United States Department of the Interior

U.S. Fish and Wildlife Service

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AUG 2 0 2012

Memorandum

To: Manager, Cottonwood Field Office, U.S. Bureau of Land Management, Cottonwood, Idaho

From: State Supervisor, Idaho Fish and Wildlife Office, U.S. Fish and Wildlife Service, Boise, Idaho

Subject: Bally Mountain Vegetation Management Project—Idaho County, Idaho—Biological Opinion
In Reply Refer to: 01EIFW00-2012-F-0203 Internal Use: CONS-100b

Enclosed are the U.S. Fish and Wildlife Service's (Service) Biological Opinion (Opinion) and concurrence on the U.S. Bureau of Land Management's (Bureau) determinations of effect on species listed under the Endangered Species Act (Act) of 1973, as amended, for the proposed Bally Mountain Vegetation Management Project (Project). In a letter dated April 19, 2012 and received by the Service on April 23, the Bureau requested formal consultation on the determination under section 7 of the Act that the proposed Project is likely to adversely affect the bull trout (*Salvelinus confluentus*) and its critical habitat. The Bureau determined that the Project is not likely to adversely affect the Canada lynx (*Lynx canadensis*). The Bureau determined that the Project will have no effect on MacFarlanes's four-o'clock (*Mirabilis macfarlanei*), Spalding's catchfly (*Silene spaldingii*), and the northern Idaho ground squirrel (*Spermophilus brunneus brunneus*). For candidate species, the Bureau determined that the Project will have no impact on the yellow-billed cuckoo (*Coccyzus americanus*), the North American wolverine (*Gulo gulo luscus*), and the whitebark pine (*Pinus albicaulis*). The Service acknowledges these no effect and no impact determinations.

The enclosed Opinion and concurrence are based primarily on our review of the proposed action, as described in your April 2012 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 Project will not jeopardize the survival and recovery of the bull trout, and will not destroy or adversely modify bull trout critical habitat. A complete record of this consultation is on file at this office.

Clean Water Act Requirement:

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 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 Opinion.

Thank you for your continued interest in the conservation of threatened and endangered species. Please contact Clay Fletcher at (208) 378-5256 if you have questions concerning this Opinion.

Attachment

cc: NOAA, Moscow (Ries)
IDFG, Lewiston (Hennekey)
COE, Boise (Phillips)

BIOLOGICAL OPINION
FOR THE
BALLY MOUNTAIN VEGETATION MANAGEMENT PROJECT

01EIFW00-2012-F-0203

AUGUST 2012

U.S. FISH AND WILDLIFE SERVICE
IDAHO FISH AND WILDLIFE OFFICE
BOISE, IDAHO

Supervisor Russell R. Holder for Brian T. Kelly

Date AUG 2 0 2012

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1. BACKGROUND AND INFORMAL CONSULTATION

1.1 Introduction

The U.S. Fish and Wildlife Service (Service) has prepared this Biological Opinion (Opinion) on the effects of the Bally Mountain Vegetation Management Project (Project) on the bull trout (*Salvelinus confluentus*) and its critical habitat. In a letter dated April 19, 2012 and received April 23, the U.S. Bureau of Land Management, Cottonwood Field Office (Bureau) requested formal consultation with the Service under section 7 of the Endangered Species Act (Act) of 1973, as amended, for its proposal to implement the action. The Bureau determined that the proposed action is likely to adversely affect the bull trout and its critical habitat. As described in this Opinion, and based on the Biological Assessment (USBLM 2012, entire) developed by the Bureau, and other information, the Service has concluded that the action, as proposed, is not likely to jeopardize the continued existence of the bull trout or destroy or adversely modify bull trout critical habitat.

The Bureau has also determined the action is not likely to adversely affect the Canada lynx (*Lynx canadensis*). In this document, the Service is providing concurrence with this determination.

1.2 Consultation History

The Service and the Bureau have had the following communication and coordination on the Project.

July 18, 2011:	The Service received an email from the Bureau with maps and a description of the preferred alternative attached.
October 4, 2012	The Service participated in a conference call with the Bureau and U.S. NOAA Fisheries Service (USNOAA) to discuss a draft Assessment received from the Bureau via email on the same day.
January 31, 2012	The Service participated in a conference call with the Bureau and USNOAA to discuss the draft Assessment received from the Bureau via email on January 30, 2012.
February 21, 2012	The Service participated in a conference call with the Bureau and USNOAA to discuss a draft Assessment received from the Bureau via email on the same day.
February 24, 2012	The Service participated in a conference call with the Bureau and USNOAA to discuss the draft Assessment received from the Bureau via email on February 24, 2012.
February 26, 2012	The Service received a revised draft Assessment from the Bureau via email. The revised Assessment contained rational supporting changing the

	effects determinations from "not likely to adversely affect" to "likely to adversely affect."
February 29, 2012	The Service sent comments on the draft Assessment to the Bureau via email. The Bureau responded back via email with a discussion on the rationale for the effects determinations.
March 9, 2012	The Service received an email from the Bureau with a revised draft Assessment attached.
March 27, 2012	The Service participated in a conference call with the Bureau and USNOAA to review the latest version of the draft Assessment received from the Bureau on the same day via email.
April 3, 2012	The Service received an email from the Bureau with a revised draft Assessment attached. The revised draft Assessment incorporated comments from the conference call held on March 27.
April 13, 2012	The Service sent an email to the Bureau with a few comments on the draft Assessment included. We stated agreement with the contents of the Assessment and effects determinations once the Bureau had addressed our comments.
April 23, 2012	The Service received the final Assessment and request for formal consultation from the Bureau.
July 2, 2012	The Service sent an early draft Opinion to the Bureau, via email, for initial review and clarification.
July 25, 2012	The Service sent a final draft Opinion to the Bureau, via email, for final review.
August 6, 2012	The Service received comments on the draft Opinion from the Bureau via email.

1.3 Informal Consultations

The Bureau proposes timber harvest on 630 acres, prescribed burning on 798 acres, permanent and temporary road construction, road decommissioning and riparian/wetland restoration within a 2,938 acre project area located in the Little Salmon River subbasin. The project area is within a designated Wildland Urban Interface or WUI. Refer to the Assessment (pp. 26-32) and section 2.1 of this Opinion for a complete Project description.

1.3.1 Canada Lynx

Service concurrence that the Project is not likely to adversely affect the Canada lynx is based on the following rationales supporting our conclusion that effects will be insignificant and/or discountable.

1. The Project is located within the Hazard Creek Lynx Analysis Unit (LAU). The majority (over 99 percent) of the suitable and potential lynx habitat within this LAU occurs on

U.S. Forest Service administered lands. Therefore the Project has very little potential to significantly impact lynx habitat in the LAU.

2. The Project will affect five acres of denning habitat and 25 acres of foraging habitat. This represents approximately 0.5 percent of the suitable lynx habitat within the LAU, and is not expected to affect connectivity between suitable habitat within the LAU and between LAUs.
3. Riparian restoration, road closures, and decommissioning will benefit lynx by maintaining/improving connectivity within and between suitable lynx habitat and LAUs. Riparian Conservation Area (RCA) buffers will protect suitable habitat and travel corridors in these areas.
4. There have been no documented lynx sightings in the Little Salmon River subbasin, therefore the risk of disturbing lynx during Project work activities is discountable.
5. Because the project area occurs within a WUI, some fuel treatments of suitable lynx habitat may occur, even if habitat thresholds have been exceeded. The Approved Cottonwood Resource Management Plan (RMP) (USBLM 2009, Volume III, V-47) provides guidance when the 30 percent unsuitable habitat threshold is exceeded and fuel projects occurring within a WUI have the potential to contribute additional acreage that are unsuitable. The cumulative total of fuel treatment projects that do meet the vegetation standards shall not exceed 6 percent of mapped lynx habitats within the LAU, and this project will not result in this standard being exceeded. Over 99 percent of the suitable lynx habitat within the LAU does not occur within the WUI area, and no fuel treatments are proposed in these areas.

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 Bureau proposes to conduct vegetation treatments on 1,444 acres of Bureau lands located south of Pinehurst, Idaho. Some private lands within the project area have been identified for prescribed burning. The Project area is encompassed by three 6th field HUCs: Round Valley Creek-Little Salmon River (Little Salmon River), Hard Creek, and Hazard Creek. The action area includes 4.9 miles of the Little Salmon River, and 2.5 miles of Hazard Creek and Hard Creek (Figure 1).

The Project area is within the Wildland Urban Interface (WUI) as identified in both the Idaho and Adams County Community Wildland Fire Protection Plans. There are several private homes and other structures scattered along the bottom of the slope, with additional opportunities for development at mid-slope locations.

