# United States Department of the Interior

FISH AND WILDLIFE SERVICE

Snake River Fish and Wildlife Office
1387 S. Vinnell Way, Room 368
Boise, Idaho 83709
Telephone (208) 378-5243
http://www.fws.gov/idaho


DEC 13 2007

Memorandum

To: Field Manager, Cottonwood Field Office, Coeur d'Alene District, Bureau of Land Management, Cottonwood, Idaho

From: Acting Field Supervisor, Snake River Fish and Wildlife Office, Fish and Wildlife Service, Boise, Idaho

Subject: Eastside Township Fuels and Vegetation Project—Idaho County, Idaho—Biological Opinion
File #1005.2000 2007-F-0416-R001

This memorandum transmits the Fish and Wildlife Service's (Service) Biological Opinion (Opinion) on the effects of the Eastside Township Fuels and Vegetation Project to species listed under the Endangered Species Act (Act) of 1973, as amended. In a letter dated November 16, 2007, and received by the Service on November 19, the Bureau of Land Management (Bureau) requested formal consultation on the determination under section 7 of the Act that the project is likely to adversely affect bull trout (*Salvelinus confluentus*). The Bureau determined that the proposed action is not likely to adversely affect the Canada lynx (*Lynx canadensis*).

The Bureau also determined that the project is not likely to jeopardize the gray wolf (*Canis lupus*). The bald eagle was removed from the list of threatened and endangered species on August 8, 2007, but remains protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. The bald eagle is also classified as a Bureau sensitive species. For sensitive species, the Bureau determined that the project may affect the bald eagle (*Haliaeetus luecocephalus*), westslope cutthroat trout (*Oncorhyncus clarki lewisi*), redband trout (*Oncorhyncus mykiss*), and Pacific lamprey (*Lampetra tridentate*), but is not likely to cause loss of viability. The Service acknowledges these determinations.

The Bureau previously submitted an Assessment for the project and request for formal consultation to the Service on April 2, 2007. The Service provided an opinion on May 29, 2007. Subsequently the Bureau modified the project and, through reinitiation, requested that the Service provide the attached Opinion on the modified project. The current Opinion voids and replaces the opinion issued in May 2007. This Opinion is based primarily on our review of the

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proposed action as described in your November 2007 Biological Assessment (Assessment) regarding the effects of the proposed action on bull trout, and was prepared in accordance with section 7 of the Act. Our Opinion concludes that the survival and recovery of bull trout populations will not be jeopardized by the project. A complete record of this consultation is on file at this office.

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: IDFG, Region II, Lewiston (Hennekey)
NMFS, Grangeville (Brege)
NPT, Lapwai (Jones)

# BIOLOGICAL OPINION
# FOR THE
# EASTSIDE TOWNSHIP FUELS AND VEGETATION PROJECT
# BUREAU OF LAND MANAGEMENT
# COUER D'ALENE DISTRICT
# COTTONWOOD FIELD OFFICE
# 2007-F-0416-R001

**DECEMBER 2007**
**FISH AND WILDLIFE SERVICE**
**SNAKE RIVER FISH AND WILDLIFE OFFICE**
**BOISE, IDAHO**

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## INTRODUCTION

The Fish and Wildlife Service (Service) has prepared the following Biological Opinion (Opinion) in response to the Bureau of Land Management's (Bureau) request for formal consultation on the effects to bull trout (*Salvelinus confluentus*) from the proposed Eastside Township Fuels and Vegetation Project. The Bureau determined that the project is likely to adversely affect bull trout.

The Bureau previously submitted an Assessment for the project and request for formal consultation to the Service on April 2, 2007. The Service provided a biological opinion on May 29, 2007. Subsequently the Bureau modified the project and, through reinitiation, requested that the Service provide a revised Opinion on the modified project. This Opinion voids and replaces the opinion issued in May 2007.

The following Opinion is based primarily on our review of the proposed action as described in your November 2007 Biological Assessment (Assessment) regarding the effects of the proposed action on bull trout, and was prepared in accordance with section 7 of the Act. Based on the analysis presented in the Biological Assessment (Assessment) for this action, the Service concludes that the survival and recovery of bull trout populations will not be jeopardized by the project.

The Service is also providing concurrence with the Bureau's determination that Canada lynx (*Lynx canadensis*) is not likely to be adversely affected by the proposed project. The bald eagle was removed from the list of threatened and endangered species on August 8, 2007, but remains protected under the Bald and Golden Eagle Protection Act and the Migratory Bird Treaty Act. The bald eagle is also classified as a Bureau sensitive species. For sensitive species, the Bureau determined that the project may affect the bald eagle (*Haliaeetus luecocephalus*), westslope cutthroat trout (*Oncorhyncus clarki lewisi*), redband trout (*Oncorhyncus mykiss*), and Pacific lamprey (*Lampetra tridentate*), but is not likely to cause loss of viability. The Service acknowledges these determinations.

The National Marine Fisheries Service (NMFS) is consulting with the Bureau on the effects of this project on steelhead (*Oncorhynchus mykiss*).

## CONSULTATION HISTORY

The Bureau and the Service have had the following meetings and correspondence concerning the proposed project. This history includes events associated with the original consultation completed on May 29, 2007.

| | |
|---|---|
| April 17, 2006 | The Service received a draft Assessment from the Bureau for review. |
| May 11, 2006 | The Service participated in a conference call on the project with the Bureau and NMFS. |
| May 17, 2006 | The Service attended a Streamlined Consultation Level 1 team meeting where the Bureau provided a copy of the draft Assessment and discussed the project with the team. |

| | |
|---|---|
| July 5, 2006 | The Service received a draft Environmental Impact Statement for the project from the Bureau. |
| February 26, 2007 | The Service received a revised draft Assessment from the Bureau for review and comments. |
| March 1, 2007 | The Service sent e-mail comments on the draft Assessment to the Bureau. |
| March 6, 2007 | The Service participated in a conference call to discuss comments on the draft Assessment and to identify any additional information needs. |
| March 15, 2007 | The Service participated in a conference call with the Bureau and NMFS to go over the Bureau's responses to comments on the Assessment. |
| March 23, 2007 | The Service participated in a conference call to review edits to the Assessment. |
| March 28, 2007 | The Service sent an e-mail to the Bureau agreeing with the contents of the final Assessment and determinations for listed species. |
| April 2, 2007 | The Service received the final Assessment and request for formal consultation. |
| May 15, 2007 | The Service sent an electronic version of the draft Opinion to the Bureau for review and comments. |
| May 29, 2007 | The Service mailed the final Opinion to the Bureau. |
| June 14, 2007 | The Service received an e-mail from the Bureau stating that the project description had been changed and that reinitiation may be required. |
| June 28, 2007 | The Service participated in a conference call with the Bureau and NMFS to discuss the proposed changes to the project and the process for reinitiation. |
| October 4, 2007 | The Service received an electronic version of the revised Assessment from the Bureau. |
| October 11, 2007 | The Service participated in a conference call with the Bureau and NMFS to discuss the Assessment and consultation timelines. |
| October 22, 2007 | The Service received electronic versions of the project maps from the Bureau. |
| November 6, 2007 | The Service received and electronic version of the revised Assessment from the Bureau. |

November 13, 2007 The Service participated in a conference call with the Bureau and NMFS to discuss final edits to the Assessment.

November 16, 2007 The Service sent the Bureau an e-mail agreeing with the contents of the final Assessment and effects determinations for listed species.

November 19, 2007 The Service received the final Assessment and request for formal consultation from the Bureau.

## INFORMAL CONSULTATION

### Canada Lynx

Service concurrence that the proposed action is not likely to adversely affect the Canada lynx is based on the following rationales presented in the Assessment.

1. Although the project area is located within lynx analysis unit (LAU) 3020306, there is no designated foraging or denning habitat in the project area. Proposed vegetation treatments will not affect any designated lynx habitat in the LAU.

2. Proposed vegetation treatments will have insignificant effects on habitat connectivity between LAUs. In the long-term, riparian restoration and road decommissioning will benefit habitat connectivity.

3. The potential for the project to disturb lynx is discountable as there is no designated lynx habitat and no lynx have been documented in the project area. Additionally, adjacent habitat is available for lynx to use for avoiding any disturbance caused by project implementation.

# BIOLOGICAL OPINION

## I. DESCRIPTION OF PROPOSED ACTION

### A. Action Area

The project area is located on Bureau administered land in the American River watershed, near Elk City, Idaho, in the upper South Fork Clearwater River subbasin (T29N, R8E, Boise Meridian). Project treatments will occur in nine subwatersheds (Table 1).

The action area is defined as all areas to be affected directly or indirectly by the Federal action and not merely the immediate area involved in the action (i.e., the project area). Because of potential downstream sediment effects, the action area therefore includes approximately three miles of the South Fork Clearwater River from its beginning at the confluence of American and Red Rivers downstream to the mouth of Crooked River.

## B. Proposed Action

Mature lodgepole pine (*Pinus contorta*) stands with extensive mountain pine beetle infestation and tree die-off characterize the current forest conditions in the project area. These conditions contribute to an increasing risk of high-intensity wildland fire. The purpose of the project is to reduce the fire risk in Elk City and the surrounding Wildland Urban Interface (WUI). Other stated project goals include managing timber stands for long-lived fire tolerant tree species, designing a safe public transportation system in the project area that meets watershed and fisheries management goals, and creating an upward trend in aquatic habitat conditions.

To meet these goals, the Bureau proposes to treat approximately 1,155 acres of public land to reduce existing and potential fuel loads through a combination of vegetation and fuels treatments. Vegetation treatment includes removing mainly dead and dying trees and live ladder fuels in both lodgepole pine and mixed conifer stands. Fuels treatments include biomass utilization, piling and burning, and prescribed burning. The project also includes watershed restoration activities. A summary of all project treatments is presented below; refer to the Assessment for a complete project description.

### 1. Vegetation Treatments

To maintain or increase forest stand resilience to low intensity fire, and insect and disease outbreaks, the Bureau will apply a treatment prescription comprising salvage/regeneration harvests, pre-commercial and commercial thinning, and prescribed burns. Specific types and acreage of harvest treatments include approximately 270 acres of shelterwood, 454 acres of irregular shelterwood, 266 acres of seed tree, 133 acres of commercial thinning and 33 acres of salvage with precommercial thinning (Table 1).

**Table 1. Acres of proposed Vegetation Treatments by subwatershed (from the Assessment)**

| Subwatershed | Shelterwood Cut | Irregular Shelterwood | Seed Tree Cut With Reserves | Thinning | [illegible] (Salvage) | Total Acres |
|---|---|---|---|---|---|---|
| Middle American R. | 51.7 | -- | 96.84 | 29.53 | 24.23 | 202.3 |
| East Fk. American R. | --- | --- | 3.98 | --- | 8.15 | 12.13 |
| Whitaker Cr. | 13.46 | 24.30 | --- | 66.49 | --- | 104.25 |
| Queen Cr. | --- | 37.75 | 23.88 | 11.66 | --- | 73.29 |
| Box Sing Cr. | --- | 39.47 | 7.48 | --- | --- | 46.95 |
| Kirks Fork | --- | 39.43 | 17.41 | --- | --- | 56.84 |
| Little Elk Cr. | 7.41 | --- | --- | --- | --- | 7.41 |
| Lower Elk. Cr. | 37.34 | --- | 60.18 | --- | --- | 97.52 |
| Lower American R. | 159.91 | 313.39 | 55.75 | 25.28 | --- | 554.33 |
| TOTAL ACRES (All Treatments) | 269.82 | 454.34 | 265.52 | 132.96 | 32.38 | 1155.02 |

The area dominated by lodgepole pine will be reduced while the proportion of Douglas fir (*Psuedotsuga menziesii*), western larch (*Larix occidentalis*), and ponderosa pine (*Pinus ponderosa*) will be increased by retention in current stands or planting in stands with fuel treatments.

