United States Department of the Interior

Fish and Wildlife Service

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JUN 15 2011

Cecilia R. Seesholtz
Forest Supervisor
Boise National Forest
Lowman Ranger District
1249 South Vinnell Way, Suite 200
Boise, Idaho 83709-1663

Subject: Bear Valley Creek Chinook Salmon Abundance Monitoring Project—Valley County, Idaho—Biological Opinion
CONS-100b 14420-2011-F-0186

Dear Ms. Seeshotlz:

Enclosed are the Fish and Wildlife Service's (Service) Biological Opinion (Opinion) and concurrence with the Boise National Forest's (Forest) determinations of effect on bull trout (*Salvelinus confluentus*) and bull trout critical habitat, listed under the Endangered Species Act (Act) of 1973, as amended, for the proposed Bear Valley Creek Chinook Salmon Abundance Monitoring Project in Valley County, Idaho. In a letter dated May 26, 2011, and received by the Service on May 31, 2011, the Forest requested formal consultation on the determination under section 7 of the Act that the proposed project is likely to adversely affect bull trout. The Forest determined that the proposed project is not likely to adversely affect bull trout critical habitat.

The enclosed Opinion and concurrence are based primarily on our review of the proposed action, as described in your May 25, 2011 Biological Assessment (Assessment), and the anticipated effects of the action on listed species, and were 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) 384-5348 if you have questions concerning this Opinion.

Sincerely,

Russell L. Holder

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

Enclosure

cc: NOAA, Boise (Edwards)
Boise National Forest SO, Boise (Faurot)
Boise National Forest Lowman Ranger District, Lowman (Kidd, Brandt)
Shoshone-Bannock Tribe, Fort Hall (Denny)
COE, Boise (Martinez)

BIOLOGICAL OPINION
FOR THE
BEAR VALLEY CREEK CHINOOK SALMON ABUNDANCE MONITORING PROJECT

14420-2011-F-0186

June 2011

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

Supervisor Russell R. Holder

Date 6/14/11

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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 Bear Valley Creek Chinook Salmon Abundance Monitoring Project (Project) on bull trout (*Salvelinus confluentus*) and bull trout critical habitat. In a letter dated May 26, 2011 and received on May 31, 2011 the Boise National Forest (Forest) 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. The Forest determined that the proposed action is likely to adversely affect bull trout. As described in this Opinion, and based on the Biological Assessment (Forest Service 2011, entire) developed by the Forest and other information, the Service has concluded that the action, as proposed, is not likely to jeopardize the continued existence of bull trout.

The Forest also determined the action is not likely to adversely affect bull trout critical habitat. In this Opinion, the Service is providing concurrence with that determination.

1.2 Consultation History

The Service, Forest and the Shoshone-Bannock Tribes (Tribes) representatives have had the following meetings regarding the project:

March 11, 2011	Initial draft Biological Assessment (Assessment) provided to the Service for review.
March 14, 2011	Agencies and Tribal representatives held a conference call to discuss components of the action and Assessment.
April 25, 2011	Agencies and Tribes met to review the draft Assessment. The Service provided comments to the Forest and the Tribe on the initial draft Assessment.
May 19, 2011	Project discussed and draft Assessment reviewed at the May Level 1 team meeting.
May 20, 2011	The Forest provided a revised draft Assessment to the Service for review.
May 24, 2011	The Service transmitted comments on the draft Assessment to the Forest.
May 31, 2011	The Service received the Final Assessment and the Forest requested consultation.
June 7, 2011	The Service provided the draft biological opinion to the Forest for review.

1.3 Informal Consultations

1.3.1 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). Bear Valley Creek is included in that designation.

The Service concurrence that the Project will not likely adversely affect bull trout critical habitat is based on information provided in the Assessment. Potential impacts from project activities on the primary constituent elements (PCEs) of bull trout critical habitat may occur when sediment is released during placement, operation and removal of the weir and screw trap. There is slight chance that sediment deposited on substrate downstream of the project may impact benthic macroinvertebrates (PCE #3) in the vicinity of the Project and temporarily degrade water quality (PCE #8), but effects would be insignificant. Other potential mechanisms of effect for PCE #8 that were identified include the potential for chemical contaminants or fuel entering the water. Project design features are included, such as proper fuel and equipment storage at the designated campsite, emergency spill containment kits, the use of existing facilities to limit new impacts, and using wood chips to reduce impacts on pathways to the water, avoid or minimize the potential for impairment of the PCE.

