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MAY 1 1 2011

S. Ross Blanchard
Operations Engineer
Federal Highway Administration, Idaho Division
3050 Lakeharbor Lane, Suite 126
Boise, Idaho 83703-6217

Subject: Johnson Creek Airport Bridge Replacement—Valley County, Idaho—Biological Opinion
CONS-100(b) 14420-2011-F-0072

Dear Mr. Blanchard:

Enclosed is the Fish and Wildlife Service's (Service) Biological Opinion (Opinion) of the Federal Highway Administration's determinations of effect on species listed under the Endangered Species Act (Act) of 1973, as amended, for the proposed Johnson Creek Airport Bridge Replacement in Valley County, Idaho. In a letter dated February 11, 2011, and received by the Service on the same date, the Federal Highway Administration requested formal consultation on the determinations under section 7 of the Act that the proposed project is likely to adversely affect bull trout (*Salvelinus confluentus*) and bull trout critical habitat. The Federal Highway Administration also determined that the proposed project will have no effect on the Canada lynx (*Lynx canadensis*), northern Idaho ground squirrel (*Spermophilis brunneus brunneus*), and gray wolf (*Canis lupus*); the Service acknowledges these determinations.

The enclosed Opinion is based primarily on our review of the proposed action, as described in your December 2010 Biological Assessment (Assessment), and the anticipated effects of the action on bull trout and bull trout critical habitat, and was prepared in accordance with section 7 of the Act. Our Opinion concludes that the proposed project will not jeopardize the survival and recovery of bull trout nor result in adverse modification of critical habitat. A complete record of this consultation is on file at this office.

Clean Water Act Requirement Language:

This Opinion is also intended to address section 7 consultation requirements for the issuance of any project-related permits required under section 404 of the Clean Water Act. Use of this letter and associated Biological Opinion to document that the Army Corps of Engineers (COE) has fulfilled its responsibilities under section 7 of the Act is contingent upon the following conditions.

1. The action considered by the COE in their 404 permitting process must be consistent with the proposed project as described in the Assessment such that no detectable difference in the effects of the action on listed species will occur.

2. Any terms applied to the 404 permit must also be consistent with conservation measures and terms and conditions as described in the Assessment and addressed in this letter and Biological Opinion.

Thank you for your continued interest in the conservation of threatened and endangered species. Please contact Pam Druliner at (208) 373-5348 if you have questions concerning this Opinion.

Sincerely,

Brian T. Kelly, State Supervisor
Idaho Fish and Wildlife Office

Enclosure

cc: NOAA, Boise (Leonard)
COE, Boise (Braspennickx)
BNF-SO, Boise (Faurot)
ITD-HQ, Boise (Sullivan, Petersen)

BIOLOGICAL OPINION
FOR THE

JOHNSON CREEK AIRPORT BRIDGE REPLACEMENT

14420-2011-F-0072

May 2011

FISH AND WILDLIFE SERVICE
IDAHO FISH AND WILDLIFE OFFICE
BOISE, IDAHO

Supervisor ______________________

Date 5/11/11

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1. BACKGROUND AND INFORMAL CONSULTATION

1.1 Introduction

The Fish and Wildlife Service (Service) has prepared this Biological Opinion (Opinion) of the effects of the Johnson Creek Airport Bridge Replacement (Project) on bull trout (*Salvelinus confluentus*) and bull trout critical habitat. In a letter dated February 11, 2011 and received on the same date, the Federal Highway Administration (Administration) requested formal consultation with the Service under section 7 of the Endangered Species Act (Act) of 1973, as amended, for its proposal to authorize the action. As the Federal action agency, the Administration determined that the proposed action is likely to adversely affect bull trout and bull trout critical habitat. However, the action and the development of the Biological Assessment (inclusive of the determinations), were proposed and prepared by the Idaho Transportation Department (Department) to their needs. As described in this Opinion, and based on the Johnson Creek Airport Bridge Replacement Biological Assessment (Idaho Transportation Department 2010) (Assessment) and other information, the Service has concluded that the action, as proposed, is not likely to jeopardize the continued existence of bull trout nor result in adverse modification of bull trout critical habitat.

1.2 Consultation History

The Service and the Department, as an agent of the Administration, have had the following meetings and correspondence concerning the proposed bridge replacement:

June 6, 2009	The Department hosted a site visit and meeting with agencies to discuss the project proposal, identify issues and concerns, and gather information and suggestions to reduce impacts to listed species. Although the Service was not represented at the meeting, we did receive the meeting notes and emails regarding the meeting.
March 15, 2010	The Service received a draft Assessment from the Department for review.
April 16, 2010	The Service transmitted comments on the draft Assessment to the Department.
October 4, 2010	Emails were exchanged between the drafters of the Assessment and the Service regarding the comments from the Service.
December 20, 2010	The Service received an updated draft Assessment from the Department that included additional information regarding baseline conditions and bull trout critical habitat.
January 4, 2011	The Service transmitted comments on the draft Assessment to the Department.
January 21, 2011	The Service reviewed the edited draft Assessment and informed the Department that the Service considered the Assessment complete.

February 11, 2011	The Administration transmitted, and the Service received, the Final Assessment and request for formal consultation.
April 28, 2011	The Service provided a draft Opinion to the Administration and the Department for their review.
May 5, 2011	The Department reviewed the draft Opinion and informed the Service that they did not have any comments.

2. BIOLOGICAL OPINION

2.1 Description of the Proposed Action

This section describes the proposed Federal action, including any measures that may avoid, minimize, or mitigate adverse effects to listed species or critical habitat, and the extent of the geographic area affected by the action (i.e., the action area). The term "action" is defined in the implementing regulations for section 7 as "all activities or programs of any kind authorized, funded, or carried out, in whole or in part, by Federal agencies in the United States or upon the high seas." The term "action area" is defined in the regulations as "all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action."

2.1.1 Action Area

The Project is located on Johnson Creek, a tributary to the East Fork of the South Fork of the Salmon River. The legal description of the action area is Township 18 North, Range 08 East, SW ¼ of section 8. It is approximately 4 miles south of the town of Yellowpine, Idaho, and just north of Deadhorse Rapids. The bridge is immediately southeast of the Johnson Creek Airstrip. Land in the vicinity of the bridge is a mixture of private property and Federal holdings administered by the Cascade District of the Boise National Forest. For the purposes of consultation, the Service considers the action area to include:

- Approximately 85 feet of both stream banks, including riparian vegetation, above and below the new bridge to properly armor (rip-rap) the structure;
- The new and existing approaches on both sides of the bridge;
- That portion of Johnson Creek Road is approximately 150 feet (ft) north and south of the new bridge centerline that will be raised and regraded to accommodate the increased bridge deck height;
- The 0.4 hectares (ha) (1 acre) staging area just south of the bridge site and all other off-site source, staging and disposal sites, if necessary;
- The portion of Johnson Creek downstream of the bridge site that will potentially be affected by sedimentation resulting from construction activities or subsequent storm events. Impacts to aquatic life from mobilized sediment would not be expected to occur more than circa (ca.) 600 ft downstream of the action area; and
- The total area at the bridge site disturbed by project activities (approximately 0.70 ha (1.7 acres)).

See Appendix A of the Assessment for aerial and site photos and project drawings.

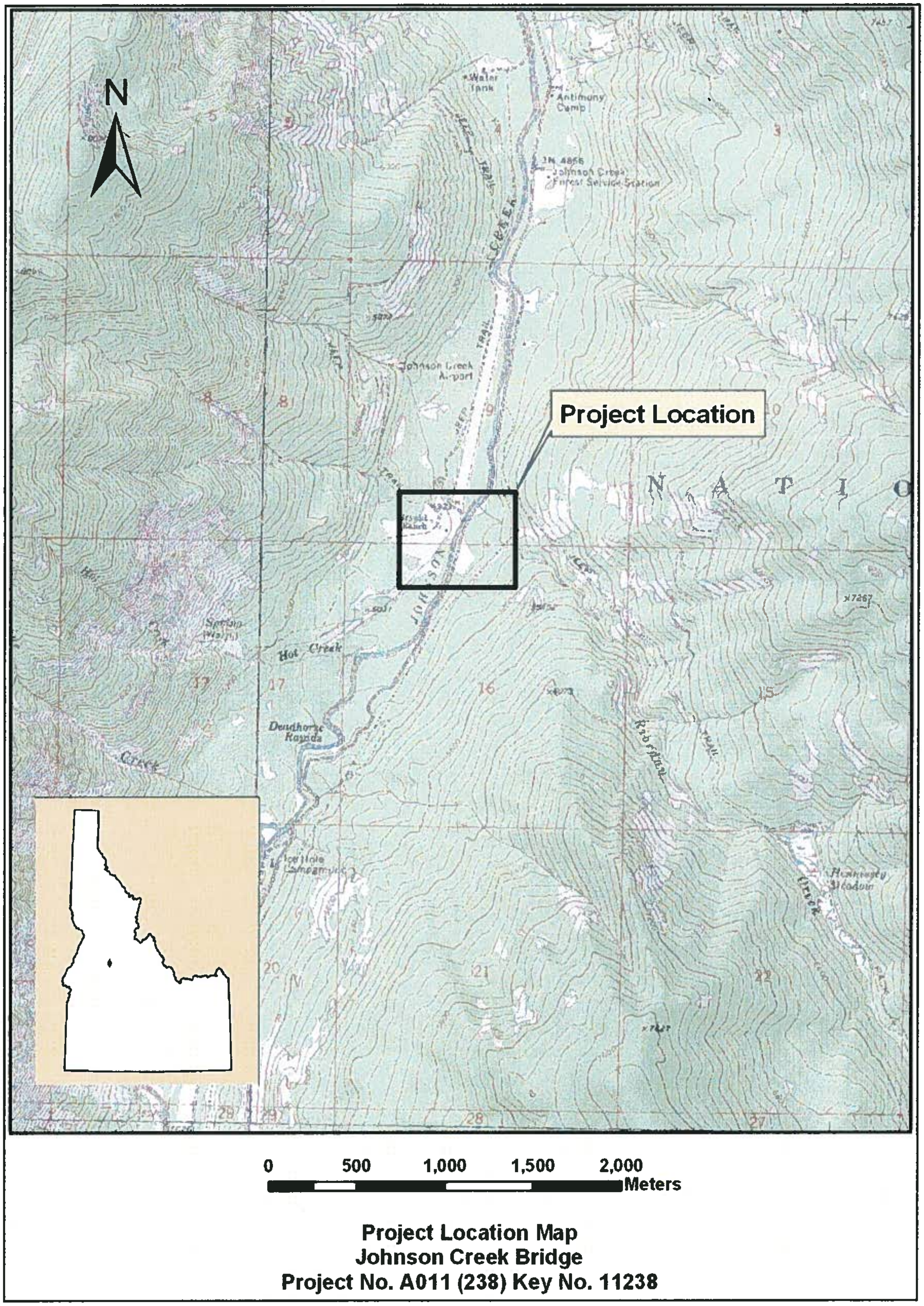

Figure 1. Project Location

2.1.2 Proposed Action

2.1.2.1 Overview

The Idaho Transportation Department (Department) proposes to replace the existing Johnson Creek Airport Bridge and realign and regrade both bridge approaches. Both stream banks will be recontoured to approximate the natural stream cross-section that existed prior to bridge construction in 1959. The current bridge is a steel girder, wood-decked single span bridge constructed in 1959 and refurbished in 1988. The bridge was recently classified as structurally deficient after inspectors documented problems with structural members, deck geometry, approach alignment, and evidence of channel scouring beneath both abutments. The existing bridge foundation has created a flow constriction that increases stream velocity through this reach and elevates up-stream water levels during high-water events. The increased water velocity has scoured the stream bottom beneath both bridge abutments, undermining bridge safety. The improved channel cross-section is expected to restore flow characteristics that will benefit both aquatic biota and bridge integrity. The new structure has been engineered to mimic natural channel and stream flow conditions, minimize impacts to aquatic fauna, and enhance public safety by placing the bridge's bottom chord a minimum of 0.61 meters (m) (2 ft) above the 50-year water surface elevation.

The new bridge will be built on a new alignment. The centerline of the new bridge will be offset 7.6 m (25 ft) to the north of the centerline of the existing structure and built on a parallel alignment. This places the south edge of the new bridge approximately 1.5 m (5 ft) downstream of the north edge of the existing bridge. This configuration, rather than replacement in the same location, offers two advantages: (1) it permits uninterrupted road access to both the Johnson Creek Airport and a private residence on the west side of Johnson Creek, and (2) it allows construction activities to occur in two stages to minimize environmental impacts to the creek and disturbance of special status fish species that are known to occur in the stream reach. The airstrip handles both recreational and commercial traffic year-round and is used as a staging area during firefighting season.

The new bridge span length will be 21.9 m (72 ft) from centerline-to-centerline of the bearings and will clear span the creek. The bridge will continue to be a single lane structure since average daily traffic (ADT) is extremely low (<50 vehicles). The bridge deck will be 6.2 m (20.25 ft) out-to-out, the width necessary to accommodate the design vehicle. The superstructure will be anchored on driven piles with a cast-in-place abutment. The deck will consist of three prestressed concrete deck bulb-T girders with attached two-tube curb mount rails. All deck components will be constructed off-site. This bridge type is durable, affordable, and relatively quick to install.

The existing bridge will be removed after the installation of the replacement bridge is completed. Mitigation for riparian impacts will occur on the project site. Following the bridge replacement, exposed embankments will be re-contoured to approximate the original stream channel cross-section and stabilized where necessary to protect the bridge and the abutments during periods of high flow. Rehabilitation measures specify restoration of reengineered stream banks using native riparian and wetland vegetation below the ordinary high water mark (OHWM).

2.1.2.2 Key Components of the Action

The key components of the Project are described in detail in the Assessment (Assessment, pp. 6-9). The project is currently programmed for construction funding in 2013, but is anticipated to obtain advanced funding to allow for a 2011 or 2012 construction season. Low-water work windows will be used to minimize disturbance of Critical Habitat fish listed under the Act. Construction is anticipated to begin in mid- to late July and be completed by October of the same year. Stream flows and weather will determine the precise start date and duration of construction activities. Elevation at the project area is approximately 1,500 meters and construction activities can be hampered by weather, inconsistent road access, or prolonged, elevated stream flows resulting from high winter snowpack. Construction activities are expected to take 65 days and should be completed by mid-October. Site rehabilitation and mitigation activities are expected to take an additional 13 days and may have to be completed during the spring or summer following bridge installation, as weather allows. The Assessment (pp. 3-9) provides a complete project description and timeline.

The project will be completed in two phases. Phase 1 includes the installation of the new foundation components and bridge deck, the realignment and re-grading of both bridge approaches, and removal of the old bridge deck. Project activities associated with Phase 1 will occur outside the wetted channel of Johnson Creek and will not require dewatering of the stream. A minimum 1-meter wide (approximately 3 ft) strip of natural stream bank will be maintained between the excavation and the stream to act as a sediment barrier. Fiber wattles running the length of the strip will act as a supplemental best management practices (BMP) to control runoff from storm events. No in-stream work is required for the old bridge deck removal; however, work will occur over the stream channel by cranes working from the new bridge deck or adjacent uplands. BMP will be in place to prevent sediment and debris from entering the stream channel. Phase 1 work activities are expected to take 39 days to complete.

Phase 2 comprises the removal of the existing bridge foundation components including the footings, wing-walls, boulder armoring, and a 2m (6 ft) high flow corrugated steel culvert directly behind the east abutment. The abutments will be saw-cut just above the existing water level, which will be during low flow, and removed with a crane working outside the stream channel. The remaining portions will be left in place to minimize stream bed disturbance and preserve the scour holes currently used as cover by migrating salmonids. The second phase concludes with the re-contouring and restoration of the streambanks, placement of rip-rap, and reseeding. To maintain access to the Johnson Creek Airport Road, the existing bridge will be removed after installation of the new structure. Phase 2 work activities are expected to take 26 days to complete.

Summary of the key construction events and their sequence:

Phase 1

- Mobilization, installation of temporary erosion and sediment control (BMP), and establish traffic control.