Topography, economics, and the need to protect residual stands will determine the type of logging system used. Choice of logging system will range from ground-based with hand and/or mechanized felling, cable systems with hand felling, to helicopter systems with hand felling or limited mechanized felling. Slash will be treated with prescribed fire and/or grapple piling or be available for biomass utilization (Table 2) [1].

**Table 2. Acres of proposed Logging Methods and Slash/Fuel Treatments (from the Assessment)**

| [illegible] | [illegible] | [illegible] (Underburn) | [illegible] (Commercial) | [illegible] (Hand Pile) | [illegible] | [illegible] |
|---|---|---|---|---|---|---|
| Middle Amer. R. | -- | -- | 103.57 | 10.63 | 88.10 | 202.3 |
| E. Fk. Amer. R. | --- | --- | 0.62 | --- | 11.51 | 12.13 |
| Whitaker Cr. | 59.54 | 21.13 | --- | 23.58 | --- | 104.25 |
| Queen Cr. | 26.76 | 23.01 | --- | 23.52 | --- | 73.29 |
| Box Sing Cr. | 33.13 | 13.79 | --- | 0.03 | --- | 46.95 |
| Kirks Fork | 8.78 | 17.41 | 30.65 | --- | --- | 56.84 |
| Little Elk Cr. | 7.41 | --- | --- | --- | --- | 7.41 |
| Lower Elk. Cr. | 97.52 | --- | --- | --- | --- | 97.52 |
| Lower Amer. R. | 326.34 | 124.55 | 103.44 | --- | --- | 554.33 |
| TOTAL ACRES (All Treatments) | 559.48 | 199.89 | 238.28 | 57.76 | 99.61 | 1155.02 |

## 2. Road Construction

Existing and new temporary roads will be used to access treatment units (Table 3). Temporary roads will be constructed across Nez Perce National Forest administered land and on private property (an existing permanent easement). Existing road on private land totals 2.94 miles, including 2.65 miles in a permanent easement and 0.29 mile of temporary easement. Existing road across Forest Service land totals 7.37 miles. An additional 10 miles of new temporary road will be required which includes 9.55 miles across Bureau administered land, 0.19 mile across private, and 0.26 mile across Forest Service administered land. Temporary roads will be decommissioned within three years of construction.

[1] Biomass utilization refers to slash or wood products used for a variety of purposes including sawlogs, pulp, firewood, post/poles, and potentially electricity generation.

**Table 3. Road and Trail Management (from the Assessment)**

| Subwatershed | Temporary Roads | Decomm. Roads | New ATV Bridge and/or Ford Closure | Road to ATV Trail Conversion | New ATV Trail |
|---|---|---|---|---|---|
| Middle American R. | -- | 0.23 | 1[1] | 0.89 | 0.3 |
| East Fk. American R. | --- | --- | --- | --- | --- |
| Whitaker Cr. | 0.44/0.24 FS | --- | --- | --- | --- |
| Queen Cr. | 0.56/0.02 FS | 0.27 | --- | --- | --- |
| Box Sing Cr. | 0.55 | 0.03 | --- | --- | --- |
| Kirks Fork | 0.41 | --- | 1[2] | --- | --- |
| Little Elk Cr. | --- | --- | --- | --- | --- |
| Lower Elk. Cr. | 1.24 | --- | --- | --- | --- |
| Lower American R. | 6.33/0.19 PVT | 0.93 | 1[2] | 1.6 | --- |
| TOTAL MILES | 10.00 | 1.46 | 3 | 2.5 | 0.3 |

[1]Includes ford closure (decommissioning) only.
[2]Includes ford closure (decommissioning) and new ATV bridge.

## 3. Watershed Restoration

The project includes watershed restoration actions summarized in Tables 3 and 4.
In general these restoration actions include:

- Decommissioning approximately 1.5 miles of roads;
- Converting and restoring 2.5 miles of existing road adjacent to American River to all-terrain vehicle (ATV) trail;
- Obliterating three fords, one each in Middle American River, Kirks Fork and Lower American River;
- Replacing the fords on Kirk Fork and Lower American River with ATV bridges;
- Recontouring 1.2 miles of bank along American River;
- Planting riparian trees and shrubs on 4.8 miles of the American River;
- Reconnecting Queen Creek to American River to provide fish access to 1.4 miles of additional habitat; and
- Restoring 0.5 acre of mine sites.

**Table 4. Restoration Activities by subwatersheds (from Assessment)**

| Subwatershed | Miles of Decomm. Roads | Miles of Road to ATV Trail Conversion | Number Ford Oblit. | Miles Streambank Recontour | Miles Riparian Plantings | Miles of Improved Fish Access | Acres of Mine Site Restoration |
|---|---|---|---|---|---|---|---|
| Middle American R. | 0.23 | 0.89 | 1 | --- | 0.9 | --- | --- |
| East Fk. American R. | --- | --- | --- | --- | --- | --- | --- |
| Whitaker Cr. | --- | --- | --- | --- | --- | --- | --- |
| Queen Cr. | 0.27 | --- | --- | --- | --- | 1.4 | --- |
| Box Sing Cr. | 0.03 | --- | --- | --- | --- | --- | --- |
| Kirks Fork | --- | --- | 1 | --- | --- | --- | --- |
| Little Elk Cr. | --- | --- | --- | --- | --- | --- | --- |
| Lower Elk. Cr. | --- | --- | --- | --- | --- | --- | --- |
| Lower American R. | 0.93 | 1.6 | 1 | 1.2 | 3.9 | --- | 0.5 |
| TOTAL | 1.46 | 2.5 | 3 | 1.2 | 4.8 | 1.4 | 0.5 |

## 4. Project Design Measures

Project Design Measures will be used to minimize resource impacts. Refer to Appendix A of this Opinion for a list of these measures.

If needed, fire suppression activities within the project area will utilize the appropriate pre-attack suppression methods for a WUI area. Fire suppression activities will utilize general fire suppression guidance included in the fire programmatic Assessment (Bureau 1999) and MIST (minimal impact suppression techniques) guidelines.

## 5. Implementation Schedule

Project implementation is expected to begin in 2008 and could take five to ten years to complete, depending on available funding. Restoration work will take place concurrently with vegetation and fuels treatments. The majority of work is expected to take place within one to three years after the start of the project. The Bureau will closely coordinate with implementation of the Nez Perce National Forest's American and Crooked River project. Coordination will be particularly important for road closures, road construction, restoration work, and restrictions on entry frequencies in some subwatersheds.

## 6. Monitoring

The project includes both implementation and effectiveness monitoring. Implementation monitoring is used to determine if design criteria and mitigation are implemented as identified in the project Final Environmental Impact Statement (FEIS) and Assessment. Effectiveness monitoring is used to determine if management practices, as designed and executed, are effective

in meeting project objectives as defined in the Eastside Project FEIS and Assessment. Also included are goals and objectives identified in the Bureau land use plan. The Assessment (pp. 47-50) contains a complete description of the proposed monitoring plan.

## II. STATUS OF THE SPECIES

### A. 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 and in the Jarbidge River in Nevada, north to various coastal rivers of Washington to the Puget Sound and east throughout major rivers within the Columbia River Basin to the St. Mary-Belly River, east of the Continental Divide in northwestern Montana (Cavender 1978, Bond 1992, Brewin and Brewin 1997, Leary and Allendorf 1997).

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 United States coterminous population of the bull trout discusses the consolidation of these DPSs, plus two other population segments, into one listed taxon and the application of the jeopardy standard under section 7 of the Act relative to this species (64 FR 58930):

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

### B. 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; Rieman et al. 1997). 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 rangewide bull trout distribution and abundance (Bond 1992; Schill 1992; Thomas 1992; Ziller 1992; Rieman and McIntyre 1993; Newton and Pribyl 1994; Idaho Department of Fish and Game in litt. 1995). Several local extirpations have been reported, beginning in the 1950s (Rode 1990; Ratliff and Howell 1992; Donald and Alger 1993; Goetz 1994; Newton and Pribyl 1994; Berg and Priest 1995; Light et al. 1996; Buchanan and Gregory 1997; Washington Department of Fish and Wildlife 1997).

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

## C. 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). 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; Bond 1992). To the west, bull trout current range includes Puget Sound, coastal rivers of British Columbia, Canada, and southeast Alaska (Bond 1992). 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; Brewin and Brewin 1997). Bull trout are wide-spread throughout the Columbia River basin, including its headwaters in Montana and Canada.

## D. Life History

Bull trout exhibit resident and migratory life-history strategies throughout much of the current range (Rieman and McIntyre 1993). 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 one to four 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; Goetz 1989). 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).

Bull trout have more specific habitat requirements than other salmonids (Rieman and McIntyre 1993). Watson and Hillman (1997) concluded that watersheds must have specific physical characteristics to provide habitat requirements for bull trout to successfully spawn and rear, and that the characteristics are not necessarily ubiquitous throughout these watersheds 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; Rieman and McIntyre 1993, 1995; Buchanan and Gregory 1997; Rieman et al. 1997). 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; Rieman and McIntyre 1995). Spawning areas are often associated with cold-water springs, groundwater infiltration, and the

coldest streams in a given watershed (Pratt 1992; Rieman and McIntyre 1993; Rieman et al. 1997). Goetz (1989) suggested optimum water temperatures for rearing of about 7 to 8°C (44 to 46°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 (Oliver 1979; Fraley and Shepard 1989; Goetz 1989; Hoelscher and Bjornn 1989; Sedell and Everest 1991; Pratt 1992; Thomas 1992; Rich 1996; Sexauer and James 1997; Watson and Hillman 1997). Jakober (1995) 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). Juvenile and adult bull trout frequently inhabit side channels, stream margins, and pools with suitable cover (Sexauer and James 1997).

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 (Fraley and Shepard 1989; Goetz 1989). Bull trout normally reach sexual maturity in 4 to 7 years and live as long as 12 years. Repeat and alternate year spawning has been reported, although repeat spawning frequency and post-spawning mortality are not well known (Leathe and Graham 1982; Fraley and Shepard 1989; Pratt 1992; Rieman and McIntyre 1996).

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). Depending on water temperature, incubation is normally 100 to 145 days (Pratt 1992), 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; Ratliff and Howell 1992).

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; Goetz 1989; Donald and Alger 1993). Adult migratory bull trout are primarily piscivores, known to feed on various fish species (Fraley and Shepard 1989; Donald and Alger 1993).

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, Fraley and Shepard 1989, Pratt 1992, Rieman and McIntyre 1996).

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.