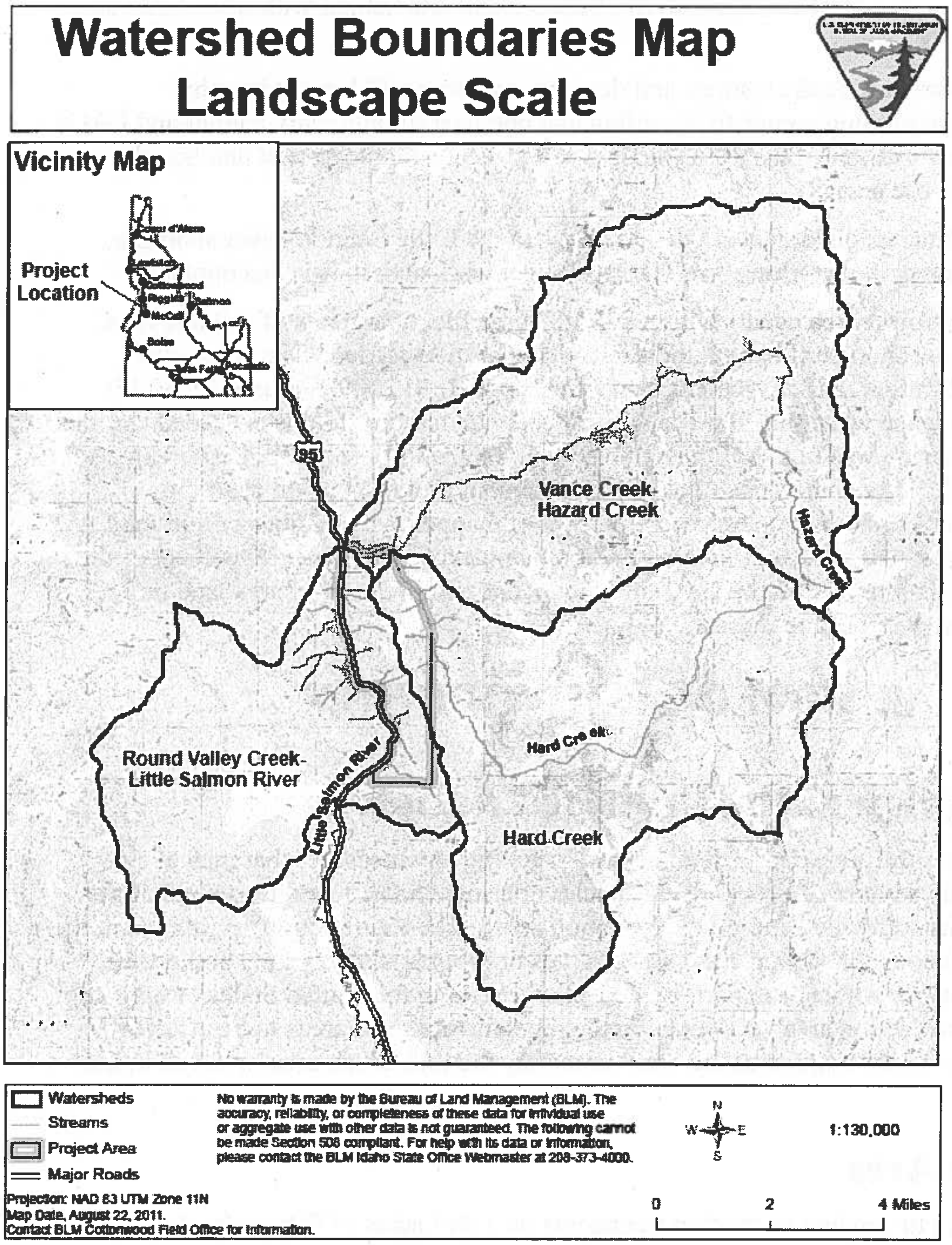

Figure 1. Project area and associated watersheds (from Assessment Map 1).

2.1.2 Proposed Action

This Project proposes to reduce surface fuel loading and ladder fuels in the WUI and open timber stands along prominent ridges and existing road systems to provide opportunities for suppression actions in the event of future wildfires. Where mechanical treatments are not feasible, prescribed fire will be used to meet Project objectives. This Project will promote stands of fire-resistant ponderosa pine (*Pinus ponderosa*), western larch (*Larix occidentalis*), and healthy Douglas-fir (*Pseudotsuga menziesii*), and restore stands of old growth ponderosa pine. Forest stands will be made more resilient to insects and disease through a combination of stocking control and sanitation. Returning fire as a disturbance agent to the landscape will maintain these open conditions and return this area to a frequent low-severity fire regime.

In addition to vegetation treatments the Project includes road closures, maintenance and decommissioning, as well as riparian/wetland restoration (Table 1).

The Bureau will implement the Project over a 10 year period beginning in 2013. It is expected that mechanical timber harvest, road work, road decommissioning, and riparian/wetland restoration will occur and be completed within 1 to 5 years and prescribed burning will occur and be completed within 1 to 10 years. This timeline is for the initial prescribed burn treatments. Repeat burning will occur every 15 to 20 years as described below.

Table 1. Summary of proposed Project activities.

	Proposed Activity	Amount of Treatment
Acres of Treatment	Thinning	429.22
	Uneven-aged	36.066
	Irregular shelterwood	122.42
	Seed tree w/ reserves	42.81
	Tractor yard/excavator pile or biomass utilization/burn	291.01
	Cable yard/burn	238.45
	Helicopter yard/burn	101.03
	Prescribed burn only	798.44
	Riparian/Riparian Conservation Area (RCA) restoration	15.39
	TOTAL acres treated	**1,444.32**
Miles of Treatment	Road closure	10.9
	Temporary road	1.37
	Permanent road	0.15
	Major Reconstruction	0.11
	Minor Reconstruction BLM	10.97
	Minor Reconstruction Private	0.68
	Road decommission	7.7
	TOTAL miles treated	**31.88**

The Project is described in more detail in the following sections which is excerpted from the Assessment (with minor modifications for clarity and consistency). Refer to the Assessment for a complete description of the Project.

Timber Harvest

The Bureau is proposing to mechanically treat approximately 631 acres followed by prescribed burning to reduce the slash. Mechanical treatments will be primarily of two types, intermediate and regeneration harvest methods. Intermediate, in this case low thinning (the removal of trees from lower crown classes or canopy layers) is used to modify the growth, quality, vigor, composition, or structure of a stand. Regeneration harvest methods include shelterwood, seed-tree, and uneven-aged harvest methods.

Mechanical treatments will include 429 acres of thinning from lower crown classes or canopy layers, 122 acres by irregular shelter wood, 36 acres of uneven-aged management, and 43 acres of seed tree cut with reserves. These treatments will be accomplished by commercial logging using tractor (291 acres), 238 acres of cable, and helicopter (101 acres) yarding methods. Tractor skidding will not be used on sustained slopes greater than 40 percent.

Prescribed Fire

In addition to slash treatments, prescribed fire will be applied to the Project area to reduce surface and ladder fuels on approximately 798 acres, including private property within the Project area. Of the 798 acres, 109 acres will be in old growth stands. A low to moderate severity underburn will be used to gradually reduce the surface fuel loading over multiple applications with minimal damage to the trees the Bureau wishes to retain. By expanding prescribed burn treatment onto private land, the proposed action will help to reduce hazardous fuels closer to homes, as well as enhance the feasibility of safer and more effective control of prescribed burn treatments by utilizing existing roads, ridges, and drainages. The methods of prescribed burning that will be used to accomplish fuel load reduction include (1) underburning of natural fuel accumulations and slash fuels from logging activity and (2) machine pile burning for activity created fuels. Prescribed burn treatments will be revisited every 15-20 years as needed to maintain desired fuel loadings, which will require as needed appropriate environmental analysis and Section 7 consultation.

Roads

Under the Bureau's Resource Management Plan (RMP) for the Cottonwood Field Office, designated existing roads in the Project area include approximately 5.1 miles that are open yearlong to public motorized use and 3.2 miles closed yearlong to public motorized use; 15.3 miles of recently inventoried road is considered by default closed to yearlong public motorized travel. The proposed action includes the alteration of some route designations. Upon completion of the proposed vegetation treatments, 5.0 miles of existing road will be open to motorized use yearlong, 10.9 miles of existing road will be closed to motorized use, and 7.7 miles of existing road will be decommissioned. The proposed action will require construction of about 800 feet of permanent road and 1.37 miles of temporary road. Approximately 300 feet of the permanent road construction will include construction activities (including one ford crossing) that occur within the RCA of a small perennial non-fish bearing stream. Approximately 580 feet of existing road will need major reconstruction. Major road reconstruction will include activities that will potentially disturb the prism, fill, and cut of the road. Approximately 1,900 feet of the proposed road decommissioning will occur within RCAs.

Riparian Restoration

The proposed action includes restoration treatments on a four acre forest type wetland including weed control, seeding, decommissioning of roads adjacent to the pond/wetland, and planting riparian vegetation. Approximately 15 acres of restoration will occur in areas adjacent to the wetland/pond, which includes the RCA and adjacent lands.

Project Design Criteria

The following design criteria will be implemented to avoid or minimize potential negative impacts to resources of concern.