The weir will pose a partial temporary barrier to migration (PCE #2), but will not block upstream or downstream movement of bull trout. The weir will be in place typically from June till early September and bull trout in the vicinity of the weir would have to navigate through the fish counting chamber, or smaller fish can move through the pickets, to migrate up Fir Creek. Effects to the PCE #2 would be insignificant.

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 in Bear Valley Creek, a tributary to the Middle Fork of the Salmon River. The fish counting station, rotary screw trap, campsite, and staff gage will be located below Fir Creek, at or adjacent to Fir Creek Campground on the Lowman District of the Boise National Forest. This site is within the Fir Creek 6th field hydrologic unit and is the same site used for the Bear Valley weir and salmon counting station in 2010.

The 2010 fish counting station site proved to be a suitable location for monitoring adult Chinook salmon escapement. When identifying sites for the fish counting station the following criteria were used: 1) suitable location for installing a temporary picket weir (e.g. water depth, water width, water velocity, substrate, riparian habitat); 2) location in relation to the Chinook salmon spawning areas and observation probability; 3) area use by the general public for fishing, hunting, floating/ boating, hiking, and camping; and 4) not a culturally significant area.

The rotary screw trap will be installed within 100 meters (m) of the fish counting station adjacent to Fir Creek Campground. This location will provide an ability to effectively enumerate juvenile production and emigration. The suitability of this location for operating a rotary screw trap throughout the season is unknown and therefore 2011 will be a "test year." If the 2011 site does not provide a suitable location, the Tribes will document the reasons why and work towards permitting at the "preferred" location.

