white sturgeon

Direct Effects

During the proposed construction period (September/October), river flows would be very low (9 kcfs in September and as low as 6 kcfs in October). Consequently, white sturgeon would be more likely to be present in deeper areas of the river where they would seek refuge from warmer temperatures that would be occurring in shallower water. The project area is located at the junction of the braided and the meander reaches. Canyon reach (furthest upstream) and braided reach have shallower water depths and therefore would be less likely to support white sturgeon during the hottest part of the year and when flows are at their lowest. Therefore, it is expected that white sturgeon could be present in the action area during construction. It is unlikely that they would be present immediately along the shoreline where the rip rap will be placed individually by a crane, but not dumped via truck. Sturgeon are likely in the deeper and thus colder areas of the river which may be in the center of the river or along sheer cliff faces that may be associated with deep water. There is such a cliff face across and upstream of the project site, but bathymetry of that area was not available to the authors of the BE. White sturgeon spawn in May and June and will have finished spawning by time construction begins. The placement of a total length of 350 feet of rock will be a new habitat feature, since these two sites had not been riprapped previously. Juvenile sturgeon may be present along the shoreline seeking refuge from predators by hiding in the rocky substrate present at the project site at the toe of the slope. However, their use of the site is unlikely, due to the relatively poor habitat quality in the remainder of this reach of the river (Flory pers. comm., 2012).

Interdependent/Interrelated Actions

No interdependent/interrelated actions are anticipated with the proposed project.

Indirect Effects

The placement of the large rock may be a beneficial effect to sturgeon over time. Rock appropriate for the fertile eggs to attach to is limited within the river in this location. Local Tribal biologists have indicated that the placement of this rock may provide some habitat necessary for the eggs that are broadcast into the water column by the female during spawning season. The addition of rock to the river would provide instream structure that may increase the success rate of embryo incubation through hatching and also increase the rate of free embryo incubation through yolk sac absorption. In other words, the rocks would give the fertile eggs a solid structure in which to attach and later a place for the juveniles to hide and grow.

Cumulative Effects

There are no known future non-federal actions proposed or planned that would, in combination with this project, result in impacts to the species or to designated critical habitat. Therefore, no cumulative effects to white sturgeon are expected.

Determination

There would be some short-term, temporary construction impacts but the impacts are discountable and insignificant. Therefore, the project *may affect, but is not likely to adversely affect* Kootenai River white sturgeon.

8.2.2 Bull trout

Direct Effects

The vast majority of bull trout in the action area have the lacustrine life history form, meaning they utilize a lake as part of their survival. This area of the river is a migratory corridor and fish move from Kootenay Lake, Canada (downstream) to Kootenai Falls, Montana (upstream) and back to the lake again. Very few bull trout have been able to make it over the falls (Marotz, MFWP pers. comm. 2007).

Adult bull trout would most likely be upstream in the higher tributaries (out of the action area), and either staging in preparation to spawn or recently completed spawning. Sub-adult bull trout may be migrating through the action area, but the numbers are expected to be low based on known densities (Flory, USFWS, pers. comm. 2012). There is no spawning in the mainstem river for bull trout. Therefore, no adult bull trout are expected in the action area during the time of construction and only a few if any sub-adult bull trout may be present in the deeper areas of the river. As work would be done during the time when water temperatures are likely at their highest, bull trout would be seeking refuge from high temperatures and low water flows and therefore would be present in the deeper areas of the mainstem or in tributaries and not likely along the shoreline where rock placement will occur. Furthermore, bull trout feed on a diel-cycle, meaning that at night they will move into the shallow water and feed in only a few feet of water (Marotz pers. comm. 2007). At dawn, they will retreat into deeper water, only to reappear at dusk (Marotz pers. comm. 2007). Therefore, no rock placement should occur between dusk and dawn (night-time hours). This is extremely unlikely, due to safety concerns. Therefore, in conclusion, the proposed project could result in temporary and insignificant, and the small area of impact is discountable. The potential effects include:

- Stress from noise of equipment and rocks being placed in the river during the day,
- Physiological stress from sediment stirred up from rocks hitting the substrate.
- Temporary turbidity from the small quantity of rock that could be placed into the water.

Beneficial effects may include:

- Addition of new interstitial spaces due to rock placement along 350 linear feet of river, and
- Reduced channel scour and associated turbidity.

Interdependent/Interrelated Actions

No interdependent/interrelated actions are anticipated with the proposed project.

Indirect Effects

Continued increased water flows from spills at Libby Dam during critical periods of the year have the potential to erode river banks and increase turbidity. Stabilization of certain banks that are susceptible to mass wasting and erosion may provide a long-term beneficial (indirect) effect by reducing the associated turbidity and loss of riparian cover and vegetation. The loss of riparian vegetation may be offset by the planting of willows at approximately elevation 1770', which is well above flood stage. Survival of the willows will be dependent on regular watering during the first spring and summer of growth.

Cumulative Effects

There are no known future non-federal actions proposed or planned that would, in combination with this project, result in impacts to the species or to designated critical habitat. Therefore, no cumulative effects to bull trout are expected.

Determination

There would be some short-term, temporary construction impacts but the impacts are discountable and insignificant. Therefore, the project *may affect, but is not likely to adversely affect* bull trout.