Soils and Water Resources

- No timber harvest will occur in areas of high landslide hazard. Modify (via site specific mitigation measure(s)) timber harvest or temporary road construction in areas of moderate landslide hazard with higher risk as needed to protect slope stability. Examples will include, but are not be limited to: modify basal area retention guides in harvest units as needed (leave more trees in designated sensitive areas, e.g., draw bottoms); require one-end suspension on cable logging; construct and apply mulch or slash on yarding corridors where bare soil is exposed; and manage tractor logging activities to limit detrimental soil disturbance.
- Restrict activities when soils are wet to prevent resource damage (indicators include excessive rutting, soil displacement, and erosion).
- Prescribed burning should be of low enough severity to insure adequate duff retention to limit surface erosion. Only light, low severity underburning is proposed on high landslide hazard areas.
- Construct slash filter windrows at the toe of fill slopes on newly constructed landings and roads concurrent with construction. Limit height of windrows to 3 feet. Provide breaks and limit length of windrow to allow easy passage of wildlife.
- Rocking and graveling the approach and departure of existing stream crossings will be done as needed to reduce road surface erosion. Priority stream crossings that will be rocked/graveled (minimum of 100 feet each side of stream crossing) include the following: (1) new permanent road stream crossing; and (2) perennial stream crossing located immediately south of Project area.
- Prepare and implement a Spill Prevention Control and Countermeasures Plan (40 CFR 112). Erosion control measures including removal of log culverts, and construction of temporary cross drains, drainage ditches, dips, or berms will be required on all temporary roads before operations cease annually.
- Scarify non-excavated skid trails and landings that are compacted or entrenched 3 inches of more.
- Scarify and re-contour excavated skid trails and landings to restore slope hydrology and soil productivity.
- All temporary roads will be scarified and decommissioned (re-contoured). Obliterated temporary roads will include seeding with desirable species. Large woody debris will be

placed on obliterated roads after seeding. As needed, weed free much will be used for erosion control. This will be completed within one year following the post-harvest activities.

- In the event of winter logging activities, snow plowing will maintain a minimum of two inches of snow on the road, leave ditches and culverts functional, side cast material will not include dirt and gravel, and berms will not be left on shoulder unless drainage holes are opened and maintained.
- Management activities within RCAs for the Little Salmon River, Hard Creek, and Hazard Creek watersheds will be conducted in accordance with the Cottonwood RMP, Action VR-1.1.4, page 24 and Appendix D, Aquatic and Riparian Management Strategy (USBLM 2009). Prescribed fire will not be ignited within RCA areas, but may back into these areas under conditions where fire intensity will be low and burning will not result in extensive reduction in canopy cover or exposure of bare soil in these RCA buffer areas.
- To mitigate the risk to channel stability, basal area retention in unit 6b[1] will be increased by either: (1) adjusting the unit boundary and reducing the total number of trees removed to maintain an Equivalent Clearcut Area (ECA) below 15 percent, or, (2) dropping unit 6b altogether.

Invasive, Non-Native Species

- Treat existing weed infestations along access roads prior to Project implementation.
- All off-road equipment must be cleaned of mud and debris before entering the treatment units.
- All rock used for road surfacing will be free of noxious weed seed. Borrow pits and stockpiles will not be used if it is determined they are infested with undesirable invasive plants.
- Disturbed areas should be inventoried for new weed introductions and treatment implemented one year (and preferably for two years) post Project.
- Necessary soil disturbance that removes desirable vegetation will be revegetated with a perennial seed mix consisting of at least five different species of which 50 percent by weight must be native species. No less than 1 lb. per acre of each species will be included in the mix. Mix is to be certified noxious weed free. Target areas will be permanent and temporary roads, firelines and any log landing areas. Mix will be broadcast applied at the target rate of 10-15 lbs per acre. Acceptable species include those listed in the Assessment (USBLM 2012, p. 31). Seeding should be accomplished the first fall or spring after disturbance.

[1] Unit 6b, located in drainage #4 as shown on Map 7 (Assessment, Appendix A) is of concern for proposed treatments. ECA was computed at 24 percent. There are three mapped landslides within the small tributary. Two of these landslides originated in areas with no previous timber harvest or roads. Referring to the map, this basin is drained by two intermittent channels. In 1997, a debris torrent occurred in the north channel upstream of a private residence. The channel stability of the north channel is rated as poor. Therefore, canopy cover reduction in the drainage area of this north channel could alter runoff patterns and increase the risk of additional debris torrents.

- All herbicide treatment will occur in accordance with and under the authority of the Coeur d'Alene District Programmatic Noxious Weed Control Environmental Assessment Number ID060-94-05 or subsequent analysis for the noxious weed program.

Wildlife

- Retain snags and snag replacement green trees in accordance with the Cottonwood RMP guidance (Appendix C; USBLM 2009). Use Coarse Woody Debris, Snag, and Green Tree desired range guidance from the Cottonwood RMP (Appendix C; USBLM 2009) for prescriptions.
- Maintain existing motorized vehicle restrictions within the planning area for wildlife security purposes. Do not allow contractors or their representatives to hunt or trap while using motorized vehicles on restricted routes. Use signs where needed to discourage public use of closed roads open for logging.
- Maintain existing motorized vehicle restrictions on reconstructed roads during and after implementation of activities, and thereby maintain existing levels of access and wildlife security. Use signs where needed to discourage public use of closed roads open for logging.
- Provide a 450-foot non-disturbance and non-treatment buffer (10-15 acres) around occupied nests for Type 2 and 3 Bureau sensitive raptor species (e.g., northern goshawk (*Accipiter gentilis*) and flammulated owl (*Otus flammeolus*)). Provide a 300-foot buffer around occupied nest for all other raptors. Buffer size may be modified upon review by Area Biologist depending on potential for disturbance from an activity or Project.

Fisheries

- RMP guidance (USBLM 2009) will be applied to landslide prone areas; and streamside and wetland RCAs.
- No log or helicopter landings within RCAs.
- No fuel storage, equipment maintenance, or fueling within RCAs.
- Fire lines within RCA will only be constructed by hand, as approved by Area Biologist (prescribed fire will only be allowed to back into RCAs).

Threatened and Endangered, and Sensitive Species

- During implementation notify Area Biologist of threatened, endangered, or sensitive species sightings where upon appropriate conservation measures will be implemented.

Forest Vegetation

- Silvicultural prescriptions will be written for each unit, including slash treatment and burn guidelines to meet desired stand conditions of species composition and structure and watershed sediment guidelines. These prescriptions emphasize retention of large early seral ponderosa pine, western larch, and Douglas-fir where practicable.
- Prescribed burning will be designed and implemented with the intent of limiting tree mortality to less than ten percent of the overstory. To mitigate prescribed fire-caused

mortality to large diameter ponderosa pine trees initial entries with prescribed fire will be under high duff moisture contents, preferably 120% or higher.

Monitoring

The Project will require on-going monitoring and maintenance based on site evaluations to determine effectiveness of the proposed harvesting and fuel reduction treatments, and the environmental design features described above. Prescribed burn treatments will be revisited every 15-20 years, and future treatments are likely to be proposed as needed to maintain desired fuel loadings and achieve the desired future condition for forest health and/or habitat diversity.

Implementation and effectiveness monitoring will be conducted to evaluate achievement of desired objectives for water resources, fish habitat, road closures, road decommissioning, soil resources, RCAs, riparian areas, and special status fish, wildlife, and plant resources.

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 species rangewide condition, the factors responsible for that condition, and its survival and recovery needs.
2. The *Environmental Baseline*, which evaluates the condition of the species in the action area, the factors responsible for that condition, and the relationship of the action area to the survival and recovery of the species.
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 species.
4. *Cumulative Effects*, which evaluates the effects of future, non-Federal activities in the action area on the species.

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 species 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 species in the wild.

The jeopardy analysis in this Opinion places an emphasis on consideration of the rangewide survival and recovery needs of the species and the role of the action area in the survival and recovery of the species 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 jeopardy determination.

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 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 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 will remain functional (or will 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 species.

The analysis in this Opinion places an emphasis on using the intended rangewide recovery function of 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 Bull Trout and Critical Habitat

2.3.1 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.

2.3.1.1 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 (USFWS 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[2] 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 1995, *in litt*, 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,

[2] We will use the term population segment in reference to these interim recovery units throughout this Opinion to avoid confusion with other uses of the term recovery unit.

mining, and urban and rural development continue to degrade bull trout habitat and depress bull trout populations (USFWS 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 (USFWS 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 (USFWS 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 (USFWS 2002a, entire; 2004a, b; entire).

Central to the survival and recovery of the bull trout is the maintenance of viable core areas (USFWS 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 (USFWS 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 (USFWS 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 (USFWS 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 (USFWS 2004a, p. 62-63). Currently this core area is at high risk of extirpation (USFWS 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 (USFWS 2002b, p. iv). The draft bull trout Recovery Plan (USFWS 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 (USFWS 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 (USFWS 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 (USFWS 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 (USFWS 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 (USFWS 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 (USFWS 2002c, p. vi). The draft bull trout Recovery Plan (USFWS 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 (USFWS 2005, pp. 1-94).

The draft bull trout Recovery Plan (USFWS 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 will 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 (USFWS 2002a, p. 54).

The draft bull trout Recovery Plan (USFWS 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. Of these 22 management units, the Salmon River management unit encompasses the Project action area.

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. Bull trout are distributed throughout most of the unit in 125 local populations located within ten core areas. The Little-Lower Salmon River core area encompasses the action area.