## E. Population Dynamics

The draft bull trout Recovery Plan (Service 2002) 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). In theory, bull trout metapopulations (core areas) can be composed of two or more local populations, but Rieman and Allendorf (2001) suggest that for a bull trout metapopulation to function effectively, a minimum of between five and 10 local populations are required. Bull trout core areas with fewer than five local populations are at increased risk of local extirpation, core areas with between five and 10 local populations are at intermediate risk, and core areas with more than 10 interconnected local populations are at diminished risk (Service 2002).

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 is 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). 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) 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). Increased habitat fragmentation reduces the amount of available habitat and increases isolation from other populations of the same species (Saunders et al. 1991). Burkey (1989) 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 non-natal 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) and Rieman and Allendorf (2001), 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).

## F. Status and Distribution

As noted above, in recognition of available scientific information relating to their uniqueness and significance, five population segments[2] 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 (Service 2002).

Central to the survival and recovery of the bull trout is the maintenance of viable core areas (Service 2002, 2004a,b). 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 in their use of spawning habitat. Each of the population segments listed above 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 (Service 2002; 2004a,b).

A core area assessment conducted by the Service for the five-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, four are at low risk and two are of unknown status (Service 2005).

### 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

[2] Population segment will be used in this Opinion rather than interim recovery unit to avoid confusion with recovery units identified in the draft bull trout Recovery Plans (Service 2002, 2004 a,b).

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 non-native fishes (Service 2004a). The draft bull trout recovery plan (Service 2004a) identifies the following conservation needs for this segment: maintain the current distribution of the bull trout within the core area, maintain stable or increasing trends in abundance of both resident and migratory bull trout in the core area, restore and maintain suitable habitat conditions for all life history stages and forms, and 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 (Service 2004a). Currently this core area is at high risk of extirpation (Service 2005).

**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 non-native fishes (Service 2002). Bull trout populations in this unit face a high risk of extirpation (Service 2002). The draft bull trout recovery plan (Service 2002) identifies the following conservation needs for this unit: maintain the current distribution of the bull trout and restore distribution in previously occupied areas, maintain stable or increasing trends in bull trout abundance, restore and maintain suitable habitat conditions for all life history stages and strategies, and 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 (Service 2002).

**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 (Service 2004b). 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 non-native species. The draft bull trout recovery plan (Service 2004b) identifies the following conservation needs for this unit:

maintain or expand the current distribution of bull trout within existing core areas, increase bull trout abundance to about 16,500 adults across all core areas, and maintain or increase connectivity between local populations within each core area.

**4. St. Mary-Belly River**

This populations segment currently contains six core areas and nine local populations (Service 2002). Currently, bull trout are widely distributed in the St. Mary River drainage and occur in nearly all of the waters that 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 (Service 2002). 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 non-native fishes (Service 2002). The draft bull trout recovery plan (Service 2002) identifies the following conservation needs for this unit: maintain the current distribution of the bull trout and restore distribution in previously occupied areas, maintain stable or increasing trends in bull trout abundance, restore and maintain suitable habitat conditions for all life history stages and forms, conserve genetic diversity and provide the opportunity for genetic exchange, and 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.

**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). 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 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, the blockage of migratory corridors by dams or other diversion structures, poor water quality, incidental angler harvest, entrainment into diversion channels, and introduced non-native 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, two are at low risk, and two are at unknown risk (Service 2005).

The Columbia River population segment has declined in overall range and numbers of fish (63 FR 31647). Although some strongholds still exist with migratory fish present, bull trout generally occur as isolated local populations in headwater lakes or tributaries where the

migratory life history form has been lost. Though still widespread, there have been numerous local extirpations reported throughout the Columbia River basin. In Idaho, for example, bull trout have been extirpated from 119 reaches in 28 streams (Idaho Department of Fish and Game in litt. 1995).

The draft bull trout recovery plan (Service 2002) identifies the following conservation needs for this population segment: maintain or expand the current distribution of the bull trout within core areas, maintain stable or increasing trends in bull trout abundance, maintain/restore suitable habitat conditions for all bull trout life history stages and strategies, and conserve genetic diversity and provide opportunities for genetic exchange.

**a. Clearwater River Recovery/Management Unit**

The draft bull trout Recovery Plan (Service 2002) identified 22 recovery units within the Columbia River population segment. These units are now referred to as management units (Service 2004c). 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.

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

Bull trout are distributed throughout most of the large rivers and associated tributary systems within the Clearwater River management unit (Clearwater Subbasin Summary 2001) and exhibit adfluvial, fluvial, and resident life history patterns. There are two naturally occurring adfluvial bull trout populations within the Clearwater River management unit; one is associated with Fish Lake in the upper North Fork Clearwater River drainage, and the other is associated with Fish Lake in the Lochsa River drainage (CBBTTAT 1998a, CBBTTAT 1998b). The Bull Trout Recovery Team has identified five core areas and 36 local bull trout populations within the Clearwater management unit (Service 2002, 2004c). The core areas include the North Fork Clearwater River, Lochsa River, South Fork Clearwater River, Selway River, and Lower and Middle Fork Clearwater Rivers.

**b. South Fork Clearwater River Core Area**

Core areas are the building blocks for conserving the bull trout's evolutionary legacy, and are appropriate units of analysis by which threats to bull trout and recovery standards should be measured (70 FR 56258, September 26, 2005). As discussed above, four factors are used to

examine the risk of extinction for a core area: number of local populations, adult abundance, productivity, and connectivity. Bull trout are currently known to use spawning and rearing habitat in five stream complexes within the South Fork Clearwater River management unit (i.e., local populations). These local populations include Red River, Crooked River, Newsome Creek, Tenmile Creek and Johns Creek. Because this core area does not have (and is unlikely to achieve) 10 local populations, the core area is at moderate risk of extinction from stochastic events. The loss of one local population in this core area may threaten its long-term viability and recovery. Current abundance and distribution of bull trout in the core area are considered lower than historic levels. It is estimated that there are at least 500 spawners present (Service 2002), so this core area is at an intermediate risk of genetic drift. Population trend data are lacking for the core area, so the Recovery Plan determined that until such data are available, the core area is at an increased risk of extinction (Service 2002, 2004c). There is an extremely low incidence of fluvial migratory adults in the core area (Forest Service 1999), as well as resident adults (D. Mays, personal communication, January 30, 2006), but migratory bull trout persist in some local populations so the core area is at an intermediate risk of extinction due to loss of connectivity (Service 2002).

A core area assessment conducted by the Service for the five-year status review ranked this core area as being at risk of extirpation (Service 2005). The main factor contributing to this risk was threats from habitat destruction or degradation, introduction of exotic species, overexploitation and direct human-caused mortality, and elimination of natural disturbance regimes such as fire or flooding. Other risk factors are low population numbers and limited geographic distribution (i.e., area of occupancy within the core area is relatively small).

Roads, forestry, grazing, residential development, brook trout, and angling threaten bull trout in this core area. Other limiting factors include water temperature, sediment, instream cover, watershed disturbances (includes upland disturbances such as mining, timber harvest, and roading), habitat degradation, exotics/introgression, harvest, and connectivity (Service 2004c).

## G. Consulted-on Effects Rangewide

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 bull trout biological opinions produced in Region 1 and Region 6 Service Offices from the time of 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. 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 that had varying levels of effects. 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.

## H. Conservation Needs

Recovery for bull trout will entail reducing threats to the long-term persistence of populations and their habitats, ensuring the security of multiple interacting groups of bull trout, and providing habitat conditions and access to them that allow for the expression of various life-history forms (Service 2002). The draft Bull Trout Recovery Plan 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 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; and (7) assess the implementation of bull trout recovery by management units, and revise management unit plans based on evaluations.

The conservation needs of the bull trout are often expressed as the four Cs: cold, clean, complex, and connected. Cold stream temperatures, clean water quality that is relatively free of sediment and contaminants, complex channel characteristics (including abundant large wood and undercut banks), and large patches of such habitat that are well connected by unobstructed migratory pathways are all needed to promote conservation of bull trout at multiple scales ranging from the coterminus to local populations. The recovery planning process for the bull trout (Service 2002; 2004a,b) has also identified the following conservation needs for the bull trout: (1) maintain and restore multiple, interconnected populations in diverse habitats across the range of each interim recovery unit; (2) preserve the diversity of life-history strategies; (3) maintaining genetic and phenotypic diversity across the range of each interim recovery unit; and (4) establish a positive population trend. Recently, it has also been recognized that bull trout populations need to be protected from catastrophic fires across the range of each interim recovery unit.

Warmer temperature regimes associated with global climate change represent another risk factor for bull trout. Increased stream temperature is a recognized effect of a warming climate (ISAB 2007). Species at the southern margin of their range that are associated with colder water temperatures, such as the bull trout, are likely to become restricted to smaller more disjunct habitat patches or become extirpated as the climate warms (Rieman et al. 2007). Climate warming is projected to result in the loss of 22 to 92 percent of suitable bull trout habitat in the Columbia River basin (ISAB 2007). Habitat conservation and restoration will be needed to mitigate these habitat losses.

## I. Critical Habitat

The Service issued a final rule designating critical habitat for bull trout range wide on September 26, 2005. The designation includes 4,813 miles of stream or shoreline and 143,218 acres of lake or reservoir. We designated areas as critical habitat that 1) have documented bull trout occupancy within the last 20 years, 2) contain features essential to the conservation of the bull trout, 3) are in need of special management, and 4) were not excluded under section 4(b)(2) of the Act. The Final Rule excluded from designation those federally managed areas covered under PACFISH, INFISH, the Interior Columbia Basin Ecosystem Management Project, and the Northwest Forest Plan Aquatic Conservation Strategy. The Service determined that these strategies provide a level of conservation and adequate protection and special management for the primary constituent elements of critical habitat at least comparable to that achieved by designating critical habitat. Areas managed under these strategies do not meet the statutory definition of critical habitat (i.e., areas requiring special management considerations) and were therefore excluded. The excluded areas include much of the proposed critical habitat in Idaho; the final rule only designates 294 miles of stream/shoreline and 50,627 acres of reservoirs or lakes. There is no designated critical habitat for bull trout within the action area.

# III. ENVIRONMENTAL BASELINE

The environmental baseline is defined as the current habitat condition including the past and present impacts on bull trout of all Federal, state or private actions and other human activities in the action area, the anticipated impacts of all proposed Federal projects in the action area that have already undergone formal or early section 7 consultation, and the impacts of state or private actions that are contemporaneous with the consultation in process.

## A. Status of the Species in the Action Area

Historically, the American River watershed likely supported a robust spawning and rearing bull trout population (Service 2002). Currently, both migratory and resident bull trout are present in the American River watershed although distribution within the watershed is not well known. Of the subwatersheds in the action area, bull trout have been documented in Lower and Middle American River, East Fork American River, Kirks Fork, and Flint Creek. Available information indicates that East Fork American River potentially provides the only spawning and early rearing areas for bull trout in the watershed. Recent fish surveys conducted by the Forest Service, the Bureau, and Idaho Department of Fish and Game (1996 to 2003) documented bull trout in mainstem American River, East Fork American River, and lower Kirks Fork. Bull trout spawning has not been documented in the watershed. The draft bull trout Recovery Plan identifies the American River as a potential local population (Service 2002). Bull trout have not been documented in Whitaker, Queen, or Box Sing Creek (Table 5). Population numbers for bull trout in the action area are lacking. The Assessment predicts that between zero and one bull trout may be found in the mainstem American River within a 300 meter reach at any time. In the American River bull trout may be present year-round (Streamnet 2007).

