Final Environmental Assessment

Kootenai River – City of Bonners Ferry Levee

Repair of Flood Control Works for City of Bonners Ferry Sewage Treatment Plant
Boundary County, Idaho

September 2007

US Army Corps of Engineers®
Seattle District

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ABSTRACT:

During May and June 2006 high water flows caused erosion and scouring along portions of the levee that protects the City of Bonners Ferry, Idaho, sewage treatment facility. The Seattle District U.S. Army Corps of Engineers (Corps) is proposing to repair the damage in October 2007. The project will include re-sloping the over steepened bank to a more stable slope, adding armor rock, and constructing a ten foot by fifteen foot weighted toe. Approximately 300 lineal feet of levee is proposed for repair which will require using approximately 1000 cubic yards of spall material and 4000 cubic yards of class III riprap. Large woody debris (LWD) and willow plantings will be incorporated into the proposed design. LWD will number 5-8 logs with root wads attached depending on spacing. Willows will be planted in a soil lift at approximately the line of vegetation (just above ordinary high water) throughout the length of the repair.

The project will not constitute a major Federal action significantly affecting the quality of the human environment.

This document is also available online at:
http://www.nws.usace.army.mil/ers/envirdocs.html

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1. INTRODUCTION AND BACKGROUND

This Environmental Assessment (EA) is being prepared pursuant to Sec. 102(C) of the National Environmental Policy Act (NEPA) of 1969. It evaluates the potential environmental effects of the proposed repair of the City of Bonners Ferry levee section along the Kootenai River in Boundary County, Idaho. During May and June 2006, high river flows caused erosion and scouring along portions of the levee that protects the City of Bonners Ferry sewage treatment facility. If the levee is not repaired there is a high risk of levee failure during the next flood event which may result in a release of raw sewage into the Kootenai River, damage to utilities, and potential damages to homes protected by this levee. Approximately 300 lineal feet of levee will be repaired using 1,000 cubic yards of spall material and 4,000 cubic yards of class III riprap.

1.1 Location and Setting

The City of Bonners Ferry levee repair site is located approximately 1 mile downstream of the Highway 95 bridge on the right bank of the Kootenai River in Boundary County in the City of Bonners Ferry Idaho. The area is within the historic floodplain of the Kootenai River, which has been converted to agricultural land. The City of Bonners Ferry is located adjacent to the levees on both banks of the Kootenai River (Figure 1).

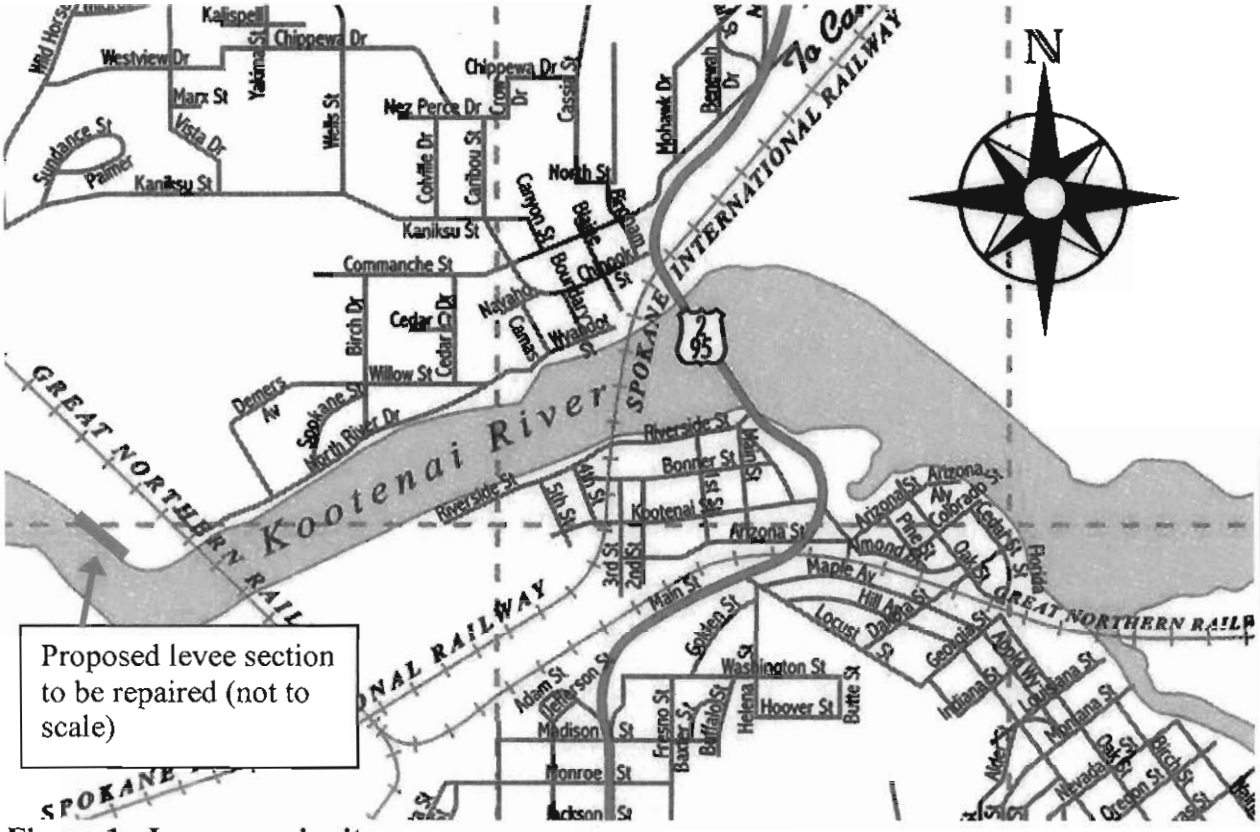

Figure 1: Levee repair site.