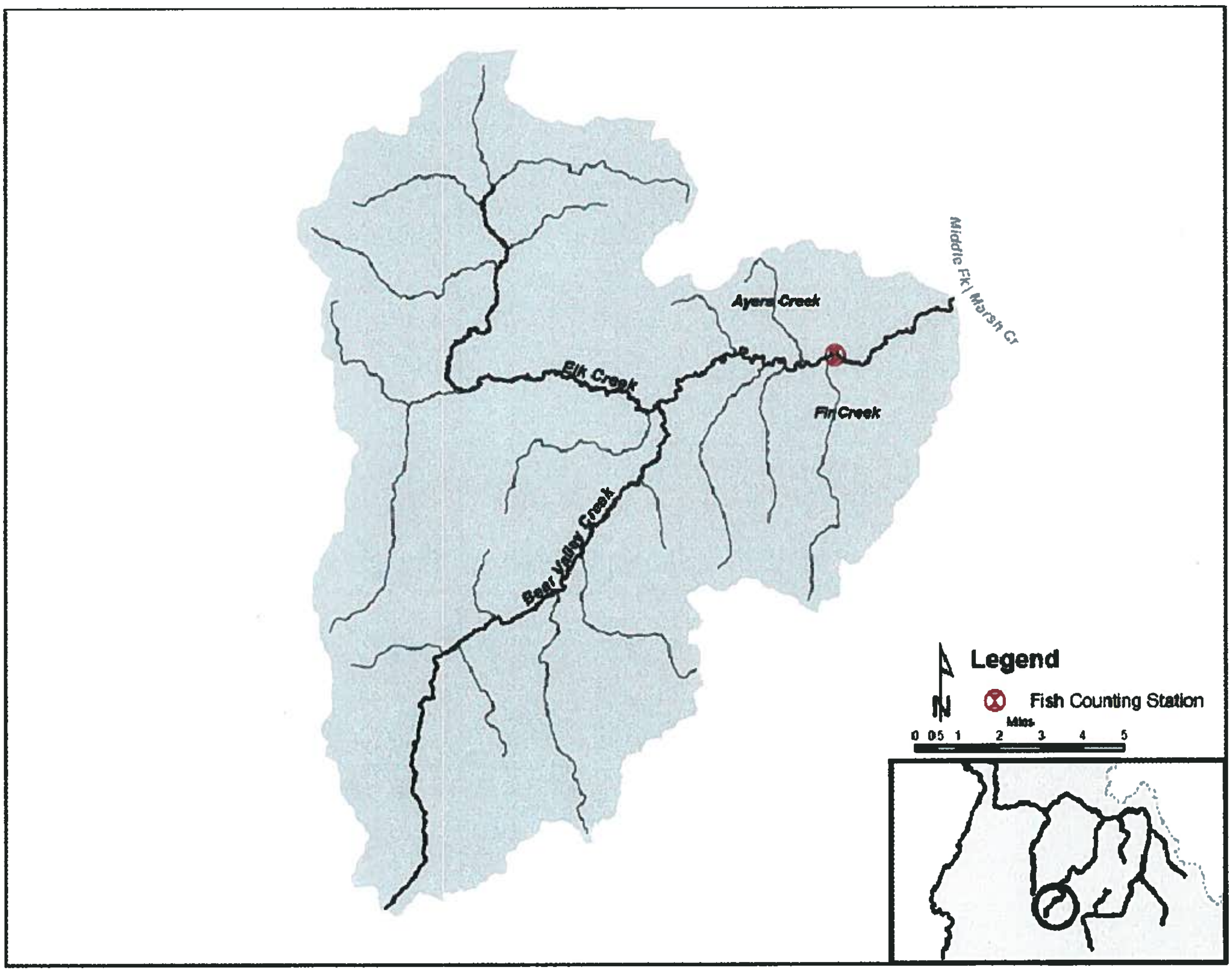

Figure 1. Project area location

2.1.2 Proposed Action

2.1.2.1 Overview

The key components of the Project are described in detail in the Assessment (Assessment, pp. 8-15). The Forest plans to issue a 10 year Special Use Permit to the Tribes which will authorize them to install and operate a weir and screw trap on Bear Valley Creek to evaluate a natural population of spring Chinook salmon in order to establish a long-term salmonid population data set. Information gathered during the study can be used to detect changes in abundance, productivity (survival), spatial structure (distribution), and genetic diversity (genetic and life history) in Chinook salmon. Although the Project is designed to study Chinook salmon, the Tribes will collect data on bull trout that can then be used to further our understanding of bull trout abundance and movement activity in Bear Valley Creek. The two main study components of the Project, briefly described below, include a fish counting station and a rotary screw trap. In addition, staff will be residing in a wall tent and trailer at the established Fir Creek Campground on the Boise National Forest.

Fish Counting Station

The fish counting station (Figure 2) components include a tri-pod supported temporary picket weir, fish counting chamber, underwater camera, and passive integrated transponder (PIT) tag array.

The picket weir consists of two sets of twenty-four tripods spanning the river in an X-shape. Tripods are weighted by attaching plastic buckets (5 gallon capacity) filled with river water to the tripod's center eye bolt. One weir panel is placed in front of two tripods and linked other panels by steel pickets; this forms the weir. Each panel is leveled and chained to the tripods. Pickets are then inserted through pre-drilled holes in the panels (approximately 65 per panel). The fish counting chamber is then anchored to the weir transitions on the upstream and downstream "V" of each weir wing. The weight of the tri-pods and counter weights prevent the weir from moving thus alleviating the need for temporary fills such as sand or gravel filled bags or use of native stream bed material to hold the weir in place. The weir guides fish to a gap which houses the fish counting station.

Figure 2. Fish counting station tripods, pickets, panels and counterweights.

The fish counting chamber is attached to the picket weir and is located in the river thalweg, which is the preferred migration route for salmon. The entrance of the fish counting chamber is 0.8 m x 0.8 m. There are two sides in the fish counting chamber, separated by a Plexiglas window. The open compartment allows fish passages to be recorded by the underwater video camera (Figure 3), which is housed in the closed compartment. The digital video recorder is programmed to record 8 fields per second. Date and time of day overlap on recorded video image is standard. The digital video recorder is stored in a weatherproof overcase with D-ring silicone gasket and all appropriate sealed jacks. The video system is powered with one set of six 6-volt DC – 220 amp/hour golf cart batteries. All six batteries are linked to each other to provide 12-volt power and charged with a generator located in the 5th wheel trailer. The batteries are charged with a three stage computer controlled triple bank weatherproof marine grade charger with individual status lights for each pair of six volt batteries.