**Table 5. Status of bull trout and selected habitat indicators in the project action area. Indicator status is based on number of indicators in low condition. Cluster analysis provided Habitat Condition categories**

| | | | | |
|---|---|---|---|---|
| Middle American | 1 | 19 | L | temperature, deposited sediment, LWD, quality pools, brook trout |
| East Fork American | 2 | 10 | H | deposited sediment, brook trout |
| Whitaker | 0 | 14 | M | lack of connectivity, deposited sediment, low flows, brook trout |
| Queen Creek | 0 | 15 | M | deposited sediment, winter rearing habitat, quality pools, low flows, lack of connectivity |
| Box Sing | 0 | 15 | M | deposited sediment, winter rearing habitat, quality pools, low flows, brook trout |
| Kirks Fork | 1 | 12 | H | deposited sediment, winter rearing habitat, quality pools, brook trout |
| Little Elk Creek | 1 | 14 | M | temp, deposited sediment, large woody debris, winter rearing habitat, quality pools, brook trout |
| Lower Elk Creek | 1 | 19 | L | temp, deposited sediment, winter rearing habitat, quality pools, brook trout |
| Lower American | 1 | 19 | L | temperature, deposited sediment, LWD, quality pools, brook trout |
| SF Clearwater | 1 | 20 | L | temperature, sediment, instream cover, brook trout |

The action area encompasses approximately three miles of the South Fork Clearwater River. Within this section of river, various surveys have documented bull trout presence. Idaho Department of Fish and Game report low numbers (average density from four observation equals 0.07 fish per 100 square meters) of bull trout between river kilometer (rkm) 97 and rkm 103 (Idaho Department of Fish and Game 2001a). The South Fork Clearwater River provides feeding, migrating, and overwintering habitat for bull trout and connectivity between local populations in the core area. Bull trout spawning has not been documented in the South Fork Clearwater River. Current numbers of large fluvial bull trout are greatly reduced from historic levels (Dechert et al. 2004).

## B. Factors Affecting the Species in the Action Area

As previously described in the Status of the Species section of this Opinion, bull trout distribution, abundance, and habitat quality have declined rangewide primarily from the combined effects of habitat degradation and fragmentation, blockage of migratory corridors, poor water quality, angler harvest, poaching, entrainment, and introduced nonnative fish species.

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. Although dam construction and urban development are not factors within the action area, they have occurred on the mainstem South Fork Clearwater River downstream of the action area and have impacted bull trout food resources (through reductions in salmon abundance) and connectivity with other core areas (Dechert et al. 2004). Timber harvest, including associated road construction, and historic dredge mining activities in the South Fork Clearwater core area have been extensive with resulting impacts to bull trout and bull trout habitat.

The baseline habitat condition of each of the nine subwatersheds in the action area can be derived from the Matrix of Pathways and Indicators (NMFS 1996). The Assessment provides a matrix for each of the subwatersheds, except that Lower and Middle American River are combined into one matrix for the American River. The Service assumes that the number of habitat indicators rated as being in low condition indicates the extent of habitat degradation within a given stream. As can be seen in Table 5, based on number of habitat condition indicators rated as low, East Fork American River is in the best relative condition while South Fork Clearwater and Lower and Middle American Rivers are in the worst condition. Using cluster analysis (SAS JMP v. 5), we grouped the subwatersheds into high, moderate, and low relative condition based on the total number of indicators rated as low. These groupings are shown in Table 5.

Using cobble embeddeness measurements[3], the FISHSED model (Stowell et al. 1983) was used to estimate the existing condition of summer and winter rearing habitat in American River and its tributaries potentially affected by this action. As displayed in Table 6 below, summer rearing is near objective for most streams. Winter rearing however is well below objective and has been identified as a limiting factor. East Fork American River and Kirks Fork have relatively low levels of human disturbance, and yet have elevated levels of deposited sediment indicating deposited sediment in the action area may be the result, in part, of natural processes.

As previously noted in this Opinion, because of potential downstream sediment routing effects from project activities, the South Fork Clearwater River, extending downstream from the confluence of American and Red Rivers to the mouth of Crooked River, is considered part of the action area for this project.

[3] Cobble embeddedness is defined as the degree to which coarse stream substrates are surrounded by fine sediment (Sylte and Fischenich 2002).

**Table 6. Cobble embeddedness, and summer and winter rearing capacity by subwatershed (from the Assessment)**

| [illegible] | [illegible] | [illegible] | [illegible] |
|---|---|---|---|
| Middle American River | 40 | 89 | 35 |
| Lower American River | 31 | 94 | 45 |
| East Fork American River | 44 | 87 | 32 |
| Kirks Fork | 45 | 87 | 31 |
| Whitaker Creek | 56 | 79 | 23 |
| Queen Creek | 42 | 88 | 34 |
| Box Sing Creek | 44 | 87 | 32 |
| Elk Creek | 64 | 72 | 19 |
| Little Elk Creek | 56 | 79 | 23 |
| South Fork Clearwater River | 30 | 94 | 46 |

In the South Fork Clearwater River watershed, historic mining has affected portions of the mainstem river, particularly the upper watershed. There has been moderate to high levels of timber harvest with approximately 3,300 acres of riparian habitat conservation area (RHCA) harvest. Watershed road density averages 3.51 miles per square mile and streamside road density averages 4.36 miles per square mile giving the watershed a low rating for this indicator. Potential changes in peak/base flow, water yield (ECA), temperature, and cobble embeddedness are rated as low. Sediment yield is rated as moderate. The Idaho Department of Environmental Quality considers the South Fork Clearwater River as water quality limited (303(d) listed) from its headwaters to its mouth (Dechert et al. 2004).

One factor directly affecting bull trout within the action area is the issuance of collection permits by the State of Idaho under a section 6 agreement with the Service for capturing and handling bull trout (using weirs, screw traps, and electrofishing) as well as surveying for bull trout by snorkeling. Within the action area approximately 99 bull trout were affected by these activities in 2002, including three mortalities (Idaho Department of Fish and Game 2004).

Some land management actions have improved habitat conditions in the action area. For example, the Service completed formal consultation on the Nez Perce National Forest's American and Crooked River Project in 2005. The American and Crooked River project is similar to the Eastside project in that both projects include vegetation/fuels treatments and watershed restoration actions. The American and Crooked River project entails 1,217 acres of vegetation treatments in the American River watershed as well as road decommissioning and stream crossing improvements. The Forest expects that the long-term consequences of the American and Crooked River project on aquatic habitat conditions in the American River are all positive. Road decommissioning and improved habitat accessibility will be largely responsible for improved baseline conditions (Forest Service 2005).

The Bureau has implemented watershed restoration activities in the American River watershed since the early 1980s. These activities have included closing and improving roads, constructing

grazing exclosures, installing instream habitat structures, and improving fish passage (Dechert et al. 2004). The Service completed formal consultation on the American River Restoration project with the Bureau in 2006. This project involved reconnecting Telephone Creek with the American River, improving instream habitat through the installation of instream structures (habitat rocks, large woody debris) in three miles of American River, and replacing a culvert with a bridge at the mouth of the East Fork American River. Removal of this full/partial barrier culvert will benefit bull trout by allowing access to approximately 13 miles of quality habitat.

As a result of past and on-going restoration actions, conditions are improving for a number of habitat parameters including large woody debris, pools and instream cover, riparian condition, and streambank stability, and habitat connectivity. Despite these improvements, conditions in all American River subwatersheds with proposed actions are degraded to a greater or lesser extent. Nevertheless, of the various subwatersheds in the action area some are in better condition than others. The relative habitat condition for the subwatersheds in the action area will be important to consider when assessing risk to bull trout from project activities.

## C. Summary of Baseline Conditions

Bull trout habitat conditions in all watersheds within the action area have been degraded primarily from historic mining and timber harvest and associated road development, although natural process and low gradient stream reaches may contribute to elevated levels of deposited sediment. Except for Kirks Fork, all watersheds are rated as being in low or moderate condition for road density. Cobble embeddedness is rated as low for all watersheds, except the South Fork Clearwater which is rated moderate. No watersheds are rated as being in a high condition for temperature. Kirks Fork is the only stream rated as being in high condition for sediment yield. Only East Fork American River and Kirks Fork are rated high for large woody debris. The Assessment identifies temperature, sediment, lack of quality pools, and winter rearing capacity as being limiting factors for all watersheds. The Idaho Department of Environmental Quality identifies sediment and temperature as pollutants in the American River (Dechert et al. 2004). Brook trout, an exotic species which competes and hybridizes with bull trout, are present in all watersheds except Queen Creek (Table 6).

The Service concludes that bull trout, a species requiring relatively pristine habitat conditions, are exposed to suboptimal habitats in the project area primarily as a result of past and on-going human activities, and population numbers are reduced from historic levels.

Past and on-going restoration projects are improving habitat conditions for bull trout and other salmonids. These projects include the recently consulted on American and Crooked River Project (Nez Perce National Forest) and the American River Restoration Project (Bureau).

# IV. EFFECTS OF THE ACTION ON BULL TROUT

## A. Direct and Indirect Effects

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 are still reasonably certain to occur (50 CFR §402).

As described in Section I.B. of this Opinion, the project includes three main categories of activities with potential direct and indirect effects on bull trout: vegetation treatments (harvest and fire), road work, and watershed improvements. In the following sections, specific project design measures (PDM) intended to reduce resource impacts are indicated in parentheses; refer to Appendix A of this Opinion for a description of pertinent criteria.

### 1. Vegetation Treatments

Vegetation treatments include 1,155 acres of harvest in the American River watershed. Fuels (i.e., logging slash) generated by harvest will be broadcast burned/underburned or piled and burned depending on the harvest system used (i.e., helicopter, tractor, or cable). Slash may also be available for biomass utilization.

Timber harvest and slash treatments using prescribed fire may affect bull trout through a variety of impacts or alterations to watershed structural conditions and functional capacity (Chamberlin et al. 1991, Troendle and Olsen 1993, Poff 1996, Spence et al. 1996, Brosofske et al. 1997, Perry 1998, Robichaud 2000, Wondzell and King 2003). The primary pathways for negative impacts are through altering hydrologic and sediment regimes, elevating stream temperatures, and reducing channel complexity and large woody debris inputs. These effects can be exacerbated by harvest on landslide prone areas and harvest in RHCAs. Other potential adverse effects also include introduction of pollutants (e.g., petroleum fuels, fertilizers, pesticides, and herbicides) into watercourses while conducting harvest, site preparation, and stand maintenance activities.

Bull trout are sensitive to hydrologic and sediment regime alterations due primarily to the extended period of time from egg deposition to fry emergence spent within the streambed (Polacek and James 2003). Hydrologic changes that alter normal bedload movement and scour and fill patterns can excavate or bury redds, exposing eggs to stream flow, and trapping or crushing eggs or fry.