1.2 Project Background

In spring 2006, conditions and Libby Dam operations in the Kootenai River Basin resulted in a flood event affecting areas downstream of Libby Dam in Libby and Troy, Montana and in Bonners Ferry, Idaho. Libby Dam released flows at or above powerhouse capacity (approximately 25,000 cfs) for the period from May 17 to June 30. At that time, the Corps could

not meaningfully reduce outflows from Libby Dam because of remaining snow pack and thunderstorm activity, and concerns about filling the reservoir and diminishing flood capacity. Spillway flows above powerhouse capacity at Libby Dam were released from June 8 until June 27, with peak spillway flows of 31,000 cfs on June 18. At Bonners Ferry, the river stage was within 1 foot below flood stage of 1764 feet (mean sea level) on May 21 and 22, and exceeded flood stage from June 16 to June 22. The peak river stage at Bonners Ferry was 1766.6 feet on June 18.

1.3 Project Need

The sewage treatment plant needs to remain operational and not be allowed to become damaged which may result in raw sewage entering the Kootenai River.

1.4 Project Purpose

The project purpose is to protect the City of Bonners Ferry sewage treatment facility from flooding.

1.5 Authority

The Flood Control Act of 1950 (PL 81 – 560), Section 204, authorized the construction and operation of Libby Dam in Montana. While the Corps is under no legal obligation to perform these repairs, the Corps is choosing to exercise discretion to proceed with these repairs to this non-federal levee.

2. ALTERNATIVES

2.1 No Federal Action

The No-Action alternative would not provide federal action, and would leave the levee in the damaged condition. The levee would remain in a damaged state until the County found additional resources and money to repair it at some future time. This alternative has a high potential for damage to occur to the sewage treatment plant.

2.2 Preferred Alternative-Return levee to pre-flood condition

The preferred alternative would be for the Corps to repair the damages by re-sloping the over-steepened bank to a more stable slope, adding a three-foot blanket of armor rock, and constructing a ten-foot by fifteen-foot weighted toe (the riverward edge of the levee). The riverward face of the levee would be re-graded to a slope of 2 horizontal:1 vertical and the existing embankment material would be incorporated into the repair, thus reducing the amount of material required to be imported to the site. The levee repair would extend approximately 300 lineal feet, and would incorporate large woody debris (LWD) and planting of willows along the riverward slope of the levee into the design. The treatment plant outfall pipe, located approximately midway along the lineal extent of the project area, would be extended outward beyond the new slope protection.

2.3 Setback/Relocate Alternative

Several other designs were considered for the repair of the levee. First, an alternative to setback/relocate the levee was examined. This alternative was rejected for economic, environmental, and social reasons. The cost of relocating the sewage treatment plant was significantly more expensive than the preferred alternative and this alternative would result in a much larger disturbance to the environment in physical size and duration.

2.4 Rock Groin Alternative

The second alternative would construct a series of rock groins into the water and landward of the original footprint along the 300 foot eroded section. This alternative was rejected due to the increased project cost associated with the larger footprint and the unpredictable impacts to local flow conditions.

3. EXISTING ENVIRONMENT

3.1 Hydrology, Soils and Topography

Mountains in the subbasin are composed of folded, faulted, and metamorphosed blocks of Precambrian sedimentary rocks of the Belt Series and minor basaltic intrusions. Primary rock types are meta-sedimentary argillites, silts, and quartzites, which are hard and resistant to erosion (Miller et al 1999). Where exposed, they form steep canyon walls and confined stream reaches. The porous nature of the rock and glaciation and have profoundly influenced basin and channel morphology.

The Kootenai River character changes dramatically from a bedrock-controlled regime in Montana to a silt/clay regime near the city of Bonners Ferry, Idaho (TetraTech 2004). During the Pleistocene, continental glaciation overrode most of the Purcell Range north of the river, leaving a mosaic of glacially scoured mountainsides, glacial till, and lake deposits. Late in the glacial period, an ice dam blocked the outlet at West Arm of Kootenay Lake. The dam formed glacial Kootenay Lake, the waters of which backed all the way to present-day Libby, Montana. Glacial Kootenay Lake filled the valley with lacustrine sediments, which included fine silts and glacial gravels and boulders. The Kootenai River and lower tributary reaches in Idaho are actively reworking these lacustrine sediments today (TetraTech 2004). A terrace of lacustrine sediments on the east side of the valley is approximately 150 feet above the current floodplain and is a remnant of the ancestral valley floor. Tributary streams working through remnant deposits to meet the present base level of the mainstem and from the mainstem reworking existing floodplain and stream bank deposits continue to be a source of fine sediments. An extensive network of marshes, tributary side channels, and sloughs were formed by lowering of the level of Kootenay Lake, flooding, and the river reworking its floodplain. Some of these wetlands continued to be supported by groundwater recharge, springtime flooding, and channel meandering (Kootenai Tribe of Idaho and MFWP 2004). Much of this riverine topography, however, has been eliminated by diking and agricultural development, especially in the reach downstream of Bonners Ferry, Idaho.

3.2 Ecology/Vegetation

Bonners Ferry is located in one of the few flood plains of the Kootenai River. Today, diking and other preventive measures largely prevent flooding of Bonners Ferry and allow extensive farming in and around Bonners Ferry. Bonners Ferry is at the beginning of the Purcell Trench (Snyder and Minshall 1996). Prior to European-American settlement, the floodplain from Bonners Ferry to Creston was one of the largest and richest riparian forest and wetland complexes in the Pacific Northwest (Jamieson and Braatne 2001). The area at one time contained cottonwood stands and extensive seasonally flooded sedge meadows prior to its draining; protection from flooding by a system of ditches, pumps, and levees; and conversion to agriculture. In Boundary County, Idaho, about 68,000 acres, of which about 35,000 acres are on the Kootenai River floodplain (HDR 2003), are now used for crop production, and hay and pasture. The remainder of open agriculture land and pastureland is on high benches, which are

cleared forestland (NRCS 2003). In the period between 1968 and 1991, some of these lands were converted from agricultural land back to wetlands and natural meadows as part of the Kootenai National Wildlife Refuge (KNWR). Areas within the City of Bonners Ferry are characterized as typical residential and commercial development with habitat for species that are adapted to coexistence with relatively high levels of human disturbance.

Most of the valley bottom in and around Bonners Ferry has been converted 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 a few remaining wetlands, willows, alder, aspen, dogwood, cattails, meadow grasses, and sedges dominate. Developed areas within Bonners Ferry are primarily lawn with scattered planted trees, shrubs, or landscaping.