Construction of New Bridge (will require work at edge of stream):

- Excavation for abutments: The ground will be excavated to a depth of 1 m (circa (ca.) 3 ft) below the stream bottom to successfully key-in rock rip-rip. A minimum 1 m (ca. 3 ft) strip of natural stream bank will be maintained between the excavation and stream to act as a sediment barrier, and temporary berm. Fiber wattles running the length of the strip will act as an supplemental BMP to control runoff from storm events. If necessary, additional material such as gravel or sandbags covered with geotextile (erosion control material) may be used to separate work activities from the stream channel. Abutment excavation is anticipated to be 1.2 – 1.5 m (4-5 ft) below the surface water elevation. Hydrostatic pressure will prevent any turbid water generated during excavation from re-entering the stream. Turbid water will be pumped from the excavated trench into portable settling tanks. Water may be returned to Johnson Creek after meeting Idaho Department of Environmental Quality water quality standards.
- Drive piles: Four steel H-piles will support each abutment. Each pile will be driven to a depth of 6.1 m (20 ft) at each pile location.
- Abutment construction: Following H-pile installation, the abutment caps will be formed and cast-in place. After the concrete has properly cured, the forms will be removed and the excavated area on the outside of the new abutment will be backfilled with granular material. Clean rock rip-rap will be placed on the stream side and around the new abutment. Pumping operations will not be required following placement of rip-rap.
- Erect pre-stressed girders: Will require work over the stream. After the abutments have been backfilled, the preformed, prestressed concrete girders will be craned into place on the abutment caps.
- Roadway grading: Both approaches to the new bridge and a portion of Johnson Creek Road will be raised to accommodate the increased deck height of the new bridge.
- Remove old bridge deck: Work will occur over the stream channel. A metal mesh and fabric barrier will be placed horizontally between the bridge and Johnson Creek to collect debris during bridge deck removal and to prevent any debris (including paint chips) from entering Johnson Creek. The old bridge deck will be lifted whole, or in sections by crane(s) operating from the new bridge deck or adjacent uplands.

<u>Phase 2</u>

- Installation of temporary erosion and sediment control BMP
- Remove old bridge abutments: Will require work over stream. The fill behind the abutments will be removed and the finished grade will approximate the existing water surface elevation. After the fill has been removed, the concrete abutments and wing walls will be broken off just above the water surface and elevation and removed. The old bridge abutments will be saw-cut longitudinally into manageable pieces and lifted with a crane. Any parts of the old bridge abutments below the waterline at the time of removal will be left in place to minimize streambed disturbance and preserve the scour pools. A metal mesh and fabric barrier will prevent debris from entering the stream channel.
- Channel restoration measures: Will require work at edge of stream. The streambanks will be re-contoured as specified in Appendix B of the Assessment. The streambanks at

the old bridge will be excavated or filled as necessary and will mimic natural channel contour. Restoration will be necessary along a 6.1 m (20 ft) section of streambank on both sides of the old and new bridge abutments. A trench (similar to that used for excavation of the new abutments) will be excavated to separate work activities from the stream. The trench is necessary to properly key-in the rip-rap. Approximately 25.9 m (85 ft) of rip-rap is required to properly armor the new structure. The channel embankment will be covered with an erosion control textile and then covered with 1.2 m (4 ft) of rip-rap, which will extend a minimum of 0.9 m (3 ft) beneath the channel bottom. Rip-rap will be topped with soil, native seed, and fertilizer to enhance vegetation establishment and streambank stabilization.

2.1.2.3 Best Management Practices and Minimization Measures

Best Management Practices (BMP) are designed to comply with federal, state, and local regulations protecting environmental quality, and natural or cultural resources. Where practical, these BMPs will be used to control surface erosion and prevent sedimentation in Johnson Creek. Temporary erosion and sediment control measures are primarily structural and will be implemented prior to ground disturbing activities at the bridge site and staging areas. Permanent erosion and sediment control measures are integral project design elements and include structural and non-structural components. In order to attain proper hydrologic function at the site, all bridge improvements will be designed to restore or retain to every practical extent the natural stream gradient, native bottom material, natural channel configuration, and bank stability.

Minimization Measures (MM) are frequently avoidance or preservation measures, but also include measures that target project-specific activities, such as designating a particular type of equipment to be used. MMs are often attached as conditions to permits, particularly where listed species may occur. The BMPs and MMs are designed to minimize potential impacts to federally listed fish species, designated critical habitat, and essential fish habitat.

For a complete list and description of BMPs and MM, refer to the Assessment (pages 9-18). Summary of the BMP and MM construction events and their sequence:

- An approved Storm Water Pollution Prevention Plan (SWPPP) will specify all erosion and sediment control measures to be used during the project.
- The proximity of Johnson Creek Road, the construction site, and the staging area to riparian habitat limits fugitive dust control measures to surface/soil stabilization techniques and judicious water application.
- Construction activities are scheduled to be completed during seasonal low runoff periods and under favorable soil moisture conditions.
- All work activities will occur outside of, or over the active stream channel, and diversion of Johnson Creek will not be necessary.
- Prior to beginning phase 1 construction activities, a fish exclosure (e.g. a polygon shaped picket weir type fence) will be placed around potential Chinook spawning habitat within the action area.
- Stream channel work (placing rip-rap, removing old rip-rap, stabilizing streambanks) will occur from September through October to minimize disturbance to spawning or

migrating special status fish. Fish salvage operations will not be necessary, as no work will occur in the active stream channel.

- Construction activities, such as abutment removal, placement of the flexible channel liner (rip-rap), and stream bank restoration measures will be completed on one stream bank at a time to minimize disturbance to aquatic organisms, wildlife, habitat, and soil.
- Key trench excavation and installation of rip-rap will occur behind a temporary berm of existing native material and streambank or gravel or sand wrapped in geotextile, to separate work activities from the active stream channel. No equipment will enter the water.
- Source material for rip-rap will be obtained outside of riparian areas and will be washed prior to use.
- The contractor will make every effort to retain native vegetation at the project area and at staging and waste disposal sites. The contractor will clearly designate the boundaries of all vegetation to be removed and avoid disturbing or damaging vegetation outside these limits.
- The contractor will begin site restoration immediately following completion of ground disturbing activities. Temporary soil stabilization measures, e.g., jute matting, are required until permanent measures are established and functioning properly. Guidance on selecting and planting native seed or plant materials will be provided by agency botanists familiar with local site conditions. The contractor will re-seed disturbed areas with an approved weed-free, native seed mix appropriate to site and climatic conditions.
- Vehicle staging areas will be located a minimum of 150 ft. from any stream, waterbody, wetland, or riparian area. The selected staging area south of the construction site meets this requirement. All refueling, maintenance, and washout operations will be performed at a staging area within a bermed containment field able to contain 110% of the fluid stored in the largest equipment tank staged at the site.
- All vehicles and equipment will be thoroughly cleaned before staging or use at the site. All equipment and vehicles will be checked daily for leaks and repairs will be performed before use. Repairs will be performed within the containment field of the staging area.
- No uncured concrete or form materials will be allowed to enter the active stream channel.
- Spill containment kits adequate for the types and quantity of hazardous materials stored at the site are required.
- Turbid water will be pumped from the excavated trench into portable settling tanks. Hydrostatic pressure will prevent any turbid water generated during excavation from re-entering the stream. Water may be returned to Johnson Creek after meeting Idaho Department of Environmental Quality water quality standards.
- Reestablishment of woody riparian vegetation sufficient to anchor stream banks will take multiple growing seasons. Monthly inspections during the growing season(s) should insure that recruitment of woody riparian vegetation is occurring.

2.2 Analytical Framework for the Jeopardy and Adverse Modification Determinations

2.2.1 Jeopardy Determination

In accordance with policy and regulation, the jeopardy analysis in this Opinion relies on four components:

1. The Status of the Species, which evaluates the bull trout's rangewide condition, the factors responsible for that condition, and its survival and recovery needs.
2. The Environmental Baseline, which evaluates the condition of the bull trout in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the bull trout.
3. The Effects of the Action, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the bull trout.
4. Cumulative Effects, which evaluates the effects of future, non-Federal activities in the action area on the bull trout.

In accordance with policy and regulation, the jeopardy determination is made by evaluating the effects of the proposed Federal action in the context of the bull trout's current status, taking into account any cumulative effects, to determine if implementation of the proposed action is likely to cause an appreciable reduction in the likelihood of both the survival and recovery of the bull trout in the wild.

As discussed below under the *Status of the Species*, interim recovery units have been designated for the bull trout for purposes of recovery planning and application of the jeopardy standard. Per Service national policy (Fish and Wildlife Service 2006, entire), it is important to recognize that the establishment of recovery units does not create a new listed entity. Jeopardy analyses must always consider the impacts of a proposed action on the survival and recovery of the species that is listed. While a proposed Federal action may have significant adverse consequences to one or more recovery units, this would only result in a jeopardy determination if these adverse consequences reduce appreciably the likelihood of both the survival and recovery of the listed entity; in this case, the coterminous U.S. population of the bull trout.

The joint Service and National Marine Fisheries Service (NMFS) *Endangered Species Consultation Handbook* (Fish and Wildlife Service and NMFS 1998, p. 4-38), which represents national policy of both agencies, further clarifies the use of recovery units in the jeopardy analysis:

> When an action appreciably impairs or precludes the capacity of a recovery unit from providing both the survival and recovery function assigned to it, that action may represent jeopardy to the species. When using this type of analysis, include in the biological opinion a description of how the action affects not only the recovery unit's capability, but the relationship of the recovery unit to both the survival and recovery of the listed species as a whole.

The jeopardy analysis in this Opinion conforms to the above analytical framework.

2.2.2 Adverse Modification Determination

This Opinion does not rely on the regulatory definition of "destruction or adverse modification" of critical habitat at 50 CFR 402.02. Instead, we have relied upon the statutory provisions of the Act to complete the following analysis with respect to critical habitat.

In accordance with policy and regulation, the adverse modification analysis in this Opinion relies on four components:

1. The Status of Critical Habitat, which evaluates the rangewide condition of designated critical habitat for the bull trout in terms of primary constituent elements (PCEs), the factors responsible for that condition, and the intended recovery function of the critical habitat overall.
2. The Environmental Baseline, which evaluates the condition of the critical habitat in the action area, the factors responsible for that condition, and the recovery role of the critical habitat in the action area.
3. The Effects of the Action, which determines the direct and indirect impacts of the proposed Federal action and the effects of any interrelated or interdependent activities on the PCEs and how that will influence the recovery role of affected critical habitat units.
4. Cumulative Effects, which evaluates the effects of future, non-Federal activities in the action area on the PCEs and how that will influence the recovery role of affected critical habitat units.

For purposes of the adverse modification determination, the effects of the proposed Federal action on bull trout critical habitat are evaluated in the context of the rangewide condition of the critical habitat, taking into account any cumulative effects, to determine if the critical habitat rangewide would remain functional (or would retain the current ability for the PCEs to be functionally established in areas of currently unsuitable but capable habitat) to serve its intended recovery role for the bull trout.

The analysis in this Opinion places an emphasis on using the intended rangewide recovery function of bull trout critical habitat and the role of the action area relative to that intended function as the context for evaluating the significance of the effects of the proposed Federal action, taken together with cumulative effects, for purposes of making the adverse modification determination.

2.3 Status of the Species and Critical Habitat

This section presents information about the regulatory, biological and ecological status of the bull trout and its critical habitat that provides context for evaluating the significance of probable effects caused by the proposed action.

2.3.1 Bull Trout

2.3.1.1 Listing Status

The coterminous United States population of the bull trout was listed as threatened on November 1, 1999 (64 FR 58910). The threatened bull trout occurs in the Klamath River Basin of south-central Oregon, the Jarbidge River in Nevada, north to various coastal rivers of Washington to the Puget Sound, east throughout major rivers within the Columbia River Basin to the St. Mary-

Belly River, and east of the Continental Divide in northwestern Montana (Cavender 1978, pp. 165-166; Bond 1992, p. 4; Brewin and Brewin 1997, pp. 209-216; Leary and Allendorf 1997, pp. 715-720). The Service completed a 5-year Review in 2008 and concluded that the bull trout should remain listed as threatened (Fish and Wildlife Service 2008, p. 53).

The bull trout was initially listed as three separate Distinct Population Segments (DPSs) (63 FR 31647, 64 FR 17110). The preamble to the final listing rule for the U.S. coterminous population of the bull trout discusses the consolidation of these DPSs, plus two other population segments, into one listed taxon and the application of the jeopardy standard under Section 7 of the Act relative to this species (64 FR 58930):

> Although this rule consolidates the five bull trout DPSs into one listed taxon, based on conformance with the DPS policy for purposes of consultation under Section 7 of the Act, we intend to retain recognition of each DPS in light of available scientific information relating to their uniqueness and significance. Under this approach, these DPSs will be treated as interim recovery units with respect to application of the jeopardy standard until an approved recovery plan is developed. Formal establishment of bull trout recovery units will occur during the recovery planning process.

Thus, as discussed above under the *Analytical Framework for the Jeopardy and Adverse Modification Determinations*, the Service's jeopardy analysis for the proposed Project will involve consideration of how the Project is likely to affect the Columbia River interim recovery unit for the bull trout based on its uniqueness and significance as described in the DPS final listing rule cited above, which is herein incorporated by reference. However, in accordance with Service national policy, the jeopardy determination is made at the scale of the listed species. In this case, the coterminous U.S. population of the bull trout.

2.3.1.1.1 Reasons for Listing

Though wide ranging in parts of Oregon, Washington, Idaho, and Montana, bull trout in the interior Columbia River basin presently occur in only about 45 percent of the historical range (Quigley and Arbelbide 1997, p. 1177; Rieman et al. 1997, p. 1119). Declining trends due to the combined effects of habitat degradation and fragmentation, blockage of migratory corridors, poor water quality, angler harvest and poaching, entrainment into diversion channels and dams, and introduced nonnative species (e.g., brook trout, *Salvelinus fontinalis*) have resulted in declines in range-wide bull trout distribution and abundance (Bond 1992, p. 4; Schill 1992, p. 40; Thomas 1992, pp. 9-12; Ziller 1992, p. 28; Rieman and McIntyre 1993, pp. 1-18; Newton and Pribyl 1994, pp. 2, 4, 8-9; Idaho Department of Fish and Game in litt. 1995, pp. 1-3). Several local extirpations have been reported, beginning in the 1950s (Rode 1990, p. 1; Ratliff and Howell 1992, pp. 12-14; Donald and Alger 1993, p. 245; Goetz 1994, p. 1; Newton and Pribyl 1994, p. 2; Berg and Priest 1995, pp. 1-45; Light et al. 1996, pp. 20-38; Buchanan and Gregory 1997, p. 120).

Land and water management activities such as dams and other diversion structures, forest management practices, livestock grazing, agriculture, road construction and maintenance, mining, and urban and rural development continue to degrade bull trout habitat and depress bull trout populations (Fish and Wildlife Service 2002a, p. 13).

2.3.1.2 Species Description

Bull trout (*Salvelinus confluentus*), member of the family Salmonidae, are char native to the Pacific Northwest and western Canada. The bull trout and the closely related Dolly Varden (*Salvelinus malma*) were not officially recognized as separate species until 1980 (Robins et al. 1980, p. 19). Bull trout historically occurred in major river drainages in the Pacific Northwest from the southern limits in the McCloud River in northern California (now extirpated), Klamath River basin of south central Oregon, and the Jarbidge River in Nevada to the headwaters of the Yukon River in the Northwest Territories, Canada (Cavender 1978, p. 165-169; Bond 1992, p. 2-3). To the west, the bull trout's current range includes Puget Sound, coastal rivers of British Columbia, Canada, and southeast Alaska (Bond 1992, p. 2-3). East of the Continental Divide bull trout are found in the headwaters of the Saskatchewan River in Alberta and the MacKenzie River system in Alberta and British Columbia (Cavender 1978, p. 165-169; Brewin and Brewin 1997, pp. 209-216). Bull trout are wide spread throughout the Columbia River basin, including its headwaters in Montana and Canada.