Increasing levels of fine sediments affect developing eggs by filling interstitial spaces within stream substrate, thereby reducing or eliminating (1) water flow through the redd and supply of oxygen to developing eggs, (2) removal of waste products, and (3) the ability of juvenile fish to emerge from the redd. Because of the extended residency of bull trout in interstitial substrate spaces (220+ days from egg deposition to emergence), eggs, alevins, and fry are highly

vulnerable to the impacts resulting from the deposition of fine sediments. Increased levels of fine sediment can also affect important components of bull trout habitat such as the number and quality of available pools (Lisle and Hilton 1992).

Bull trout require colder water temperatures than most salmonids and these requirements vary by life cycle stage. Timber harvest has the potential to affect stream temperatures primarily through reducing streamside canopy levels (Kishi et al. 2004). The potential for riparian vegetation to moderate stream temperatures is greatest for small to intermediate size streams and diminishes as stream size increases (Spence et al. 1996). Generally, small and intermediate streams represent the majority of total aggregate stream length within a watershed (Chamberlin et al. 1991). Given these relationships, maintaining adequate canopy conditions on small and medium sized streams (including intermittent streams) is necessary to avoid altering natural temperature regimes.

Groundwater entering streams may be an important determinant of stream temperatures and may provide localized thermal refugia or spawning areas for bull trout. Baxter et al. (1999), for example, found a positive correlation between numbers of bull trout redds and areas of ground water exchange in the Swan River Basin, Montana. Timber harvest from upland areas exposes the soil surface to greater amounts of solar radiation than under forested conditions, and where groundwater flows originate above a neutral temperature zone, where temperatures remain constant throughout the year, fluctuations in groundwater temperature can be expected. Fluctuations will be greatest at the soil surface and will decrease with increasing depth until the neutral zone is reached (Spence et al. 1996). Increases in groundwater temperature may result in increases in stream temperature, especially in small streams dependent upon lateral groundwater input to maintain flows during base flow periods (Spence et al. 1996, Brosofske et al. 1997, Poole and Berman 2001). Because of increased surface area exposure, potential effects to ground water and stream temperature are expected to be greater in areas that are clearcut.

Project design measures expected to reduce the risks of negative impacts on bull trout from vegetation treatments include no vegetation treatments or fire ignition in streamside RHCAs (PDMs 1,4, and 5), restricting tractor harvesting to slopes less than 35 percent, and prohibiting timber harvest in areas of high landslide hazard (PDM 6). Ground disturbance will be limited or restricted when soils are wet (PDM 12). Skid trails will be scarified and recontoured (PDM 13), and revegetated (PDM 33). The access route for excavator piling in the Middle American River subwatershed will be mulched and seeded and monitored after work is complete.

Measures to reduce potential impacts to water quality include preparation of a spill prevention plan (PDM 20), inspection of equipment for fuel leaks (PDM 19), and noxious weed management (PDMs 33 through 39). If fire suppression is needed, the use of chemical fire retardants may adversely impact bull trout. Retardants can have direct and indirect effects on salmonids. Large quantities of retardant delivered directly into streams can cause direct mortality. Indirect effects of retardants delivered directly into streams include mortality of invertebrates and eutrophication of downstream reaches (Spence et al. 1996). Any fire suppression will follow MIST guidelines and the guidelines in the fire Programmatic Assessment (Bureau 1999).

Aquatic processes identified in the Assessment that may potentially be affected by vegetation treatments include surface erosion (sediment) and infiltration/runoff/peaks (hydrologic process). The Assessment predicts that surface erosion and negative effects to infiltration, runoff, and flow peaks will be short-term (five years or less) and insignificant (see Table F.2 in Assessment). Vegetation treatments will have insignificant long-term positive effects on riparian shading and large woody debris recruitment. No short or long-term significant impacts are expected to bull trout or bull trout habitat from vegetation treatments.

As shown in Table 7, very little (12 acres) vegetation management is proposed in the only stream with potential bull trout spawning, East Fork American River. Sixty-six percent of the project acreage treated will be in Middle and Lower American River, where bull trout may occur year round but are not known to spawn.

**Table 7. Total acres treated (harvest and fire) by subwatershed. Also bull trout use and baseline condition category are shown for each subwatershed in the project area**

| [illegible] | [illegible] | [illegible] | [illegible] |
|---|---|---|---|
| Middle American R. | 1 | L | 202.3 |
| East Fk. American R. | 2 | H | 12.13 |
| Whitaker Cr. | 0 | M | 104.09 |
| Queen Cr. | 0 | M | 73.29 |
| Box Sing Cr. | 0 | M | 46.95 |
| Kirks Fork | 1 | H | 56.84 |
| Little Elk Cr. | 1 | L | 7.41 |
| Lower Elk. Cr. | 1 | L | 97.52 |
| Lower American R. | 1 | L | 554.33 |

## 2. Road Construction, Improvement, and Maintenance

The project proposes 10 miles of temporary road construction and 2.4 miles of road improvement. Gucinski et al. (2001) indicate that there may be fewer direct adverse effects to aquatic species from temporary roads compared to permanent roads, but this difference is dependent upon the degree of temporary road decommissioning. Additionally, the indirect effects from temporary roads include the effects from the activities for which the roads were built, such as sediment production from timber harvest.

Potyondy et al. (1991) indicate that the majority of surface erosion associated with road construction in general (whether temporary or permanent) occurs in the first year and continues at a reduced but relatively high rate for several years. The project requires that temporary roads will be built, used, and decommissioned within a one to three year period (PDM 9). This measures should minimize but not eliminate the potential for sediment delivery and adverse effects to bull trout from temporary road construction.

The project proposes 2.4 miles of road improvement. Road improvement includes surface blading, drainage repair, roadway brushing, culvert installations, slump repairs, and stabilization work to prepare roads for log hauling.

Although not specified in the Assessment, the Service assumes that road improvement will include both heavy and light reconstruction with significant surface erosion expected. As with temporary road construction, surface erosion resulting from road improvement will be highest in the first year after the improvement activity (although at a reduced rate compared to new road construction) and will continue at a lower rate during subsequent years. The amount of erosion during subsequent years is dependent upon the intensity of use or upon whether the road is closed or decommissioned (Potyondy et al. 1991). Similarly, Luce and Black (2001) identified road maintenance and vehicle traffic as primary factors affecting forest road sediment production. Increased surface erosion and sediment delivery to bull trout habitat has the potential to affect bull trout through the pathways described in the sections above. Adverse effects may be reduced by the use of sediment and erosion control measures such as dewatering culverts, using sediment barriers, and rocking road surfaces and ditches (PDM 15).
The Assessment identifies surface erosion and sediment delivery associated with temporary road construction as the only significant impacts expected from the roads component of the project. Although significant this effect is expected to be short term (i.e., less than 5 years).

**3. Watershed, Riparian, and Fish Habitat Improvements**

Proposed restoration activities include road decommissioning, road abandonment, road relocation (out of riparian areas), stream ford obliteration/restoration, road to ATV trail conversion, ATV bridge construction (to replace two fords), riparian seeding and planting, streambank recontouring, and mine site reclamation. Also included is reconnecting Queen Creek with the American River to improve fish passage.

Fuel spills and equipment leaks associated with ford obliteration, ATV bridge construction, riparian seeding and planting, streambank recontouring, and reconnecting Queen Creek may result in toxic effects to bull trout as discussed previously. Any instream work is expected to result in increases in suspended sediment. Depending upon concentration and duration of exposure, suspended sediment may directly affect bull trout physiological condition and behavior (Newcombe and Jensen 1996, Bash et al. 2001). Newcombe and Jensen (1996) predict sublethal adverse effects are expected for juvenile and adult salmonids at suspended sediment concentrations as low as 55 mg/l (using a surrogate of 25 NTUs) at exposure times of three hours. This level of exposure may produce short-term reductions in feeding rates and feeding success, and minor physiological stress. Compared with other salmonids, bull trout are more sensitive to sediment and require the lowest suspended sediment levels (Bash et al. 2001). The Bureau will conduct implementation and effectiveness monitoring, and modify the project if needed, to insure that the surrogate turbidity level of 25 NTUs is not exceeded for more than three hours. Presence of equipment in stream may also increase the likelihood of injury or disturbance for any bull trout that may be in the construction zone.

Design measures to reduce the risk of adverse effects to bull trout from watershed improvements include the use of flow diversions and sediment barriers to minimize sediment delivery to streams (PDM 15); conducting work during the instream work window (July 1 to August 15) to avoid effects to spawning fish (PDM 16); conducting equipment inspections to ensure no leakage of oil, fuel, or hydraulic fluid (PDM 19); and, using electrofishing (following NOAA fisheries guidelines,1998) or other means to remove bull trout from instream activity sites (PDM 21). The use of electrofishing or other methods to remove bull trout from instream work sites requires that the Bureau possess a current Scientific Collection Permit issued by Idaho Department of Fish and Game, and follow all associated requirements. These requirements include the terms and conditions from the Service's Programmatic Biological Opinion (dated February 14, 2000) evaluating the impacts of exempting states, under section 6 of the Act, from prohibitions on take of bull trout.

**4. Project Effects Summary**

The Assessment describes the main negative impact expected from project implementation as a short-term increase in sediment yield, characterized by one or more sediment pulses. Sediment yield is defined as the movement of sediment past a point in the stream over a period of time, and is expressed as percent over natural base. The Bureau uses NEZSED to model sediment yield. The NEZSED computer model is an adaptation of the Forest Service R1/R4 sediment yield guide (Cline et al. 1981). NEZSED accounts for natural background sediment and activity sediment generated from roads, timber harvest, and fire. The activity sediment is estimated from surface erosion processes and small mass failures. NEZSED was not used to model sediment produced from riparian restoration and streambank recontouring, nor from reconnecting Queen Creek.

The R1/R4 Guide cautions that model results are intended primarily for comparing management alternatives and only secondarily for quantifying sediment yield. Gloss' study (1995) concluded that the NEZSED model cannot be expected to provide highly accurate sediment yield estimates.

Given these limitations, the NEZSED model predicts that during the first year of implementation, the only significant changes in sediment yield (i.e., more than 10 percent change) will occur in Whitaker Creek, Queen Creek, and Box Sing Creek. The model does not predict any significant increase in sediment yield for any bull trout streams.

A stream can transport a limited volume of sediment if it is in equilibrium, meaning that the channel is neither aggrading nor degrading (Lisle and Hilton 1992). If volume of sediment exceeds the amount that can be transported sediment settles to the channel bottom of depositional reaches with resulting potential impacts to aquatic organisms and habitat (e.g., substrate condition, pool habitat, and water temperature). The Bureau uses FISHSED (Stowell et al. 1983) to model the effect of sediment yield (values from NEZSED) on fish abundance. A basic assumption of the FISHSED model is that increased levels of deposited sediment reduce fish survival and abundance (modeled as winter and summer rearing capacity). FISHSED predicts

insignificant changes in rearing capacity for most watersheds, but predicts a greater than 10 percent increase in embeddedness for Lower American and Queen Creek and a decrease in

winter rearing capacity for Queen and Whitaker Creek. Because bull trout have not been found in Queen and Whitaker Creeks, these predicted changes will only affect bull trout in Lower American River. Downstream sediment effects will be insignificant in the South Fork Clearwater River. Bull trout will also be directly exposed to elevated levels of suspended sediment during watershed restoration projects.