The setup is completed with safety equipment including an eyewash station with a minimum of two 1 Liter (L) bottles of eyewash solution supplied with acid resistant gloves and splash resistant goggles. The digital video recorder, handheld monitor, batteries and safety equipment will be placed in the cargo trailer at the Fir Creek Campground.

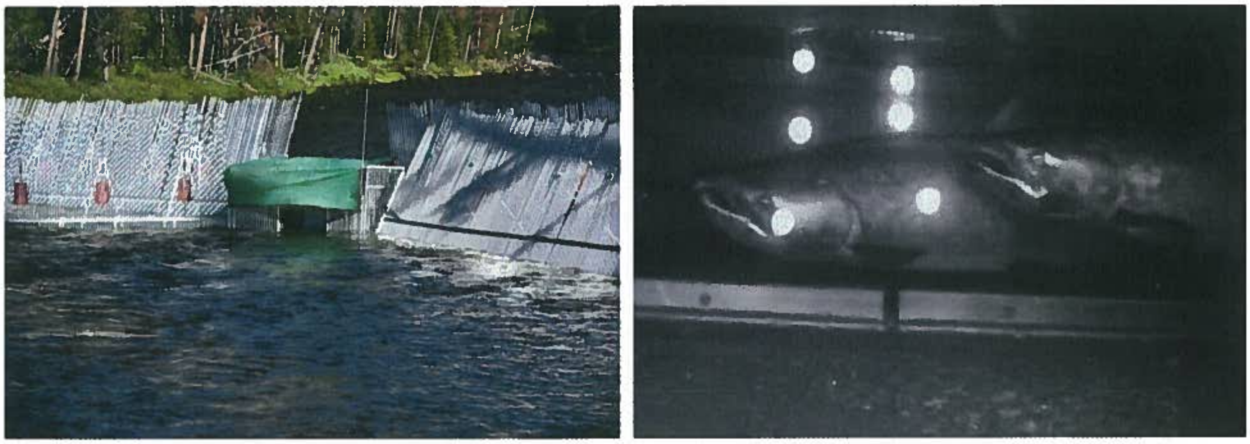

Figure 3. Bear Valley Creek fish counting chamber and two adult Chinook salmon.

The PIT tag array will be located on the entrance and exit of the fish counting chamber to enumerate any PIT tagged fish that pass the device or attached to the steam substrate directly in front of and behind the fish counting chamber. The in-stream detection system will consist of a tandem array, deployed serially. The array may include standard site monitoring equipment including: air and water temperature probes, and a water pressure transducer to monitor stream level. Electrical power is provided by portable batteries, already in-place to power the underwater video equipment and may be attached to a remote communication provided by a satellite modem.

Rotary Screw Trap

The Tribes plan to install a rotary screw trap in Bear Valley Creek for the purposes of enumerating, tagging, and tissue sampling migrating juvenile Chinook salmon. Juvenile migration occurs year around, with peak emigration occurring in the spring and fall, associated with the smolt and pre-smolt life stages.

The rotary screw trap will be installed in the spring and removed in the fall, pending conditions. We anticipate the period of operation to be from April 1 – November 30. In 2011, the Tribes will install the trap as soon as all permits are acquired, which will likely be in June. The trap will be operated through the fall and removed from the river as soon as ice prevents the trap from functioning properly. Once this occurs, the trap will be removed and stored on-site under a large tarp.

The rotary screw trap (Figure 4) is a temporary floating structure that measures 15 feet (ft) length (l) x 6.5 ft width (w) x 3 ft depth (d) and consists of two floating pontoons (15 ft x 1.5 ft), a rotating cylindrical corkscrew cone, and a live box (2.5 ft l x 2.5 ft w x 1.5 ft d). The rotary screw trap is attached to a 2 inch steel cable drag line, hooked to temporary anchors (e.g., trees, rocks, duckbill, etc) on each side of the river; a pulley system is attached to move the rotary screw trap within the river channel. The rotary screw trap is set to operate in or near the stream thalweg with the conical cylinder facing upstream. The conical cylinder rotates with stream flow and captures and funnels all downstream migrants into the fish holding tank. If depth becomes inadequate, the screw trap will be adjusted and/or relocated to continue juvenile data collection. Small substrate (e.g., cobble, small boulders) under the trap cone will be moved by hand to acquire enough depth to allow trap operation; only the necessary amount of substrate will be manipulated in the channel thalweg. We expect the maximum amount of substrate moved to have dimensions of 12 ft l x 8 ft w x 1 ft d. Manipulated substrate would remain within the stream channel.