3.3 Fish

Fish species that are located within the Kootenai River are listed in Table 1, below.

Table 1. Fish species in the Kootenai River near Bonners Ferry, Idaho

Westslope cutthroat trout	*Oncorhynchus clarki lewisi*	Rainbow trout	*Oncorhynchus mykiss*
Bull trout	*Salvelinus confluentus*	Kokanee salmon	*Oncorhynchus nerka*
Mountain whitefish	*Prosopium wouldiamsoni*	Burbot	*Lota lota*
Redside shiner	*Richardsonius balteatus*	Peamouth chub	*Mylocheilus caurinus*
Northern pikeminnow	*Ptychocheilus oregonensis*	Largescale sucker	*Catostomus macrocheilus*
Longnose sucker	*Catostomus catostomus*	Longnose dace	*Rhinichthys cataractae*
Torrent sculpin	*Cottus rhotheus*	Slimy sculpin	*Cottus cognatus*
White sturgeon	*Acipenser transmontanus*		

Of these species, the white sturgeon and bull trout are listed as endangered and threatened species, respectively, and are addressed in the biological evaluation prepared for this proposed project. The Kootenai Tribal sturgeon hatchery is located a short distance downstream and on the same bank as the proposed project. This hatchery produces sturgeon as part of a conservation aquaculture program pursuant to sturgeon recovery efforts.

3.4 Wildlife

Since the area surrounding the levees is so highly developed and urbanized the most likely species found are raccoons, coyotes, squirrels and various songbirds. The riparian vegetation along these portions of the levees is essentially non existent consisting of a few willow shrubs found sporadically along the riverward side. There is insufficient habitat for larger species.

3.5 Threatened and Endangered Species

In accordance with Section 7(a)(2) of the Endangered Species Act of 1973, as amended, federally funded, constructed, permitted, or licensed projects must take into consideration impacts to federally listed and proposed threatened or endangered species. Four species listed as threatened may be found in the area of the project, and are listed in Table 1. The effects of the federal

action in regards to the ESA are analyzed in a separate Biological Evaluation (BE), which has been submitted to the U.S. Fish and Wildlife Service by FEMA. In addition, the Corps acknowledged the BE submitted by FEMA by letter which was sent to USFWS dated 29 August 2007.

Table 2 lists the threatened and endangered species that may occur in the vicinity of Bonners Ferry. Of those species, the only species that likely inhabit the project area are the bull trout and Kootenai River white sturgeon.

Table 2. Threatened and Endangered Species that occur in the vicinity of Bonners Ferry, Idaho

Kootenai River white sturgeon	*Acipenser transmontanus*	Endangered
Woodland caribou	*Rangifer tarandus caribou*	Endangered
Gray wolf	*Canis lupus*	Threatened
Canada lynx	*Lynx canadensis*	Threatened
Bull trout	*Salvelinus confluentus*	Threatened
Grizzly bear	*Ursus arctos*	Threatened
Spalding's catchfly	*Silene spaldingii*	Threatened
Water howellia	*Howellia aquatilis*	Threatened

3.5.1 Bull trout

Limited information is available regarding abundance and life history attributes of bull trout in the lower Kootenai River in Idaho. The Idaho Department of Fish and Game is currently conducting research on bull trout distribution and movements. Bull trout have been documented in the Idaho portion of the basin in the Kootenai and Moyie Rivers and Callahan, Curley, Deer, Deep, Fall, Caribou, Snow, Myrtle, Rock, Trout, Parker, Long Canyon, and Boundary Creeks (PBTTAT 1998). Additional observations of bull trout were reported in Boulder, Caboose, and Debt creeks in Idaho, just downstream from the Montana border. 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).

3.5.2 White Sturgeon

The Kootenai River population of white sturgeon (*Acipenser transmontanus*) was federally listed as endangered under the ESA in September 1994 (USFWS 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 1999). Kootenai River white sturgeon occur in the river downstream from Kootenai Falls 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 (USFWS 2001). On February 8, 2006, the USFWS published an interim rule to designate additional critical habitat for sturgeon, extending the existing critical habitat 6.9 miles from the highway bridge upstream into the braided reach (USFWS 2006). The new critical habitat rule became effective March 10, 2006.

In the spring, white sturgeon migrate upstream from Kootenay Lake to the spawning reach located between Bonners Ferry and Shorty's Island. 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. 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.

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 the 2006 Biological Opinion, 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. Pursuant to the 2006 USFWS Biological Opinion, these specific attributes may be altered or adjusted through coordination with the USFWS.

In 2000, the Idaho Department of Fish and Game (IDFG) estimated that that there were about 760 adult sturgeon remaining in the Kootenai River population (Paragamian *et al.* 2005). This is down from an estimated 5,000 to 6,000 adults in the early 1980s. These adults are now being lost to natural causes at the rate of 9 percent per year, leading to a 2005 population estimate of fewer than 500 adults (Paragamian *et al.* 2005). Based on recently revised aging information, females are not expected to reach sexual maturity until approximately age 30. 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.

3.6 Cultural Resources

No prehistoric or historic archaeological sites or other potential historic properties are present in the affected area (See Appendix B).

3.7 Water Quality

Downstream from Libby Dam, the Montana Department of Environmental Quality (Montana DEQ 2005) lists the Kootenai River water quality under Section 303(d) of the Clean Water Act (CWA) as partially impaired for aquatic life support and coldwater fisheries (trout) due to flow alterations and thermal modifications resulting from dam operations. The Kootenai River fully supports primary contact (recreation), drinking water, agriculture, and industry.

The Idaho Department of Environmental Quality under Section 303 (d) of the CWA lists the Kootenai River as impaired for siltation and thermal modifications (IDEQ 2005). It is listed as not supporting beneficial uses for aquatic life. The Kootenai River is listed as supporting primary contact for recreation. There appeared to be no assessment for drinking water supply, agriculture, industrial water supply, wildlife habitats, or aesthetics.