In conclusion, bull trout habitat conditions are currently degraded throughout the action area. Project implementation will result in a short-term increases in suspended sediment, sediment yield and cobble embeddedness and reduced winter and summer rearing capacity. With the exception of Lower American River, these modeled effects are expected to be insignificant for bull trout streams. Proposed restoration projects will improve aquatic habitat conditions in the long-term.

**5. Risk Assessment**

We assessed the risk to bull trout from project implementation by looking at effects to four Matrix indicators: Water Yield, Sediment Yield, Suspended Sediment, and Harassment/disturbance. These indicators were chosen to best represent potential short-term effects from the project to bull trout habitat, and potential short-term harassment or disturbance of individual bull trout when in-channel activities are occurring. Details of the analysis are displayed in Appendix B of this Opinion. Table 8 summarizes the results of the analysis. The larger the risk score number the greater the predicted risk to bull trout.

As shown in Table 8, bull trout are expected to be most at risk in Lower and Middle American River because of a combination of high project-related risk (resulting primarily from project impacts on sediment yield, suspended sediment, and harassment/disturbance indicators) and low habitat condition. Bull trout may be present year-round in Middle and Lower American Rivers, but no spawning has been documented and population numbers are low (zero to one bull trout per 300 meters of stream). Because they have not been found in these drainages, bull trout are not expected to be at risk in Whitaker, Queen, and Box Sing Creeks. Bull trout in the East Fork American River and Kirks Fork are at the lowest risk because these two watersheds are in the best relative habitat condition and there are few treatments.

**Table 8. Project risk ratings for subwatersheds potentially affected by the Eastside Fuels and Vegetation project. Table includes short-term effects only.**

| Subwatershed | Project Risk Rating[1] | Habitat Quality Score[2] | Bull Trout Use[3] | Risk Score[4] |
|---|---|---|---|---|
| Middle American | 8 | 15 | 1 | 120 |
| East Fork American | 2 | 5 | 2 | 20 |
| Whitaker | 6 | 10 | 0 | 0 |
| Queen Creek | 12 | 10 | 0 | 0 |
| Box Sing | 6 | 10 | 0 | 0 |
| Kirks Fork | 4 | 5 | 1 | 20 |
| Little Elk Creek | 0 | 15 | 1 | 0 |
| Lower Elk Creek | 2 | 15 | 1 | 30 |
| Lower American | 10 | 15 | 1 | 150 |
| South Fork Clearwater | 1 | 15 | 1 | 15 |

[1] Based on the analysis in this Appendix
[2] Based on Analysis in Baseline section of this Opinion: 5 = High Relative Condition, 10 = Moderate Relative Condition, 15 = Low Relative Condition
[3] 0=Probably Absent, 1= Present, 2=Potential Spawning and Early Rearing
[4] Risk score based on consideration of project risk rating, habitat quality score, and bull trout use. Risk = Project Risk Rating x Habitat Quality Score x Bull Trout Use

No known trend data exists for bull trout in American River. Based on limited, available data, the migratory component is very low or non-existent in some years. Although trends cannot be determined because of the absence of data, given current low densities and sporadic observations of bull trout in the watershed, it is probable that the species has declined in the watershed over the past two to three decades (Forest Service 2005). The project is not expected to increase the risk of extinction for the American River potential local population of bull trout because of the low level of project activity in potential bull trout strongholds, and projected long-term improvement in watershed/habitat conditions resulting from the proposed restoration activities.

### B. Effects of Interrelated or Interdependent Actions

The Service did not identify any interrelated or interdependent actions associated with the project.

## V. CUMULATIVE EFFECTS

Cumulative effects are 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.

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 were identified in the Status of the Species section of this Opinion. These activities include

timber harvest and road building, grazing, water diversion, residential development, and agriculture. City, county, and state transportation departments conduct annual herbicide spraying of rights-of ways in the action area with unknown concentrations of herbicides potentially delivered to bull trout streams.

Illegal and inadvertent harvest of bull trout is also considered a cumulative effect. Harvest can occur through both misidentification and deliberate catch. Being aggressive piscivores, bull trout readily take lures or bait (Ratliff and Howell 1992). Spawning bull trout are particularly vulnerable to harvest because the fish are easily observed during autumn low flow conditions. Hooking mortality rates range from four percent for nonanadromous salmonids with the use of artificial lures and flies (Schill and Scarpella 1997) to a 60 percent worst case scenario for bull trout taken with bait (Idaho Department of Fish and Game 2001b). Thus, even in cases where bull trout are released after being caught some mortality can be expected.

## VI. CONCLUSION

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. It is the Service's biological opinion that the project is not likely to jeopardize the continued existence of the South Fork Clearwater River core area or the Columbia River population segment of bull trout, and therefore the species (64 FR 58930, November 1, 1999).

The Service concludes that direct effects would be limited to short-term disturbance of adult and juvenile migratory or resident bull trout. Short-term indirect effects from proposed project activities may occur but these effects are anticipated to occur only within the action area and should be minimized by the design measures incorporated into the project proposal. The Service expects that the numbers, distribution, and reproduction of bull trout in the action area, the American River potential local population, the South Fork Clearwater core area, the Clearwater River management unit, or in the Columbia Basin population segment will not be significantly changed as a result of this project. Reproduction is not expected to be appreciably altered because spawning areas have not been documented in the action area and only a limited amount of project treatments will occur in suspected spawning areas (East Fork American River). Connectivity between the American River potential local population and local populations in the Clearwater River recovery unit will not be adversely affected. Proposed restoration actions should result in long-term improvements in habitat quality and connectivity. As such, we have concluded that the survival and recovery of bull trout populations will not be jeopardized by the project.

No critical habitat is designated in the action area so none will be affected.

## VII. 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 special 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 is further defined by the Service to 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 intentional or negligent actions that create the likelihood of injury to listed species 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)].

## A. Amount or Extent of Take

The Service expects that all bull trout in the vicinity of road and ATV bridge construction, bank recontouring, riparian planting, reconnecting Queen Creek, and within the downstream extent of sediment and/or turbidity effects (300 feet) may be subject to take in the form of harassment. Given an estimated density of one fish per 300 meters, a total of 11 bull trout may harassed during the 10 year life of the project (Table 9). The Service believes that the risk of take will be minimized considerably through application of the design measures to be applied during implementation of the proposed action, which may reduce impacts to bull trout and bull trout habitat.

**Table 9. Total number of bull trout subject to take by project treatment (based on density of one bull trout per 300 meters of stream). Each of these treatments is expected to be completed within one year.**

| Treatment | Number of [illegible] in miles/meters | [illegible] |
|---|---|---|
| Streambank Recontouring and Restoration | 1.2 /1610 | 5 |
| Ford closure and restoration | 3 | 3 |
| ATV bridges | 2 | 2 |
| Queen Creek Reconnect | 1 | 1 |
| Total | | 11 |

The Service anticipates that incidental will only occur and be permitted during the following time period and in the following forms during the estimated maximum 10 year life of the project.

1. Take of bull trout in the form of harassment associated with direct disturbance from American River streambank recontouring and restoration, ford closures and restoration, ATV bridge construction, and Queen Creek channel reconnect. In or near occupied bull trout habitat, these types of activities will be confined to a July 1 to August 15 work window. Because bull trout are not expected in Queen Creek, the work window for the channel reconnect is July 1 to October 15. These work windows may be adjusted on a site specific basis with Service approval.

2. Take of bull trout in the form of harassment associated with the disturbance of substrate materials or sediment production, intentionally or unintentionally, while working in the stream channel between July 1 and August 15 (or October 15 for Queen Creek). Again, these work windows may be adjusted on a site specific basis with Service approval.

3. Take of bull trout in the form of harassment from short-term habitat and food supply effects, and short-term changes in water quality and habitat conditions associated with sediment delivery from project activities, including road construction.

Incidental take will be limited to the following locations, life forms, and life stages that are likely to be affected.

1. The location of the expected incidental take is: Lower American River (streambank recontouring and restoration, one ford closure, and one ATV bridge), Kirks Fork (ford closure and ATV bridge), Queen Creek (reconnect), and Middle American River (riparian planting and ford closure).

2. The life forms expected to be harassed include fluvial and resident bull trout.

3. The life stages expected to be harassed include adult and juvenile fish.

The Service expects no direct lethal take of bull trout (including eggs, alevins, and fry). If the incidental take anticipated by this document (i.e., harassment of 9 bull trout within the action area) is exceeded, project activities associated with this exceedence will cease and the Bureau will immediately contact the Service to determine if consultation should be reinitiated. Authorized take will be exceeded if project activities result in bull trout (including eggs, alevins, and fry) mortality; instream or bank disturbance activities result in significant (i.e., greater than 25 NTUs over background levels for more than three consecutive hours) sediment effects extending downstream more than 300 feet; or if project-related changes to bull trout habitat in the action area exceed what is predicted in the Assessment (including long-term adverse changes to cobble embeddedness, stream temperature, water quality, bank stability, riparian condition, and channel morphology).

If bull trout are present in the action area, they may be injured or killed in the process of collecting and removing fish prior to instream work. This take has already been anticipated and analyzed in the Service's Biological Opinion for Idaho Department of Fish and Game's Scientific Collecting Permit (Service 2000), and will not be addressed in this Incidental Take Statement.

## B. Effect of the Take

The Columbia River population segment comprises 22 recovery units including the Clearwater River unit (Service 2002). The Clearwater recovery unit contains seven core areas with 36 local populations. American River is considered a potential local population as spawning has not been documented. Anticipated take may be reduced because the project includes design measures to avoid and reduce adverse effects. The probability that the proposed action will eliminate the American River potential local population of bull trout is insignificant. Local bull trout densities and distribution in the affected streams are not expected to be significantly altered. As none of the 36 local populations may be affected by project activities, it is unlikely that the proposed action will impair productivity or population numbers of bull trout in the Clearwater recovery units or in the Columbia River population segment.

## C. Reasonable and Prudent Measures

The Service believes that the following reasonable and prudent measure is necessary and appropriate to minimize take resulting from project implementation:

- Minimize the potential for harassment of bull trout and disruption of riparian and aquatic habitat from project activities.

## D. Terms and Conditions

In order to be exempt from the prohibitions of section 9 of the Act, the Bureau must comply with the following terms and conditions, which implements the reasonable and prudent measure described above and outline required reporting and monitoring requirements. These term and conditions are non-discretionary.

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

2. Project activities shall cease during periods of heavy precipitation where run-off could potentially cause erosion and sediment delivery to bull trout habitat in the action area.

3. To minimize sediment effects, new temporary road will be constructed using minimal road widths and out-sloped surface drainage, where feasible. High landslide prone areas will be avoided. Highly erosive road cuts and fills will be stabilized with annual grass cover where roads are held more than one year.

## E. Monitoring

1. The Bureau shall provide an annual report detailing project implementation progress and baseline updates which will include results of implementation and effectiveness monitoring, any bull trout surveys conducted in the project area, a summary of bull trout observed or handled under the state Collecting Permit, as well as the results of monitoring revegetation efforts. The monitoring report will be sent to the Snake River Fish and Wildlife Office, 1387 South Vinnell Way, Suite 368, Boise, Idaho 83709, by March 15 or other mutually agreed upon date.