Table 8-1
USFWS Checklist for Documenting the Environmental Baseline of the Bonners Ferry Levee Repairs Project on Bull Trout Pathways and Indicators

	Population and Environmental Baseline			Effects of the Action(s)		
Indicators	**Functioning Appropriately**	**Functioning at Risk**	**Functioning at Unacceptable Risk**	**Restore**	**Maintain**	**Degrade**
SUBPOPULATION CHARACTERISTICS						
Subpopulation Size	X				X	
Growth and Survival	X				X	
Life History Diversity and Isolation		X			X	
Persistence and Genetic Integrity		X			X	
WATER QUALITY						
Temperature			X		X	
Sediment			X		X	
Chemical Contamination-Nutrients	X				X	
HABITAT ACCESS						
Physical Barriers			X		X	
HABITAT ELEMENTSX						
Substrate Embeddedness		X			X	
Large Woody Debris (material)		X			X	

Indicators	Population and Environmental Baseline			Effects of the Action(s)		
	Functioning Appropriately	Functioning at Risk	Functioning at Unacceptable Risk	Restore	Maintain	Degrade
Pool Frequency and Quality		X			X	
Large Pools		X			X	
Off Channel Habitat		X			X	
Refugia		X			X	
CHANNEL CONDITIONS AND DYNAMICS						
Wetted Width/Max Depth Ratio	X				X	
Streambank Condition	X				X	
Floodplain Connectivity		X			X	
FLOW/HYDROLOGY						
Change in Peak/Base Flow			X		X	
Increase in Drainage Network	X				X	
WATERSHED CONDITIONS						
Road Density and Location	X				X	
Disturbance History		X			X	
Riparian Conservation Areas	X				X	
SPECIES AND HABITAT						
Integration of Species and Habitat Conditions		X			X	

8.2.3 Bald eagle

Direct Effects

The project will have no direct effect on bald eagle habitats. No habitat features important for bald eagles, such as large trees and snags, will be removed as part of this project. Noise from construction activities (estimated to be 100 dBA 50 feet from source) could be expected to exceed ambient conditions during some parts of the day. However, regular recreational activities on the river, including use of boats and personal watercraft, likely produce comparable or greater noise (71-107 dBA 50 feet from source) (and may cause a greater disturbance response from wildlife because they are mobile (line sources) with distinct operational behavior (MOCZM 2002) rather than point sources of noise (WSDOT 2007).

Bald eagle breeding activities occur between January 1 and August 15. Wintering activities occur between October 31 and March 31. The project is proposed to be constructed between September 1 and October 31. Therefore, eagles associated with the nearby nest and any undocumented wintering eagles would be absent during construction, and therefore, would not be affected by construction activities such as equipment operation; hauling; dumping; and rock placement. Coordination with the IDFG (2012) confirms that young of the year bald eagles will

be fledged prior to construction, so the project would have no effect on nesting activity. Therefore, a permit under the BAGEPA is not required.

Interdependent/Interrelated Actions

No effects to the bald eagle are expected from interdependent or interrelated actions. The conservation measures/BMPs implemented for the project should reduce the potential for a spill or detectable erosion/sedimentation that would affect the eagle's aquatic prey base.

Indirect Effects

No indirect effects to bald eagles are expected.

Cumulative Effects

There are no known future non-federal actions proposed or planned that would, in combination with this project, result in impacts to the species. Therefore, no cumulative effects to the bald eagle are expected.

8.3 Effects to Critical Habitat

Critical habitat effects analysis addresses critical habitat designated for the Kootenai River population of white sturgeon and bull trout.

8.3.1 Kootenai River white sturgeon

In the July 2008 designation, USFWS defined four PCEs determined to be essential to the conservation of Kootenai River white sturgeon. Sufficient PCE components to support successful spawning must be present and protected during May into July, the time of the year when the PCE components are needed to fulfill the requirements to ensure successful spawning, which are the particular conservation need for which the reach was designated (71 FR 6383-6396).

Action Area Primary Constituent Elements

1. A flow regime, during the spawning season of May through June, that approximates natural variable conditions and is capable of producing depths of 23 ft (7 m) or greater when natural conditions (for example, weather patterns, water year) allow. The depths must occur at multiple sites throughout, but not uniformly within, the Kootenai River designated critical habitat. The current flow regime is controlled by the U.S. Army Corps of Engineers' Libby Dam. The proposed project will have no effect upon the flow regime or water depth. Work proposed for 2012 will not take place during the May-June time frame in any case.

2. A flow regime, during the spawning season of May through June, that approximates natural variable conditions and is capable of producing mean water column velocities of 3.3 ft/s (1.0 m/s) or greater when natural conditions (for example, weather patterns, water year) allow. The velocities must occur at multiple sites throughout, but not uniformly within, the Kootenai River designated critical habitat. The current flow

regime is controlled by the U.S. Army Corps of Engineer's Libby Dam. The proposed project will have no effect upon the flow regime or velocities. Work proposed for 2012 will not take place during the May-June time frame in any case.

3. During the spawning season of May through June, water temperatures between 47.3 and 53.6 °F (8.5 and 12 °C), with no more than a 3.6 °F (2.1 °C) fluctuation in temperature within a 24-hour period, as measured at Bonners Ferry. Existing water temperatures are influenced by a variety of factors including elevation, solar radiation, wind, air temperature, the flow regime of Libby Dam, riparian vegetation, and channel configuration. The project would not affect other factors that control the water temperature. Work proposed for 2012 will not take place during the May-June time frame in any case.