On a daily basis, the live box on the screw trap will be emptied when the sunlight shines on the river. Evident non-target species will be enumerated, recorded, and released directly downstream of the trap. Bull trout will be properly anesthetized, measured and tissue sampled and allowed time to recover to normal fish activity prior to releasing.

Figure 4. Example of rotary screw trap installed in the Yankee Fork Salmon River.

On-Site Camping

The Tribes plan to have on-site housing and workstation in place during the Project operations. The yurt or wall tent will provide on-site lodging and a condensed work station for rotary screw trap operations in the spring period. The yurt or wall tent will not exceed 20 ft x 20 ft in dimension and will be erected at the identified campsite.

A 5th wheel trailer and cargo trailer will be transported to Fir Creek Campground in June, coinciding with the installation and operation of the fish counting station. The 5th wheel trailer is approximately 29 ft x 10 ft and provides living quarters for all staff working on the Project. The cargo trailer is approximately 14 ft x 7 ft and provides a workstation for staff working on the fish counting station and rotary screw trap.

The 5th wheel trailer will remain at Fir Creek Campground from June 1 through October 31. The cargo trailer will remain at Fir Creek Campground from June 1 – November 30, or whenever the rotary screw trap is dissembled. Once the 5th wheel trailer is gone, staff will travel to the monitoring site on a daily basis to operate the rotary screw trap. Ultimately, the cargo trailer will allow the Tribes to protect valuable equipment and keep the campsite organized. The cargo trailer will be located adjacent to the 5th wheel trailer at the 2010 project site.

2.1.2.2 Project Design Features

The Project is designed to limit disturbance on the fish populations to the maximum extent possible. All fish will be processed in a timely manner in appropriate workstation facilities that are proven by the Shoshone-Bannock Tribes to be very effective.

To limit the possibility of petroleum based product from reaching streams during project activities, these measures will be followed: A spill containment kit (the size of which commensurate with the amount of fuel) must be readily available in the event of a fuel spill when operating equipment. Fuels shall be stored and fuel servicing will take place at the designated campsite in a spill containment kit; spill containment kit must be able to hold 1 ½ times the stored volume. All equipment shall be in good repair and free of leakages of lubricants, fuels, coolants and hydraulic fluids. Generators shall be placed in spill proof containment basins for the duration of the project.

To limit the amount of sediment entering Bear Valley Creek, any pathways to the weir or rotary screw trap from the streambank will be hardened. Examples of hardening materials are wood chips or gravel (1+ angular rock). Vegetation removal shall be minimized to the extent possible to provide for sediment filtration and full riparian function.

Project will use existing facilities (e.g. outhouse, existing roads, paths, campground) as much as possible to limit human impacts at the project site.

2.2 Analytical Framework for the Jeopardy Determination

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.

2.3 Status of the Species

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 Clearwater 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 Middle Fork Salmon River Core Area

The Middle Fork Salmon River Core Area includes 28 local populations (Fish and Wildlife Service 2002d, p.17). It includes the entire Middle Fork Salmon River drainage, most of which is in the Frank Church River of No Return Wilderness. The southern boundary is in the headwaters of Bear Valley Creek; the mountains to the north of Big Creek form the northern boundary. The eastern boundary follows the high peaks to the west of Panther Creek and the Main Salmon River, McElney Mountain and Twin Peaks. The area encompasses 7,404 square kilometers (2,860 square miles) and includes 5,712 kilometers (3,550 miles) of streams. The Service, in the bull trout 5-year review (Fish and Wildlife Service 2008, p. 34), ranked this core area as being at "Low Risk" of extirpation.

2.3.1.5 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).