2.3.1.3 Life History

Bull trout exhibit resident and migratory life history strategies throughout much of the current range (Rieman and McIntyre 1993, p. 2). Resident bull trout complete their entire life cycle in the streams where they spawn and rear. Migratory bull trout spawn and rear in streams for 1 to 4 years before migrating to either a lake (adfluvial), river (fluvial), or, in certain coastal areas, to saltwater (anadromous) where they reach maturity (Fraley and Shepard 1989, p. 1; Goetz 1989, pp. 15-16). Resident and migratory forms often occur together and it is suspected that individual bull trout may give rise to offspring exhibiting both resident and migratory behavior (Rieman and McIntyre 1993, p. 2).

Bull trout have more specific habitat requirements than other salmonids (Rieman and McIntyre 1993, p. 4). Watson and Hillman (1997, p. 248) concluded that watersheds must have specific physical characteristics to provide habitat requirements for bull trout to successfully spawn and rear. It was also concluded that these characteristics are not necessarily ubiquitous throughout these watersheds, thus resulting in patchy distributions even in pristine habitats.

Bull trout are found primarily in colder streams, although individual fish are migratory in larger, warmer river systems throughout the range (Fraley and Shepard 1989, pp. 135-137; Rieman and McIntyre 1993, p. 2 and 1995, p. 288; Buchanan and Gregory 1997, pp. 121-122; Rieman et al. 1997, p. 1114). Water temperature above 15°C (59°F) is believed to limit bull trout distribution, which may partially explain the patchy distribution within a watershed (Fraley and Shepard 1989, p. 133; Rieman and McIntyre 1995, pp. 255-296). Spawning areas are often associated with cold water springs, groundwater infiltration, and the coldest streams in a given watershed (Pratt 1992, p. 6; Rieman and McIntyre 1993, p. 7; Rieman et al. 1997, p. 1117). Goetz (1989, pp. 22, 24) suggested optimum water temperatures for rearing of less than 10°C (50°F) and optimum water temperatures for egg incubation of 2 to 4°C (35 to 39°F).

All life history stages of bull trout are associated with complex forms of cover, including large woody debris, undercut banks, boulders, and pools (Goetz 1989, pp. 22-25; Pratt 1992, p. 6; Thomas 1992, pp. 4-5; Rich 1996, pp. 35-38; Sexauer and James 1997, pp. 367-369; Watson and Hillman 1997, pp. 247-249). Jakober (1995, p. 42) observed bull trout overwintering in deep beaver ponds or pools containing large woody debris in the Bitterroot River drainage, Montana, and suggested that suitable winter habitat may be more restrictive than summer habitat. Bull trout prefer relatively stable channel and water flow conditions (Rieman and McIntyre 1993, p. 6). Juvenile and adult bull trout frequently inhabit side channels, stream margins, and pools with suitable cover (Sexauer and James 1997, pp. 368-369).

The size and age of bull trout at maturity depend upon life history strategy. Growth of resident fish is generally slower than migratory fish; resident fish tend to be smaller at maturity and less fecund (Goetz 1989, p. 15). Bull trout normally reach sexual maturity in 4 to 7 years and live as long as 12 years. Bull trout are iteroparous (they spawn more than once in a lifetime), and both repeat- and alternate-year spawning has been reported, although repeat-spawning frequency and post-spawning mortality are not well documented (Leathe and Graham 1982, p. 95; Fraley and Shepard 1989, p. 135; Pratt 1992, p. 8; Rieman and McIntyre 1996, p. 133).

Bull trout typically spawn from August to November during periods of decreasing water temperatures. Migratory bull trout frequently begin spawning migrations as early as April, and have been known to move upstream as far as 250 kilometers (km) (155 miles (mi)) to spawning grounds (Fraley and Shepard 1989, p. 135). Depending on water temperature, incubation is normally 100 to 145 days (Pratt 1992, p.1) and, after hatching, juveniles remain in the substrate. Time from egg deposition to emergence may exceed 200 days. Fry normally emerge from early April through May depending upon water temperatures and increasing stream flows (Pratt 1992, p. 1).

The iteroparous reproductive system of bull trout has important repercussions for the management of this species. Bull trout require two-way passage up and downstream, not only for repeat spawning, but also for foraging. Most fish ladders, however, were designed specifically for anadromous semelparous (fishes that spawn once and then die, and therefore require only one-way passage upstream) salmonids. Therefore, even dams or other barriers with fish passage facilities may be a factor in isolating bull trout populations if they do not provide a downstream passage route.

Bull trout are opportunistic feeders with food habits primarily a function of size and life history strategy. Resident and juvenile migratory bull trout prey on terrestrial and aquatic insects, macro zooplankton and small fish (Boag 1987, p. 58; Goetz 1989, pp. 33-34; Donald and Alger 1993, pp. 239-243). Adult migratory bull trout are primarily piscivores, known to feed on various fish species (Fraley and Shepard 1989, p. 135; Donald and Alger 1993, p. 242).

2.3.1.3.1 Population Dynamics

The draft bull trout Recovery Plan (Fish and Wildlife Service 2002a, pp. 47-48) defined core areas as groups of partially isolated local populations of bull trout with some degree of gene flow occurring between them. Based on this definition, core areas can be considered metapopulations. A metapopulation is an interacting network of local populations with varying frequencies of migration and gene flow among them (Meefe and Carroll 1994, p. 188). In theory, bull trout metapopulations (core areas) can be composed of two or more local populations, but Rieman and Allendorf (2001, p. 763) suggest that for a bull trout metapopulation to function effectively, a minimum of 10 local populations are required. Bull trout core areas with fewer than 5 local populations are at increased risk of local extirpation, core areas with between 5 and 10 local populations are at intermediate risk, and core areas with more than 10 interconnected local populations are at diminished risk (Fish and Wildlife Service 2002a, pp. 50-51).

The presence of a sufficient number of adult spawners is necessary to ensure persistence of bull trout populations. In order to avoid inbreeding depression, it is estimated that a minimum of 100 spawners are required. Inbreeding can result in increased homozygosity of deleterious recessive alleles which can in turn reduce individual fitness and population viability (Whitesel et al. 2004, p. 36). For persistence in the longer term, adult spawning fish are required in sufficient numbers to reduce the deleterious effects of genetic drift and maintain genetic variation. For bull trout, Rieman and Allendorf (2001, p. 762) estimate that approximately 1,000 spawning adults within any bull trout population are necessary for maintaining genetic variation indefinitely. Many local bull trout populations individually do not support 1,000 spawners, but this threshold may be met by the presence of smaller interconnected local populations within a core area.

For bull trout populations to remain viable (and recover), natural productivity should be sufficient for the populations to replace themselves from generation to generation. A population that consistently fails to replace itself is at an increased risk of extinction. Since estimates of population size are rarely available, the productivity or population growth rate is usually estimated from temporal trends in indices of abundance at a particular life stage. For example, redd counts are often used as an indicator of a spawning adult population. The direction and magnitude of a trend in an index can be used as a surrogate for growth rate.

Survival of bull trout populations is also dependent upon connectivity among local populations. Although bull trout are widely distributed over a large geographic area, they exhibit a patchy distribution even in pristine habitats (Rieman and McIntyre 1993, p. 7). Increased habitat fragmentation reduces the amount of available habitat and increases isolation from other populations of the same species (Saunders et al. 1991, p. 22). Burkey (1989, p. 76) concluded that when species are isolated by fragmented habitats, low rates of population growth are typical in local populations and their probability of extinction is directly related to the degree of isolation and fragmentation. Without sufficient immigration, growth of local populations may be low and probability of extinction high. Migrations also facilitate gene flow among local populations because individuals from different local populations interbreed when some stray and return to nonnatal streams. Local populations that are extirpated by catastrophic events may also become reestablished in this manner.

In summary, based on the works of Rieman and McIntyre (1993, pp. 9-15) and Rieman and Allendorf (2001, pp 756-763), the draft bull trout Recovery Plan identified four elements to consider when assessing long-term viability (extinction risk) of bull trout populations: (1) number of local populations, (2) adult abundance (defined as the number of spawning fish present in a core area in a given year), (3) productivity, or the reproductive rate of the population, and (4) connectivity (as represented by the migratory life history form).

2.3.1.4 Status and Distribution

As noted above, in recognition of available scientific information relating to their uniqueness and significance, five population segments of the coterminous United States population of the bull trout are considered essential to the survival and recovery of this species and are identified as: (1) Jarbidge River, (2) Klamath River, (3) Coastal-Puget Sound, (4) St. Mary-Belly River, and (5) Columbia River. Each of these segments is necessary to maintain the bull trout's distribution, as well as its genetic and phenotypic diversity, all of which are important to ensure the species' resilience to changing environmental conditions.

A summary of the current status and conservation needs of the bull trout within these units is provided below. A comprehensive discussion of these topics is found in the draft bull trout Recovery Plan (Fish and Wildlife Service 2002a, entire; 2004a, b; entire).

Central to the survival and recovery of the bull trout is the maintenance of viable core areas (Fish and Wildlife Service 2002a, p. 54). A core area is defined as a geographic area occupied by one or more local bull trout populations that overlap in their use of rearing, foraging, migratory, and overwintering habitat, and, in some cases, their use of spawning habitat. Each of the population segments listed below consists of one or more core areas. One hundred and twenty one core areas are recognized across the United States range of the bull trout (Fish and Wildlife Service 2005, p. 9).

A core area assessment conducted by the Service for the 5 year bull trout status review determined that of the 121 core areas comprising the coterminous listing, 43 are at high risk of extirpation, 44 are at risk, 28 are at potential risk, 4 are at low risk and 2 are of unknown status (Fish and Wildlife Service 2008, p. 29).

2.3.1.4.1 Jarbidge River

This population segment currently contains a single core area with six local populations. Less than 500 resident and migratory adult bull trout, representing about 50 to 125 spawners, are estimated to occur within the core area. The current condition of the bull trout in this segment is attributed to the effects of livestock grazing, roads, angler harvest, timber harvest, and the introduction of nonnative fishes (Fish and Wildlife Service 2004a, p. iii). The draft bull trout Recovery Plan identifies the following conservation needs for this segment: (1) maintain the current distribution of the bull trout within the core area, (2) maintain stable or increasing trends in abundance of both resident and migratory bull trout in the core area, (3) restore and maintain suitable habitat conditions for all life history stages and forms, and (4) conserve genetic diversity and increase natural opportunities for genetic exchange between resident and migratory forms of the bull trout. An estimated 270 to 1,000 spawning fish per year are needed to provide for the persistence and viability of the core area and to support both resident and migratory adult bull trout (Fish and Wildlife Service 2004a, p. 62-63). Currently this core area is at high risk of extirpation (Fish and Wildlife Service 2005, p. 9).

2.3.1.4.2 Klamath River

This population segment currently contains three core areas and 12 local populations. The current abundance, distribution, and range of the bull trout in the Klamath River Basin are greatly reduced from historical levels due to habitat loss and degradation caused by reduced water quality, timber harvest, livestock grazing, water diversions, roads, and the introduction of nonnative fishes. Bull trout populations in this unit face a high risk of extirpation (Fish and Wildlife Service 2002b, p. iv). The draft bull trout Recovery Plan (Fish and Wildlife Service 2002b, p. v) identifies the following conservation needs for this unit: (1) maintain the current distribution of the bull trout and restore distribution in previously occupied areas, (2) maintain stable or increasing trends in bull trout abundance, (3) restore and maintain suitable habitat conditions for all life history stages and strategies, and (4) conserve genetic diversity and provide the opportunity for genetic exchange among appropriate core area populations. Eight to 15 new local populations and an increase in population size from about 3,250 adults currently to 8,250 adults are needed to provide for the persistence and viability of the three core areas (Fish and Wildlife Service 2002b, p. vi).

2.3.1.4.3 Coastal-Puget Sound

Bull trout in the Coastal-Puget Sound population segment exhibit anadromous, adfluvial, fluvial, and resident life history patterns. The anadromous life history form is unique to this unit. This population segment currently contains 14 core areas and 67 local populations (Fish and Wildlife Service 2004b, p. iv; 2004c, pp. iii-iv). Bull trout are distributed throughout most of the large rivers and associated tributary systems within this unit. With limited exceptions, bull trout continue to be present in nearly all major watersheds where they likely occurred historically within this unit. Generally, bull trout distribution has contracted and abundance has declined, especially in the southeastern part of the unit. The current condition of the bull trout in this population segment is attributed to the adverse effects of dams, forest management practices (e.g., timber harvest and associated road building activities), agricultural practices (e.g., diking, water control structures, draining of wetlands, channelization, and the removal of riparian vegetation), livestock grazing, roads, mining, urbanization, angler harvest, and the introduction of nonnative species. The draft bull trout Recovery Plan (Fish and Wildlife Service 2004b, pp. ix-x) identifies the following conservation needs for this unit: (1) maintain or expand the current distribution of bull trout within existing core areas, (2) increase bull trout abundance to about 16,500 adults across all core areas, and (3) maintain or increase connectivity between local populations within each core area.

2.3.1.4.4 St. Mary-Belly River

This population segment currently contains six core areas and nine local populations (Fish and Wildlife Service 2002c, p. v). Currently, bull trout are widely distributed in the St. Mary River drainage and occur in nearly all of the waters that were inhabited historically. Bull trout are found only in a 1.2-mile reach of the North Fork Belly River within the United States. Redd count surveys of the North Fork Belly River documented an increase from 27 redds in 1995 to 119 redds in 1999. This increase was attributed primarily to protection from angler harvest (Fish and Wildlife Service 2002c, p. 37). The current condition of the bull trout in this population segment is primarily attributed to the effects of dams, water diversions, roads, mining, and the introduction of nonnative fishes (Fish and Wildlife Service 2002c, p. vi). The draft bull trout Recovery Plan (Fish and Wildlife Service 2002c, pp. v-ix) identifies the following conservation needs for this unit: (1) maintain the current distribution of the bull trout and restore distribution in previously occupied areas, (2) maintain stable or increasing trends in bull trout abundance, (3) maintain and restore suitable habitat conditions for all life history stages and forms, (4) conserve genetic diversity and provide the opportunity for genetic exchange, and (5) establish good working relations with Canadian interests because local bull trout populations in this unit are comprised mostly of migratory fish whose habitat is mainly in Canada.

2.3.1.4.5 Columbia River

The Columbia River population segment includes bull trout residing in portions of Oregon, Washington, Idaho, and Montana. Bull trout are estimated to have occupied about 60 percent of the Columbia River Basin, and presently occur in 45 percent of the estimated historical range (Quigley and Arbelbide 1997, p. 1177). This population segment currently contains 97 core areas and 527 local populations. About 65 percent of these core areas and local populations occur in Idaho and northwestern Montana.

The condition of the bull trout populations within these core areas varies from poor to good, but generally all have been subject to the combined effects of habitat degradation, fragmentation and alterations associated with one or more of the following activities: dewatering, road construction and maintenance, mining and grazing, blockage of migratory corridors by dams or other diversion structures, poor water quality, incidental angler harvest, entrainment into diversion channels, and introduced nonnative species.

The Service has determined that of the total 97 core areas in this population segment, 38 are at high risk of extirpation, 35 are at risk, 20 are at potential risk, 2 are at low risk, and 2 are at unknown risk (Fish and Wildlife Service 2005, pp. 1-94).

The draft bull trout Recovery Plan (Fish and Wildlife Service 2002a, p. v) identifies the following conservation needs for this population segment: (1) maintain or expand the current distribution of the bull trout within core areas, (2) maintain stable or increasing trends in bull trout abundance, (3) maintain and restore suitable habitat conditions for all bull trout life history stages and strategies, and (4) conserve genetic diversity and provide opportunities for genetic exchange.