<u>Little-Lower Salmon River Core Area</u>

The draft bull trout Recovery Plan identifies seven local populations and three potential local populations within the Little–Lower Salmon River core area. The mainstem Salmon and Little Salmon Rivers provide foraging/adult rearing habitat and connectivity between local populations (USFWS 2002d, pp. 22, 28-29).

Because there are seven local populations, this core area is at intermediate risk of extinction from stochastic events. Adult bull trout abundance is grossly estimated to be between 500 and 5,000 individuals, indicating that this core area is at reduced risk from deleterious effects associated with genetic drift. The Little-Lower Salmon River core area is one of the few core areas with at least 10 years of population trend data. Based on this data, this core area is thought to be at intermediate risk of extinction. A fourth factor required for bull trout population viability is connectivity (as represented by the presence of the migratory life history form) between local populations within core areas. Migratory bull trout are present in most local populations within the Little-Lower Salmon River core area; therefore this core area is at reduced risk of extinction from loss of connectivity (USFWS 2002d, pp. 63-66). However, in the 5-year Review we ranked this core area as being "At High Risk" of extirpation (USFWS 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 U.S. 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 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 and U.S. 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 U.S. Forest Service and the Bureau 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 (USFWS 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 (USFWS 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 will 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).

2.3.1.7 Bull Trout Critical Habitat

2.3.1.7.1 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)[3].

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 2. 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**

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

[3] 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.

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 will 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.

2.3.1.7.2 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.

2.3.1.7.3 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).

2.3.2 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.

2.3.2.1 Status of Bull Trout in the Action Area

The action area is located within the Little – Lower Salmon River core area and borders the Little Salmon River, Hard and Hazard Creeks. The Little Salmon River provides FMO habitat for bull trout and connectivity between local populations. Hazard Creek is considered a potential bull trout local population. In the draft bull trout Recovery Plan (USFWS 2002d, p. 28), the Service considered Hard Creek, a tributary to Hazard Creek, to be a bull trout local population, meaning that spawning and early rearing occur in the stream. However, the Assessment indicates that bull trout use both lower Hazard and Hard Creeks for adult and subadult rearing (USBLM 2012, pp. 20, 23) and barrier falls on both streams (at stream mile 0.6 on Hard Creek and stream mile 3.7 on Hazard Creek) preclude bull trout access to upstream spawning habitat. Other available sources of information support this conclusion (e.g., CBBTTAT 1998, p. 67 and Burns et al. 2005, pp. 15-16). There appears to be no bull trout spawning in any of the action area streams.

2.3.2.2 Factors Affecting Bull Trout in the Action Area

As previously described in the Status of the Species section of this Opinion, bull trout distributions, abundance, and habitat quality have declined range-wide primarily from the combined effects of habitat degradation and fragmentation, blockage of migratory corridors, poor water quality, angler harvest, poaching, entrainment, and introduced non-native fish species such as the brook trout.

Land and water management activities that depress bull trout populations and degrade habitat include dams and other water diversion structures, forest management practices, livestock grazing, agriculture, road construction and maintenance, mining, and urban and rural development. All of these activities have occurred or are occurring in the action area to varying degrees with resulting adverse impacts on bull trout and bull trout habitat. The bull trout draft Recovery Plan (USFWS 2002d, pp. 31-54) contains detailed discussions on these activities and effects within this core area.

The Matrices of Pathways and Indicators (MPI) shown in Appendix C of the Assessment show the baseline condition of parameters important for bull trout that may be affected by the Project.

The Assessment provided MPIs for the Little Salmon River, Hazard Creek, and Hard Creek. The Matrices are summarized in Table 3 below.

Table 3. Summary of the Matrix of Pathways and Indicator baseline condition for the Little Salmon River, Hazard Creek, and Hard Creek.

Watershed (Stream(s))	High Condition (number of indicators)	Moderate Condition (number of indicators)	Low Condition (number of indicators)	Percentage of Total Indicators in High, Moderate, and Low Condition
Little Salmon River	Percent Surface Fines, Redd Distrubance (2)	Landslide Prone Road Density, Water Yield (ECA), Temperature (Rearing/migration), Chemical Contamination/nutrients, Cobble Embeddedness, Percent Fines by Depth, Pool Quality, Harassment, Juvenile/Adult Harvest (9)	Watershed Road Density, Streamside Road Density, Riparian Vegetation Condition, Peak/Base Flow, Sediment Yield, Width/Depth Ratio, Streambank Stability, Floodplain Connectivity, Temperature (Spawning), Suspended Sediment, Physical Barriers – Adult, Physical Barriers – Juvenile, Large Woody Debris, Pool Frequency, Off-channel Habitat, Habitat Refugia, Subpopulation Size, Growth and Survival, Life History Diversity, Persistence and Genetic Integrity, Integration of Species and Habitat Condition	H = 6% M = 28% L = 66%

Watershed (Stream(s))	High Condition (number of indicators)	Moderate Condition (number of indicators)	Low Condition (number of indicators)	Percentage of Total Indicators in High, Moderate, and Low Condition
			(21)	
Hazard Creek	Watershed Road Density, Streamside Road Density, Landslide Prone Road Density, Riparian Vegetation Condition, Peak/Base Flow, Water Yield (ECA), Sediment Yield, Width/Depth Ratio, Streambank Stability, Floodplain Connectivity, Temperature (Spawning), Suspended Sediment, Chemical Contamination/Nutrients, Physical Barriers – Adult, Physical Barriers – Juvenile, Percent Surface Fines, Pool Quality, Off-channel Habitat, Harassment, Redd Disturbance, Juvenile/Adult Harvest (21)	Temperature (Migration), Cobble Embeddedness, Percent Fines by Depth, Large Woody Debris Pool Frequency, Habitat Refugia, (11)	Peak/Base Flows (Upper), Water Yield (Upper) (2)	H = 62% M = 32% L = 6%
Hard Creek	Landslide Prone Road Density, Riparian Vegetation Condition, Peak/Base Flow (Lower), Water Yield/ECA (Lower), Sediment Yield, Width/Depth Ratio, Streambank Stability, Floodplain Connectivity, Temperature (Spawning), Suspended Sediment, Chemical Contamination/Nutrients, Physical Barriers – Adult,	Watershed Road Density, Streamside Road Density, Temperature (Migration), Cobble Embeddedness, Percent Fines by Depth, Large Woody Debris, Pool Frequency, Habitat Refugia (8)	Peak/Base Flow (Upper), Water Yield/ECA (Upper), Subpopulation Size, Growth and Survival, Life History Diversity, Persistence and Genetic Integrity, Integration of Species and Habitat Condition	H = 56% M = 23% L = 21%

Watershed (Stream(s))	High Condition (number of indicators)	Moderate Condition (number of indicators)	Low Condition (number of indicators)	Percentage of Total Indicators in High, Moderate, and Low Condition
	Physical Barriers – Juvenile, Percent Surface Fines, Pool Quality, Off-channel Habitat, Harassment, Redd Disturbance, Juvenile/Adult Harvest (19)		(7)	

Little Salmon River

Recent and past flood events have contributed to adverse channel and riparian impacts. The lower canyon river reaches are in a state of disequilibrium while the river adjusts by reworking alluvial deposition and builds new stream banks. The upper valley reaches have a large amount of unstable streambanks, primarily attributed to cattle grazing; while the lower reaches have unstable streambanks which are primarily attributed to flood events.

Primary limiting factors for fish production in the Little Salmon River are elevated summer water temperatures, lack of good quality pools, and channel and streambank scouring (flood damage). Private land development and Highway 95 have encroached on river channel and riparian habitats.

As shown in Table 3, of the three affected watersheds, habitat conditions are most degraded in the Little Salmon River where 66 percent of the matrix indicators are rated as being in Low condition and only six percent are in High condition.

Hazard Creek

A large amount of the drainage is roadless and undeveloped; however, sediment production within the watershed has been accelerated in some areas through human-related activities such as roads, timber harvest, and recreation. During early January, 1997, a rain on snow event resulted in the occurrence of several debris torrents in the lower elevation first order tributaries. This particular event contributed large amounts of sediment to lower Hazard and Hard Creeks. During 1994, the Corral Fire burned a large amount of the upper portions of the Hazard and Hard Creek watersheds. ECA is above 30 percent in the upper Hazard and Hard Creek watersheds as a result of this fire.

The primary limiting factors for fish production in Hazard Creek include deposited sediment, elevated summer water temperatures, and limited amounts of good quality spawning gravels.

Natural barriers restrict listed species use to a small percentage of suitable habitat. A full passage barrier (falls) for bull trout occurs at stream mile 3.7 on Hazard Creek.

Of the three affected watersheds, Hazard Creek is in the best condition with 62 percent of the indicators ranked as being in High condition and only six percent in low condition.

Hard Creek

Primary limiting factors for fish production in Hard Creek include deposited sediment, elevated summer water temperatures, limited large woody debris, and limited good quality spawning gravels. Natural barriers at stream mile 0.6 and 4.7 restrict listed species use to a small percentage of suitable habitat. Within the watershed, the highest quality spawning areas (Hard Creek meadows) for bull trout occur upstream from the fish passage barrier at stream mile 0.6. Hard Creek is also in fairly good condition for bull trout with 56 percent of the indicators in High condition and 21 percent in Low condition.

2.3.2.2.1 Climate Change

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 (ISAB 2007, p. iv).