4. Submerged rocky substrates in approximately 5 continuous river miles (8 river kilometers) to provide for natural free embryo redistribution behavior and downstream movement. The project did introduce additional rocky substrate during the emergency work of 2011, and will provide new rock in summer of 2012 where it has been absent since the high flows of June 2011 caused the bank to slough. The addition of this rock is not expected to adversely affect sturgeon, and could potentially provide additional habitat for white sturgeon eggs and free embryos.

5. A flow regime that limits sediment deposition and maintains appropriate rocky substrate and inter-gravel spaces for sturgeon egg adhesion, incubation, escape cover, and free embryo development. Note: the flow regime described above under PCEs 1 and 2 should be sufficient to achieve these conditions. Construction of the project is not expected to affect the flow regime, as flow is currently controlled by Libby Dam.

Determination

There would be some short-term, temporary construction impacts but the impacts are discountable and insignificant. Therefore, the project *may affect, but is not likely to adversely affect* designated critical habitat for Kootenai River white sturgeon.

8.3.2 Bull trout

In the October 2010 listing, USFWS defined nine PCEs determined to be essential to the conservation of bull trout. The Kootenai River in Idaho does not support spawning of bull trout, but does provide a migratory corridor as well as overwintering habitat.

Action Area Primary Constituent Elements

1. Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity and provide thermal refugia. The current flow regime is controlled by the U.S. Army Corps of Engineer's Libby Dam. The proposed project will have no effect upon the flow regime, including hyporheic flows, springs, seeps, or groundwater sources.

2. Migration habitats with minimal physical, biological, or water quality impediments between spawning, rearing, overwintering, and freshwater and marine foraging habitats, including but not limited to permanent, partial, intermittent, or seasonal barriers. The proposed project will not create physical or chemical impediments to migration in the long-term. Short-term and insignificant turbidity may result from rock placement on the levee banks, but this will occur during low-flows and associated relatively high water temperatures, when bull trout are not expected to be present. The turbidity would have no effect on designated critical habitat. There will be no temperature effects.
3. An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish. The proposed project would have no affect on the food base for bull trout, as the only expected effect of the project is from short-term and minor turbidity.
4. Complex river, stream, lake, reservoir, and marine shoreline aquatic environments, and processes that establish and maintain these aquatic environments, with features such as large wood, side channels, pools, undercut banks and unembedded substrates, to provide a variety of depths, gradients, velocities, and structure. The proposed project would have no effect on complex the stream environment of the Kootenai River. The repair of the plug near Fodge Mill prevents access to the meander channel at its upstream end, though the downstream end of the channel is still open to the river, though it is unlikely that bull trout would be dependent on this channel in any event.
5. Water temperatures ranging from 2 to 15 °C (36 to 59 °F), with adequate thermal refugia available for temperatures that exceed the upper end of this range. Specific temperatures within this range will depend on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shading, such as that provided by riparian habitat; streamflow; and local groundwater influence. Existing water temperatures are influenced by a variety of factors including solar radiation, wind, air temperature, elevation, the flow regime of Libby Dam, riparian vegetation, and channel configuration. The sparse riparian vegetation that currently exists on the sites will be replaced by willows planted at approximately 1770’ elevation. Survival will be dependent on regular watering during the first year. The project would not affect other factors that control the water temperature.
6. In spawning and rearing areas, substrate of sufficient amount, size, and composition to ensure success of egg and embryo overwinter survival, fry emergence, and young-of-the-year and juvenile survival. A minimal amount of fine sediment, generally ranging in size from silt to coarse sand, embedded in larger substrates, is characteristic of these conditions. The size and amounts of fine sediment suitable to bull trout will likely vary from system to system. This reach of the river does not support bull trout spawning or rearing. Even if it did, the amount of sediment released during construction of the levee repair is insignificant and short-term, and would not alter the long-term quality of the riverine environment.
7. A natural hydrograph, including peak, high, low, and base flows within historic and seasonal ranges or, if flows are controlled, minimal flow departure from a natural hydrograph. The current flow regime is controlled by the U.S. Army Corps of

Engineer's Libby Dam. The proposed project will have no effect upon the flow regime.

8. Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited. The current flow regime is controlled by the U.S. Army Corps of Engineer's Libby Dam. Permanent and sufficient water quantity is assured and would not be affected by the proposed project.
9. Sufficiently low levels of occurrence of nonnnative predatory (e.g., lake trout, walleye, northern pike, smallmouth bass); interbreeding (e.g., brook trout); or competing (e.g., brown trout) species that, if present, are adequately temporally and spatially isolated from bull trout. The proposed project would have no effect on nonnative predatory or competing species of bull trout.

Determination

There would be some short-term, temporary construction impacts but the impacts are discountable and insignificant. Therefore, the project *may affect, but is not likely to adversely affect* designated critical habitat for bull trout.

9.0 DETERMINATION OF EFFECT

Table 9-1
ESA Effects Determination – Listed Species

Species	ESA Status	Effects Determination
Kootenai River white sturgeon *(Acipenser transmontanus)*	Endangered	May affect, not likely to adversely affect
Bull trout *(Salvelinus confluentus)*	Threatened	May affect, not likely to adversely affect
Bald eagle *(Haliaeetus leucocephalus)*	Delisted	No effect

Table 9-2
ESA Effects Determination – Critical Habitat

Species	ESA Status	Effects Determination
Kootenai River white sturgeon *(Acipenser transmontanus)*	Endangered	May affect, not likely to adversely affect
Bull trout *(Salvelinus confluentus)*	Threatened	May affect, not likely to adversely affect

10.0 COORDINATION / CONSULTATION HISTORY

Information about species present or likely to be present in the project area was obtained from USFWS and the ICDC.