In general, contaminant levels are low but some measurements in Montana and Idaho in the mid-1990s found elevated levels of mercury, lead, and selenium (Kinne and Anders 1996), and occasional point measurements in 2002 and 2003 measured levels of copper, lead, and mercury in the river that approach thresholds for the chronic effects to aquatic life (Montana DEQ 2004)

at sites in British Columbia, Montana, and Idaho (Holderman and Hardy 2004). Sampling in 2003 found low levels of these constituents (Berkas *et al.* 2004). Possible sources of pollution to the lake include tailings from mines throughout the watershed, runoff from municipalities and agricultural areas, and forestry operations

3.8 Air Quality and Noise

Air resources describe the existing concentrations of various pollutants and the climatic and meteorological conditions that influence the quality of the air. Precipitation, wind direction, wind speed, and atmospheric stability are factors that determine the extent of pollutant dispersion. EPA designates localities that exceed these maximum levels (National Ambient Air Quality Standards) as non-attainment areas.

Boundary County is currently an attainment area for all monitored air pollutants. There are no apparent operable point sources or fugitive sources of emissions that are classified as major point sources by regulatory agency compliance programs (Tier I or II operating permits.

The project site is near commercial businesses and Highways 95. These highways are major thoroughfares through Bonners Ferry and transport large numbers of vehicles that affect the overall air quality and noise within the immediate vicinity. Noise levels in Bonners Ferry are similar to other cities of the same size and amount of industrial activity.

3.9 Utilities and Public Services

The levee provides protection for the sewage treatment plant, residences, commercial properties, roads, and associated public infrastructure. In addition, the Kootenai Tribal sturgeon hatchery is located a short distance downstream and would be adversely affected if raw sewage was to enter the Kootenai River.

3.10 Land Use

Land use in the project area consists of developed residential and commercial areas, including industrial areas such as the Louisiana Pacific Mill location that closed in the spring of 2003. Additional examples of land uses include a hospital, railroads, levee systems, the sewage treatment plant, the Kootenai Tribal hatchery, and across the river is downtown Bonners Ferry.

3.11 Recreation

Year-round outdoor recreation is a primary attraction for natives and visitors alike. Hiking, hunting, skiing, snowmobiling, and endless backcountry trails beckon from every direction. Dozens of alpine lakes and streams dot the Selkirk Crest.

The Kootenai and Moyie rivers offer many choices of water activities; both are blue ribbon trout streams and the Moyie is renowned for (guided) whitewater rafting every spring. A self-guided rafting or canoe float down the Kootenai Canyon from Montana is a more leisurely yet exciting adventure that provides a way to see birds and game in their natural environment. Interpretive jet boat tours are Bonners Ferry another way to see the river and relive its history

3.12 Hazardous, Toxic, and Radioactive Waste

There are no known disposal sites at the project locations that have any hazardous, toxic, or radioactive waste.

3.13 Aesthetics

The City of Bonners Ferry levees are located on the Kootenai River and are also in the flood plain of that river. The views of the surrounding mountains and the Kootenai River highlight the aesthetic value of this community.

4. ENVIRONMENTAL EFFECTS

4.1 Hydrology, Soils and Topography

4.1.1 No-Action Alternative

Continued erosion on the banks of the Kootenai River and a higher risk of damage from flooding of the river would persist under the no-action alternative. The current soil conditions and topography would not be impacted.

4.1.2 Preferred Alternative

Hydrologically, the repaired levee should return the area to its pre-flood river characteristics. The riverward slope would be returned to the pre-flood slope of 2:1 and the cross-sectional hydraulic capacity would remain the same. Frequency and depth of floodplain inundation of the site should be returned to pre-flood conditions. Overall project effects to hydrology, soils and topography would be insignificant.

Construction activities associated with the proposed project would result in approximately 1000 cubic yards of spall material and 4000 cubic yards of class III riprap being added to the project site. This material would be placed on the riverward slope along an approximately 300 foot section of the levee. In addition, soils would be compacted in areas where heavy machinery would be operating such as the access road.

4.2 Ecology/Vegetation

4.2.1 No-Action Alternative

The levee at project area is primarily rock lacking vegetation other than grasses and weeds and would likely continue to remain devoid of native vegetation.

4.2.2 Preferred Alternative

The proposed project would result in a minor, short-term disturbance to the site during construction but the site would be returned to pre-flood event condition. No significant impacts to ecological health occurred. No vegetation other than grasses, weeds, and a few small shrubs would be removed as a result of construction activities. The proposed project includes planting willows which would increase the vegetation in the area in the long term as the willows grow.

4.3 Fish

4.3.1 No-Action Alternative

The no-action alternative may result in an increase in sediment from erosion of the banks and could result in raw sewage entering the river. This would likely result in a large fish kill as the

Biological Oxygen Demand (BOD) would be large greatly reducing the oxygen available to fish downstream of the treatment plant.

4.3.2 Preferred Alternative

Effects to fish, if any, would be temporary and occur primarily during construction. However, the use of hardening material along the banks perpetuates the current condition and the pre-flood event condition that is not considered beneficial to most species of fish. However, the rock toe that would be placed below the ordinary high water mark may be beneficial to spawning sturgeon by providing a suitable substrate for egg attachment. In addition, this section of the levee currently consists almost entirely of grasses and weeds, and the Corps would be incorporating LWD and willows into the design increasing habitat and cover for all species of fish in the area.

4.4 Wildlife

4.4.1 No-Action Alternative

The levee at project area is primarily rock lacking vegetation other than grasses and weeds and would likely continue to remain devoid of native vegetation. If the levee was to fail raw sewage may enter the river resulting in severely degraded water quality condition that would likely be harmful to wildlife in the area. At a minimum it would likely result in wildlife avoiding the contaminated area altering their behavior.

4.4.2 Preferred Alternative

Effects to wildlife, if any, would be temporary and occur primarily during construction. The use of hardening material along the banks perpetuates the current condition and the pre-flood event condition that is not considered beneficial to wildlife however, the Corps would be incorporating LWD and willows into the design increasing habitat and cover in the area. In addition, the preferred alternative would provide protection to the sewage treatment plant greatly reducing the potential for raw sewage to enter the river which would be harmful to wildlife including bald eagles in the area.

4.5 Threatened and Endangered Species

4.5.1 Bull Trout

4.5.1.1 No-Action Alternative

The no-action alternative may result in an increase in sediment from erosion of the banks and could result in raw sewage entering the river. This would likely result in a large fish kill as the Biological Oxygen Demand (BOD) would be large greatly reducing the oxygen available to bull trout downstream of the treatment plant.