2.3.2.2.2 Landslides and Climate Change

Landslide[4] hazard is variable within the project area, and instances of landslides have occurred in harvest units or along roads (including several small slumps along the Hard Creek Road, near the Hazard Creek confluence), as well as under natural conditions. Field reconnaissance indicates landslides have been generally restricted to small scale-events with minor or moderate impacts, however, landslides and scouring of stream channels and some localized landslide events have resulted in higher levels of impacts within the action area. Landslides can result in on-site loss of soil productivity, as surface soils are translocated down slope. Sediment delivered to streams may comprise fine sediments, which could have negative impacts to fish and their habitat (e.g., through increases in percent surface fines and cobble embeddedness and decreases in pool quality), or larger rock and large organic debris, which could enhance stream habitat complexity.

A plot of known landslides, together with output from the slope stability model (SINMAP) was acquired from the Payette National Forest. These were used as an initial screen to rate landslide-prone hazard areas as low, moderate, or high, based on geologic materials, slope gradient and shape, thickness of soil mantle, and other factors. Within the action area landslide hazard ratings

[4] Although technically differentiated, in this Opinion we will use the term landslide in reference to all types of mass soil movement including debris flows, debris torrents, mass wasting, and slumps.

using the slope stability model estimate approximately 255 acres of high, 1191 acres of moderate, and 1,465 acres of low (stable) landslide hazard areas.

In the Rocky Mountain West (which encompasses the action area) air temperatures have increased approximately 1 degree C over the last century which is higher than the global average (Rieman and Isaak 2010, p. i), and are predicted to increase another 1 to 3 degrees C by the middle of 21st century (Rieman and Isaak 2010, p. 4). Increasing air temperature is expected to adversely affect forests in the northwest U.S. These effects will be manifested through increased incidences of disease, insect outbreaks, and wildfire (Chmura et al. 2011, p.1121) and are predicted to change forest species composition and structure at a landscape scale (Chmura et al. 2011, p. 1121). Predicted changes in precipitation patterns are more variable, but for central Idaho, modeling by Duffy et al. (2006, p. 893) predicts significant increases in precipitation. More rain in the winter is expected, and an increase in rain on snow events (Chmura et al. 2011, p. 1123) and other extreme precipitation events are likely.

When the effects of a warming climate are considered along with the presence of high and moderate landslide hazard areas, an increase in the occurrence of landslides in the action area may be expected. As described above, these events may have significant negative effects to baseline habitat conditions for bull trout in the Little Salmon River, Hazard Creek, and Hard Creek.

2.3.2.3 Status of Bull Trout Critical Habitat in the Action Area

Within the action area the Little Salmon River, Hard Creek, and Hazard Creek are designated bull trout critical habitat. The Little Salmon River provides FMO habitat while Hazard Creek from its confluence with the Little Salmon River upstream 3.0 mi and Hard Creek from its confluence with Hazard Creek upstream 5.0 mi to its confluence with Brown Creek provide spawning and rearing habitat (USFWS 2010, p. 674). But as noted previously, bull trout spawning does not appear to be occurring in the action area.

2.3.2.4 Factors Affecting Bull Trout Critical Habitat in the Action Area

As discussed in section 2.3.2.2, the Matrix of Pathways and Indicators (MPI) (USNOAA 1996, entire) is used to evaluate and document baseline habitat conditions and aid in determining whether a project is likely to adversely affect or result in the incidental take of bull trout.

Analysis of the affected MPI habitat indicators can provide a thorough evaluation of the existing baseline condition and potential Project impacts to the PCEs of bull trout critical habitat (see section 2.3.3.3, Table 12 below).

The same factors affecting the species and its habitat, as discussed in section 2.3.2.2, are affecting bull trout critical habitat in the action area.

2.3.3 Effects of the Proposed Action

Effects of the action considers the direct and indirect effects of an action on the listed species 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.

2.3.3.1 Direct and Indirect Effects of the Proposed Action on Bull Trout

The Project proposes timber harvesting on 630 acres; prescribed burning on 798 acres; constructing 0.15 mile of new permanent road with one stream crossing on a non-fish bearing stream; constructing 1.37 miles of temporary roads; decommissioning of 7.7 miles of road; closing 10.9 miles of motorized road; and restoring 15 acres of wetland. Implementation of most Project components is expected to result in short term insignificant increases in erosion/sediment and insignificant effects to bull trout. Effects are expected be insignificant because of the design criteria incorporated into the Project which include not allowing timber harvest or prescribed fire ignition in RCAs. For prescribed burning in general, initial entries with fire will occur when duff moisture content is high, preferably greater than 120 percent. All temporary roads will be decommissioned (recontoured) and seeded with native plants when no longer needed for Project activities. The one stream crossing to be constructed is located on a non-fish bearing stream. In addition bull trout spawning does not appear to be occurring in the action area.

The exception to the above conclusion that the Project will have insignificant effects on bull trout, is the low but not discountable risk of landslides (including debris torrents, mass wasting, and slumps) associated with vegetation treatments on high and moderate landslide hazard areas. These events could result in the delivery of large amounts of sediment to bull trout habitat in the Little Salmon River, Hazard Creek, and Hard Creek. Such an event would degrade the baseline condition of all sediment related habitat indicators (e.g., sediment yield, suspended sediment/turbidity, percent surface fines, etc.) and have direct and indirect negative impacts to any bull trout present.

The Assessment acknowledges that the project is located in an area of the Little Salmon River drainage with sensitive soils/landtypes, has a history of extreme climatic events, and has been subject to past flood damage and landslides. Project design criteria have been incorporated into all vegetation treatments, road work, road decommissioning, and restoration actions to avoid or minimize the potential for adverse effects occurring from erosion/sediment and landslides. However, given the large size of the vegetation treatments (1,428 acres) proximity to high value aquatic habitats and designated critical habitats (i.e., Little Salmon River, Hazard Creek, and Hard Creek), sensitive landtypes, and the amount of vegetation treatments proposed on moderate and high landslide hazard areas, the risks for adverse effects to bull trout and bull trout critical habitat cannot be discounted.

As previously described, within the action area the slope stability model estimates approximately 255 acres of high landslide hazard areas, 1191 acres of moderate landslide hazard areas, and 1,465 acres of low (stable) landslide hazard areas. These areas and actual landslide points are shown in Figure 2 below. As shown in Figure 2, high and moderate landslide hazard areas are located immediately adjacent to the Little Salmon River, Hazard Creek, and Hard Creek. These streams provide FMO and rearing habitat for adult and subadult bull trout.

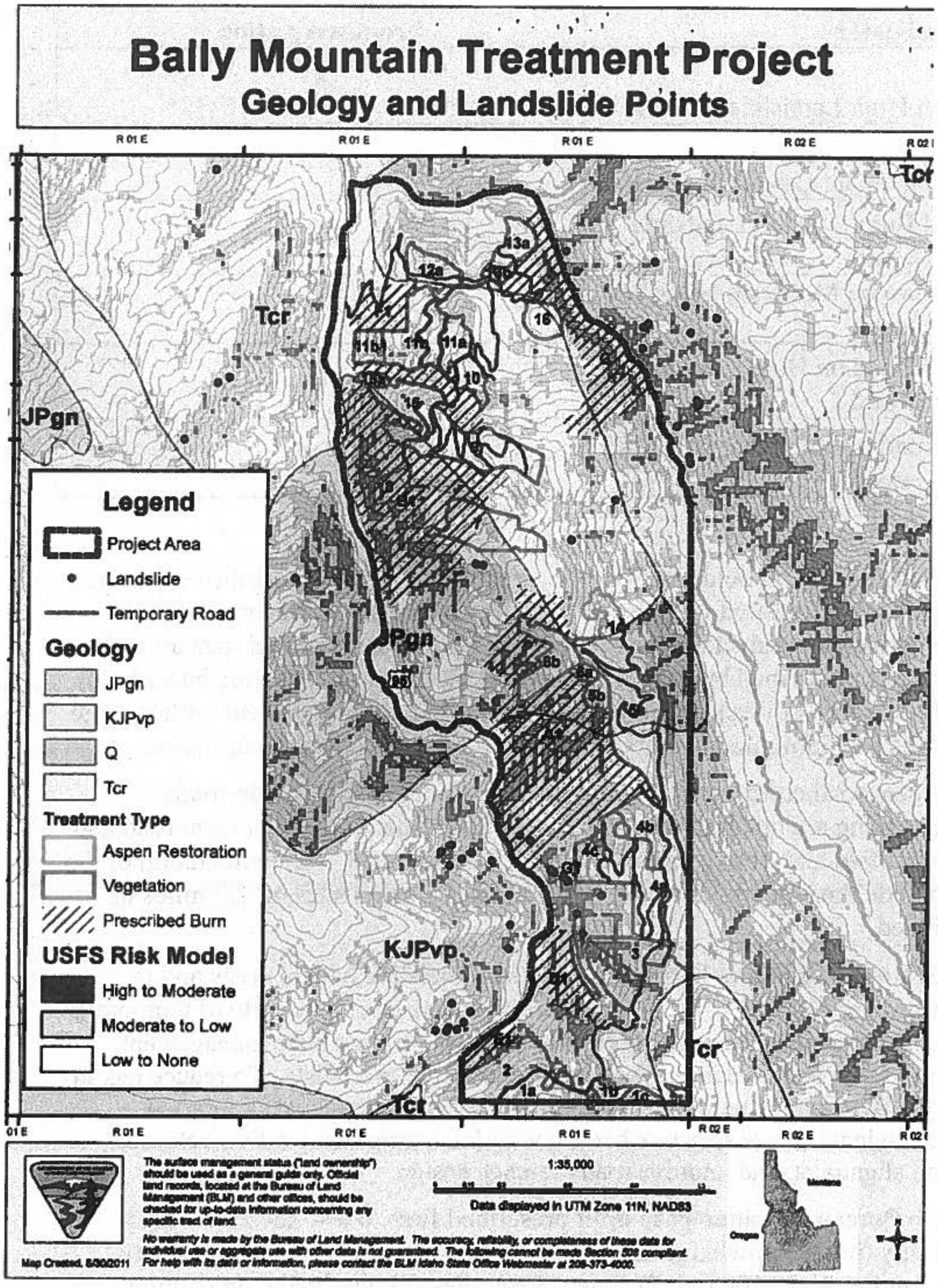

Figure 2. Map showing landslide hazard areas and landslide points (from Assessment, Map 6).