2.3.1.4.5.1 Columbia River Recovery/Management Units

Achieving recovery goals within each management unit is critical to recovering the Columbia River population segment. Recovering bull trout in each management unit would maintain the overall distribution of bull trout in their native range. Individual core areas are the foundation of management units and conserving core areas and their habitats within management units preserves the genotypic and phenotypic diversity that will allow bull trout access to diverse habitats and reduce the risk of extinction from stochastic events. The continued survival and recovery of each individual core area is critical to the persistence of management units and their role in the recovery of a population segment (Fish and Wildlife Service 2002a, p. 54).

The draft bull trout Recovery Plan (Fish and Wildlife Service 2002a, p. 2) identified 22 recovery units within the Columbia River population segment. These units are now referred to as management units. Management units are groupings of bull trout with historical or current gene flow within them and were designated to place the scope of bull trout recovery on smaller spatial scales than the larger population segments. The action area is encompassed by the Salmon River management unit.

2.3.1.4.5.1.1 Salmon River Management Unit

The Salmon River Management Unit encompasses the entire Salmon River basin, an area of approximately 14,000 square miles which includes 17,000 miles of streams (Fish and Wildlife Service 2002d, p. v). The Management Unit includes the entire Salmon River basin in Idaho upstream from its confluence with the Snake River to the headwaters in the Sawtooth Valley. Bull trout are distributed throughout most of the unit in 125 local populations located within ten core areas. The Project action area occurs within the South Fork Salmon River core area of the Salmon River Management Unit.

2.3.1.4.5.1.1.1 South Fork Salmon River Core Area

The South Fork Salmon River Core Area includes 27 local populations and five potential local populations (Fish and Wildlife Service 2002d, p. 19). Because there are 27 local populations, this core area is at diminished risk of extinction from stochastic events. Adult abundance is estimated to be greater than 5,000, therefore this core area is at reduced risk of genetic drift. Because there is no trend data for this core area, the core area is assumed to be at an increased extinction risk until additional information is available. Migratory bull trout are present in all local populations; therefore this core area is at reduced risk based on this factor (Fish and Wildlife Service 2002d, pp. 63-66). The Service ranked this core area as being "At Risk" of extirpation in our 5-Year Review (Fish and Wildlife Service 2008, p. 34).

2.3.1.5 Previous Consultations and Conservation Efforts

2.3.1.5.1 Consultations

Consulted-on effects are those effects that have been analyzed through section 7 consultation as reported in a biological opinion. These effects are an important component of objectively characterizing the current condition of the species. To assess consulted-on effects to bull trout, we analyzed all of the biological opinions received by the Region 1 and Region 6 Service Offices from the time of bull trout's listing until August 2003; this summed to 137 biological opinions. Of these, 124 biological opinions (91 percent) applied to activities affecting bull trout in the Columbia Basin population segment, 12 biological opinions (9 percent) applied to activities affecting bull trout in the Coastal-Puget Sound population segment, 7 biological opinions (5 percent) applied to activities affecting bull trout in the Klamath Basin population segment, and one biological opinion (< 1 percent) applied to activities affecting the Jarbidge and St. Mary-Belly population segments (Note: these percentages do not add to 100, because several biological opinions applied to more than one population segment). The geographic scale of these consultations varied from individual actions (e.g., construction of a bridge or pipeline) within one basin to multiple-project actions occurring across several basins.

Our analysis showed that we consulted on a wide array of actions which had varying levels of effect. Many of the actions resulted in only short-term adverse effects, some with long-term beneficial effects. Some of the actions resulted in long-term adverse effects. No actions that have undergone consultation were found to appreciably reduce the likelihood of survival and recovery of the bull trout. Furthermore, no actions that have undergone consultation were anticipated to result in the loss of local populations of bull trout.

2.3.1.5.2 Regulatory mechanisms

The implementation and effectiveness of regulatory mechanisms vary across the coterminous range. Forest practices rules for Montana, Idaho, Oregon, Washington, and Nevada include streamside management zones that benefit bull trout when implemented.

2.3.1.5.3 State Conservation Measures

State agencies are specifically addressing bull trout through the following initiatives:

- Washington Bull Trout and Dolly Varden Management Plan developed in 2000.
- Montana Bull Trout Restoration Plan (Bull Trout Restoration Team appointed in 1994, and plan completed in 2000).

- Oregon Native Fish Conservation Policy (developed in 2004).
- Nevada Species Management Plan for Bull Trout (developed in 2005).
- State of Idaho Bull Trout Conservation Plan (developed in 1996). The watershed advisory group drafted 21 problem assessments throughout Idaho which address all 59 key watersheds. To date, a conservation plan has been completed for one of the 21 key watersheds (Pend Oreille).

2.3.1.5.4 Habitat Conservation Plans

Habitat Conservation Plans (HCP) have resulted in land management practices that exceed State regulatory requirements. Habitat conservation plans addressing bull trout cover approximately 472 stream miles of aquatic habitat, or approximately 2.6 percent of the Key Recovery Habitat across Montana, Idaho, Oregon, Washington, and Nevada. These HCPs include: Plum Creek Native Fish HCP, Washington Department of Natural Resources HCP, City of Seattle Cedar River Watershed HCP, Tacoma Water HCP, and Green Diamond HCP.

2.3.1.5.5 Federal Land Management Plans

PACFISH is the "Interim Strategy for Managing Anadromous Fish-Producing Watersheds and includes Federal lands in Western Oregon and Washington, Idaho, and Portions of California." INFISH is the "Interim Strategy for Managing Fish-Producing Watersheds in Eastern Oregon and Washington, Idaho, Western Montana, and Portions of Nevada." Each strategy amended Forest Service Land and Resource Management Plans and Bureau of Land Management Resource Management Plans. Together PACFISH and INFISH cover thousands of miles of waterways within 16 million acres (ac) and provide a system for reducing effects from land management activities to aquatic resources through riparian management goals, landscape scale interim riparian management objectives, Riparian Habitat Conservation Areas (RHCAs), riparian standards, watershed analysis, and the designation of Key and Priority watersheds. These interim strategies have been in place since 1992 and are part of the management plans for Bureau of Land Management and Forest Service lands.

The Interior Columbia Basin Ecosystem Management Plan (ICBEMP) is the strategy that replaces the PACFISH and INFISH interim strategies when federal land management plans are revised. The Southwest Idaho Land and Resource Management Plan (LRMP) is the first LRMP under the strategy and provides measures that protect and restore soil, water, riparian and aquatic resources during project implementation while providing flexibility to address both short- and long-term social and economic goals on 6.6 million acres of National Forest lands. This plan includes a long-term Aquatic Conservation Strategy that focuses restoration funding in priority subwatersheds identified as important to achieving Endangered Species Act, Tribal, and Clean Water Act goals. The Southwest Idaho LRMP replaces the interim PACFISH/INFISH strategies and adds additional conservation elements, specifically, providing an ecosystem management foundation, a prioritization for restoration integrated across multiple scales, and adaptable active, passive and conservation management strategies that address both protection and restoration of habitat and 303(d) stream segments.

The Southeast Oregon Resource Management Plan (SEORMP) and Record of Decision is the second LRMP under the ICBEMP strategy which describes the long-term (20+ years) plan for managing the public lands within the Malheur and Jordan Resource Areas of the Vale District.

The SEORMP is a general resource management plan for 4.6 million acres of Bureau of Land Management administered public lands primarily in Malheur County with some acreage in Grant and Harney Counties, Oregon. The SEORMP contains resource objectives, land use allocations, management actions and direction needed to achieve program goals. Under the plan, riparian areas, floodplains, and wetlands will be managed to restore, protect, or improve their natural functions relating to water storage, groundwater recharge, water quality, and fish and wildlife values.

The Northwest Forest Plan covers 24.5 million acres in Washington, Oregon, and northern California. The Aquatic Conservation Strategy (ACS) is a component of the Northwest Forest Plan. It was developed to restore and maintain the ecological health of watersheds and the aquatic ecosystems. The four main components of the ACS (Riparian Reserves, Watershed Analysis, Key Watersheds, and Watershed Restoration) are designed to operate together to maintain and restore the productivity and resiliency of riparian and aquatic ecosystems.

It is the objective of the Forest Service and the Bureau of Land Management to manage and maintain habitat and, where feasible, to restore habitats that are degraded. These plans provide for the protection of areas that could contribute to the recovery of fish and, overall, improve riparian habitat and water quality throughout the basin. These objectives are accomplished through such activities as closing and rehabilitating roads, replacing culverts, changing grazing and logging practices, and re-planting native vegetation along streams and rivers.

2.3.1.6 Conservation Needs

The recovery planning process for the bull trout (Fish and Wildlife Service 2002a, p. 49) has identified the following conservation needs (goals) for bull trout recovery: (1) maintain the current distribution of bull trout within core areas as described in recovery unit chapters, (2) maintain stable or increasing trends in abundance of bull trout as defined for individual recovery units, (3) restore and maintain suitable habitat conditions for all bull trout life history stages and strategies, and (4) conserve genetic diversity and provide opportunity for genetic exchange.

The draft bull trout Recovery Plan (Fish and Wildlife Service 2002a, p. 62) identifies the following tasks needed for achieving recovery: (1) protect, restore, and maintain suitable habitat conditions for bull trout, (2) prevent and reduce negative effects of nonnative fishes, such as brook trout, and other nonnative taxa on bull trout, (3) establish fisheries management goals and objectives compatible with bull trout recovery, (4) characterize, conserve, and monitor genetic diversity and gene flow among local populations of bull trout, (5) conduct research and monitoring to implement and evaluate bull trout recovery activities, consistent with an adaptive management approach using feedback from implemented, site-specific recovery tasks, (6) use all available conservation programs and regulations to protect and conserve bull trout and bull trout habitats, (7) assess the implementation of bull trout recovery by management units, and (8) revise management unit plans based on evaluations.

Another threat now facing bull trout is warming temperature regimes associated with global climate change. Because air temperature affects water temperature, species at the southern margin of their range that are associated with cold water patches, such as bull trout, may become restricted to smaller, more disjunct patches or become extirpated as the climate warms (Rieman et al. 2007, p. 1560). Rieman et al. (2007, pp. 1558, 1562) concluded that climate is a primary determining factor in bull trout distribution. Some populations already at high risk, such as the

Jarbidge, may require "aggressive measures in habitat conservation or restoration" to persist (Rieman et al. 2007, p. 1560). Conservation and restoration measures that would benefit bull trout include protecting high quality habitat, reconnecting watersheds, restoring flood plains, and increasing site-specific habitat features important for bull trout, such as deep pools or large woody debris (Kinsella 2005, entire).

2.3.2 Bull Trout Critical Habitat

2.3.2.1 Legal Status

Ongoing litigation resulted in the U.S. District Court for the District of Oregon granting the Service a voluntary remand of the 2005 critical habitat designation. Subsequently the Service published a proposed critical habitat rule on January 14, 2010 (75 FR 2260) and a final rule on October 18, 2010 (75 FR 63898). The rule became effective on November 17, 2010. A justification document was also developed to support the rule and is available on our website (http://www.fws.gov/pacific/bulltrout). The scope of the designation involved the species' coterminous range, which includes the Jarbidge River, Klamath River, Coastal-Puget Sound, St. Mary-Belly River, and Columbia River population segments (also considered as interim recovery units)[1].

Rangewide, the Service designated reservoirs/lakes and stream/shoreline miles in 32 critical habitat units (CHU) as bull trout critical habitat (see Table 1). Designated bull trout critical habitat is of two primary use types: (1) spawning and rearing; and (2) foraging, migrating, and overwintering (FMO).

Table 1. Stream/shoreline distance and reservoir/lake area designated as bull trout critical habitat by state.

State	Stream/Shoreline Miles	Stream/Shoreline Kilometers	Reservoir/ Lake Acres	Reservoir/ Lake Hectares
Idaho	8,771.6	14,116.5	170,217.5	68,884.9
Montana	3,056.5	4,918.9	221,470.7	89,626.4
Nevada	71.8	115.6	-	-
Oregon	2,835.9	4,563.9	30,255.5	12,244.0
Oregon/Idaho	107.7	173.3	-	-
Washington	3,793.3	6,104.8	66,308.1	26,834.0
Washington (marine)	753.8	1,213.2	-	-
Washington/Idaho	37.2	59.9	-	-
Washington/Oregon	301.3	484.8	-	-
Total	**19,729.0**	**31,750.8**	**488,251.7**	**197,589.2**

[1] The Service's 5 year review (Fish and Wildlife Service 2008, p. 9) identifies six draft recovery units. Until the bull trout draft recovery plan is finalized, the current five interim recovery units are in affect for purposes of section 7 jeopardy analysis and recovery. The adverse modification analysis does not rely on recovery units.

Compared to the 2005 designation, the final rule increases the amount of designated bull trout critical habitat by approximately 76 percent for miles of stream/shoreline and by approximately 71 percent for acres of lakes and reservoirs.

This rule also identifies and designates as critical habitat approximately 1,323.7 km (822.5 miles) of streams/shorelines and 6,758.8 ha (16,701.3 acres) of lakes/reservoirs of unoccupied habitat to address bull trout conservation needs in specific geographic areas in several areas not occupied at the time of listing. No unoccupied habitat was included in the 2005 designation. These unoccupied areas were determined by the Service to be essential for restoring functioning migratory bull trout populations based on currently available scientific information. These unoccupied areas often include lower mainstem river environments that can provide seasonally important migration habitat for bull trout. This type of habitat is essential in areas where bull trout habitat and population loss over time necessitates reestablishing bull trout in currently unoccupied habitat areas to achieve recovery.

The final rule continues to exclude some critical habitat segments based on a careful balancing of the benefits of inclusion versus the benefits of exclusion. Critical habitat does not include: (1) waters adjacent to non-Federal lands covered by legally operative incidental take permits for habitat conservation plans (HCPs) issued under section 10(a)(1)(B) of the Endangered Species Act of 1973, as amended, in which bull trout is a covered species on or before the publication of this final rule; (2) waters within or adjacent to Tribal lands subject to certain commitments to conserve bull trout or a conservation program that provides aquatic resource protection and restoration through collaborative efforts, and where the Tribes indicated that inclusion would impair their relationship with the Service; or (3) waters where impacts to national security have been identified (75 FR 63898). Excluded areas are approximately 10 percent of the stream/shoreline miles and 4 percent of the lakes and reservoir acreage of designated critical habitat. Each excluded area is identified in the relevant CHU text, as identified in paragraphs (e)(8) through (e)(41) of the final rule. It is important to note that the exclusion of waterbodies from designated critical habitat does not negate or diminish their importance for bull trout conservation. Because exclusions reflect the often complex pattern of land ownership, designated critical habitat is often fragmented and interspersed with excluded stream segments.

2.3.2.2 Conservation Role and Description of Critical Habitat

The conservation role of bull trout critical habitat is to support viable core area populations (75 FR 63943). The core areas reflect the metapopulation structure of bull trout and are the closest approximation of a biologically functioning unit for the purposes of recovery planning and risk analyses. CHUs generally encompass one or more core areas and may include FMO areas, outside of core areas, that are important to the survival and recovery of bull trout.

As previously noted, 32 CHUs within the geographical area occupied by the species at the time of listing are designated under the final rule. Twenty-nine of the CHUs contain all of the physical or biological features identified in this final rule and support multiple life-history requirements. Three of the mainstem river units in the Columbia and Snake River basins contain most of the physical or biological features necessary to support the bull trout's particular use of that habitat, other than those physical and biological features associated with Primary Constituent Elements (PCEs) 5 and 6, which relate to breeding habitat (see list below).

The primary function of individual CHUs is to maintain and support core areas, which (1) contain bull trout populations with the demographic characteristics needed to ensure their persistence and contain the habitat needed to sustain those characteristics (Rieman and McIntyre 1993, p. 19); (2) provide for persistence of strong local populations, in part, by providing habitat conditions that encourage movement of migratory fish (MBTSG 1998, pp. 48-49; Rieman and McIntyre 1993, pp. 22-23); (3) are large enough to incorporate genetic and phenotypic diversity, but small enough to ensure connectivity between populations (MBTSG 1998, pp. 48-49; Rieman and McIntyre 1993, pp. 22-23); and (4) are distributed throughout the historic range of the species to preserve both genetic and phenotypic adaptations (MBTSG 1998, pp. 13-16; Rieman and Allendorf 2001, p. 763; Rieman and McIntyre 1993, p. 23).