4.5.1.2 Preferred Alternative

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 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 pers. comm. 2007). 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. They would also be seeking refuge from high temperatures and low water flows and therefore would be present in the deeper areas of the mainstem and not likely along the shoreline where rock placement would occur. Furthermore, bull trout feed on a diel-cycle, meaning that at night they would move into the shallow water and feed in only a few feet of water (Marotz pers. comm. 2007). At dawn, they would retreat into deeper water, only to reappear at dusk (Marotz pers. comm. 2007). Therefore, no rock placement should occur between dusk and dawn nighttime hours). This is extremely unlikely, due to safety concerns. Therefore, in conclusion, the potential non-lethal, direct effects that may impact a small number of sub-adult bull trout 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.

Beneficial effects may include:

- Persistence of interstitial spaces, and
- Reduced channel scour and associated turbidity.

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.

4.5.2 Kootenai River White Sturgeon

4.5.2.1 No-Action Alternative
The no-action alternative may result in an increase in sediment from erosion of the banks and could result in raw sewage entering the river. This would likely result in a large fish kill as the Biological Oxygen Demand (BOD) would be large greatly reducing the oxygen available to sturgeon downstream of the treatment plant.

4.5.2.2 Preferred Alternative

Direct Effects
Effects to white sturgeon, if any, would be temporary and occur primarily during construction. 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 as they prefer deep, low velocity areas with fine substrate (Ford et al 1995). 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 would be placed individually by a crane, but not dumped via truck. Sturgeon are likely in the deeper 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. White sturgeon spawn in May and June and would have finished spawning by time construction begins. 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 unknown. In fact, sturgeon eggs were found near the newly-placed riprap from the 2006 flood fight repair on the right bank, on June 28, 2006 after onset of spill (Corps 2006).

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. Rock of similar size was used by the Tribe for a restoration/recovery project just downstream of the project site. The rock was placed into the river and the goal was to 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.

4.5.3 Kootenai River white sturgeon Critical Habitat

4.5.3.1 No-Action Alternative

The no-action alternative may result in an increase in sediment from erosion of the banks and could result in raw sewage entering the river. This would likely result in a large fish kill as the Biological Oxygen Demand (BOD) would be large greatly reducing the oxygen available to sturgeon downstream of the treatment plant.

4.5.3.2 Preferred Alternative

In the September 1994 listing, USFWS defined four Primary Constituent Elements (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. During the spawning season of May into July, a flow regime that periodically (not necessarily annually) produces flood flows capable of producing intermittent depths of at least 5 meters, and mean water column velocities of at least 3.3 ft/s (1.0 m/s) throughout, but not uniformly within the braided reach. The current flow regime is controlled by the U.S. Army Corps of Engineer's Libby Dam. The proposed project would have no effect upon the flow regime.

2. Stable, temperatures of roughly 50 degrees F in May into July with no sudden drops in temperature exceeding 3.6 degrees F at Bonners Ferry during the spawning season and water temperatures suitable for natural rates of development of embryos. Existing water temperatures are influenced by a variety of factors including the flow regime of Libby Dam, riparian vegetation, and channel configuration. The proposed project includes a provision for planting riparian vegetation (willows) that could help to shade (and lower temperatures in) the Kootenai River over the long-term. The project would not affect other factors that control the water temperature.
3. Presence of approximately 5 miles of continuous submerged rocky substrates for normal free embryo redistribution behavior and downstream movement. The project would introduce additional rocky substrate where it has been absent since the high flow event of June 2006 caused the bank to slough. The addition of this rock would potentially provide additional habitat for white sturgeon eggs and free embryos.
4. A flow regime that limits sediment deposition and maintains appropriate rocky substrate for sturgeon egg adhesion, incubation, escape cover, and free embryo development. Construction of the project is not expected to affect the flow regime, as flow is currently controlled by Libby Dam.

Effects
There would be some short-term, temporary construction impacts to PCE #4, but the impacts are minor in comparison to the long-term benefit of installing additional rocky substrate that may be suitable for egg attachment.

4.6 Cultural Resources

4.6.1 No-Action Alternative
No effects would result from the No-Action Alternative.

4.6.2 Preferred Alternative
No historic properties would be affected by the levee repair action. A letter from the State Historic Preservation Officer concurring with a finding of No Historic Properties Affected dated June 25, 2007 was received by FEMA. The work encompassed by FEMA was identical in scope and location to the Corps proposed project, therefore no historic properties are expected to be encountered. The construction contract will contain a stop-work clause to notify the appropriate officials if evidence of cultural or human artifacts is unearthed.

4.7 Water Quality

4.7.1 No-Action Alternative
If the levee failed and raw sewage entered the river the effect of the no-action alternative could be severe. Raw human wastewater contains a potent mixture of contaminants, including biochemical oxygen demand (BOD), high concentrations of nitrogen and phosphorus, numerous chemicals, and a variety of bacteria, protozoans, and viruses that are pathogenic to humans.

4.7.2 Preferred Alternative

Water quality is not anticipated to be significantly impacted by construction activities. During construction there may be a temporary and localized water quality impact such as an increase in turbidity. Equipment would not enter the water and would remain on dry ground at all times. During construction, best management practices for equipment operation and storage and use of hazardous materials would be employed. Therefore, no leakage or spills of hazardous materials is anticipated to occur.

This work constitutes repair of an existing structure and would be performed by the Corps of Engineers, and is thus considered exempt from permitting requirements under the Clean Water Act.

4.8 Air Quality and Noise

4.8.1 No-Action Alternative

No effects would result from the No-Action Alternative.

4.8.2 Preferred Alternative

During construction, there may be a temporary and localized reduction in air quality due to emissions from heavy machinery operating during fill placement, and grading. These emissions would not exceed EPA's *de minimis* threshold levels (100 tons/year for carbon monoxide and 50 tons/year for ozone) or affect the implementation of Idaho's Clean Air Act implementation plan. Therefore, impacts would be insignificant.

Ambient noise levels would increase slightly while construction equipment is operating. However, these effects would be temporary and localized. As a result, impacts are anticipated to be insignificant.