Table 4. Proposed activities on High and Moderate Landslide Hazard Areas.

Indicator	Proposed Action
Acres of Harvest on High Landslide Hazard	0
Acres of Harvest on Moderate Landslide Hazard	218
Acres of Prescribed Burn on High Landslide Hazard	130
Acres of Prescribed Burn on Moderate Landslide Hazard	119
Miles of Temporary Road on High Landslide Hazard	0
Miles of Temporary Road on Moderate Landslide Hazard	0.32

All areas rated as high hazard will be field verified by a specialist with slope stability expertise and if confirmed as high hazard, the area will be excluded from mechanical treatments. However the Bureau proposes to conduct prescribed burning on 130 acres of high hazard areas (Table 4). The objective for prescribed burning in areas identified as high landslide hazard will be to have low intensity burns and overstory mortality of no more than five percent with a range of one to 10 percent. This will minimize, but not eliminate, the risk of landslide initiation.

No temporary or permanent road construction will occur in high hazard areas. No roads proposed for decommissioning are on areas mapped as high landslide hazard, but local road and slope failures will be identified and treated as roads are decommissioned. Implementation of the proposed action will include the potential to stabilize local mass erosion sites on 7.7 miles of road to be decommissioned.

The Bureau proposes 218 acres of timber harvest in moderate landslide hazard areas and to conduct prescribed burning on 130 acres. The Bureau will also construct 0.32 mile of temporary road in these areas. In moderate hazard areas (with low to moderate relative risk) management actions are designed with review and guidance of appropriate resource specialists. To reduce risk in moderate hazard areas, the Bureau may reduce harvest yield or basal area removal of forested vegetation, increase rotation lengths, use selective harvest with full suspension yarding, relocate existing or proposed road alignment, and improve road drainage design.

As previously stated, the Bureau will attempt to limit prescribed fires to low severity with 5 percent overstory mortality (but acknowledge that overstory mortality may be as high as 10 percent). However, as Lepine et al. (2004, p. 7) state, "Regardless of how many precautions are taken, it is impossible to eliminate the risk of fires escaping from prescribed burning." Should a fire burn out of prescription and/or escape in the project area and burn more severely than expected on high or moderate landslide hazard areas, evapotranspiration and root strength may be reduced, resulting in increased surface runoff (Ice et al. 2004, p. 18). These effects to soil cohesion and surface runoff when combined with an extreme precipitation or rain on snow event significantly increase the probability of landslides and the delivery of large amounts of sediment to bull trout habitat. Also, the occurrence of extreme weather events is predicted to increase with global warming. Intense rainfall or rain on snow events can be expected to increase the risk of landslides in the project area especially if these areas have been severely burned. This risk is exacerbated on moderate landslide hazard areas by mechanical vegetation treatments combined with prescribed burning.

In summary there is a low, but not discountable, risk that prescribed burning on high landslide hazard areas and prescribed burning and timber harvest on moderate landslide hazard areas will trigger landslides that will adversely impact adult and subadult bull trout in the Little Salmon River, Hazard Creek, and Hard Creek through the delivery of potentially large volumes of sediment. Suspended sediment may cause a range of effects (depending upon concentration and duration of exposure) from reduced feeding rates to gill abrasion and mortality (Newcombe and Jensen 1996, p. 694). Deposited sediment may smother redds[5], reduce the quality of rearing habitat, reduce the availability of aquatic food resources (e.g., macroinvertebrates), change the ratio of pools to riffles, and fill pools (Swanston 1991, p. 140, Schuster and Highland 2004, p. 29).

2.3.3.2 Effects of Interrelated or Interdependent Actions on Bull Trout

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

2.3.3.3 Direct and Indirect Effects of the Proposed Action on Bull Trout Critical Habitat

As discussed in section 2.3.2.2, the Matrix of Pathways and Indicators (MPI) (USNOAA 1996, entire) is used to evaluate and document baseline habitat conditions and aid in determining whether a project is likely to adversely affect or result in the incidental take of bull trout.

Analysis of the affected MPI habitat indicators can provide a thorough evaluation of the existing baseline condition and potential Project impacts to the PCEs of bull trout critical habitat (see Table 5 below).

As discussed in section 2.3.3.1 above, we expect that prescribed fire on high landslide hazard areas and prescribed fire and mechanical treatments on moderate hazard areas will result in some form of sediment delivery of varying severity and duration to bull trout critical habitat. The effects to the PCEs are summarized in Table 5. As shown in Table 5, based on degradation of of some sediment related indicators, the Project will adversely affect PCEs 1 (springs, seeps etc.), 2 (migration habitats), 3 (abundant food base), 6 (substrate), and 8 (migration habitats).

[5] Bull trout spawning is not known to occur in the action area, so spawning adults, early life stages, or redds are not expected to be affected.

Table 5. Anticipated effects to the PCEs of bull trout critical habitat from Project implementation.

	Primary Constituent Elements (PCEs)	Associated Habitat Indicators	Environmental Baseline Present or Absent	Effects of the Actions (Restore, Maintain, or Degrade)	Determination of Effect
1	Springs, seeps, groundwater sources, and subsurface water connectivity (hyporehic flows) to contribute to water quality and quantity and provide thermal refugia.	Flood plain connectivity, changes in peak/base flows, cobble embeddedness, road density, streambank stability, chemical contamination/nutrients	Present	Degrade – cobble embeddedness	LAA
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*, chemical contamination/nutrients, physical barriers, peak/base flow, width/depth ratio, refugia	Present	Degrade – sediment	LAA
3	An abundant food base, including terrestrial organisms of riparian origin, aquatic macroinvertebrates, and forage fish.	Floodplain connectivity, riparian vegetation condition, pool frequency and quality, cobble embeddedness, temperature, chemical contaminants and nutrients	Present	Degrade – cobble embeddedness	LAA
4	Complex river, stream, lake, reservoir, and marine shoreline aquatic environments and processes with features such as large wood, side channels, pools, undercut banks and un-embedded substrates, to provide a variety of depths, gradients, velocities, and structure.	Large woody debris, pool frequency and quality, width/depth ratio, off-channel habitat, streambank stability, riparian vegetation condition, floodplain connectivity, disturbance history and regime, refugia	Present	Maintain	NLAA

	Primary Constituent Elements (PCEs)	Associated Habitat Indicators	Environmental Baseline Present or Absent	Effects of the Actions (Restore, Maintain, or Degrade)	Determination of Effect
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 vary depending on bull trout life-history stage and form; geography; elevation; diurnal and seasonal variation; shade, such as that provided by riparian habitat; and local groundwater influence.	Temperature, refugia, pool frequency and quality, width/depth ratio, change in peak/base flows, streambank stability, floodplain connectivity, road density	Present	Maintain	NLAA
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, cobble embeddedness, large woody debris, pool frequency and quality, streambank stability	Present	Degrade – sediment, cobble embeddedness	LAA
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.	Peak/base flow, road density, riparian vegetation condition, floodplain connectivity	Present	Maintain	NLAA

	Primary Constituent Elements (PCEs)	Associated Habitat Indicators	Environmental Baseline Present or Absent	Effects of the Actions (Restore, Maintain, or Degrade)	Determination of Effect
8	Sufficient water quality and quantity such that normal reproduction, growth, and survival are not inhibited.	Floodplain connectivity, change in peak/base flow, temperature, sediment, chemical contaminant and nutrients	Present	Degrade - sediment	LAA
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.	Physical barriers	Absent (brook trout present in most affected streams within bull trout populations)	Maintain	No Effect

*Sediment as used in this table encompasses all associated indicators in the MPI: sediment yield, suspended sediment/turbidity, percent surface fines, and percent surface fines by depth.

2.3.3.4 Effects of Interrelated or Interdependent Actions on Bull Trout Critical Habitat

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

2.3.4 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.