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

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

## VIII. CONSERVATION RECOMMENDATIONS

Section 7(a)(1) of the Act requires 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 plans, or to develop information. The Service recommends that the Bureau implement the following conservation measures.

1. Evaluate opportunities for selectively removing brook trout in areas where they coexist with bull trout and assess fish passage projects for their potential to facilitate brook trout access to isolated bull trout populations.

2. Monitor and evaluate all-terrain vehicle use of trails within the project action area as press sources of sediment to aquatic systems. If an assessment indicates these trails are adversely affecting aquatic systems, then eliminate the source of adverse effects by closing and rehabilitating trails. Where closure is not feasible continue to install bridges at stream crossings.

3. Promote recovery of bull trout in the action area by identifying additional habitat restoration opportunities and implementing these actions in the near-term.

4. Continue to survey and monitor bull trout populations and habitat in the action area. Consult Peterson et al. (2002) for a suitable survey protocol for determining presence. Locating spawning areas should be a high priority.

To keep the Service informed of actions minimizing or avoiding adverse effects or benefiting listed species or their habitats, the Service requests notification on implementation of any conservation recommendations.

## IX. REINITIATION NOTICE

This concludes formal consultation on the action outlined in the request. 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 retained (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 not considered in this Opinion; or (4) a new species is listed or critical habitat designated that may be affected by the action. In instances where the amount or extent of incidental take is exceeded, any operations causing such take must cease pending reinitiation.

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**APPENDIX A. PROJECT DESIGN MEASURES (PDM) from the Assessment.**

| # | Project Design Measure | Implementation Method |
|---|---|---|
| 1 | No timber harvest or mechanical fuel reduction activities would occur in RHCAs, or areas of high landslide risk. | Project Design, silviculture prescription and field prep. |
| 2 | Silvicultural prescriptions would 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 | Silvicultural prescription, and burn plan |
| 3 | Livestock grazing will be restricted for two growing seasons or until reforestation and restoration objectives are achieved. | Grazing Lease coordination with lessees. |
| 4 | No cutting of trees would be allowed in PACFISH RHCAs, except restoration/habitat improvements, and to facilitate anchoring of cable yarding systems. Anchoring may result in individual tree mortality, and trees could be left standing if needed for site protection. Not all cable units would require anchors within RHCAs. Anchor trees would generally be located in the outer 50 feet of the RHCA, spaced usually at greater than 50 foot intervals along the perimeter. | Project Design, field prep., contract and contract administration/ inspection |
| 5 | Post harvest burning will be designed and implemented with the intent of restricting burning to stay within the unit boundary. Fire that moves outside the external unit boundary will be suppressed if it poses a threat to riparian resources. On occasion fire will move into RHCA adjacent to the harvest unit. Fire will not be ignited within these areas, but may be allowed to 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 RHCA inclusions. | Silvicultural prescription, burn plan , and BLM Fuels management |
| 6 | Landslide prone areas are also considered Riparian Habitat Conservation Areas (RHCAs). No timber harvest would occur in areas of high landslide risk, as described in (1) above. If additional, unmapped landslide prone areas are found during project implementation, areas would be dropped or activities would be modified with watershed specialist oversight to protect slope stability. | Project Design, silviculture prescription and field prep. |
| 7 | The State of Idaho Best Management Practices (BMPs) would be applied. These are incorporated by reference. | Contract and contract administration/inspection |
| 8 | Biomass utilization would be applied where feasible in lieu of excavator piling to reduce physical soil damage and to encourage natural regeneration. Trees would be yarded whole, the slash would be at the landing allowing it to be either piled and burned or hauled for use off site. Most ground based units can have whole tree yarding. | NEPA project design, silviculture prescription, and contract |
| 9 | Temporary roads would be built, used, and decommissioned within a 1 to 3-year period, in order to reduce the amount of sediment production. Coordination of temporary road use and decommissioning with the NPNF American and Crooked River project would be required. | NEPA project design and contract administration |

| # | Project Design Measure | Implementation Method |
|---|---|---|
| 10 | 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 & limit length of windrow to allow easy passage of wildlife. | Contract and contract administration/inspection |
| 11 | Snow plowing will maintain a minimum of two inches of snow on the road, leave ditches and culverts functional, sidecast material will not include dirt and gravel, and berms will not be left on shoulder unless drainage holes are opened and maintained. | Contract and contract administration/inspection. |
| 12 | Timber harvest, fuel reduction, and stream restoration activities would be limited or suspended when soils are wet, such that resource damage may occur, to reduce rutting, displacement and erosion. However, harvest could occur during frozen conditions. Frozen conditions are defined as greater than 4 inches of frozen ground, a barrier of snow greater than two feet in depth (unpacked snow), or one foot in depth (packed snow). | Contract and contract administration/inspection |
| 13 | Excavated skid trails and landings with cut slopes of more than 1 foot would be scarified and recontoured, replacing topsoil as feasible on all landings and trails. | Contract and contract administration/inspection |
| 14 | Restore soil permeability on temporary roads and landings by scarifying compacted soils to a minimum of 16 inches, or depth of compaction. Excavator, winged subsoiler or similar equipment is preferred, to avoid mixing surface ash layer and subsoil. Partially recontour where needed, seeding with native species (including annual grasses), mulching where needed, and pull slash over the surface to achieve 50% ground cover prior to seasonal runoff events. | Contract and contract administration/inspection |
| 15 | Sediment and erosion control measures such as dewatering culverts, sediment barriers, rocking road surfaces and/or ditches, etc., would be used to protect fish habitat and water quality. | Contract and contract administration |
| 16 | Activities including stream crossing road improvements would be conducted in fish bearing streams between July 1 and August 15 to avoid sediment deposition on emerging steelhead or chinook redds, or disturbance to bull trout moving to natal streams. These dates may be site-specifically adjusted through coordination with the Central Idaho Level 1 team and other agencies. | NEPA project design, contract and contract administration/inspection |
| 17 | When designing new structures, consider and give preference to open-bottom arches, bridges and oversized culverts. | NEPA project design, contract and contract administration/inspection |
| 18 | During restoration habitat improvement activities, tree felling in RHCAs would occur only where that activity would benefit Riparian Management Objectives | Contract and contract administration/inspection |
| 19 | Prior to instream habitat improvement activities, heavy equipment would be inspected to assure no leakage of oil, fuel, or hydraulic fluid. | Contract and contract administration/inspection |

| # | Project Design Measure | Implementation Method |
|---|---|---|
| 20 | A Spill Prevention Control and Countermeasures Plan (40 CFR 112) would be prepared and implemented that incorporates the rules and requirements of the Idaho Forest Practices Act Section 60, Use of Chemicals and Petroleum Products; and US Department of Transportation rules for fuels haul and temporary storage; and additional direction as applicable. | Contract and contract administration/inspection |
| 21 | For instream activities in fish-bearing streams that contain listed species, fish are expected to disperse from the activity area. If needed, additional measures would be used to ensure fish are not harmed or killed by instream activity. If electrofishing were necessary, it would be conducted in accordance with NOAA Fisheries electrofishing guidelines found at http://www.nwr.noaa.gov. | Contract and contract administration/inspection |
| 22 | Procedures outlined in the North Idaho Smoke Management Memorandum of Agreement would be followed, including restrictions imposed by the smoke management-monitoring unit. | BLM fuels management |
| 23 | Prescribed burning. Priority in scheduling would be given to units accessed by temporary roads scheduled for decommissioning. | BLM fuels management |
| 24 | Additional restrictions, beyond those imposed by the smoke management monitoring unit, would be considered for prescribed burning for local air quality reasons, including visual. | BLM fuels management |
| 25 | Should an active goshawk nest be discovered within 450 feet of timber harvest or fuel reduction activities, the nest tree will be protected, as well as a 10–15 acre no-treatment buffer area around the nest tree | Field prep, contract and contract administration/inspection |
| 26 | The integrity of existing access management restrictions on NPNF roads would be maintained within the planning area for wildlife security purposes. No contractor or their representatives may use motorized vehicles to hunt or trap animals on a restricted road. | Contract and contract administration/inspection |
| 27 | Gates/closures will be installed on temporary roads as needed to restrict public vehicle use. | Project design, contract, contract administration. |
| 28 | Avoid or protect known historic properties when possible. | Project design, contract administration |
| 29 | When necessary to cross historic mine ditches the following will be implemented. Ditches will be approached perpendicular to the ditch to minimize the affect. The ditch crossing will be documented with photographs and GPSed. Logs, culverts, or other solid material will be laid horizontally up to the berm of the ditch. The harvest equipment or cable corridors will only use these designated areas to transport the logs across the platform. When the treatment operation is complete the material will be removed from the ditch. These crossings will be about 20 feet in width.<br>When sections of ditch may be obliterated by road construction then the same documentation actions will be incorporated as well preparing cross-section profiles. | Project design, contract administration |

| # | Project Design Measure | Implementation Method |
|---|---|---|
| 30 | When historic mine dredge tailings will be impacted the site will be documented with photographs, measured, and GPSed in areas of potential impact. | Project design, contract administration |
| 31 | If additional cultural resources are discovered during project implementation then all activities will cease in that area and the BLM archeologist notified and sites evaluated according to 36 CFR 800. | Contract Administration |
| 32 | Treatment activities in units 34 and 35 would be conducted using the frozen conditions noted in #10. | Contract and contract administration/inspections |
| 33 | Desirable vegetation would be promptly established on disturbed areas, such as log landings, road cuts and fills, skid trails etc., using native and non-native plant species as appropriate to reach restoration goals. The species used for restoration / revegetation will be determined by the appropriate Cottonwood FO personnel. | Contract and contract administration/inspection |
| 34 | All seed utilized in revegetation will be certified weed free and documentation of the seed inspection test will be provided to the contract administrator. All straw and mulch, prior to beimg used for restoration or revegetation projects, would be certified as free of noxious weed seed. | Contract and contract administration and inspection |
| 35 | All mud, soil and plant parts would be removed from all equipment associated with the project before moving into the project area to limit the spread of noxious and other weeds. | Contract and contract administration and inspection |
| 36 | All private rock used for road surfacing would be county-certified as free of noxious weed seed. Borrow pits and stockpiles will not be used if it is determined, by the appropriate Cottonwood FO specialist, that it is infested with an invasive plant that is not found in the area where the material will be placed. | Contract and contract administration/ inspection |
| 37 | Small outbreaks of invasive weeds within one mile of the project area. and along all haul routes leading to the project areas will be pretreated prior to ground disturbing activities under the existing weed management program. | Field prep, contract |
| 38 | Areas disturbed during project activities will be inventoried a minimum of two years post project to detect establishment of noxious weeds. The inventory data will then be forwarded to the weeds program manager for inclusion in the treatment program. | Post project monitoring |
| 39 | New weed sites found during inventory efforts will be given a high priority for weed treatment to help prevent further spread. | Post project monitoring, BLM weed program protocols. |
| 40 | Candystick, a species of concern, occurs in some management units north of Whitaker Creek. Where live mature lodgepole are associated with candystick, groups of live mature lodgepole pine would be left to protect candystick from management activities. | Project design, field prep, contract and contract administration/ inspection |

| # | Project Design Measure | Implementation Method |
|---|---|---|
| 41 | Idaho barren strawberry, a BLM sensitive plant species, occurs in some management units Core areas where it occurs would be protected in tractor skidding units. Areas will be avoided or logged when snow conditions are greater than two feet in depth (unpacked snow), or one foot in depth (packed snow). | Project design, field prep, contract and contract administration/ inspection |
| 42 | Any authorized range improvement (i.e., fences, spring developments) would be restored by the BLM if during the logging operation they were removed or damaged. | Contract and contract administration/ inspection |

## APPENDIX B. Bull Trout Risk Assessment for the Eastside Township Fuels and Vegetation Project.

### 1. Risk Assessment

Table 1 below displays the results of a project risk assessment conducted for the Eastside Township Fuels and Vegetation project. A description of the details of this analysis follows.