4.9 Utilities and Public Services

4.9.1 No-Action Alternative

The No-Action Alternative could result in the levee being damaged further resulting in raw sewage entering the river, and taking the sewage treatment plant out of service. In addition, damages could occur to residences, commercial properties, roads, and associated public infrastructure.

4.9.2 Preferred Alternative

Construction vehicles associated with this project may disrupt local traffic due to increased truck traffic merging, turning and traveling together with local traffic. Such a disruption would be temporary and highly localized, therefore impacts would be insignificant. The preferred alternative would provide protection to the sewage treatment plant, residences, commercial properties, roads, and associated public infrastructure.

4.10 Land Use

4.10.1 No-Action Alternative

The No-Action Alternative would have no impacts on land use.

4.10.2 Preferred Alternative

The project would not cause unique effects or impacts to land use.

4.11 Recreation

4.11.1 No-Action Alternative

The No-Action Alternative would have no effect to recreation.

4.11.2 Preferred Alternative

Effects to recreation values because of the levee repair are anticipated to be insignificant. Recreational resource and value uses would not change as a result of the project.

4.12 Hazardous, Toxic, and Radioactive Waste

4.12.1 No-Action Alternative

The No-Action Alternative would have no effect to hazardous, toxic, and radioactive waste.

4.12.2 Preferred Alternative

The project would not introduce new hazardous, toxic, or radioactive waste to the area.

4.13 Aesthetics

4.13.1 No-Action Alternative

The No-Action Alternative would have no effect to aesthetics.

4.13.2 Preferred Alternative

Restoration of the constructed features of the project would not significantly affect the aesthetics of the site or the river.

5. UNAVOIDABLE ADVERSE EFFECTS

Unavoidable adverse effects associated with this project include:

(1) a temporary and localized increase in noise, which may temporarily disrupt wildlife in the area, and

(2) a temporary and localized disruption of local traffic by construction vehicles.

6. COORDINATION

The U.S. Fish and Wildlife Service (USFWS), Idaho Department of Fish and Game (IDFG), Idaho Department of Environmental Quality (IDEQ), and the Kootenai Tribe of Idaho were notified of the repair work. In addition, the Notice of Preparation for this EA was sent to elected officials and numerous stakeholders in the region, in part through the Kootenai Valley Resource Initiative distribution list.

7. CUMULATIVE EFFECTS

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 evaluation. Future federal actions would require additional NEPA and ESA evaluation at the time of their development.

There are no significant cumulative effects that can be identified from the implementation of this project. There are no known plans to raise the levees to provide an increased level of flood protection. The levees would continue to be maintained at their current level. The Corps knows of no other actions that are reasonably certain to occur within the action area.

Cumulative impacts from local, short-term disturbances caused by the construction project (noise, emissions, etc.) would be minor and insignificant.

8. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The irreversible and irretrievable commitment of resources is the use of materials, resources, or land during implementation of an alternative that makes these resources unavailable for other uses, given known technology and reasonable economics.

Industrial resources required during implementation of the selected alternative would include fossil fuels, construction-related materials, and labor and capital.

9. ENVIRONMENTAL COMPLIANCE

Table 9.1. Summary of Consistency of Project With Applicable Laws, Regulations and Policies[1]

LAWS AND REGULATIONS RELATING TO THE PROPOSED ALTERNATIVES	REQUIREMENT SUMMARIZED	CONSISTENCY OF PREFERRED ALTERNATIVE
National Environmental Policy Act (NEPA)	Requires all federal agencies to consider the environmental effects of their actions and to seek to minimize negative impacts.	Consistent – Environmental Assessment completed.
Clean Air Act	Section 176 of the Clean Air Act, 42 USC 7506 (c), prohibits Federal agencies from approving any action that does not conform to an approved state or Federal implementation plan.	Consistent – please refer to Air Quality effects evaluation.
Clean Water Act (CWA)	Pursuant to 33, USC 1344 (f)(1)(B) discharges or fill material for emergency levee repair are excluded from regulation under CWA.	Consistent – levee repair is excluded from regulation.
Endangered Species Act	Requires federal agencies to protect listed species and consult with US Fish & Wildlife or NMFS regarding the proposed action.	Endangered species addressed in a separate document. Concurrence from the USFWS with the Corps/FEMA effects determination was received
National Historic Preservation Act	Requires federal agencies to identify and protect historic properties.	Consistent – please refer to the Cultural Resources evaluation.
Executive Order 12898 Environmental Justice	Requires federal agencies to identify and address disproportionately high and	Consistent – no minority or low-income populations

	adverse human health or environmental effects on minority and low-income populations.	occur within the project area.
Executive Order 11988, Floodplain Management	Requires federal agencies to consider how their activities may encourage future development in floodplains.	Consistent – no new or additional protection would be provided that would encourage additional development in the floodplain.
Coastal Zone Management Act (CZMA)	Requires federal agencies to comply to the maximum extent practicable with approved state coastal zone management programs.	Not applicable. Project does not occur within a coastal zone.
Executive Order 12898 Environmental Justice	Requires federal agencies to identify and address disproportionately high and adverse human health or environmental effects on minority and low-income populations.	Consistent. No disproportionately high effects on minority or low-income populations were identified.

10. CONCLUSION

Based on the above analysis, the levee repair would not be a major Federal action significantly affecting the quality of the human environment, and therefore does not require preparation of an environmental impact statement.