2.4 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 Status of the Bull Trout in the Action Area

The Middle Fork Salmon River Core Area includes 28 local populations (Fish and Wildlife Service 2002d, p. 17). Within the Bear Valley Local Population, there are four 6th field hydrologic units (HU) that are considered occupied spawning and rearing habitat "patches" for bull trout (see Figure 5 below). Project activities will take place in Bear Valley Creek which is within the Fir Creek Patch and provides foraging, migratory and overwintering habitat. Based on 2007 sampling conducted by the Forest, they estimate the bull trout population in the Fir Creek Patch at 262 fish – or 64 bull trout per mile with a juvenile:adult ratio of 2:1 (Assessment, p. 29). This is based on surveys conducted on 4.1 miles of occupied spawning and rearing habitat in the Fir Creek patch. The estimate does not indicate a clear population trend.

Bull trout in the Bear Valley local population are well connected to other local bull trout populations in the Middle Fork Salmon River Core Area (Assessment, p. 29). This connectivity is important because it could allow for re-colonization or recovery in case a short term disturbance occurs in one of the patches. Brook trout are present in the Fir Creek HU and hybridization or displacement by brook trout is likely occurring (Assessment, p. 30).

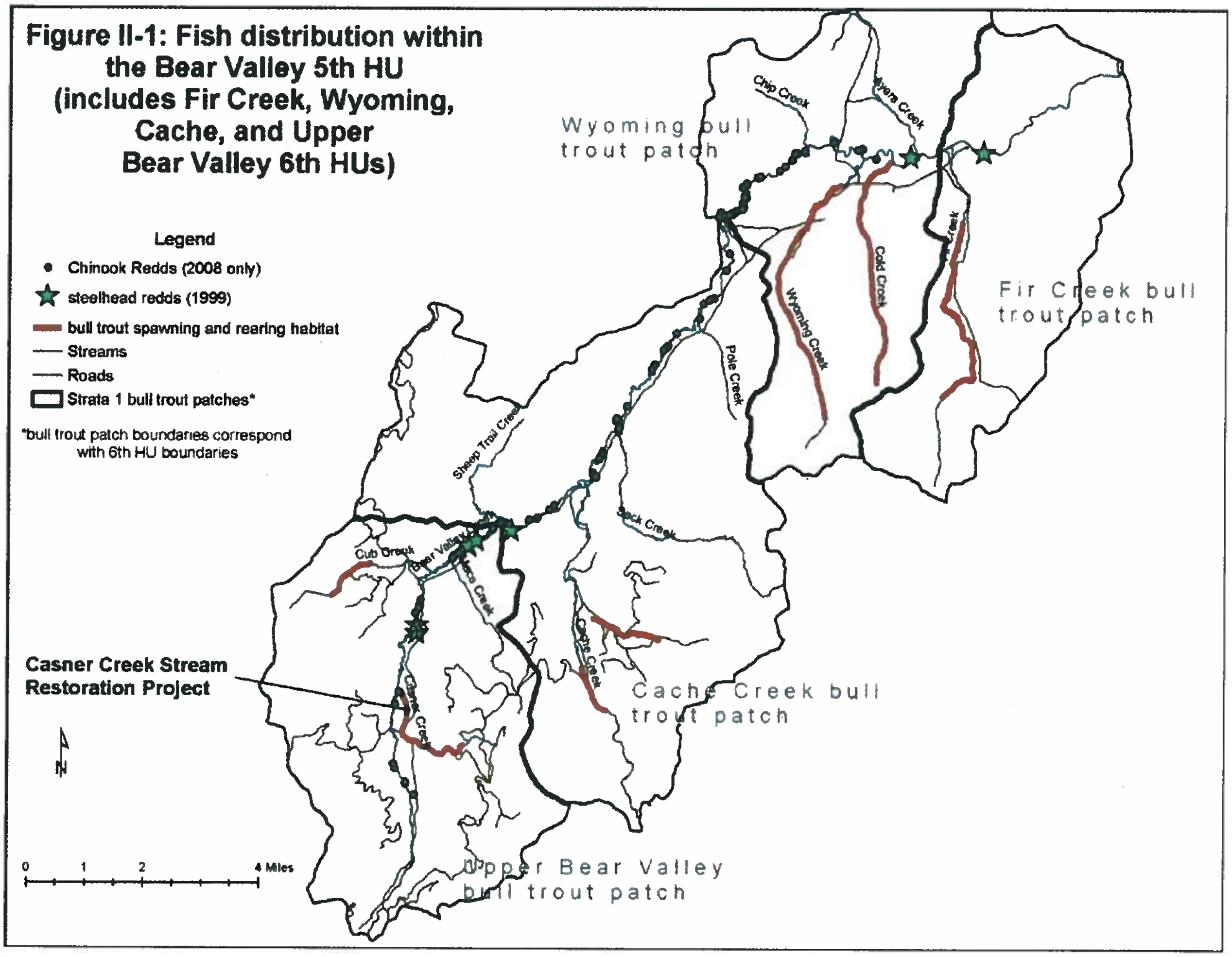

Figure 5: Bull trout spawning and rearing habitat and fish distribution in the Bear Valley Subwatershed (map incorporated from the Casner Creek stream restoration biological assessment).

2.4.2 Factors Affecting Bull Trout in the Action Area

Three of the four patches within the Bear Valley Watershed support moderately strong bull trout populations. Connectivity within Bear Valley Creek is relatively good for all life stages of bull trout. However, high stream temperatures during summer months in Bear Valley Creek likely pose a thermal barrier to bull trout, affecting population connectivity.

Historically, livestock grazing in Bear Valley Creek contributed sediment to the stream, eroded streambanks, and resulted in poor riparian condition. Livestock grazing, as of 2000, no longer occurs in Bear Valley Creek, and the area has been recovering from those impacts. Due to the granitic geology of the area, however, Bear Valley Creek typically contains relatively high levels of background sediment. Bear Valley Creek is on Idaho's 2008 integrated 305(b) report as not supporting cold water aquatic life use and is 303(d) listed: Sediment/siltation and water temperature are the pollutants of concern.