**Table B-1. Project risk ratings for subwatersheds potentially affected by the Eastside Fuels and Vegetation project. Includes short-term effects only.**

| Subwatershed | Project Risk Rating[1] | Habitat Quality Score[2] | Bull Trout Use[3] | Risk Score |
|---|---|---|---|---|
| Middle American | 8 | 15 | 1 | 120 |
| East Fork American | 2 | 5 | 2 | 20 |
| Whitaker | 6 | 10 | 0 | 0 |
| Queen Creek | 12 | 10 | 0 | 0 |
| Box Sing | 6 | 10 | 0 | 0 |
| Kirks Fork | 4 | 5 | 1 | 20 |
| Little Elk Creek | 0 | 15 | 1 | 0 |
| Lower Elk Creek | 2 | 15 | 1 | 30 |
| Lower American | 10 | 15 | 1 | 150 |
| South Fork Clearwater | 1 | 15 | 1 | 15 |

[1] Based on the analysis in this Appendix
[2] Based on Analysis in Baseline section of this Opinion: 5 = High Relative Condition, 10 = Moderate Relative Condition, 15 = Low Relative Condition
[3] 0=Probably Absent, 1= Present, 2=Potential Spawning and Early Rearing
[4] Risk grouping based on consideration of project risk rating, habitat quality score, and bull trout use. Risk = Project Risk Rating x Habitat Quality Score x Bull Trout Use

### 2. Methods Used to Determine Project Risk Ratings by Subwatershed (adapted from the analysis provided by the Nez Perce National Forest for the Red Pines Biological Opinion).

Four indicators were used to obtain risk ratings for each subwatershed. These indicators were taken from the North Central Idaho Interagency Level 1 Team Matrix of Pathways and Indicators for listed steelhead and bull trout. Numerical risk ratings were assigned to each indicator and summed to obtain the numbers displayed above in Table 1. Possible ratings range from 0 to 16. The ratings were based on consideration of probability of effect combined with potential magnitude of effect. This rating system was used in 1998 when effects to all the 5$^{th}$ code HUC watersheds were assessed and incorporated in the 1999 subbasin biological assessments. In summary, the rating system was based on the following table:

**Table B-2. Rating system for project risk analysis.**

| | Probability of Effect | | | | |
|---|---|---|---|---|---|
| **Potential Level of Effect** | None | Very Low | Low | Moderate | High |
| None | 0 | 0 | 0 | 0 | 0 |
| Very Low | 0 | 1 | 1 | 1 | 1 |
| Low | 0 | 1 | 1 | 2 | 2 |
| Moderate | 0 | 2 | 3 | 3 | 4 |
| High | 0 | 3 | 4 | 4 | 4 |

Matrix indicators used to assess project risk include water yield, sediment yield, suspended sediment, and harassment/disturbance. These indicators were chosen to best represent potential effects from the project to habitat focusing on short-term effects only, and potential short-term harassment or disturbance of individual bull trout when in-channel activities are occurring.

*Water yield:* this effect pathway included potential effects from fuel treatment units, temporary road construction, and prescribed burning. Calculations of equivalent clearcut area (ECA) were applied to above table. In general, ECA increases of one or two percent were considered to have a low probability of effect and a very low potential of effect, resulting in a risk rating of 1. All post-project ECA in the watersheds displayed above in Table 1 were below 15 percent.

*Sediment yield:* this effect pathway included potential effects from fuel treatment units, temporary road construction, road reconditioning, road decommissioning, post harvest fuel treatment, mine rehabilitation, and soil restoration. Indicators used included NEZSED predictions of peak sediment yield, which include short-term sediment effects from fuel treatment units, temporary road construction, road reconditioning, and road decommissioning.

Other indicators considered included acres of soil restoration, number of site of mine rehabilitation, and acres of post harvest (slash) fuel treatments.

*Suspended Sediment:* this effect pathway included potential effects from in-channel reconstruction and improvements, stream crossing upgrades, sediment trap decommissioning, and maintenance of existing habitat improvement structures. Indicators used included length of in-channel reconstruction, number, location and type of stream crossing upgrades, number of sediment traps proposed for decommissioning, and miles of stream structure maintenance.

*Harassment/Disturbance:* this effect pathway included potential disturbance to individual bull trout from increases in suspended sediment and use of machinery and/or persons working in or adjacent to streams. Indicators used included miles of in-channel reconstruction; and number, location, and type of stream crossing upgrades.

**3. Analysis of Project Risk Ratings Displayed in Table 1 (adapted from the analysis provided by the Nez Perce National Forest for the Red Pines Biological Opinion).**

***Middle American River***

| | |
|---|---|
| Water yield: | Existing ECA = 3 |
| | Predicted ECA = 5 |
| | Risk rating = I |
| Sediment yield: | NEZSED existing sediment yield = 12 percent over base. |
| | NEZSED peak sediment yield = 17 percent over base. |
| | Acres slash treatment = 282 |
| | Risk rating = 3 |
| Suspended sediment: | Number of crossing upgrades = 2 |
| | Miles Streambank recontour = 0 |
| | Risk rating = 2 |
| Harass/Disturbance: | same as suspended sediment |
| | Risk rating = 2 |

Total risk rating = 8

***East Fork American***

| | |
|---|---|
| Water yield: | Existing ECA = 6 percent |
| | Predicted ECA = 7 percent |
| | Risk rating = 0 |
| Sediment yield: | Existing sediment yield = 12 percent over base |
| | Predicted sediment yield = 17 percent over base |
| | Acres slash treatment = 12 |
| | Risk rating = 2 |

| | |
|---|---|
| Suspended sediment: | Number of crossing upgrades = 0 |
| | Miles Streambank recontour = 0 |
| | Risk rating = 0 |
| Harass/disturbance: | same as suspended sediment |
| | Risk rating = 0 |

Total risk rating = 2

***Whitaker***

| | |
|---|---|
| Water yield: | Existing ECA = 10 |
| | Predicted ECA = 20 |
| | Risk rating = 2 |
| Sediment yield: | Existing yield = 31 percent over base |
| | Predicted peak yield = 59 percent over base |
| | Acres slash treatment = 104 |
| | Risk rating = 4 |
| Suspended sediment: | Number of crossing upgrades = 0 |
| | Miles Streambank recontour = 0 |
| | Risk rating = 0 |
| Harass/Disturbance: | same as suspended sediment |
| | Risk rating = 0 |

Total rating = 6

***Queen Creek***

| | |
|---|---|
| Water yield: | Existing ECA = 13 percent |
| | Predicted ECA = 23 percent |
| | Risk rating = 2 |
| Sediment yield: | Existing yield = 37 percent over base |
| | Predicted peak yield = 60 percent over base |
| | Acres slash treatment = 73 |
| | Risk rating = 4 |
| Suspended sediment: | Number of crossing upgrades = 0 |
| | Miles Streambank recontour = 0 |
| | Queen Creek Reconnect = 3 |
| | Risk rating = 3 |
| Harass/Disturbance: | same as suspended sediment |
| | Risk rating = 3 |

Total risk rating = 12

***Box Sing Creek***

| | |
|---|---|
| Water yield: | Existing ECA = 6 |
| | Predicted ECA = 15 |
| | Risk Rating = 2 |
| Sediment yield: | Existing yield = 21 percent over base |
| | Predicted peak yield = 60 percent over base |
| | Acres slash treatment = 47 |
| | Risk rating = 4 |
| Suspended sediment: | Number of crossing upgrades = 0 |
| | Miles Streambank recontour = 0 |
| | Risk rating = 0 |
| Harass/Disturbance: | same as suspended sediment |
| | Risk rating = 0 |

Total risk rating = 6

***Kirks Fork***

| | |
|---|---|
| Water yield: | Existing ECA = 2 |
| | Predicted ECA = 3 |
| | Risk rating = 0 |
| Sediment yield: | Existing yield = 5 percent over base |
| | Predicted peak yield = 8 percent over base |
| | Acres slash treatment = 56 |
| | Risk rating = 2 |
| Suspended sediment: | Number of crossing upgrades = 1 |
| | Miles Streambank recontour = 0 |
| | Risk rating = 1 |
| Harass/Disturbance: | same as suspended sediment |
| | Risk rating = 1 |

Total risk rating = 4

***Little Elk Creek***

| | |
|---|---|
| Water yield: | Existing ECA = 11 |
| | Predicted ECA = 11 |
| | Risk rating = 0 |
| Sediment yield: | Existing yield = 24 percent over base |
| | Predicted peak yield = 24 percent over base |
| | Acres slash treatment = 7 |
| | Risk rating = 0 |
| Suspended sediment: | Number of crossing upgrades = 0 |
| | Miles Streambank recontour = 0 |
| | Risk rating = 0 |

| | |
|---|---|
| Harass/Disturbance: | same as suspended sediment |
| | Risk rating = 0 |

Total risk rating = 0

***Lower Elk Creek***

| | |
|---|---|
| Water yield: | Existing ECA = 14 |
| | Predicted ECA = 14 |
| | Risk rating = 0 |
| Sediment yield: | Existing yield = 16 percent over base |
| | Predicted peak yield = 18 percent over base |
| | Acres slash treatment = 97 |
| | Risk rating = 2 |
| Suspended sediment: | Number of crossing upgrades = 0 |
| | Miles Streambank recontour = 0 |
| | Risk rating = 0 |
| Harass/Disturbance: | same as suspended sediment |
| | Risk rating = 0 |

Total risk rating = 2

***Lower American River***

| | |
|---|---|
| Water yield: | Existing ECA = 9 |
| | Predicted ECA = 11 |
| | Risk rating = 1 |
| Sediment yield: | Existing yield = 15 percent over base |
| | Predicted peak yield = 22 percent over base |
| | Acres slash treatment = 554 |
| | Risk rating = 3 |
| Suspended sediment: | Number of crossing upgrades = 2 |
| | Miles Streambank recontour = 1.2 |
| | Risk rating = 3 |
| Harass/Disturbance: | same as suspended sediment |
| | Risk rating = 3 |

Total risk rating = 10

***South Fork Clearwater River***

| | |
|---|---|
| Water yield: | Existing ECA = 9 |
| | Predicted ECA = 11 |
| | Risk rating = 0 |
| Sediment yield: | Existing yield = 16percent over base |
| | Predicted peak yield = 19 percent over base |
| | Acres slash treatment = 0 |
| | Risk rating = 1 |
| Suspended sediment: | Number of crossing upgrades = 0 |
| | Miles Streambank recontour = 0 |
| | Risk rating = 0 |
| Harass/Disturbance: | same as suspended sediment |
| | Risk rating = 0 |

Total risk rating = 1