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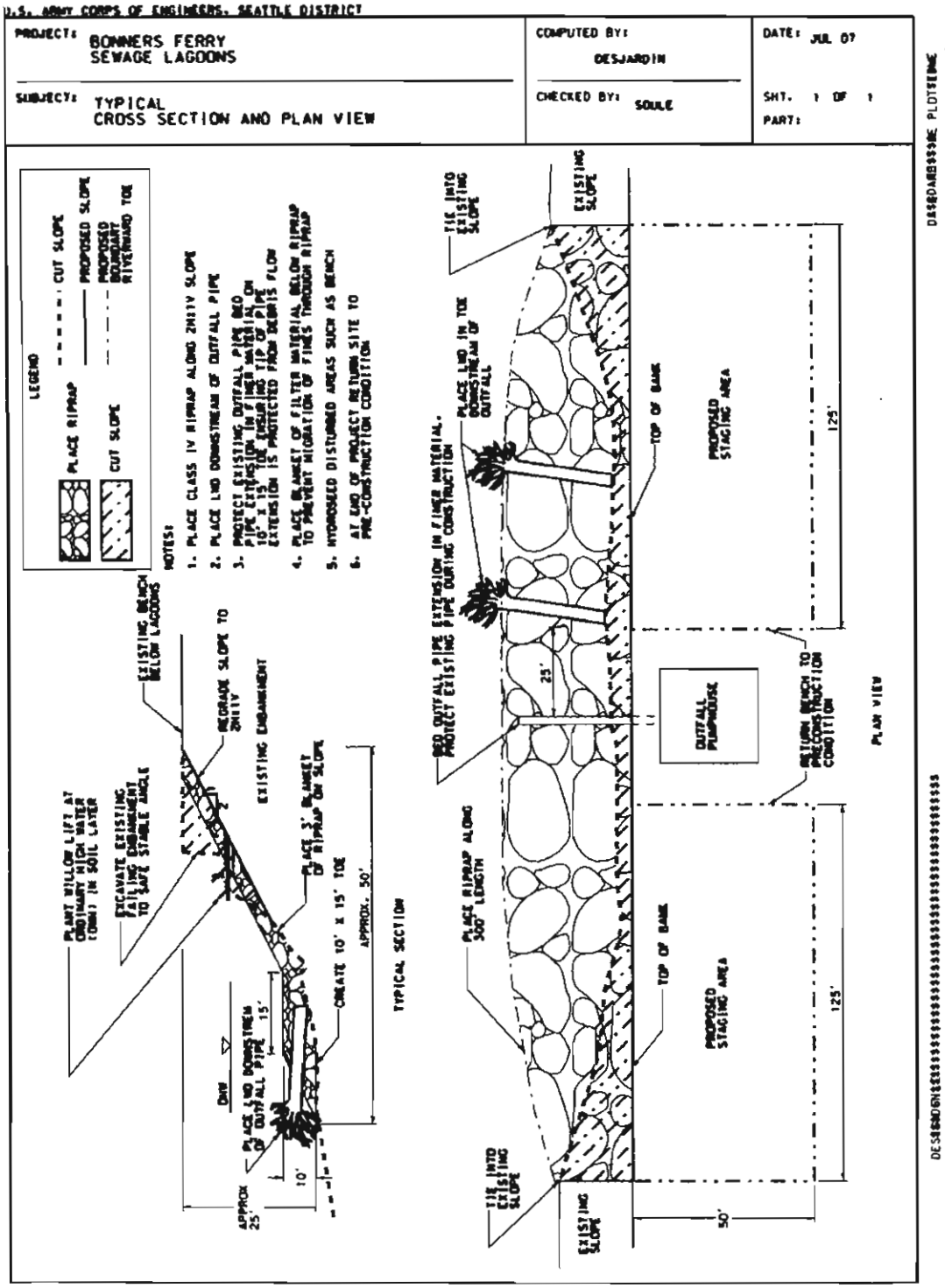
Appendix A

Project Drawing and Photo


U.S. ARMY CORPS OF ENGINEERS, SEATTLE DISTRICT
PROJECT: BONNERS FERRY SEWAGE LAGOONS
SUBJECT: TYPICAL CROSS SECTION AND PLAN VIEW
COMPUTED BY: DESJARDIN
CHECKED BY: SOULE
DATE: JUL 07
SHT. 1 OF 1
PART:
LEGEND
PLACE RIPRAP
CUT SLOPE
PROPOSED SLOPE
PROPOSED BOUNDARY RIVERWARD TOE
NOTES:
1. PLACE CLASS IV RIPRAP ALONG 2H:1V SLOPE
2. PLACE LND DOWNSTREAM OF OUTFALL PIPE
3. PROTECT EXISTING OUTFALL PIPE BEO PIPE EXTENSION IN FINER MATERIAL ON 10' X 15' TOE ENSURING TIP OF PIPE EXTENSION IS PROTECTED FROM DEBRIS FLOW
4. PLACE BLANKET OF FILTER MATERIAL BELOW RIPRAP TO PREVENT MIGRATION OF FINES THROUGH RIPRAP
5. HYDROSEED DISTURBED AREAS SUCH AS BENCH
6. AT END OF PROJECT RETURN SITE TO PRE-CONSTRUCTION CONDITION
PLANT WILLOW LIFT AT ORDINARY HIGH WATER (OHW) IN SOIL LAYER
EXCAVATE EXISTING FAILING EMBANKMENT TO SAFE STABLE ANGLE
EXISTING BENCH BELOW LAGOONS
REGRADE SLOPE TO 2H:1V
EXISTING EMBANKMENT
PLACE 3' BLANKET OF RIPRAP ON SLOPE
CREATE 10' X 15' TOE
APPROX. 50'
OHW
PLACE LND DOWNSTREAM OF OUTFALL PIPE
15'
10'
APPROX 25'
TYPICAL SECTION
TIE INTO EXISTING SLOPE
EXISTING SLOPE
PLACE LND IN TOE DOWNSTREAM OF OUTFALL
BEO OUTFALL PIPE EXTENSION IN FINER MATERIAL. PROTECT EXISTING PIPE DURING CONSTRUCTION
TOP OF BANK
PROPOSED STAGING AREA
125'
25'
OUTFALL PUMPHOUSE
RETURN BENCH TO PRE-CONSTRUCTION CONDITION
PLACE RIPRAP ALONG 500' LENGTH
50'
PLAN VIEW

Photograph of project site showing sloughing that occurred after the flood events in June 2006.