In the Fir Creek subwatershed road density is relatively low (0.29 mi/mi^2) with 1.7 miles of roads within riparian conservation areas (Assessment p. 35). Riparian areas show some disturbance from past and ongoing land management activities, including road construction, dispersed recreation and developed recreation. In the past few years, the Forest has been actively trying to manage dispersed recreation in the area to limit the effects it has on stream habitat. The 2006 Red Mountain Fire burned 2,061 acres within the Fir Creek subwatershed, with most of the high intensity fire occurring in the upper Fir Creek drainage. Flows may be altered in the subwatershed until the vegetation is re-established.

Brook trout are present within the Fir Creek patch and pose a threat to genetic integrity of bull trout, and also compete with bull trout for space and prey.

2.5 Effects of the Proposed Action

Effects of the action considers 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 Direct and Indirect Effects of the Proposed Action on Bull Trout

After examining the effects discussion in the Assessment (pp. 18-24) and considering the minimization measures and project design features, the Service has determined that the main anticipated effects to bull trout from Project implementation are (1) direct disturbance from in-stream work (displacement); (2) temporary, insignificant effects from increased suspended sediment in Bear Valley Creek due to set up and operation of the weir; and (3) effects to bull trout from trapping and handling. Adult, subadult and juvenile bull trout may occur in the action area and may be subject to effects. While spawning does not occur in Bear Valley Creek, spawning does occur in tributaries and therefore there is potential for juvenile bull trout to be present in Bear Valley Creek. While the potential for effects to individual bull trout exists, no population level effects are expected.

Placement of tripod supports, weir panels, pickets, PIT tag array and screw trap will entail people walking in the stream and constructing/maintaining structures. This work will be completed by hand without the use of machinery. The general increase in human activities has the potential to disturb any bull trout in the vicinity and they may flush away from the disturbance. In the action area, however, Bear Valley Creek is fairly wide, over 50 feet, with workers only occupying a small section of the stream's cross-section at any given moment. Therefore, individual fish should readily avoid workers in-stream, easily relocating to other suitable habitat upstream or downstream from the project area. Considering this along with the short duration of in-water set-up, the effects of installation and maintenance via disturbance are considered insignificant.