2.3.4.1 Cumulative Effects on Bull Trout

Within the action area there are numerous State, Tribal, local, and private actions that potentially affect bull trout. Many of the categories of on-going activities with potential effects to bull trout and bull trout habitat were identified in the Status of the Species and Environmental Baseline sections of this Opinion. These activities include timber harvest and road building, grazing, water diversion, residential development, and agriculture. The Service assumes that future private and State actions will continue within the action area, increasing as population density rises. As the human population in the action area continues to grow, demand for agricultural, commercial, or residential development is also likely to grow. The effects of new development caused by that demand are likely to reduce the conservation value of bull trout habitat within the action area.

City, state, and county governments have ongoing weed spraying programs, some with less-stringent measures to prevent water contamination. Unknown amounts of herbicides are sprayed annually along road right-of-ways by state and county transportation departments, sometimes several times a year. Private landholders also spray unknown chemicals in unknown amounts. Any private herbicide use could potentially combine with contaminants from other Federal and non-Federal activities, and could contribute to formation of chemical mixtures or concentrations that could kill or harm bull trout. In addition, fish stressed by elevated sediment and temperatures are more susceptible to toxic effects of herbicides. While the mechanisms for cumulative effects are clear, the actual effects cannot be quantified due to a lack of information about chemical types, quantity and application methods used.

Illegal and inadvertent harvest of bull trout is also 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). Idaho Department of Fish and Game report that 400 bull trout were caught and released in the regional (Clearwater administrative region) waters of the Salmon and Snake Rivers during the 2002 salmon and steelhead fishing seasons. In the Little Salmon River, 89 bull trout were caught and released during the same fishing seasons (Idaho Department of Fish and Game 2004, p. 11). 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% 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 (ISAB 2007, p. iii; Hansen et al. 2001, p. 767). Global climate change threatens bull trout throughout its range in the coterminous United States. Downscaled regional climate models for the Columbia River basin predict a general air temperature warming of 1.0 to 2.5 °C (1.8 to 4.5 °F) or more by 2050 (Rieman et al. 2007, p. 1552). This predicted temperature trend may have important effects on the regional distribution and local extent of habitats available to salmonids (Rieman et al. 2007, p. 1552), although the relationship between changes in air temperature and water temperature are not well understood. Bull trout spawning and early rearing areas are currently largely constrained by low fall and winter water temperatures that define the spatial structuring of local populations or habitat patches across larger river basins; habitat patches represent networks of thermally suitable habitat that may lie in adjacent watersheds and are disconnected (or fragmented) by intervening stream segments of seasonally unsuitable habitat or by actual physical barriers (Rieman et al. 2007, p. 1553).

2.3.4.2 Cumulative Effects on Bull Trout Critical Habitat

We assume that many of the threats to critical habitat identified previously in this Opinion will continue to impact critical habitat, including climate change.

Warming of the global climate seems quite certain. Changes have already been observed in many species' ranges consistent with changes in climate (ISAB 2007, p. iii; Hansen et al. 2001, p. 767). Global climate change threatens bull trout throughout its range in the coterminous United States. Downscaled regional climate models for the Columbia River basin predict a general air temperature warming of 1.0 to 2.5 °C (1.8 to 4.5 °F) or more by 2050 (Rieman et al. 2007, p. 1552). This predicted temperature trend may have important effects on the regional distribution and local extent of habitats available to salmonids (Rieman et al. 2007, p. 1552), although the relationship between changes in air temperature and water temperature are not well understood. Bull trout spawning and early rearing areas are currently largely constrained by low fall and winter water temperatures that define the spatial structuring of local populations or habitat patches across larger river basins; habitat patches represent networks of thermally suitable habitat that may lie in adjacent watersheds and are disconnected (or fragmented) by intervening stream segments of seasonally unsuitable habitat or by actual physical barriers (Rieman et al. 2007, p. 1553). With a warming climate, thermally suitable bull trout spawning and rearing areas are predicted to shrink during warm seasons, in some cases very dramatically, becoming even more isolated from one another under moderate climate change scenarios (Rieman et al. 2007, pp. 1558–1562; Porter and Nelitz 2009, pp. 5–7). Climate change will likely interact with other stressors, such as habitat loss and fragmentation (Rieman et al. 2007, pp. 1558–1560; Porter and Nelitz 2009, p. 3); invasions of nonnative fish (Rahel et al. 2008, pp. 552–553); diseases and parasites (McCullough et al. 2009, p. 104); predators and competitors (McMahon et al. 2007, pp. 1313–1323; Rahel et al. 2008, pp. 552–553); and flow alteration (McCullough et al. 2009, pp. 106–108), rendering some current spawning, rearing, and migratory habitats marginal or wholly unsuitable. 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.

2.3.5 Conclusion

2.3.5.1 Conclusion for Bull Trout

The Service has reviewed the current status of bull trout, the environmental baseline for the action area, the effects of the proposed action, and the cumulative effects. The Service concludes that direct and indirect effects to bull trout will be limited to harm from landslide associated sediment delivered to habitat occupied by adult and subadult bull trout. These effects are anticipated to only impact adult and subadult bull trout in the Little Salmon River, Hazard Creek and Hard Creek. Bull trout spawning is not known to occur in the action area, so we are not expecting the Project to impact any spawners, redds, or early life stages. The design criteria incorporated into the Project will minimize, but not eliminate the risk of Project activities initiating landslides that deliver sediment to bull trout habitat.

Therefore it is the Service's biological opinion that the Project is not likely to significantly impact the viability of any bull trout populations in the Little-Lower Salmon River core area.. Effects to the Little-Lower Salmon River core area, the Salmon River management unit, and the

Columbia River population segment will be discountable. Therefore, we conclude that the proposed action will not jeopardize the coterminous population of bull trout.

2.3.5.2 Conclusion for 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. The Project will result in adverse effects to PCEs 1 (springs, seeps etc.), 2 (migration habitats), 3 (abundant food base), 6 (substrate), and 8 (migration habitats). We expect that Project design criteria should reduce the risk and magnitude of adverse effects, but not eliminate them. The Project will not significantly impact the long-term functionality of critical habitat in the action area; the Little Salmon River CHSU; or, the Salmon River CHU, and by extension, critical habitat rangewide in providing for the conservation of the bull trout.

2.3.6 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 Bureau has a continuing duty to regulate the activity covered by this incidental take statement. If the Bureau 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 Bureau 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)].

2.3.6.1 Form and Amount or Extent of Take Anticipated

Bull trout are present in the action area but the number of individuals potentially impacted by the Project is unknown. We will therefore use the extent of bull trout habitat bordering the project area plus an additional 0.2 mile for downstream effects in the Little Salmon River as a surrogate for take. Therefore, the Service expects that all adult and subadult bull trout located within 1.6 miles of Hard Creek, 0.9 mile of Hazard Creek and 5.1 miles of the Little Salmon River (7.6 miles in total extent) may be subject to take in the form of harm from exposure to sediment from Project initiated landslides. The Service believes that the risk of take will be minimized considerably through application of the design criteria, to be applied during implementation of the proposed action, which may reduce, but not eliminate, impacts to bull trout. This Incidental Take Statement is valid for 10 years beginning in 2013.

The Bureau will exceed the authorized level of take if any of the following occurs:

1. More than one landslide, initiated/occurring in a treatment unit identified in the project proposal, reaches bull trout habitat in any given year; or,
2. Any prescribed fire burns out of prescription (i.e., results in mineral soil damage or greater than 10 percent overstory mortality); or,
3. Bull trout redds are located in Hard or Hazard Creeks; or
4. The Project results in more than one bull trout mortality.

2.3.6.2 Effect of the Take

Landslides resulting from vegetation treatments on high and moderate landslide hazard areas are anticipated to harm bull trout within the Little Salmon River, Hazard Creek, and Hard Creek. This anticipated take may be reduced because of the design criteria to avoid and reduce adverse effects included in the proposal. Although individual bull trout may be harmed, the probability that the Project will eliminate any bull trout local population is insignificant. Local bull trout densities and distribution are not expected to be altered. The Project will not impair productivity or population numbers of bull trout in the Salmon River management unit or in the Columbia River population segment. As we concluded in the accompanying Opinion, the anticipated level of take is not likely to jeopardize the continued existence of the bull trout across its range.

2.3.6.3 Reasonable and Prudent Measures

The Service believes that the following reasonable and prudent measure is necessary and appropriate to further minimize take resulting from the Project during the 10-year implementation period beginning in 2013.

- Minimize the potential for harm to bull trout from landslides initiated from Project related activities.

2.3.6.4 Terms and Conditions

To be exempt from the prohibitions of section 9 of the Act, the Bureau must comply with the following terms and conditions which implement the reasonable and prudent measure described above. These terms and conditions are non-discretionary.

1. The Bureau will conduct low intensity prescribed burning for the burn treatments within watershed 6.
2. The Bureau will drop Unit 6b timber harvest and only conduct low intensity prescribed burning for the burn treatments within watershed 4. Within watershed 4, preparation for prescribed burning would consist of hand thinning/slashing small diameter, non-merchantable trees (<12" DBH) in order to reduce ladder fuels.
3. The Bureau will conduct no more than 40 percent of the prescribed burn only treatments in a single year.