Appendix B

SHPO Concurrence

IDAHO STATE HISTORICAL SOCIETY

"The History and Preservation People"

Our mission: to educate through the identification, preservation, and interpretation of Idaho's cultural heritage.
www.idahohistory.net

C.L. "Butch" Otter
Governor of Idaho

Administration
2205 Old Penitentiary Road
Boise, Idaho 83712-8250
Office: (208) 334-2682
Fax: (208) 334-2774

Archaeological Survey of Idaho
210 Main Street
Boise, Idaho 83702-7264
Office: (208) 334-3847
Fax: (208) 334-2775

Historical Museum and Education Programs
610 North Julia Davis Drive
Boise, Idaho 83702-7695
Office: (208) 334-2120
Fax: (208) 334-4059

Historic Preservation Office
210 Main Street
Boise, Idaho 83702-7264
Office: (208) 334-3861
Fax: (208) 334-2775

Historic Sites Office
2445 Old Penitentiary Road
Boise, Idaho 83712-8254
Office: (208) 334-2844
Fax: (208) 334-3225

Public Archives and Research Library
2205 Old Penitentiary Road
Boise, Idaho 83712-8250

Public Archives
Office: (208) 334-2620
Fax: (208) 334-2626

Research Library
Office: (208) 334-3356
Fax: (208) 334-3198

Oral History
Office: (208) 334-3863
Fax: (208) 334-3198

DATE: June 25, 2007
TO: Mark G. Eberlein, Regional Environmental Officer
FEDERAL AGENCY: US Department of Homeland Security, FEMA
PROJECT NAME: Riverbank Repairs, Kootenai River, Bonners Ferry, Idaho.

Section 106 Evaluation

	The field work and documentation presented in this report meet the Secretary of the Interior's Standards.
X	No additional investigations are recommended; project can proceed as planned.
	Additional information is required to complete the project review. (See comments.)
	Additional investigations are recommended. (See comments.)

Identification of Historic Properties (36 CFR 800.4):

X	No historic properties were identified within the project area.
	Property is not eligible. Reason:
	Property is listed in National Register of Historic Places.
	Property is eligible for listing in the National Register of Historic Places. Criterion: A B C D Context for evaluation:
X	*No historic properties* will be affected within project area.

Assessment of Adverse Effects (36 CFR 800.5):

	Project will have *no adverse effect* on historic properties.
	Project will have an *adverse effect* on historic properties; further consultation is recommended.

Comments:

Thank you for requesting our office's comments while in the planning stages of the project and prior to construction. We are please you have consulted with the Kootenai Tribe to resolve this issue. Please notify our office immediately if archaeological remains are discovered during project construction. If I can answer any questions or be of further assistance, please contact me at (208) 334-3847 ext. 107 or Shelby Day at ext. 109.

Susan Pengilly Neitzel

Susan Pengilly Neitzel, Deputy SHPO
State Historic Preservation Office

6/25/07
Date

RECEIVED
JUN 28 2007
FEMA - Hi... X

Appendix C

USFWS Concurrence

United States Department of the Interior

FISH AND WILDLIFE SERVICE

TAKE PRIDE IN AMERICA

Upper Columbia Fish and Wildlife Office
11103 East Montgomery Drive
Spokane, Washington 99206

September 11, 2007

Mark G. Eberlein, Regional Environmental Officer
U.S. Department of Homeland Security
FEMA
Region X
130 228th Street, SW
Bothell, WA 98021-9796

Subject: City of Bonners Ferry – Kootenai River Bank Repairs
FWS Reference 1-9-07-I-0172 (File #1300.0000)

Dear Mr. Eberlein:

This responds to your August 15, 2007, letter requesting informal consultation on the City of Bonners Ferry – Kootenai River Bank Repairs in Boundary County, Idaho. We understand that the project involves conducting river bank repairs on the Kootenai River at the Bonners Ferry Sewage Lagoon Outfall. It is FEMA's intent to provide funding for this project under emergency conditions so that work can be conducted during the optimal river flow conditions this year. FEMA believes this action is necessary to alleviate an impending emergency this fall/winter in order to protect health, safety, and welfare prior to completion of consultation. Project construction will be completed by the U.S. Army Corps of Engineers (CORPS). Your letter, with a biological assessment (BA), was received in this office on August 15, 2007, and requested our concurrence with your determinations of effect for bull trout, Kootenai River white sturgeon, designated Kootenai River white sturgeon critical habitat, and bald eagle. The Service also received the CORPS letter dated August 29, 2007, acknowledging the FEMA BA, and addressing minor inaccuracies in the project, however, these do not alter the effects determinations for listed species addressed in the BA.

On August 8, 2007, the bald eagle was removed from the Endangered Species list therefore, section 7 consultation is no longer required for the bald eagle. Adherence to the requirements of the Migratory Bird Treaty Act and the Bald and Golden Eagle Protection Act is still required. For further information on these requirements, please refer to the Services web page: http://www.fws.gov/migratorybirds/baldeagle.htm. The National Bald Eagle Management Guidelines will also provide helpful information when addressing project impacts to bald eagles.

The U.S. Fish and Wildlife Service (Service) concurs that the proposed project, as described in the BA, is "not likely to adversely affect" bull trout, Kootenai River white sturgeon and designated Kootenai River white sturgeon critical habitat. This decision is based on the fact that there is no bull trout spawning in the mainstem Kootenai River and bull trout numbers in the project area are expected to be low. This decision is also based on the fact that although Kootenai River white sturgeon may be present in the action area, it is unlikely they would be present immediately along the shoreline where project activities will occur due to higher water temperatures and their preference for deeper water. In addition, sturgeon will have finished spawning by the time construction begins. There may be minimal short-term, construction effects to sturgeon critical habitat, such as increased turbidity and sediment, however a qualified biologist from the CORPS will be present during all project activities and activities will cease if turbidity levels increase, although this is not expected to happen. For these reasons, the project may affect, but is not likely to adversely affect designated Kootenai River white sturgeon critical habitat. Concurrence by the Service is contingent upon implementing the project as described in the BA.

This concludes informal consultation pursuant to section 7(a)(2) of the Endangered Species Act of 1973, as amended (Act). This project should be re-analyzed if new information reveals effects of the action that may affect listed species or critical habitat in a manner or to an extent not considered in this consultation; if the action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this consultation; and/or, if a new species is listed or critical habitat is designated that may be affected by this project.

If you have further questions about this letter or your responsibilities under the Act, please contact Carrie Cordova of this office at 509-893-8022.

Sincerely,

Suzanne Audet

for Supervisor

c: IDFG, Coeur d'Alene
U.S Army Corps of Engineers, Mark T. Ziminske, Chief, Environmental Resources Section