The Olympic Peninsula and Puget Sound CHUs are essential to the conservation of amphidromous bull trout, which are unique to the Coastal-Puget Sound population segment. These CHUs contain marine nearshore and freshwater habitats, outside of core areas, that are used by bull trout from one or more core areas. These habitats, outside of core areas, contain PCEs that are critical to adult and subadult foraging, migrating, and overwintering.

In determining which areas to propose as critical habitat, the Service considered the physical and biological features that are essential to the conservation of bull trout and that may require special management considerations or protection. These features are the PCEs laid out in the appropriate quantity and spatial arrangement for conservation of the species. The PCEs of designated critical habitat are:

1. Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity and provide thermal refugia.

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.

3. An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.

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.

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.

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.

7. A natural hydrograph, including peak, high, low, and base flows within historic and seasonal ranges or, if flows are controlled, minimal flow departures from a natural hydrograph.

8. Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.

9. Sufficiently low levels of occurrence of nonnative 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.

2.3.2.3 Current Rangewide Condition of Bull Trout Critical Habitat

The condition of bull trout critical habitat varies across its range from poor to good. Although still relatively widely distributed across its historic range, the bull trout occurs in low numbers in many areas, and populations are considered depressed or declining across much of its range (67 FR 71240). This condition reflects the condition of bull trout habitat.

The primary land and water management activities impacting the physical and biological features essential to the conservation of bull trout include timber harvest and road building, agriculture and agricultural diversions, livestock grazing, dams, mining, urbanization and residential development, and nonnative species presence or introduction (75 FR 2282).

There is widespread agreement in the scientific literature that many factors related to human activities have impacted bull trout and their habitat, and continue to do so. Among the many factors that contribute to degraded PCEs, those which appear to be particularly significant and have resulted in a legacy of degraded habitat conditions are as follows:

1. Fragmentation and isolation of local populations due to the proliferation of dams and water diversions that have eliminated habitat, altered water flow and temperature regimes, and impeded migratory movements (Dunham and Rieman 1999, p. 652; Rieman and McIntyre 1993, p. 7).

2. Degradation of spawning and rearing habitat and upper watershed areas, particularly alterations in sedimentation rates and water temperature, resulting from forest and rangeland practices and intensive development of roads (Fraley and Shepard 1989, p. 141; MBTSG 1998, pp. ii - v, 20-45).

3. The introduction and spread of nonnative fish species, particularly brook trout and lake trout, as a result of fish stocking and degraded habitat conditions, which compete with bull trout for limited resources and, in the case of brook trout, hybridize with bull trout (Leary et al. 1993, p. 857; Rieman et al. 2006, pp. 73-76).

4. In the Coastal-Puget Sound region where amphidromous bull trout occur, degradation of mainstem river FMO habitat, and the degradation and loss of marine nearshore foraging and migration habitat due to urban and residential development.

5. Degradation of FMO habitat resulting from reduced prey base, roads, agriculture, development, and dams.

The bull trout critical habitat final rule also aimed to identify and protect those habitats that provide resiliency for bull trout use in the face of climate change. Over a period of decades, climate change may directly threaten the integrity of the essential physical or biological features described in PCEs 1, 2, 3, 5, 7, 8, and 9. Protecting bull trout strongholds and cold water refugia from disturbance and ensuring connectivity among populations were important considerations in addressing this potential impact. Additionally, climate change may exacerbate habitat degradation impacts both physically (e.g., decreased base flows, increased water temperatures) and biologically (e.g., increased competition with nonnative fishes).

2.4 Environmental Baseline of the Action Area

This section assesses the effects of past and ongoing human and natural factors that have led to the current status of the species, its habitat and ecosystem in the action area. Also included in the environmental baseline are the anticipated impacts of all proposed Federal projects in the action area that have already undergone section 7 consultations, and the impacts of state and private actions which are contemporaneous with this consultation.

2.4.1 Bull Trout

The South Fork Salmon River Core Area includes 27 local populations and five potential local populations (Fish and Wildlife Service 2002d, p. 19). Although it is not known what local populations of bull trout overwinter or migrate through this portion of Johnson Creek and which, therefore, may be affected by the project, the nearest local population to the project area occurs in Riordan Creek. The Riordan Creek local population is estimated to be around 2,000 individuals. Riordan Creek enters Johnson Creek approximately ¼ mile downstream of the project area.

2.4.1.1 Status of the Bull Trout in the Action Area

Bull trout populations in Johnson Creek are typically resident or fluvial. An adfluvial population occurs in Riordan Creek and Riordan Lake, which is just downstream of the project. Breeding and rearing occur in tributary streams while mainstem Johnson Creek typically functions as a migration corridor. Based on regional similarities in bull trout migration patterns, adult bull trout in Johnson Creek likely begin migrating in March or April and enter tributaries between late July and September. Bull trout abundance estimates for Johnson Creek are limited. Capture data from a Chinook salmon picket weir 1.2 km upstream of the airport bridge indicate that adult bull trout are migrating through the project area during July and August (Assessment, p. 32). Captures at the weir between 2000 and 2008 have ranged between 44 fish in 2001 and 0 fish in 2008, with a total of 164 fish recorded (Assessment, p. 32). After spawning, adult fish return to higher order streams. Bull trout may be encountered in the vicinity of the Johnson Creek Airport Bridge at any time. A screw trap operating in Johnson Creek below the Riordan Creek confluence has captured adult and juvenile bull trout year round. Annual captures rates are similar to those at the picket weir; 182 total fish recorded, ranging between a high of 54 fish in 2000 and 2 fish in 2006 (Assessment, p. 32).

2.4.1.2 Factors Affecting the Bull Trout in the Action Area

In the Johnson Creek drainage, livestock grazing, logging activities, mining, and road construction historically impacted bull trout habitat (Fish and Wildlife Service 2002d, p. v). More recently, post-fire sedimentation has degraded water quality in the watershed. Development of private lands along lower Johnson Creek also potentially impact bull trout by altering streambanks and instream habitat. Additionally, low populations of anadromous (steelhead and Chinook) fish in Johnson Creek may limit the prey base for bull trout.

Recent disturbances have exacerbated sediment problems and degraded habitat conditions within the watershed. As described in the Assessment (p. 36), fire-induced sediment from the 2007 Cascade Complex fire is expected to exceed the storage capacity of existing Large Woody Debris (LWD) and pools within the fire perimeter and habitat quality is expected to decline for several years (Kellet 2008, entire). The loss of stream shading from recent fires may lead to increases in stream temperatures, possibly limiting the distribution of bull trout and/or impeding development of juvenile fish. Currently, stream temperatures regularly exceed 15° C in mainstem migration corridors during summer months. Substrate quality and pool habitats may temporarily decline following the recent fires.

Bull trout are known to hybridize with introduced brook trout and hybridization is a potential factor in population declines. Brook trout were historically stocked, and still occur in Johnson Creek. The effects of hybridization with bull trout in the watershed have not been assessed.

Changes in hydrology and temperature caused by changing climate have the potential to negatively impact aquatic ecosystems in Idaho, with salmonid fishes being especially sensitive. Average annual temperature increases due to increased carbon dioxide are affecting snowpack, peak runoff, and base flows of streams and rivers (Mote et al. 2003, p. 45). Increases in water temperature may cause a shift in the thermal suitability of aquatic habitats (Poff et al. 2002, p. iii). For species that require colder water temperatures to survive and reproduce, warmer temperatures could lead to significant decreases in available suitable habitat. Increased frequency and severity of flood flows during winter can affect incubating eggs and alevins in the streambed and over-wintering juvenile fish. Eggs of fall spawning fish, such as bull trout, may suffer high levels of mortality when exposed to increased flood flows (Independent Scientific Advisory Board 2007, p. iv).

The desired conditions and environmental baseline for the Watershed Condition Indicators (WCIs) are briefly described in Table 2 (from the Assessment, pp. 33-36). Much of the information used to establish the baseline was derived from a 2010 Biological Assessment prepared by the Boise National Forest (Foust & Nalder 2010) for a different project occurring near the action area. For more detailed information regarding the baseline condition, see the Assessment (pp. 36-41).

Table 2 Acronyms

USFWS = U.S. Fish and Wildlife Service
USEPA = U.S. Environmental Protection Agency
IDEQ = Idaho Department of Environmental Quality
ECA = Equivalent Clearcut Area
RCA = Riparian Conservation Area
HUC = Hydrologic Unit Code
USFS = U.S. Forest Service
SFSR = South Fork Salmon River
BNF = Boise National Forest
LWD = Large Woody Debris
PVG = Potential Vegetation Group
WCI = Watershed Condition Indicator

Table 2. Watershed Condition Indicator baseline condition for the Porcupine-Johnson Creek 6th field HUC.

Agency/Unit:	Idaho Transportation Department	**HU Code & Name:**	170602080108 Porcupine Creek-Johnson Creek
Fish Species Present:	Bull trout, Chinook salmon, Steelhead/Rainbow trout, Westslope cutthroat trout	**Spatial Scale of Matrix:**	6th Field HUC
Bull trout Core Area:	South Fork Salmon River	**Local Population:**	None
Agency Actions:	Johnson Creek Airport Bridge Replacement		
Watershed Condition Indicator	**Desired Condition to Function Appropriately**	**Functionality Rating**	**Discussion of Current Conditions: Environmental Baseline**
Bull Trout local Population Characteristics within Core Areas			
Local Population Size	Mean total local population size or local habitat capacity more than several thousand individuals. Adults in local population >500. All life stages are represented within the local population.	Functioning at Risk	Abundance data for bull trout specific to this reach of Johnson Creek are not available, but the USFWS considers populations in the SFSR to be at risk. Incidental captures above and below the project area by the Nez Perce tribe indicates this stream reach provides migratory habitat for bull trout. Several tributaries in this 6th field HUC are unoccupied.
Growth and Survival	Local population has the resilience to recover from temporary or short-term disturbances (e.g. catastrophic events) or local population declines within 1 to 2 generations (5-10 years). The local population is characterized as increasing or stable. At least 10 years of data support this estimate	Functioning at Risk	Fewer than 10 years of population data. Spawning in bull trout is indicated by the presence of individuals <150 mm total length (Rieman and McIntyre 1995). Bull trout are not known to spawn in this reach of Johnson Creek. Juvenile captures below the project area may be out-year fluvial migrants from Riordan Creek, where spawning has been documented.
Life History Diversity and Isolation	The migratory form is present and the local populations are in close proximity to each other. Migratory corridors and rearing habitat (lake or larger river) are in good to excellent condition for the species. Neighboring local populations are large with high likelihood of producing	Functioning at Risk	There are no barriers to fish movement through the project area, but barriers at road-stream crossings are documented in the Core Area. There are 27 local populations in the SFSR Core Area, 23 of which are connected and 4 are considered strong. Increased sedimentation and water temperatures exceeding 15° C are expected to impact

	surplus individuals or straying adults that will mix with other local populations.		spawning and migratory habitat in the watershed. The migratory form of bull trout is present within the subwatershed and project area.
Persistence and Genetic Integrity	Connectivity is high among multiple (≥5) local populations with at least several thousand fish each. Each of the relevant local populations has a low risk of extinction. The probability of hybridization or displacement by competitive species is low to nonexistent.	Functioning at Risk	There are 27 local populations in the SFSR Core area, 23 of which are connected and 4 are considered strong. Barriers to movement at road-stream crossings partially limit connectivity within the Core Area. Degraded habitat and the expected impacts from recent large fires to spawning and rearing habitat is expected to impact bull trout for at least several years. Brook trout populations in portions of the Core Area present a significant risk of hybridization or displacement.
Water Quality			
Temperature (Chinook and steelhead) Temperature (Bull trout)	7-day average maximum. Spawning, rearing and migration: 50-57°F (10-13.9°C) 7-day average maximum temperature in a reach during the following life history stages: Incubation: 2-5°C or 35.6-41.0°F Rearing: 4-12°C or 39.2-53.6°F Spawning: 4-9°C or 39.2-48.2°F Also temperatures do not exceed 15°C or 59.0°F in areas used by adults during migration (no thermal barriers).	Functioning at Unacceptable Risk	Water temp. was monitored in 2005 at the adult picket weir, ca. 560 m upstream from the project area. Temperatures exceeded thresholds for Chinook salmon and steelhead spawning and likely present a thermal barrier to bull trout migration. Average 7-day temp. in July and August, when peak Chinook spawning occurs was 13.8° C. Daily average temp. exceeded 14.0° C on 18 days in July and 13 days in August. Daily average temp. exceeded 15.0 ° C on 6 days in July and 7 days in August. Elevated water temperatures are expected to persist for several decades until woody vegetation can reestablish in burned areas. Increased water yields in burned areas and groundwater sources may offset loss of stream shading in some portions of the watershed (USFS 2010).
Sediment/ Turbidity (Chinook and steelhead) Sediment/ Turbidity (Bull trout)	Low turbidity is indicated by <12% surface fines (<0.85 mm). <12% fines (<0.85 mm) in gravel. Surface fines (≤6mm) ≤20%	Functioning at Risk	Wholman pebble count data from the Hanson C&H allotment (upstream of the project area) show 1% fines (<2.0 mm). Core sample trend data from Ice Hole show 5-7% fines (<0.85 mm) (USFS 2010). Fines in tributary streams are exhibiting much higher rates of sedimentation. Following the Cascade Complex Fire in 2007, Riordan Creek averaged 33% surface fines (<6.0 mm) (USFS 2008).

			The Sediment WCI is anticipated to worsen in the short term due to accelerated erosion in tributary and mainstem Johnson Creek following the Cascade Complex Wildfire
Chemical Contaminants/ Nutrients	Low levels of chemical contamination from agricultural, industrial, and other sources; no excess nutrients, no 303(d) water quality limited water bodies.	Functioning at Risk	4th Order Johnson Creek is listed as not fully supporting cold-water biota beneficial uses in the 2008 Integrated report prepared by IDEQ and approved by the USEPA in 2009.
Habitat Access			
Physical Barriers	Any man-made barriers present in watershed allow upstream and downstream fish passage at all flows.	Functioning at Unacceptable Risk	There is at least one identified road-stream crossing barrier in the watershed (Moose Creek @ FR413). There are no barriers within the project area.
Habitat Elements			
Substrate Embeddedness	Dominant substrate is gravel or cobble (interstitial spaces clear), or embeddedness is <20%.	Functioning at Risk	There are no substrate embeddedness data available for the Porcupine-Johnson subwatershed. 2004 Johnson Creek survey data indicate Sediment WCI is functioning at risk. Fine sediment delivery in Johnson Creek and subsequently embeddedness is expected to increase over the short term due to the effects of the Cascade Complex Fires.
Large Woody Debris (LWD)	Number of LWD >0.1m diameter and >3m or 2/3 stream width long per 100m stream length by stream width categories by parent material in Table 8 of the *Natural Conditions Database* (Overton et al 1995, pp 23-27).	Functioning at Unacceptable Risk	Surveyed reaches in the upper portion (Wardenhoff-Bear subwatershed) of the Porcupine-Johnson watershed show LWD loading is 7.3 stems per mile. This figure is expected to increase in mainstem Johnson Creek as fire-killed trees are transported through the watershed. Reestablishment of LWD-providing forests in tributary streams and mainstem Johnson Creek is projected to take several decades (USFS 2010).
Pool Frequency and Quality	Pool frequency values per 100m are available by Rosgen channel type, by geologic parent material and by stream width in Table 8 of the *Natural Conditions Database* (Overton et al 1995, pp 23-27).	Functioning at Unacceptable Risk	There is no pool frequency data for the project area. Surveyed areas in the Wardenhoff-Bear subwatershed show pool frequency is 6.8 pools/mi., well below the recommendations of 56 pools/mi (Chinook salmon/steelhead) and 39 pools/mi (bull trout) found in Overton et al. 1995. Water temperatures exceed bull trout thermal maximums in July and August. Sediment delivery is expected to increase following the Cascade Complex Fires of 2007, potentially degrading existing pool habitat.