On April 18. 2012, a list of federal threatened, endangered, proposed and candidate species and critical habitats for Boundary County, Idaho were obtained via the website: http://www.fws.gov/idaho/species/T&E/TE072611IFWOREV.pdf. The list was dated July 2011.

In a phone conversation between Mary Terra-Berns (IDFG Coeur d'Alene office) and Ken Brunner (Corps Biologist) on April 17, 2012, Ms. Terra-Berns confirmed that the aquatic species present within the Project Area included: Kootenai River white sturgeon (endangered) and bull trout (threatened). Ms. Terra-Berns also indicated that the in-water work window in this stretch of the Kootenai River is August 1 to August 31 when both species are unlikely to be present, and also suggested an earlier start date of July 15 would be preferable. In addition, Ms. Terra-Berns asked that the project incorporate BMPs to prevent sedimentation and erosion.

In a telephone conversation between Jason Flory (USFWS Spokane, Washington office) and Ken Brunner (Corps Biologist) on April 26, 2012, Mr. Flory described bull trout as spawning in Kootenai River tributaries, but not the mainstem of the river. According to Mr. Flory, bull trout use the Kootenai River primarily as a migration corridor, and would be migrating post-spawning during the proposed August/September construction period from Kootenay Lake to Libby Dam. Mr. Flory stated that bull trout occur in low densities in the Kootenai and a May Affect, Not Likely to Adversely Affect determination would be appropriate. Mr. Flory further stated that the likelihood of white sturgeon in the vicinity of the project during construction is so low that the project will have No Effect on the population, although individuals could be disturbed by the activity. Mr. Flory also indicated that the designated work window is August 1-September 30 and that work in September is therefore acceptable. In addition, Mr. Flory indicated that work in July is NOT acceptable as there is a possibility that larval or juvenile Kootenai River sturgeon may be in the project area. This is at odds with the work window established by IDFG (see above discussion with Mary Terra-Burns). Subsequent coordination with Ms. Terra-Burns affirmed that IDFG agrees that the September work window would be protective of these species. Therefore, the Corps has elected to conduct the 2012 levee repair work in early September.

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APPENDICES

APPENDIX A

Figures and Engineering Plans

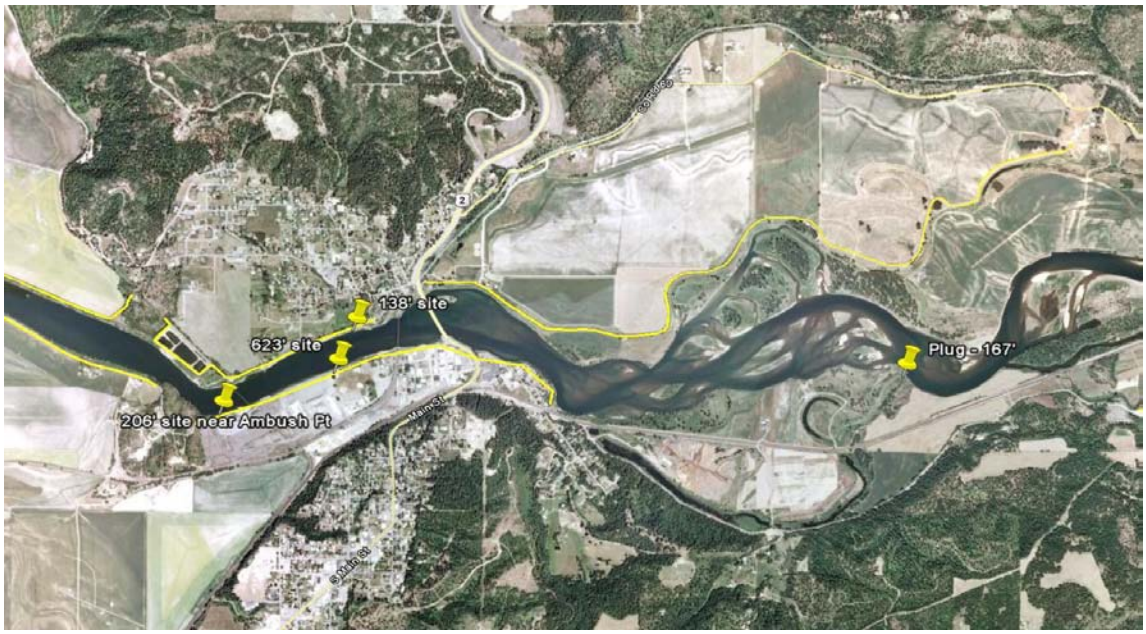


Figure A**1**--Overview of Project area. Levees are shown in yellow. Emergency work locations done in May 2011 indicated by yellow pushpins.