4. The Bureau will conduct bull trout spawning surveys in Hard and Hazard Creeks (within the action area only) during the first spawning season prior to any treatments adjacent to these drainages. Should redds be found, the Bureau will reinitiate consultation with the Service.
5. In moderate landslide hazard areas, the Bureau will leave an appropriate amount of woody debris on the slope to capture/ reduce velocity of sediment/runoff associated with precipitation events. The amount of woody material needed will be determined by a Bureau specialist.

2.3.6.5 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)].

The Bureau will report to the Service on:

1. Compliance with implementation of the Terms and Conditions.
2. Remedies to address and resolve problems identified in (1), above.
3. Any environmental effects of the action that were not considered in the Assessment or this Opinion.

The Bureau will notify the Service promptly of any emergency or unanticipated situations in the action area that may be detrimental to bull trout. The Service will then determine if Project activities must cease or may continue, pending resolution of the problem and impacts. The Bureau will implement a monitoring strategy that includes monitoring burn severity and post fire overstory mortality. Areas subject to prescribed burning will be monitored annually after burning to assess the frequency and extent of post burn tree mortality. The Bureau will report to the Service on the actual number of acres treated on high and moderate landslide hazard areas and the number landslides (if any) resulting from Project activities. If landslides do occur the Bureau will provide detailed information on the location, extent, and resulting riparian and aquatic effects. The Bureau will provide these required monitoring reports annually by December 31, beginning the first year after Project implementation begins. Submit all reports, to: U.S. Fish and Wildlife Service, Idaho Fish and Wildlife Office, 1387 S. Vinnell Way, Suite 368, Boise, Idaho 83709.

2.3.7 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.

1. Revegate burn pile scars with native vegetation at the earliest opportunity to reduce surface erosion and the potential for the establishment of noxious/invasive weeds.
2. Conduct prescribed burning during the spring, when feasible, to reduce the potential for prescribed fires to burn out of prescription and/or escape.

3. Continue to survey and monitor bull trout populations and habitat in the action area to gather baseline and population trend information.

2.6 Reinitiation Notice

This concludes formal consultation on the Program. 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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4. APPENDICES

4.1 MPI for the Little Salmon River

PATHWAYS Indicators	**ENVIRONMENTAL BASELINE 1/**			**EFFECTS OF THE ACTION**		
	High	**Moderate**	**Low**	**Restore 2/**	**Maintain 3/**	**Degrade 4/**
WATERSHED CONDITIONS 1. Watershed Road Density			X		X+	
2. Streamside Road Density			X		X	
3. Landslide Prone Road Dens.		X			X+	
4. Riparian Vegetation Cond.			X		X+	
5. Peak/Base Flow			X		X-	
6. Water Yield (ECA)		X			X-	
7. Sediment Yield			X		X-ST X+LT	X[5]
CHANNEL COND.&DYNAMICS 1. Width/Depth Ratio			X		X	
2. Streambank Stability			X		X	
3. Floodplain Connectivity			X		X	
WATER QUALITY 1. Temp.-Spawn.			X		X	
2. Temp.-Rear/Migration		X			X	
3. Suspended Sediment			X		X- X+LT	X[5]
4. Chem. Contam./Nutrients		X			X	
HABITAT ACCESS 1. Physical Barriers - Adult			X		X	
2. Physical Barriers – Juvenile			X		X	

PATHWAYS Indicators	ENVIRONMENTAL BASELINE 1/			EFFECTS OF THE ACTION		
	High	Moderate	Low	Restore 2/	Maintain 3/	Degrade 4/
HABITAT ELEMENTS 1. Cobble Embeddedness		X			X-ST X+LT	X[5]
2. Percent Surface Fines	X				X-ST X+LT	X[5]

PATHWAYS Indicators	ENVIRONMENTAL BASELINE 1/			EFFECTS OF THE ACTION		
	High	Moderate	Low	Restore 2/	Maintain 3/	Degrade 4/
3. Percent Fines By Depth		X			X-ST X+LT	X[5]
4. Large Woody Debris			X		X	
5. Pool Frequency			X		X	
6. Pool Quality		X			X	
7. Off-Channel Habitat			X		X	
8. Habitat Refugia			X		X	
TAKE 1. Harassment		XSH			X	
2. Redd Disturbance	X				X	
3. Juvenile/Adult Harvest		XSH			X	
BULL TROUT SUBPOP. CHAR. AND HABITAT INTEGRATION 1. Subpopulation Size			X		X	
2. Growth and Survival			X		X	
3. Life History Diversity, Isolation			X		X	
4. Persist. & Genetic Integrity			X		X	
5. Integr. of Species & Habitat Condition			X		X	

4.2 MPI for Hazard Creek

PATHWAYS Indicators	ENVIRONMENTAL BASELINE 1/			EFFECTS OF THE ACTION		
	High	Moderate	Low	Restore 2/	Maintain 3/	Degrade 4/
WATERSHED CONDITIONS 1. Watershed Road Density	X				X+	
2. Streamside Road Density	X				X	
3. Landslide Prone Road Dens.	X				X	
4. Riparian Vegetation Cond.	X				X	
5. Peak/Base Flow	X Lower		X Upper		X-	
6. Water Yield (ECA)	X Lower		X Upper		X-	
7. Sediment Yield	X				X-ST X+LT	X[5]
CHANNEL COND.&DYNAMICS 1. Width/Depth Ratio	X				X	
2. Streambank Stability	X				X	
3. Floodplain Connectivity	X				X	
WATER QUALITY 1. Temp.-Spawn.	X ST,BT	X SCH			X	
2. Temp.-Rear/Migration		X			X	
3. Suspended Sediment	X				X-ST X+LT	X[5]
4. Chem. Contam./Nutrients	X				X	
HABITAT ACCESS 1. Physical Barriers - Adult	X				X	
2. Physical Barriers – Juvenile	X				X	
HABITAT ELEMENTS 1. Cobble Embeddedness		X			X-ST X+LT	X[5]
2. Percent Surface Fines	X				X-ST X+LT	X[5]
3. Percent Fines By Depth		X			X-ST X+LT	X[5]
4. Large Woody Debris		X			X	
5. Pool Frequency		X			X	
6. Pool Quality	X				X	

PATHWAYS Indicators	ENVIRONMENTAL BASELINE 1/			EFFECTS OF THE ACTION		
	High	Moderate	Low	Restore 2/	Maintain 3/	Degrade 4/
7. Off-Channel Habitat	X				X	
8. Habitat Refugia		X			X	
TAKE 1. Harassment	X				X	
2. Redd Disturbance	X				X	
3. Juvenile/Adult Harvest	X SCH, BT	X SH			X	
BULL TROUT SUBPOP. CHAR. AND HABITAT INTEGRATION 1. Subpopulation Size		X			X	
2. Growth and Survival		X			X	
3. Life History Diversity, Isolation		X			X	
4. Persist. & Genetic Integrity		X			X	
5. Integr. of Species & Habitat Condition		X			X	

4.3 MPI for Hard Creek

PATHWAYS Indicators	ENVIRONMENTAL BASELINE 1/			EFFECTS OF THE ACTION		
	High	Moderate	Low	Restore 2/	Maintain 3/	Degrade 4/
WATERSHED CONDITIONS 1. Watershed Road Density		X			X+	
2. Streamside Road Density		X			X	
3. Landslide Prone Road Dens.	X				X	
4. Riparian Vegetation Cond.	X				X	
5. Peak/Base Flow	X Lower		X Upper		X-	
6. Water Yield (ECA)	X Lower		X Upper		X-	
7. Sediment Yield	X				X-ST X+LT	X[5]
CHANNEL COND.&DYNAMICS 1. Width/Depth Ratio	X				X	
2. Streambank Stability	X				X	
3. Floodplain Connectivity	X				X	
WATER QUALITY 1. Temp.-Spawn.	X SH, BT	X SCH			X	
2. Temp.-Rear/Migration		X			X	
3. Suspended Sediment	X				X-	
4. Chem. Contam./Nutrients	X				X	
HABITAT ACCESS 1. Physical Barriers - Adult	X				X	
2. Physical Barriers – Juvenile	X				X	
HABITAT ELEMENTS 1. Cobble Embeddedness		X			X-ST X+LT	X[5]
2. Percent Surface Fines	X				X-ST X+LT	X[5]
3. Percent Fines By Depth		X			X-ST X+LT	X[5]
4. Large Woody Debris		X			X-	
5. Pool Frequency		X			X	

PATHWAYS **Indicators**	**ENVIRONMENTAL BASELINE 1/**			**EFFECTS OF THE ACTION**		
	High	**Moderate**	**Low**	**Restore 2/**	**Maintain 3/**	**Degrade 4/**
6. Pool Quality	X				X	
7. Off-Channel Habitat	X				X	
8. Habitat Refugia		X			X	
TAKE 1. Harassment	X				X	
2. Redd Disturbance	X				X	
3. Juvenile/Adult Harvest	X SCH, BT	X SH			X	
BULL TROUT SUBPOP. CHAR. AND HABITAT INTEGRATION 1. Subpopulation Size			X		X	
2. Growth and Survival			X		X	
3. Life History Diversity, Isolation			X		X	
4. Persist. & Genetic Integrity			X		X	
5. Integr. of Species & Habitat Condition			X		X	