Large Pools/Pool Quality	Each reach has many large pools >1 meter deep; good cover and cool water; minor pool volume reduction by sediment; large woody debris is functioning appropriately (Overton et al 1995).	Functioning at Risk	Large pool habitat in the project area is lacking. Water temperatures exceed bull trout thermal maximums in July and August. Sediment delivery is expected to increase following the Cascade Complex Fires of 2007, potentially degrading large pool quality.
Off-Channel Habitat	Watershed has many ponds, oxbows, backwaters, and other off-channel areas with cover; side channels are low energy areas.	Functioning Appropriately	The prevalence of Rosgen "C" channels throughout the watershed indicate that off-channel habitat is common to abundant. There is no off-channel habitat in the project area. Sinuosity is low and the floodplain is narrow.
Refugia (Chinook and steelhead) Refugia (Bull trout)	Habitat refugia exist and are adequately buffered (e.g., by intact riparian conservation areas); existing refugia are sufficient in size, number, and connectivity to maintain viable populations or sub-populations. Habitats capable of supporting strong and significant local populations, are protected and are well distributed and connected for all life stages and forms of the species.	Functioning at Risk	Habitat conditions are expected to decline in the short-term following the Cascade Complex Fires of 2007. Chinook populations in the SFSR watershed are considered at risk. Johnson Creek provides migratory habitat for bull trout. Thermal maximums are commonly exceeded during July and August when bull trout are migrating towards spawning tributaries. Road crossings present migration barriers within the watershed.
Channel Conditions and Dynamics			
Wetted Width/ Maximum Depth Ratio	≤10	Functioning at Risk	This ratio for the Wardenhoff-Bear subwatershed was reported to be 18.44 in the BNF Aquatic Survey database (2004). Readings for the Porcupine-Johnson Creek subwatershed are expected to be similar. This ratio is expected to increase from streambed aggradation and channel widening resulting from the Cascade Complex Fires in 2007.
Streambank Condition	>90% of any stream reach has stable banks relative to the percent of inherent stable streambanks associated with a similar unmanaged stream system.	Functioning at Risk	The Wardenhoff-Bear subwatershed reported mean bank stability to be 85% (BNF Aquatic Survey database 2004). Flow constrictions at the existing airport bridge have destabilized the west bank below the bridge abutments. The bridge replacement is expected to alleviate this condition.
Floodplain Connectivity	Within RCAs, floodplains and wetlands are hydrologically linked to the main channel; overbank flows occur and maintain wetland/floodplain	Functioning at Risk	Johnson Creek Road (FR 413) has reduced floodplain connectivity throughout the watershed. Floodplain at the project area is limited by stream channel confinement.

	functions; and riparian vegetation succession.		
Flow/Hydrology			
Change in Peak/Base Flows	Watershed hydrograph indicates peak flow, base flow, and flow timing characteristics comparable to an undisturbed watershed of a similar size, geomorphology and climatology.	Functioning at Unacceptable Risk	Equivalent clearcut area (ECA) was measured at 54.6% in the Wardenhoff-Bear sub-watershed, well above the 15% upper limit for appropriate function.
Change in Drainage Network	Zero or minimum change in active channel length correlated with human caused disturbance.	Functioning at Risk	The proximity of FR 413 to Johnson Creek has limited channel migration and stream meanders in floodplain locations.
Watershed Conditions			
Road Density and Location	Total road density <0.7 miles/square mile of subwatershed; no roads within RCAs.	Functioning at Risk	Road density in the Porcupine-Johnson subwatershed (6th field HUC) is 0.79 mi/mi^2; RCA road density is 2.2 mi/mi^2.
Disturbance History	<15% ECA (entire watershed) with no concentration of disturbance in areas with landslide or landslide prone areas, and/or refugia, and/or RCAs.	Functioning at Unacceptable Risk	ECA was measured at 54.6% in the Wardenhoff-Bear sub-watershed, well above the 15% upper limit for appropriate function. RCA road density is 2.2 mi/mi^2.
Riparian Conservation Areas	The riparian conservation areas within the subwatershed(s) have historic and occupied refugia for listed, sensitive or native/desired nonnative fish species which are present and provide: adequate shade, large woody debris recruitment, sediment buffering, connectivity, and habitat protection and connectivity to adequately minimize adverse effects from land management activities (>80% intact).	Functioning at Risk	RCA road density is 2.2 mi/^{mi2}. The effects of the Cascade Complex Fires throughout the watershed have reduced stream shading, enhanced sediment delivery and channel aggradation, and elevated stream temperatures during bull trout migratory periods. Fire has not affected potential vegetation groups in the riparian area through the project area.
Disturbance Regime	Disturbance resulting from land management activities are negligible or temporary. Streamflow regimes are appropriate to the local geomorphology, potential vegetation and climatology resulting in appropriate high quality habitat and watershed complexity that provide refugia and rearing space for all life stages or multiple life-history forms. Ecological processes are within historical ranges. Resiliency of habitat to recover from land management	Functioning at Risk	The effects of the Cascade Complex Fires will impact watershed conditions until woody vegetation reestablishes.

	disturbances is high.		
Integration of Species and Habitat Conditions	Habitat quality and connectivity among local populations is high. The migratory form is present. Disturbance has not altered channel equilibrium. Fine sediments and other habitat characteristics influencing survival and growth are consistent with pristine habitat. The local population has the resilience to recover from short-term disturbance within one to two generations (5-10 years). Local population is fluctuating around equilibrium or is growing.	Functioning at Risk	WCIs are not expected to return to pre-2007 levels for at least 10 years.

2.4.2 Bull Trout Critical Habitat

The Service published a final rule designating critical habitat for bull trout rangewide on October 18, 2010 (effective November 17, 2010). Johnson Creek is included in that designation.

2.4.2.1 Status of Bull Trout Critical Habitat in the Action Area

Johnson Creek is located in the Salmon River Basin Unit (unit 27), one of 32 critical habitat units (CHUs) that were designated. The Salmon River basin extends across central Idaho from the Snake River to the Montana-Idaho border. Within the CHU there are 10 subunits, or CHSUs, including the South Fork Salmon River, which includes Johnson Creek.

2.4.2.2 Factors Affecting Bull Trout Critical Habitat in the Action Area

Primary constituent elements (PCEs) (see Section 2.3.2.2) are used to describe biological and physical habitat features that are essential to the conservation of bull trout. The Watershed Condition Indicator (WCI) matrix (Table 2) provides a means to assess the baseline condition of the PCEs in the action area and the effects of the action on the PCEs (Table 2). Table 3, below, illustrates the link between PCEs and the associated WCIs evaluated in the environmental baseline. This reach of Johnson Creek is considered Foraging, Migratory and Overwintering (FMO) habitat for bull trout. Habitat characteristics do not support bull trout spawning and rearing habitat.

Table 3. The Primary Constituent Elements (PCEs) of bull trout critical habitat and the corresponding Watershed Condition Indicators (WCIs) used to describe existing conditions and functionality in the watershed (from Table 6, pages 28 and 29 of the Assessment).

PCE #	PCE Description	Associated Watershed Condition Indicator
1	Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity and provide thermal refugia.	Sediment/turbidity, Channel Conditions and Dynamics (wetted width/maximum depth ratio, streambank condition, floodplain connectivity), riparian conservation areas.
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.	Temperature, sediment/turbidity, chemical contamination/nutrients, physical barriers, change in peak/base flow, width/depth ratio, refugia
3	An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.	Water quality (temperature, sediment/turbidity, chemical and nutrient contaminants), substrate embeddedness, Channel Conditions and Dynamics (wetted width/maximum depth ratio, streambank condition, floodplain connectivity), changes in peak/base flows, riparian conservation areas
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.	Habitat elements (substrate embeddedness, LWD, pools frequency and quality, large pools, off-channel habitat, and refugia)
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.	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.	Sediment/turbidity, substrate embeddedness
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.	Flow/ Hydrology (Changes in Peak /Base flows and Drainage Network Increase)
8	Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.	Floodplain connectivity, peak/base flow, water quality (Temperature, sediment/turbidity, Chemical Contaminants and Nutrients)

PCE #	PCE Description	Associated Watershed Condition Indicator
9	Sufficiently low levels of occurrence of nonnative 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.	Persistence and Genetic Integrity

Factors influencing critical habitat are similar to those described above under the species. The Assessment provides detailed information regarding the condition of the habitat in the action area (pp. 32 – 41) and the factors that influence the habitat condition. In summary, the baseline indicates that many of the WCIs and corresponding PCEs are in good condition, while some of the PCEs may be impaired within the watershed and action area. In the action area, summer stream temperatures have exceeded ranges described in PCE 5 and at times may pose a partial thermal barrier for bull trout, thereby affecting PCE 2. Elevated water temperatures are expected to persist for several decades until woody vegetation can reestablish in burned areas. Increased water yields in burned areas and groundwater sources may offset loss of stream shading in some portions of the watershed.

Historically, vegetation damage from unchecked livestock grazing was the most egregious source of sediment delivery to Johnson Creek. Grazing along Johnson Creek on Forest Service administered land is now restricted and not contributing significant sediment to Johnson Creek. Roads and wildland fires are the leading cause of erosion in the lower portion of the watershed. Surface fines and core samples taken from near the action area indicate that sediment levels are likely not affecting PCEs (such as 1, 3, 4 and 8). However, the 2007 Cascade Complex Fires, which burned a significant portion of the Johnson Creek watershed, may affect runoff, sediment delivery, and debris flow characteristics for many years.

Deep pools and large woody debris, indicators associated with PCEs 3 and 4, are low for the watershed and limited within the action area. Scour holes under the existing bridge abutments function as pool habitat and are currently used as holding areas for migrating adult fish. A number of historical practices limited the availability of LWD to many streams and rivers in the watershed. These practices included splash damming, debris removal, road and rail construction, poor livestock grazing practices, and unregulated timber harvest. More recently, severe wildfires have eliminated large stands of trees in riparian zones.

PCE 6 is not present in the action area: Johnson Creek is not considered bull trout spawning or rearing habitat. Substrate is primarily cobble and boulder and stream temperatures are too high to promote bull trout spawning.

Floodplain connectivity and development is limited within the action area due to flow constrictions associated with the existing airport bridge. The channel constriction here has also destabilized the west stream bank, altering PCEs 1 and 7. Likewise, Johnson Creek Road (FR 413) has contributed to reduced floodplain connectivity throughout the watershed.

This reach of Johnson Creek does not meet water quality standards for cold water biota, specifically stream temperatures standards for bull trout have been exceeded periodically during the summer. Therefore, PCE 8 would be considered impaired for reproduction in the project area. However, sufficient water quality and quantity does exist for FMO habitat.

Brook trout, as related to PCE 9, are present in Johnson Creek and likely compete with bull trout for space and prey, but are not at risk of interbreeding with bull trout in the action area. Due to the potential competition with brook trout, PCE 9 is impaired in Johnson Creek.

2.5 Effects of the Proposed Action

Effects of the action consider the direct and indirect effects of an action on the listed species and/or critical habitat, together with the effects of other activities that are interrelated or interdependent with that action. These effects are considered along with the environmental baseline and the predicted cumulative effects to determine the overall effects to the species. Direct effects are defined as those that result from the proposed action and directly or immediately impact the species or its habitat. 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. An interrelated activity is an activity that is part of the proposed action and depends on the proposed action for its justification. An interdependent activity is an activity that has no independent utility apart from the action under consultation.

2.5.1 Bull Trout

2.5.1.1 Direct and Indirect Effects of the Proposed Action

The effects analysis for the project is summarized in Table 4. Generally, all effects resulting from project activities will be localized to the project area and a small portion of Johnson Creek downstream from the project area. While the potential for effects to individual bull trout exists, no population level effects are expected.

Temporary effects are short-duration impacts associated with specific construction activities that are not expected to persist longer than 24 hours. Examples include turbidity pulses and increased noise levels from pile driving equipment. Short term effects are those expected to occur for up to 2 years after construction activities have ended. These include sediment flushing and reestablishment of upland vegetation at staging areas. Long term effects will persist for more than 2 years, until woody vegetation sufficient to stabilize stream banks is reestablished.

Table 4. Effects analysis summary for subpopulation and watershed condition indicators

Watershed Condition Indicator	Effects of the Action		
	Improve	Maintain	Degrade
Bull trout subpopulation size		X	
Bull trout growth and survival			X - temporary
Bull trout life history diversity and isolation		X	
Bull trout persistence and genetic integrity		X	
Water Temperature		X	
Sediment/turbidity			X - temporary
Chemical contamination and nutrients		X	
Physical barriers		X	
Substrate embeddedness	X – long-term		
Large Woody Debris		X	
Pool Frequency/quality/depth		X	
Off-Channel Habitat		X	
Refugia		X	
Floodplain Connectivity		X	
Width to Depth Ratios	X – long-term		
Streambank Condition	X – long-term		X – short-term
Change in Peak Flows	X – long-term		
Change in Drainage Network		X	
Road Density and Location		X	
Disturbance Regime/history		X	
Riparian Conservation Areas			X - short-term
Bull Trout Population Characteristics		X	

The main anticipated effects to bull trout from project implementation are (1) temporary and short term affects from increased sediment inputs into Johnson Creek due to ground disturbing activities, and (2) avoidance behavior in fish created by increased human presence, project activities, including the possible placement of picket weir fencing around Chinook salmon spawning areas, and in response to elevated noise levels from pile driving.

As stated in the Assessment (p. 44), impacts to aquatic habitats will result from pulses of turbidity from project activities. Any turbidity generated will occur on only one stream bank at a time, allowing downstream fish to relocate laterally, if necessary. BMP will be used to mitigate disturbance in both upland and adjacent aquatic habitats. The effects of the action will not have long-term adverse effects on habitat quality. Human activity associated with construction activities may displace adult, subadult and juvenile bull trout or elicit avoidance responses during daylight hours, but these effects will be spatially and temporally restricted to individuals at or near the project area. If stream conditions are appropriate, bull trout may be migrating towards spawning habitat in tributary streams. Passage through the site for migrating individuals will not be impeded by devices used to exclude fish from occupying near-bank habitats.

2.5.1.1.1 Sediment Related Effects

Ground disturbing activities have the potential to indirectly affect fish and fish habitat through effects to water quality and alteration of in-stream habitat. The magnitude of these effects will vary as a result of the nature, extent, and duration of the construction activities and whether bull trout are present at the time of implementation. BMPs that limit the amount of sediment entering Johnson Creek will reduce sediment related effects to bull trout.

Increases in suspended sediment have been shown to affect salmonid behavior in several ways. Fish may avoid high concentrations of suspended sediments altogether (Hicks et al. 1991, p. 483-485). Social (Berg and Northcote 1985, p. 1410) and feeding behavior can be disrupted by increased levels of suspended sediment. Even small elevations in suspended sediment may reduce feeding efficiency and growth rates of some salmonids (Sigler et al. 1984, p. 142).

Newcomb and Jensen (1996, pp. 720-727) and Bash et al. (2001, p. 24) provide syntheses of research that has been conducted on the effects of suspended sediment on the physical condition of salmonids. Newcomb and Jensen used their syntheses of field and laboratory data on effects from sediment to develop a dose response model and described 14 severity levels of effects, ranging from "no behavioral effects" (0) to greater than 80 to 100 percent mortality (14). This range is divided into four major categories, including "nil effect," "behavioral effects," "sublethal effects," and "lethal and Para lethal effects." Bash et al. (2001, p. 2) further refine the categories by describing whether the effect is behavioral, physiological, or habitat-based. For example, Newcomb and Jensen (1996, pp. 694-698) report that suspended sediment concentrations of 500 mg/l for 3 hours caused signs of sublethal stress in adult steelhead, which we would also expect for bull trout. If suspended sediment concentrations reach 3,000 mg/l for up to an hour it may cause moderate physiological stress (Newcomb and Jensen 1996, pp. 698-702), and could result in gill trauma and/or temporary adverse changes in blood physiology such as elevated blood sugars, plasma glucose, or plasma cortisol (Servizi and Martens 1987 in Bash et al. 2001, p. 16; Servizi and Martens 1992, pp. 1389-1390; Bash et al. 2001, p. 17). Lethal effects can occur if suspended sediment concentrations reach 22,026 mg/l at any one time, or remain at concentrations of 3,000 mg/l for 3 hours (Newcomb and Jensen 1996, pp. 698-702).