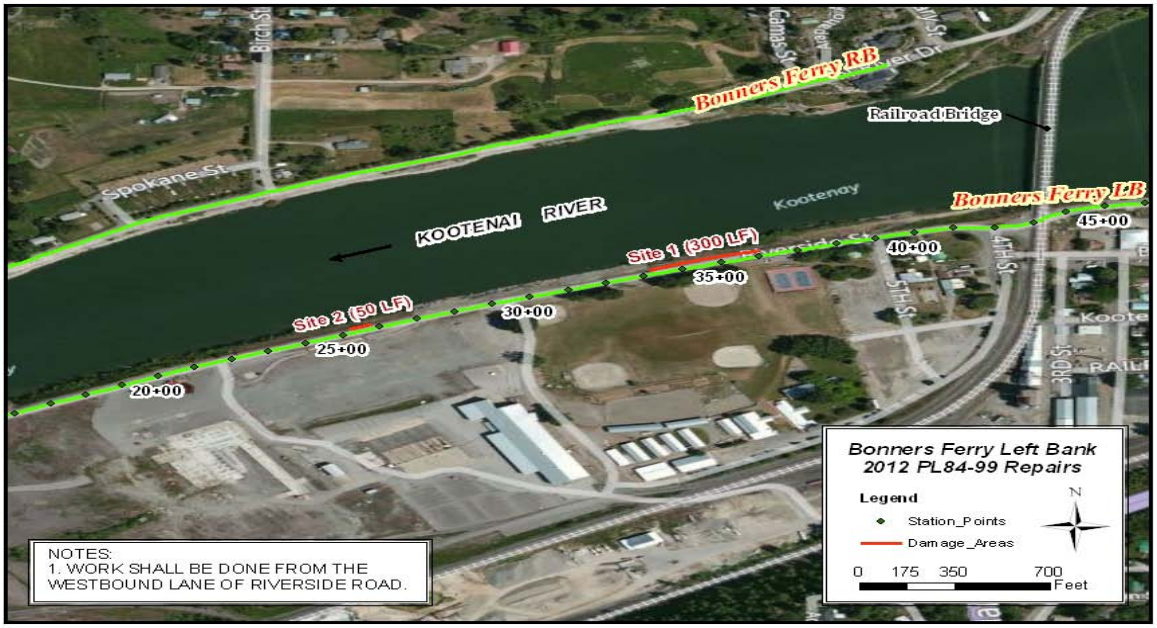


Figure A2—2012 Repair Sites 1 and 2, showing locations and stations.

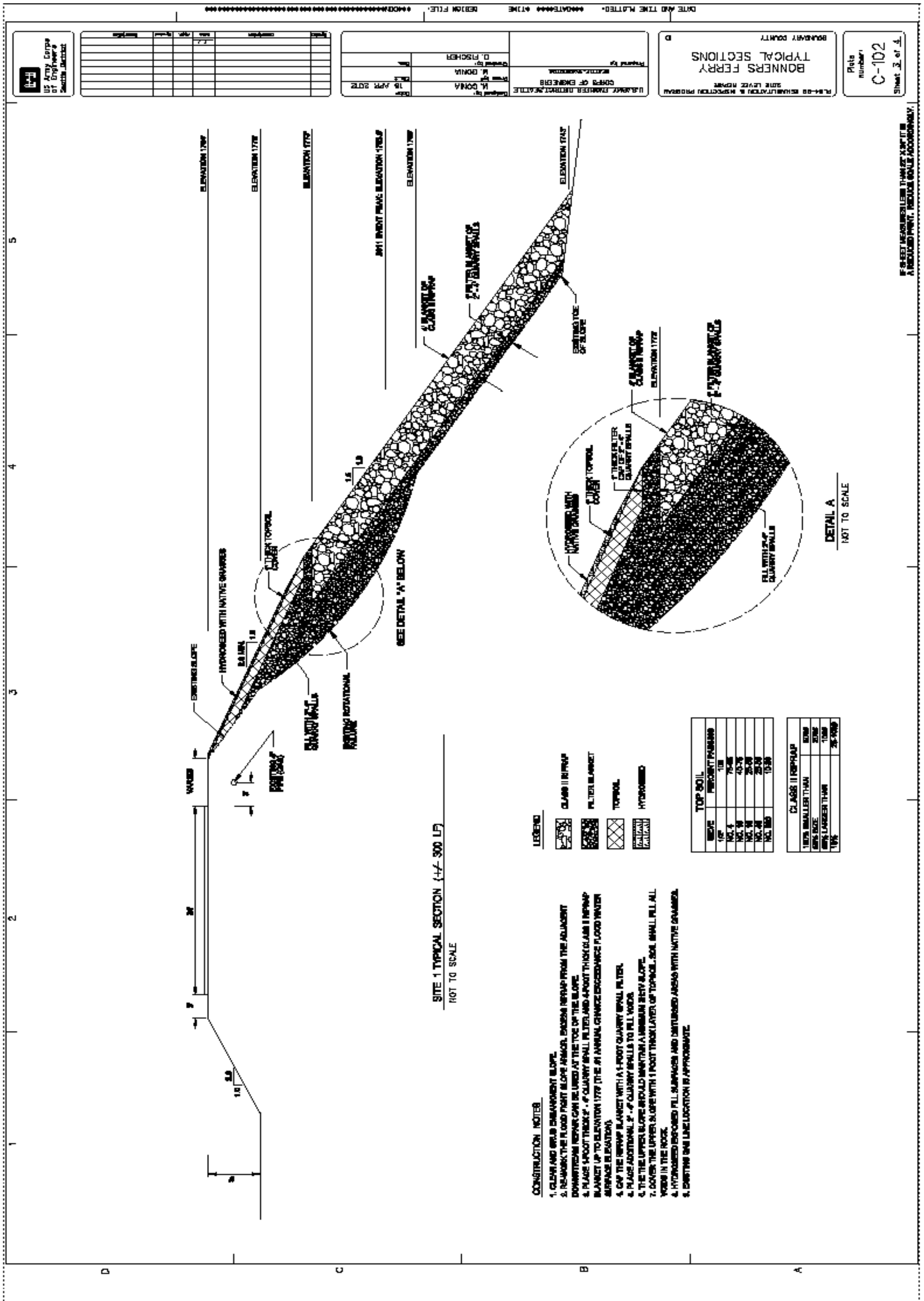


Figure A3—Site 1 cross-section.