Once the weir is constructed, bull trout may be delayed temporarily as they navigate to the opening in the weir. Effects from this temporary delay are also expected to be insignificant. In addition, the visual method to enumerate fish passing through the weir is non-intrusive and does not involve direct handling of listed fish. It is not expected to result in any direct effects to individual fish.

There is potential for suspended sediment and turbidity to be increased during weir construction. The weir and supports will be placed on the surface of the creekbed and their placement will not require any excavation of the streambed. Some rocks may be overturned during placement, but overall disturbance to the substrate will be minor and localized. Suspended sediment may also be increased by workers wading in the stream during installation, maintenance and removal of the weir. At times, substrate may need to be moved to increase flow to the screw trap. If this is needed, substrate material (i.e. cobbles and small boulders) will be moved to a different location near the screw trap. It is expected that the sediment plumes associated with these activities would be small, of short duration, and isolated to a very small portion of the river's cross-section at any given time. Low stream gradient combined with larger substrate should effectively limit the amount of sediment suspended as a result of in-stream work. Since no clearing of riparian vegetation will be required to install the weir and screw trap, no additional sediment is expected to be contributed from outside the active channel. Sediment generated as a result of the Project is not expected to reach levels likely to affect substrate composition in or downstream of the project area. The effects to bull trout from potential slight increases in sediment and turbidity are expected to be insignificant.

Juvenile screw trap fish collection, handling, and relocation activities may result in direct adverse effects. As described in the Assessment (pp. 22-23), these activities may disrupt normal behavior in the short term, and in some instances cause injury or mortality. Because bull trout have resident-stream life history forms, both juveniles and adults could experience effects. Individual bull trout are subject to potential injury when trapped and subsequently handled and released. These include stress, tissue damage, bruising, exposure to chemicals, predation and infection from wounds. A similar project and design in Yankee Fork conducted by the Tribes has recorded 0.15 percent mortality to listed species in 2 years of operation (Assessment, pp. 22). Similarly, the Nez Perce tribe has operated juvenile screw traps for many years throughout the Clearwater River and Salmon River drainages with very low injury and mortality rates.

Injury or mortality that may occur as a result of the operation of the screw trap and fish handling are regulated by the Idaho Department of Fish and Game's (IDFG) scientific collection permit program. The Tribes must obtain a scientific collection permit and comply with its requirements. To avoid and minimize adverse effects to bull trout, the Tribes must adhere to all conservation measures in their scientific collection permit relating to the capture and handling of bull trout. Incorporating IDFG direction will minimize stress, mortality, and competitive effects. The Service has already analyzed the effects to bull trout from this activity and consulted on this permit at a programmatic level (Fish and Wildlife Service 2000, pp. 5-10).

In summary, effects to bull trout from the Project due to direct disturbance from in-stream work and subsequent increased suspended sediment and turbidity are insignificant. Effects to bull trout from trapping and handling have been consulted on under the Idaho Department of Fish and Game Scientific Collection Permit program and therefore will not be considered further herein (Fish and Wildlife Service 2000, entire).

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.

2.6 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 Bear Valley 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.

Although cumulative effects can be identified, we cannot quantify the magnitude of their impacts on bull trout populations. We do not expect cumulative effects to appreciably alter the existing baseline condition in the action area during the short lifetime of the project.

2.7 Conclusion

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 continued existence of the species. Apart from the effects associated with screw trap operation, all other Project effects are expected to be insignificant. We have already addressed the effects of screw trap and other collection methods in our 2000 Biological Opinion (Fish and Wildlife Service 2000, entire) and concluded that these activities were not likely to jeopardize the coterminous population of bull trout.

Project implementation is expected to provide long-term benefits to bull trout in Bear Valley Creek as more data becomes available to inform management decisions and recovery activities.

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.

Implementation of the proposed action may result in project-related take associated with juvenile screw trap operations. This take has already been anticipated and analyzed in the Service's Biological Opinion for the Idaho Department of Fish and Game's Scientific Collecting Permit (Fish and Wildlife Service 2000, entire) and will not be addressed further in this Opinion. We do not expect any other take from Project implementation.

2.9 Reinitiation Notice

This concludes formal consultation on the Bear Valley Creek Salmon Abundance Monitoring 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.

3. LITERATURE CITED

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