There are several difficulties in using this information to try and anticipate what amount of sediment in the water column is likely to be produced by a project and what impacts they might cause to fish. First, field turbidity monitoring uses turbidimeters that record data in nephelometric turbidity units (NTUs) while Newcomb and Jensen's data is in milligrams/liter (mg/l). And second, turbidity as a result of projects is not consistent and can be present in short intense bursts or a lower level over long periods of time. While there is a relationship between suspended solids measured in mg/l and NTUs, it is highly variable because of differences in many factors including water temperature and particle size.

While developing Total Maximum Daily Load (TMDL) criteria for the Umatilla River Basin, Oregon used regression analysis to express the suspended solids (in mg/l) that represented 30 NTU for 14 watersheds (Oregon Department of Environmental Quality, p. A6-3). Values ranged from 60 to 110 mg/l for the target value of 30 NTUs. If a similar relationship existed with Newcomb and Jensen's data, their 3 hour lethal range of 3,000 mg/l could equate to an NTU reading of between 833 and 1,764 which is a very wide potential range of values.

Idaho state standards for cold water biota are measured as water column turbidity. Levels are set at 50 NTUs instantaneously or >25 NTU for more than 10 consecutive days above background levels (Rowe et al. 2003, p. 8). That NTU level was based on data from Lloyd et al. 1987 (*in* Bash et al. 2001, p. 67) suggesting that salmonids reacted negatively by beginning to move away from areas when the turbidity reaches 50 NTU. NTU is an optical quality referring to the attenuation of light transmitted through a water column. Total suspended solids (TSS) is a common sediment measure when quantifying effects to aquatic life and refers to the quantity of particles in suspension.

Because culvert replacement and removal is one of the most common construction activities in fish bearing streams, there is more specific information on the amount of sediment released, degree of turbidity, turbidity plume length and plume duration generated by culvert projects. Culvert removal has a high potential for releasing sediment because the soil is disturbed when removing large culverts, soil is disturbed when the channel is reconfigured and then water is reintroduced into that disturbed site.

Bakke et al. (2002, p.1) reported maximum suspended sediment levels of 514 to 2,060 mg/l associated with culvert removals near Olympia, Washington. These concentrations did not last for more than one hour. Both Jakober (2002, p. 6) and Casselli et al. (2000, pp. 8-9) reported that turbidity decreased to pre-project levels within about 24 hours after flow reintroduction. Casselli et al. (2000, pp. 8-9) noted that sediment levels remained at pre-project levels about 1.5 miles downstream of the project site. Jakober (2002) found that suspended sediment levels rose from a background reading of 1.69 mg/l to 15,588 mg/l for 30 minutes following channel re-watering. However, this excessive concentration lasted <30 minutes and within 26 hours readings had returned to normal.

This project, however, which does not involve culvert removal or in-stream construction work, will likely not produce the levels of increased suspended sediment seen in culvert replacement projects. The action may temporarily elevate TSS and turbidity above background levels, which will be at their lowest during most construction activities (low flow summer months). Limited water quality data from the USGS gauge at Yellowpine show background TSS levels as low as 1 - 2 mg/l for Johnson Creek during the summer months of 2007 and 2008. Precipitation events elevated readings during that time period to as high as 14 mg/l.

As described in the Assessment (p. 46), drilling and pile driving activities will occur outside the stream channel and will not introduce appreciable amounts of sediments into the stream. Hydrostatic pressure will prevent turbid water generated during excavation at the abutment locations from entering the stream. Turbid water will be pumped into a temporary or portable settling pond. Rain events during the project may mobilize disturbed sediments despite the use of BMPs.

The Fish and Wildlife Service believes that the amount of sediment released or any resulting sediment plume from the described activities will not be as large or as persistent as that during a culvert removal. Culvert removal directly disturbs more soil during removal and creation of water bypasses, and when reintroducing water into the original channel. The Fish and Wildlife Service expects suspended sediment levels to increase slightly during ground disturbing project activities, work activity at the edge of the stream, and when the old bridge is removed and then decrease after those phases are complete. Another pulse of sediment may occur in the spring following the construction when higher energy spring-flows move through the construction site. Sediment related effects will be localized (limited to within 600 feet of the construction site), low intensity and of short duration. As discussed in the Assessment (p. 46), the low intensity and short duration of the sediment releases should preclude any chronic effects to bull trout associated with long term exposure to low levels of sediments.

The Assessment (Assessment, pp. 2, 17) indicates the impacts to bull trout from sediment and suspended solids should be limited to within approximately 600 feet downstream from the project site. Data from the Nez Perce Tribe (Assessment, p. 32) indicates that bull trout may be present during project activities. Any bull trout present in Johnson Creek during the project are expected to suffer only temporary sub-lethal behavior and physiological effects due to the low intensity, short duration of elevated suspended sediments. This includes temporary disturbance-related affects associated with avoidance or moving to areas with less suspended solids and particle build-up on gills. Because work will take place on one side of the stream at a time it is expected that fish would move out of the immediate vicinity to avoid disturbance and turbidity, if it occurs.

In the long term, the action is expected to improve sediment transport in lower Johnson Creek as upstream sediment inputs are lowered. Recent disturbances have temporarily reversed trends that led to the removal of Johnson Creek from Idaho's list of 303(d) list of impaired waters for sediment. Fire-induced sediment from the 2007 Cascade Complex fire is expected to exceed the storage capacity of existing pools and LWD catchments within the fire perimeter and habitat quality is expected to decline for several years. The quantity of sediment that may be released by the action is quite small relative to the annual sediment budget of the watershed.

2.5.1.1.2 Noise and Disturbance Related Effects

Pile Driving Activities

Bull trout in Johnson Creek will be exposed to noise from pile driving, construction, and increased human activity adjacent to the stream. Bull trout that are near construction activities in Johnson Creek may be repeatedly disturbed by the activity and flush from the disturbance. In the longer term, fish that have established territories in habitat specific areas in a stream become knowledgeable about all the features in that area. If displaced, they may have to search out new areas for feeding, hiding or favorable water quality. In the time it takes them to do that, they can be subjected to a greater risk of predation, competition with other fish, greater stress and lowered physical condition.

Pile driving will occur over several days during Phase 1 of the Project. Four steel H-piles will support each abutment. The drill rig will be positioned near the edge of the excavation. The steel H-piles will be driven vertically with an impact hammer to the required capacity in the predrilled holes.

The Assessment (pp. 46-48) provides detailed analysis of sound impulses from impacts and the subsequent possible effects to fish. Sound impulses from impacts have been shown to affect fish in a variety of ways. Effects may include behavioral responses or the masking of biologically relevant sounds, stress or other physiological symptoms, permanent or temporary hearing loss. The severity and duration of the effects are dependent on the characteristics of the sound impulse, the distance from source, the qualities of the sound transmitting medium (e.g. water density and depth, substrate type), and the size and species of fish. Longer-term or cumulative effects of exposure to pile driving sounds have not been evaluated, but potential effects are predicted to be similar to those listed above and may include a greater susceptibility to delayed mortality (Popper and Hastings 2009, p. 10).

Impact pile driving equipment typically generates sound in excess of 170 dB, a level below what is reported to have lethal effects in teleost fish, but in excess of levels reported to cause hearing loss in some species (Popper and Hastings 2009, pp. 15-19). Currently, the Fish and Wildlife Service and the National Marine Fisheries Service use 180 dB_{peak} as a threshold for sound levels resulting from impacts. Hearing loss in fish is difficult to quantify and depends on the characteristics of the sound impulse and the species and age of the fish. Sound energy thresholds required to cause other types of physical injuries have not been reliably estimated and many pile driving studies have reported only mortality. In many cases where mortality was reported, sound energy levels were not measured. Multiple studies reviewed by Popper and Hastings (2009, p. 11) showed fish mortality related to pile driving used caged subjects in close proximity to sound impulses generated and propagated underwater. Sound levels in these studies measured >200 dB_{peak} at a duration of more than 200 minutes. No reliable studies have measured the effects of near-water sound impulses on fish.

Accurately predicting noise levels generated by pile driving equipment is impossible without knowing the type of equipment that will be used, ambient noise levels, and substrate and other site characteristics that affect sound propagation and attenuation. Sound levels from pile driving activities conducted in similar environments may provide a reasonable approximation of the sound levels expected at the Johnson Creek project area.

Sound levels during pile driving were measured at the Evans Creek bridge project near Redmond, Washington in 2006 (Laughlin 2006). Substrate consisted of sand and cobble up to ca. 6 cm in diameter with occasional rocks exceeding 25 cm. Five 16-inch round steel piles were driven to bearing depth at various distances from the creek channel with a diesel impact driver. No piles were driven in water. Measurements were made 1 foot underwater at mid-channel. No sound attenuation devices were used. Ambient sound levels from the construction equipment averaged ca. 137 dB_{RMS} to 141 dB_{RMS}. None of the peak values exceeded the 180 dB_{peak} threshold currently being used by the services. Since dB are measured on a logarithmic scale, substantially more energy would have been needed to exceed this threshold. Additionally, no fish mortality or visible distress was observed during the pile driving operation (Laughlin p. 15).

For this action, between 4 and 6 steel H-piles will be driven to anchor each new abutment at the Johnson Creek bridge replacement. The piles will be pre-drilled. To limit disturbance to aquatic organisms, work will occur on one side of the stream at a time and all activities will occur outside of the wetted stream channel. The sound generated by pile driving equipment will be intermittent but is expected to occur for up to 5 days.

It is likely that background and peak noise levels from impact pile driving equipment or other earth-moving machinery at the project area will temporarily displace aquatic and terrestrial wildlife. Limited studies suggest that impairment to behavioral and physiological processes can occur in fish exposed to concussive sound, although these thresholds have not been reliably estimated. Studies have shown that vibratory pile driving would cause avoidance response by salmonids within the immediate vicinity (approximately 20 to 30 feet) (Carlson et al 2001, p. A.5). Direct mortality of fish in close proximity to pile driving equipment has been documented in open water (Popper & Hastings 2009, p. 22) but sound levels at the project area are not expected to meet or exceed levels shown to cause fish mortality. The abutments will be predrilled and pile driving will occur outside the wetted channel, reducing potential effects of the action. Fish in or near the project area are expected to display avoidance behavior during times when pile driving or other heavy machinery is operating.

Fish Exclosures and Human Disturbance

In order to reduce disturbance to Chinook salmon spawning habitat and prevent salmon from spawning in the action area, prior to beginning phase 1 construction activities, a fish exclosure (e.g. picket weir) will be placed around potential spawning habitat within the action area. The fish exclosure will not extend across the entire channel, but will circle any potential Chinook spawning areas. Placement of the exclosures will maintain channel width and depth sufficient to allow passage of migrating fish. A lack of preferred spawning habitat in the project area, the placement of exclosures prior to Chinook spawning activity and the presence of work crews and machinery should discourage salmon and bull trout from occupying the project area for the duration of construction activities (Assessment, p. 18). Although it is unlikely that spawning habitat will be identified in the project area thus negating the need for the exclosure devices, because the structures will be in the water, there is potential for bull trout to be impinged on the pickets, which may result in adverse affects that could lead to death. Bull trout would instinctively avoid the pickets, so the likelihood of this occurring is low, but should not be discounted.

The general increase in human disturbance levels from construction activities and the rehabilitation of disturbed areas after Project completion may disturb and displace adult, subadult and juvenile bull trout in the action area. Human disturbance will be temporary and of a low intensity and will not involve in-stream work – other than blocking off potential Chinook spawning habitat. Construction activity will take place during daylight hours, limiting the disturbance effects on bull trout. However, the Service assumes that adult, subadult and juvenile bull trout in the area are likely to be exposed to and experience disturbance-related displacement and avoidance effects which are expected to be temporary and sublethal. But, bull trout are expected to recover quickly once displacement is over.

2.5.1.2 Effects of Interrelated or Interdependent Actions

The Service has not identified any actions that are interrelated or interdependent with the proposed project.

2.5.2 Bull Trout Critical Habitat

2.5.2.1 Direct and Indirect Effects of the Proposed Action

In the action area, the Service has designated Johnson Creek as critical habitat for bull trout. The watershed condition indicator (WCI) matrix for bull trout is used to evaluate and document baseline conditions and to aid in determining whether a project is likely to adversely affect or result in the incidental take of bull trout. Analysis of the affected WCI can provide a thorough evaluation of the existing baseline condition and potential project impacts to the Primary Constituent Elements (PCEs) of bull trout critical habitat (see Table 5 below).

Table 5. Bull Trout Primary Constituent Elements (PCEs) and Anticipated Effects from the Project

	PCEs	Associated Habitat Indicators	Habitat Indicators Degraded by Proposed Action	Anticipated Effect to PCE
1	Springs, seeps, groundwater sources, and subsurface water connectivity (hyporheic flows) to contribute to water quality and quantity and provide thermal refugia.	Sediment/turbidity, Channel Conditions and Dynamics (wetted width/maximum depth ratio, streambank condition, floodplain connectivity), riparian conservation areas.	There will be a temporary increase in turbidity during project implementation.	The PCE will not be affected by the project. The increase in turbidity will not adversely affect this PCE.
2	Migratory 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.	Temperature, sediment/turbidity, chemical contamination/nutrients, physical barriers, change in peak/base flow, width/depth ratio, refugia	Sediment/turbidity, physical barriers	Migratory habitat may be temporarily reduced by fish exclusion devices or by increased sediment
3	An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.	Water quality (temperature, sediment/turbidity, chemical and nutrient contaminants), substrate embeddedness, Channel Conditions and Dynamics (wetted width/maximum depth ratio, streambank condition, floodplain connectivity), changes in peak/base flows, riparian conservation areas	Sediment/turbidity may be increased in the short term. Long term, substrate embeddednesss should be improved in the project area, although improvements may not be measurable. Streambank condition will be negatively impacted during project implementation by removal of vegetation. In the long term, streambank condition will be improved as riparian vegetation stabilizes the banks and streamflows are not constricted above the bridge.	The aquatic food base may be negatively impacted by deposited sediment downstream of the bridge and by changes in the riparian community. Effects would be immeasurable. In the long term, due to restored channel dynamics, this PCE should be improved.
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	Habitat elements (substrate embeddedness, LWD, pools frequency and quality, large pools, off-channel habitat, and refugia)	Substrate embeddedness may be improved in the long term.	This PCE will be maintained.

	PCEs	Associated Habitat Indicators	Habitat Indicators Degraded by Proposed Action	Anticipated Effect to PCE
	wood, side channels, pools, undercut banks and unembedded substrates to provide a variety of depths, gradients, velocities, and structure.			
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.	Temperature	Temperature will not be affected by the project.	This PCE will be maintained.
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.	Sediment/turbidity, substrate embeddedness	See discussion above regarding sediment/turbidity and substrate embeddedness	This PCE will not be affected by the project as it is not a component of the habitat in the project area.
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.	Flow/ Hydrology (Changes in Peak /Base flows and Drainage Network Increase)	No effects to these habitat features	The PCE will be maintained
8	Sufficient water quality and quantity such that	Water Quality (Temperature,	Sediment/turbidity may be temporarily	Water quality will not be affected to the level

	PCEs	Associated Habitat Indicators	Habitat Indicators Degraded by Proposed Action	Anticipated Effect to PCE
	normal reproduction, growth, and survival are not inhibited.	sediment/turbidity, Chemical Contaminants and Nutrients)	increased during project implementation. Increases in turbidity would be temporary and slight. No effects to temperature.	that the PCE would be impaired. The PCE will be maintained.
9	Sufficiently low levels of occurrence of nonnative 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.	Persistence and Genetic Integrity	No effects to persistence and genetic integrity	This PCE will be maintained.