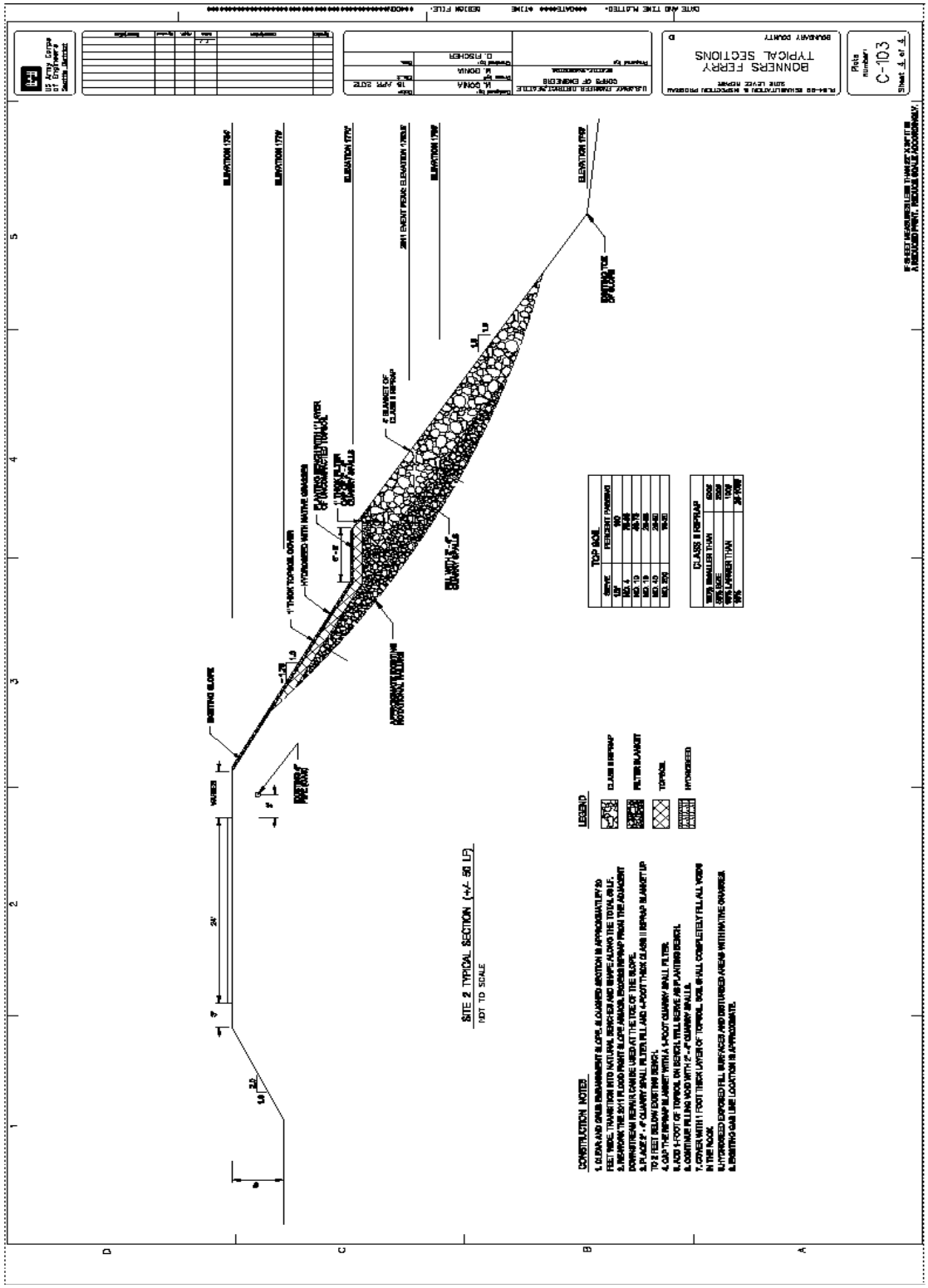


Figure A4—Site 2 cross-section.

APPENDIX B

Species Lists and Critical Habitat

U.S. Fish & Wildlife Service - Idaho Fish and Wildlife Office

Threatened, Endangered, Candidate and Delisted Species

THREATENED AND ENDANGERED SPECIES

MAMMALS

Selkirk Mountain caribou (*Rangifer tarandus caribou*)
Endangered

Canada lynx (*Lynx canadensis*)
Threatened, Designated Critical Habitat

Grizzly bear (*Ursus arctos horribilis*)
Threatened

Northern Idaho ground squirrel (*Spermophilus brunneus brunneus*)
Threatened

FISH

Kootenai River white sturgeon (*Acipenser transmontanus*)
Endangered, Designated Critical Habitat

Bull trout (*Salvelinus confluentus*)
Threatened, Coterminous listing; Designated Critical Habitat

NOAA Fisheries Jurisdiction
Sockeye salmon (*Oncorhynchus nerka*)
Endangered

Spring/Summer chinook salmon (*Oncorhynchus tshawytscha*)
Threatened

Fall chinook salmon (*Oncorhynchus tshawytscha*)
Threatened

Steelhead trout (*Oncorhynchus mykiss*)
Threatened

PLANTS

MacFarlane's four-o'clock (*Mirabilis macfarlanei*)
Threatened

Water howellia (*Howellia aquatilis*)
Threatened

Ute ladies'- tresses (*Spiranthes diluvialis*)
Threatened

Spalding's catchfly (*Silene spaldingii*)
Threatened

Slickspot peppergrass (*Lepidium papilliferum*)
Threatened

INVERTEBRATES

Snake River physa snail (*Haitia (Physa) natricina*)
Endangered

Bliss Rapids snail (*Taylorconcha serpenticola*)
Threatened

Banbury Springs lamt (*Lanx* sp.)
Endangered

Bruneau hot springsnail (*Pyrgulopsis bruneauensis*)
Endangered

BIRDS

None listed currently in Idaho

Bull trout photograph by Joseph Sartore for U.S. Fish and Wildlife Service

DELISTED SPECIES

MAMMALS

Gray wolf (*Canis lupus*) - Northern Rocky Mountain Population

BIRDS

Bald eagle (*Haliaeetus leucocephalus*)

INVERTEBRATES

Idaho springsnail (*Pyrgulopsis idahoensis*)
Utah valvata snail (*Valvata utahensis*)

CANDIDATES FOR LISTING

MAMMALS

Southern Idaho ground squirrel (*Spermophilus brunneus endemicus*)
North American Wolverine (*Gulo gulo luscus*)

FISH

None listed currently in Idaho

PLANTS

Christ's paintbrush (*Castilleja christii*)
Goose Creek milkvetch (*Astragalus anserinus*)
Packard's milkvetch (*Astragalus cusickii* var. *packardiae*)
Whitebark Pine (*Pinus albicaulis*)

AMPHIBIANS

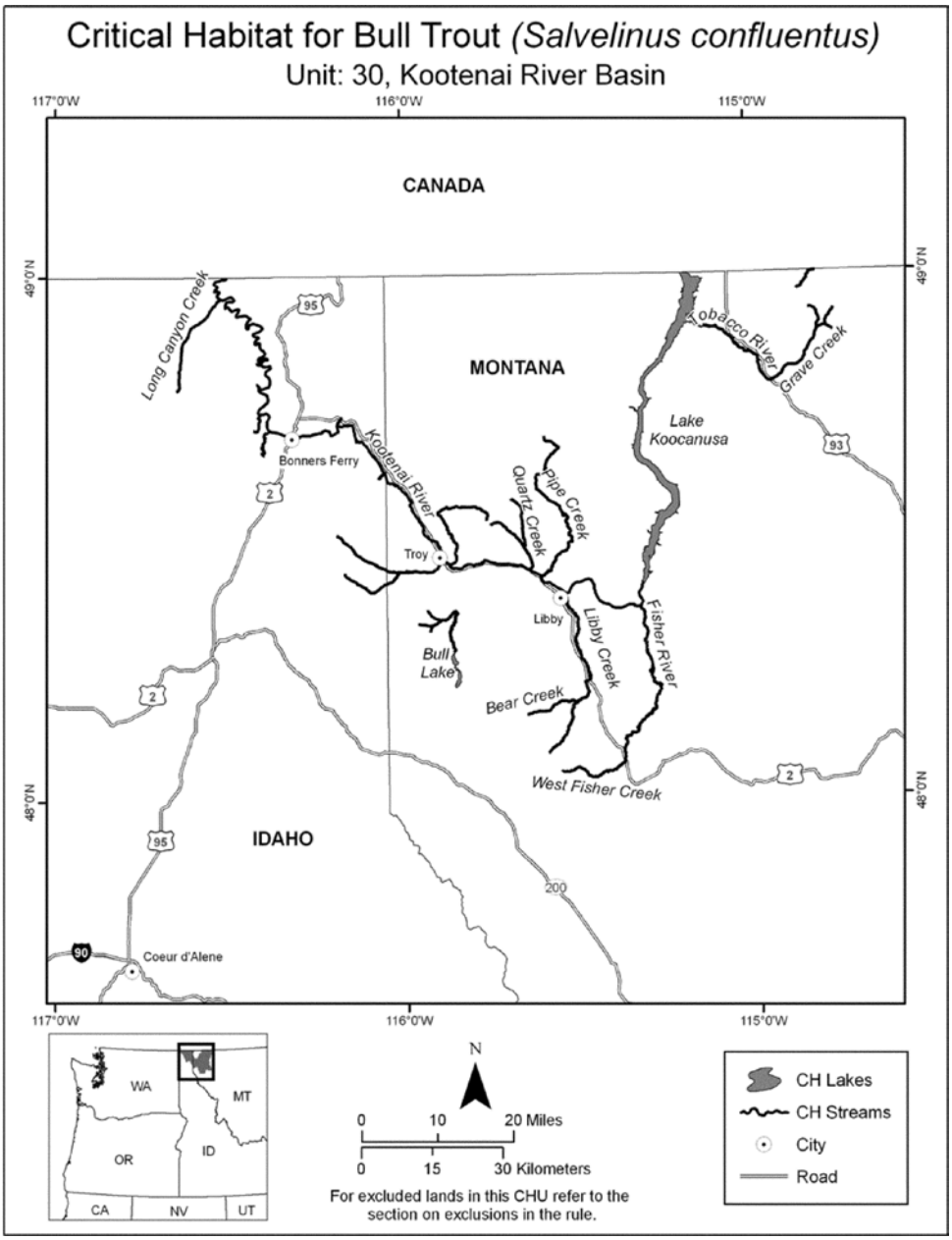
Columbia spotted frog (*Rana luteiventris*), Great Basin population