2.5.2.1.1 Sediment Related Effects

Project activities, including excavation, removal of riparian vegetation, and placement of flexible channel liner (fill), will have temporary and short-term impacts to bull trout habitat mainly due to ground disturbing activities that may increase turbidity in Johnson Creek. Increased sediment and suspended solids have the potential to affect primary production and benthic invertebrate abundance, due to reductions in photosynthesis within murky waters resulting in decreased food availability for fish (Cordone and Kelley 1961, pp. 189-190; Lloyd et al. 1987, p. 18). Pools, which are an essential habitat type, can be filled by sediment and degraded or lost. Overwintering and juvenile rearing habitat may be affected as in-channel sediment transport can last until stabilization of the substrate occurs, probably after the first spring flow event. Flushing of deposited sediments will occur during high flows for 3 to 5 years (Assessment, p. 29).

Erosion prevention and soil stabilization BMPs are expected to prevent or attenuate potential impacts associated with the ground disturbing activities. The BMPs will remain in place until site revegetation permanently stabilizes soil surfaces. Restoration of the original channel contour and proper hydrologic function at the site are expected to have long term benefits to aquatic species and their habitats.

Potential impacts from project activities on the PCEs of bull trout critical habitat are largely sediment related. However, the quantity of sediment released during construction activities is not expected to be significant and any adverse effects will be short-lived and reversible. Migratory habitat (PCE #2) may be temporarily reduced by fish exclusion devices installed near abutment installations, as adult fish will either avoid or have to move around the devices, or impacted by turbidity from unexpected sediment releases. There is a slight chance that sediment deposited on gravels downstream of the project area may impact benthic macroinvertebrates (PCE #3) until sediment is flushed from the area.

2.5.2.1.2 Beneficial Effects

The largest positive effect from this project on bull trout critical habitat is the restored hydrologic function of Johnson Creek at the bridge site. The current bridge constricts the stream channel, causing material to aggrade, and causing streambank damage above and below the bridge. The new bridge will free span the channel, preventing erosion and restoring channel contour. It will also restore floodplain connectivity, accommodate high flows, including 50 year floods, restore riparian function, protect the streambank, and improve fish habitat. Substrate characteristics are not likely to change much from the existing condition. Overall riparian vegetation should be improved throughout the project site.

2.5.2.2 Effects of Interrelated or Interdependent Actions

The Service has not identified any actions that are interrelated or interdependent with the proposed project.

2.6 Cumulative Effects

The implementing regulations for section 7 define cumulative effects to include the effects of future State, tribal, local or private actions that are reasonably certain to occur in the action area considered in this Opinion. 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.

Illegal and inadvertent harvest of bull trout is considered a cumulative effect. Harvest can occur through both misidentification and deliberate catch. Schmetterling and Long (1999, p. 1) found that only 44 percent of the anglers they interviewed in Montana could successfully identify bull trout. Being aggressive piscivores, bull trout readily take lures or bait (Ratliff and Howell 1992, pp. 15-16). Spawning bull trout are particularly vulnerable to harvest because the fish are easily observed during autumn low flow conditions. Hooking mortality rates range from 4 percent for non-anadromous salmonids with the use of artificial lures and flies (Schill and Scarpella 1997, p. 1) to a 60 percent worst-case scenario for bull trout taken with bait (Cochnauer et. al. 2001, p. 21). Thus, even in cases where bull trout are released after being caught, some mortality can be expected.

An additional cumulative effect to bull trout is global climate change. Warming of the global climate seems quite certain. Changes have already been observed in many species' ranges consistent with changes in climate (Independent Scientific Advisory Board 2007, p. iii; Hansen et al. 2001, p. 767). Future climate change may lead to fragmentation of suitable habitats that may inhibit adjustment of plants and wildlife to climate change through range shifts (Independent Scientific Advisory Board 2007, p. iii; Hansen et al. 2001, pp. 768-773). Changes due to climate change and global warming could be compounded considerably in combination with other disturbances such as fire and invasive species. Fire frequency and intensity have already increased in the past 50 years, particularly in the past 15 years, in the shrub steppe and forested regions of the west (Independent Scientific Advisory Board 2007, p. iii). Larger climate-driven fires can be expected in Idaho and Montana in the future. Small isolated bull trout populations will be at increased risk of extirpation in the event of larger and more numerous fires. In addition, the preference of bull trout for colder water temperatures gives them a competitive advantage over invasive species, such as brook trout, inhabiting warmer stream reaches. Rahel et al. (2008, p. 552) state that "Climate change will produce a direct threat to bull trout through thermally stressful temperatures and an indirect threat by boosting the competitive ability of other trout species present."

In the Johnson Creek watershed, it is difficult to anticipate what climate change will mean for bull trout. Spawning and rearing habitat, not a concern for this project, may be reduced in the headwaters of many tributaries. Summer flows, when bull trout are migrating to spawning habitats, may be reduced in Johnson Creek and the timing of the hydrograph may be altered. As the vegetation in the watershed regrows from the recent fires, it may offset any climate change impacts to the hydrograph that would be observed. At some point in the future, however, effects to stream habitat from climate change will likely occur.

Valley County provides routine maintenance and repairs on the Johnson Creek Road (FR413) as needed. An unknown quantity of sediment likely enters the stream channel via runoff from road surfaces following grading, culvert and ditch clearing, and other road maintenance activities. Temporary and permanent BMPs at the project area are designed to control and contain sediment generated during the bridge replacement project and associated road work and minimize the risk of mobilized sediments from reaching the stream channel during runoff events. Any cumulative impacts from sediment introduced from road surfaces in the project area are expected to be insignificant.

Nez Perce Tribe Fisheries personnel operate a picket weir and adult trap upstream of the project area and a juvenile screw trap downstream of the site. Fish movement through the project area will not be physically impeded by the project, although aversion to human presence and disturbance may delay fish movement through the site while construction activities are occurring. The picket weir and screw trap are not known to have any adverse effects on fish populations or habitat quality and function and no cumulative impacts arising from the bridge replacement project are expected.

2.7 Conclusion

2.7.1 Bull Trout

The Service has reviewed the current status of the bull trout, the environmental baseline in the action area, effects of the proposed action, and cumulative effects, and it is our conclusion that the proposed action is not likely to jeopardize the species continued existence. The Service concludes that direct effects to adult, subadult, and juvenile bull trout in Johnson Creek will be limited to short-term disturbance, sound impacts, feeding rate reduction due to increased disturbance in the area, increased predation risk, and physiological distress resulting in adverse affects from increased levels of suspended sediment/turbidity and deposited sediment.

Impacts to bull trout are expected in only 600 feet of habitat in Johnson Creek, a tributary to the South Fork Salmon River. The South Fork Salmon River core area contains approximately 115 miles of Foraging, Migratory, and Overwintering habitat. If exclusion devices, such as picket weirs, are placed around Chinook spawning habitat in the project area, bull trout may be adversely affected due to impingement on the device or injury from moving through the device. The likelihood of these adverse affects occurring is low, as it is unlikely that there is spawning habitat within the project area and fish generally tend to avoid these types of structures. However, these potential effects should not be discounted. Anticipated effects should be minimized by the BMPs and minimization measures incorporated into the project. Project activities will not occur in bull trout spawning areas; therefore, spawning bull trout, eggs, or alevins are not expected to be affected by the project.

The Service expects that the numbers and distribution in the action area, the South Fork Salmon River Core area, the Salmon River management unit, or in the Columbia Basin population segment will not be significantly changed as a result of this project; project impacts will not reduce appreciably the likelihood of both the survival and recovery of bull trout. Therefore, it is the Service's biological opinion that the proposed action will not jeopardize the coterminous population of bull trout.

2.7.2 Bull Trout Critical Habitat

The Service has reviewed the current status of bull trout critical habitat, the environmental baseline in the action area, effects of the proposed action, and cumulative effects, and it is our conclusion that the proposed action is not likely to destroy or adversely modify designated critical habitat for bull trout. Although the PCEs of designated bull trout critical habitat may be adversely affected by the project, we expect these effects to be limited in duration and spatial extent. We also expect the BMPs incorporated into the project to minimize effects. There are approximately 29 miles of FMO critical habitat in Johnson Creek. This project will affect 600 linear feet of Johnson Creek. The South Fork Salmon River critical habitat subunit provides about 114 miles of bull trout critical habitat. Given this scale, impacts to this portion of critical habitat will not affect the functioning or the conservation values of the Salmon River Basin Critical Habitat Unit or the South Fork Salmon River Subunit. Therefore, we conclude that the project will not destroy or adversely modify designated critical habitat.

2.8 Incidental Take Statement

Section 9 of the Act and Federal regulations pursuant to section 4(d) of the Act prohibit the take of endangered and threatened species, respectively, without specific exemption. Take is defined as to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture or collect, or to attempt to engage in any such conduct. Harm in the definition of take in the Act means an act which actually kills or injures wildlife. Such act may include significant habitat modification or degradation that results in death or injury to listed species by significantly impairing essential behavioral patterns, including breeding, feeding, or sheltering. Harass is defined by the Service as an intentional or negligent act or omission which creates the likelihood of injury to listed species by annoying it to such an extent as to significantly disrupt normal behavior patterns which include, but are not limited to, breeding, feeding, or sheltering.

Incidental take is defined as take that is incidental to, and not the purpose of, the carrying out of an otherwise lawful activity. Under the terms of section 7(b)(4) and section 7(o)(2), taking that is incidental to and not intended as part of the agency action is not considered to be prohibited taking under the Act provided that such taking is in compliance with the terms and conditions of this Incidental Take Statement.

The Administration has a continuing duty to regulate the activity covered by this incidental take statement. If the Administration fails to assume and implement the terms and conditions the protective coverage of section 7(o)(2) may lapse. In order to monitor the impact of incidental take, the Administration must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [50 CFR §402.14(i)(3)].

2.8.1 Form and Amount or Extent of Take Anticipated

Based on data in the Assessment (pp. 32), the Service assumes the presence of bull trout in the action area. However, it is difficult for us to anticipate the exact number of individual bull trout that will be taken as a result of project construction activities. The greatest number of adult bull trout captured in the adult picket weir upstream of the project area is 44 in 1 year. The greatest number of juvenile and adult bull trout captured downstream below Riordan Creek is 54 in 1 year. Because we cannot determine the exact number of bull trout that may be taken from the project, to address take associated with sediment and turbidity, we will use the amount of habitat affected as a surrogate. We anticipate that all adult, subadult, and juvenile bull trout downstream 600 feet of the bridge construction site (i.e., the assumed downstream extent of sediment effects), will be subject to take in the form of harassment from direct exposure to the increased levels of suspended sediment, turbidity, and deposited sediment. In addition, we anticipate that all adult, subadult and juvenile bull trout within 50 feet of pile driving activities will be subject to take in the form of harassment from exposure to sound waves.

Although it is unlikely to occur for reasons explained above, we expect that one adult or subadult bull trout may also be harmed or killed by impingement on exclosure devices installed to prevent Chinook spawning in the project area.

Incidental take of bull trout from project construction activities is anticipated to occur during Phase 1 and 2 of the work activities including construction of the new bridge, removal of the old bridge, placement of fill and rehabilitation of the disturbed stream bank. The Project is currently scheduled for 2013, but is anticipated to obtain advanced funding to allow for a 2011 or 2012 construction season. Construction is anticipated to begin in mid to late July and be completed by October of the same year, which will correspond to low water work windows and will minimize effects to adult and subadult bull trout. BMPs and minimization measures incorporated into the project are expected to reduce the level of anticipated take.

If incidental take anticipated by this document is exceeded, all project activities will cease and the Administration will immediately contact the Service to determine if consultation should be reinitiated. Authorized take will be exceeded if:

1. Suspended sediment exposure (concentration and duration) levels determined to have more than minor physiological effects to bull trout (i.e., turbidity levels greater than 25 NTUs above background levels for more than 3 hours) occur within 600 feet downstream of the new bridge; or

2. Deposited sediment extends further than 600 feet downstream of the new bridge; or

3. More than one bull trout are harmed or killed due to impingement on the picket weir fencing.

2.8.2 Effect of the Take

In the accompanying Opinion, the Service determined that this level of anticipated take is not likely to jeopardize the continued existence of the bull trout across its range.

The Columbia River population segment comprises 22 management units including the Salmon River management unit. This unit consists of 125 local populations within 10 core areas. Although this reach of Johnson Creek is not within a local population or potential local population, it is near the Riordan Creek and Trapper Creek local populations. The probability that the Project will eliminate either population is insignificant. Bull trout densities and distribution in Johnson Creek are not expected to be significantly altered. As the Project will not directly affect any designated local populations, it is highly unlikely that the proposed action would impair productivity or population numbers of bull trout in the Salmon River management unit or in the Columbia River population segment. Anticipated take may be reduced because the project includes BMPs and minimization measures to reduce adverse effects. Bridge replacement is expected to result in long-term improvements in bull trout habitat conditions.

2.8.3 Reasonable and Prudent Measures

The Service concludes that the following reasonable and prudent measures are necessary and appropriate to minimize the take of bull trout caused by the proposed action.

1. Minimize the potential for harassment to bull trout resulting from project-related sediment effects or the introduction of chemical contaminants.

2. Minimize the potential for harassment of bull trout at spawning habitat exclosure devices.

3. Minimize the loss or conversion of streambank and riparian habitat components.

2.8.4 Terms and Conditions

1.
   a. The Federal Highways Administration will take all measures necessary to ensure that sediment delivery into Johnson Creek from areas where fill material is stored, or in areas where material is disposed, does not occur. Appropriate use of sediment containment BMPs will be used on all off-site areas.

   b. All erosion and sediment control measures will be maintained until construction is complete and disturbed areas are stabilized.

2. Exclosures around Chinook spawning habitat will be checked regularly to ensure that they are functioning properly, are free of debris and are not impinging any bull trout. Exclosures will be designed to allow migrating bull trout passage (i.e. pickets will be assembled with adequate space to allow bull trout to move between pickets).

3. Maximize to the extent practicable the use of bio-engineering or soft armoring techniques, such as the use of root wads and vegetation mats, to stabilize streambanks where possible and consistent with engineering needs.

2.8.5 Reporting and Monitoring Requirement

In order to monitor the impacts of incidental take, the Federal agency or any applicant must report the progress of the action and its impact on the species to the Service as specified in the incidental take statement [(50 CFR 402.14 (i)(3)].

1. Upon locating dead, injured, or sick bull trout as a result of Project activities, such activities shall be terminated and notification must be made within 24 hours to the Service's Division of Law Enforcement at (208) 378-5333. Additional protection measures will be developed through discussions with the Service.

2. During project implementation promptly notify the Service of any emergency or unanticipated situations arising that may be detrimental for bull trout relative to the proposed activity.

2.9 Conservation Recommendations

Section 7(a)(1) of the Act directs Federal agencies to utilize their authorities to further the purposes of the Act by carrying out conservation programs for the benefit of endangered and threatened species. Conservation recommendations are discretionary agency activities to minimize or avoid adverse effects of a proposed action on listed species or critical habitat, to help implement recovery programs, or to develop new information on listed species. We recommend the following activities for this project:

1. Use native species for revegetating disturbed sites.

2. Inspect and maintain equipment to ensure no leakage of oil, fuel, or hydraulic fluid prior to conducting instream work.
3. Inspect equipment prior to commencement of construction activities to ensure equipment is free from noxious weeds (including contaminated soil and seeds) and free of aquatic invasive organisms.

2.10 Reinitiation Notice

This concludes formal consultation on the Johnson Creek Airport Bridge Replacement Project. As provided in 50 CFR §402.16, reinitiation of formal consultation is required where discretionary Federal agency involvement or control over the action has been maintained (or is authorized by law) and if:

1. The amount or extent of incidental take is exceeded.

2. New information reveals effects of the agency action that may affect listed species or critical habitat in a manner or to an extent not considered in this Opinion.

3. The agency action is subsequently modified in a manner that causes an effect to the listed species or critical habitat that was not considered in this Opinion.

4. A new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

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