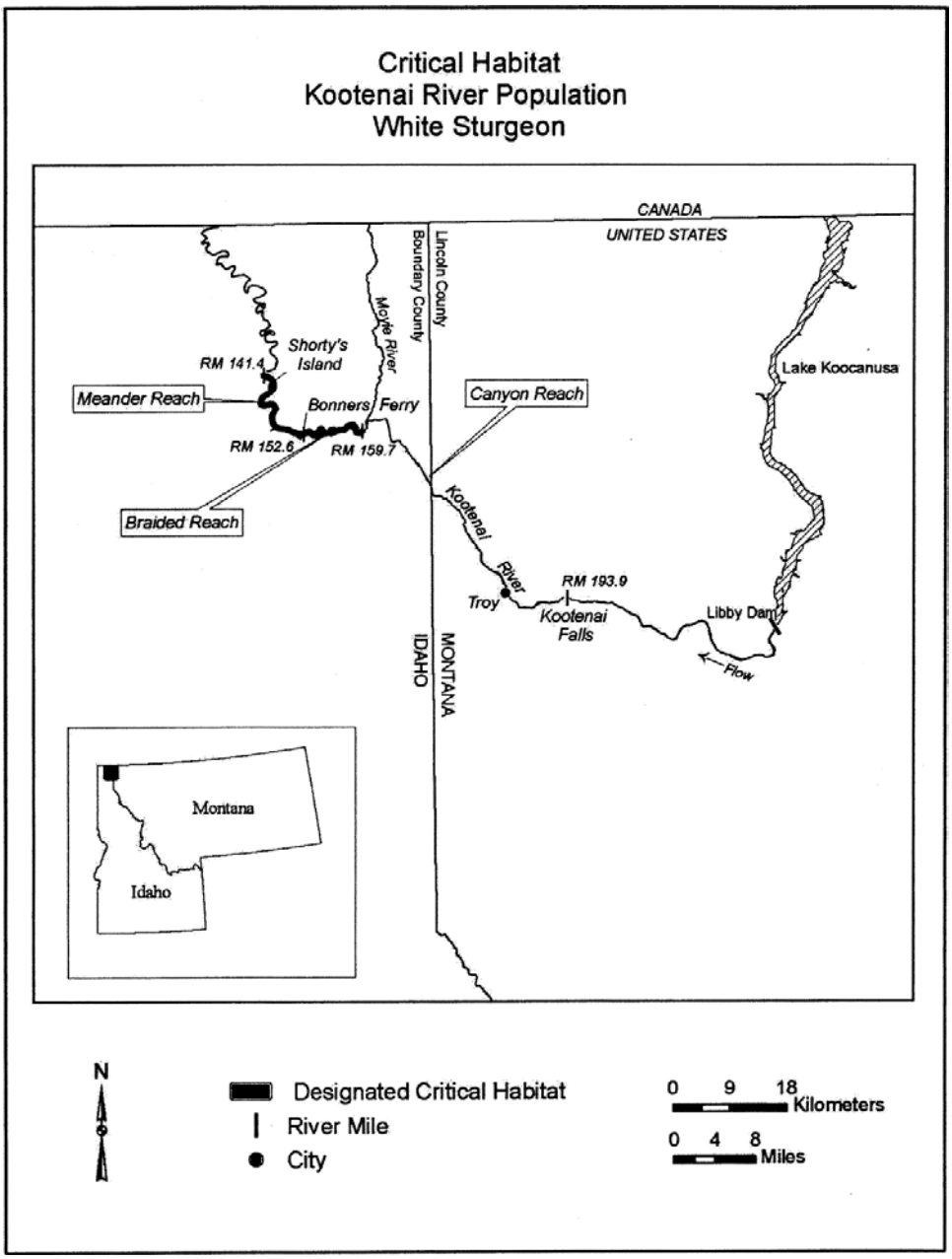
INVERTEBRATES

None listed currently in Idaho

BIRDS

Yellow-billed cuckoo (*Coccyzus americanus*)
Greater sage-grouse (*Centrocercus urophasianus*)


Critical Habitat for Bull Trout (Salvelinus confluentus)
Unit: 30, Kootenai River Basin
117°0'W
116°0'W
115°0'W
49°0'N
48°0'N
CANADA
MONTANA
IDAHO
Long Canyon Creek
Bonners Ferry
Kootenai River
Troy
Quartz Creek
Pipe Creek
Lake Koocanusa
Tobacco River
Grave Creek
Libby
Libby Creek
Fisher River
Bull Lake
Bear Creek
West Fisher Creek
Coeur d'Alene
95
2
93
200
90
WA
MT
OR
ID
CA
NV
UT
N
0 10 20 Miles
0 15 30 Kilometers
For excluded lands in this CHU refer to the section on exclusions in the rule.
CH Lakes
CH Streams
City
Road



APPENDIX C

Site Photographs

Figure C1—Left Bank Damage, Site 1

Figure C2—Damage to Left Bank, Site 2

Figure C3—Fodge Mill Emergency Repair 2011

Figure C4—Emergency Repair 2011